October 24, 2025

VIA E-FILING

Debbie-Anne Reese, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Subject: Pillager Hydroelectric Project (FERC Project No. 2663) Draft Application for New License for Major Water Power Project, 10 MW or Less

Dear Secretary Reese:

ALLETE, Inc., doing business as Minnesota Power (MP or Licensee), hereby submits to the Federal Energy Regulatory Commission (Commission or FERC) the Draft License Applications (DLAs) for the Little Falls Hydroelectric Project (Little Falls Project) (FERC No. 2532), Sylvan Hydroelectric Project (Sylvan Project) (FERC No. 2454), and Pillager Hydroelectric Project (Pillager Project) (FERC No. 2663), collectively referred to as the "Projects."

The Little Falls Project is a 4.720-megawatt (MW) run-of-river (ROR) facility located on the Mississippi River in Morrison County, Minnesota. The Sylvan Project is a 1.800-MW ROR facility located on the Crow Wing River in Cass, Crow Wing, and Morrison counties, Minnesota. The Pillager Project is a 1.520-MW ROR facility located on the Crow Wing River in Cass and Morrison counties, Minnesota. The FERC licenses for the Projects expire on March 31, 2028. The Licensee is using the Commission's Integrated Licensing Process (ILP) to relicense the Projects concurrently, due to the proximity and similarities of the Projects.

In accordance with 18 Code of Federal Regulation (CFR) Sections 4 and 5, as amended by 86 Federal Register (FR) 42710 August 5, 2021, the Projects are considered to be Major Water Power Projects, 10 MW or Less. The three Projects have three separate license applications, with a consolidated Exhibit E. The DLA for the Pillager Project has been prepared in conformance with 18 CFR § 4.61 and includes the following:

Initial Statement	
Exhibit A	Project Description
Exhibit E	Environmental Report
Exhibit F	General Design Drawings and Supporting Design Report
Exhibit G	Project Map
Exhibit H	Description of Project Management and Need for Project Power

The DLA is organized into volumes based on the sensitivity classification of the information therein. Volume I of the DLA is the public volume, Volume II contains Critical Energy Infrastructure Information (CEII), and Volume III contains privileged information. Volume II and Volume III are submitted under separate cover for the Commission's non-public file.

In accordance with the Commission's Order No. 630 (68 FR 9857), Exhibit F contains CEII and is being filed as such. CEII portions of Exhibit F contain sensitive and detailed engineering information that, if used incorrectly, may compromise the safety of the Projects and those responsible for its proper operation. Members of the public requesting CEII information for the Projects must comply with the Commission's procedures for obtaining access to CEII as required under CFR §388.113. All public requests for CEII should be made to the Commission's CEII Coordinator.

Revised cultural resource studies are being filed in Volume III due to the sensitive cultural resource information contained therein.

In accordance with the Commission's regulations at 18 CFR §4.38(c)(4)(iii) and §16.8(c)(4)(iii), MP is requesting review and comment on the DLA. Comments are due within 90 days of this distribution, or by January 22, 2026.

Please feel free to contact me with any questions or comments. I can be reached by phone at 218-355-3191 or via email at gprom@allete.com.

Best Regards,



Greg Prom
Senior Environmental Compliance Specialist
ALLETE, Inc., d.b.a. Minnesota Power
30 West Superior Street
Duluth, Minnesota 55802-2093

Attachments: Distribution List
Draft License Application for the Pillager Project (FERC P-2663)

Distribution List

Little Falls (P-2532), Sylvan (P-2454), Pillager (P-2663) Hydroelectric Projects
Relicensing Distribution List

Federal Agencies

Tammie Poitra
Director, Midwest Regional Office
Midwest Regional Office
U.S. Bureau of Indian Affairs
5600 West American Blvd, Suite 500
Bloomington, Minnesota 55437

Mary Manydeeds
Chief, Branch of Water and Dam Safety
Midwest Regional Office
U.S. Bureau of Indian Affairs
5600 West American Blvd, Suite 500
Bloomington, Minnesota 55437

Bob Edstrom
FERC Coordinator
U.S. Army Corps of Engineers
Saint Paul District
190 5th St East Suite 700
Saint Paul, Minnesota 55101-1638

Darin Simpkins
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
2661 Scott Tower Drive
New Franken, Wisconsin 54229-9565

David Thomson
Hydropower Coordinator
National Park Service
601 Riverfront Drive
Omaha, Nebraska 68102-4226

Tribes

Durell Cooper III
Chairman
Apache Tribe of Oklahoma
P.O. Box 1330
Anadarko, Oklahoma 73005

Robert Blanchard
Chairman
Bad River Band of Lake Superior Chippewa Indians of the Bad River Reservation, Wisconsin
P.O. Box 39
Odanah, Wisconsin 54861

Larry "Moose" Plucinski
Tribal Historic Preservation Officer
Bad River Band of Lake Superior Chippewa Indians of the Bad River Reservation, Wisconsin
P.O. Box 39
Odanah, Wisconsin 54861

Gavin D'Acquisto
Deputy Tribal Historic Preservation Officer
Bad River Band of Lake Superior Chippewa Indians of the Bad River Reservation, Wisconsin
P.O. Box 39
Odanah, Wisconsin 54861

Reggie Wassana
Governor
Cheyenne and Arapaho Tribes of Oklahoma
P.O. Box 38
Concho, Oklahoma 73022

Max Bear
Tribal Historic Preservation Officer
Cheyenne and Arapaho Tribes of Oklahoma
700 Black Kettle Boulevard
Concho, Oklahoma 73022

Anthony Reider
President
Flandreau Santee Sioux Tribe of South Dakota
P.O. Box 283
Flandreau, South Dakota 57028

Garrie Kills-A-Hundred
Tribal Historic Preservation Officer
Flandreau Santee Sioux Tribe of South Dakota
P.O. Box 283
Flandreau, South Dakota 57028

Jeffery Stiffarm
President
Fort Belknap Indian Community of the Fort Belknap Reservation of Montana
158 Tribal Way
Harlem, Montana 59526

Michael Blackwolf
Tribal Historic Preservation Officer
Fort Belknap Indian Community of the Fort Belknap Reservation of Montana
656 Agency Main Street
Harlem, Montana 59526

Timothy Rhodd
Chairman
Iowa Tribe of Kansas and Nebraska
3345 Thrasher Road
White Cloud, Kansas 66439

Alan Kelley
Tribal Historic Preservation Officer
Iowa Tribe of Kansas and Nebraska
3345-B Thrasher Road
White Cloud, Kansas 66094

Robert R.D. Curtis Jr.
President
Keweenaw Bay Indian Community, Michigan
16429 Beartown Road
Baraga, Michigan 49908

Alden Connor
Tribal Historic Preservation Officer
Keweenaw Bay Indian Community, Michigan
16429 Beartown Road
Baraga, Michigan 49908

Sarah Thompson
Tribal Historic Preservation Office
Lac du Flambeau Band of Lake Superior Chippewa Indians of the Lac du Flambeau Reservation of Wisconsin
P.O. Box 67
Lac du Flambeau, Wisconsin 54538

James Williams, Chairman
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
P.O. Box 249
Watersmeet, Michigan 49969

Alina Shively
Tribal Historic Preservation Officer
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
P.O. Box 249
Watersmeet, Michigan 49969

Lisa Brunk
Deputy Tribal Historic Preservation Officer
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
P.O. Box 249
Watersmeet, Michigan 49969

Robert Larsen
President
Lower Sioux Indian Community in the State of Minnesota
P.O. Box 308
Morton, Minnesota 56270

Cheyanne St. John
Tribal Historic Preservation Officer
Lower Sioux Indian Community in the State of Minnesota
P.O. Box 308
Morton, Minnesota 56270

Gena Kakkak
Chairperson
Menominee Indian Tribe of Wisconsin
P.O. Box 910
Keshena, Wisconsin 54135

David Grignon
Tribal Historic Preservation Officer
Menominee Indian Tribe of Wisconsin
P.O. Box 910
Keshena, Wisconsin 54135

Carlos Hernandez
Chairperson
Minnesota Chippewa Tribe - Bois Forte Band (Nett Lake)
5344 Lake Shore Drive
Nett Lake, Minnesota 55772

Jaylen Strong
Tribal Historic Preservation Officer
1500 Bois Forte Road
Tower, Minnesota 55790
Minnesota Chippewa Tribe - Bois Forte Band

Bruce Savage
Chairman
Minnesota Chippewa Tribe - Fond du Lac Band
1720 Big Lake Road
Cloquet, Minnesota 55720

Evan Schroeder
Tribal Historic Preservation Officer
Minnesota Chippewa Tribe - Fond du Lac Band
28 University Road
Cloquet, Minnesota 55720

Robert Deschampe
Chairman
Minnesota Chippewa Tribe - Grand Portage Band
P.O. Box 428
Grand Portage, Minnesota 55605

Rob Hull
Tribal Historic Preservation Officer
Minnesota Chippewa Tribe - Grand Portage Band
P.O. Box 428
Grand Portage, Minnesota 55605

Faron Jackson Sr.
Chairman
Minnesota Chippewa Tribe - Leech Lake Band
190 Sailstar Drive NW
Cass Lake, Minnesota 56633

Gina Lemon
Tribal Historic Preservation Officer
Minnesota Chippewa Tribe - Leech Lake Band
190 Sailstar Drive NE
Cass Lake, Minnesota 56633

Virgil Wind
Chief Executive
Minnesota Chippewa Tribe - Mille Lacs Band
43408 Oodena Drive
Onamia, Minnesota 56359

Mike Wilson
Tribal Historic Preservation Officer
Minnesota Chippewa Tribe - Mille Lacs Band
43408 Oodena Drive
Onamia, Minnesota 56359

Susan Klapel
Executive Director of Natural Resources
Minnesota Chippewa Tribe - Mille Lacs Band
43408 Oodena Drive
Onamia, Minnesota 56359

Michael Fairbanks
Chairman
Minnesota Chippewa Tribe - White Earth Band
P.O. Box 418 (Hwy 224)
White Earth, Minnesota 56591

Jaime Arsenault
Tribal Historic Preservation Officer
Minnesota Chippewa Tribe - White Earth Band
P.O. Box 418 (Hwy 224)
White Earth, Minnesota 56591

Michael LaRoque
President
Minnesota Chippewa Tribe, Minnesota
P.O. Box 217
Cass Lake, Minnesota 56633

Jane Rea-Bruce
Executive Assistant
Minnesota Chippewa Tribe, Minnesota
P.O. Box 217
Cass Lake, Minnesota 56633

Sarah Bartell
Office Manager
Prairie Island Indian Community in the State of Minnesota
5636 Sturgeon Lake Road
Welch, Minnesota 55089

Noah White
Tribal Historic Preservation Officer
Prairie Island Indian Community in the State of Minnesota
5636 Sturgeon Lake Road
Welch, Minnesota 55089

Nicole Boyd
Chairman
Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin
88385 Pike Road Highway 13
Bayfield, Wisconsin 54814

Marvin DeFoe
Tribal Historic Preservation Officer
Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin
88385 Pike Road Highway 13
Bayfield, Wisconsin 54814

Darrell Seki
Chairman
Red Lake Band of Chippewa Indians
P.O. Box 550
Red Lake, Minnesota 56671

George Branchaud
Tribal Historic Preservation Officer
Red Lake Band of Chippewa Indians
P.O. Box 274
Red Lake, Minnesota 56671

Alonzo Denney
Chairman
Santee Sioux Nation, Nebraska
108 Spirit Lake Avenue West
Niobrara, Nebraska 68760-7219

Larry Thomas
Tribal Historic Preservation Officer
Santee Sioux Nation, Nebraska
425 Frazier Avenue North, Suite 2
Niobrara, Nebraska 68760

Cole Miller
Chairman
Shakopee Mdewakanton Sioux Community of Minnesota
2330 Sioux Trail, NW
Prior Lake, Minnesota 55372-9077

Leonard Wabasha
Tribal Historic Preservation Officer
Shakopee Mdewakanton Sioux Community of Minnesota
2330 Sioux Trail, NW
Prior Lake, Minnesota 55372-9077

J. Garret Renville
Tribal Chairman
Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota
P.O. Box 509
Agency Village, South Dakota 57262

Dianne Desrosiers
Tribal Historic Preservation Officer
Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota
P.O. Box 709
Agency Village, South Dakota 57262

Robert VanZile
Chairman
Sokaogon Chippewa Community, Wisconsin
3051 Sand Lake Road
Crandon, Wisconsin 54520

Michael LaRonge
Tribal Historic Preservation Officer
Sokaogon Chippewa Community, Wisconsin
3051 Sand Lake Road
Crandon, Wisconsin 54520

Lonna Jackson-Street
Chairperson
Spirit Lake Tribe, North Dakota
P.O. Box 359
Fort Totten, North Dakota 58335

Kenneth Graywater
Tribal Historic Preservation Officer
Spirit Lake Tribe, North Dakota
P.O. Box 198
Fort Totten, North Dakota 58335

Janet Alkire
Chairperson
Standing Rock Sioux Tribe of North & South Dakota
P.O. Box D
Fort Yates, North Dakota 58538

Courtney Yellow Fat
Tribal Historic Preservation Officer
Standing Rock Sioux Tribe of North & South Dakota
P.O. Box D
Fort Yates, North Dakota 58538

Kathleen Wooden Knife
President
Rosebud Sioux Tribe of the Rosebud Indian Reservation, South Dakota
P.O. Box 430
Rosebud, South Dakota 57570

Ione Quigley
Tribal Historic Preservation Officer
Rosebud Sioux Tribe of the Rosebud Indian Reservation, South Dakota
P.O. Box 750
Rosebud, South Dakota 57570

Jamie Azure
Chairman
Turtle Mountain Band of Chippewa Indians of North Dakota
P.O. Box 900
Belcourt, North Dakota 58316

Larus Longie
Tribal Historic Preservation Officer
Turtle Mountain Band of Chippewa Indians of North Dakota
P.O. Box 900
Belcourt, North Dakota 58316

Kevin Jensvold
Chairman
Upper Sioux Community, Minnesota
P.O. Box 147
Granite Falls, Minnesota 56241

Samantha Odegard
Tribal Historic Preservation Officer
Upper Sioux Community, Minnesota
P.O. Box 147
Granite Falls, Minnesota 56241

State Agencies

John Jaschke, Executive Director
Minnesota Board of Water & Soil Resources
520 Lafayette Road North
Saint Paul, Minnesota 55155-0001

Lucy Harrington
State Historic Preservation Office
Minnesota Department of Administration
203 Administration Building
50 Sherburne Avenue
Saint Paul, Minnesota 55155

Shannon Geshick
Executive Director
Minnesota Indian Affairs Council
161 Saint Anthony Avenue, Suite 919
Saint Paul, Minnesota 55103

George Googleye, Jr.
Cultural Resource Manager
Minnesota Indian Affairs Council
161 Saint Anthony Avenue, Suite 919
Saint Paul, Minnesota 55103

Jill Townley
Environmental Review Supervisor
Minnesota Department of Natural Resources
500 Lafayette Road
Saint Paul, Minnesota 55155-4025

Dan O'Shea
River Ecology Unit/Ecological and Water Resource Division
Minnesota Department of Natural Resources
500 Lafayette Road
St. Paul, Minnesota 55155-4025

Jason Boyle
Dam Safety Engineer
Minnesota Department of Natural Resources
500 Lafayette Road
Eco. Resources - Box 25

Eric Altena
Area Fisheries Supervisor
Minnesota Department of Natural Resources
16543 Haven Road
Little Falls, Minnesota 56345

Robert Tipping
Director
Minnesota Geological Survey
2609 Territorial Road
Saint Paul, Minnesota 55114-1032

Jennifer Tworzyanski
Assistant to the State Archaeologist
Minnesota Office of the State Archaeologist
328 West Kellogg Boulevard
Saint Paul, Minnesota 55102

Jesse Anderson
Research Scientist
Minnesota Pollution Control Agency
525 South Lake Avenue, Suite 400
Duluth, Minnesota 55802

Bonnie Finnerty
Watershed Project Manager
Minnesota Pollution Control Agency
7678 College Road, Suite 105
Baxter, Minnesota 56425

Bill Wilde
Pollution Control Specialist
Minnesota Pollution Control Agency
520 Lafayette Rd. N.
St. Paul, Minnesota 55155

Sasha Bergman
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
Saint Paul, Minnesota 55101-2163

Local Governments

Josh Stevenson
Administrator
Cass County, Minnesota
P.O. Box 3000
Walker, Minnesota 56484

Deborah A. Erickson
County Administrator
Crow Wing County, Minnesota
326 Laurel Street, Suite 13
Brainerd, Minnesota 56401

Matt LeBlanc
Administrator
Morrison County, Minnesota
213 1st Avenue SE
Little Falls, Minnesota 56345

Wendy Zylka
City Clerk
City of Little Falls, Minnesota
100 Northeast Seventh Avenue
P.O. Box 244
Little Falls, Minnesota 56345-0244

Alex Smith
City Administrator
City of Little Falls, Minnesota
100 Northeast Seventh Avenue
P.O. Box 244
Little Falls, Minnesota 56345-0244

Greg Kimman
Public Works Director/Engineer
City of Little Falls, Minnesota
100 Northeast Seventh Avenue
P.O. Box 244
Little Falls, Minnesota 56345-0244

Mike LeMieur
District 1 Commissioner
Green Prairie Township, Minnesota
19227 Ginger Road
Little Falls, Minnesota 56345

Amy Walker
Clerk
Rosing Township, Minnesota
8497 Azalea Road
Pillager, Minnesota 56473

Jenna Ruggles
Clerk
Sylvan Township, Minnesota
12956 24th Avenue SW
Pillager, Minnesota 56473

Dave Kavanaugh
Mayor
East Gull Lake City, Minnesota
10790 Gull Point Road
East Gull Lake, Minnesota 56401

Lori Blumke
City Clerk/Treasurer
City of Pillager, Minnesota
306 Elm Avenue West
Pillager, Minnesota 56473

Bianca Wyffels
Clerk
May Township, Minnesota
5834 112th Street SW
Pillager, Minnesota 56473

Ken Swecker
Clerk
Motley Township, Minnesota
4032 Azalea Road
Motley, Minnesota 56466

Darrel Olson
Mayor
City of Baxter, Minnesota
13190 Memorywood Drive
Baxter, Minnesota 56425

Dave Badeaux
Mayor
Brainerd, Minnesota
501 Laurel Street
Brainerd, Minnesota 56401

Non-Governmental Organizations

Tim Terrill
Mississippi Headwaters Board
Land Services Building
322 Laurel Street
Brainerd, Minnesota 56401

Morrison County Historical Society
2151 South Lindbergh Drive
P.O. Box 239
Little Falls, Minnesota 56345

Crow Wing County Historical Society
320 Laurel Street
Brainerd, Minnesota 56401

Cass County Historical Society
P.O. Box 505
205 Minnesota Avenue W.
Walker, Minnesota 56484

Ray Nelson
Friends of Old Crow Wing
320 Laurel Street
Brainerd, Minnesota 56401

Roy Luukkonen
Friends of Old Crow Wing
320 Laurel Street
Brainerd, Minnesota 56401

Don Wedll
Friends of Old Crow Wing
320 Laurel Street
Brainerd, Minnesota 56401

Stephen Schaitberger
Friends of Old Crow Wing
1402 S 8th Street
Brainerd, Minnesota 56401

Licensee

Mark Kayser
Manager-Renewable Business Operations
ALLETE, Inc., d.b.a. Minnesota Power
360 State Highwater 210
Jay Cooke State Park
Carlton, Minnesota 55718

Greg Prom
Senior Environmental Compliance Specialist
ALLETE, Inc., d.b.a. Minnesota Power
30 West Superior Street
Duluth, Minnesota 55802

Jackson Evans
Attorney
ALLETE, Inc., d.b.a. Minnesota Power
30 West Superior Street
Duluth, Minnesota 55802

Matthew Radzak
ALLETE, Inc., d.b.a. Minnesota Power
30 West Superior Street
Duluth, Minnesota 55802

Lesley Brotkowski
Senior Regulatory Advisor
Kleinschmidt Associates
233403 Stettin Ridge Court
Wausau, Wisconsin 54401

Draft License Application for the Pillager Project (FERC P-2663)

PILLAGER HYDROELECTRIC PROJECT
FERC NO. 2663

DRAFT INITIAL STATEMENT

BEFORE THE
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Pillager Hydroelectric Project **FERC Project No. 2663**

DRAFT APPLICATION FOR LICENSE FOR A MAJOR WATER POWER PROJECT, 10 MW OR LESS[1]

INITIAL STATEMENT

(Pursuant to 18 CFR §4.61)

1. ALLETE, Inc. (Licensee or Applicant), doing business as Minnesota Power (MP), applies to the Federal Energy Regulatory Commission (FERC or Commission) for a New License for the Pillager Hydroelectric Project (Pillager Project), an existing licensed major project, as described hereafter. The Pillager Project is licensed as FERC Project No. 2663. The current license for the Pillager Project was issued by order dated April 27, 1998.[2] This license will expire on March 31, 2028.

2. The location of the Pillager Project is:

State:	Minnesota
County:	Cass and Morrison
Township or nearby town:	Sylvan Township, Rosing Township, May Township, and Motley Township
Stream or body of water:	Crow Wing River

[1] Pursuant to the regulations of 18 CFR Sections 4 and 5, as amended by 86 FR 42710 August 5, 2021, the Pillager Project is considered to be a Major Water Power Project, 10 MW or less.

[2] 83 ¶ 62,073 (1998).

3. The exact name, business address, and telephone number of the Applicant are:

   ALLETE, Inc.
   30 West Superior Street
   Duluth, Minnesota 55802-2093
   Phone: 218-279-5000

4. The exact name, business address, and telephone number of each person authorized to act as agent for the Applicant in this application are:

   Mark Kayser
   Manager-Renewable Business Operations
   ALLETE, Inc., d.b.a. Minnesota Power
   360 State Highwater 210
   Jay Cooke State Park
   Carlton, Minnesota 55718
   Phone: 218-725-2101
   Email: mkayser@mnpower.com

   Greg Prom
   Senior Environmental Compliance Specialist
   ALLETE, Inc., d.b.a. Minnesota Power
   30 West Superior Street
   Duluth, Minnesota 55802-2093
   Phone: 218-355-3191
   Email: gprom@allete.com

   It is requested that copies of all correspondence pertaining to this application also be provided to:

   Lesley Brotkowski
   Senior Regulatory Advisor
   Kleinschmidt Associates
   233403 Stettin Ridge Court
   Wausau, Wisconsin 54401
   Phone: 715-318-3729
   Email: Lesley.Brotkowski@KleinschmidtGroup.com

5. The Applicant, ALLETE, Inc., is a domestic business corporation organized under the laws of the State of Minnesota and is not claiming preference under Section 7(a) of the Federal Power Act (See 16 U.S.C. 796).
6. (i) The statutory or regulatory requirements of the State of Minnesota, the state in which the Pillager Project is located, which would, assuming jurisdiction and applicability, affect the Pillager Project with respect to bed and banks, and to the appropriation, diversion, and use of water for power purposes, and with respect to the right to engage in the business of developing, transmitting, and distributing power, and in any other business necessary to accomplish the purposes of the license under the Federal Power Act are:

    a. Minnesota Statutes, sections:

        a. 103A.203 states that the Minnesota Legislature found the public health, safety, and welfare of the state are promoted by the use of state waters to produce hydroelectric power.

        b. 103F.125 indicates that proper consideration should be given to the needs of an industry whose business requires that it be located within a floodplain.

        c. 103G.127 delegates authority to the Commissioner of Natural Resources, with the concurrence of Board of Water and Soil Resources and the Commissioner of Agriculture, to establish a program for regulating the discharge of material into waters of the state as necessary to obtain approval from the United States Environmental Protection Agency to administer the permit program under Section 404 of the Clean Water Act.

        d. 103G.245 requires a state-issued permit to make changes in a reservoir, dam, waterway, or on a public water in any manner or diminish the course, current, or cross-section of public waters.

    b. Minnesota Administrative Rules, parts:

        a. 6115.0190 requires permit authority to place fill into public waters.

        b. 6115.0200 requires permit authority to excavate and remove material in public waters.

        c. 6115.0210 requires permit authority for construction of structures in public waters.

    (ii) The steps the Applicant has taken, or plans to take, to comply with each of the laws cited above are:

a. The Applicant will apply to the Minnesota Pollution Control Agency (MPCA) for a Water Quality Certificate pursuant to Section 401 of the Federal Clean Water Act and Minnesota Statutes, Section 103G.245.

b. There are no changes planned at the Pillager Project and, therefore, no changes that would diminish the course, current, or cross-section of public waters.

c. There are no current construction projects planned at the Pillager Project requiring permits under Minnesota Regulations.

7. Brief Project Description:

The Pillager Project is a 1.520-megawatt (MW) run-of-river facility located on the Crow Wing River in Cass and Morrison counties, Minnesota. The Pillager Project works consists of a powerhouse with two generating units, a 615-acre reservoir known as Lake Placid, a concrete gravity dam with gated spillways, earth embankments, and dikes along the reservoir shoreline, and associated infrastructure. The complete Pillager Project description is in Exhibit A.

(i) The currently authorized and proposed generating capacity is 1.520 MW. The Licensee is not proposing to modify or add facilities or operations at this time.

(ii) Check appropriate box:

☒ Existing Dam ☐ Unconstructed Dam

☐ Existing Dam, Major Modified Project (see § 4.30(b)(14))

8. Lands of the United States.

There are no lands of the United States within the Pillager Project Boundary, and no lands of the United States are affected by Pillager Project operations.

	Name	Acres
(i) National Forest	N/A	0
(ii) Indian Reservation	N/A	0
(iii) Public Lands Under Jurisdiction of	N/A	0
(iv) Other	N/A	0
(v) Total U.S. Lands	N/A	0

(vi) Check appropriate box:

☒ Surveyed Land ☐ Unsurveyed Land

9. Construction of the Project.

   The Pillager Project is an existing hydroelectric project. No construction is planned at this time.

(Pursuant to 18 CFR §4.32)

1. Identify every person, citizen, association of citizens, domestic corporation, municipality, or state that has or intends to obtain and will maintain any proprietary right necessary to construct, operate, or maintain the project:

   The Applicant possesses all proprietary rights necessary to construct, operate, and maintain the Pillager Project.

2. Identify (providing names and mailing addresses):

   (i) Every county in which any part of the project, and any federal facilities that would be used by the project, would be located:

   Cass County, Minnesota
   P.O. Box 3000
   Walker, Minnesota 56484

   Morrison County, Minnesota
   213 1st Avenue SE
   Little Falls, Minnesota 56345

   There are no federal facilities used by the Pillager Project.

   (ii) Every city, town, or similar local political subdivision:

   (A) In which any part of the project, and any federal facilities that would be used by the project, would be located; or

   Rosing Township
   8497 Azalea Road
   Pillager, Minnesota 56473

Sylvan Township
12956 24th Avenue SW
Pillager, Minnesota 56473

May Township
5834 112th Street SW
Pillager, Minnesota 56473

Motley Township
4032 Azalea Road
Motley, Minnesota 56466

There are no federal facilities used by the Pillager Project.

(B) That has a population of 5,000 or more people and is located within 15 miles of the project dam:

City of Baxter, Minnesota
13190 Memorywood Drive
Baxter, Minnesota 56425

Brainerd, Minnesota
501 Laurel Street
Brainerd, Minnesota 56401

(iii) Every irrigation district, drainage district, or similar special purpose political subdivision:

(A) In which any part of the project, and any federal facilities that would be used by the project, would be located; or

Mississippi Headwaters Board
Land Services Building
322 Laurel Street
Brainerd, Minnesota 56401

(B) That owns, operates, maintains, or uses any project facilities that would be used by the project:

None. The Pillager Project uses no federal facilities and occupies no federal lands.

(iv) Every other political subdivision in the general area of the project that there is reason to believe would likely be interested in, or affected by, the application; and

There are no other political districts or subdivisions that are likely to be interested in or affected by the application.

(v) All Indian tribes that may be affected by the project.

The Licensee is not aware that the Pillager Project affects any Native American Tribe. The following is a listing of Native American Tribes that may have some level of interest in the area surrounding the Pillager Project and have been included on the relicensing Distribution List:

Apache Tribe of Oklahoma
P.O. Box 1330
Anadarko, Oklahoma 73005

Bad River Band of Lake Superior Chippewa Indians of the Bad River Reservation, Wisconsin
P.O. Box 39
Odanah, Wisconsin 54861

Cheyenne and Arapaho Tribes of Oklahoma
P.O. Box 38
Concho, Oklahoma 73022

Fort Belknap Indian Community of the Fort Belknap Reservation of Montana
158 Tribal Way
Harlem, Montana 59526

Iowa Tribe of Kansas and Nebraska
3345 Thrasher Road
White Cloud, Kansas 66439

Keweenaw Bay Indian Community, Michigan
16429 Beartown Road
Baraga, Michigan 49908

Lac du Flambeau Band of Lake Superior Chippewa Indians of the Lac du Flambeau Reservation of Wisconsin
P.O. Box 67
Lac du Flambeau, Wisconsin 54538

Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
P.O. Box 249
Watersmeet, Michigan 49969

Menominee Indian Tribe of Wisconsin
P.O. Box 910
Keshena, Wisconsin 54135

Minnesota Chippewa Tribe – Bois Forte Band (Nett Lake)
5344 Lake Shore Drive
Nett Lake, Minnesota 55772

Minnesota Chippewa Tribe – Fond du Lac Band
1720 Big Lake Road
Cloquet, Minnesota 55720

Minnesota Chippewa Tribe – Grand Portage Band
P.O. Box 428
Grand Portage, Minnesota 55605

Minnesota Chippewa Tribe – Leech Lake Band
6530 U.S. Hwy 2 Northwest
Cass Lake, Minnesota 56633

Minnesota Chippewa Tribe – Mille Lacs Band
43408 Oodena Drive
Onamia, Minnesota 56359

Minnesota Chippewa Tribe, Minnesota
P.O. Box 217
Cass Lake, Minnesota 56633

Minnesota Chippewa Tribe – White Earth Band
P.O. Box 418 (Hwy 224)
White Earth, Minnesota 56591

Red Lake Band of Chippewa Indians
P.O. Box 550
Red Lake, Minnesota 56671

Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin
88385 Pike Road Highway 13
Bayfield, Wisconsin 54814

Sokaogon Chippewa Community, Wisconsin
3051 Sand Lake Road
Crandon, Wisconsin 54520

Upper Sioux Community of Minnesota
P.O. Box 147
Granite Falls, Minnesota 56241

3. *(i) For a license (other than a license under Section 15 of the Federal Power Act), state that the applicant has made, either at the time of or before filing the application, a good faith effort to give notification by certified mail of the filing of the application to:*

(A) Every property owner of record of any interest in the property within the bounds of the project, or in the case of the project without a specific project boundary, each such owner of property which would underlie or be adjacent to any project works including any impoundments; and

Property owners of lands within the Little Falls Project Boundary will be notified by a Certificate of Service attached to the transmittal letter of the Final License Application. Landowners affected by proposed Project Boundary additions will be notified by certified mail per 18 CFR § 5.17.

(B) The entities identified in paragraph (a)(2) of this section, as well as any other federal, state, municipal, or other local government agencies that there is reason to believe would likely be interested in or affected by such application.

A Certificate of Service will be attached to the transmittal letter of the Final License Application.

(ii) Such notification must contain the name, business address, and telephone number of the applicant and a copy of the Exhibit G contained in the application and must state that a license application is being filed with the Commission.

The notification will contain the name, business address, and telephone number of the Applicant. The notification will also include a copy of the Exhibit G and statement that the license application is being filed with the Commission.

4. *(i) As to any facts alleged in the application or other materials filed, be subscribed and verified under oath in the form set forth in paragraph (a)(3)(B) of this section by the person filing, an officer thereof, or other person having knowledge of the matters set forth. If the subscription and verification is by anyone other than the person filing or an officer thereof, it must include a statement of the reasons therefor.*

   The subscription for this application will be signed by a person authorized to act as agent for the Applicant.

5. *Contain the information and documents prescribed in the following Sections of this chapter, except as provided in paragraph (b) of this Section, according to the type of application.*

   The application is for a major water power project, 10 MW or less, and contains the following information per 18 CFR § 4.61:

   Initial Statement

   Exhibit A – Project Description

   Exhibit E – Environmental Report

   Exhibit F – General Design Drawings and Supporting Design Report

   Exhibit G – Project Map

   Exhibit H – Description of Project Management and Need for Project Power

SUBSCRIPTION
[To be completed in the Final License Application]

This Application for New License for the Pillager Hydroelectric Project, FERC Project No. 2663, is executed in the State of Minnesota, County of _____, by Signee of ALLETE, Inc. (30 West Superior Street, Duluth, Minnesota 55802-2093), who, being duly sworn, deposes and says that the contents of this application are true to the best of their knowledge or belief and that they are authorized to execute this application. The undersigned has signed this application this _____ day of _____, 2025.

ALLETE, Inc.

By: _____

Name: _____

Title: _____

VERIFICATION

Subscribed and sworn to before me, a Notary Public of the State of Minnesota this _____ day of _____, 2025.

_____

(Notary Public)

(My Commission Expires _____)/seal

PILLAGER HYDROELECTRIC PROJECT
FERC NO. 2663

DRAFT EXHIBIT A
PROJECT DESCRIPTION

TABLE OF CONTENTS

1.0 INTRODUCTION A-1

2.0 DESCRIPTION OF PROJECT AND PROPOSED MODE OF OPERATION (18 C.F.R. §4.61[C][1]) A-1
- 2.1 Overview A-1
- 2.2 Generating Units A-5
- 2.3 Turbine Characteristics A-5
- 2.4 Project Operation A-5
- 2.5 Average Annual Generation A-6
- 2.6 Average Head A-7
- 2.7 Reservoir Characteristics A-7
- 2.8 Hydraulic Capacity A-7
- 2.9 Project Facilities A-8
- 2.10 Estimated Project Cost A-9
- 2.11 Estimated Capital and Annual Costs of Proposed Environmental Measures A-9

3.0 PURPOSE OF THE PROJECT (18 C.F.R. § 4.61[C][2]) A-9

4.0 COST OF RELICENSING (18 C.F.R. § 4.61[C][3]) A-9

5.0 VALUE OF ON-PEAK AND OFF-PEAK VALUES OF PROJECT POWER (18 C.F.R. § 4.61[C][4]) A-10

6.0 CHANGE IN PROJECT GENERATION (18 C.F.R. § 4.61[C][5]) A-10

7.0 NET INVESTMENT (18 C.F.R. § 4.61[C][6]) A-10

8.0 ESTIMATED ANNUAL OPERATION AND MAINTENANCE EXPENSE OF THE PROJECT – 18 C.F.R. § 4.61 (C)(7) A-10

9.0 SINGLE-LINE DIAGRAM – 18 C.F.R. § 4.61 (C)(8) A-10

10.0 STATEMENT OF SAFE MANAGEMENT, OPERATION, AND MAINTENANCE – 18 C.F.R. § 4.61 (C)(9) A-11

11.0 REFERENCES A-11

LIST OF TABLES

Table 2-1: Pillager Project Specifications A-2

Table 2-2: Monthly, Annual, and Average Monthly Net Project Generation (MWh) for the Pillager Project for 2020–2024 ..... A-6

Table 2-3: Annual and Monthly Average, Minimum, and Maximum (cfs) Mississippi River Flow at the Pillager Project, January 1, 1995, to December 31, 2024 ..... A-8

LIST OF FIGURES

Figure 2-1: Pillager Project Facilities Overview A-4

APPENDICES

Appendix A-1: Flow Duration Curves

Appendix A-2: Pillager Project Single-Line Diagram (CEII)

DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

Applicant	ALLETE, Inc.
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulations
cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission
FERC	Federal Energy Regulatory Commission
kW	kilowatt
kV	kilovolt
Licensee	ALLETE, Inc.
Minnesota DNR	Minnesota Department of Natural Resources
MW	megawatt
MWh	megawatt-hour
NGVD 29	National Geodetic Vertical Datum of 1929
Pillager Project	Pillager Hydroelectric Project, FERC No. 2663
PME	protection, mitigation, and enhancement
USGS	United States Geological Survey

1.0 INTRODUCTION

Minnesota Power (MP), a subsidiary of ALLETE, Inc. (Licensee or Applicant), has prepared this Exhibit A Project Description as part of its application for a new license from the Federal Energy Regulatory Commission (FERC or Commission) for the Pillager Hydroelectric Project (P-2663) (Pillager Project). The Pillager Project is a 1.520-megawatt (MW) run-of-river (ROR) facility located on the Crow Wing River in Cass and Morrison counties, Minnesota. This exhibit is prepared in conformance with 18 Code of Federal Regulations (CFR) §5.18 and 18 CFR §4.61. This exhibit conforms to the content requirements of Exhibit A as described in 18 CFR §4.61(c).

2.0 DESCRIPTION OF PROJECT AND PROPOSED MODE OF OPERATION (18 C.F.R. §4.61[C][1])

2.1 Overview

Table 2-1 summarizes existing specifications at the Pillager Project. The primary Pillager Project facilities are depicted on Figure 2-1.

The Pillager Project works consist of: (a) a 1,330-foot long earthfill section along the north shoreline of the reservoir (North Dike); (b) 225-foot long earthfill section with concrete core wall extending from the north side of the powerhouse to the natural earth embankment of the river (Left Embankment); (c) 98-foot long reinforced concrete powerhouse with two generating units with a total installed capacity of 1,520 kilowatts (kW); (d) 357-foot long concrete gravity rollway dam with 18 vertical slide gates separated by concrete piers; (e) 223-foot long earthfill section right embankment is separated from the spillway by a 3-foot thick concrete right abutment wall, extending from the south side of the spillway to the natural earth embankment of the river; (f) 85-foot long earthfill section along the south shoreline of the reservoir (South Dike) separated from the right embankment by approximately 600 feet; (g) approximately 615-acre reservoir (commonly known as Lake Placid) at normal pool elevation 1199.25 feet National Geodetic Vertical Datum of 1929 (NGVD 29); and (h) appurtenant facilities. The primary structures are concrete on a soil foundation flanked by earth embankments. The Pillager Project generators are connected to the electrical grid by a 150-foot long, 2.3-kilovolt (kV) interconnection line running from the powerhouse to a 2.3 kV/34.5 kV step-up

transformer and a 30-foot long, 34.5 kV interconnection line running from the transformer to the 44 switch (point of interconnect).

Table 2-1: Pillager Project Specifications

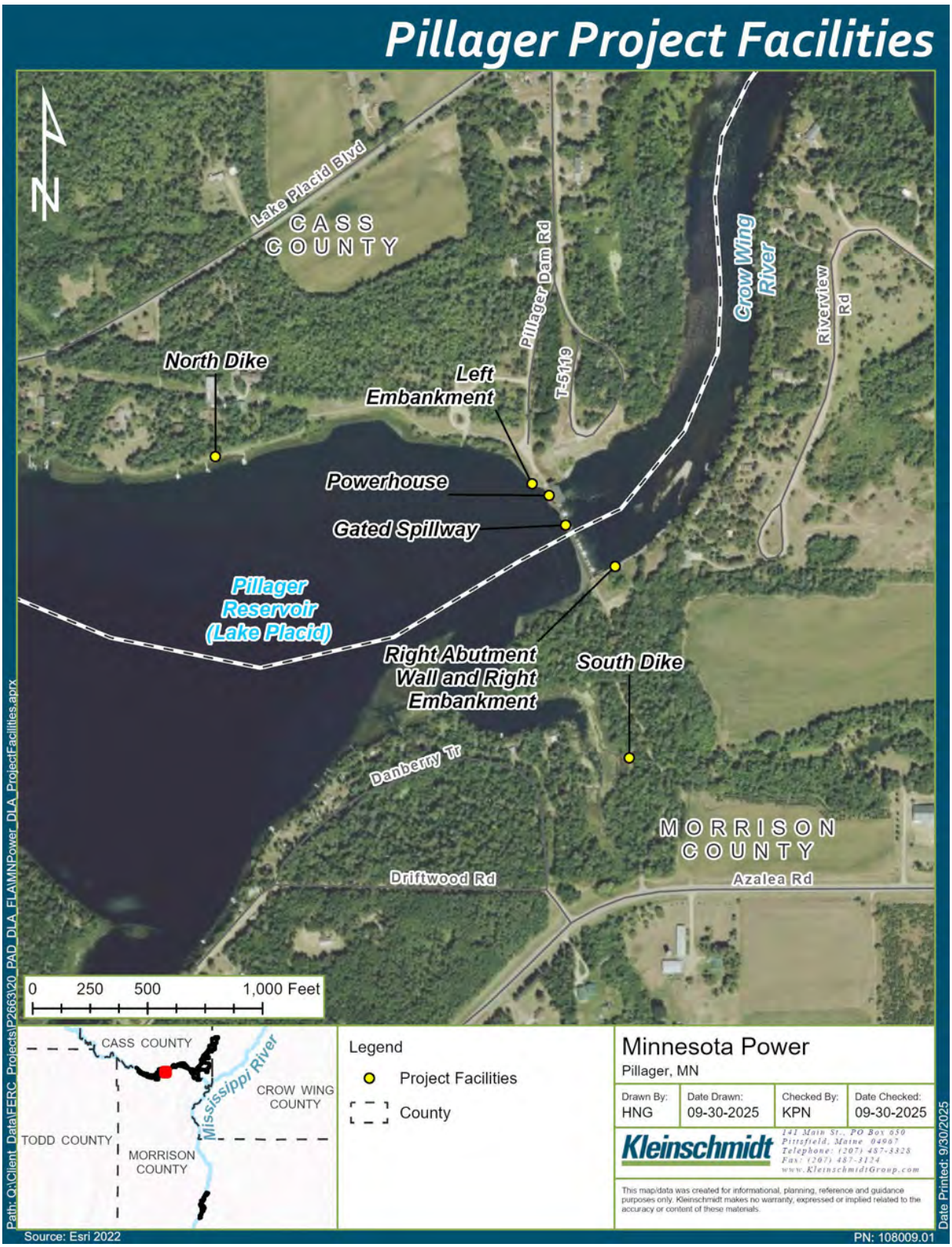
Pillager Project Description	Specification
General Information	
FERC Number	FERC P-2663
License Issuance Date	4/27/1993
License Expiration Date	3/31/2028
Licensed Capacity	1.520 MW
Project Location	Cass and Morrison counties, Minnesota
Drainage Area	3,230 square miles
Operation Type	Run-of-river
Generation	
Average Annual Generation	8,110 MWh
Dependable Capacity[1]	1.4 MW
Maximum Hydraulic Capacity	Unit 1: 610 cubic feet per second (cfs) Unit 2: 610 cfs Total: 1,220 cfs
Minimum Hydraulic Capacity	Unit 1: 250* cfs Unit 2: 250 cfs Total: 500 cfs *Minimum hydraulic capacity with one unit running is 250 cfs
Powerhouses	
Number of Powerhouses	One (1)
Turbine Generators	Two (2) turbine generator units
Unit 1	Installed Capacity: 760 kW RPM: 120 Type: Vertical Francis Manufacturer: Morgan-Smith/G.E. Year in Service: 1917
Unit 2	Installed Capacity: 760 kW RPM: 120 Type: Vertical Francis Manufacturer: Morgan-Smith/G.E. Year in Service: 1917

[1] Dependable capacity is based on Midcontinent Independent System Operator median output.

Pillager Project Description	Specification
Powerhouse Configuration	Reinforced concrete supported on timber piles. 98 feet by 37 feet, 51 feet high.
Reservoir (also known as Lake Placid)	
Normal Pool Elevation*	1199.25 feet
Surface Area of Reservoir	Approximately 615 acres at normal pool elevation
Storage Volume of Reservoir	4,600 acre-feet at normal pool elevation
Bottom of License Operating Band	1198.75 feet
Top of the License Operating Band	1199.75 feet
Dam / Spillways	
North Dike	1,330-foot long earth dike with a maximum height approximately 3 feet
Left Embankment	225-foot long, 25-foot high earth embankment with a 2-foot wide concrete core wall
Gated Spillway	357-foot long concrete gravity rollway (ogee crest shape) with a maximum height of 35 feet. Includes 18 steel vertical lift gates (Gates 1 through 16 vary in length from 18.4 feet to 20.7 feet, and Gates 17 and 18 are 6.0 feet and 4.0 feet wide, respectively)
Right Abutment Wall and Right Embankment	223-foot long, 15-foot high south earth embankment separated from the spillway by a 3-foot thick concrete right abutment wall
South Dike	85-foot long earthfill dike with a maximum height of approximately 3 feet
Interconnection Lines and Transformers	
Number of Interconnection Line(s)	Two (2)
Interconnection Line #1 Length and Voltage	150 feet, 2.3 kV
Transformer(s)	One (1) 2.3 kV/34.5 transformer
Interconnection Line #2 Length and Voltage	30 feet, 34.5 kV
Point of Interconnect	44 switch

* All elevations are in National Geodetic Vertical Datum of 1929 (NGVD 29).

Figure 2-1: Pillager Project Facilities Overview



2.2 Generating Units

The Pillager Project consists of two generating units with installed capacities as follows: Unit 1 is 760 kW, and Unit 2 is 760 kW. There are no provisions for future units.

2.3 Turbine Characteristics

Both Unit 1 and Unit 2 are equipped with vertical-axis Francis turbines.

2.4 Project Operation

The Pillager Project is remotely operated in ROR mode by the hydro operator located at MP's Thomson Station located in Carlton, Minnesota. Numerous parameters are continuously monitored by the hydro operator including reservoir and tailwater elevations, unit and waste gate flows, and generating unit status. The need for flow changes to maintain run-of-river is determined by the hydro operator. If local gate operation is required, maintenance personnel are dispatched as needed from the Little Falls Project. The Pillager Project is operated in a run-of-river mode whereby inflows at the dam match outflows, to the greatest extent possible. The pond level at the Pillager dam is maintained at elevation 1199.25 +/- 0.25 feet for flows less than 1,040 cubic feet per second (cfs) and at elevation 1199.25 +/- 0.50 feet for higher flows. The water flow to the turbines is adjusted to match available river flow.

The rate of change (ramping rate) in Pillager Project outflow (the total of both turbine and spillway discharges) is not to exceed 10 percent per hour unless the inflow changes at a greater rate. In the case of the inflow changing at a rate greater than 10 percent per hour, the actual rate of change in inflow or the 10 percent outflow change limit, whichever is greater, is considered the maximum outflow change limit. The need to exceed a 10 percent per hour outflow change limit is determined by whether the pond level change trend can be arrested with a 10 percent per hour change in outflow as maintaining pond level takes precedence over ramping rates.

Flood events require increased vigilance by the operator, maintenance personnel, and dam safety engineers. The operator closely monitors river conditions and weather forecasts; an additional operator may be called on-duty to assist during flood operations if needed. Maintenance completes additional debris control as needed to keep water flowing freely through the gates. Pike poles and pole saws are available to help flush

woody debris through the gates. Additional engineering inspections are completed at the discretion of the dam safety engineer.

The trigger level for activating the Emergency Action Plan under a High Flow Condition is 12,000 cfs. Most gates are fully open at this point, and maintenance personnel are dispatched to complete inspections more frequently. When the flow reaches 13,000 cfs, all gates must be fully open to maintain the pond level within the license operating band. If the flood continues to increase, the pond will surcharge.

The Licensee participates in the Mississippi River Low Flow Management Plan coordinated by the Minnesota Department of Natural Resources (Minnesota DNR 2015). The plan defines operating procedures for Mississippi River dams upstream of St. Paul, Minnesota, under low flow conditions. Low flow conditions of 1,500 cfs observed at Royalton (United States Geological Survey [USGS] Gage No. 05267000) trigger implementation of low flow procedure, with ramping rates of no more than 10 percent change in flow in 1 hour.

The Licensee is proposing to continue run-of-river operations. No changes to operations are proposed.

2.5 Average Annual Generation

The average annual generation for the period 2020–2024 was 8,110 megawatt-hours (MWh). Average monthly and annual generation data for the Pillager Project for the period 2020–2024 are contained in Table 2-2.

Table 2-2: Monthly, Annual, and Average Monthly Net Project Generation (MWh) for the Pillager Project for 2020–2024

Period	2020	2021	2022	2023	2024	Average
January	839	853	558	518	554	664
February	840	505	407	454	549	551
March	1,034	997	504	514	613	732
April	985	984	510	493	580	710
May	1,201	231	536	553	577	620
June	907	0	531	591	536	513

Period	2020	2021	2022	2023	2024	Average
July	1,027	1	593	432	578	526
August	1,080	121	617	310	585	543
September	1,076	499	597	253	587	602
October	1,103	605	603	578	597	697
November	1,072	595	536	494	579	655
December	891	525	504	548	450	584
Annual Total	**12,055**	**5,917**	**6,496**	**5,737**	**10,345**	**8,110**

2.6 Average Head

Estimated gross head for the Pillager Project is 27 feet.

2.7 Reservoir Characteristics

The surface area of the reservoir is approximately 615 acres at the normal pond elevation of 1199.25 feet. The net storage capacity of the reservoir is 4,600 acre-feet at normal pool elevation, and the gross storage capacity of the reservoir is approximately 4,900 acre-feet. However, as a run-of-river facility, the Pillager Project has no net useable storage capacity, and no peaking operations occur.

2.8 Hydraulic Capacity

The maximum and minimum hydraulic capacity of the Pillager Project are 1,220 cfs and 250 cfs, respectively, and are shown by unit in Table 2-1. Flows above the minimum and maximum hydraulic capacity of the Pillager Project occur approximately 99 percent and 44 percent of the time, respectively.

The average, minimum, and maximum flows at the Pillager Project for the period January 1, 1995, through December 31, 2024, are shown on Table 2-3 and were 1,367 cfs, 143 cfs, and 14,517 cfs, respectively. Daily average flow data at the Pillager Project were obtained from United States Geological Society (USGS) Gage No. 05247500 Crow Wing River near Pillager, Minnesota. The gage is approximately 7 river miles downstream of the Pillager Project and directly downstream of the Sylvan Project dam. The flow data were

prorated to the Pillager Project dam based on the ratio of the drainage area at the Pillager dam to the drainage area at USGS Gage No. 05247500 (3,230 square miles/3,760 square miles = 0.859) (USGS 2025). Annual and monthly flow duration curves for the Pillager Project are presented in Appendix A-1.

Table 2-3: Annual and Monthly Average, Minimum, and Maximum (cfs) Mississippi River Flow at the Pillager Project, January 1, 1995, to December 31, 2024

Month	Average (cfs)	Minimum (cfs)	Maximum (cfs)
January	836	356	1,847
February	798	344	3,384
March	1,489	409	11,339
April	3,294	602	14,517
May	2,753	829	8,384
June	2,216	415	8,848
July	1,599	264	5,979
August	1,127	143	3,513
September	1,056	200	3,677
October	1,346	382	5,815
November	1,283	164	3,797
December	993	258	3,505
Annual	**1,567**	**143**	**14,517**

Source: USGS 2025
Notes: cfs = cubic feet per second

2.9 Project Facilities

Specifications of the Pillager Project facilities are provided in Table 2-1. The Licensee is not proposing to modify or add any facilities at this time.

2.10 Estimated Project Cost

The total estimated original cost of the Pillager Project (including land and facilities) is unknown, as the Licensee's files do not date back to project construction. The net investment for the Pillager Project is provided in Section 7.0.

2.11 Estimated Capital and Annual Costs of Proposed Environmental Measures

Estimated annual operation and maintenance costs associated with proposed protection, mitigation, and enhancement (PME) measures for the Pillager Project include:

- $0 for run-of-river operation. This is a continuation of an existing measure and therefore does not represent a new cost to the Pillager Project;
- $10,000 initial cost for the development and implementation of a revised Land Management Plan;
- $0 for the continued protection of Natural Character Areas. This is a continuation of an existing measure and therefore does not represent a new cost to the Pillager Project;
- $10,000 initial cost for the development and implementation of a Historic Properties Management Plan; and
- Ongoing operation and support of the recreation sites is estimated at approximately $10,000 annually, which includes leasing land to the Minnesota Department of Natural Resources for the Pillager Dam Public Boat Launch, as well as maintenance of the Pillager Dam Public Canoe Portage and Shorefishing Access, and the Crow Wing River Canoe Campsite.

3.0 PURPOSE OF THE PROJECT (18 C.F.R. § 4.61[C][2])

The primary purpose of the Pillager Project is hydropower generation.

4.0 COST OF RELICENSING (18 C.F.R. § 4.61[C][3])

The total estimated costs incurred by the Licensee to develop the Pillager Project License Application are estimated to be $392,000. This includes consultation, studies, administrative, and legal costs.

5.0 VALUE OF ON-PEAK AND OFF-PEAK VALUES OF PROJECT POWER (18 C.F.R. § 4.61[C][4])

The Pillager Project operates in a run-of-river mode, and therefore, estimated values of on- and off-peak project power are not required.

6.0 CHANGE IN PROJECT GENERATION (18 C.F.R. § 4.61[C][5])

No change in operation is proposed; therefore, the estimated average Pillager Project generation and value of power will not increase or decrease due to operations.

7.0 NET INVESTMENT (18 C.F.R. § 4.61[C][6])

The net investment for the Pillager Project, based on the book value as of December 31, 2024, is $1,349,030. This should not be interpreted as the fair market value of the Pillager Project.

8.0 ESTIMATED ANNUAL OPERATION AND MAINTENANCE EXPENSE OF THE PROJECT – 18 C.F.R. § 4.61 (C)(7)

The estimated average annual operation and maintenance expense of the Pillager Project, including insurance, taxes, and administrative costs, is approximately $160,035.

9.0 SINGLE-LINE DIAGRAM – 18 C.F.R. § 4.61 (C)(8)

The single-line diagram for the Pillager Project is included in Appendix A-2, which is filed as Critical Energy Infrastructure Information (CEII).

10.0 STATEMENT OF SAFE MANAGEMENT, OPERATION, AND MAINTENANCE – 18 C.F.R. § 4.61 (C)(9)

The Licensee is committed to safe and compliant operation of the Pillager Project. The Licensee's Owners Dam Safety Program for the Pillager Project incorporates dam safety inspection components, monitoring responsibilities, and communications required for this dam classification and complies with safety regulations. The Pillager Project undergoes annual FERC dam safety reviews and generates regular updates to the Dam Safety Surveillance and Monitoring Plan, Dam Safety Surveillance and Monitoring Reports, Emergency Action Plan, and Public Safety Plan.

11.0 REFERENCES

Minnesota Department of Natural Resources (DNR). 2015. System-Wide Low-Flow Management Plan Mississippi River above St. Paul, Minnesota Revised June 2015. Available online: https://files.dnr.state.mn.us/natural_resources/climate/drought/Mississippi_River_Low_Flow_Management_Plan.pdf. Accessed October 21, 2025.

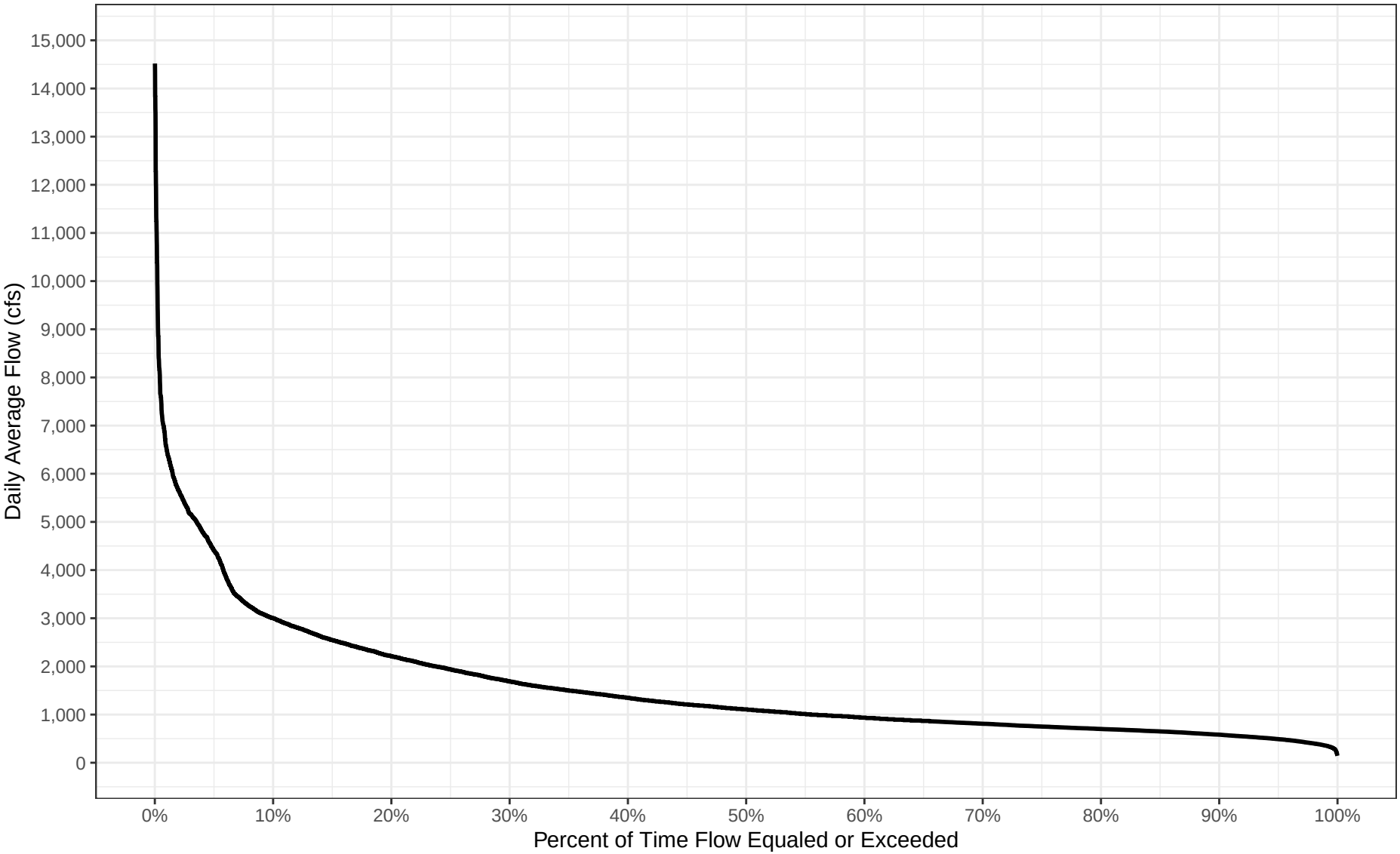
United States Geological Survey (USGS). 2025. USGS Gage No. 05247500 Crow Wing River near Pillager, MN. Available online: https://waterdata.usgs.gov/nwis/uv?site_no=05247500&legacy=1. Accessed July 28, 2025.

APPENDIX A-1

FLOW DURATION CURVES

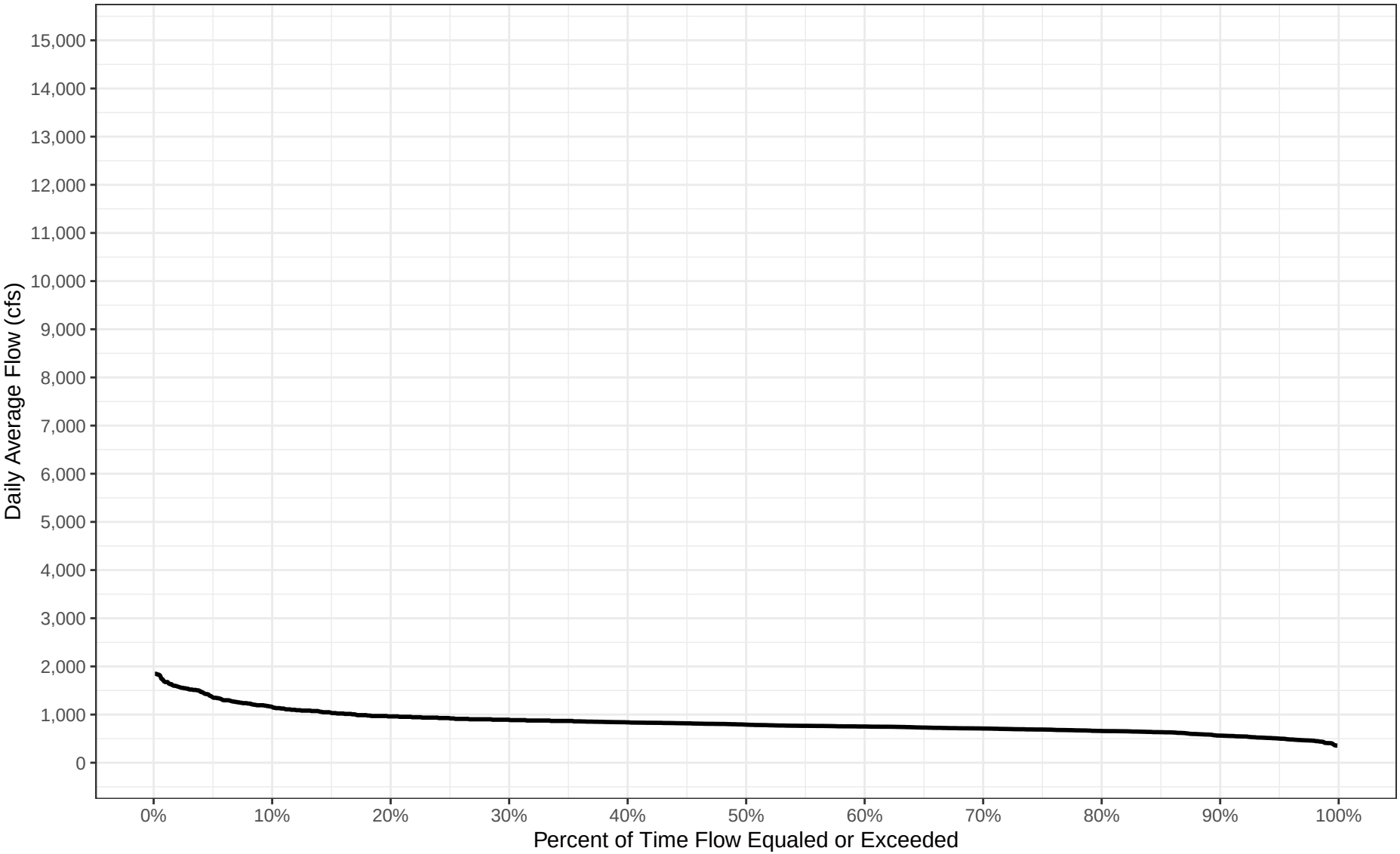
Pillager Project Annual Flow Duration Curve

Prorated from USGS Gage No. 05247500 Crow Wing River near Pillager, MN
Period of Record: January 1995 to December 2024



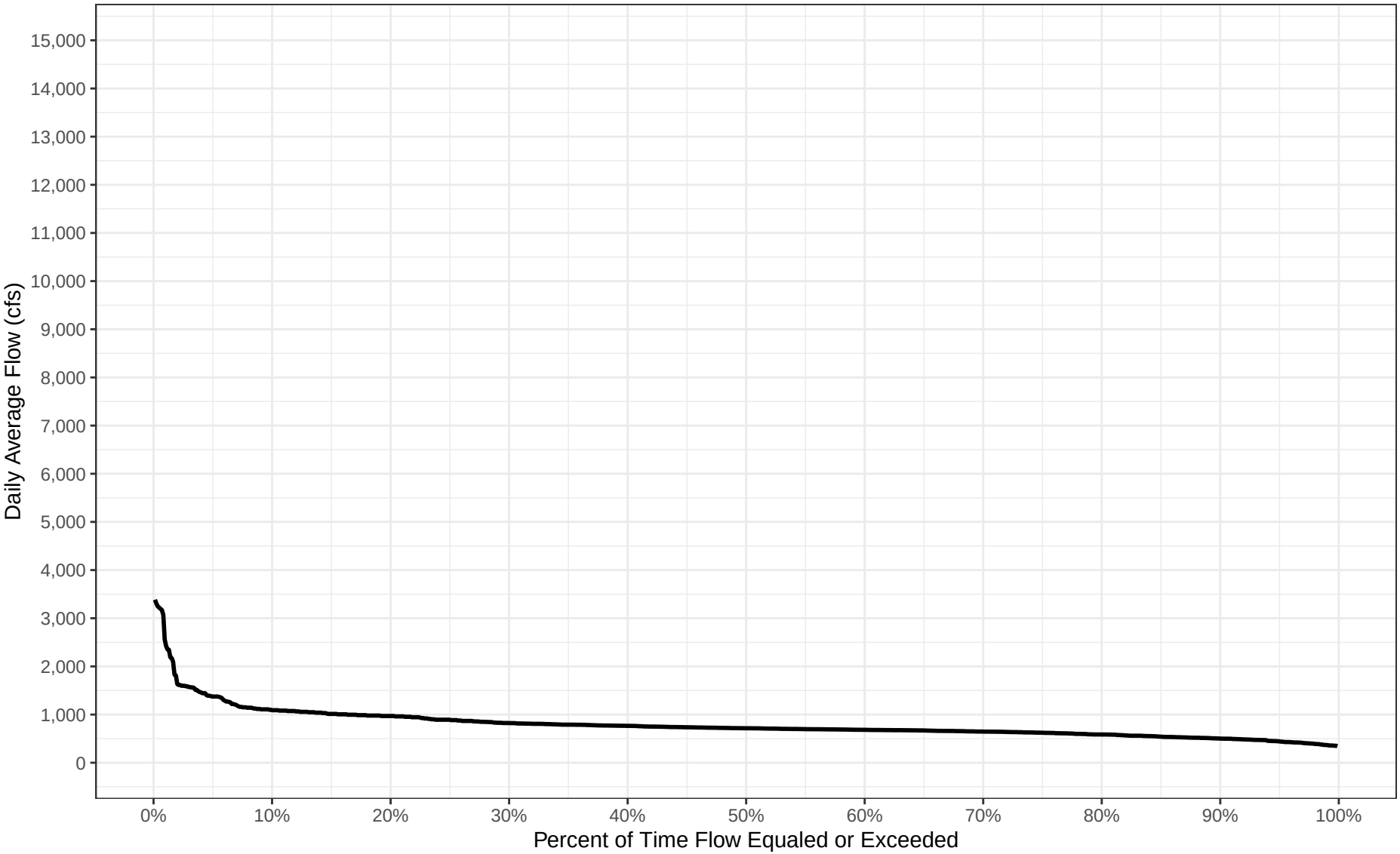
Pillager Project January Flow Duration Curve

Prorated from USGS Gage No. 05247500 Crow Wing River near Pillager, MN
Period of Record: January 1995 to December 2024



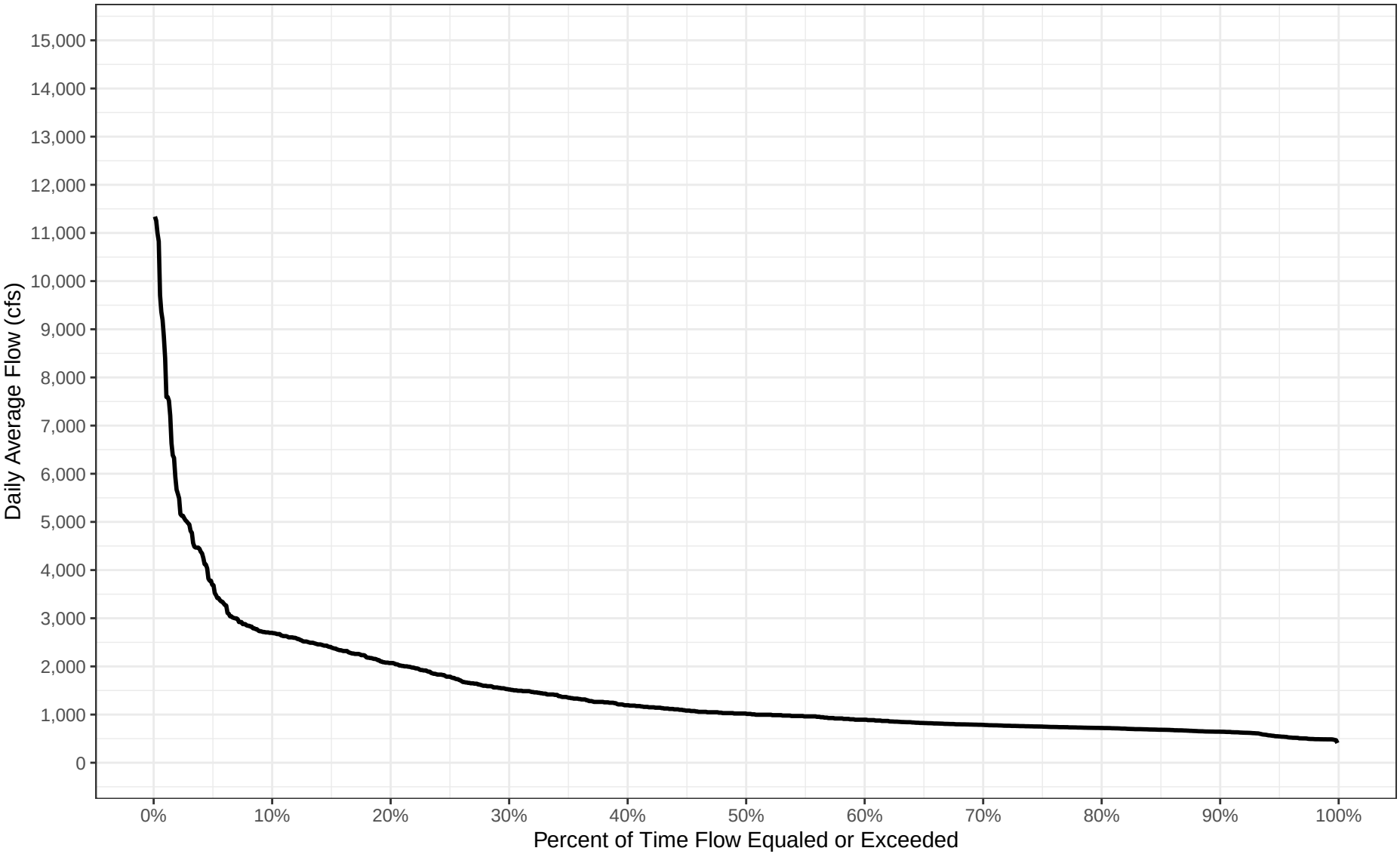
Pillager Project February Flow Duration Curve

Prorated from USGS Gage No. 05247500 Crow Wing River near Pillager, MN
Period of Record: January 1995 to December 2024



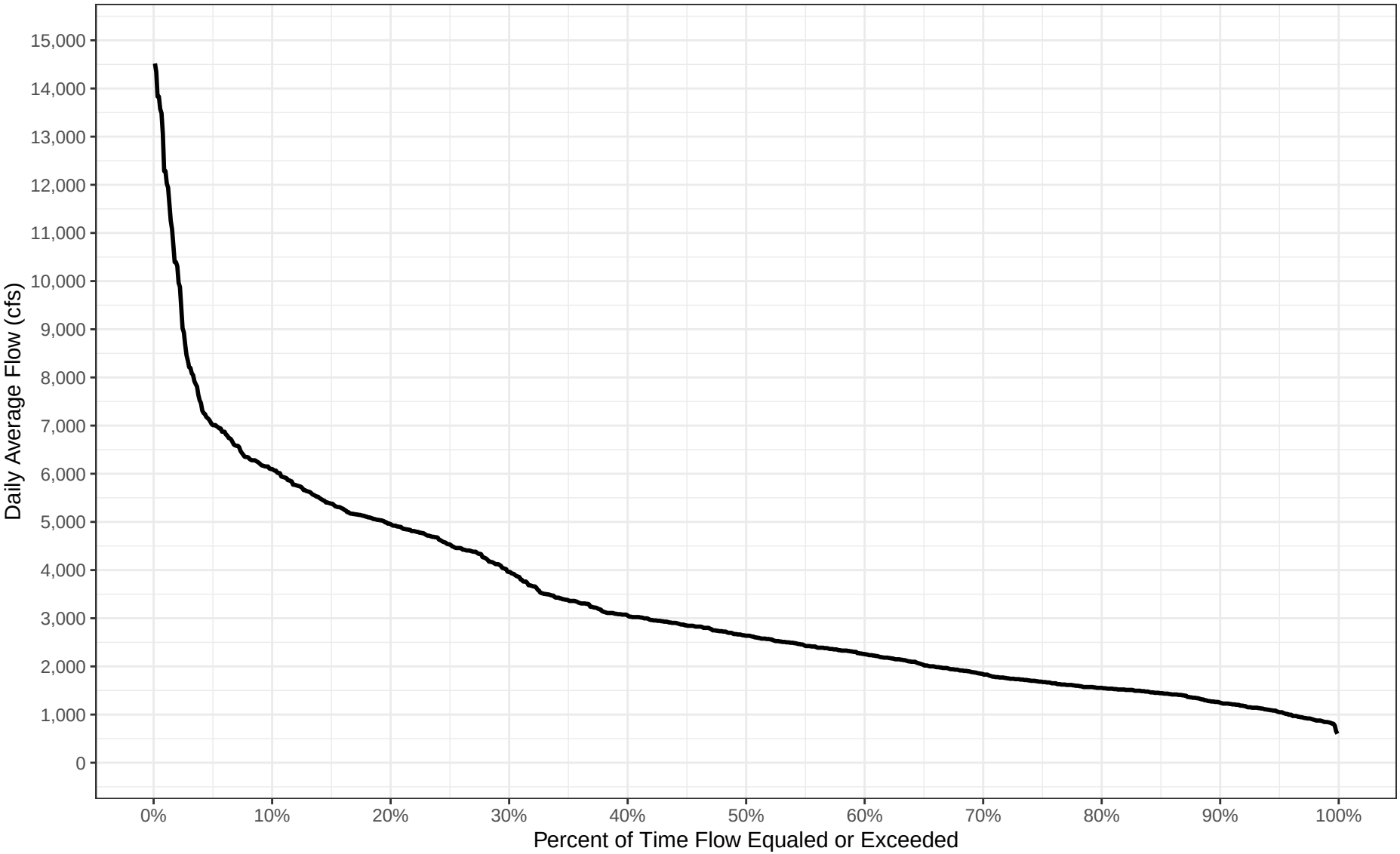
Pillager Project March Flow Duration Curve

Prorated from USGS Gage No. 05247500 Crow Wing River near Pillager, MN
Period of Record: January 1995 to December 2024



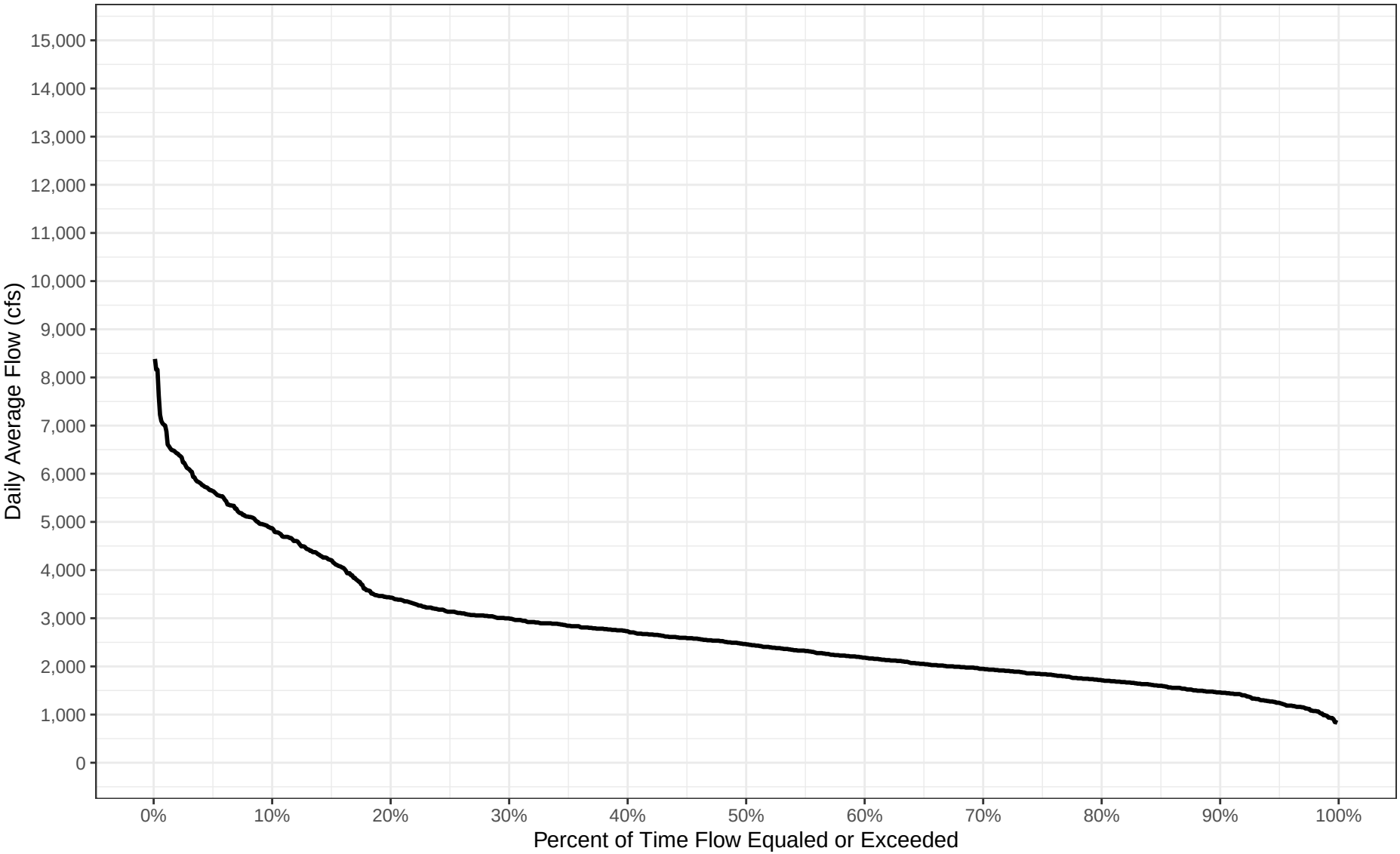
Pillager Project April Flow Duration Curve

Prorated from USGS Gage No. 05247500 Crow Wing River near Pillager, MN
Period of Record: January 1995 to December 2024



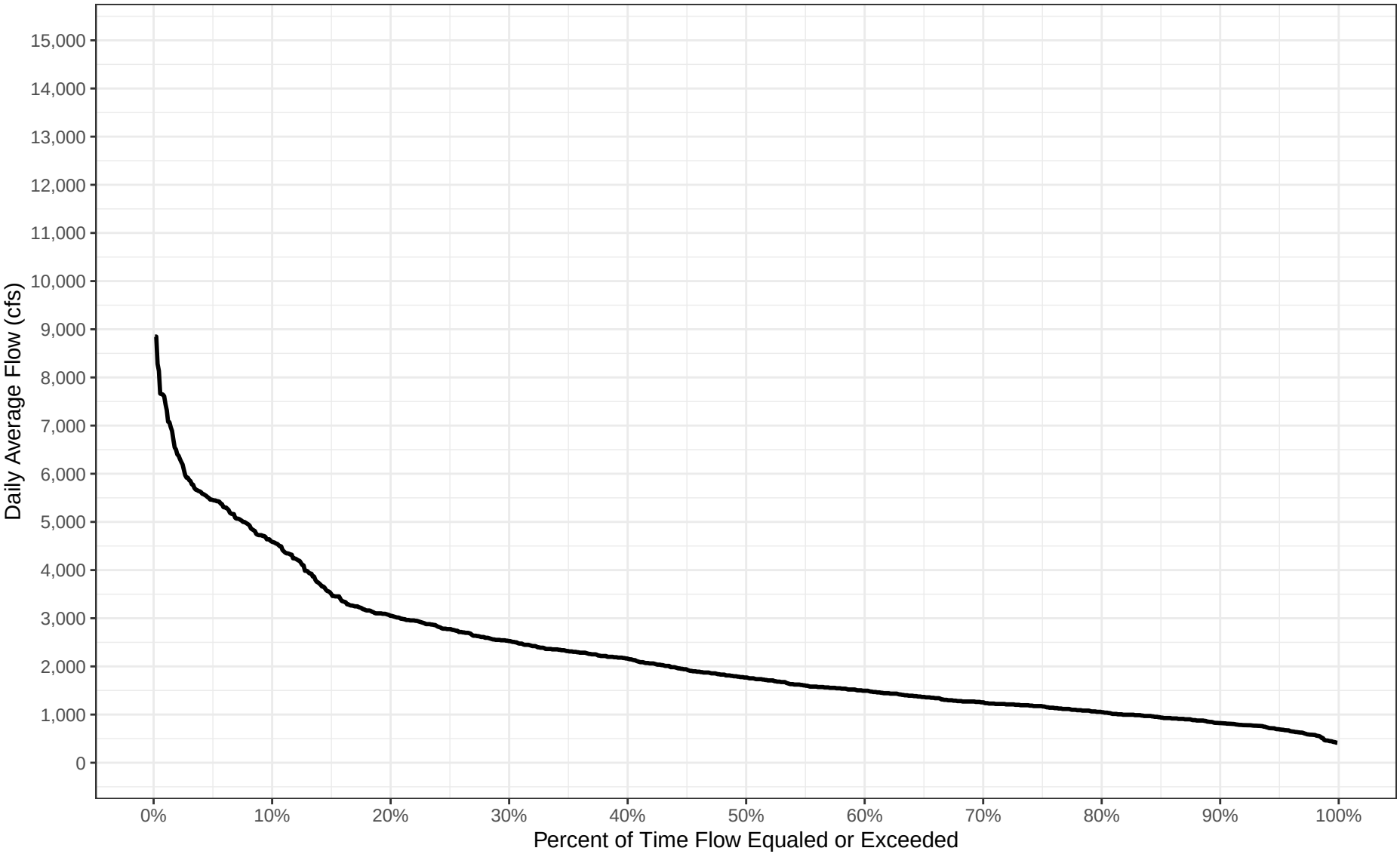
Pillager Project May Flow Duration Curve

Prorated from USGS Gage No. 05247500 Crow Wing River near Pillager, MN
Period of Record: January 1995 to December 2024



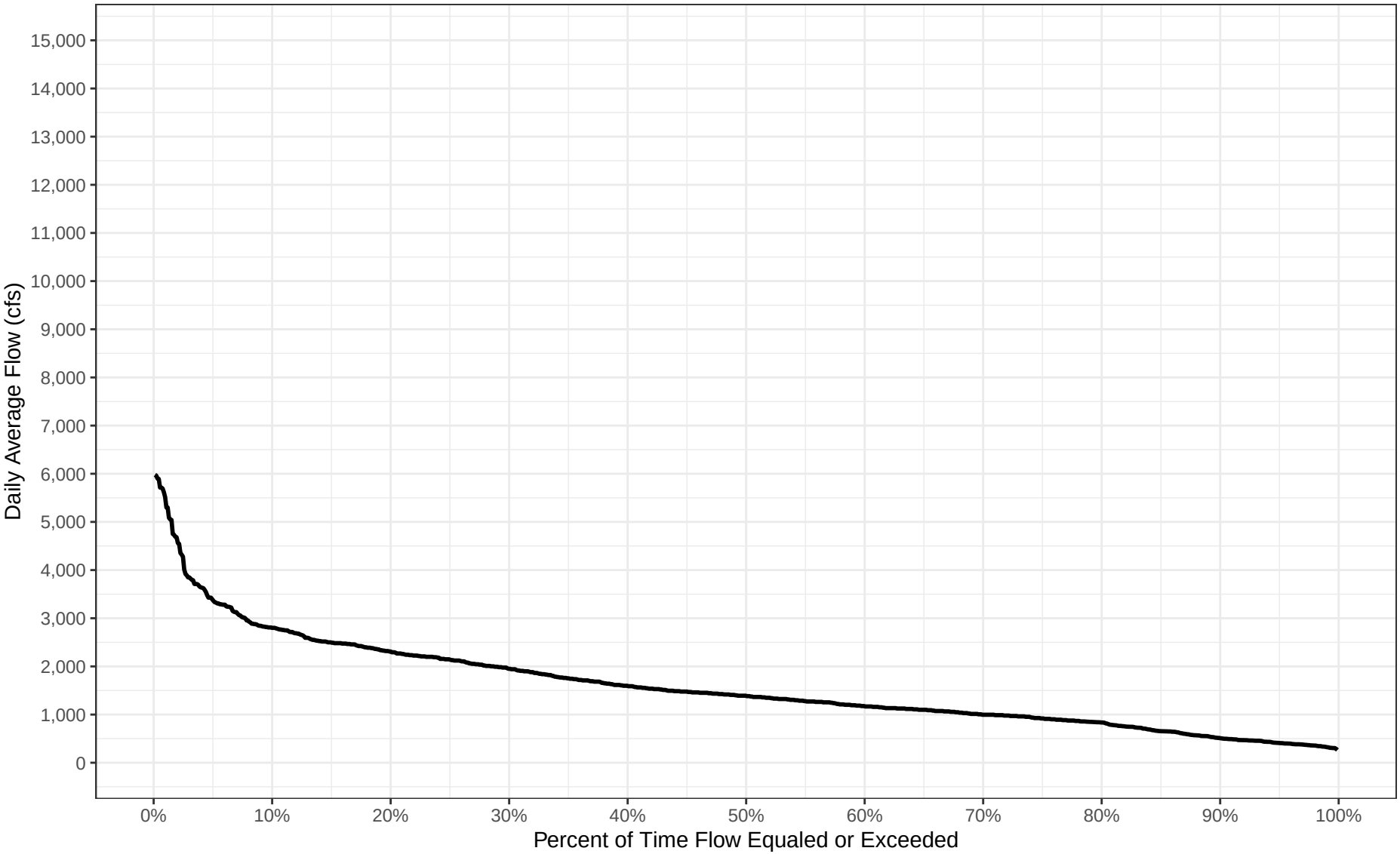
Pillager Project June Flow Duration Curve

Prorated from USGS Gage No. 05247500 Crow Wing River near Pillager, MN
Period of Record: January 1995 to December 2024



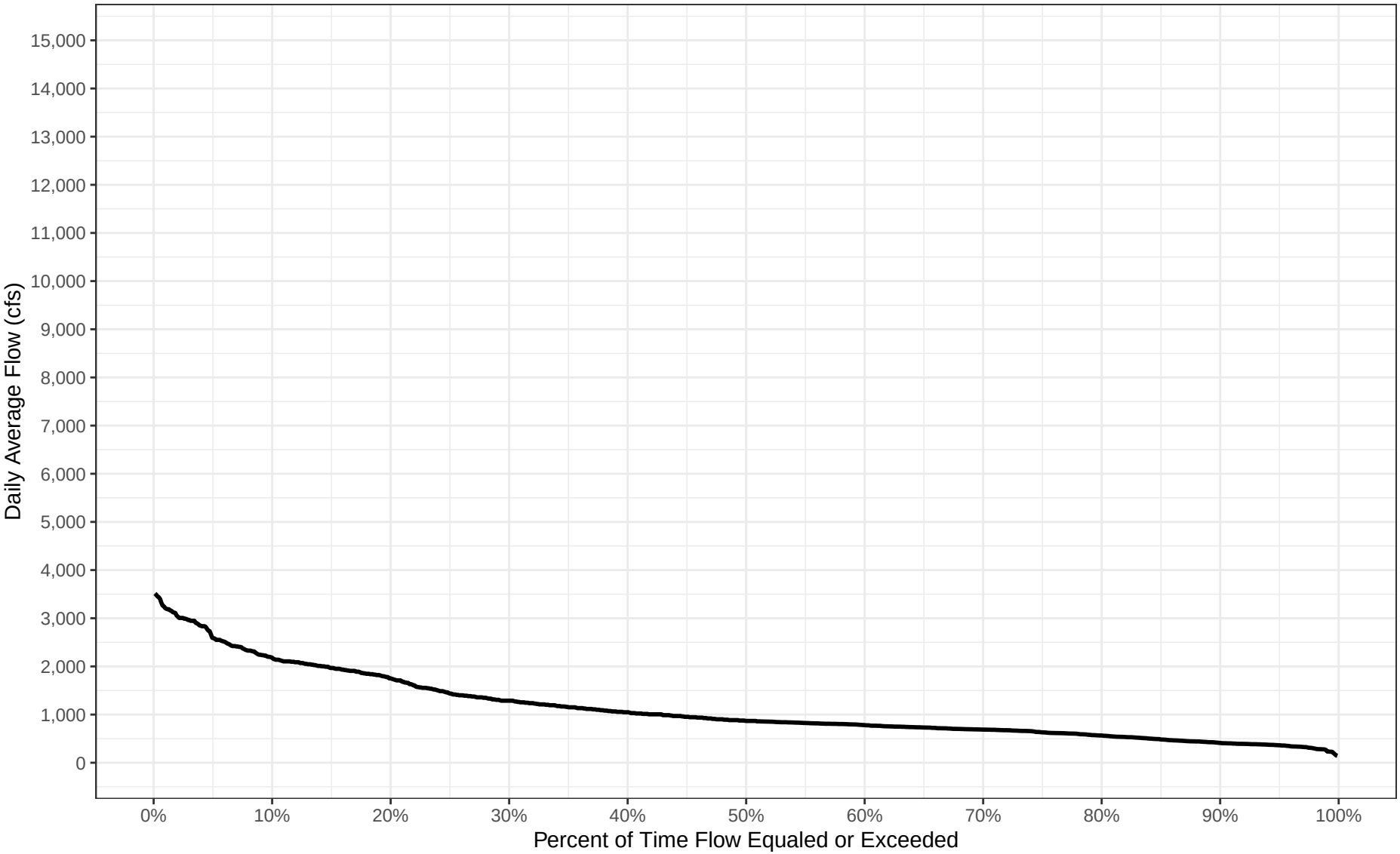
Pillager Project July Flow Duration Curve

Prorated from USGS Gage No. 05247500 Crow Wing River near Pillager, MN
Period of Record: January 1995 to December 2024



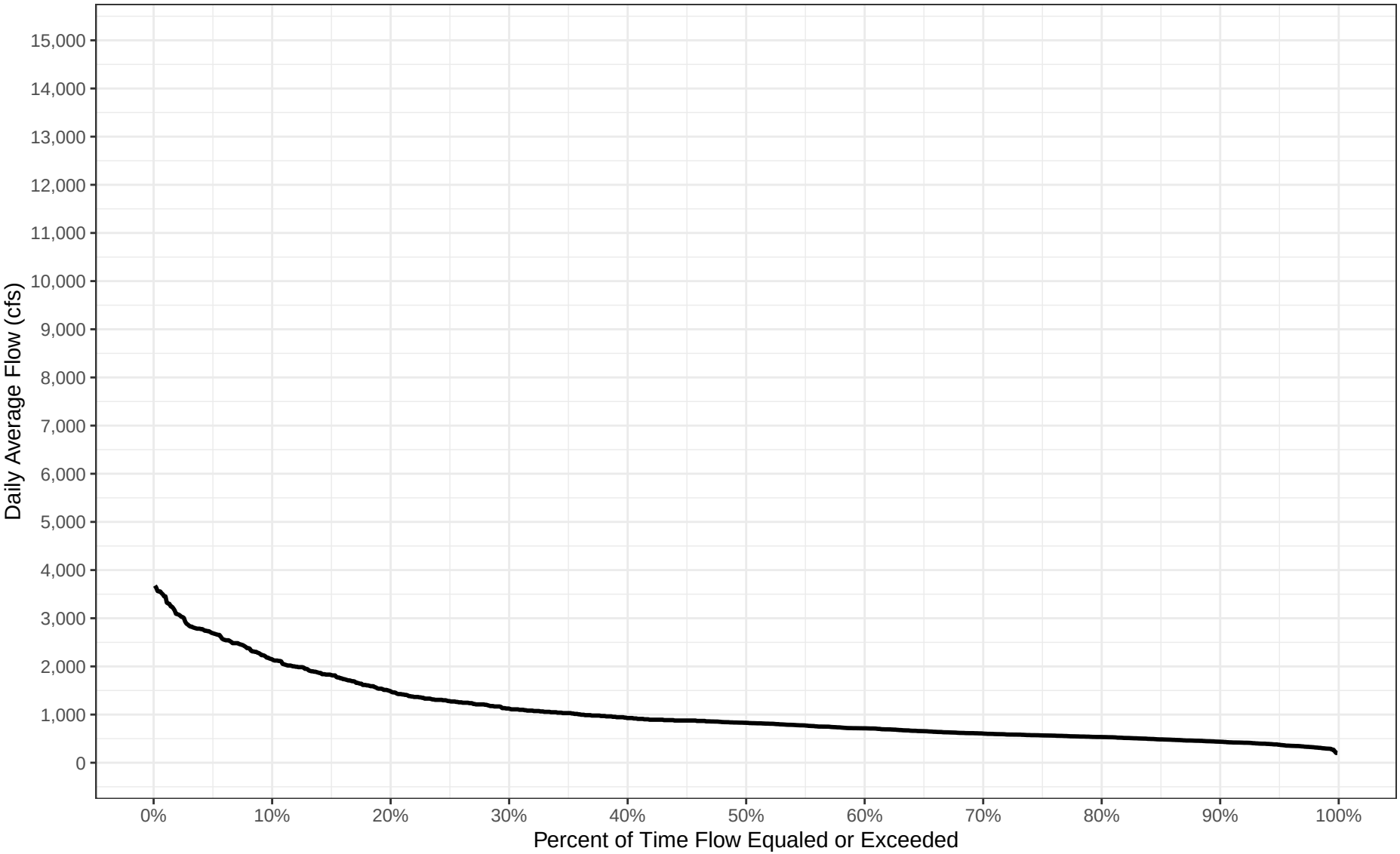
Pillager Project August Flow Duration Curve

Prorated from USGS Gage No. 05247500 Crow Wing River near Pillager, MN
Period of Record: January 1995 to December 2024



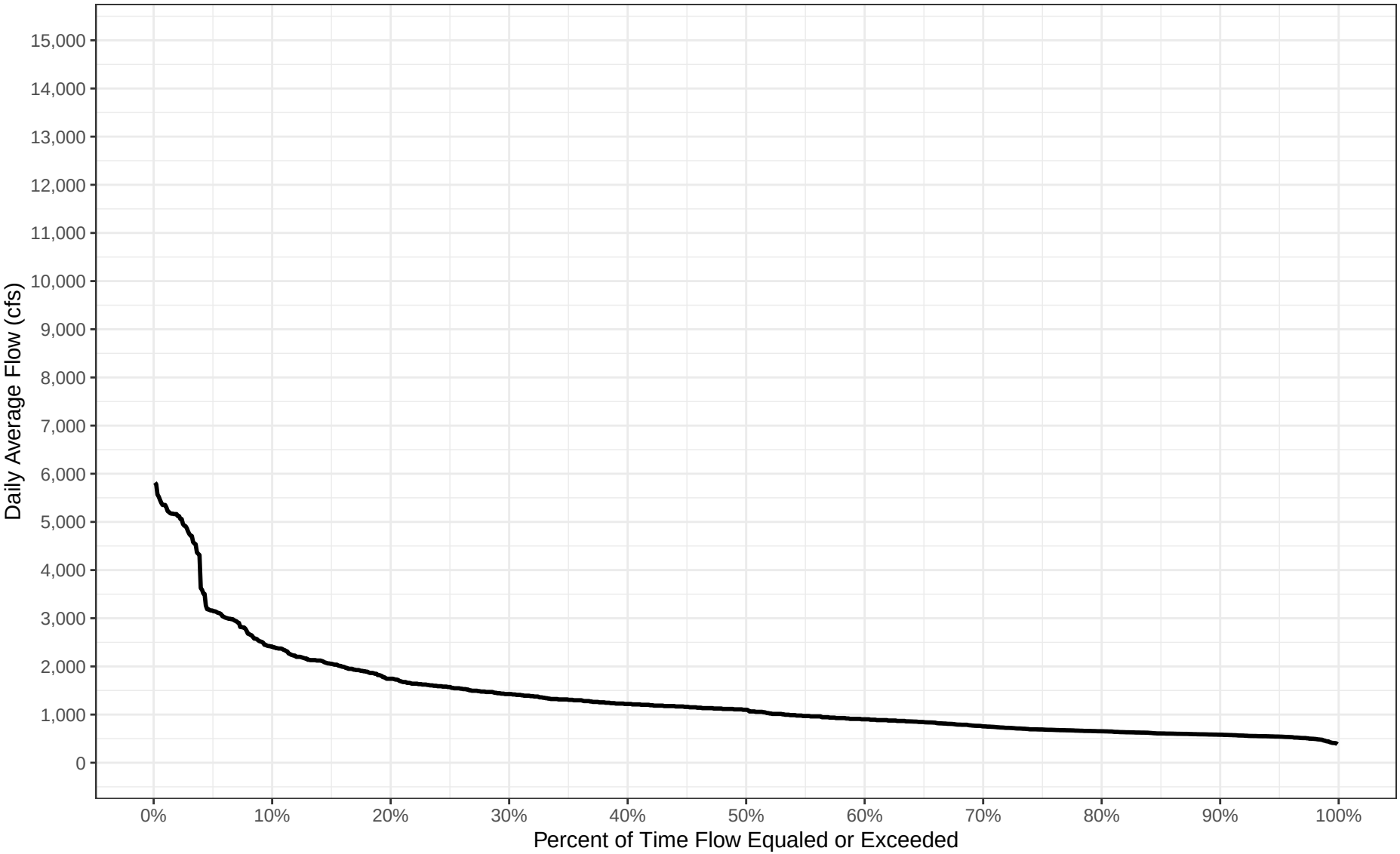
Pillager Project September Flow Duration Curve

Prorated from USGS Gage No. 05247500 Crow Wing River near Pillager, MN
Period of Record: January 1995 to December 2024



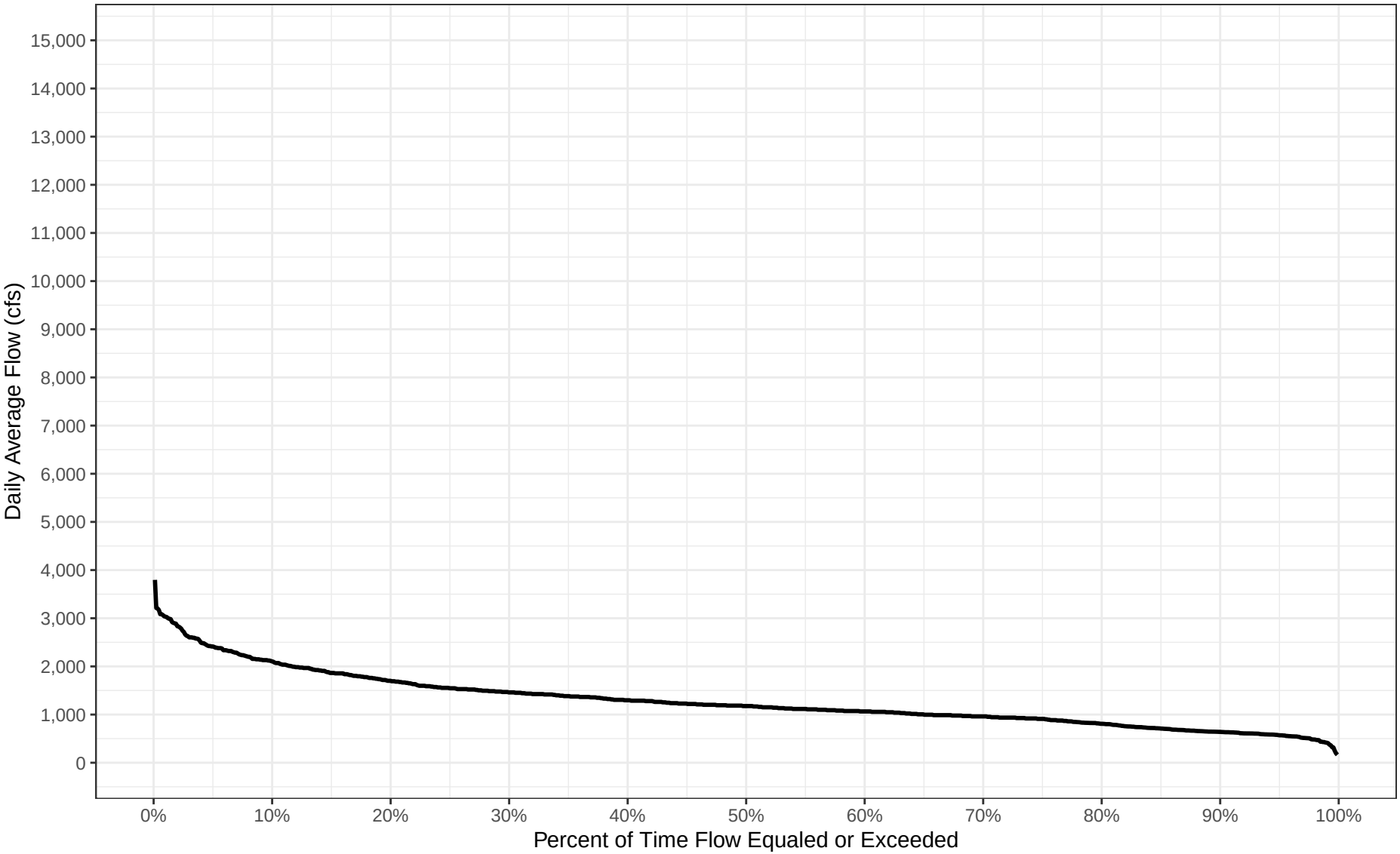
Pillager Project October Flow Duration Curve

Prorated from USGS Gage No. 05247500 Crow Wing River near Pillager, MN
Period of Record: January 1995 to December 2024



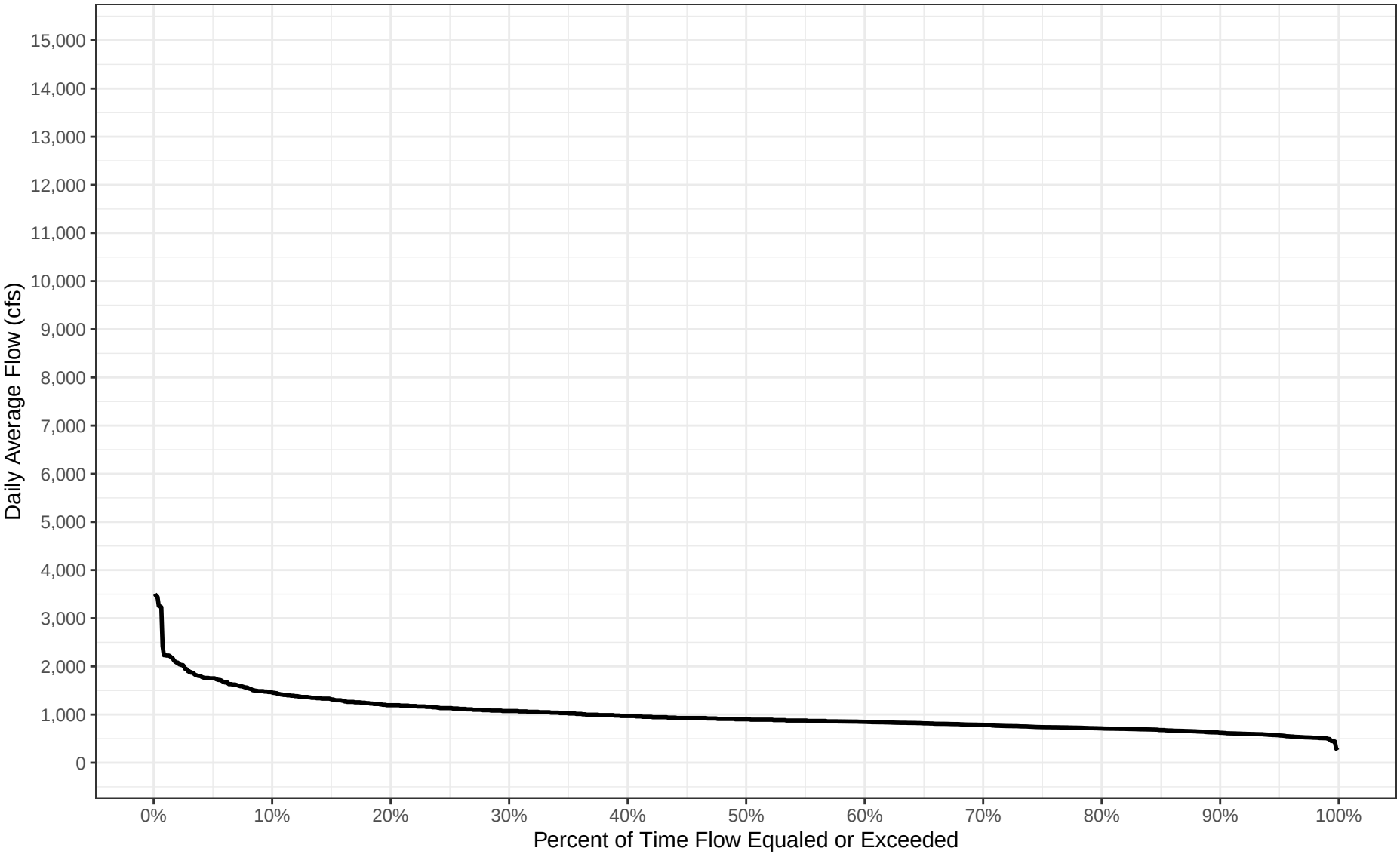
Pillager Project November Flow Duration Curve

Prorated from USGS Gage No. 05247500 Crow Wing River near Pillager, MN
Period of Record: January 1995 to December 2024



Pillager Project December Flow Duration Curve

Prorated from USGS Gage No. 05247500 Crow Wing River near Pillager, MN
Period of Record: January 1995 to December 2024



APPENDIX A-2

PILLAGER PROJECT SINGLE-LINE DIAGRAM (CEII)

Little Falls Hydroelectric Project
FERC No. 2532

Sylvan Hydroelectric Project
FERC No. 2454

Pillager Hydroelectric Project
FERC No. 2663

Draft Exhibit E
Environmental Report

TABLE OF CONTENTS

LIST OF TABLES ..... E-V

LIST OF FIGURES ..... E-IX

LIST OF PHOTOS ..... E-XI

LIST OF APPENDICES ..... E-XIII

DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS ..... E-XIV

1.0 INTRODUCTION E-1
- 1.1 Background E-1
- 1.2 Purpose of Exhibit E E-1
- 1.3 Consultation E-2
- 1.4 Purpose of Action and Need for Power E-3

2.0 STATUTORY AND REGULATORY REQUIREMENTS E-4
- 2.1 Federal Power Act E-4
  - 2.1.1 Section 18 Fishway Prescriptions E-4
  - 2.1.2 Section 4(e) Conditions E-4
  - 2.1.3 Section 10(j) Recommendations E-4
- 2.2 Section 401 of the Clean Water Act E-5
- 2.3 Endangered Species Act E-5
- 2.4 Magnuson-Stevens Fishery Conservation and Management Act E-5
- 2.5 Coastal Zone Management Act E-6
- 2.6 National Historic Preservation Act E-6
- 2.7 Wild and Scenic Rivers and Wilderness Acts E-6
- 2.8 Bald and Golden Eagle Acts E-7
- 2.9 References E-7

3.0 PROPOSED ACTION AND ALTERNATIVES E-8
- 3.1 No-Action Alternative E-8
  - 3.1.1 Existing Facilities E-8
  - 3.1.2 Existing Operations E-14
  - 3.1.3 Existing Environmental Measures E-14
  - 3.1.4 Existing FERC Project Boundaries E-15
- 3.2 Proposed Action E-19
  - 3.2.1 Proposed Facilities E-19
  - 3.2.2 Proposed Operations E-19

3.2.3 Proposed Environmental Measures....E-19
3.2.4 Proposed FERC Project Boundaries....E-20
3.3 Alternatives Considered but Eliminated from Further Analysis....E-27
3.3.1 Federal Government Takeover of the Project....E-27
3.3.2 Decommissioning the Project....E-27

4.0 ENVIRONMENTAL ANALYSIS....E-28
4.1 General Description of the River Basin....E-28
4.1.1 River Basin and Subbasin Descriptions....E-28
4.1.2 River Basin Tributaries and Dams....E-30
4.1.3 Major Land Uses....E-32
4.1.4 Major Water Uses....E-32
4.1.5 Climate....E-33
4.1.6 References....E-34
4.2 Scope of Cumulative Effects Analysis....E-35
4.3 Geology and Soils....E-36
4.3.1 Affected Environment....E-36
4.3.2 Environmental Analysis....E-52
4.3.3 Protection, Mitigation, Enhancement Measures....E-53
4.3.4 Unavoidable Adverse Effects....E-53
4.3.5 References....E-53
4.4 Water Resources....E-56
4.4.1 Affected Environment....E-56
4.4.2 Environmental Effects....E-93
4.4.3 Protection, Mitigation, Enhancement Measures....E-94
4.4.4 Unavoidable Adverse Effects....E-94
4.4.5 References....E-94
4.5 Fish and Aquatic Resources....E-98
4.5.1 Affected Environment....E-98
4.5.2 Environmental Effects....E-113
4.5.3 Protection, Mitigation, Enhancement Measures....E-114
4.5.4 Unavoidable Adverse Effects....E-115
4.5.5 References....E-115
4.6 Terrestrial Wildlife and Botanical Resources....E-118
4.6.1 Affected Environment....E-118
4.6.2 Environmental Effects....E-132
4.6.3 Protection, Mitigation, Enhancement Measures....E-133
4.6.4 Unavoidable Adverse Effects....E-134
4.6.5 References....E-134
4.7 Wetlands, Riparian, and Littoral Habitat....E-136

4.7.1 Affected Environment E-136
4.7.2 Environmental Effects E-146
4.7.3 Protection, Mitigation, Enhancement Measures E-146
4.7.4 Unavoidable Adverse Effects E-147
4.7.5 References E-147
4.8 Rare, Threatened, and Endangered Species E-150
4.8.1 Affected Environment E-150
4.8.2 Environmental Effects E-158
4.8.3 Protection, Mitigation, Enhancement Measures E-158
4.8.4 Unavoidable Adverse Effects E-158
4.8.5 References E-159
4.9 Recreation and Land Use E-162
4.9.1 Affected Environment E-162
4.9.2 Environmental Effects E-212
4.9.3 Protection, Mitigation, Enhancement Measures E-212
4.9.4 Unavoidable Adverse Effects E-213
4.9.5 References E-213
4.10 Aesthetic Resources E-216
4.10.1 Affected Environment E-216
4.10.2 Environmental Effects E-229
4.10.3 Protection, Mitigation, Enhancement Measures E-230
4.10.4 Unavoidable Adverse Effects E-230
4.10.5 References E-230
4.11 Cultural Resources E-231
4.11.1 Affected Environment E-231
4.11.2 Environmental Effects E-248
4.11.3 Protection, Mitigation, Enhancement Measures E-251
4.11.4 Unavoidable Adverse Effects E-252
4.11.5 References E-252
4.12 Socioeconomic Resources E-254
4.12.1 Affected Environment E-254
4.12.2 Environmental Effects E-259
4.12.3 Protection, Mitigation, Enhancement Measures E-259
4.12.4 Unavoidable Adverse Effects E-259
4.12.5 References E-259
4.13 Tribal Resources E-262
4.13.1 Affected Environment E-262
4.13.2 Environmental Effects E-263
4.13.3 Protection, Mitigation, Enhancement Measures E-263

4.13.4 Unavoidable Adverse Effects E-263

5.0 DEVELOPMENTAL ANALYSIS E-264
5.1 Costs and Value of PME Measures Affecting Developmental Resources E-264
5.2 Costs and Value of PME Measures Affecting Non-Developmental Resources E-264
5.3 Project Value and Term of License E-264

6.0 CONSISTENCY WITH COMPREHENSIVE PLANS E-265
6.1 Relevant Qualifying Federal and State or Comprehensive Waterway Plans E-265
6.2 References E-266

LIST OF TABLES

Table 4-1: Soil Types at the Little Falls Project E-45
Table 4-2: Soil Types at the Sylvan Project E-46
Table 4-3: Soil Types at the Pillager Project E-49
Table 4-4: Annual and Monthly Average, Minimum, and Maximum (cfs) Mississippi River flow at the Little Falls Project, January 1, 1995, to December 31, 2024 ..... E-58
Table 4-5: Annual and Monthly Average, Minimum, and Maximum (cfs) Crow Wing River flow at the Sylvan Project, January 1, 1995, to December 31, 2024 ..... E-59
Table 4-6: Annual and Monthly Average, Minimum, and Maximum (cfs) Crow Wing River flow at the Pillager Project, January 1, 1995, to December 31, 2024 ..... E-60
Table 4-7: Active Wastewater Discharges in Projects Vicinities and Surrounding Areas E-61
Table 4-8: Surface Water Use Classifications and Water Quality Standards for the Mississippi River at the Little Falls Project, the Crow Wing River at the Sylvan Project and Pillager Project, and the Gull River E-64
Table 4-9: Water Quality Data from Site S000-151 on the Mississippi River Upstream of the Little Falls Project E-67
Table 4-10: Water Quality Data from Site S007-331 on the Mississippi River Downstream of the Little Falls Project E-68
Table 4-11: Mean, Minimum, and Maximum Water Temperature (°C) and DO (mg/L) during the 2024 Water Quality Study at the Little Falls Project ... E-71
Table 4-12: Water Quality Data from Site S016-349 Downstream of the Sylvan Project Dam E-76
Table 4-13: Water Quality Data from Site 49-0036-01-202 and Site 49-0036-02-202 Upstream of the Sylvan Project Dam E-78
Table 4-14: Mean, Minimum, and Maximum Water Temperature (°C) and DO (mg/L) during the 2024 Water Quality Study at the Sylvan Project E-82
Table 4-15: Water Temperature (°C) and DO Concentration (mg/L) Vertical Profiles Collected at the Deep Spot in the Pillager Reservoir, 1999-2001 ..... E-87

Table 4-16: Water Temperature (°C) and DO Concentration (mg/L) Collected in the Pillager Tailrace, 1999-2001 ..... E-88
Table 4-17: Vertical Profile Data Collected at Site 49-0080-00-101 and Site 49-0080-00-100 in the Pillager Reservoir E-89
Table 4-18: Water Quality Data Collected at Site 49-0080-00-101 and Site 49-0080-00-100 in the Pillager Reservoir E-91
Table 4-19: Water Quality Data from Site S007-301 Upstream of the Pillager Dam E-91
Table 4-20: Fish Species Documented in the Reach of the Mississippi River That Encompasses the Little Falls Project E-103
Table 4-21: Fish Species Documented in the Crow Wing River Watershed E-107
Table 4-22: Fish Species Documented in the Sylvan and Pillager Reservoirs During 2014 and 2024 ..... E-109
Table 4-23: Estimated Annual Fish Entrainment at the Little Falls, Sylvan, and Pillager Projects E-111
Table 4-24: Estimated Annual Entrainment Mortality at the Little Falls, Sylvan, and Pillager Projects E-111
Table 4-25: Mussel Species Documented in the Crow Wing River and Mississippi River E-112
Table 4-26: Existing Sylvan Project Boundary Forest Cover Type Acreage Based on 2016 Inventory E-119
Table 4-27: Existing Pillager Project Boundary Forest Cover Type Acreage Based on 2016 Inventory E-122
Table 4-28: Common Wildlife Known or Likely to Occur within the Little Falls, Sylvan, and Pillager Projects Vicinities E-125
Table 4-29: Invasive Terrestrial Plants Observed within the Projects Vicinities E-131
Table 4-30: USFWS National Wetland Inventory Mapped Wetlands in the Little Falls Existing and Proposed Project Boundary E-137
Table 4-31: USFWS National Wetland Inventory Mapped Wetlands in the Sylvan Existing and Proposed Project Boundary E-137
Table 4-32: USFWS National Wetland Inventory Mapped Wetlands in the Pillager Existing and Proposed Project Boundary E-138

Table 4-33: Wetland Plants Known or Likely to Occur within the Little Falls, Sylvan, and Pillager Projects Vicinities E-143
Table 4-34: Federally Listed Wildlife Species with the Potential to Occur in the Projects Vicinities E-154
Table 4-35: State-Listed Wildlife Species with the Potential to Occur within 1-mile of Proposed Projects Boundaries E-155
Table 4-36: State-Listed Botanical Species with the Potential to Occur in the Projects Vicinities E-157
Table 4-37: Public Recreation Sites in the Little Falls Project Vicinity E-163
Table 4-38: Sylvan Project Recreation Sites E-177
Table 4-39: Existing Use and Capacity at Sylvan Project Recreation Sites E-179
Table 4-40: Pillager Project Recreation Sites E-187
Table 4-41: Existing Use and Capacity at Pillager Project Recreation Sites E-189
Table 4-42: Land Cover Type in the Little Falls Existing and Proposed Project Boundary and Little Falls Project Vicinity E-202
Table 4-43: Land Cover Type in the Sylvan Existing and Proposed Project Boundary and Sylvan Project Vicinity E-206
Table 4-44: Land Cover Type in the Pillager Existing and Proposed Project Boundary and Pillager Project Vicinity E-209
Table 4-45: Minnesota's Cultural Periods E-231
Table 4-46: Historic Architectural Resources Surveyed by Merjent within the Existing Little Falls Project APE E-236
Table 4-47: Historic Architectural Resources Surveyed by Merjent within the Existing Sylvan Project APE E-238
Table 4-48: Historic Architectural Resources Surveyed by Merjent within the Existing Pillager Project APE E-239
Table 4-49: Archaeological Resources Surveyed by Merjent within the Existing Little Falls Project APE E-242
Table 4-50: Archaeological Resources Surveyed by Merjent within the Existing Sylvan Project APE E-244
Table 4-51: Archaeological Resources Surveyed by Merjent within the Existing Pillager Project APE E-247

Table 4-52: Estimated Population of Applicable Cities, Counties, and the State of Minnesota E-255

Table 4-53: Household and Family Distribution E-257

Table 4-54: Top Employment Sectors in 2023 for the Cities of Little Falls, Pillager, and Baxter, and Morrison, Crow Wing, and Cass Counties, Minnesota E-258

Table 4-55: Tribes Included on Projects Distribution List E-262

Table 6-1: List of Qualifying Comprehensive Plans Potentially Relevant to the Projects E-265

LIST OF FIGURES

Figure 3-1: Little Falls Project Facilities E-9
Figure 3-2: Sylvan Project Facilities E-11
Figure 3-3: Pillager Project Facilities E-13
Figure 3-4: Little Falls Existing FERC Project Boundary E-16
Figure 3-5: Sylvan Existing FERC Project Boundary E-17
Figure 3-6: Pillager Existing FERC Project Boundary E-18
Figure 3-7: Little Falls Project Existing and Proposed FERC Project Boundary E-22
Figure 3-8: Sylvan Project Existing and Proposed FERC Project Boundary E-24
Figure 3-9: Pillager Project Existing and Proposed FERC Project Boundary E-26
Figure 4-1: Watersheds and River Basins of the Projects E-29
Figure 4-2: Tributaries and Dams on the Mainstems within the Projects' Watersheds and River Basins E-31
Figure 4-3: Minnesota DNR's Ecological Subsections for the State of Minnesota E-37
Figure 4-4: Topography at the Little Falls Project E-39
Figure 4-5: Topography at the Sylvan and Pillager Projects E-40
Figure 4-6: Geology at the Little Falls, Sylvan, and Pillager Projects E-43
Figure 4-7: Soils at the Little Falls Project E-50
Figure 4-8: Soils at the Sylvan and Pillager Projects E-51
Figure 4-9: Minnesota PCA Water Quality Monitoring Sites Near Little Falls Project E-66
Figure 4-10: Monitoring Sites During the 2024 Water Quality Study at the Little Falls Project E-70
Figure 4-11: Water Temperature (°C) Profiles at the Little Falls Project Forebay E-71
Figure 4-12: DO (mg/L) Profiles at the Little Falls Project Forebay E-72
Figure 4-13: Minnesota PCA Water Quality Monitoring Sites Near the Sylvan and Pillager Projects E-75
Figure 4-14: DO Concentration (mg/L) and Percent Saturation at Site S001-926 Downstream of the Sylvan Dam E-76

Figure 4-15: Water Temperature (°C) and pH at Site S001-926 Downstream of the Sylvan Dam E-77
Figure 4-16: TKN and Nitrate+Nitrate N (mg/L) at Site S001-926 Downstream of the Sylvan Dam E-77
Figure 4-17: Specific Conductance (µS/cm) and Total Phosphorus (mg/L) at Site S001-926 Downstream of the Sylvan Dam E-78
Figure 4-18: Monitoring Sites for the 2024 Water Quality Study at the Sylvan Project E-81
Figure 4-19: Water Temperature (°C) profiles at the Forebay of the Sylvan Project E-82
Figure 4-20: DO (mg/L) Profiles at the Forebay of the Sylvan Project E-83
Figure 4-21: Water Temperature (°C) profiles at the Powerhouse Outlet of the Sylvan Project E-83
Figure 4-22: DO (mg/L) at the Powerhouse Outlet of the Sylvan Project E-84
Figure 4-23: NWI Mapped Wetlands in the Little Falls Project Vicinity E-139
Figure 4-24: NWI Mapped Wetlands in the Sylvan and Pillager Projects Vicinity E-140
Figure 4-25: Recreation Sites in the Little Falls Project Vicinity E-164
Figure 4-26: Sylvan Project Recreation Sites E-178
Figure 4-27: Pillager Project Recreation Sites E-188
Figure 4-28: Land Cover in Little Falls Project Vicinity E-203
Figure 4-29: Land Cover in Sylvan Project Vicinity E-207
Figure 4-30: Land Cover in Pillager Project Vicinity E-210
Figure 4-31: Pillager Project Natural Character Area E-211

LIST OF PHOTOS

Photo 4-1: Mill Park E-165
Photo 4-2: Maple Island Park E-166
Photo 4-3: James Green Park E-167
Photo 4-4: Columbia Park E-168
Photo 4-5: Veterans Memorial Park E-169
Photo 4-6: Memorial Park E-170
Photo 4-7: Kiwanis Park E-171
Photo 4-8: Old City Beach Parking Lot E-172
Photo 4-9: Pine Tree Playground E-173
Photo 4-10: Canoe Portage at Little Falls Project E-174
Photo 4-11: LeBourget Park E-175
Photo 4-12: Riverside Park E-176
Photo 4-13: Wilder's Landing E-181
Photo 4-14: Fisherman's Bridge Boat Launch and Fishing Area – Pedestrian Bridge E-182
Photo 4-15: Fisherman's Bridge Boat Launch and Fishing Area – Boat Launch E-183
Photo 4-16: Fisherman's Bridge Boat Launch and Fishing Area – Shorefishing Area E-184
Photo 4-17: Sylvan Dam Boat Access and Fishing Area E-185
Photo 4-18: Sylvan Canoe Portage E-186
Photo 4-19: Alvah's Landing E-191
Photo 4-20: Pillager Dam Public Boat Launch E-192
Photo 4-21: Pillager Dam Public Boat Launch Parking Area E-193
Photo 4-22: Pillager Dam Public Canoe Portage and Shorefishing Access – Portage Take Out E-194
Photo 4-23: Pillager Dam Public Canoe Portage and Shorefishing Access – Portage Trail E-195
Photo 4-24: Pillager Dam Public Canoe Portage and Shorefishing Access – Shorefishing Area E-196

Photo 4-25: Crow Wing River Canoe Campsite Access E-197
Photo 4-26: Crow Wing River Canoe Campsite Fire Pit E-198
Photo 4-27: Crow Wing River Canoe Campsite Picnic Table E-199
Photo 4-28: View of Little Falls Project from Reservoir E-216
Photo 4-29: Little Falls Project Spillway Facing East E-217
Photo 4-30: Little Falls Project Spillway E-218
Photo 4-31: Little Falls Project Tailwater E-219
Photo 4-32: Little Falls Project Powerhouses E-220
Photo 4-33: Little Falls Project Powerhouse Units 5 and 6 ..... E-221
Photo 4-34: Sylvan Project Reservoir and Dam E-222
Photo 4-35: Sylvan Project Reservoir E-223
Photo 4-36: View of Sylvan Project Dam E-224
Photo 4-37: View of Sylvan Project from Downstream E-225
Photo 4-38: Sylvan Project Tailwater View from Spillway E-226
Photo 4-39: Sylvan Project Reservoir Shoreline E-227
Photo 4-40: View of Pillager Project from Downstream E-228
Photo 4-41: Pillager Project Dam E-229

LIST OF APPENDICES

Appendix E-1: Consultation Documentation

Appendix E-2: Coastal Zone Management Act Compliance Documentation

Appendix E-3: Sylvan Project and Pillager Project 2025 Recreation Use Survey Report

Appendix E-4: Rare Species Information

Appendix E-5: Cultural Resources Information (Privileged)

DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

APE	Area of Potential Effects as pertaining to Section 106 of the National Historic Preservation Act
Applicant	ALLETE, Inc.
B.P.	Before Present
°C	Celsius
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulations
cfs	cubic feet per second
Chl-a	chlorophyll-a
cm	centimeter
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
DLA	Draft License Application
DO	dissolved oxygen
DOI	U.S. Department of Interior
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EL	Elevation
ESA	Endangered Species Act
°F	Fahrenheit
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FLA	Final License Application
FOIA	Freedom of Information Act
FPA	Federal Power Act
GIS	Geographic Information Systems
HPMP	Historic Properties Management Plan
ILP	Integrated Licensing Process
IPaC	Information for Planning and Conservation
kV	Kilovolts

kW	kilowatt
kWh	kilowatt-hour
Licensee	ALLETE, Inc.
Little Falls Project	Little Falls Hydroelectric Project, FERC No. 2532
MAPP	Mid-continent Area Power Pool
mg	milligrams
µg/L	microgram per liter
mg/L	milligrams per liter
mi2	square miles
Minnesota DNR	Minnesota Department of Natural Resources
Minnesota PCA	Minnesota Pollution Control Agency
ml	milliliter
MLRA	Major Land Resource Area
MP	Minnesota Power
µS	microsiemens
MS	Microsoft
msl	mean sea level
MW	megawatt
MWh	megawatt hours
N	nitrogen
NAIP	National Agriculture Imagery Program
NCA	Natural Character Area
NEPA	National Environmental Policy Act
NGO	non-governmental organization
NGVD29	National Geodetic Vertical Datum of 1929
NHD	National Hydrography Dataset
NLCD	National Land Cover Database Class
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	National Rivers Inventory

NTU	Nephelometric Turbidity Units
NWI	National Wetlands Inventory
PA	Programmatic Agreement
PAD	Pre-Application Document
PCU	Platinum Cobalt Units
PDF	Portable Document Format
PF	power factor
Pillager Project	Pillager Hydroelectric Project, FERC P-2663
PLSS	Public Land Survey System
PME	Protection, Mitigation and Enhancement Measures
POR	Period of record
Projects	Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and Pillager Hydroelectric Project (P-2663)
Project Vicinity	The area within ½ mile of the associated FERC Project Boundary, as depicted on the Project Vicinity figures
PSP	Proposed Study Plan
PURPA	Public Utility Regulatory Policies Act
RM	river mile
RMP	Recreation Management Plan
RPM	revolutions per minute
RSP	Revised Study Plan
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SD1	Scoping Document 1
SHPO	State Historic Preservation Office
SU	Standard Units (pH)
Sylvan Project	Sylvan Hydroelectric Project, FERC P-2454
TBD	to be determined
TCP	Traditional Cultural Properties
Total P	Total phosphorus
TKN	Total Kjeldahl Nitrogen
TMDL	total maximum daily load
TNS	terrestrial nuisance species

USACE	U.S. Army Corps of Engineers
U.S.C.	U.S. Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WMA	Wildlife Management Area

1.0 INTRODUCTION

1.1 Background

Minnesota Power (MP), a subsidiary of ALLETE, Inc., is the Licensee, owner, and operator of the Little Falls Hydroelectric Project (P-2532) (Little Falls Project), Sylvan Hydroelectric Project (P-2454) (Sylvan Project), and Pillager Hydroelectric Project (P-2663) (Pillager Project), herein collectively referred to as the "Projects." The Little Falls Project is a 4.720-megawatt (MW) run-of-river facility located on the Mississippi River in Morrison County, Minnesota. The Sylvan Project is a 1.800 MW run-of-river facility located on the Crow Wing River in Cass, Crow Wing, and Morrison counties, Minnesota. The Pillager Project is a 1.520 MW run-of-river facility located on the Crow Wing River in Cass and Morrison counties, Minnesota.

The Projects are licensed by the Federal Energy Regulatory Commission (FERC or Commission) under the authority granted to FERC by Congress through the Federal Power Act (FPA), 16 U.S. Code (U.S.C) §791(a), et seq., to license and oversee the operation of non-federal hydroelectric projects on jurisdictional waters and/or federal land. There are no federal lands associated with the Projects. The Little Falls Project FERC license was issued October 27, 1993. The Sylvan Project FERC license was issued October 29, 1993. The Pillager Project FERC license was issued April 27, 1998. The current operating licenses for each of the Projects expire on March 31, 2028. In accordance with FERC's regulations at 18 Code of Federal Regulations (CFR) §16.9(b), the Licensee must file its applications for new licenses with FERC no later than March 31, 2026, for the Projects. The Licensee is using the Commission's Integrated Licensing Process (ILP) and is engaging in concurrent relicensing efforts for the Projects with combined documents, meetings, and overall relicensing schedules.

1.2 Purpose of Exhibit E

This Exhibit E conforms with the content requirements of 18 CFR § 4.61(d). Exhibit E is an Environmental Report. The purpose of the Exhibit E is to describe the existing resources at the Projects, and how the existing and proposed Projects' facilities or operations may affect those resources, including measures for protection, mitigation, and enhancement (PME) with respect to each resource affected. The Exhibit E also assesses potential impacts of existing Projects' operations and maintenance on resources, including direct, indirect,

and cumulative impacts based on information generated during the relicensing studies. The environmental analysis in this Exhibit E (Section 4.0) presents the assessment of effects associated with existing and proposed Projects' operations and facilities and the expected benefits of proposed PME measures. This analysis is based on available information and on the results of studies conducted during the relicensing process.

1.3 Consultation

On March 30, 2023, the Licensee filed with the Commission a Pre-Application Document (PAD) and three Notices of Intent (NOIs) for the Projects. The NOIs and PAD were distributed to federal and state resource agencies, local governments, Native American Tribes, non-governmental organizations, and others likely to be interested in the relicensing proceeding. FERC issued Scoping Document 1 (SD1) on May 26, 2023. FERC held two scoping meetings on June 21 and June 22, 2023. Visits to the Projects were held on June 21, 2023. FERC issued Scoping Document 2 (SD2) on September 8, 2023. SD2 includes the ILP Process Plan and Schedule for the relicensing of the Projects. Consultation documentation is included as Appendix E-1.

The Licensee submitted a Proposed Study Plan (PSP) on September 8, 2023, and held a Study Plan Meeting on October 11, 2023. A Revised Study Plan (RSP) was then filed on January 9, 2024. On January 31, 2024, FERC issued the Study Plan Determination (SPD), which approved the studies outlined in the RSP. For the Little Falls Project, the approved studies included a Water Quality Study, a Desktop Fish Entrainment and Impingement Study, and a Cultural Resources Study. The Sylvan Project included those three same studies, along with a Recreation Use and Facility Inventory Study. For the Pillager Project, the approved studies included a Desktop Fish Entrainment and Impingement Study, Recreation Use and Facility Inventory Study, and Cultural Resources Study.

The 2024 study season was completed, and the Initial Study Report (ISR) was filed with FERC on February 7, 2025. An ISR meeting to review the study results was held on February 19, 2025, and the meeting summary was submitted on February 27, 2025. On April 4, 2025, FERC issued comments on the ISR, requesting that additional survey dates be conducted for the Recreation Use Survey for the Sylvan Project and Pillager Project. In response, the Licensee submitted a letter on May 1, 2025, confirming that the requested additional survey dates would be completed during the 2025 study season (see Appendix E-3, Sylvan Project and Pillager Project 2025 Recreation Use Survey Report).

On May 16, 2025, MP received a comment letter from the Minnesota State Historic Preservation Office (SHPO) regarding the Phase I Architectural History Reconnaissance Surveys, Phase I Archaeological Investigations, and the Conditions Assessment for Archaeological Sites included in the ISR. The Licensee filed a response to SHPO's comments on June 2, 2025. No other comments or requests to amend the study plan were received by the April 8, 2025 deadline. On July 2, 2025, the Crow Wing County Historical Society submitted comments in support of SHPO's May 16, 2025 letter.

1.4 Purpose of Action and Need for Power

The purpose of the Projects is to generate hydroelectric power. The average annual generation at the Projects is described in each Exhibit A, and the need for project power is described in each Exhibit H.

2.0 STATUTORY AND REGULATORY REQUIREMENTS

2.1 Federal Power Act

Issuance of new licenses for the Projects is subject to requirements under the FPA and other federal statutes. Requirements applicable to the license application are summarized below.

2.1.1 Section 18 Fishway Prescriptions

Under Section 18 of the FPA, FERC must require the licensee to construct, operate, and maintain any fishways prescribed by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service. There are no fishways located at the Projects, and there are no prescriptions in place for future fishways.

2.1.2 Section 4(e) Conditions

Section 4(e) of the FPA provides that any license issued by FERC for a project within a federal reservation shall contain and be subject to such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation. The Projects do not include federal reservation lands.

2.1.3 Section 10(j) Recommendations

Under Section 10(j) of the FPA, licenses for hydroelectric projects must include conditions to protect, mitigate damages to, and enhance fish and wildlife resources, including related spawning grounds and habitat. These conditions are to be based on recommendations received from federal and state fish and wildlife agencies. The Commission is required to include such recommendations unless it finds that they are inconsistent with Part I of the FPA or other applicable law, and that alternative conditions will adequately address fish and wildlife issues. Before rejecting an agency recommendation, the Commission and the agencies must attempt to resolve the inconsistency, giving due weight to the agencies' recommendations, expertise, and statutory authority. If the Commission does not adopt a 10(j) recommendation, in whole or in part, it must publish findings that adoption of the recommendation is inconsistent with the purposes and requirements of Part 1 of the FPA or other applicable provisions of law, and that conditions selected by the Commission adequately and equitably protect, mitigate damages to, and enhance fish and wildlife,

including related spawning grounds and habitat. Resource agencies have not recommended Section 10(j) conditions for the Projects.

2.2 Section 401 of the Clean Water Act

Under Section 401(a)(1) of the Clean Water Act (CWA), an applicant for a federal license or permit to conduct an activity that may result in discharge into waters of the United States must provide the licensing or permitting agency with a water quality certification (WQC) that the discharge would not violate water quality standards from the applicable state. The Applicant will apply to the Minnesota Pollution Control Agency (Minnesota PCA) and U.S. Army Corps of Engineers (USACE) for the Section 401 WQCs for the Projects. This request will be submitted no later than 60 days following the FERC Issuance of the Notice of Application Ready for Environmental Analysis. A copy of the WQC applications as submitted will be filed with the Commission.

2.3 Endangered Species Act

Section 7(a)(2) of the Endangered Species Act (ESA) requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of federally listed threated and endangered species or result in the destruction or adverse modification of their designated critical habitat. By letter dated May 26, 2023, FERC designated the Licensee as FERC's non-federal representative for executing informal consultation pursuant to Section 7 of the ESA. Additional discussion on rare, threatened, and endangered species is provided in Section 4.8 of this Exhibit E.

2.4 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), first passed in 1976, fosters long-term biological and economic sustainability of the nation's marine fisheries extending to 200 nautical miles from shore. This act is the primary law governing marine fisheries management in United States federal waters. The Magnuson-Stevens Act requires the eight regional Fishery Management Councils, in collaboration with National Oceanic and Atmospheric Administration (NOAA), to consider essential fish habitat (EFH) in resource management decisions. Congress defines EFH as those waters and substrates necessary to fish for spawning, breeding, feeding or growth and maturity. The designation and consideration of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. There is no EFH located at the

Projects and therefore, EFH consultation pursuant to Section 305(b) of the Magnuson-Stevens Act is not required.

2.5 Coastal Zone Management Act

Pursuant to Section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), 16 U.S.C. Section 1456(3)(A), FERC must receive concurrence from the state CZMA agency that the project is not within or affecting the state's coastal zone prior to issuing a license, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification. On August 5, 2025, MP requested concurrence that because the Projects are located outside of Minnesota's coastal zone, the license renewal of the Projects would not have any reasonably foreseeable effect on a coastal use or resource (see Appendix E-2, Coastal Zone Management Act Compliance Documentation). No response has been received from the Minnesota Department of Natural Resources' (DNR's) Lake Superior Coastal Program as of the date of this filing, and concurrence is presumed if no response is received within 6 months of the request. Assuming presumed or written concurrence, it is anticipated that the federal consistency regulations do not apply and there is no requirement for a federal consistency certification for the Projects. The Projects are in compliance with the Minnesota Coastal Zone Management Program.

2.6 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, requires that every federal agency "take into account" how each of its undertakings could affect historic properties. Historic properties include districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are listed in or eligible for inclusion in the National Register of Historic Places (NRHP). By letter dated May 26, 2023, FERC designated the Licensee as FERC's non-federal representative for executing informal consultation pursuant to Section 106 of the NHPA. Additional information related to cultural resources is provided in Section 4.11.

2.7 Wild and Scenic Rivers and Wilderness Acts

The Wild and Scenic Rivers Act was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future

generations. The Wilderness Act of 1964 (Public Law 88-577; 16 U.S.C. 23 et seq.) created the National Wilderness Preservation System. It defines wilderness as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain" and "an area of undeveloped federal land retaining its primeval character and influence without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions." The Projects are not located on a river designated under the National Wild and Scenic Rivers System (National Wild and Scenic Rivers System 2025). There are no trails in the Projects Vicinities that are designated on the National Park Service (NPS) National Trails System (NPS 2025). No area in the Projects Vicinities have been designated as wilderness areas, recommended for such designation, or designated as wilderness study areas under the Federal Wilderness Act (U.S. Department of Agriculture [USDA] 2025).

2.8 Bald and Golden Eagle Acts

The Bald and Golden Eagle Protection Act was originally enacted in 1940 (16 U.S.C 668-668d) to protect eagles from human-induced alterations and human interactions. As defined in 50 CFR, Part 22, permits are required for the "taking" (meaning to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb), possession, and transportation within the United States of bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) and their parts, nests, and eggs. Bald eagles are discussed in Section 4.8 of this Exhibit E.

2.9 References

National Park Service (NPS). 2025. National Trails System. Available online: https://www.nps.gov/subjects/nationaltrailssystem/index.htm Accessed: July 2025.

National Wild and Scenic Rivers System. 2025. Minnesota. Available online: https://www.rivers.gov/minnesota.php Accessed: July 2025.

U.S. Department of Agriculture (USDA) Forest Service. 2025. Wilderness & Wild and Scenic Rivers & Wilderness Study Areas. Available online: https://data.fs.usda.gov/geodata/other_fs/wilderness/index.php Accessed: July 2025.

3.0 PROPOSED ACTION AND ALTERNATIVES

This section describes the Projects and the Licensee's proposal for the continued operation of the Projects. It includes a description of the Projects as they exist and are operated under the existing licenses, and a description of proposed operations and measures on existing resources. Additional details regarding existing Projects' facilities, operations, and safety are provided in Exhibit A.

3.1 No-Action Alternative

The no-action alternative is the baseline from which to compare the proposed action (i.e., relicensing of the Projects) and all action alternatives that are assessed. Under the no-action alternative, the Projects would continue to operate under the terms and conditions of the current licenses. Thus, the no-action alternative includes the existing facilities and current operations as described in the subsections below.

3.1.1 Existing Facilities

3.1.1.1 Little Falls Project

The Little Falls Project is a 4.720 MW run-of-river facility located on the Mississippi River in Morrison County, Minnesota. The Little Falls Project works consist of two powerhouses with six generating units, former power canal crossed and headgate structure, multiple spillways, a reservoir, and supporting infrastructure. The river at the Little Falls Project dam is divided into two channels by Mill Island, which has large rock outcrops. The powerhouses are on the west channel, and the primary spillway sections are on the east channel. The Little Falls Project structures are founded directly on slate bedrock. The complete Little Falls Project description is available in Exhibit A. The primary Little Falls Project facilities are depicted on Figure 3-1.

Figure 3-1: Little Falls Project Facilities



3.1.1.2 Sylvan Project

The Sylvan Project is a 1.800 MW run-of-river facility located on the Crow Wing River in Cass, Crow Wing, and Morrison counties, Minnesota. The Sylvan Project works consist of a powerhouse with three generating units, spillways with gates and inflatable dams, two dikes, a reservoir, multiple embankments, and supporting infrastructure. Other than the two dikes, the dam structures are situated in or adjacent to the main channel of the Crow Wing River. The dam structures are primarily concrete on a soil foundation. A detailed description of the Sylvan Project facilities is provided in Exhibit A. The primary Sylvan Project facilities are depicted on Figure 3-2.

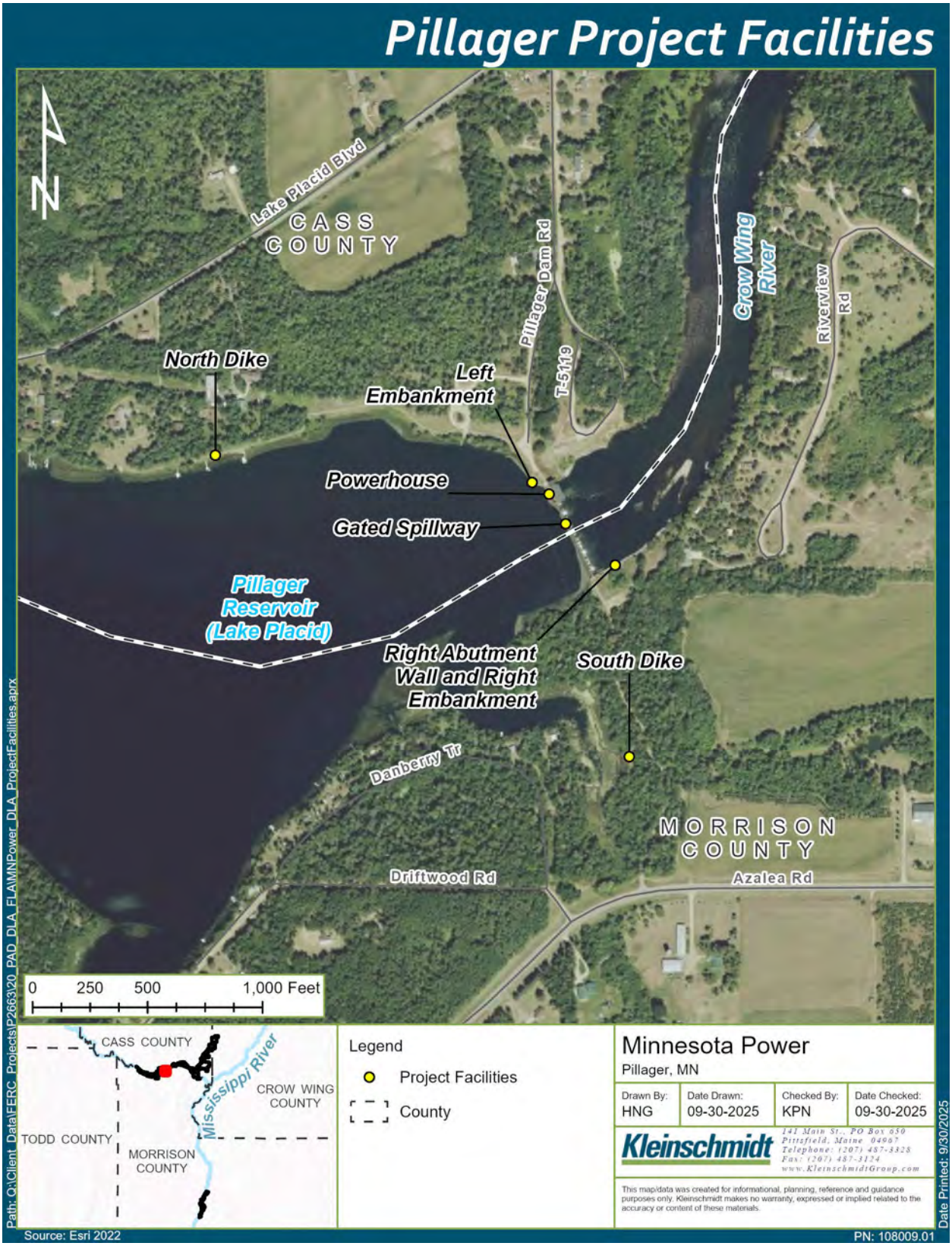
Figure 3-2: Sylvan Project Facilities



3.1.1.3 Pillager Project

The Pillager Project is a 1.520 MW run-of-river facility located on the Crow Wing River in Cass and Morrison counties, Minnesota. The Pillager Project works consist of a powerhouse with two generating units, a reservoir known as Lake Placid, a concrete gravity dam with gated spillways, earth embankments, and dikes along the reservoir shoreline, and associated infrastructure. A summary of the Pillager Project facilities is provided below, with a detailed description available in Exhibit A. The primary Pillager Project facilities are depicted on Figure 3-3.

Figure 3-3: Pillager Project Facilities



3.1.2 Existing Operations

The Projects are operated in run-of-river mode where outflow from the powerhouse is approximately equal to inflow. Run-of-river operations minimize water level fluctuations in the reservoirs; protect water quality, aquatic resources, and visual resources; and provide natural river flows downstream.

There is a minimum flow requirement for the Little Falls Project if the reservoir needs to be drawn down to replace flashboards during the spring walleye (*Sander vitreus*) spawning season. In that event, a minimum flow of 350 cubic feet per second (cfs) must be provided to the east channel. There are no other minimum flow requirements at the Projects.

3.1.3 Existing Environmental Measures

The existing environmental measures at the Projects are as follows:

Little Falls Project

- Operation in a run-of-river mode, with a minimum flow of 350 cfs during walleye spawning season
- Implementation of the Cultural Resources Management Plan (CRMP) required by the Programmatic Agreement (PA) executed in 1993. In addition, MP is required to perform annual monitoring of the reservoir shoreline by an archaeologist for the Little Falls Project.

Sylvan Project

- Operation in a run-of-river mode
- Implementation of the FERC approved Land Management Plan[1] that includes information on land management activities and public recreation facilities at the Sylvan Project. The Land Management Plan provides details regarding the management of wildlife, forests and wetlands, listed species, timber, public recreational sites, recreational leases, and cultural resources.
- Four Commission-approved recreation sites
- Implementation of the CRMP required by the PA executed in 1993. In addition, MP is required to perform annual monitoring of the reservoir shoreline by an

[1] The existing Sylvan Project Land Management Plan requires revision every 10 years, with the next revision due in 2026. The Licensee proposes to extend the Land Management Plan revision deadline to post-license issuance so lands within the approved FERC Project Boundary are accurately represented.

archaeologist for the Sylvan Project, as well as perform archaeological assessments on the leased lots at the Sylvan Project prior to any lot development or improvement.

Pillager Project

- Operation in a run-of-river mode
- Implementation of the FERC approved Land Management Plan[2] that includes information on the land management activities and public recreation facilities at the Pillager Project. The Land Management Plan provides details regarding the management of wildlife, forests and wetlands, listed species, timber, public recreational sites, recreational leases, and cultural resources.
- Protection of Natural Character Areas (NCAs)
- Four Commission-approved recreation sites
- Implementation of the CRMP required by the PA executed in 1993. In addition, MP is required to perform annual monitoring of the reservoir shoreline by an archaeologist for the Pillager Project, as well as perform archaeological assessments on the leased lots at the Pillager Project prior to any lot development or improvement.

3.1.4 Existing FERC Project Boundaries

The existing FERC Project Boundaries of the Little Falls Project, Sylvan Project, and Pillager Project are shown on Figure 3-4, Figure 3-5, and Figure 3-6, respectively.

[2] The existing Pillager Project Land Management Plan requires revision every 10 years, with the next revision due in 2026. The Licensee proposes to extend the Land Management Plan revision deadline to post-license issuance so lands within the approved FERC Project Boundary are accurately represented.

Figure 3-4: Little Falls Existing FERC Project Boundary

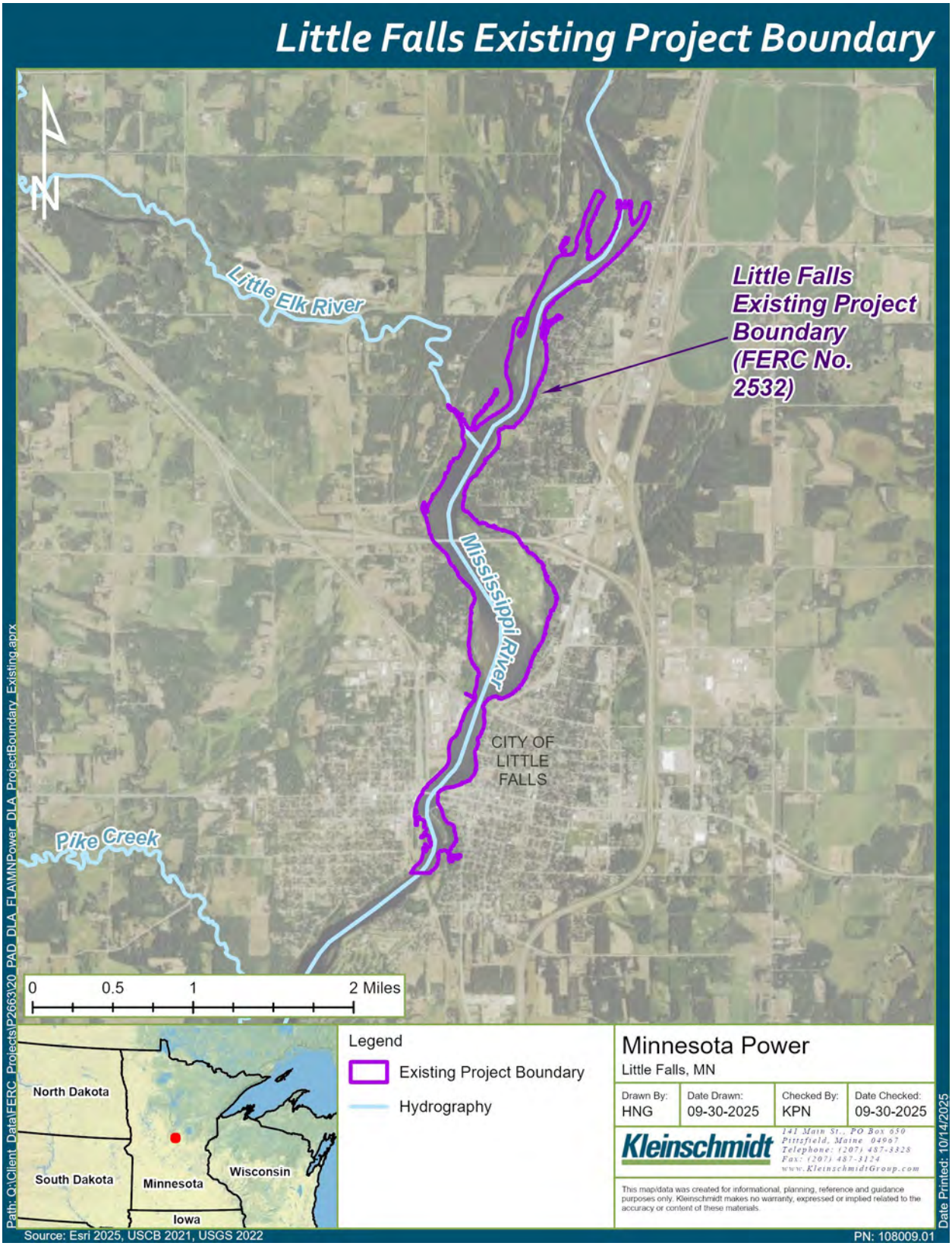


Figure 3-5: Sylvan Existing FERC Project Boundary

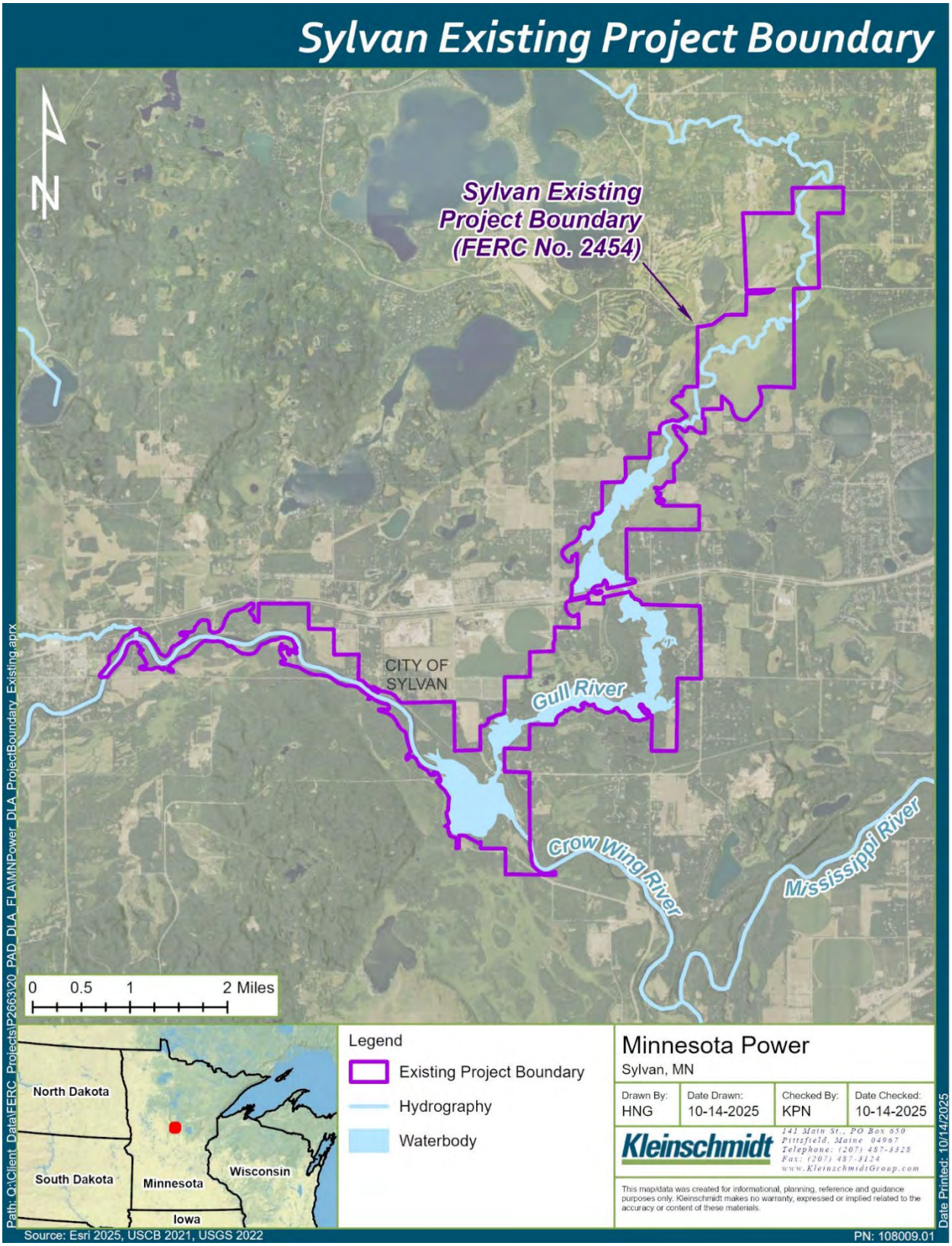
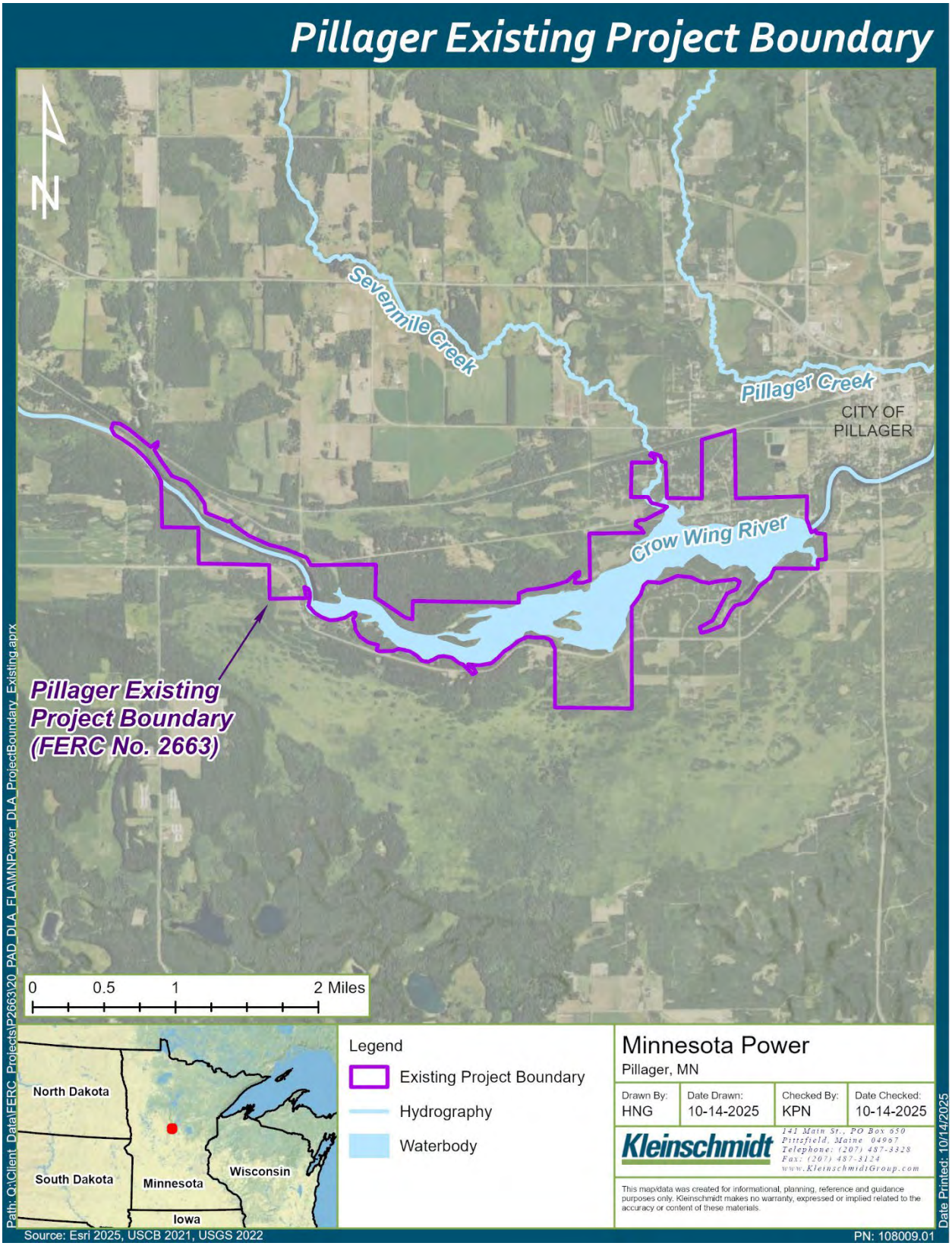


Figure 3-6: Pillager Existing FERC Project Boundary



3.2 Proposed Action

3.2.1 Proposed Facilities

The Licensee is proposing no changes to facilities at the Projects.

3.2.2 Proposed Operations

The Licensee is proposing no changes to operations at the Projects.

3.2.3 Proposed Environmental Measures

The Licensee is proposing PME measures for the Projects, as outlined in the sections below. These measures are intended to address potential environmental, recreational, cultural, and operational effects associated with the continued operation of the Projects.

3.2.3.1 Little Falls Project

At the Little Falls Project, the following PME measures are proposed. Detailed descriptions of each measure are provided in the relevant resource sections within Section 4.0.

- Continued run-of-river operation
- Minimum flow of 350 cfs during walleye spawning season
- Develop and implement a Historic Properties Management Plan (HPMP) post-license issuance

3.2.3.2 Sylvan Project

At the Sylvan Project, the following PME measures are proposed. Detailed descriptions of each measure are provided in the relevant resource sections within Section 4.0.

- Continued run-of-river operation
- Develop and implement a revised Land Management Plan post-license issuance
- Continued operation of Sylvan Project recreation sites
- Develop and implement an HPMP post-license issuance

3.2.3.3 Pillager Project

At the Pillager Project, the following PME measures are proposed. Detailed descriptions of each measure are provided in the relevant resource sections within Section 4.0.

- Continued run-of-river operation
- Develop and implement a revised Land Management Plan post-license issuance
- Preservation of NCAs
- Continued operation of the Pillager recreation sites
- Develop and implement an HPMP post-license issuance

3.2.4 Proposed FERC Project Boundaries

The Licensee is proposing modifications to FERC Project Boundaries for each of the Projects, as outlined in the descriptions provided below. These proposed changes are intended to more accurately reflect the lands necessary for authorized project purposes as outlined in 18 CFR § 4.61(f). Specifically, the modifications aim to align the Project Boundaries with the operational requirements of the Projects, the physical footprints of project facilities, and the inclusion of designated project recreation sites and protection of resources.

3.2.4.1 Little Falls Project

The Licensee proposes the following modifications to the FERC Project Boundary at the Little Falls Project: (1) addition of land or water necessary for the operation and maintenance of the Little Falls Project; and (2) removal of land or water that is not required for operations, maintenance, or any other project purpose. The proposed modifications are administrative in nature and are intended to align with the Commission's definition of a Project Boundary.

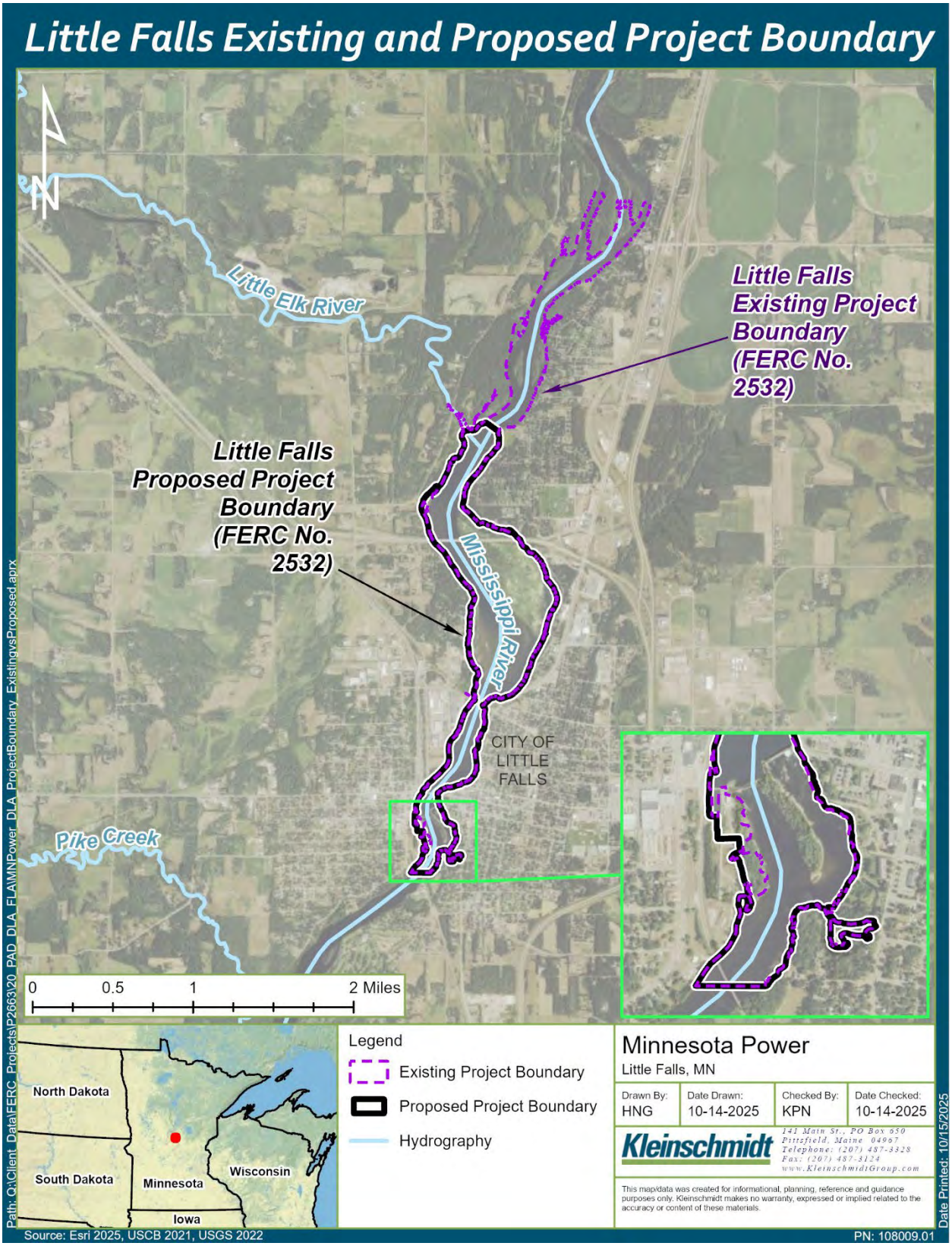
Figure 3-7 illustrates the proposed Little Falls FERC Project Boundary in comparison to the existing Little Falls FERC Project Boundary. As shown, the primary driver of the modification is the use of elevation data to encompass the true operational footprint of the reservoir. The proposed Little Falls Project Boundary around the reservoir is based on elevation 1108.0 feet National Geodetic Vertical Datum of 1929 (NGVD 29), which encompasses the operating band of 1107.0 +/- 0.5 feet NGVD 29. This correction ensures that the boundary reflects the actual extent of water surface elevations during normal operations, aligning with FERC's guidance for defining project lands and waters necessary for operation, maintenance, and resource protection. Additionally, the entirety of the

former power canal, MP-owned land associated with project facilities, and land within the tailwater have been incorporated into the proposed boundary.

As a result of these updates, the total acreage within the Little Falls Project Boundary would be revised from 689.1 acres (including 575-acre reservoir and riverine habitat beyond the impounded reservoir, 36.8-acre tailwater, and 77.3 acres of land) to 518.3 acres (including 420-acre reservoir, 41.6-acre tailwater, and 56.7 acres of lands associated with Project facilities or operations), ensuring that only lands and waters essential to the Little Falls Project's function and regulatory purpose are included.

The potential impacts resulting from the modification of the Little Falls Project Boundary are discussed in detail in the appropriate environmental resource discussions in Section 4.0, Environmental Analysis.

Figure 3-7: Little Falls Project Existing and Proposed FERC Project Boundary



3.2.4.2 Sylvan Project

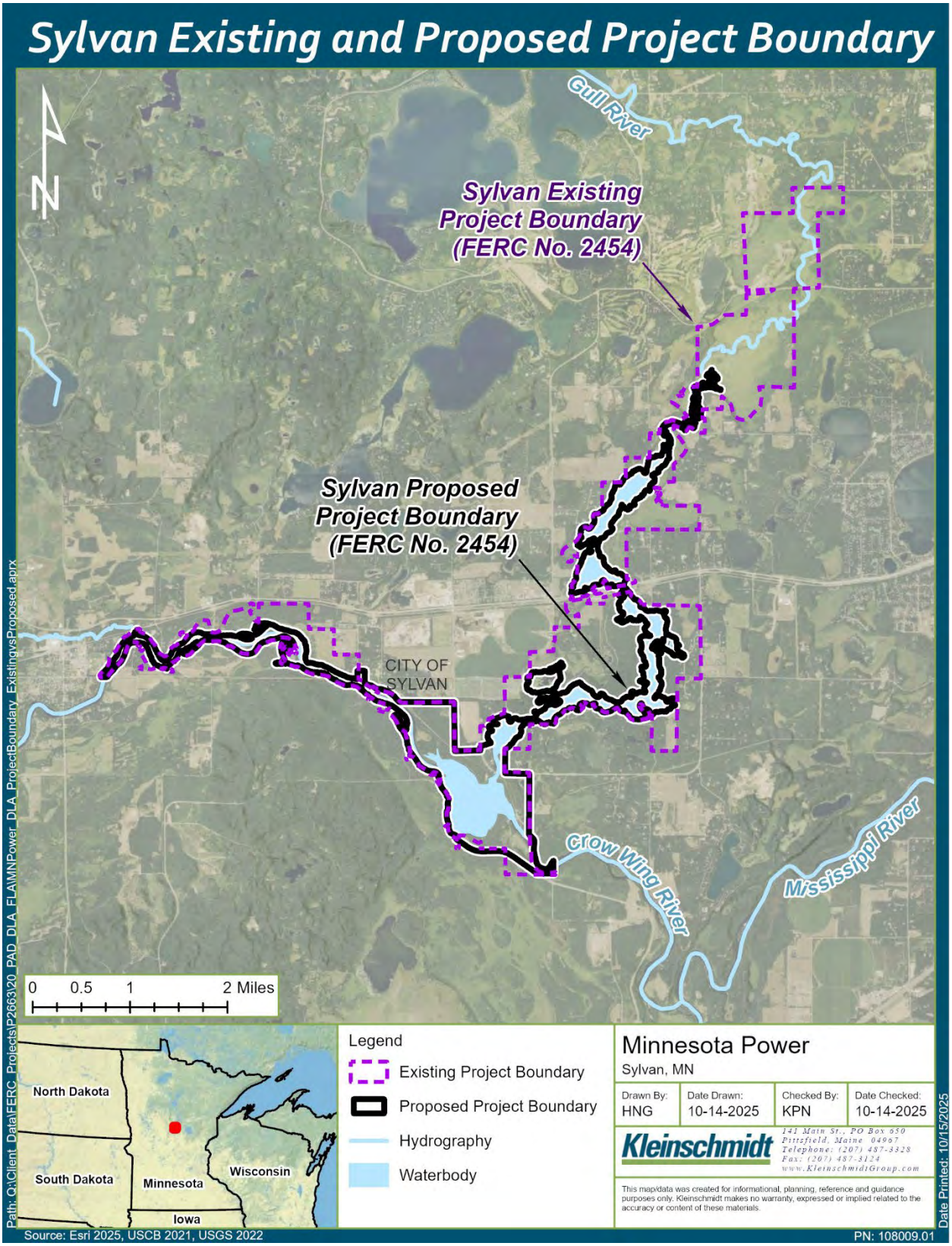
The Licensee proposes the following modifications to the FERC Project Boundary at the Sylvan Project: (1) addition of land or water that is necessary for the operation and maintenance, of the Sylvan Project or its recreation sites; and (2) removal of land or water that is not required for operations, maintenance, or any other project purpose. The proposed modifications are administrative in nature and are intended to align with the Commission's definition of a Project Boundary.

Figure 3-8 illustrates the proposed Sylvan FERC Project Boundary in comparison to the existing Sylvan FERC Project Boundary. A primary driver of the modification is the use of elevation data to encompass the true operational footprint of the reservoir. The proposed Sylvan Project Boundary around the reservoir is based on elevation 1178.0 feet NGVD 29, which encompasses the operating band of 1177.0 +/- 0.5 feet NGVD 29. This correction ensures that the boundary reflects the actual extent of water surface elevations during normal operations, aligning with FERC's guidance for defining project lands and waters necessary for operation, maintenance, and resource protection. Additionally, lands surrounding the boundary that do not serve any project purpose were removed. Lands around the reservoir that remain in the Sylvan Project Boundary are those that include Project facilities, access roads, recreation sites, or for the protection of resources.

The proposed Sylvan Project Boundary modification would result in revised total acreage, changing from 4,479.7 acres (including 1,280-acre reservoir and riverine habitat beyond the impounded reservoir, 16.2-acre tailwater, and 3,183.5 acres of land) to 1,672.5 acres (including 1,215-acre reservoir, 30.1-acre tailwater, and 427.4 acres of lands associated with Project facilities, recreation sites, or the protection of resources).

The potential impacts resulting from the modification of the Sylvan Project Boundary are discussed in detail in the appropriate environmental resource discussions in Section 4.0, Environmental Analysis.

Figure 3-8: Sylvan Project Existing and Proposed FERC Project Boundary



3.2.4.3 Pillager Project

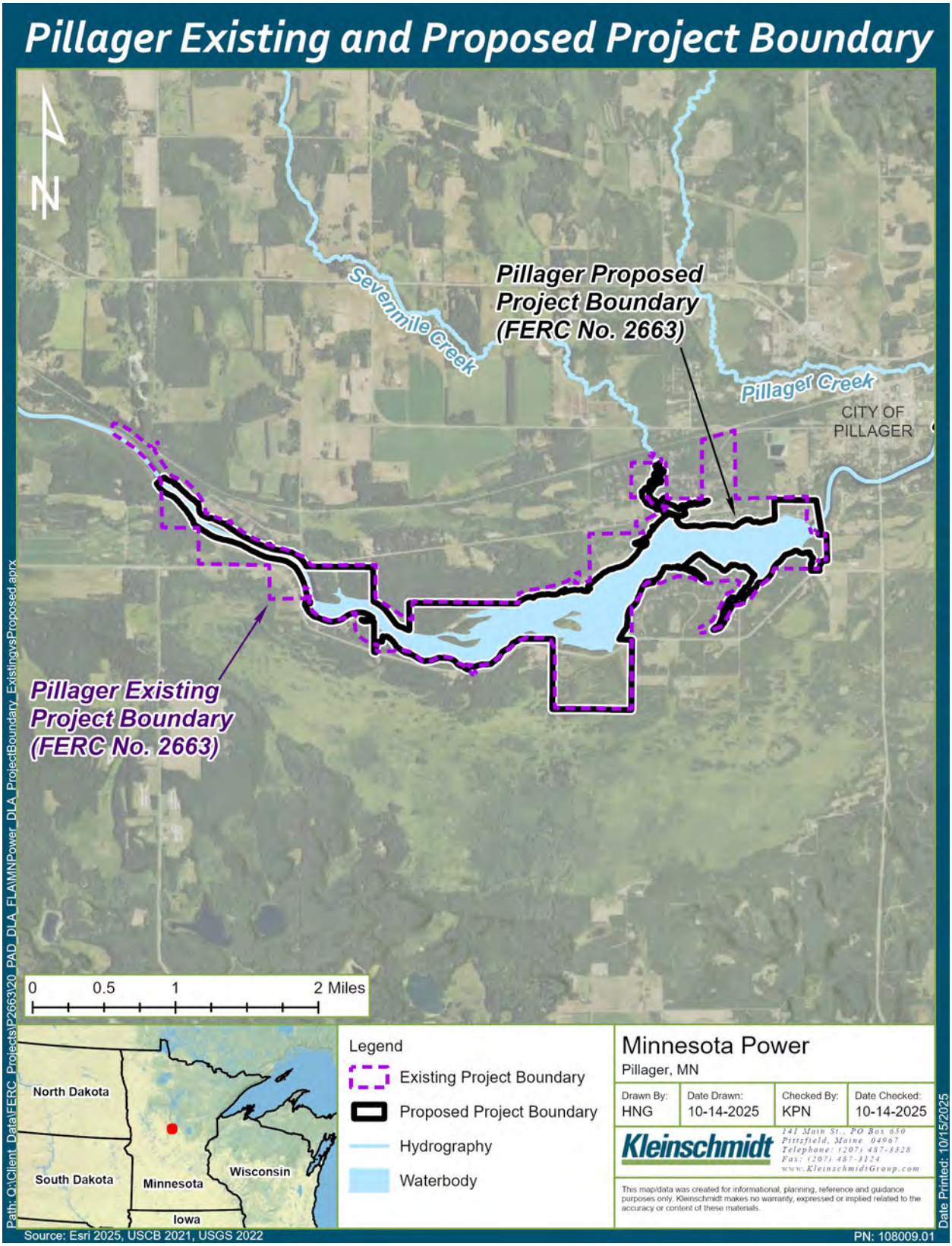
The Licensee proposes the following modifications to the FERC Project Boundary at the Pillager Project: (1) addition of land that is necessary for the operation and maintenance of the Pillager Project; and (2) removal of land that is not required for operations, maintenance, or any other project purpose. The proposed modifications are administrative in nature and are intended to align with the Commission's definition of a Project Boundary.

Figure 3-9 illustrates the proposed Pillager Project Boundary in comparison to the existing Pillager FERC Project Boundary. The modifications include the use of elevation data to encompass the true operational footprint of the reservoir, the removal of lands outside of the reservoir that do not serve any project purpose, and inclusion of land required for project purposes. The proposed Pillager Project Boundary around the reservoir is based on elevation 1200.0 feet NGVD 29, which encompasses the operating band of 1199.25 +/- 0.5 feet NGVD 29. This correction ensures that the boundary reflects the actual extent of water surface elevations during normal operations, aligning with FERC's guidance for defining project lands and waters necessary for operation, maintenance, and resource protection. The Natural Character Areas remain in the boundary. Near the Pillager Project powerhouse and dam, the boundary was modified to include project facilities and access roads, as well as the tailwater associated with the Pillager Project.

The proposed Pillager Project modification would result in revised total acreage, changing from 1,593.7 acres (including 700-acre reservoir and riverine habitat beyond the impounded reservoir, 0.30-acre tailwater, and 893.4 acres of land) to 1,071.1 acres (including 615-acre reservoir, 4.4-acre tailwater, and 451.7 acres of lands associated with Project facilities, recreation sites, or the protection of resources).

The potential impacts resulting from the modification of the Pillager Project Boundary are discussed in detail in the appropriate environmental resource discussions in Section 4.0, Environmental Analysis.

Figure 3-9: Pillager Project Existing and Proposed FERC Project Boundary



3.3 Alternatives Considered but Eliminated from Further Analysis

3.3.1 Federal Government Takeover of the Project

No party suggested that a federal takeover of the Projects would be appropriate, and no federal agency has expressed an interest in operating any of the Projects. There is no evidence that indicates a federal takeover should be recommended to Congress. Federal takeover of the Projects is not a reasonable alternative and is not explored in detail in this assessment.

3.3.2 Decommissioning the Project

The Projects provide economically viable, safe, and clean renewable sources of power to the region. Decommissioning any of the three Projects would result in the loss of a non-polluting generation asset and therefore is not considered a reasonable alternative to new licenses at this time.

4.0 ENVIRONMENTAL ANALYSIS

4.1 General Description of the River Basin

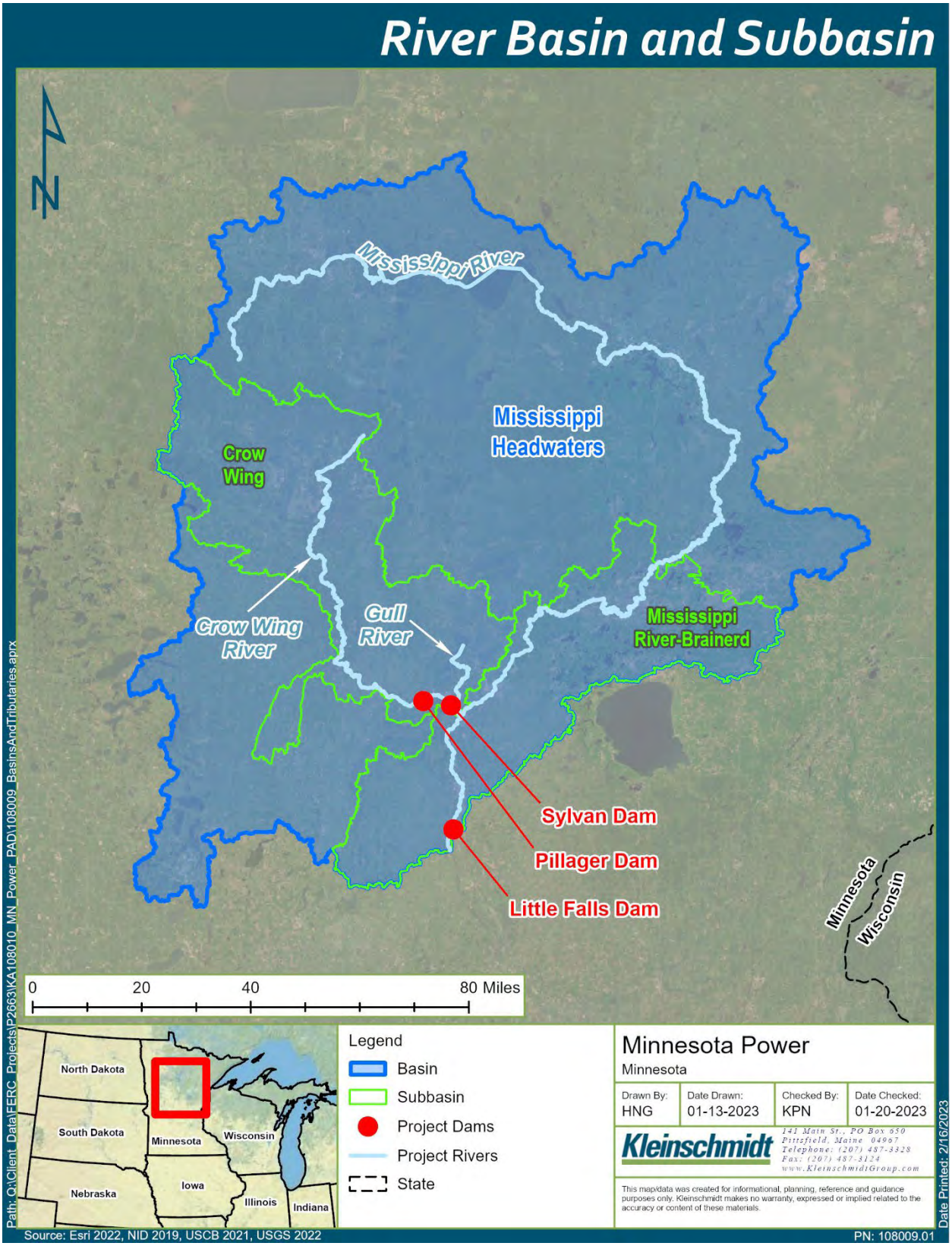
4.1.1 River Basin and Subbasin Descriptions

The Little Falls Project is located on the Mississippi River within the Mississippi River-Brainerd Watershed (Hydrologic Unit Code [HUC] 07010104). The Sylvan and Pillager Projects are both located on the Crow Wing River within the Crow Wing River Watershed (HUC 07010106). Both watersheds are part of the Mississippi River Headwaters Watershed (HUC 6-070101), which itself is within the larger Upper Mississippi watershed (HUC 2-07). Figure 4-1 illustrates the location of the Projects relative to the watersheds in which they operate.

The Mississippi River-Brainerd Watershed covers approximately 1,687 square miles in north central Minnesota (Minnesota PCA 2025a). From northeast to southwest, the watershed stretches 90 miles and encompasses parts of Aitkin, Crow Wing, Morrison, and Todd counties. The watershed contains approximately 2,100 river miles (RMs) and over 200 lakes greater than 10 acres. The Mississippi River enters the watershed after its confluence with the Willow River, near Hassman, Minnesota. The Mississippi River then flows southwesterly approximately 119 miles to its confluence with the Swan River, until it reaches the southern boundary of the Mississippi River-Brainerd Watershed (Minnesota PCA 2019).

The Crow Wing River Watershed is in the north central portion of Minnesota and originates through a series of 11 lakes, which were formed by the melting of blocks of ice that occurred following the glaciation period. These lakes are named sequentially from the First Crow Wing Lake through the Eleventh Crow Wing Lake (the uppermost headwater lake being the Eleventh Crow Wing Lake) and contain a combined surface area of approximately 5,000 acres. The watershed covers 1,946 square miles within Becker, Cass, Clearwater, Crow Wing, Hubbard, Morrison, Otter Tail, Todd, and Wadena counties (Minnesota PCA 2014). The Crow Wing River Watershed includes over 627 lakes 10 acres in size or greater as well as approximately 1,650 RMs (Minnesota PCA 2025b). The Crow Wing River begins at the Eleventh Crow Wing Lake near Akeley, Minnesota and flows through the entire chain of lakes in a southward direction for approximately 20 miles. The Crow Wing River continues for approximately 80 more miles before entering the Mississippi River near Baxter, Minnesota (Minnesota PCA 2014).

Figure 4-1: Watersheds and River Basins of the Projects

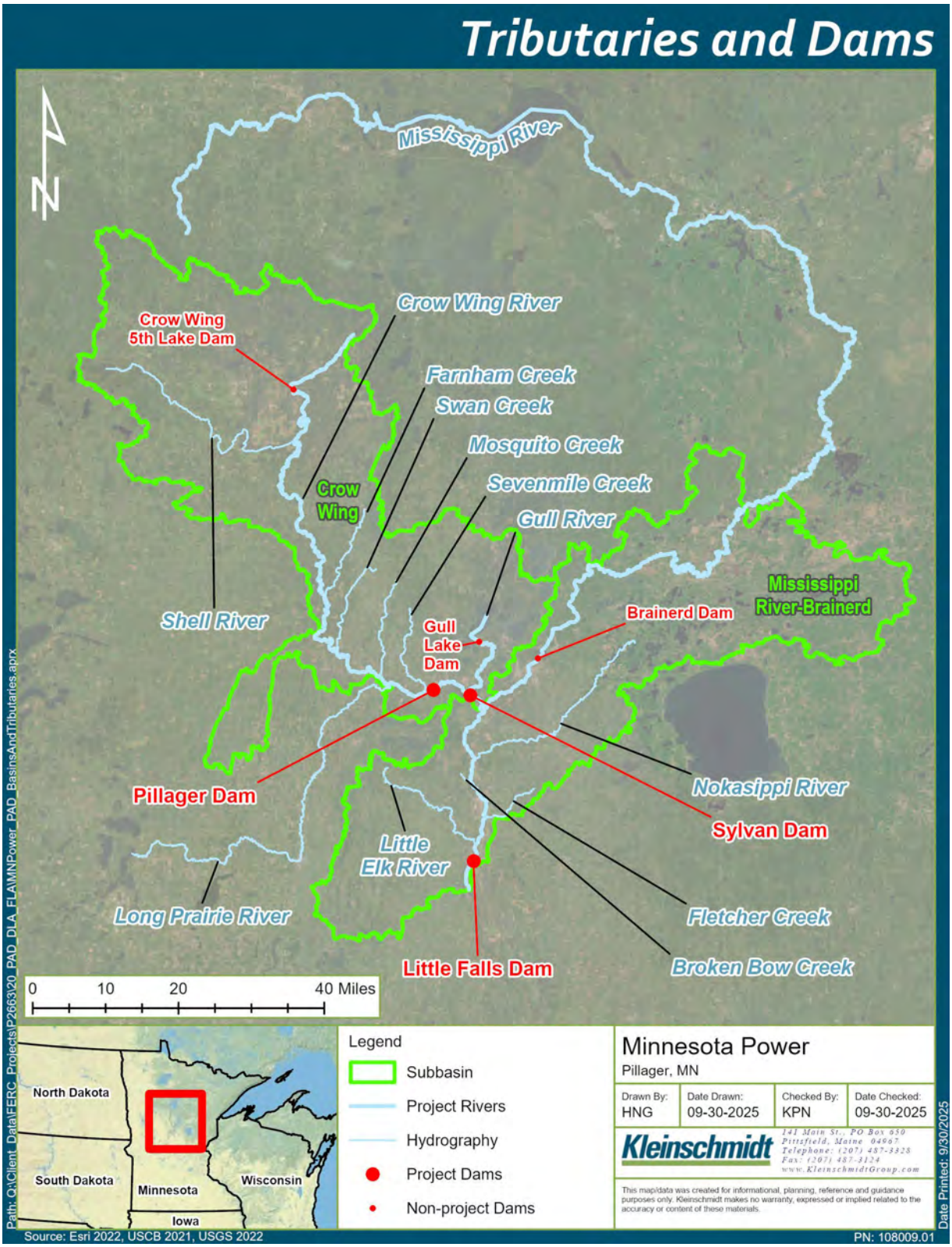


4.1.2 River Basin Tributaries and Dams

Major tributary streams to the Mississippi River within the Mississippi River-Brainerd Watershed include the Little Elk River, the Nokasippi River, Fletcher Creek, Broken Bow Creek, and many other smaller tributaries (Minnesota PCA 2019) (Figure 4-2). There are 23 dams within the Mississippi River-Brainerd Watershed, which range from small privately owned dams to larger hydroelectric facilities (USACE 2025). Dams located on the mainstems of the Mississippi, Crow Wing, and Gull rivers within the Mississippi River-Brainerd Watershed are included in Figure 4-2.

The Crow Wing River grows from a small headwater stream to a rather large fifth order stream as it meanders from Eleventh Crow Wing Lake to the Mississippi River. As the river forms and begins to flow to the southeast, it receives water from several major tributaries including the Gull River, Long Prairie River, Seven Mile Creek, Swan Creek, Farnham Creek, and the Shell River (Figure 4-2). The entrance of the Gull River is less than 0.5 miles from the Sylvan Project dam. The tributaries that contribute to the Crow Wing River have different sources, including wetlands and underground springs (Minnesota PCA 2014). There are 17 dams within the Crow Wing River Watershed, which range from small privately owned dams to larger hydroelectric facilities (USACE 2025). Dams located on the mainstems of the Mississippi, Crow Wing, and Gull rivers within the Crow Wing River Watershed are included in Figure 4-2.

Figure 4-2: Tributaries and Dams on the Mainstems within the Projects' Watersheds and River Basins



4.1.3 Major Land Uses

The majority of the Upper Mississippi River – Brainerd Watershed is within the Level III North Central Hardwood Forests Ecoregion (ecoregion 51) with portions in the Northern Lakes and Forests Ecoregion (ecoregion 50). Historically, the watershed was dominated by old-growth forests, wetlands, and open water. Currently, the watershed is mostly forested (42 percent), with grasslands and shrub wetlands comprising 38 percent, followed by row crops (10 percent), water (6 percent), and the remaining land (4 percent) is considered urban (Minnesota PCA 2025a).

The northwest and southeast portions of the Crow Wing River Watershed are within the Northern Lakes and Forests Ecoregion, with the remainder within the North Central Hardwoods Ecoregion. The majority of lands within the watershed are not highly erodible and suitable for agricultural use. Land use within the watershed is mostly forested and agriculture. Historically, the Crow Wing River was covered by oak savannah, prairie, forests, and wetland habitats. Currently, land use within the watershed is dominated by forest/shrub lands (55 percent) followed by rangeland (pasture) (14 percent), wetlands (11 percent), row crops (10 percent), water (7 percent) and developed land (i.e., residential, urban) (3 percent) (Minnesota PCA 2014).

4.1.4 Major Water Uses

The Minnesota PCA monitored rivers, streams, and lakes within the Upper Mississippi River – Brainerd Watershed and the waterbodies were assessed to determine if they met standards that are protective of aquatic life, aquatic recreation, and aquatic consumption (Minnesota PCA 2019).[3] The majority of lakes within the Upper Mississippi River – Brainerd Watershed met aquatic recreation and aquatic life standards. Of the 141 lakes monitored, 92 had sufficient data to assess aquatic recreation (nutrients), and 61 had sufficient data to assess aquatic life (fish). Seventy-four lakes met the established standards for supporting aquatic recreation, and 18 did not support aquatic recreation. Fifty-seven lakes supported aquatic life and only four lakes did not meet aquatic life standards. The aquatic life in streams (as indicated by the fish and macroinvertebrate communities) is generally

[3] Minnesota PCA's water management efforts are tied to the 1972 Federal Clean Water Act (CWA), which requires states to adopt water quality standards to protect their water resources and the designated uses of those waters, such as for drinking water, recreation, fish consumption and aquatic life (Minnesota PCA 2019).

good. However, several streams are impaired[4] for aquatic life, likely as the result of low dissolved oxygen (DO), altered hydrology, and/or loss of stream connectivity with upstream resources (Minnesota PCA 2019).

The Crow Wing River Watershed includes pristine, high-value recreational lakes and cold-water streams that support trout (Minnesota PCA 2025b). The Minnesota PCA implemented an intensive watershed monitoring effort for the Crow Wing River Watershed in 2010. Some lakes and a few tributaries do not meet water quality standards for beneficial uses such as aquatic recreation, drinking, and swimming. Sixty-eight sites on rivers and streams were sampled for biology, habitat, and water chemistry. Subsets (15) of these locations were selected for more intensive water chemistry monitoring. In addition, 111 lakes were sampled for water chemistry. The majority of lakes within the Crow Wing River Watershed demonstrate good water quality by meeting aquatic recreation standards. Of the 379 lakes (greater than 10 acres), the trophic status of 111 lakes were assessed: 104 lakes supported aquatic recreation, and seven lakes did not and are considered impaired (Minnesota PCA 2014). The main lake pollutant within the Crow Wing River Watershed is phosphorus, which can cause algae blooms in summer months (Minnesota PCA 2025b). Thirty-two stream assessment units fully support aquatic life, and 13 streams fully support aquatic recreation, with 19 not supporting aquatic life and/or aquatic recreation. None of the streams were impaired for turbidity, with aquatic life impairments due to low fish and macroinvertebrate Index of Biotic Integrity (IBI) scores and/or low dissolved oxygen (Minnesota PCA 2014).

4.1.5 Climate

Minnesota is characterized as having a continental climate with warm summers and cold winters (Minnesota PCA 2019). The Upper Mississippi River – Brainerd Watershed has an average annual air temperature of 41.6 degrees Fahrenheit (°F), with a 13.8°F average in the winter (December to February) and 66.6°F average in the summer (June to August). The Upper Mississippi River – Brainerd Watershed has an average annual minimum air temperature of 31.3°F and an average annual maximum air temperature of 51.8°F. The

[4] Waters that do not meet established standards are referred to as "impaired waters," and the state must make appropriate plans to restore these waters, including the development of total maximum daily loads (TMDLs) (Minnesota PCA 2019).

Upper Mississippi River – Brainerd Watershed has an average annual precipitation of 28.5 inches, with the majority occurring within the summer months (Minnesota DNR 2019a).

The Crow Wing River Watershed has an average annual air temperature of 40.8°F, with a 12.3°F average in the winter (December to February) and 66.3°F average in the summer (June to August). The Crow Wing River Watershed has an average annual minimum air temperature of 30.6°F and an average annual maximum air temperature of 50.9°F. The Crow Wing River Watershed has an average annual precipitation of 26.2 inches, with the majority occurring within the summer months (Minnesota DNR 2019b).

4.1.6 References

Minnesota Department of Natural Resources (Minnesota DNR). 2019a. Climate Summary for Watersheds: Mississippi River-Brainerd. Available online: http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/climate_summary_major_10.pdf. Accessed July 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2019b. Climate Summary for Watersheds: Crow Wing River. Available online: http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/climate_summary_major_12.pdf. Accessed July 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2014. Crow Wing River Watershed Monitoring and Assessment Report. Available online: https://www.pca.state.mn.us/sites/default/files/wq-ws3-07010106c.pdf. Accessed July 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2019. Upper Mississippi River-Brainerd Watershed monitoring and Assessment Report. Available online: https://www.pca.state.mn.us/sites/default/files/wq-ws3-07010104b.pdf. Accessed July 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2025a. Mississippi River – Brainerd. Available online: https://www.pca.state.mn.us/watershed-information/mississippi-river-brainerd. Accessed July 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2025b. Crow Wing River. Available online: https://www.pca.state.mn.us/watershed-information/crow-wing-river. Accessed July 2025.

U.S. Army Corps of Engineers (USACE). 2025. National Inventory of Dams. https://nid.sec.usace.army.mil/nid/#/ Accessed October 2025.

4.2 Scope of Cumulative Effects Analysis

A cumulative effect is an impact on the environment resulting from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time, including hydropower and other land and water development activities. The Licensee has not identified any resources that would be cumulatively affected by the continued operation of the Projects; therefore, no further discussion of cumulative effects is included within this license application.

4.3 Geology and Soils

4.3.1 Affected Environment

4.3.1.1 Overview

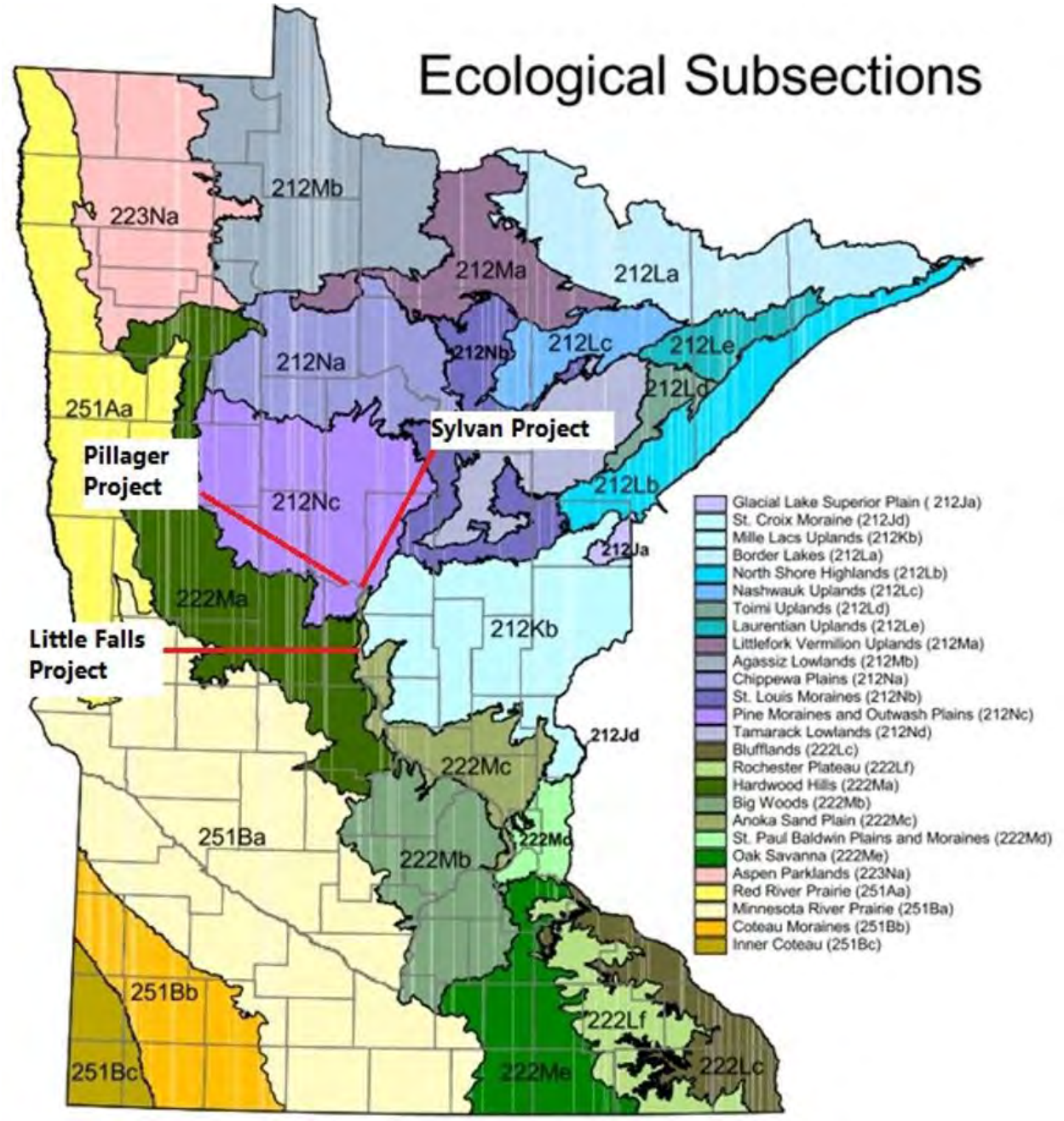
NPS divided the contiguous United States into physiographic provinces according to their geomorphology[5] (NPS 2017). Minnesota is comprised of two main physiographic provinces: the Superior Upland Province and the Central Lowland Province. The Projects are located within the Central Lowland Province, which is the largest physiographic province extending from western New York to North Dakota and south to Texas (NPS 2018).

Minnesota DNR and the U.S. Forest Service developed a hierarchical Ecological Classification System (ECS) for ecological mapping and landscape classification in Minnesota (Minnesota DNR 2025a). The ECS divides the state of Minnesota into six levels: provinces, sections, subsections, land type associations, land types, and land type phases (Minnesota DNR 2025a). The data associated with the first three levels (provinces, sections, and subsections[6]) were readily available. The Little Falls Project lies within the Eastern Broadleaf Forest Province (222), the Minnesota and Northeast Iowa Morainal (222M) Section, and the Anoka Band Plain Subsection (222Mc). The Sylvan and Pillager Projects are located within the Laurentian Mixed Forest Province (212), the North Minnesota Drift and Lake Plains Section (212N), and the Pine Moraines and Outwash Plains Subsection (212Nc). Minnesota DNR's ECS subsections are shown in Figure 4-3.

[5] Geomorphology refers to the physical features and processes of landforms, and their relation to geologic structures.

[6] Provinces are units of land defined using major climate zones, native vegetation, and biomes such as prairies, deciduous forests, or boreal forests. Sections are units within Provinces that are defined by origin of glacial deposits, regional elevation, distribution of plants, and regional climate. Subsections are units within Sections that are defined using glacial deposition processes, surface bedrock formations, local climate, topographic relief, and the distribution of plants, especially trees (Minnesota DNR 2025a).

Figure 4-3: Minnesota DNR's Ecological Subsections for the State of Minnesota



Source: Minnesota DNR 1999

4.3.1.2 Topography

The majority of the Central Lowland Province is surrounded by higher relief with elevations ranging from 1,000 feet above mean sea level (MSL) in the east to less than 2,000 feet MSL in the west (NPS 2018). Topography in the Projects Vicinities is relatively flat with elevations ranging from approximately 1,110 feet to 1,150 feet MSL at the Little Falls Project, approximately 1,170 feet to 1,250 feet MSL at the Sylvan Project, and approximately 1,210 feet to 1,270 feet MSL at the Pillager Project. Figure 4-4 and Figure 4-5 depict the general topography at the Little Falls Project, and Sylvan and Pillager Projects, respectively.

Figure 4-4: Topography at the Little Falls Project

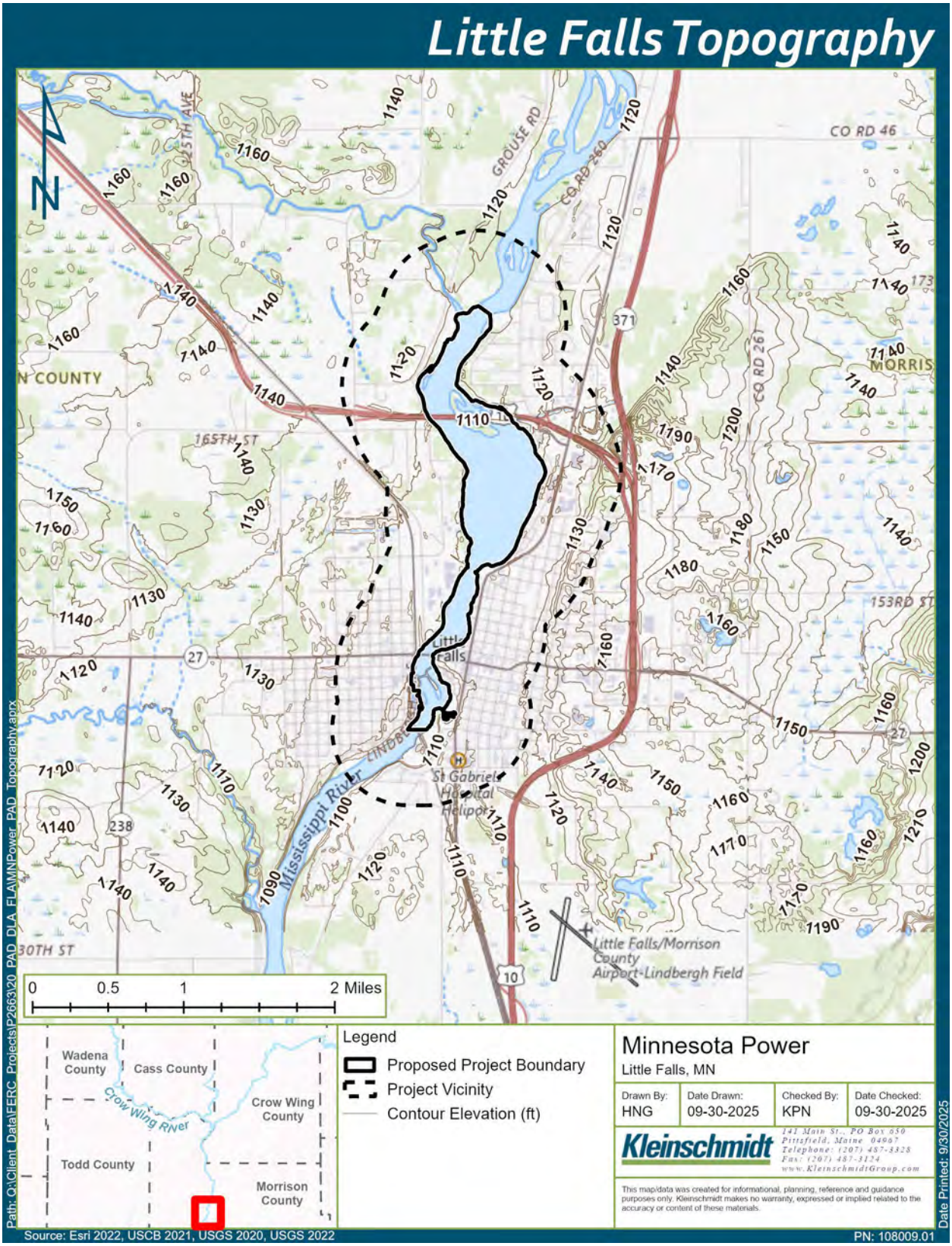
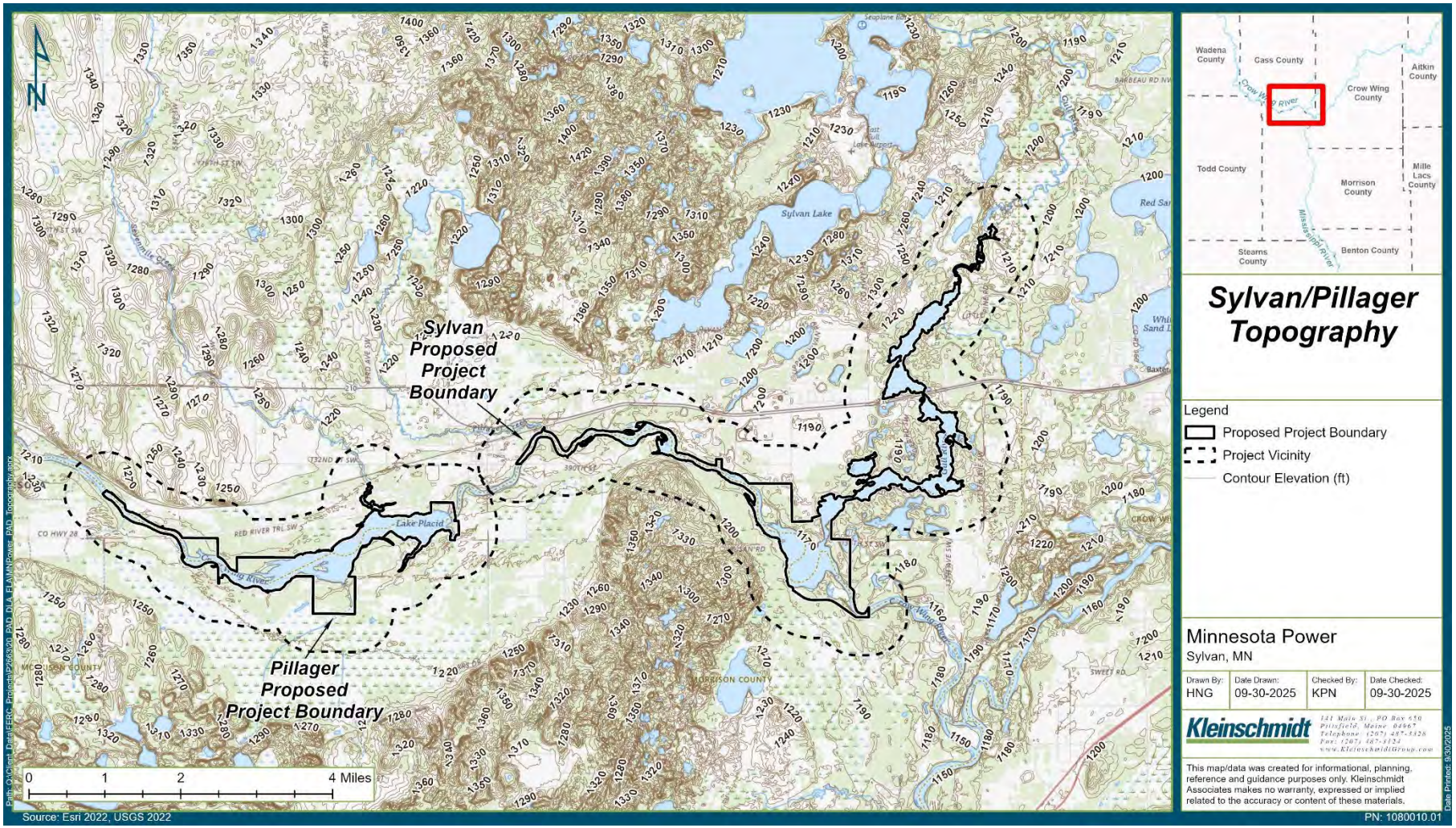


Figure 4-5: Topography at the Sylvan and Pillager Projects



4.3.1.3 Geology

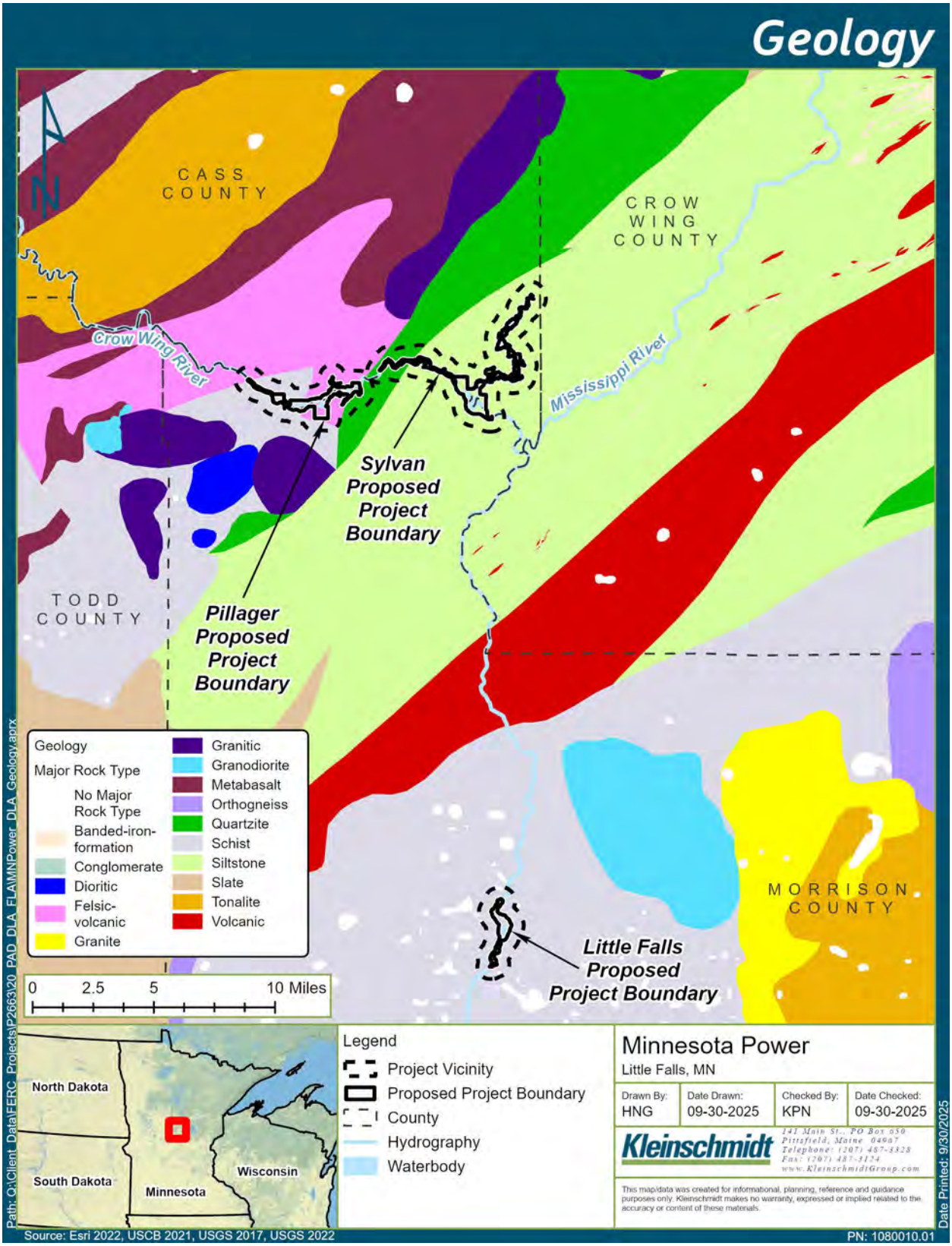
The Central Lowland Province is characterized by flat lands with geomorphic remnants of glaciation. The Central Lowlands were subject to repeated Pleistocene glaciations and can be divided into regions based on glacial features, including the Great Lakes, Small Lakes, Driftless Area, Till Plains, Dissected Till Plains, and Osage Plains. Underlying glacial deposits are largely horizontal Paleozoic sandstones, shales, limestones, conglomerates, and coals (NPS 2022).

The Little Falls Project is located within the Eastern Broadleaf Forest Province, the Minnesota and Northeast Iowa Morainal Section, and the Anoka Band Plain Subsection. The Eastern Broadleaf Forest Province is the product of Pleistocene glacial processes and characterized by thick (100 to 300 feet) deposits of glacial drift (Minnesota DNR 2025b). Over half of the Minnesota and Northeast Iowa Morainal Section consists of rugged moraines along the eastern margin of the Des Moines ice lobe from the last glaciation, with another quarter of the area consisting of rolling till or basal till. Small sand plains occur within the moraines, and the Little Falls Project exists in the Anoka Sand Plain (Minnesota DNR 2025c). The Anoka Sand Plain Subsection consists of a flat, sandy lake plain and terraces along the Mississippi River. Surface glacial deposits are typically less than 200 feet thick and underlain by Cambrian and Ordovician dolomite, sandstone, and shale (Minnesota DNR 2025d). The major rock type at the Little Falls Project is schist as shown in Figure 4-6.

The Sylvan and Pillager Projects are located within the Laurentian Mixed Forest Province, the North Minnesota Drift and Lake Plains Section, and the Pine Moraines and Outwash Plains Subsection. The Laurentian Mixed Forest Province ranges from rugged terrain covered with lakes and thin glacial deposits on top of bedrock, to undulating plains with deep glacial drift, to large, flat poorly drained peatlands (Minnesota DNR 2025e). The Minnesota Drift and Lake Plains Section has complex surface geology and is characterized by deep (200 to 600 feet) glacial deposits in outwash plains, lake plains, till plains, outwash channels, moraines, and drumlin fields (Minnesota DNR 2025f). The Pine Moraines and Outwash Plains Subsection is a mix of end moraines, outwash plains, till plains, and drumlin fields. The moraines are relatively large and formed from portions of multiple glacial lobes. Thick glacial drift covers the bedrock in the majority of this Subsection. A diversity of Precambrian rock underlies the glacial drift, with iron formations along with argillite, siltstone, quartzite, and graywacke at the southeastern edge of the Subsection.

Cretaceous marine shale, sandstone, and variegated shale are present in the southwest area of the Subsection (Minnesota DNR 2025g). The major rock types at the Sylvan Project are siltstone and quartzite and the major rock types at the Pillager Project are schist and felsic-volcanic, as shown in Figure 4-6.

Figure 4-6: Geology at the Little Falls, Sylvan, and Pillager Projects



4.3.1.4 Soils

The Soil Survey Geographic Database (SSURGO) was reviewed to characterize the soil types in the Projects Boundaries and Projects Vicinities. Soils are organized into 12 major groups (orders) that are determined by major climate factors, dominant materials, or degree of weathering (USDA NRCS 2025a). Soil erosion factors are used to quantify erosion and include k-factor[7] (rock free), t-factor,[8] and wind erodibility index and group.[9] Table 4-1 (Little Falls), Table 4-2 (Sylvan), and Table 4-3 (Pillager) provide the soil types, soil orders, accompanying acreage, and associated erosion factors at the Projects. Soil orders are depicted in Figure 4-7 and Figure 4-8.

[7] The k-factor is a soil erodibility factor representing both susceptibility of soil to erosion and the rate of runoff. Soils high in clay have low k values because they are resistant to detachment. Sandy soils also have low k values due to low rate of runoff, although they are easily detached. Medium textured soils (such as silt loam soils) have moderate k values (Michigan State University 2002).

[8] The t-factor is the soil loss tolerance in tons per acres. The factor of 1 ton per acre per year is for shallow or fragile soils, and 5 tons per acre per year designate deep soils that are least susceptible to damage by erosion (USDA NRCS 2025b).

[9] Soil erodibility by wind is directly related to the percentage of dry non-erodible surface soil aggregates larger than 0.84 millimeters in diameter. From this percentage, the wind erodibility index is determined. The index is an expression of the stability of these soil aggregates against breakdown by tillage and abrasion from wind erosion. Soils are placed in Wind Erodibility Groups having similar percentages of dry soil aggregates larger than 0.84 millimeters (SD Tech Guide 2002).

Table 4-1: Soil Types at the Little Falls Project

Soil Type	Soil Order	k-factor Rock Free	t-factor	Wind Erodibility Group	Wind Erodibility Index	Existing Project Boundary Area (Acres)	Proposed Project Boundary Area (Acres)
Water	Bodies of Water	-	-	-	-	585.5	436.4
Fordum-Winterfield complex	Entisols	0.12	4	5	56	69.4	43.9
Udorthents, loamy	Entisols	0.43	5	5	56	9.4	9.5
Becker fine sandy loam	Mollisols	0.22	3	3	86	8.3	8.6
Hubbard loamy sand, 1 to 6 percent slopes	Mollisols	0.04	5	2	134	7.6	6.6
Menahga loamy sand, 8 to 15 percent slopes	Entisols	0.02	5	2	134	3.7	5.6
Menahga loamy sand, 1 to 8 percent slopes	Entisols	0.02	5	2	134	1.6	2.0
Menahga loamy sand, 15 to 30 percent slopes	Entisols	0.02	5	2	134	1.5	3.7
Isan-Isan, frequently ponded, complex, 0 to 2 percent slopes	Mollisols	0.11	2	3	86	0.9	0.0
Menahga loamy sand, 0 to 2 percent slopes	Entisols	0.02	5	2	134	0.5	1.8
Meehan loamy sand, 0 to 3 percent slopes	Entisols	0.04	5	2	134	0.4	0.0
Watab loamy fine sand	Alfisols	0.33	4	2	134	0.2	0.1
Duelm loamy sand, 0 to 2 percent slopes	Mollisols	0.05	5	2	134	0.1	0.2
Hubbard loamy sand, 0 to 2 percent slopes	Mollisols	0.04	5	2	134	0.0	0.0

Source: USDA NRCS 2025c

Table 4-2: Soil Types at the Sylvan Project

Soil Types	Soil Order	k-factor Rock Free	t-factor	Wind Erodibility Group	Wind Erodibility Index	Existing Project Boundary Area (Acres)	Proposed Project Boundary Area (Acres)
Water	Bodies of Water	-	-	-	-	1,206.4	1147.8
Menahga loamy sand, 1 to 8 percent slopes	Entisols	0.02	5	2	134	521.5	132.2
Hubbard loamy sand, 0 to 2 percent slopes	Mollisols	0.04	5	2	134	508.0	162.1
Rifle-Rifle, ponded, complex, 0 to 1 percent slopes	Histosols		2	7	38	333.0	0.0
Hubbard loamy sand, 1 to 6 percent slopes	Mollisols	0.04	5	2	134	290.9	41.6
Markey muck, occasionally ponded, 0 to 1 percent slopes	Histosols	0.02	1	8	0	262.5	15.7
Menahga loamy sand, 8 to 15 percent slopes	Entisols	0.02	5	2	134	243.4	35.3
Seelyeville-Seelyeville, ponded, complex, 0 to 1 percent slopes	Histosols		2	2	134	186.3	0.0
Lougee-Totagatic-Bowstring complex, 0 to 1 percent slopes, frequently flooded	Histosols	0.07	1	7	38	182.9	0.0
Menahga loamy sand, 15 to 30 percent slopes	Entisols	0.02	5	2	134	141.7	23.1
Graycalm loamy sand, 12 to 25 percent slopes	Entisols	0.06	5	2	134	110.4	0.0
Menahga loamy sand, 0 to 2 percent slopes	Entisols	0.02	5	2	134	108.0	43.4
Friendship loamy sand	Entisols	0.05	5	2	134	52.8	24.2
Roscommon loamy sand	Entisols	0.05	5	2	134	42.5	6.7

Soil Types	Soil Order	k-factor Rock Free	t-factor	Wind Erodibility Group	Wind Erodibility Index	Existing Project Boundary Area (Acres)	Proposed Project Boundary Area (Acres)
Zimmerman loamy fine sand, 0 to 2 percent slopes	Entisols	0.16	5	2	134	39.7	0.0
Zimmerman loamy fine sand, 6 to 15 percent slopes	Entisols	0.16	5	2	134	39.3	0.0
Meehan loamy sand, 0 to 3 percent slopes	Entisols	0.04	5	2	134	35.6	3.0
Graycalm-Wurtsmith complex, 2 to 8 percent slopes	Entisols	0.07	5	2	134	33.1	0.0
Cathro-Seelyeville complex	Histosols	0.32	1	2	134	32.2	7.5
Zimmerman loamy fine sand, 1 to 6 percent slopes	Entisols	0.16	5	2	134	22.4	0.0
Gerrish-Mahtomedi complex, 12 to 25 percent slopes	Entisols	0.07	5	2	134	18.3	0.0
Isan-Isan, frequently ponded, complex, 0 to 2 percent slopes	Mollisols	0.11	2	3	86	16.1	3.7
Fordum-Winterfield complex	Entisols	0.12	4	5	56	14.0	16.0
Mahtomedi loamy sand, 8 to 15 percent slopes	Entisols	0.07	5	2	134	13.1	0.0
DeMontreville loamy sand, 2 to 8 percent slopes	Alfisols	0.27	5	2	134	9.4	0.0
Mahtomedi loamy sand, 1 to 8 percent slopes	Entisols	0.07	5	2	134	7.1	6.6
Graycalm loamy sand, 2 to 8 percent slopes	Entisols	0.07	5	2	134	4.7	0.0
Fluvaquents, frequently flooded	Entisols	0.11	2	4L	86	1.9	3.4

Soil Types	Soil Order	k-factor Rock Free	t-factor	Wind Erodibility Group	Wind Erodibility Index	Existing Project Boundary Area (Acres)	Proposed Project Boundary Area (Acres)
Lougee-Barber-Guida complex, 0 to 6 percent slopes	Entisols	0.11	1	7	38	0.9	0.0
Mooselake and Lupton soils, 0 to 1 percent slopes	Histosols		2	2	134	0.5	0.0
Warba-Cromwell complex, 1 to 8 percent slopes	Alfisols	0.24	5	3	86	0.4	0.0
Graycalm-Grayling complex, 12 to 25 percent slopes	Entisols	0.06	5	2	134	0.2	0.0
Uskabwanka-Rifle-Lougee complex, 0 to 1 percent slopes	Histosols	0.03	1	7	38	0.1	0.0

Source: USDA NRCS 2025c

Table 4-3: Soil Types at the Pillager Project

Soil Types	Soil Order	k-factor Rock Free	t-factor	Wind Erodibility Group	Wind Erodibility Index	Existing Project Boundary Area (Acres)	Proposed Project Boundary Area (Acres)
Water	Bodies of Water					696.4	683.1
Meehan loamy sand, 0 to 3 percent slopes	Entisols	0.04	5	2	134	320.3	103.7
Menahga loamy sand, 1 to 8 percent slopes	Entisols	0.02	5	2	134	195.7	120.2
Friendship loamy sand	Entisols	0.05	5	2	134	93.8	38.3
Roscommon loamy sand	Entisols	0.05	5	2	134	85.6	23.1
Menahga loamy sand, 0 to 2 percent slopes	Entisols	0.02	5	2	134	46.8	18.9
Meehan-Isan complex	Entisols	0.09	5	2	134	36.6	36.3
Menahga loamy sand, 8 to 15 percent slopes	Entisols	0.02	5	2	134	32.4	16.3
Fordum-Winterfield complex	Entisols	0.12	4	5	56	21.1	11.1
Cathro-Seelyeville complex	Histosols	0.32	1	2	134	20.1	9.6
Isan-Isan, frequently ponded, complex, 0 to 2 percent slopes	Mollisols	0.11	2	3	86	19.3	0.0
Menahga loamy sand, 15 to 30 percent slopes	Entisols	0.02	5	2	134	14.0	8.3
Markey muck, occasionally ponded, 0 to 1 percent slopes	Histosols	0.02	1	8	0	7.7	1.0
Hubbard loamy sand, 0 to 2 percent slopes	Mollisols	0.04	5	2	134	3.7	0.0
Staples loamy sand, acid substratum	Alfisols	0.29	4	2	134	0.2	0.0
Fluvaquents, frequently flooded	Entisols	0.11	2	3	86	0.0	1.1

Source: USDA NRCS 2025c

Figure 4-7: Soils at the Little Falls Project

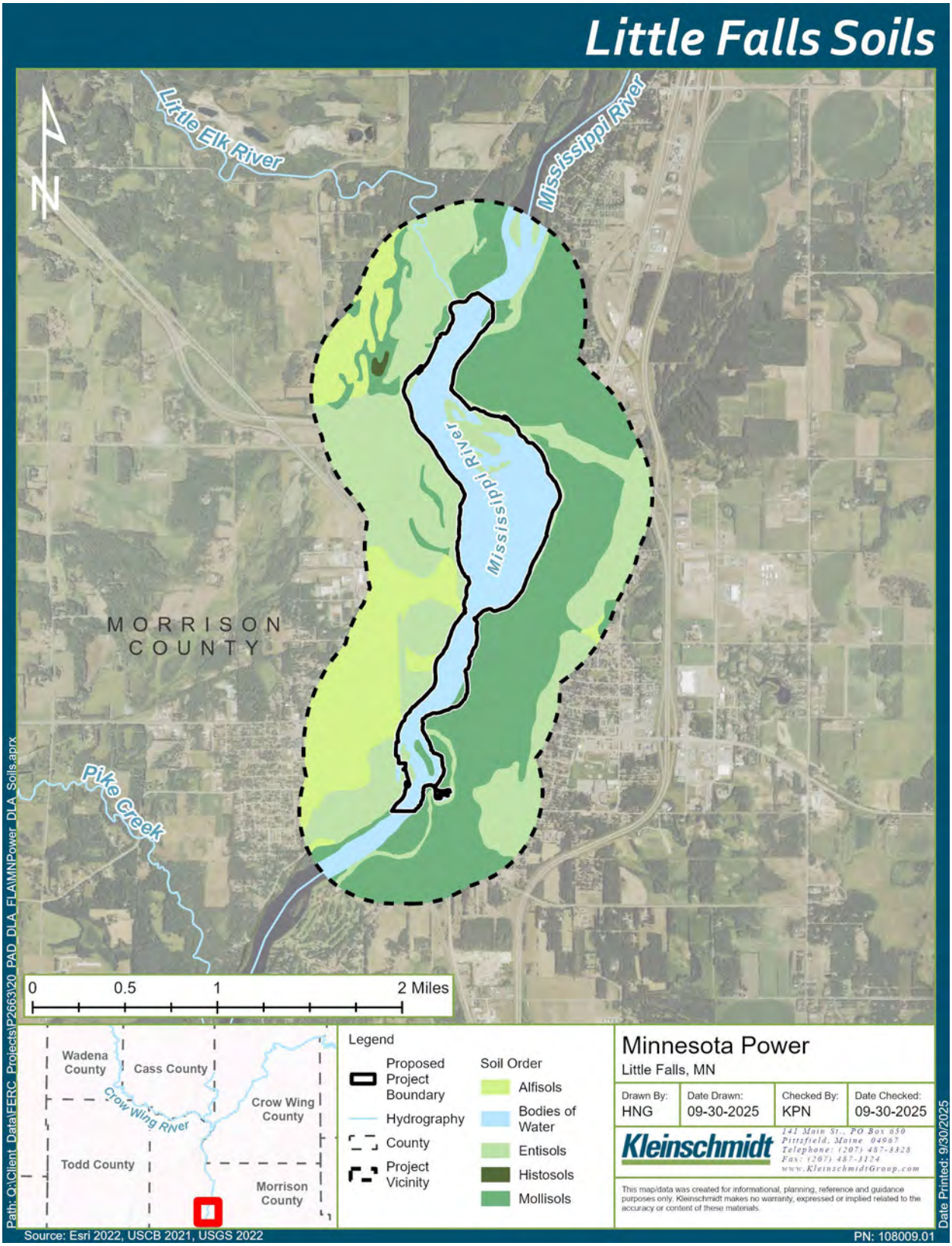
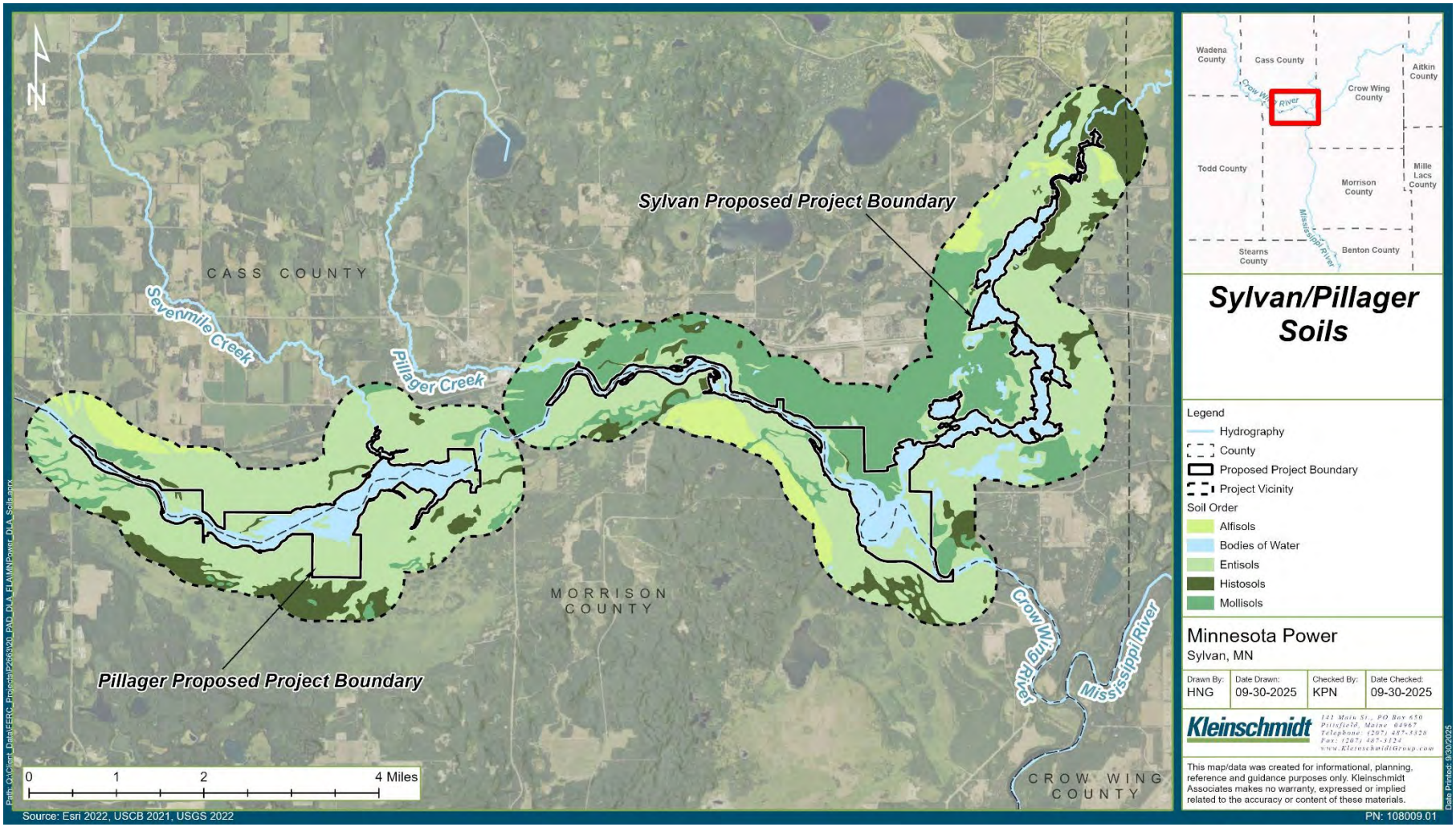


Figure 4-8: Soils at the Sylvan and Pillager Projects



4.3.1.5 Reservoir Shoreline and Streambanks

The Little Falls, Sylvan, and Pillager reservoir shorelines are relatively flat as depicted in Figure 4-4 and Figure 4-5 above. The shorelines are vegetated with forests, grasslands, and wetlands as described in more detail in Sections 4.7 and 4.9.

The Projects' reservoirs are not subject to annual drawdowns and do not widely fluctuate during the year. However, potential for erosion along the shorelines does occur. The Cultural Resources Management Plans (CRMP) for the Projects identified river currents, wind and ice action, water access, bank grooming, and cattle crazing as the main sources of erosion on the Projects' shorelines (IMA 1996a, 1996b, 1999[10]). As a requirement of the Projects' existing CRMPs, MP is required to submit annual reports that include general shoreline monitoring. Review of the most recent annual reports for the 2024 and 2023 monitoring seasons (In Situ 2025 and 2024[11]) stated that the annual site monitoring found no visible impacts (i.e., active erosion) from the operation and maintenance of the Projects (In Situ 2025, 2024a, 2024b, 2024c, 2023a, 2023b). One isolated incident of limited (as opposed to moderate or major) erosion was observed in 2024 along the Sylvan Project reservoir (discussed in Section 4.11.1.5). One area of erosion is present along the northern shoreline of the Pillager Project tailwater. There is no current evidence of active erosion, slumping, or slope instability along the Projects' reservoir shorelines.

4.3.2 Environmental Analysis

The Licensee proposes no changes in operation of the Projects and will continue to operate the Projects in a run-of-river mode. This mode of operation will minimize large fluctuations and will help to maintain stable flows. Such stability will minimize the potential for erosion along the reservoir shorelines in the Projects' Boundary. The Licensee is not proposing changes to the facilities, construction, or dredging activities as part of the proposed action that could disturb sediments, affect soils, or affect geologic

[10] Cattle grazing was not identified as a source of erosion at the Pillager Project.

[11] The 2024 and 2023 Little Falls Project Annual Reports were filed under Accession Numbers 20241015-5122 and 20231011-5126. The 2024 and 2023 Sylvan Project Annual Reports were filed under Accession Numbers 20241015-5120 and 20231011-5128. The 2024 and 2023 Pillager Project Annual Reports were filed under Accession Numbers 20250127-5044 and 20240124-5043.

resources. The Licensee is not proposing changes to operations of the Projects that would affect geology or soils.

The Licensee is proposing modifications to the FERC Project Boundaries for the Projects, as described in Section 3.2.4. The modification of the Project Boundaries to make the Project Boundary only for project purposes, including the removal of lands unnecessary for project purposes, and the addition of lands necessary of project purposes, will not impact geological resources.

4.3.3 Protection, Mitigation, Enhancement Measures

The Licensee proposes to continue operating the Projects in a run-of-river mode, which helps minimize erosion associated with Project operations.

4.3.4 Unavoidable Adverse Effects

Continued operation and relicensing of the Projects as proposed is not expected to have unavoidable adverse effects on geology or soils.

4.3.5 References

Institute for Minnesota Archaeology (IMA) Consulting. 1996a. Cultural Resource Management Plan for the Little Falls Hydroelectric Project on the Mississippi River, Morrison County, Minnesota.

Institute for Minnesota Archaeology (IMA) Consulting. 1996b. Cultural Resource Management Plan for the Sylvan Hydroelectric Project on the Crow Wing River in Cass, Crow Wing, and Morrison County, Minnesota.

Institute for Minnesota Archaeology (IMA). 1999. Cultural Resources Management Plan for the Pillager Hydroelectric Project on the Crow Wing River in Cass and Morrison Counties, Minnesota.

In Situ Archaeological Consulting (In Situ). 2025. Annual Report of Cultural Resource Management Activities Undertaken at the Pillager Hydroelectric Project (FERC License #2663), Cass and Morrison Counties, Minnesota: 2024 Field Season.

In Situ Archaeological Consulting (In Situ). 2024a. Annual Report of Cultural Resource Management Activities Undertaken at the Little Falls Hydroelectric Project (FERC #2352), Morrison County, Minnesota: 2024 Field Season.

In Situ Archaeological Consulting (In Situ). 2024b. Annual Report of Cultural Resource Management Activities Undertaken at the Sylvan Hydroelectric Project (FERC #2454), Cass, Crow Wing, and Morrison Counties, Minnesota: 2024 Field Season.

In Situ Archaeological Consulting (In Situ). 2024c. Annual Report of Cultural Resource Management Activities Undertaken at the Pillager Hydroelectric Project (FERC License #2663), Cass and Morrison Counties, Minnesota: 2023 Field Season.

In Situ Archaeological Consulting (In Situ). 2023a. Annual Report of Cultural Resource Management Activities Undertaken at the Little Falls Hydroelectric Project (FERC #2352), Morrison County, Minnesota: 2023 Field Season.

In Situ Archaeological Consulting (In Situ). 2023b. Annual Report of Cultural Resource Management Activities Undertaken at the Sylvan Hydroelectric Project (FERC #2454), Cass, Crow Wing, and Morrison Counties, Minnesota: 2023 Field Season.

Michigan State University. 2002. Technical Guide to RUSLE (Online Soil Erosion Assessment Tool) use in Michigan. Available online: http://www.iwr.msu.edu/rusle/kfactor.htm. Accessed August 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025a. Ecological Classification System. Available online: https://www.dnr.state.mn.us/ecs/index.html. Accessed August 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025b. Eastern Broadleaf Forest Province. Available online: https://www.dnr.state.mn.us/ecs/222/index.html. Accessed August 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025c. Minnesota and Northwest Iowa Morainal Section. Available online: https://www.dnr.state.mn.us/ecs/222M/index.html. Accessed August 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025d. Available online: https://www.dnr.state.mn.us/ecs/222Mc/index.html Accessed August 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025e. Laurentian Mixed Forest Province. https://www.dnr.state.mn.us/ecs/212/index.html. Accessed August 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025f. Northern Minnesota Drift and Lake Plains Section. Available online: https://www.dnr.state.mn.us/ecs/212N/index.html. Accessed August 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025g. Pine Moraines and Outwash Plains Subsection. Available online: https://www.dnr.state.mn.us/ecs/212Nc/index.html. Accessed August 2025.

National Park Service (NPS). 2017, March 17. Physiographic Provinces. Available online: https://www.nps.gov/subjects/geology/physiographic-provinces.htm. Accessed July 2025.

National Park Service (NPS). 2018, April 30. Central Lowland Province. Available online: https://www.nps.gov/articles/centrallowlandprovince.htm. Accessed July 2025.

South Dakota Technical Guide. 2002. Section II – Cropland Interpretations. Wind Erodibility Groups (I). Available online: https://efotg.sc.egov.usda.gov/references/Agency/SD/Archived_winderos_100415.pdf. Accessed July 2025.

U.S. Department of Agriculture (USDA) Natural Resources Conservation Service Soil Survey Staff. 2025a. The Twelve Orders of Soil Taxonomy. Available online: https://www.nrcs.usda.gov/resources/education-and-teaching-materials/the-twelve-orders-of-soil-taxonomy. Accessed July 2025.

U.S. Department of Agriculture (USDA) Natural Resources Conservation Service U.S. 2025b. National soil survey handbook, title 430-VI. Available online: https://casoilresource.lawr.ucdavis.edu/gmap/help/defn-t-factor.html. Accessed July 2025.

U.S. Department of Agriculture (USDA) Natural Resources Conservation Service Soil Survey Staff. 2025c. Web Soil Survey. Available online: https://websoilsurvey.nrcs.usda.gov/. Accessed July 2025.

4.4 Water Resources

4.4.1 Affected Environment

4.4.1.1 Overview

The Little Falls Project is located approximately 350 RMs downstream of the origin of the Mississippi River at Lake Itasca in Itasca State Park, Park Rapids, Minnesota. The Mississippi River upstream of the Little Falls Project has a riverine character, while the river becomes more lake-like and straighter downstream of the Little Falls Project (Minnesota Power & Light Company [MPLC] 1991a). The proposed Little Falls Project Boundary extends upstream approximately 2.7 RM to just upstream of the confluence with the Little Elk River, which joins the Little Falls Project reservoir approximately 2.5 RMs upstream of the Little Falls dam. The width of the Mississippi River near Brainerd, Minnesota, is approximately 150 yards; the average width of the river upstream of the Little Falls Project is approximately 350 yards. The width of the Mississippi River downstream of the Little Falls Project increases from approximately 250 yards near the Little Falls Project to 400 yards near Royalton, Minnesota (MPLC 1991a).

The Sylvan dam is approximately 4 RMs upstream from confluence with the Mississippi River; the Pillager dam is approximately 8 RMs upstream from the Sylvan Project dam. The 35-mile Gull River is a tributary of the Crow Wing River and enters the Sylvan Project reservoir approximately 2,100 feet upstream of the Sylvan dam. The proposed Sylvan Project Boundary extends upstream from the dam approximately 5.5 RMs and extends upstream in the Gull River approximately 6.5 RMs. The Gull Lake dam is approximately 10 RMs upstream of the confluence with the Sylvan reservoir. The proposed Pillager Project Boundary extends upstream approximately 5.3 RMs from the dam.

4.4.1.2 Drainage Area

The drainage area at the Little Falls Project is 11,145 square miles (MPLC 1991a). The drainage area at the Sylvan Project is 3,760 square miles (U.S. Geological Survey [USGS] 2025a). The drainage area at the Pillager Project is 3,230 square miles (MPLC 1995).

4.4.1.3 Streamflow, Gage Data, and Flow Statistics

Little Falls Project

Daily average flow data at the Little Falls Project were prorated from USGS Gage No. 05267000 Mississippi River near Royalton, Minnesota, which is approximately 12 RMs downstream of the Little Falls Project with a drainage area of 11,600 square miles (USGS 2025b). The prorate factor was determined from the ratio of the drainage area at Little Falls dam to the drainage area at USGS Gage No. 05267000 (11,145 square miles/11,600 square miles = 0.961). The run-of-river Blanchard Hydroelectric Project (FERC No. 346) is approximately 8.5 RMs downstream of the Little Falls Project dam and is between the Little Falls Project and the USGS gage. The annual average, minimum, and maximum flows at the Little Falls Project were 5,837 cfs, 503 cfs, and 36,710 cfs, respectively (Table 4-4). The monthly average flow ranged from 3,427 cfs in February to 10,905 cfs in April. The highest flows are typically observed in the spring (March to June). The minimum daily average flow (503 cfs) was observed on August 14, 2021, and the maximum daily average flow (36,710 cfs) occurred on April 8, 1997. Annual and monthly flow duration curves are provided in Exhibit A. Flows above the minimum (95 cfs)[12] and maximum (3,710 cfs) hydraulic capacity of the Little Falls Project occur approximately 100 percent and 60 percent of the time, respectively.

[12] Minimum hydraulic capacity is based on operation of one unit only.

Table 4-4: Annual and Monthly Average, Minimum, and Maximum (cfs) Mississippi River flow at the Little Falls Project, January 1, 1995, to December 31, 2024

Month	Average (cfs)	Minimum (cfs)	Maximum (cfs)
January	3,637	1,297	8,092
February	3,427	999	12,493
March	5,063	1,288	23,929
April	10,905	2,201	36,710
May	10,374	2,700	25,947
June	8,007	1,518	24,121
July	6,528	752	20,854
August	4,098	503	10,475
September	3,547	763	12,397
October	5,003	1,009	18,067
November	5,275	1,057	15,568
December	4,105	940	12,781
Annual	**5,837**	**503**	**36,710**

Source: USGS 2025b

Sylvan Project

Daily average Crow Wing River flow data at the Sylvan Project were obtained from USGS Gage No. 05247500 Crow Wing River near Pillager, Minnesota, for the period January 1, 1995, to December 31, 2024; the gage is located directly downstream of the Sylvan Project dam with a drainage area of 3,760 square miles (USGS 2025a). The annual average, minimum, and maximum flows were 1,824 cfs, 167 cfs, and 16,900 cfs, respectively (Table 4-5).[13] The monthly average flow ranged from 929 cfs in February to 3,834 cfs in April. The highest flows are typically observed in March to June. The minimum daily average flow (167 cfs) was observed on August 18, 2021, and the maximum daily average

[13] Annual peak streamflow data from USGS Gage No. 05247000 Gull River at Gull Lake Dam near Brainerd, Minnesota, is available from 1982 to 1994; the gage is no longer active (USGS 2025c). The annual peak streamflow ranged from 150 cfs to 672 cfs. This range provides an estimate of the minimum and maximum amount of inflow at the Sylvan Project provided by the Gull River.

flow (16,900 cfs) occurred on April 12, 2001. Annual and monthly flow duration curves are provided in Exhibit A. Flows above the minimum (85 cfs)[14] and maximum (1,395 cfs) hydraulic capacity of the Sylvan Project occur approximately 100 percent and 45 percent of the time, respectively.

Table 4-5: Annual and Monthly Average, Minimum, and Maximum (cfs) Crow Wing River flow at the Sylvan Project, January 1, 1995, to December 31, 2024

Month	Average (cfs)	Minimum (cfs)	Maximum (cfs)
January	973	415	2,150
February	929	400	3,940
March	1,734	476	13,200
April	3,834	701	16,900
May	3,205	965	9,760
June	2,579	483	10,300
July	1,861	307	6,960
August	1,312	167	4,090
September	1,229	233	4,280
October	1,567	445	6,770
November	1,494	191	4,420
December	1,156	300	4,080
Annual	**1,824**	**167**	**16,900**

Source: USGS 2025a

Pillager Project

Daily average Crow Wing River flow data at the Pillager Project were obtained from USGS Gage No. 05247500 Crow Wing River near Pillager, Minnesota, for the period January 1, 1995, to December 31, 2024 (USGS 2025a). The gage is approximately 7 RMs downstream of the Pillager Project and directly downstream of the Sylvan Project dam. The flow data were prorated to the Pillager Project dam based on the ratio of the drainage area at the

[14] Minimum hydraulic capacity is based on operation of one unit only.

Pillager dam to the drainage area at USGS Gage No. 05247500 (3,230 square miles/3,760 square miles = 0.859). The annual average, minimum, and maximum flows were 1,567 cfs, 143 cfs, and 14,517 cfs, respectively (Table 4-6). The monthly average flow ranged from 798 cfs in February to 3,294 cfs in April. Annual and monthly flow duration curves are provided in Exhibit A. Flows above the minimum (250 cfs)[15] and maximum (1,220 cfs) hydraulic capacity of the Pillager Project occur approximately 99 percent and 44 percent of the time, respectively.

Table 4-6: Annual and Monthly Average, Minimum, and Maximum (cfs) Crow Wing River flow at the Pillager Project, January 1, 1995, to December 31, 2024

Month	Average (cfs)	Minimum (cfs)	Maximum (cfs)
January	836	356	1,847
February	798	344	3,384
March	1,489	409	11,339
April	3,294	602	14,517
May	2,753	829	8,384
June	2,216	415	8,848
July	1,599	264	5,979
August	1,127	143	3,513
September	1,056	200	3,677
October	1,346	382	5,815
November	1,283	164	3,797
December	993	258	3,505
Annual	**1,567**	**143**	**14,517**

Source: USGS 2025a

[15] Minimum hydraulic capacity is based on operation of one unit only.

4.4.1.4 Existing and Proposed Uses of Waters

Use of the Mississippi River at the Little Falls Project and the Crow Wing River at the Sylvan and Pillager Projects is for hydroelectric power generation. Uses of the Mississippi River in the Little Falls Project Vicinity and surrounding area include recreation, wastewater assimilation, irrigation, industry, and aquatic habitat. Uses of the Gull River and Crow Wing River in the Sylvan Project and the Pillager Project Vicinities and surrounding areas include recreation, wastewater assimilation, irrigation, and aquatic habitat. Several active permitted wastewater discharges occur in the surrounding area of the Little Falls, Sylvan, and Pillager Projects (Table 4-7). The Licensee is not proposing any new uses of water at the Projects.

Table 4-7: Active Wastewater Discharges in Projects Vicinities and Surrounding Areas

Facility	Location	Permit Number	Type	Discharge Site
Camp Ripley Military Reservation Wastewater Treatment Plant (WWTP)	Little Falls, MN	MN0025721	Municipal wastewater	Mississippi River, approximately 8 RMs upstream of the Little Falls Dam
Anderson Custom Processing	Little Falls, MN	MNG255005	Industrial	Mississippi River, approximately 2,000 feet downstream of the Little Falls Project dam
Little Falls WWTP	Little Falls, MN	MN0020761	Municipal wastewater	Mississippi River, 0.5 RM downstream of the Little Falls Project dam
East Gull Lake WWTP	Sylvan Township, MN	MN0059871	Municipal wastewater	North Plant-Gull River, approximately 14 RMs upstream of the confluence with the Sylvan reservoir
		MN0059871	Municipal wastewater	South Plant-Gull River, approximately 6 RMs upstream of the confluence with the Sylvan reservoir
Pillager WWTP	Pillager, MN	MNG585209	Municipal wastewater	Crow Wing River, approximately 600 ft downstream Pillager Project dam
Motley WWTP	Motley, MN	MN0024244	Municipal wastewater	Crow Wing River approximately 9 RMs upstream of Pillager Project dam

Sources: NRRI-UMD 2025; Minnesota PCA 2015, 2020a

4.4.1.5 Existing Instream Flow Uses

The Projects are operated in run-of-river mode where outflow from the powerhouse is approximately equal to inflow. Run-of-river operations minimize water level fluctuations in the reservoirs; protect water quality, aquatic resources, and visual resources; and provide natural river flows downstream.

There is a minimum flow requirement of 350 cfs to the east channel of the Little Falls Project during the spring walleye spawning season. There are no other minimum flow requirements at the Projects.

4.4.1.6 Federally Approved Water Quality Standards

Water quality standards for the state of Minnesota are provided in Minnesota Rules Chapter 7050 (Minnesota Legislature 2021). Surface waters are classified into seven beneficial use classes: Class 1 domestic consumption, Class 2 aquatic life and recreation, Class 3 industrial consumption, Class 4 agricultural and wildlife, Class 5 aesthetics and navigation, Class 6 other uses, and Class 7 limited resource value water (Minnesota PCA 2025a). All surface waters are protected for Class 2 aquatic life and recreation unless that water body has been re-classified as a Class 7. All surface waters are also protected for at least one subclass within use Classes 3, 4, 5, or 6 (Table 4-8) (Minnesota PCA 2025a).

The Mississippi River from the southerly border of Morrison County to Sauk River, including the Little Falls Project, is classified as 1C, 2Bdg, 3, 4A, 4B, 5, 6 (Minnesota PCA 2023). The Crow Wing River from Long Prairie River to the Mississippi River, including the Sylvan Project and Pillager Project, is classified as 2Bg, 3C, 4A, 4B, 5, 6 (Minnesota PCA 2020b). The Gull River, from Gull Lake to the confluence with the Crow Wing River, is classified as 2Bg, 3C, 4A, 4B, 5, 6 (Minnesota PCA 2020b).

The state of Minnesota separated the state into three different river nutrient regions based on U.S. Environmental Protection Agency (EPA) Level III ecoregions (Minnesota PCA 2019). The three regions (i.e., north, central, and south) each have their own nutrient standards. The Little Falls Project is in the central nutrient region. The Sylvan Project and Pillager Project are in the north nutrient region.

The reach of the Mississippi River containing the Little Falls Project, the reach of the Crow Wing River containing the Sylvan Project and Pillager Project, and the North Basin of the

Sylvan reservoir are listed as impaired for the use of aquatic consumption because of mercury in fish tissue (Minnesota PCA 2024a). A statewide mercury Total Maximum Daily Load (TMDL) was approved by EPA in 2007 and most recently updated in 2024 (Minnesota PCA 2025b).

Table 4-8: Surface Water Use Classifications and Water Quality Standards for the Mississippi River at the Little Falls Project, the Crow Wing River at the Sylvan Project and Pillager Project, and the Gull River

Project and Beneficial Use Classification	Beneficial Use Subclass Description	Applicable Numeric Water Quality Standards
Mississippi River at Little Falls Project: 1C, 2Bdg, 3, 4A, 4B, 5, 6	1C: domestic consumption (requires heavy treatment) 2Bdg: aquatic life and recreation also protected as a source of drinking water – general warm water habitat 3: industrial consumption 4A: agriculture and wildlife (irrigation) 4B: agriculture and wildlife (livestock and wildlife) 5: aesthetics and navigation 6: other uses	For 1C: Color 15 PCU For 1C: Nitrate 10 mg/L pH: 6.5-8.5 for 1C classification pH: 6.0 to 9.0 for 4B and 5 classifications pH: 6.5 to 9.0 for 2Bd classification DO: daily minimum 5 mg/L Temperature: must not exceed 5°F (2.7°C) above natural in streams and 3°F (1.7°C) above natural in lakes, based on monthly average of maximum daily temperature, except in no case shall it exceed the daily average temperature of 86°F (30°C). Eutrophication standards for Class 2Bd rivers and streams: Central River Nutrient Region Total Phosphorus (µg/L) – less than or equal to 100 Chlorophyll-a (µg/L) – less than or equal to 18
Crow Wing River at Sylvan Project and Pillager Project, and the Gull River (Gull Lake to Crow Wing River): 2Bg, 3C, 4A, 4B, 5, 6	2Bg: aquatic life and recreation – general warm water habitat 3C: industrial consumption (heavy treatment) 4A: agriculture and wildlife (irrigation) 4B: agriculture and wildlife (livestock and wildlife) 5: aesthetics and navigation 6: other uses	pH: 6.5-9.0 for 2B classification pH: 6.0 to 9.0 for 4B and 5 classifications DO: daily minimum 5 mg/L Temperature - Class 2B standard: must not exceed 5°F (2.7°C) above natural in streams and 3°F (1.7°C) above natural in lakes, based on monthly average of maximum daily temperature, except in no case shall it exceed the daily average temperature of 86°F (30°C). Eutrophication standards for Class 2B rivers and streams: Crow Wing River from confluence of Long Prairie River to mouth at the Mississippi River Total phosphorus (µg/L) – less than or equal to 75 Chlorophyll-a (µg/L) – less than or equal to 13

Sources: Minnesota Legislature 2021, 2023
PCU = Platinum Cobalt Units; mg/L = milligram per liter; µg/L = microgram per liter
°F = degrees Fahrenheit = (°C*1.8) + 32

4.4.1.7 Water Quality Data

Little Falls Project

Minnesota PCA Water Quality Data

The Minnesota PCA collects and compiles water quality data for multiple parameters throughout the Mississippi River including sites in, upstream, and downstream of the Little Falls Project Vicinity (Minnesota PCA 2025c). Results for DO, water temperature, pH, chlorophyll-a (chl-a), inorganic nitrogen (nitrate and nitrite as N) (NO2NO3), total phosphorus, and specific conductivity collected upstream and downstream of the Little Falls Project are shown in Table 4-9 and Table 4-10. The monitoring sites are shown in Figure 4-9.

Site S000-151 is approximately 7.8 RMs upstream of the Little Falls Project on the Mississippi River near Camp Ripley. Water quality data collected during the last two sampling years (2018 and 2024) are shown in Table 4-9. The DO concentration was above the 5 mg/L daily minimum and ranged from 6.8 mg/L to 9.3 mg/L. The pH was within the range of the 6.5 to 8.5 standard. Chlorophyll-a and total phosphorus were below the nutrient standards for the central nutrient region. Maximum water temperatures between 25°C and 26°C (77°F to 78.8°F) were observed in July.

Site S007-331 is approximately 1.3 RMs downstream of the Little Falls dam; data collected at this site during the last two sampling years (2018 and 2024) are shown in Table 4-10. The DO concentration was well above the daily minimum and ranged from 7.5 mg/L to 9.9 mg/L, and the DO percent saturation ranged from 88.5 percent to 109.9 percent. The pH was in attainment with the standard and ranged from 7.6 to 8.3. Chlorophyll-a and total phosphorus were below the applicable standards.

Figure 4-9: Minnesota PCA Water Quality Monitoring Sites Near Little Falls Project



Table 4-9: Water Quality Data from Site S000-151 on the Mississippi River Upstream of the Little Falls Project

Date	DO (mg/L)	DO (percent saturation)	Water Temperature (°C)	pH	Specific Conductance (µS/cm)	Chl-a (µg/L)	NO2NO3 (mg/L)	Total P (mg/L)
5/8/2018	9.3	92.8	15.4	8.2	236	-	0.05	0.05
6/6/2018	8.5	92.4	19.6	8.0	246	3.3	0.2	0.06
6/12/2018	7.6	83.6	19.9	7.8	232	3.3	0.16	0.07
6/18/2018	7.5	84.9	21.7	7.9	271	-	-	-
7/9/2018	7.4	89.9	25.5	7.9	243	2.7	0.14	0.08
7/16/2018	7.0	83.9	24.6	7.6	230	5.2	0.13	0.09
7/23/2018	7.0	81.7	23.2	7.6	237	-	-	-
8/6/2018	7.8	89.5	22.1	8.0	288	2.7	0.21	0.05
8/13/2018	8.0	-	24.6	8.0	289	4.4	0.14	0.04
8/20/2018	8.2	95.9	23.1	8.1	300	-	-	-
9/18/2018	7.6	82.3	19.3	8.1	288	5.1	0.15	0.05
5/13/2024	8.9	92.0	17.0	7.9	240	-	0.08	0.05
6/11/2024	8.1	87.6	19.0	7.9	266	3.0	0.08	0.06
7/15/2024	6.8	82.4	25.0	7.5	274	1.1	0.11	0.08
7/29/2024	7.8	94.4	25.0	7.9	303	1.1	0.13	0.06
8/14/2024	8.2	92.4	21.0	7.7	313	1.8	0.10	0.05
8/26/2024	7.4	87.2	23.0	7.8	337	1.6	0.09	0.04
9/9/2024	9.2	101.0	20.0	8.0	343	1.9	0.11	0.04

Source: Minnesota PCA 2025c.

Notes: DO = dissolved oxygen; °C = degrees Celsius; pH = power of hydrogen; Chl-a = chlorophyll-a; NO2NO3 = inorganic nitrogen (nitrate and nitrite as N); P = phosphorus; µS/cm = microSiemens per centimeter; µg/L = micrograms per liter; mg/L = milligrams per liter

Table 4-10: Water Quality Data from Site S007-331 on the Mississippi River Downstream of the Little Falls Project

Date	DO (mg/L)	DO (% saturation)	Water Temperature (°C)	pH	Chl-a (µg/L)	NO2NO3 (mg/L)	Total P (mg/L)
5/8/2018	9.5	95.4	15.7	8.2	-	0.05	0.04
6/6/2018	8.6	93.6	19.6	8.0	3.1	0.23	0.07
6/12/2018	8.3	91.0	19.6	7.8	2.6	0.17	0.06
6/18/2018	7.9	88.7	21.4	7.9	-	-	-
7/9/2018	7.8	95.4	25.5	7.9	2.7	0.17	0.08
7/16/2018	7.9	94.1	24.4	7.7	1.5	0.14	0.09
7/23/2018	8.1	94.6	23.2	7.7	-	-	-
8/6/2018	8.0	91.7	22.4	8.0	3.9	0.2	0.05
8/13/2018	8.2	99.0	25.1	8.3	4.4	0.1	0.04
8/20/2018	8.0	94.3	24.5	8.2	-	-	-
9/18/2018	8.7	93.4	18.9	8.1	3.2	0.17	0.05
5/13/2024	8.7	88.5	16	7.8	-	0.09	0.05
6/11/2024	8.8	94.9	19	7.9	2.7	0.06	0.07
7/15/2024	7.5	91.8	26	7.6	1.6	0.10	0.08
7/29/2024	7.5	90.5	25	7.9	3.1	0.18	0.05
8/14/2024	8.9	100.3	21	7.8	1.5	0.14	0.05
8/26/2024	8.3	98.1	24	7.6	1.6	0.05	0.04
9/9/2024	9.9	109.9	20	8.2	2.6	0.10	0.04

Source: Minnesota PCA 2025c

Notes: DO = dissolved oxygen; °C = degrees Celsius; pH = power of hydrogen; Chl-a = chlorophyll-a; NO2NO3 = inorganic nitrogen (nitrate and nitrite as N); P = phosphorus; µS/cm = microSiemens per centimeter; µg/L = micrograms per liter; mg/L = milligrams per liter

2024 Little Falls Project Water Quality Study

The Licensee completed a water quality study in June through September 2024 in support of the Little Falls Project relicensing (MP 2025). Water temperature and DO were monitored at three sites two times per month for a total of 8 monitoring days. The three monitoring sites were at the Forebay, Downstream of Spillway, and Downstream of Powerhouse (Figure 4-10). On each sample day, a vertical profile of water temperature and DO was collected at the Forebay in 1-meter (~3.3-foot) increments. A single measurement was recorded at the Downstream of Spillway and Downstream of Powerhouse sites each day at the bottom of the water column.

The objectives of the Water Quality Study were to:

- Document the DO concentration and temperature of water entering the project intake;
- Identify the degree and timing of any stratification that may occur;
- Identify temporal variation in DO and water temperature;
- Identify any instances where DO and water temperature levels do not meet applicable state standards; and
- Identify any differences in DO and water temperature in the river downstream of the Little Falls Project.

The water temperature and DO concentration were similar at the three monitoring sites. The mean water temperature was 20.9°C (69.6°F), 20.9°C (69.6°F), and 21.2°C (70.2°F) at the Forebay, Downstream of Spillway, and Downstream of Powerhouse, respectively (Table 4-11). The mean DO concentration was 8.8 mg/L and 8.7 mg/L at the Downstream of Spillway and Downstream of Powerhouse sites, and 8.3 mg/L at the Forebay. The highest water temperatures (23.5°C or 74.3°F) were observed at all sites on July 25, 2024; the lowest water temperatures were on the first (June 11, 2024) and last (September 25, 2024) monitoring days. DO generally exhibited the opposite trend with lowest concentrations in mid-summer. The DO concentration exceeded the 5.0 mg/L standard at all three sites. While the results were based on single daily measurements, the data suggests that water temperatures were below the 86°F (30°C) daily average threshold.

The Forebay site did not thermally stratify. The water temperature and DO profiles were uniform throughout the water column on all 8 monitoring days (Figure 4-11, Figure 4-12).

Figure 4-10: Monitoring Sites During the 2024 Water Quality Study at the Little Falls Project



Table 4-11: Mean, Minimum, and Maximum Water Temperature (°C) and DO (mg/L) during the 2024 Water Quality Study at the Little Falls Project

Parameter	Forebay			Downstream of Spillway			Downstream of Powerhouse		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Water Temperature (°C) (°F)	20.9 (69.6)	18.6 (65.5)	23.5 (74.3)	20.9 (69.6)	16.7 (62.1)	23.5 (74.3)	21.2 (70.2)	18.5 (65.3)	23.5 (74.3)
DO (mg/L)	8.3	7.4	10.2	8.8	7.8	9.9	8.7	7.8	10.2

Source: MP 2025

Figure 4-11: Water Temperature (°C) Profiles at the Little Falls Project Forebay

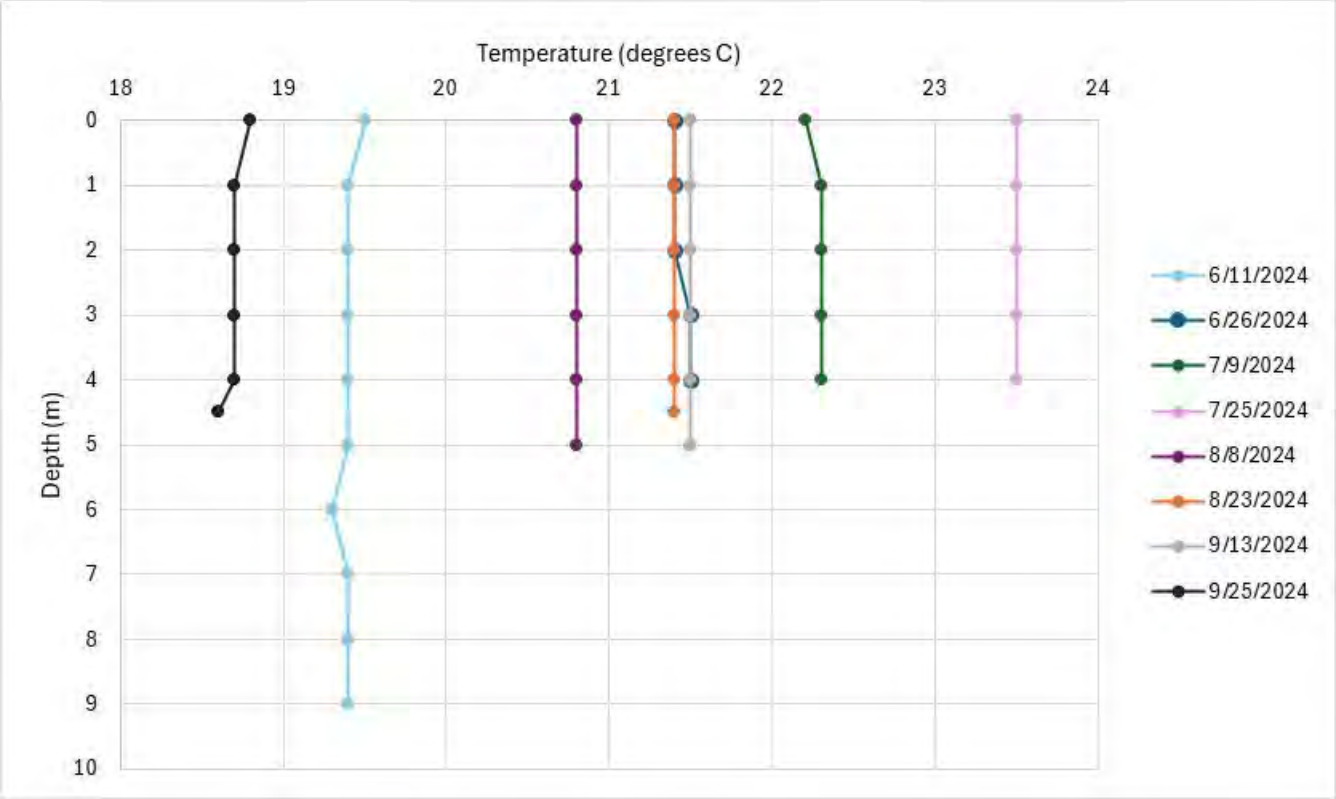
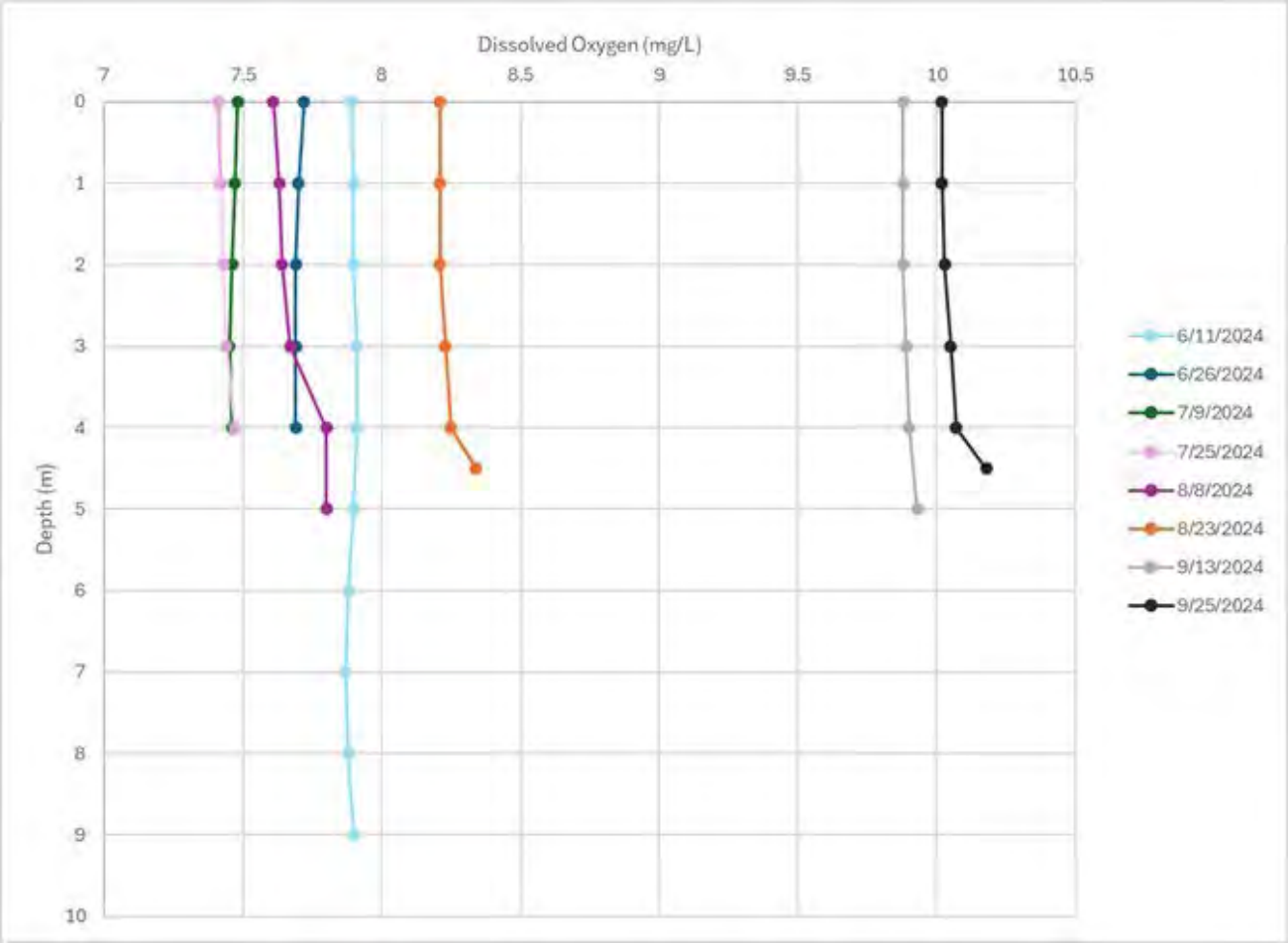


Figure 4-12: DO (mg/L) Profiles at the Little Falls Project Forebay



Sylvan Project

Minnesota PCA Water Quality Data

The Minnesota PCA has collected water quality data at multiple sites throughout the Crow Wing River and its tributaries (Minnesota PCA 2025c). The locations of sites near the Sylvan dam are shown in Figure 4-13. Results for DO, water temperature, pH, chlorophyll-a, inorganic nitrogen, total phosphorus, total Kjeldahl Nitrogen (TKN), and specific conductivity collected upstream and downstream of the Sylvan Project dam are shown in Table 4-12, Table 4-13, and Figures 4-14 to 4-17.

Data collected in 2020 and 2021 at Site S016-349 are shown in Table 4-12; this site is approximately 600 feet downstream of the Sylvan powerhouse and within the Project Boundary. The DO concentration ranged from 7.5 mg/L to 12.9 mg/L and was above the standard. The pH was within the range of the standard. The maximum water temperature was 28.2°C (82.8°F) in July 2020. Chlorophyll-a and total phosphorus were below the Class 2B nutrient standards for the north nutrient region.

Site S001-926 is just downstream of the Sylvan dam and within the Project Boundary (Figure 4-13). This is one of three sites in the Crow Wing River watershed in the Watershed Pollutant Load Monitoring Network for the state of Minnesota (Minnesota PCA 2025d). Data from 2021 to 2025 are shown in Figure 4-14, Figure 4-15, Figure 4-16, and Figure 4-17 (Minnesota PCA 2025c). DO exceeded the 5 mg/L standard and was generally higher in the spring and fall, with lower values in the summer when water temperatures were highest. Water temperatures reached 22°C to 25°C (71.6°F to 77.0°F) in the summer, suggesting that water temperatures were below the daily average threshold of 86°F (30°C). The pH ranged from 6.8 to 8.9 and was within the range of the standard; pH was higher in summer and fall and lowest in the winter. TKN ranged from 0.4 mg/L to 1.3 mg/L and reached maximum values in the spring. Nitrate+Nitrite N ranged from 0.05 mg/L to 1.3 mg/L and was higher in the winter. Total phosphorus was below the 75 µg/L (0.075 mg/L) standard except for two or three measurements each spring when it exceeded the standard; total phosphorus concentrations were lower in the winter. The specific conductance ranged from 200 µS/cm to 500 µS/cm.

Site 49-036-01-202 was in the Sylvan Project reservoir approximately 1,400 feet upstream of the dam and within the Project Boundary (Figure 4-13). Chlorophyll-a and total

phosphorus were above the standards in August and early September 2008; they were both below the standards in the other samples (Table 4-13).

Site 49-036-02-202 was in the Gull River approximately 0.9 RM upstream of the Sylvan Project dam and within the Project Boundary (Figure 4-13). Chlorophyll-a exceeded the 13 µg/L standard in late August 2008 and early September 2008. Total phosphorus was below the standard (Table 4-13).

The Minnesota PCA has estimated the Trophic State Index (TSI) of the Sylvan reservoir. The TSI summarizes the nutrient richness of a water body based on trophic state indicators (e.g., chlorophyll-a, total phosphorus, Secchi Disk depth). Based on data collected between 2009 and 2018, the Sylvan reservoir had a trophic state index of 50, which is between mesotrophic (moderately productive) and eutrophic (highly productive) and is similar to the TSI of lakes in the same ecoregion (Minnesota PCA 2025c).

Figure 4-13: Minnesota PCA Water Quality Monitoring Sites Near the Sylvan and Pillager Projects

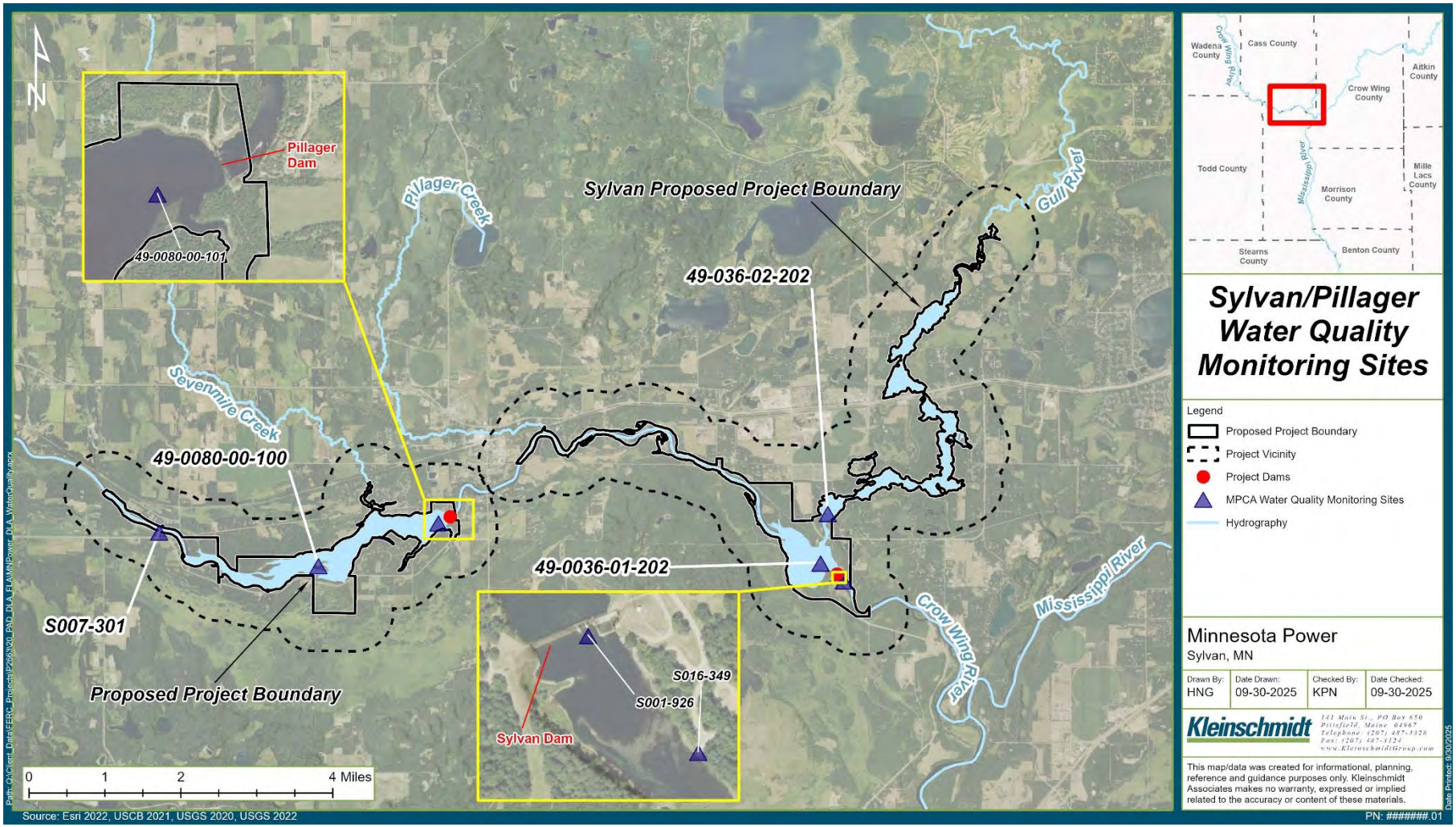


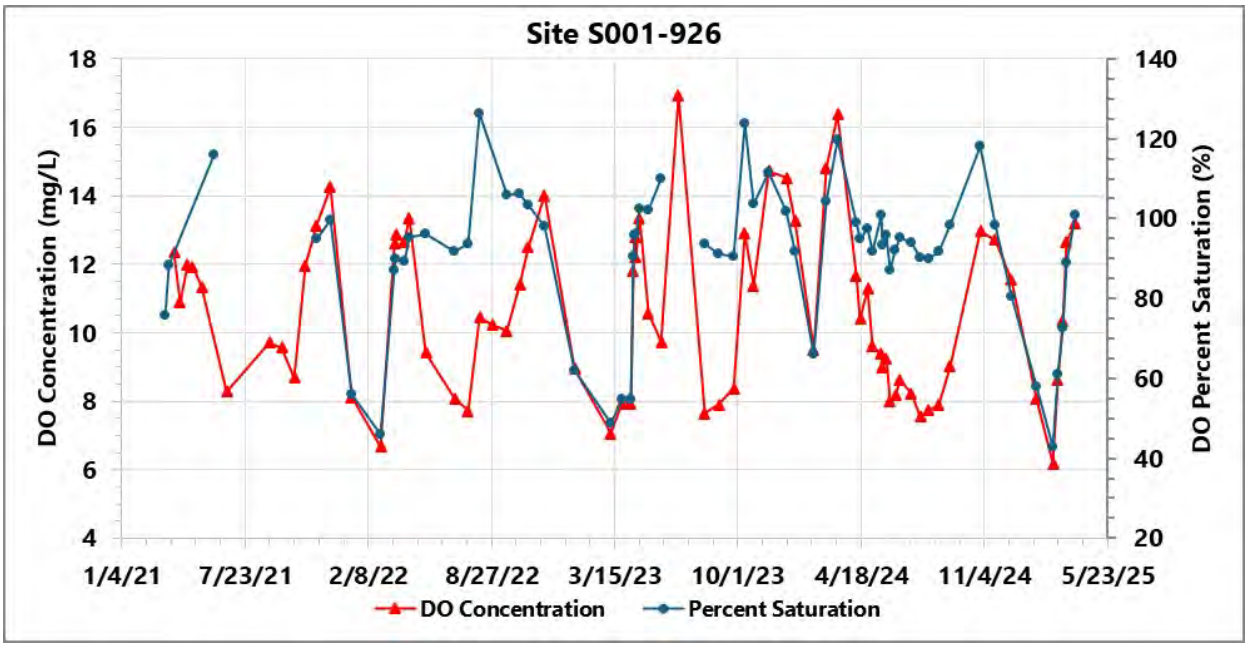
Table 4-12: Water Quality Data from Site S016-349 Downstream of the Sylvan Project Dam

Date	DO (mg/L)	Water Temperature (°C)	pH	Specific Conductance (µS/cm)	Chl-a (µg/L)	Total P (mg/L)
6/8/2020	10.2	23.8	8.4	426	-	-
6/24/2020	8.3	22.8	8.4	388	7.5	0.06
7/6/2020	8.8	28.2	8.4	370	21	0.06
7/31/2020	8.3	24.9	8.1	373	8	0.08
8/7/2020	8.8	22.7	8.3	422	9.6	0.06
8/28/2020	7.5	24.5	8.2	392	6.9	0.08
9/9/2020	9.6	15.9	8.3	430	5.9	0.06
9/21/2020	12.9	16.5	8.6	431	13	0.03
6/3/2021	-	-	-	-	27	0.06

Source: Minnesota PCA 2025c

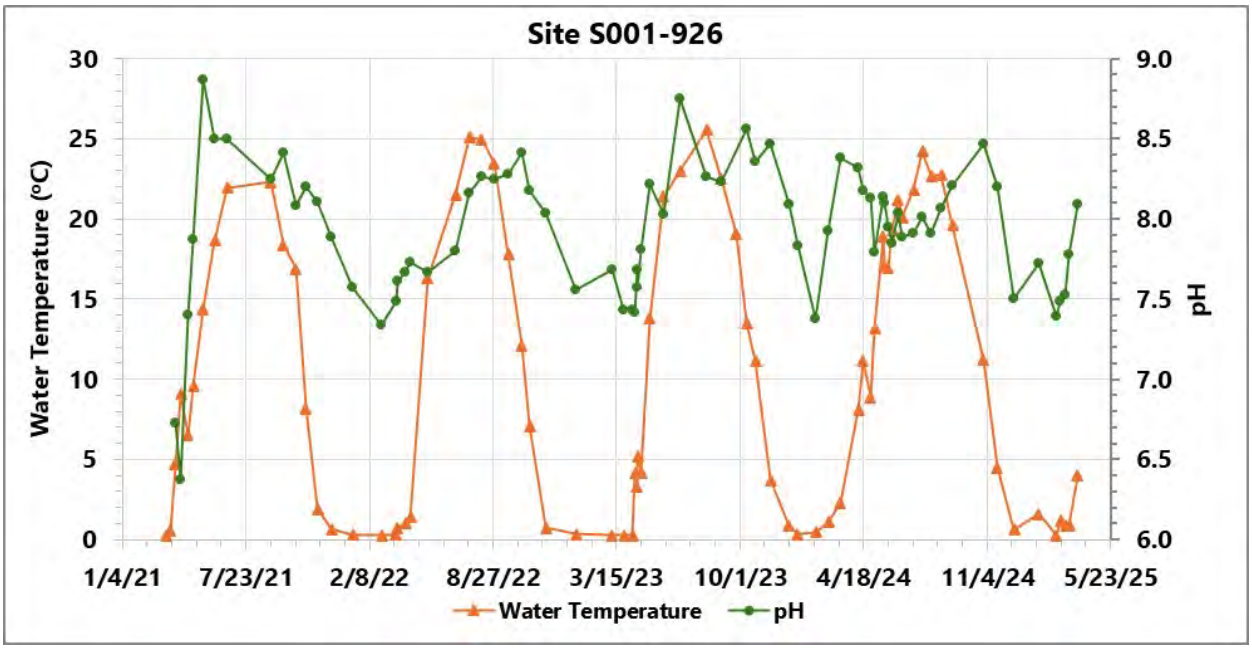
Notes: DO = dissolved oxygen; °C = degrees Celsius; pH = power of hydrogen; µS/cm = microSiemens per centimeter; mg/L = milligrams per liter

Figure 4-14: DO Concentration (mg/L) and Percent Saturation at Site S001-926 Downstream of the Sylvan Dam



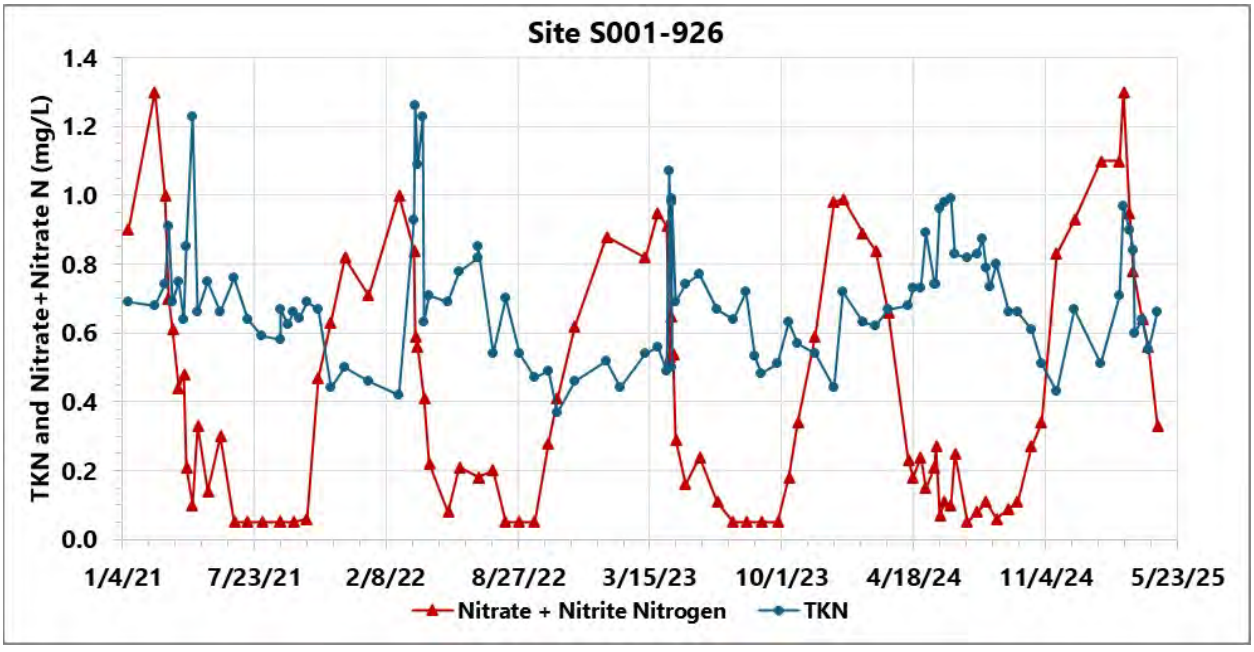
Source: Minnesota PCA 2025c

Figure 4-15: Water Temperature (°C) and pH at Site S001-926 Downstream of the Sylvan Dam



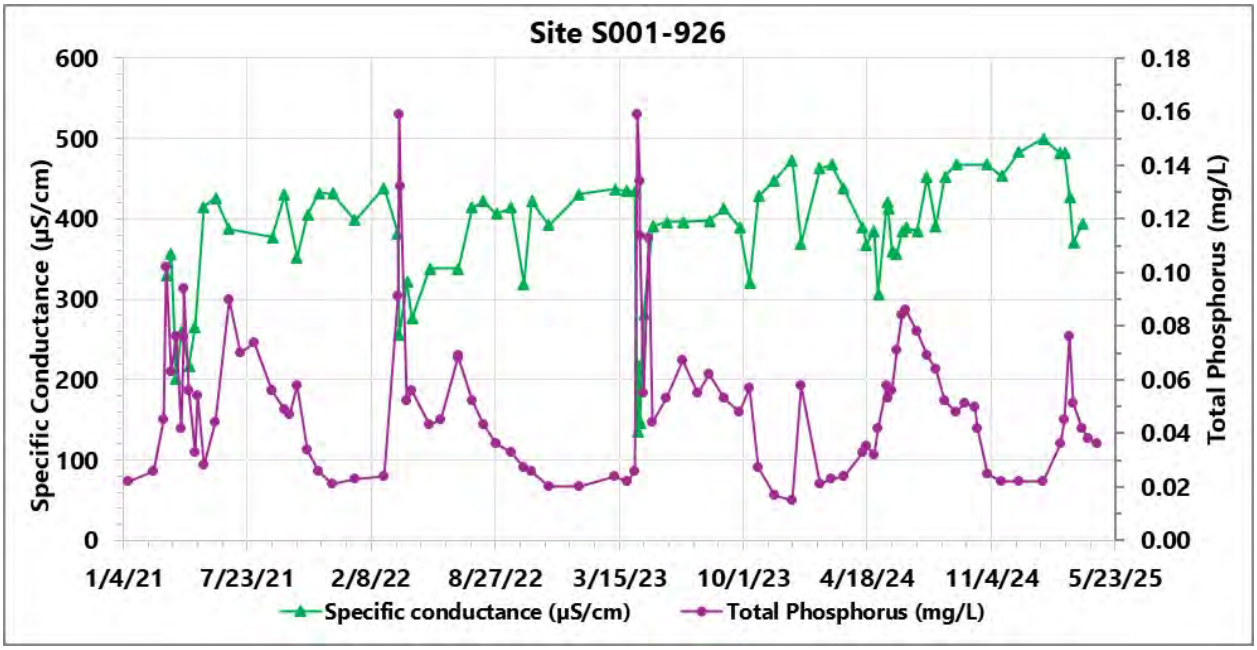
Source: Minnesota PCA 2025c

Figure 4-16: TKN and Nitrate+Nitrate N (mg/L) at Site S001-926 Downstream of the Sylvan Dam



Source: Minnesota PCA 2025c

Figure 4-17: Specific Conductance (µS/cm) and Total Phosphorus (mg/L) at Site S001-926 Downstream of the Sylvan Dam



Source: Minnesota PCA 2025c

Table 4-13: Water Quality Data from Site 49-0036-01-202 and Site 49-0036-02-202 Upstream of the Sylvan Project Dam

Date	Site 49-0036-01-202			Site 49-0036-02-202		
	Chl-a (µg/L)	Total P (mg/L)	Secchi Disk Depth (m)	Chl-a (µg/L)	Total P (mg/L)	Secchi Disk Depth (m)
6/9/2008	4	0.07	-	11	0.04	2.4
6/25/2008	8	0.07	-	1	0.02	-
7/14/2008	5	0.04	-	4	0.03	-
8/5/2008	39	0.08	1.7	8	0.03	4
8/25/2008	21	0.09	1.8	22	0.04	3.1
9/9/2008	20	0.06	2.1	16	0.05	1.4
8/6/2009	4	0.03	-	4	0.03	3.4
8/19/2009	4	0.05	2.1	3	0.03	3.1
9/9/2009	4	0.05	2.3	7	0.02	2.4

Source: Minnesota PCA 2025c

Notes: Chl-a = chlorophyll-a; P = phosphorus; m = meter; mg/L = milligrams per liter

2024 Sylvan Project Water Quality Study

The Licensee completed a water quality study during June through September 2024 in support of the Sylvan Project relicensing (MP 2025). Water temperature and DO were monitored at three sites two times per month for a total of 8 monitoring days. The three monitoring sites were at the Forebay, Powerhouse Outlet, and Downstream of Project (Figure 4-18). On each sample day, a vertical profile of water temperature and DO was collected at the Forebay in 1-meter (~3.3-foot) increments. At the Powerhouse Outlet location, measurements were taken at the surface, middle, and bottom of the water column. A single measurement was recorded at the Downstream of Project site each day at the bottom of the water column.

The goal of the water quality study was to evaluate DO and water temperature upstream and downstream of the Sylvan Project to determine compliance with state water quality standards. The objectives of the study were to:

- Document the DO concentration and temperature of water entering the project intake;
- Identify the degree and timing of any stratification that may occur;
- Identify temporal variation in DO and water temperature;
- Identify any instances where DO and water temperature levels do not meet applicable state standards; and
- Identify any differences in DO and water temperature in the river downstream of the Sylvan Project.

Overall, the ranges of water temperature and DO concentration were similar at the three monitoring sites. The mean water temperature was 21.3°C (70.3°F) or 21.4°C (70.5°F), and the mean DO concentration ranged from 7.9 mg/L to 8.1 mg/L (Table 4-14). The highest water temperatures were observed at all sites on July 25, 2024 (approximately 24°C or 75.2°F), and the lowest temperatures were observed on September 25, 2024 (18°C to 19°C or 64.4°F to 66.2°F); the observed water temperatures suggest that the daily average temperature remained below the 86°F (30°C) standard. At the Forebay and Powerhouse Outlet, the DO concentration was highest on the two September sampling days (8.1 mg/L to 9.1 mg/L) and lowest on July 25 and August 8 (7.3 mg/L to 7.7 mg/L) (Figure 4-19, Figure 4-20, Figure 4-21, Figure 4-22). At the Downstream of Project site, DO was lowest

on August 8 (7.3 mg/L) and September 25 (7.4 mg/L). The DO concentration exceeded the 5.0 mg/L standard at all three sites.

The Forebay site did not thermally stratify. The water temperature and DO profiles were uniform throughout the water column on all 8 monitoring days (Figure 4-19, Figure 4-20, Figure 4-21, Figure 4-22).

Figure 4-18: Monitoring Sites for the 2024 Water Quality Study at the Sylvan Project



Table 4-14: Mean, Minimum, and Maximum Water Temperature (°C) and DO (mg/L) during the 2024 Water Quality Study at the Sylvan Project

Parameter	Forebay			Powerhouse Outlet			Downstream of Project		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Water Temperature (°C) (°F)	21.3 (70.3)	19.4 (66.9)	24.0 (75.2)	21.4 (70.5)	19.4 (66.9)	24.1 (75.4)	21.3 (70.3)	18.2 (64.8)	23.8 (74.8)
DO (mg/L)	7.9	7.4	8.8	8.0	7.3	9.2	8.1	7.3	9.2

Source: MP 2025

Figure 4-19: Water Temperature (°C) profiles at the Forebay of the Sylvan Project

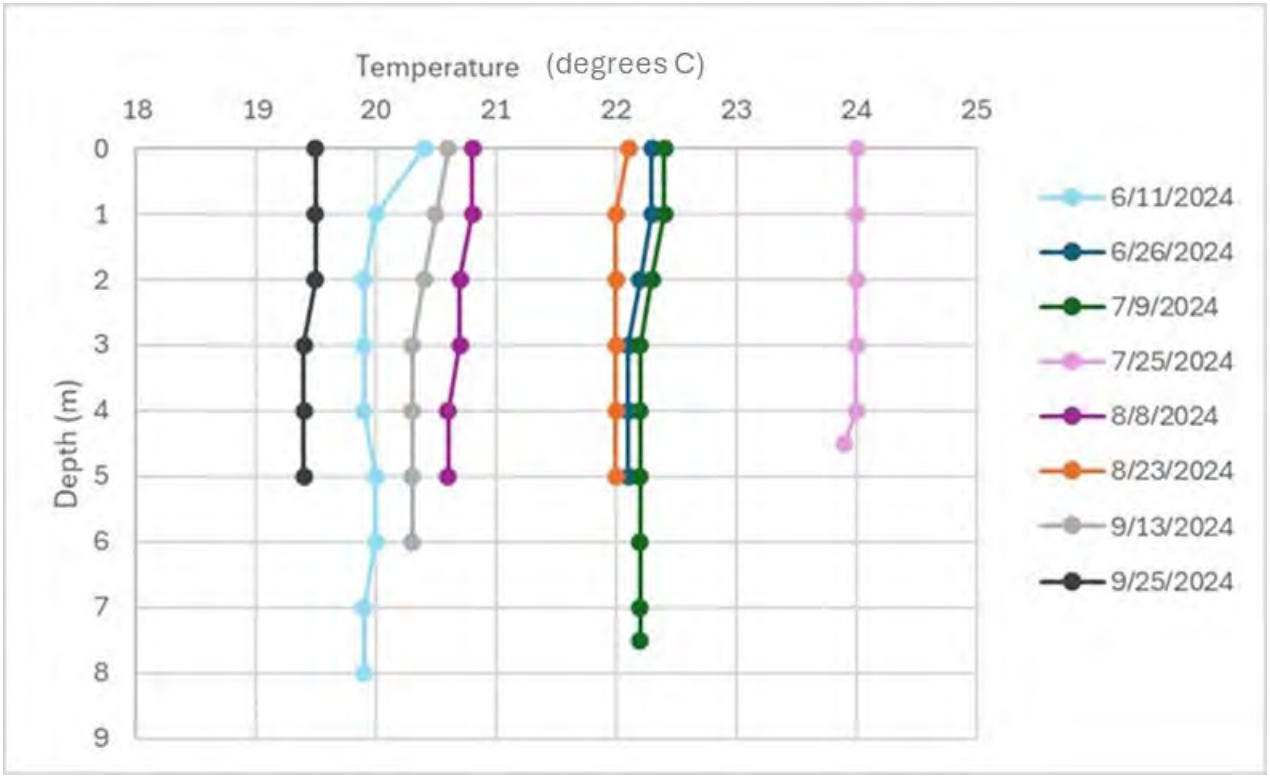


Figure 4-20: DO (mg/L) Profiles at the Forebay of the Sylvan Project

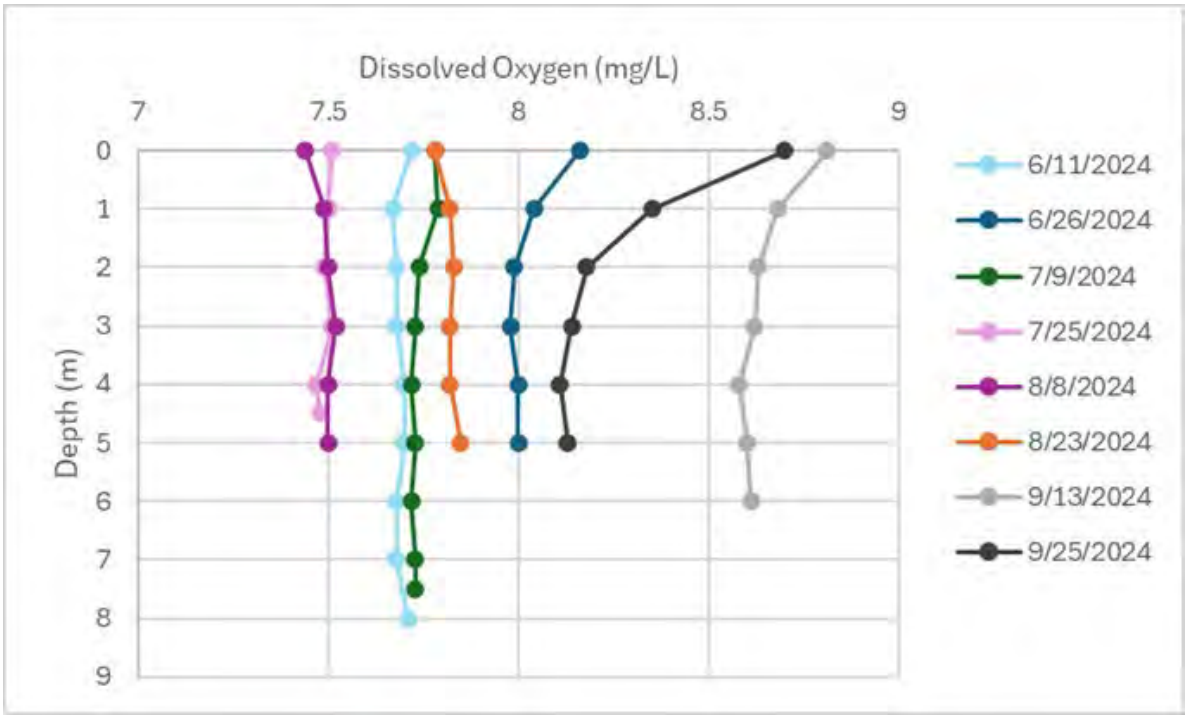


Figure 4-21: Water Temperature (°C) profiles at the Powerhouse Outlet of the Sylvan Project

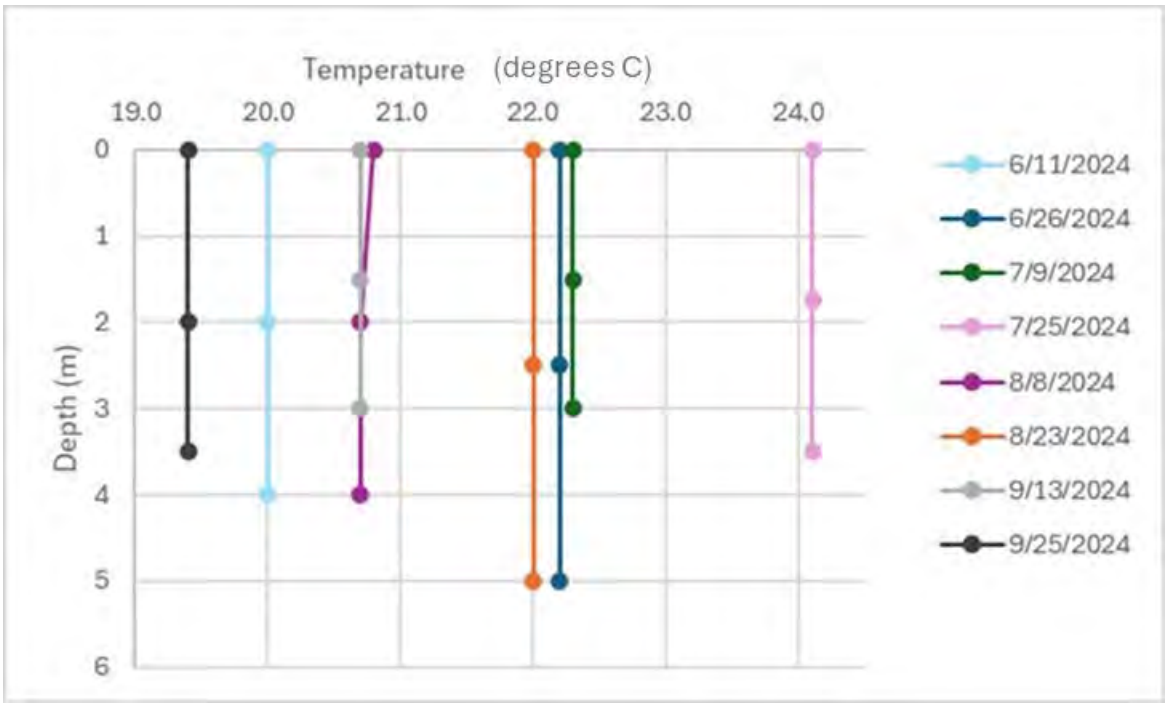
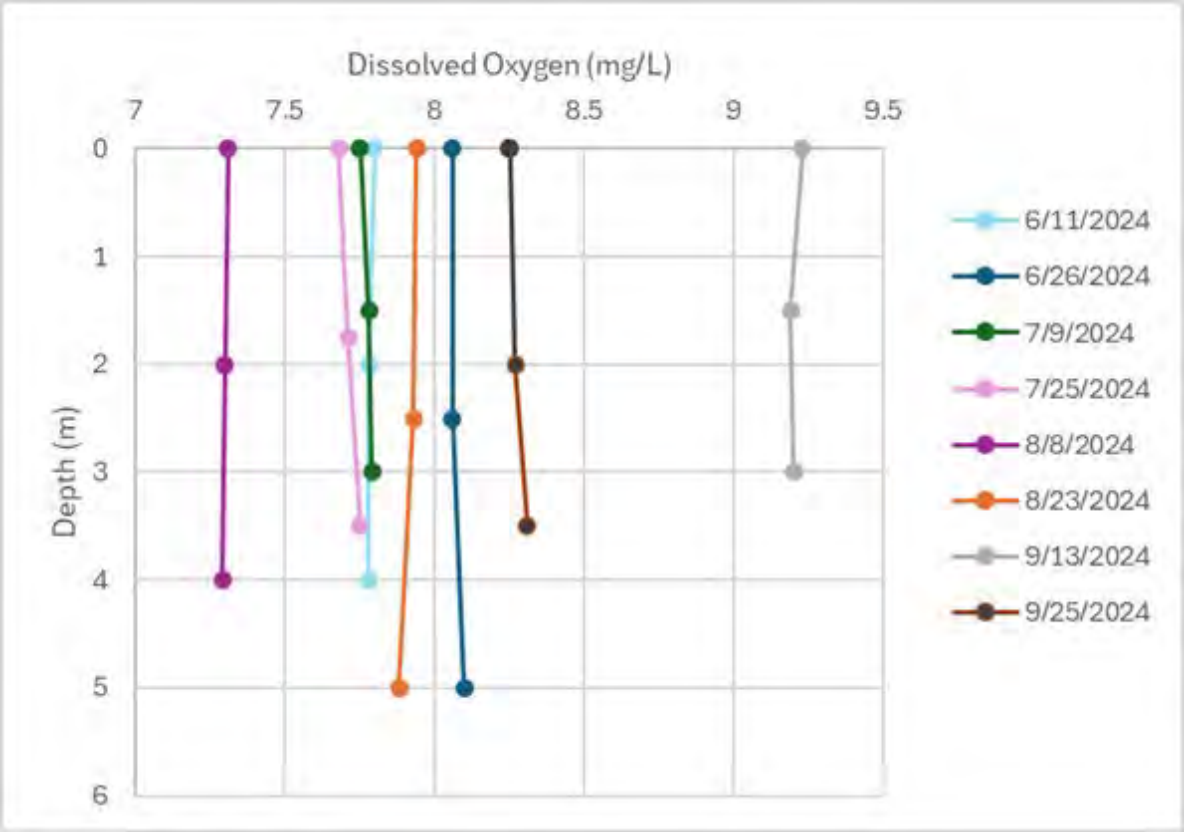


Figure 4-22: DO (mg/L) at the Powerhouse Outlet of the Sylvan Project



Pillager Project

1993-1994 Water Quality Data

The Licensee conducted water quality monitoring between March 1 and July 31, 1993, and February to September 1994 at one site upstream of the Pillager Project dam and one site downstream of the powerhouse during the previous relicensing[16] (MPLC 1995). Vertical DO and water temperature profiles were collected upstream of the dam, and a single measurement was collected downstream of the dam two to four times per month. At the upstream site, DO was less than 5 mg/L in March 1993, in a single measurement at a depth of 6 meters (~19.7 feet) on May 7, 1993, and in February 1994; DO was above the 5 mg/L standard in all the other measurements performed upstream and downstream of the dam in 1993 and 1994. There was no evidence that the reservoir thermally stratified over the summer. Overall, DO values downstream of the powerhouse were similar to the concentrations in the reservoir; when there was spill over the dam, DO was 1 mg/L to 2 mg/L higher at the downstream site. The water temperature reached 20°C to 23°C (68°F to 73.4°F) in summer 1993 and 20°C to 24°C (68°F to 75.2°F) in summer 1994.

On June 20 and August 23, 1994, water chemistry samples and Secchi Disk transparency depths were collected at two sites in the Pillager Project reservoir; Site 1 was at the deepest site in the reservoir and Site 2 was at the upstream end of the reservoir (MPLC 1995). At the deep spot in the reservoir, there was evidence of thermal stratification during the June sampling. The TSI was estimated for the Pillager Project reservoir based on chlorophyll-a, total phosphorus, and Secchi Disk measurements. The TSI based on total phosphorus and Secchi Disk was in the range for eutrophic (highly productive) waters, and the TSI based on chlorophyll-a was characteristic of mesotrophic (medium productivity) and eutrophic waters.

1999-2001 Water Quality Data

Article 404 of the 1998 Pillager Project license required the Licensee to develop a plan to monitor DO upstream and downstream of the Pillager dam for 3 years (FERC 1998). The objective of the monitoring was to further evaluate the low DO concentrations that were documented in late winter and that could occur if the reservoir stratified during the summer. If DO concentrations less than 5 mg/L were observed, the Licensee was to

[16] A water quality study was not requested or required at the Pillager Project during the current relicensing process, thus previously collected data are summarized herein.

evaluate reasonable measures to modify or enhance Pillager Project operations to increase DO levels. The Licensee developed a plan to monitor DO and water temperature once per month at three sites upstream of the Pillager dam, including at the deep spot upstream of the dam, and one site downstream of the powerhouse (MP 1998); FERC approved the plan on April 7, 1999 (FERC 1999).

The DO and water temperature results from the deep spot in the Pillager reservoir and from the tailrace are shown in Table 4-15 and Table 4-16. At the deep spot in the Pillager reservoir, there was evidence of DO stratification with decreasing DO with increasing depth during each year of monitoring. One measurement in 1999 was below the 5 mg/L standard (4.7 mg/L on June 8, 1999, at 5 meters/~16.4 feet), and four measurements in 2000 were less than 5 mg/L (1.8 mg/L on August 10, 2000, at 7 meters/~23 feet and 3.5 mg/L to 4.4 mg/L below 5 meter/16.4 feet depth on September 8, 2000) (Table 4-15). In 2001, DO concentrations less than 5 mg/L were observed on May 23, July 24, and August 14. All DO data collected in the Pillager tailrace were above the standard, suggesting that DO stratification in the reservoir did not influence DO downstream of the Pillager Project in the Crow Wing River (MP 2002).

Table 4-15: Water Temperature (°C) and DO Concentration (mg/L) Vertical Profiles Collected at the Deep Spot in the Pillager Reservoir, 1999-2001

Depth (m)	6/8/1999		7/14/1999		8/10/1999		9/15/1999	
	Temp	DO	Temp	DO	Temp	DO	Temp	DO
0	23.2	8.9	24.6	9.4	22.4	9.5	13.7	9.3
1	23.2	8.9	24.5	9.3	22.4	9.6	13.5	9.3
2	23.2	9.3	24.4	8.7	22.3	9.4	13.4	9.2
3	23.2	6.7	24.3	8.3	22.3	9.2	13.4	9.2
4	22.8	5.2	24.1	7.9	22.2	9.0	13.4	9.1
5	22.8	4.7	23.4	7.0	22.2	8.9	13.3	8.5
6	22.6	5.1	22.9	6.7	22.2	8.8	13.3	8.8
7	21.7	6.1	-	-	22.1	8.3	13.4	8.6

Depth (m)	4/30/2000		5/25/2000		6/28/2000		7/3/2000		8/10/2000		9/8/2000		10/12/2000	
	Temp	DO	Temp	DO	Temp	DO	Temp	DO	Temp	DO	Temp	DO	Temp	DO
0	15.7	17.7	17.8	12.5	19.7	9.5	24.7	8.1	24.5	8.1	17.8	9.2	7.3	13.1
1	14.7	14.9	17.8	13.4	19.6	9.9	24.7	9.4	25.1	8.3	18.0	7.8	7.3	13.1
2	13.1	14.8	17.7	15.5	19.5	9.8	24.6	9.2	25.1	8.2	18.0	11.3	7.0	13.1
3	12.2	14.2	17.7	14.5	19.4	11.4	24.6	9.1	25.1	8.8	18.1	8.0	7.0	13.1
4	11.5	12.6	17.6	14.9	19.4	10.9	24.4	8.4	25.1	8.6	18.0	6.1	7.0	12.9
5	10.8	10.8	17.6	12.5	19.4	11.3	24.3	7.8	25.1	7.8	18.0	4.4	7.0	13.1
6	10.9	5.2	17.5	12.1	19.4	10.5	24.1	6.3	25.1	7.7	18.0	3.7	7.0	13.1
7	-	-	17.4	10.4	19.1	6.4	23.2	6.3	24.5	1.8	18.0	3.5	7.0	13.1

Depth (m)	5/23/2001		6/19/2001		7/24/2001		8/14/2001		9/18/2001		10/16/2001	
	Temp	DO	Temp	DO	Temp	DO	Temp	DO	Temp	DO	Temp	DO
0	11.8	10.6	18.8	11.8	26.8	5.6	23.4	5.6	16.1	11.6	9.5	9.8
1	11.9	10.9	18.8	11.9	27.2	8.5	23.9	3.0	15.9	9.1	9.5	9.8
2	11.8	7.6	18.8	11.5	27.2	9.7	24.0	4.2	15.6	6.9	9.4	8.9
3	11.7	5.6	18.8	10.2	27.2	4.4	24.0	4.6	15.5	6.6	9.4	8.8
4	11.7	4.5	18.8	9.3	27.3	9.4	23.6	4.4	15.4	6.5	9.3	7.9
5	11.6	3.8	18.7	9.6	27.2	7.2	23.4	4.2	15.4	-	9.3	7.5
6	11.6	3.3	18.7	8.1	27.2	6.6	23.3	3.7	15.4	6.2	9.3	6.4
7	11.6	3.2	18.7	7.9	26.8	5.8	23.2	3.2	15.3	6.2	9.3	6.4

Source: MP 2002; Notes: temp = temperature; DO = dissolved oxygen; °C = degrees Celsius; m = meter; mg/L = milligrams per liter

Table 4-16: Water Temperature (°C) and DO Concentration (mg/L) Collected in the Pillager Tailrace, 1999-2001

Date	Temp (°C)	DO (mg/L)
6/8/1999	23.0	7.1
7/14/1999	24.0	8.1
8/10/1999	22.4	8.8
9/14/1999	14.0	10.0
10/28/1999	6.2	13.1
11/23/1999	2.6	13.5
12/8/1999	0.7	15.2
1/5/2000	0.0	6.7
2/18/2000	0.1	7.2
3/1/2000	0.4	11.8
4/28/2000	15.2	13.5
5/25/2000	17.7	15.5
6/28/2000	19.4	15.2
7/12/2000	24.4	11.1
8/1/2000	25.9	7.5
9/6/2000	17.3	10.5
10/3/2000	14.6	11.6
5/23/2001	11.7	13.1
6/19/2001	18.6	10.5
7/24/2001	27.1	7.9
8/14/2001	23.7	6.2
9/18/2001	15.8	12.2
10/11/2001	9.8	9.8

Source: MP 2002

Notes: temp = temperature; DO = dissolved oxygen; °C = degrees Celsius; m = meter; mg/L = milligrams per liter

Minnesota PCA Water Quality Data

The Minnesota PCA has collected water quality data in the Pillager reservoir (Minnesota PCA 2025c). Results for DO, water temperature, pH, chlorophyll-a, inorganic nitrogen, total phosphorus, TKN, and specific conductivity are shown in Table 4-17, Table 4-18, and Table 4-19. The locations of these sites are shown in Figure 4-13.

The DO concentration in vertical profiles collected at two sites in the Pillager reservoir in 1999 was above the 5 mg/L standard; the DO concentration ranged from 6.2 mg/L to 10.4 mg/L (Table 4-17). The pH levels were within the range of the standard, and total phosphorus was below the standard (Table 4-18). On July 20, 1999, chlorophyll-a was above the 13 µg/L standard at 14.9 µg/L; chlorophyll-a was below the standard in the other samples.

Site S007-301 was approximately 4.4 RMs upstream of the Pillager dam and at the upper end of the current Project Boundary. The DO concentration and pH data at this site were in attainment with the water quality standards (Table 4-19). The total phosphorus concentration on June 30, 2010, was above the 75 µg/L standard (0.075 mg/L).

The Pillager reservoir has a TSI of 53, which is between mesotrophic (moderately productive) and eutrophic (highly productive), based on Secchi Disk transparency, chlorophyll-a, and total phosphorus data collected between June and September 1999 to 2008 (Minnesota PCA 2022f). This value is at the upper end of TSI values for lakes in the same ecoregion.

Table 4-17: Vertical Profile Data Collected at Site 49-0080-00-101 and Site 49-0080-00-100 in the Pillager Reservoir

Depth (m)	Site 49-0080-00-101					Site 49-0080-00-100		
	DO (mg/L)					DO (mg/L)		
	6/22/1999	7/20/1999	8/17/1999	9/21/1999		6/22/1999	7/20/1999	9/21/1999
0	10.4	7.7	8.8	9.3		8.7	7.2	8.9
1	10.2	7.9	8.8	9.2		8.5	6.8	9.1
2	9.9	7.8	8.4	9.2		8.3	6.6	9.0
3	9.7	7.6	8.2	9.0		8.3	6.4	9.0
4	9.7	6.2	8.1	8.9		-	-	9.0
5	9.1	-	7.9	8.8		-	-	-
6	8.3	-	7.9	-		-	-	-

Depth (m)	DO (% Saturation)					DO (% Saturation)		
	6/22/1999	7/20/1999	8/17/1999	9/21/1999		6/22/1999	7/20/1999	9/21/1999
0	119.6	96.3	104.4	93.5		98.8	90.1	88.6
1	117.1	97.5	103.2	93.6		96.4	82.7	90.5
2	112.0	96.5	97.8	93.0		92.8	79.6	89.8
3	109.0	93.9	95.2	91.4		92.3	77.3	89.0
4	107.6	74.5	-	90.1		-	-	88.9
5	100.6	-	89.8	88.0		-	-	-
6	89.4	-	-	-		-	-	-
Depth (m)	**Water Temperature (°C)**					**Water Temperature (°C)**		
	6/22/1999	**7/20/1999**	**8/17/1999**	**9/21/1999**		**6/22/1999**	**7/20/1999**	**9/21/1999**
0	21.7	24.6	22.2	14.4		21.2	24.6	13.5
1	21.5	24.3	21.9	14.4		21.0	23.2	13.6
2	21.3	24.0	21.3	14.4		20.6	22.9	13.5
3	20.7	23.8	21.0	14.3		20.3	22.6	13.4
4	20.3	22.8	20.6	14.2		-	-	13.4
5	19.9	-	20.5	14.1		-	-	-
6	19.5	-	20.4	-		-	-	-
Depth (m)	**pH**					**pH**		
	6/22/1999	**7/20/1999**	**8/17/1999**	**9/21/1999**		**6/22/1999**	**7/20/1999**	**9/21/1999**
0	8.5	8.1	8.2	8.2		8.3	8.0	8.2
1	8.4	8.1	8.2	8.2		8.2	7.9	8.2
2	8.4	8.1	8.2	8.2		8.2	7.9	8.2
3	8.4	8.1	8.3	8.3		8.3	7.9	8.2
4	8.4	8.0	-	8.2		-	-	8.2
5	8.4	-	8.1	8.2		-	-	-
6	8.3	-	-	-		-	-	-
Depth (m)	**Specific Conductance (µS/cm)**					**Specific Conductance (µS/cm)**		
	6/22/1999	**7/20/1999**	**8/17/1999**	**9/21/1999**		**6/22/1999**	**7/20/1999**	**9/21/1999**
0	411	341	356	403		409	342	405
1	411	341	356	403		408	344	405
2	410	341	357	404		408	345	405
3	415	342	356	404		410	348	405
4	416	344	-	403		-	-	404
5	417	-	356	403		-	-	-
6	419	-	-	-		-	-	-

Source: Minnesota PCA 2025c

Notes: DO = dissolved oxygen; °C = degrees Celsius; pH = power of hydrogen; m = meter; mg/L = milligrams per liter; µS/cm = microSiemens per centimeter

Table 4-18: Water Quality Data Collected at Site 49-0080-00-101 and Site 49-0080-00-100 in the Pillager Reservoir

Date	Site 49-0080-00-101			
	Chl-a (µg/L)	TKN (mg/L)	Total P (mg/L)	Secchi Disk (m)
6/22/1999	10.6	0.74	0.04	1.5
7/20/1999	14.9	-	0.07	-
8/17/1999	4.0	1.48	0.06	2
9/21/1999	8.8	0.65	0.04	2.9
Date	**Site 49-0080-00-100**			
	Chl-a (µg/L)	**TKN (mg/L)**	**Total P (mg/L)**	**Secchi Disk (m)**
5/18/1999	-	0.77	0.05	-
6/22/1999	2.3	0.69	0.04	1.5
7/20/1999	7.0	0.80	0.06	1.6
8/17/1999	4.1	0.79	0.05	2.2
9/21/1999	2.9	0.65	0.04	2.7

Source: Minnesota PCA 2025c

Notes: Chl-a = chlorophyll-a; TKN = Total Kjeldahl Nitrogen; P = phosphorus; m = meter; mg/L = milligrams per liter

Table 4-19: Water Quality Data from Site S007-301 Upstream of the Pillager Dam

Date	DO (mg/L)	DO (% saturation)	Water Temperature (°C)	pH	Specific Conductance (µS/cm)	NO2NO3 (mg/L)	Total P (mg/L)
6/30/2010	9.7	-	22.7	8.4	471	0.24	0.13
8/25/2011	11.7	-	23.4	8.5	406	-	-
10/1/2020	11.1	104.4	12.5	8.4	419	-	-
7/21/2021	6.4	74.3	23.0	8.0	419	0.02	0.02

Source: Minnesota PCA 2025c

Notes: DO = dissolved oxygen; °C = degrees Celsius; pH = power of hydrogen; m = meter; mg/L = milligrams per liter; µS/cm = microSiemens per centimeter

4.4.1.8 Projects Reservoirs

Little Falls Project

The Little Falls Project reservoir specifications are described in Exhibit A. The maximum depth of the reach of the Mississippi River between Brainerd, Minnesota, and Royalton, Minnesota, is 25 feet (MPLC 1991a). The average depth upstream of the Little Falls dam is approximately 6 feet, and the average depth downstream is about 12 feet. The average width of the Mississippi River upstream of the Little Falls dam is approximately 350 feet (MPLC 1991a). The approximate shoreline length within the proposed Little Falls Project Boundary based on contour elevations derived from Minnesota DNR ME LiDAR data and National Agriculture Imagery Program (NAIP) 2013 aerial imagery is 9.6 miles (Minnesota DNR and Woolpert, Inc. 2013; USDA 2013). The Little Falls reservoir is dominated by sandy substrates, with rocky substrates also present (MPLC 1991a).

Sylvan Project

The Sylvan Project reservoir specifications are described in Exhibit A. In addition to the Crow Wing River, other inflow sources to the Sylvan reservoir include the Gull River from the northeast and a bog seepage area along the southwest shoreline (MPLC 1991b). The reservoir has a maximum depth of approximately 31 feet, and a mean depth of approximately 10 feet (MPLC 1991b). The reservoir shoreline is gradual with gravel-rubble, sand, and organic soils. The approximate shoreline length within the proposed Sylvan Project Boundary based on contour elevations derived from Minnesota DNR ME LiDAR data and NAIP 2023 aerial imagery is 40.3 miles (Minnesota DNR and Woolpert, Inc. 2013; USDA 2023). The Sylvan reservoir is dominated by sandy substrates (MPLC 1991b).

Pillager Project

The Pillager reservoir specifications are described in Exhibit A. In addition to the Crow Wing River, other sources of inflow to the reservoir include Seven Mile Creek, which enters from the north, and unnamed creeks that enter from the south. The reservoir has a maximum water depth of approximately 25 feet (MPLC 1995). The reservoir shoreline is gradual with gravel-rubble, sand, and organic soils. The approximate shoreline length within the proposed Pillager Project Boundary based on contour elevations derived from Minnesota DNR ME LiDAR data and NAIP 2023 aerial imagery is 19.8 miles (Minnesota DNR and Woolpert, Inc. 2013; USDA 2023). The Pillager reservoir is dominated by fine substrates including silt and sand (MPLC 1995).

4.4.1.9 Gradient of Downstream Reaches

Little Falls Project

The Mississippi River drops 15 feet in elevation within a mile downstream of the Little Falls dam (Google Earth Elevation Model 2022). Overall, the gradient of the Mississippi River from the Little Falls dam to Royalton, Minnesota, is about 1.7 feet per mile (MPLC 1991a).

Sylvan Project and Pillager Projects

Overall, the Crow Wing River has a low gradient and drops 200 feet in elevation from the headwaters to the confluence with the Mississippi River or a decrease of approximately 0.5 feet per mile (MP 2013). The Crow Wing River drops approximately 2 feet in elevation downstream of the Pillager tailrace to the top of the Sylvan reservoir. Based on the Google Earth elevation model, the Crow Wing River decreases approximately 7 feet in elevation from the Sylvan tailrace to the confluence with the Mississippi River (approximately 2.2 feet per mile).

4.4.2 Environmental Effects

The Licensee is not proposing any modifications to existing project facilities. The Licensee is proposing to continue to operate the Projects as run-of-river where outflow from the project is approximately equal to inflow, water level fluctuations in the reservoirs are minimized, and natural river flows are provided downstream. The Licensee is proposing to continue to provide a minimum flow at the Little Falls Project if the reservoir needs to be drawn down to replace flashboards during the spring walleye spawning season. In that event, a minimum flow of 350 cfs will be provided to the east channel. The continued operation of the Projects is not anticipated to impact water quantity resources.

Water quality monitoring completed upstream and downstream of the dams at the Little Falls Project and the Sylvan Project in 2024 demonstrated attainment with state water quality standards and that the water column in the forebays did not stratify. Water temperature and DO were similar upstream and downstream of the dams demonstrating that operation of the Projects did not adversely affect water quality conditions. Overall, water quality data collected throughout the Project Vicinities over the past four decades has found water quality conditions to be good and in attainment with standards. Due to the proposed continued run-of-river operations, no changes to water quality conditions at the Projects are anticipated.

4.4.3 Protection, Mitigation, Enhancement Measures

The Licensee is proposing to continue run-of-river operation at the Projects, which will be protective of water quantity and water quality. The Licensee is proposing to continue to provide a minimum flow at the Little Falls Project if the reservoir needs to be drawn down to replace flashboards during the spring walleye spawning season. No additional PME measures are being proposed specific to water quantity or quality resources.

4.4.4 Unavoidable Adverse Effects

Continued operation and relicensing of the Projects as proposed is not expected to have unavoidable adverse effects on water resources.

4.4.5 References

Federal Energy Regulatory Commission (FERC). 1998. Order Issuing New License (Major Project). Pillager Hydroelectric Project. FERC Project No. 2663. April 27, 1998.

Federal Energy Regulatory Commission (FERC). 1999. Order Modifying and Approving Water Quality Monitoring Plan. Pillager Hydroelectric Project. FERC Project No. 2663. April 7. 1999. Available online: https://elibrary.ferc.gov/eLibrary/search. Accession number 19990408-0269.

Minnesota Department of Natural Resources (Minnesota DNR) and Woolpert, Inc. 2013. Lidar Elevation, Central Lakes Region, Minnesota, 2012 [LAS point clouds; 1 m DEM; contours; building outlines]. Minnesota Geospatial Information Office and Minnesota Department of Natural Resources. Acquired April 5–28, 2012 for Aitkin, Cass, Hubbard, Itasca, Todd, Wadena, and part of Koochiching Counties.

Minnesota Legislature. 2021. Minnesota Administrative Rules. Chapter 7050.0220 Specific Water Quality Standards by Associated Use Classes. Available online: https://www.revisor.mn.gov/rules/7050.0220/. Accessed December 30, 2022.

Minnesota Legislature. 2023. Minnesota Administrative Rules. Chapter 7050.0222 Specific Water Quality Standards for Class 2 Waters of the State; Aquatic Life and Recreation. Available online: https://www.revisor.mn.gov/rules/7050.0222/. Accessed August 7, 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2015. Crow Wing River Watershed – Watershed Restoration and Protection Strategy Report. Document number: wq-ws4-09a. Available online: https://www.pca.state.mn.us/sites/default/files/wq-ws4-09a.pdf. Accessed August 7, 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2019. Regionalization of Minnesota's Rivers for Application of River Nutrient Criteria. Document number: wq-s6-18. Available online: https://www.lrl.mn.gov/docs/2019/other/190203.pdf. Accessed August 7, 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2020a. Mississippi River-Brainerd Area Watershed Restoration and Protection Strategy Report. Document number: wq-ws4-65a. Available online: https://www.pca.state.mn.us/sites/default/files/wq-ws4-65a.pdf. Accessed August 7, 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2020b. Beneficial Use Designations for Stream Reaches: Crow Wing River Watershed (07010106). Available online: https://www.pca.state.mn.us/sites/default/files/wq-s6-47j.pdf. Accessed August 7, 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2023. Beneficial Use Designations for Stream Reaches: Mississippi River – Brainerd Watershed (07010104). Available online: https://www.pca.state.mn.us/sites/default/files/wq-s6-47h.pdf. Accessed August 7, 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2024a. Minnesota's 2024 Impaired Waters List. Available online: https://www.pca.state.mn.us/air-water-land-climate/minnesotas-impaired-waters-list. Accessed August 7, 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2025a. Water Quality Standards. Available online: https://www.pca.state.mn.us/business-with-us/water-quality-standards. Accessed August 7, 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2025b. Minnesota Statewide Mercury TMDL. Available online: https://www.pca.state.mn.us/business-with-us/statewide-mercury-tmdl. Accessed August 7, 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2025c. Surface Water Data. Available online: https://webapp.pca.state.mn.us/surface-water/search. Accessed August 7, 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2025d. Watershed Pollutant Load Monitoring. Available online: https://www.pca.state.mn.us/air-water-land-climate/watershed-pollutant-load-monitoring. Accessed August 12, 2025.

Minnesota Power (MP). 1998. License Article 404 – Dissolved Oxygen Monitoring Plan. Pillager Hydroelectric Project. FERC Project No. 2663. Available online: https://elibrary.ferc.gov/eLibrary/search. Accession number 19981028-0230.

Minnesota Power (MP). 2002. Final Dissolved Oxygen Monitoring Report. February 2002. Available online: https://elibrary.ferc.gov/eLibrary/search. Accession number 20020207-0300.

Minnesota Power (MP). 2013. Sylvan Hydroelectric Project FERC Project No. 2452-072. Temporary Amendment of License Article 401 to temporarily Lower Reservoir Level. Available online: https://elibrary.ferc.gov/eLibrary/search. Accession number 20130430-5161.

Minnesota Power (MP). 2025. Initial Study Report. Accession number 20250207-5138. Available online: https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20250207-5138&optimized=false&sid=4e0c9c3d-faca-4b34-af77-36a4de33fb5c.

Minnesota Power & Light Company (MPLC). 1991a. Application for New License Major Water Power Project. Little Falls Hydroelectric Project. FERC Project No. 2532.

Minnesota Power & Light Company (MPLC). 1991b. Application for New License Major Water Power Project. Sylvan Hydroelectric Project. FERC Project No. 2454.

Minnesota Power & Light Company (MPLC). 1995. Application for New License Major Water Power Project. Pillager Hydroelectric Project. FERC Project No. 2663.

Natural Resources Research Institute University of Minnesota Duluth (NRRI-UMD). 2025. Natural Resource Atlas of Minnesota. Available online: https://mnatlas.org/gis-tool/. Accessed August 7, 2025.

U.S. Department of Agriculture (USDA), Farm Service Agency – Aerial Photography Field Office. 2013. National Agriculture Imagery Program (NAIP) 2013 Aerial Imagery for Minnesota [1 m, 4-band orthophotos, 8-bit radiometric resolution]. Distributed by Minnesota Geospatial Information Office (MnGeo). Available online: https://resources.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_mngeo/base_naip_2013_airphotos/metadata/metadata.html Accessed: October 2025.

U.S. Department of Agriculture (USDA), Farm Production and Conservation – Business Center – Geospatial Enterprise Operations. 2023. National Agriculture Imagery Program (NAIP) 2023 Aerial Imagery for Minnesota [30 cm, 4-band orthophotos, 8-bit radiometric resolution]. Distributed by Minnesota Geospatial Information Office (MnGeo). Available online: https://resources.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_mngeo/base_naip_2023_airphotos/metadata/metadata.html Accessed: October 2025.

U.S. Geological Survey (USGS). 2025a. USGS Gage No. 05247500 Crow Wing River near Pillager, MN. Available online: https://waterdata.usgs.gov/nwis/uv?site_no=05247500&legacy=1. Accessed July 28, 2025.

U.S. Geological Survey (USGS). 2025b. USGS Gage No. 05267000 Mississippi River near Royalton, MN. Available online: https://waterdata.usgs.gov/monitoring-location/05267000/#parameterCode=00065&period=P7D. Accessed July 28, 2025.

U.S. Geological Survey (USGS). 2025c. USGS 05247000 Gull River at Gull Lake Dam near Brainerd, MN. Available online: https://waterdata.usgs.gov/nwis/inventory/?site_no=05247000. Accessed August 7, 2025.

4.5 Fish and Aquatic Resources

4.5.1 Affected Environment

4.5.1.1 Existing Aquatic Habitat

Little Falls Project

The Little Falls Project creates a reservoir on the Mississippi River. Past fish assemblage surveys in the reach of the Mississippi River near the Little Falls Project have documented fish species compositions that are indicative of fair to good aquatic habitat quality (Minnesota DNR 2009a, 2009b). The riverine reaches upstream and downstream of the Little Falls Project include riffle, run, and pool complexes. Much of the riverine reach is dominated by coarse substrate, while the Little Falls reservoir is dominated by fine gravel and sand (Minnesota DNR 2009c). Smallmouth bass (*Micropterus dolomieu*) habitat is present throughout much of the Mississippi River upstream and downstream of the Little Falls reservoir in tailwater, island, and backwater areas (Minnesota DNR 2022). Specifically, smallmouth bass spawning habitat has been documented throughout the upstream and downstream reach, with spawning conditions and habitat suitability tied to annual flow rates (Minnesota DNR 2009a, 2009b, 2022).

Sylvan Project

The Sylvan Project creates a reservoir on the Crow Wing River and Gull River, with a maximum depth of approximately 31 feet (MPLC 1991b). Waters are characterized as eutrophic, with chlorophyll and total phosphorous levels above or equal to the expected range for similar lakes (Minnesota PCA 2014). Gravel and cobble-based substrates that are suitable spawning habitat for walleye are found in the riverine portions of the Crow Wing and Gull rivers, with past stocking efforts utilized to supplement the population. Sandy and vegetated littoral habitats that provide suitable spawning habitat for largemouth bass (*Micropterus salmoides*) and panfish species occur throughout the Sylvan reservoir. Aquatic vegetation has historically been abundant in the middle of Sylvan reservoir, at the confluence of the Gull and Crow Wing rivers, and in surrounding shoreline and wetland habitats (MPLC 1991b). Vegetated littoral reaches in the Sylvan reservoir provide adequate spawning habitat for species including northern pike (*Esox Lucius)*, bluegill (*Lepomis macrochirus*), black crappie (*Pomoxis nigromaculatus*), and largemouth bass (Minnesota DNR 2021a).

Habitat assessments conducted in the Gull River and Crow Wing River by the Minnesota DNR and the Minnesota PCA noted that the reaches of those rivers that include the Sylvan Project have stream habitat assessment ratings of fair. The reaches of the Crow Wing River near the Sylvan Project meet state standards for fish IBI ratings, based on habitat and fish assemblage surveys conducted by the Minnesota DNR and Minnesota PCA during 2010 (Minnesota PCA 2014).

Pillager Project

The Pillager Project creates a reservoir on the Crow Wing River. The reservoir is relatively shallow, and the deepest point is approximately 25 feet (MPLC 1995). It is characterized as eutrophic, with chlorophyll and total phosphorous levels above or equal to the expected range for similar lakes (Minnesota PCA 2014). The reservoir above the dam and the Pillager tailrace create aquatic habitat that supports both warmwater and coolwater fish species (MPLC 1995). Marshy areas with emergent aquatic vegetation are present in the upstream reaches of the reservoir. Submerged aquatic vegetation has been historically abundant in the shallow portions of the reservoir, and in littoral areas. Aquatic plant species documented in the Pillager reservoir that provide refuge to multiple life stages of fish species include coontail (*Ceratophyllum demersum*) and northern watermilfoil (*Myriophyllum sibiricum*). Specifically, suitable habitat for bluegill, black crappie, and largemouth bass is present in the Pillager reservoir, with more suitable habitat for walleye and smallmouth bass in the riverine reaches upstream and downstream of the Pillager Project. Although walleye likely use the riverine portions of the Crow Wing River during most of the year, they may utilize the deeper water habitats in the reservoir during the winter months (Minnesota DNR 2021b). The predominant substrate types present in the reservoir are silt and sand, with some gravel present (MPLC 1995).

Habitat assessments conducted in the Crow Wing River by the Minnesota DNR and the Minnesota PCA noted that the reach that encompasses the Pillager Project has a stream habitat assessment rating of fair. These reaches of the of the Crow Wing River also meet state standards for fish IBI ratings, based on habitat and fish assemblage surveys conducted by the Minnesota DNR and Minnesota PCA during 2010 (Minnesota PCA 2014).

4.5.1.2 Fish Assemblage and Management

Little Falls Project

A total of 35 fish species have been documented in the reach of the Mississippi River that encompasses the Little Falls Project (Table 4-20). Common non-game fish species include white sucker (*Catostomus commersonii*) common carp (*Cyprinus carpio*), and shorthead redhorse (*Moxostoma macrolepidotum*). Smallmouth bass and bluegill are among the most abundant gamefish species in the reach (Minnesota DNR 2009a, 2022). Other non-game species that are common near the Little Falls Project include common shiner (*Luxilus cornutus*), spotfin shiner (*Cyprinella spiloptera*), hornyhead chub (*Nocomis biguttatus*), rock bass (*Ambloplites rupestris*), Johnny darter (*Etheostoma nigrum*), yellow perch (*Perca flavescens*), silver redhorse (*Moxostoma anisurum*), and common logperch (*Percina caprodes*) (Minnesota DNR 2009a, 2009b, 2009c). Other gamefish species documented in the reach of the Mississippi River that encompasses the Little Falls Project during recent years include bluegill, channel catfish (*Ictalurus punctatus*), yellow perch (*Perca flavescens*), largemouth bass, muskellunge (*Esox masquinongy*), northern pike, smallmouth bass, and walleye. Bluegill and largemouth bass are less abundant upstream and downstream of the Little Falls Project, and largemouth bass likely move into the Little Falls Project Vicinity from upstream reservoirs (Minnesota DNR 2022). Bluegill are not abundant at the Little Falls Project but do reach catchable size and have increased in abundance during recent years. Bluegill are targeted by anglers in the Little Falls Project reservoir, although the primary sport fisheries at the Little Falls Project are for muskellunge, smallmouth bass, and walleye (Minnesota DNR 2009a, 2009b). Channel catfish abundance has increased throughout the Mississippi River upstream and downstream of the Little Falls Project during recent years (Minnesota DNR 2022).

Invasive carp species have been documented approximately 125 miles downstream of the Little Falls Project. Specifically, silver carp (*Hypophthalmichthys molitrix*) and bighead carp (*Hypophthalmichthys nobilis*) have been collected in the Mississippi River immediately south of St. Paul, Minnesota (Minnesota DNR 2024a). Additionally, eDNA samples have indicated the presence of invasive carp upstream of the Coon Rapids dam (P-4369), in a reach of the Mississippi River north of Minneapolis/St. Paul, Minnesota (Friends of the Mississippi River 2011). The Coon Rapids dam is located approximately 95 miles downstream of the Little Falls Project.

The Minnesota DNR has conducted daytime electrofishing surveys in known smallmouth bass spawning reaches upstream of the Little Falls Project and in the Little Falls reservoir since 1994. The most recent surveys of these reaches were conducted during 2021. Smallmouth bass are the target species for the surveys, but attempts are made to capture all gamefish species that are encountered. Smallmouth bass have been the most abundant species collected across transects and years. Young-of-year smallmouth bass have been documented across years, with high recruitment associated with drought conditions and associated low, stable river flows during the summer months (Minnesota DNR 2022). Substantial recruitment of smallmouth bass has been documented both upstream and downstream of the Little Falls dam during recent years (Minnesota DNR 2009a, 2009b, 2022).

Smallmouth bass are managed in the reach of the Mississippi River that encompasses the Little Falls Project. Trophy-sized smallmouth bass are present throughout the reach, and documented growth rates are considered normal to fast as compared to similar populations. In addition to smallmouth bass management, abundance thresholds for walleye and muskellunge are also maintained (Minnesota DNR 2009a, 2009b). Muskellunge stocking efforts were conducted in the reach of the Mississippi River immediately downstream of the Little Falls Project during 1976-1980. Muskellunge were also stocked during 1988, 1990, and 1991. Over 1 million walleye were stocked in the same reach of the Mississippi River during 1984 (Minnesota DNR 2009a). Additionally, muskellunge stocking was conducted in the reach of the Mississippi River upstream from the Little Falls Project during 1970-1975, 1977, 1988, 1990, and 1991. Walleye stocking also occurred in this reach in 1984 (Minnesota DNR 2009b). Gamefish populations in the reaches of the Mississippi River upstream and downstream of the Little Falls Project are currently self-sustaining, and stocking efforts have not been implemented during more recent years (Minnesota DNR 2009a, 2009b).

The Minnesota DNR and the city of Little Falls have expressed interest in the potential installation of fish passage facilities at the Little Falls Project. FERC requested information on fish passage feasibility for the Little Falls Project in its comments on the PSP. MP included an evaluation of fish passage options in the RSP to provide site-specific information on the feasibility and costs associated with installation of a fishway. Fish passage options that were evaluated included nature-like fishway and pool and weir fishway. Anticipated construction costs were estimated for each fishway option, with cost

estimates ranging from $2 to $5 million dollars, excluding potential costs for soil remediation, issues with attraction flows, and costs associated with additional construction of access facilities. Additional operating and maintenance costs were estimated at $37,000 for a nature-like fishway and $155,000 for a pool and weir structure.

Hydrologic data and known hydraulic capacity of the Little Falls Project suggest that a recommended 200 cfs fishway diversion flow would require flow to be diverted from hydroelectric generation approximately 43 percent of the time for a nature-like fishway, and 35 percent of the time for a pool and weir fishway. Results of the assessment suggest that diversion of water at the Little Falls Project for fish passage would result in 699 megawatt hours (MWh) in lost generation seasonally (May through October) and 943 MWh in lost generation annually, with annual revenue loss estimates ranging from $83,880 to $113,160.

MP also noted in the RSP that there is an existing similar and diverse fish assemblage both upstream and downstream of the Little Falls Project, with at least 37 fish species in the downstream reach between the Little Falls and Blanchard dams, and 41 fish species in the upstream reach between the Little Falls and Brainerd dams. No lack of suitable habitat has been documented as a limiting factor for the presence of popular gamefish species, and negative impacts to migratory species have not been identified. A majority of documented mussel species in the reach of the Mississippi River that includes the Little Falls Project are found both upstream and downstream of the Little Falls dam.

MP determined that costs associated with construction, maintenance, and lost generation were not reasonable compared to the limited biological benefits of fishway construction.

Table 4-20: Fish Species Documented in the Reach of the Mississippi River That Encompasses the Little Falls Project

Scientific Name	Common Name
Ameiurus melas	black bullhead
Pomoxis nigromaculatus	black crappie
Notropis heterolepis	blacknose shiner
Lepomis macrochirus	bluegill
Pimephales notatus	bluntnose minnow
Amia calva	bowfin
Labidesthes sicculus	brook silverside
Ameiurus nebulosus	brown bullhead
Lota lota	burbot
Umbra limi	central mudminnow
Campostoma anomalum	central stoneroller
Cyprinus carpio	common carp
Luxilus cornutus	common shiner
Lepomis cyanellus	green sunfish
Nocomis biguttatus	hornyhead chub
Etheostoma nigrum	Johnny darter
Micropterus salmoides	largemouth bass
Percina caprodes	logperch
Rhinichthys cataractae	longnose dace
Cottus bairdii	mottled sculpin
Esox masquinongy	muskellunge
Esox lucius	northern pike
Lepomis gibbosus	pumpkinseed
Ambloplites rupestris	rock bass
Moxostoma macrolepidotum	shorthead redhorse
Moxostoma anisurum	silver redhorse
Micropterus dolomieu	smallmouth bass
Cyprinella spiloptera	spotfin shiner
Noturus gyrinus	tadpole madtom
Percopsis omiscomaycus	trout-perch
Sander vitreus	walleye
Catostomus commersonii	white sucker
Ameiurus natalis	yellow bullhead
Perca flavescens	yellow perch

Source: Minnesota DNR 2009a, 2009b, 2009c, 2022

Sylvan Project

The fish assemblage in the Sylvan reservoir and the downstream reach includes gamefish species (walleye, northern pike, largemouth bass, smallmouth bass, black crappie, bluegill) and non-game species (redhorse species, common carp, white sucker) (MPLC 1991b; Minnesota DNR 2021a, 2024b). Panfish are generally more abundant in the reservoir, with walleye more abundant in the lotic reaches of the Crow Wing River (including the Sylvan tailrace) during much of the year (MPLC 1991b). Specifically, walleye are likely to spend much of the warmer months in the riverine reaches and may utilize the Sylvan reservoir during the winter months (Minnesota DNR 2014a, 2021a).

Surveys conducted by the Minnesota DNR and Minnesota PCA in 2010 documented 55 fish species in the Crow Wing River Watershed. These surveys encompassed the entire watershed, including the reaches of the Gull River and Crow Wing River at the Sylvan Project (Table 4-21). Fish assemblage surveys in the Sylvan reservoir have occurred during 1958, 1985, 1986, 1987, 1990, 1996, 2000, 2002, 2008, 2014, and 2024. Sampling methods across one or multiple years included the use of gill nets, trap nets, and electrofishing techniques. Sampling during the most recent sampling years (2014 and 2024) included the use of trap nets and electrofishing techniques. A total of 18 fish species were collected at the Sylvan Project during the two most recent survey years (Table 4-22). Bluegill was the most abundant species collected during trap netting across both sampling years. Largemouth bass was the most abundant species collected during electrofishing in 2014, and smallmouth bass was the most abundant species collected during electrofishing in 2024 (Minnesota DNR 2014a, 2024b). Bluegill abundance and size structure at the Sylvan Project is generally consistent with the expected values for similar lakes in Minnesota (Minnesota DNR 2014a, 2021a). Bluegill total lengths during trap netting ranged from 3.2 to 8.4 inches in 2014, and 3.3 to 9.0 inches in 2024. Mean bluegill length was 6.4 inches in 2014 and 6.6 inches in 2024. Mean growth increment in 2014 was 1.5 inches for bluegill in their first year of life, and 1.1 inches in year 2 (Minnesota DNR 2014a). No walleye were collected during 2014 electrofishing surveys. A total of 16 walleye were collected during 2024 electrofishing surveys, with an average length of 18.8 inches (Minnesota DNR 2014a, 2024b).

Invasive silver carp and bighead carp have been collected further downstream in the drainage from the Mississippi River below St. Paul, Minnesota (Minnesota DNR 2024a). Additionally, eDNA samples have indicated the presence of invasive carp upstream of the

Coon Rapids dam (P-4369), in a reach of the Mississippi River north of Minneapolis/St. Paul, Minnesota.

Stocking of walleye fry occurred annually at the Sylvan Project from 1986-1991, and walleye fingerlings were stocked in 1992 and 1994. Additional stocking of walleye fry occurred during 2006-2009 and has occurred during odd numbered years since 2013 (Minnesota DNR 2021a). Some walleye recruitment during 1994-2006 was maintained by natural reproduction (Minnesota DNR 2014a). Minnesota DNR fisheries management goals for the Sylvan Project include maintaining northern pike and walleye populations, maintaining size structure and density targets for bluegill and black crappie, and maintaining largemouth bass abundance (Minnesota DNR 2021a). Planned Minnesota DNR management activities in future years include trap net assessments to target panfish, electrofishing assessments to target walleye and largemouth bass, biennial walleye stocking efforts, review of flow data and vegetation abundance, and possible roughfish removal allowances (Minnesota DNR 2021a).

Pillager Project

The Pillager reservoir fish assemblage is largely comprised of catostomids (e.g., white sucker and redhorse species) and sunfish species (e.g., pumpkinseed [*Lepomis gibbosus*] and rock bass) (MPLC 1995; Minnesota DNR 2014b, 2024c). Managed fish species include warmwater gamefish species, as well as walleye. Previous fish assemblage surveys have documented centrarchid and sucker species upstream of the dam, with walleye more abundant downstream of the dam (MPLC 1995). Documented non-game fish species include catostomids (sucker and redhorse species) and minnow species; documented sportfish species include rock bass, bluegill, largemouth bass, black crappie, northern pike, walleye, and muskellunge. Commercial roughfish (e.g., common carp, bullhead species) removals were conducted in 1977, 1984, and 1990 (MPLC 1995).

Surveys conducted by the Minnesota DNR and Minnesota PCA in 2010 documented 55 fish species in the Crow Wing River Watershed. These surveys encompassed the entire Crow Wing River Watershed, including the reach of the Crow Wing River at the Pillager Project, more upstream and downstream reaches of the Crow Wing River outside of the Pillager Project Vicinity, and tributaries within the watershed (Table 4-21). The Minnesota DNR has conducted recent fish assemblage surveys in the Pillager reservoir during 2008, 2009, 2014, and 2024. Collection methodologies during 2014 and 2024 included trap

netting and electrofishing techniques. Twenty fish species were documented (Table 4-22). The most common species collected via trap netting were rock bass, bullhead species, and bluegill. The most common species collected via trap netting during 2024 were pumpkinseed, bullhead species, and yellow perch. Smallmouth bass was the most common species collected via electrofishing during 2014 and 2024 (Minnesota DNR 2014b, 2024c). Bluegill total lengths during trap netting ranged from 3.5 to 9.1 inches in 2014, and 4.8 to 9.1 inches in 2024. Smallmouth bass total lengths during electrofishing ranged from 8.5 to 19.4 inches in 2014, and 9.7 to 19.7 inches in 2024. Mean growth increment in 2014 was 1.6 inches for bluegill in their first year of life, and 1.2 inches in year 2 (Minnesota DNR 2014b).

Invasive silver carp and bighead carp have been collected further downstream in the drainage from the Mississippi River below St. Paul, Minnesota (Minnesota DNR 2024a). Additionally, eDNA samples have indicated the presence of invasive carp upstream of the Coon Rapids dam, in a reach of the Mississippi River north of Minneapolis/St. Paul, Minnesota.

The Minnesota DNR previously stocked walleye in the Pillager reservoir, and long-term management goals have included increasing walleye abundance (MPLC 1995). Past walleye management included stocking fry at a rate of 350,000 fry per year during 1986-1991. Stocking of fingerlings occurred in 1992 and 1994, as it was determined that the larger fingerlings may experience less predation and have better survival than fry (MPLC 1995). It does not appear that substantial walleye recruitment occurred directly from the stocking efforts, although natural walleye recruitment has been documented during more recent surveys. The Minnesota DNR does not currently have plans for additional fish stocking at the Pillager Project, as natural reproduction at levels that can sustain sport fisheries have been documented for species including walleye, smallmouth bass, bluegill, and black crappie, while walleye stocking did not appear to provide a long-term benefit for that species. Current Minnesota DNR fisheries management goals for the Pillager Project include maintaining a naturally reproducing walleye population, with specific goals informed by trap netting and electrofishing survey results. Additional goals include maintaining abundance thresholds for largemouth bass, smallmouth bass, and bluegill (Minnesota DNR 2021b).

Table 4-21: Fish Species Documented in the Crow Wing River Watershed

Scientific Name	Common Name
Fundulus diaphanus	banded killifish
Notropis dorsalis	bigmouth shiner
Ameiurus melas	black bullhead
Pomoxis nigromaculatus	black crappie
Notropis heterodon	blackchin shiner
Rhinichthys atratulus	blacknose dace
Notropis heterolepis	blacknose shiner
Lepomis macrochirus	bluegill
Pimephales notatus	bluntnose minnow
Amia calva	bowfin
Hybognathus hankinsoni	brassy minnow
Culaea inconstans	brook stickleback
Salvelinus fontinalis	brook trout
Ameiurus nebulosus	brown bullhead
Salmo trutta	brown trout
Lota lota	burbot
Umbra limi	central mudminnow
Campostoma anomalum	central stoneroller
Cyprinus carpio	common carp
Luxilus cornutus	common shiner
Semotilus atromaculatus	creek chub
Pimephales promelas	fathead minnow
Chrosomus neogaeus	finescale dace
Moxostoma sp.	redhorse (general)
Moxostoma valenciennesi	greater redhorse
Lepomis cyanellus	green sunfish
Nocomis biguttatus	hornyhead chub
-	hybrid dace
Lepomis sp.	hybrid sunfish
Etheostoma exile	Iowa darter
Etheostoma nigrum	Johnny darter
Micropterus salmoides	largemouth bass
Etheostoma microperca	least darter
Percina caprodes	logperch

Scientific Name	Common Name
Rhinichthys cataractae	longnose dace
Notropis volucellus	mimic shiner
Cottus bairdii	mottled sculpin
Esox lucius	northern pike
Chrosomus eos	northern redbelly dace
Margariscus nachtriebi	pearl dace
Notropis anogenus	pugnose shiner
Lepomis gibbosus	pumpkinseed
Ambloplites rupestris	rock bass
Moxostoma macrolepidotum	shorthead redhorse
Moxostoma anisurum	silver redhorse
Micropterus dolomieu	smallmouth bass
Cyprinella spiloptera	spotfin shiner
Notropis hudsonius	spottail shiner
Noturus gyrinus	tadpole madtom
Percopsis omiscomaycus	trout-perch
Sander vitreus	walleye
Notropis texanus	weed shiner
Catostomus commersonii	white sucker
Ameiurus natalis	yellow bullhead
Perca flavescens	yellow perch

Source: Minnesota PCA 2014

Table 4-22: Fish Species Documented in the Sylvan and Pillager Reservoirs During 2014 and 2024

Scientific Name	Common Name	Documented at Sylvan	Documented at Pillager
Ameiurus melas	black bullhead		X
Pomoxis nigromaculatus	black crappie	X	X
Lepomis macrochirus	bluegill	X	X
Amia calva	bowfin	X	
Ameiurus nebulosus	brown bullhead	X	X
Cyprinus carpio	common carp	X	X
Semotilus atromaculatus	creek chub		X
Notemigonus crysleucas	golden shiner	X	
Moxostoma valenciennesi	greater redhorse		X
Lepomis cyanellus	green sunfish		X
Lepomis sp.	hybrid sunfish	X	X
Micropterus salmoides	largemouth bass	X	
Esox lucius	northern pike	X	X
Lepomis gibbosus	pumpkinseed	X	X
Ambloplites rupestris	rock bass	X	X
Moxostoma macrolepidotum	shorthead redhorse	X	X
Moxostoma anisurum	silver redhorse	X	X
Micropterus dolomieu	smallmouth bass	X	X
Noturus gyrinus	tadpole madtom		X
Sander vitreus	walleye	X	X
Catostomus commersonii	white sucker	X	X
Ameiurus natalis	yellow bullhead	X	X
Perca flavescens	yellow perch	X	X

Sources: Minnesota DNR 2014a, 2014b, 2024b, 2024c

Fish Entrainment

The Licensee conducted a Desktop Entrainment and Impingement Study to provide an order of magnitude estimate of impingement and entrainment, and to estimate turbine passage survival for relevant fish species at the Projects. A full description of methods and results is in the Sylvan, Pillager, and Little Falls Desktop Fish Entrainment and Impingement Study Reports were filed as part of the Initial Study Report (ISR) on February 7, 2025 (FERC Accession Number 20250207-5138).

The use of desktop techniques to evaluate entrainment and impingement of fish at hydropower projects is a widely accepted technique to develop an understanding of the potential effects that hydropower operations may have on fishery resources. Individual desktop analyses were conducted for each of three projects, and included identification of site-specific data (e.g., intake characteristics, generating unit characteristics, river flows, and hydraulic capacities) and use of impoundment specific fisheries data. The goal for each of the three analyses was to estimate entrainment (number of fish passing through the turbines) and turbine passage survival/mortality, and to assess the potential for fish to become impinged on Project trashracks. An estimate of entrainment potential was developed based on rates documented at other hydropower sites where quantitative sampling of entrainment (i.e., tailrace netting studies) occurred (Electric Power Research Institute 1997). An estimate of impingement risk was developed based on relationships between fish body size, potential swim speeds, clear spacing of trashracks, and intake velocities.

Estimated annual entrainment rates at the Little Falls Project range from approximately 25,000 to 74,000 fish. Annual entrainment mortality estimates range from approximately 2,400 to 14,500 fish (Table 4-24). Entrainment rates and entrainment mortality were estimated across a range of flow and operational scenarios. Estimated fish entrainment rates are similar at the Sylvan and Pillager Projects, with a range of approximately 10,000 to 35,000 fish entrained annually at each site (Table 4-23). Annual entrainment mortality estimates at the Sylvan Project range from approximately 1,500 to approximately 10,600 fish, and entrainment mortality estimates at the Pillager Project range from approximately 1,600 to approximately 11,500 fish (Table 4-24). Estimated fish entrainment species composition at all three Projects are comprised of a high percentage of centrarchid (sunfish) species. Centrarchids less than 6 inches in total length were also the most abundant size class and family group documented during empirical entrainment studies at multiple projects in the Midwest (Electric Power Research Institute 1997).

The likelihood of impingement at the Projects is minimal. A comparison of fish body size and expected swim speeds indicates that the largest individuals of species or family groups that are too large to fit through the trashrack spacing would have burst and sustained swim speeds that well exceed intake velocities and would not be susceptible to impingement.

Table 4-23: Estimated Annual Fish Entrainment at the Little Falls, Sylvan, and Pillager Projects

Project	Number of Fish Entrained Annually – Low Flow	Number of Fish Entrained Annually – High Flow
Little Falls	24,685	73,545
Sylvan	10,162	34,380
Pillager	10,414	36,069

Table 4-24: Estimated Annual Entrainment Mortality at the Little Falls, Sylvan, and Pillager Projects

Project	Annual Entrainment Mortality – Low Flow	Annual Entrainment Mortality – High Flow
Little Falls	2,445 to 4,858 fish	7,284 to 14,477 fish
Sylvan	1,572 to 3,142 fish	5,316 to 10,632 fish
Pillager	1,660 to 3,323 fish	5,753 to 11,503 fish

4.5.1.3 Benthic Macroinvertebrates and Freshwater Mussels

The Minnesota DNR conducted mussel surveys in the Crow Wing River and Mississippi River during 2003 and 2007. Survey reaches included the reach of the Crow Wing River upstream of the Pillager Project, the reach of the Mississippi River near the confluence with the Crow Wing River (e.g., downstream of the Sylvan Project/upstream of the Little Falls Project), and the reach of the Mississippi River downstream of the Little Falls Project (Minnesota DNR 2003, 2007). Eight mussel species were documented upstream of the Pillager Project, eight mussel species were documented between the Sylvan Project and Little Falls Project, and six mussel species were documented downstream of the Little Falls Project (Table 4-25). The most abundant species documented across all three reaches was the fatmucket (*Lampsilis siliquoidea)*. The second most abundant species at all three reaches was the plain pocketbook (*Lampsilis cardium)*. Two Minnesota state-listed species, black sandshell (*Ligumia recta)* and creek heelsplitter (*Lasmigona compressa)*, were collected at all three reaches. No federally listed species were documented. Statewide mussel collections by the Minnesota DNR have documented extirpation rates of 0 to 3 percent throughout the region of Minnesota that includes the Little Falls Project,

Sylvan Project, and Pillager Project, with higher mussel extirpation rates (> 50 percent) occurring in drainages located in more southern portions of Minnesota (Minnesota DNR 2025a). The invasive zebra mussel (*Dreissena polymorpha)* was documented in the reach of the Mississippi River upstream of the Little Falls Project (Minnesota DNR 2003, 2007). Additional observations of zebra mussel have been documented in the Crow Wing River upstream of the Pillager Project and in the Gull River upstream of the Sylvan Project (USGS 2023). Faucet snail (*Bithynia tentaculata*) have also been documented in the Mississippi River, Gull River, and Crow Wing River (Minnesota DNR 2025b).

Sampling conducted by the Minnesota DNR and Minnesota PCA in 2010 and 2011 documented 272 unique macroinvertebrate taxa in the Crow Wing River Watershed. The most commonly observed macroinvertebrate genera were *Simulium* (Diptera), *Hyalella* (Amphipoda), *Polypedilum* (Diptera), *Physa* (Gastropoda), and *Cheumatopsyche* (Trichoptera) (Minnesota PCA 2014).

Table 4-25: Mussel Species Documented in the Crow Wing River and Mississippi River

Scientific Name	Common Name	Crow Wing River – Upstream of Pillager	Mississippi River – Crow Wing River to Little Falls	Mississippi River – Downstream of Little Falls
Anodontoides ferussacianus	cylindrical papershell	8	-	-
Lampsilis cardium	plain pocketbook	71	98	9
Lampsilis siliquoidea	fatmucket	238	371	86
Lasmigona complanata	white heelsplitter	1	53	1
Lasmigona compressa	creek heelsplitter	9	2	1
Ligumia recta	black sandshell	17	98	5
Pyganodon grandis	giant floater	4	7	1
Utterbackia imbecillis	paper pondshell	1	-	-
Dreissena polymorpha	zebra mussel	-	2	-
Strophitus undulatus	creeper	-	1	-

Sources: Minnesota DNR 2003, 2007

4.5.1.4 Aquatic Invasive Species

Aquatic invasive species have been documented in the Crow Wing River, Gull River, and Mississippi River. Occurrences of zebra mussel have been documented in the reach of the Mississippi River upstream of the Little Falls Project (Minnesota DNR 2003, 2007). Additional observations of zebra mussel have been documented in the Crow Wing River upstream of the Pillager Project and in the Gull River upstream of the Sylvan Project (USGS 2023). Faucet snail have also been documented in the Mississippi River, Gull River, and Crow Wing River (Minnesota DNR 2025b). Silver carp and bighead carp have been collected from the reach of the Mississippi River below St. Paul, Minnesota (Minnesota DNR 2024a). Additionally, eDNA samples have indicated the presence of invasive carp upstream of the Coon Rapids dam (P-4369), in a reach of the Mississippi River north of Minneapolis/St. Paul, Minnesota.

MP has developed and implemented guidance procedures for preventing the spread of aquatic species (MP 2023). The guidance document outlines procedures for preventing the spread of aquatic invasive species on watercraft, in compliance with Minnesota Statute's Chapter 84D and Minnesota Rule Chapter 6216.

4.5.1.5 Essential Fish Habitat

The National Marine Fisheries Service identifies EFH for fish species that are commercially managed under the Magnuson-Stevens Fishery Conservation and Management Act. EFH is defined as "the habitat necessary for managed fish species to complete their life cycle such that the fishery can be harvested sustainably" (NOAA 2023). There are no federally managed commercial fish species near the Projects; therefore, there is no EFH in the Projects Vicinities.

4.5.2 Environmental Effects

Fisheries and aquatic resources in the rivers on which the Projects are located are well understood. Fish assemblage and mussel data collected by the Minnesota DNR document existing diverse fish and mussel populations and active sport fisheries at the Projects. Fish assemblage diversity extends throughout the Projects reaches, with existing sport fisheries present both upstream and downstream of the Little Falls Project, Sylvan Project, and Pillager Project. Suitable spawning and rearing habitat appears to be present, with annual recruitment of juvenile fish documented for multiple fish species at the Projects.

Entrainment rate and species composition are similar to other Midwest desktop and empirical studies, with relatively high survival rates of entrained fish. The entrainment assessment used sustained swim speeds to evaluate entrainment and impingement, as opposed to burst speed, which has a lower velocity threshold. Some smaller fish that are listed as unable to avoid intakes due to having sustained swim speeds at or below intake velocities may have the ability to avoid entrainment when utilizing faster burst speeds over short timeframes. This would further reduce the number of fish susceptible to entrainment.

Estimated fish entrainment composition at all three Projects includes a high percentage of centrarchid (sunfish) species. Sunfish species are highly fecund and can produce large numbers of offspring per individual female each season. The smallest individuals of these species would likely have relatively high entertainment survival rates. Conversely, the smallest size groups that occur soon after hatching have the highest natural mortality rates (typically 90 percent or greater) associated with ecological and environmental factors. Natural mortality in the population would be substantially higher than the estimated entrainment mortality of the Projects. Only a small proportion of the population is subject to entrainment impacts, and for those that are, the entrainment mortality rate for young-of-year sized fish is expected to be lower than that of larger bodied fish.

Continued run-of-river operations aid in the protection of downstream habitat by keeping aquatic habitats wetted and would be expected to maintain a natural flow regime during critical spawning periods. These operations avoid unnatural drawdown or dewatering periods that would expose mussels or fish spawning and rearing habitat during the spring and summer. The Licensee proposes to continue run-of-river operations for the continued protection of fish and aquatic resources.

4.5.3 Protection, Mitigation, Enhancement Measures

Run-of-river operations will continue to be implemented, whereby inflows at the dam match outflows to the greatest extent possible.

A minimum flow requirement will also continue to be implemented at the Little Falls Project when there is a reservoir drawdown to replace flashboards during walleye spawning season in the spring. In that event, a minimum flow of 350 cfs will continue to be maintained in the east channel to aid in the protection of spawning conditions.

The Licensee will continue to comply with Minnesota State Statute Chapter 84D and Minnesota Rule part 6216 to prevent the spread of aquatic invasive species at the Projects.

No additional PME measures are being proposed specific to fish and aquatic resources.

4.5.4 Unavoidable Adverse Effects

No unavoidable adverse impacts to fish and aquatic communities are expected to occur as a result of the continued operation of the Projects.

4.5.5 References

Electric Power Research Institute. 1997. Turbine Entrainment and Survival Database Field Tests. Prepared by Alden Research Laboratories, Inc. TR-108630.

Friends of the Mississippi River. 2011. Invasive Carp Detected Above Coon Rapids Dam. Article published 2011. Available online: https://fmr.org/invasive-carp-detected-above-coon-rapids-dam.

Minnesota Department of Natural Resources (Minnesota DNR). 2003. Mussel Survey Data. Data received from Dan O'Shea, Minnesota DNR on January 13, 2023.

Minnesota Department of Natural Resources (Minnesota DNR). 2007. Mussel Survey Data. Data received from Dan O'Shea, Minnesota DNR on January 13, 2023.

Minnesota Department of Natural Resources (Minnesota DNR). 2009a. Stream Management Plan- Little Falls Dam to Blanchard Dam- Zebulon Pike Reservoir.

Minnesota Department of Natural Resources (Minnesota DNR). 2009b. Stream Management Plan- Brainerd Dam to Little Falls Dam.

Minnesota Department of Natural Resources (Minnesota DNR). 2009c. Fisheries and Stream Morphology Assessment of the Mississippi River From the Crow Wing River Confluence to St. Cloud, Minnesota. River Miles 926 to 993. F-29-R(P).

Minnesota Department of Natural Resources (Minnesota DNR). 2014a. Lake Survey Report- Sylvan. DOW Number 49-0036-00.

Minnesota Department of Natural Resources (Minnesota DNR). 2014b. Lake Survey Report- Placid. DOW Number 49-0080-00.

Minnesota Department of Natural Resources (Minnesota DNR). 2021a. Lake Management Plan- Sylvan Reservoir. DOW Number 49-0036.

Minnesota Department of Natural Resources (Minnesota DNR). 2021b. Lake Management Plan- Placid (Pillager Reservoir). DOW Number 49-0080.

Minnesota Department of Natural Resources (Minnesota DNR). 2022. Stream Survey Report- Mississippi R- St. Cloud Dam to Brainerd Dam. Survey ID 17692113240558000.

Minnesota Department of Natural Resources (Minnesota DNR). 2024a. Invasive Carp Sampling Report: January-December 2023. Upper Mississippi River Pools 1-8, Lower St. Croix River Below St. Croix Falls, Minnesota River Below Granite Falls. February 26, 2024.

Minnesota Department of Natural Resources (Minnesota DNR). 2024b. Lake Survey Report- Sylvan. DOW Number 49-0036-00.

Minnesota Department of Natural Resources (Minnesota DNR). 2024c. Lake Survey Report- Placid. DOW Number 49-0080-00.

Minnesota Department of Natural Resources (Minnesota DNR). 2025a. Minnesota Statewide Mussel Survey. Available online: https://www.dnr.state.mn.us/nhnrp/mussel_survey/index.html. Accessed August 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025b. Infested Waters List. Available online: https://www.dnr.state.mn.us/invasives/ais/infested.html. Accessed August 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2014. Crow Wing River Watershed Monitoring and Assessment Report. Document number wq-ws3-07010106c.

Minnesota Power & Light Company (MPLC). 1991a. Application for New License Major Water Power Project. Little Falls Hydroelectric Project. FERC Project No. 2532.

Minnesota Power & Light Company (MPLC). 1991b. Application for New License Major Water Power Project. Sylvan Hydroelectric Project. FERC Project No. 2454.

Minnesota Power & Light Company (MPLC). 1995. Application for New License Major Water Power Project. Pillager Hydroelectric Project. FERC Project No. 2663.

Minnesota Power (MP). 2022. Preventing the Spread of Aquatic Invasive Species Guidance. 4 pp. Revised March 29, 2022.

National Oceanic and Atmospheric Administration (NOAA). 2023. Habitat Conservation: Understanding Essential Fish Habitat. Available online: https://www.fisheries.noaa.gov/insight/understanding-essential-fish-habitat. Accessed January 2023.

U.S. Geological Survey (USGS). 2023. NAS- Non-indigenous Aquatic Species Database. Crow Wing Drainage. Available online: https://nas.er.usgs.gov/queries/CollectionInfo.aspx?SpeciesID=5&State=MN&HUCNumber=7010106. Accessed February 2023.

4.6 Terrestrial Wildlife and Botanical Resources

4.6.1 Affected Environment

4.6.1.1 Upland Botanical Resources

The Little Falls Project lies within the western portion of the Mississippi River – Brainerd Watershed (HUC 07010104). This region is characterized by rangeland, agriculture, development, wetlands, and forests (Minnesota PCA 2019). The Sylvan and Pillager Projects are located within the Crow Wing River Watershed (HUC 8-07010106), which is made up of moderately rolling terrain covered by mixed deciduous and coniferous forests (MP 1995).

Little Falls Project

The Little Falls Project is located in an urban area within the city of Little Falls and includes a limited amount of land beyond the banks of the Mississippi River. The area within the Little Falls proposed Project Boundary includes forested areas and wetlands along the shorelines and on islands within the Mississippi River. The Little Falls Project Vicinity is mostly urban and suburban, with a mix of forested, residential, and agricultural lands outside the city limits. Despite the high levels of human development, the Little Falls Project sits in a unique ecological position in which a prairie-forest transition zone intersects the Mississippi Valley. The mouth of the Little Elk River, which is within the Little Falls proposed Project Boundary approximately 2.5 miles upstream of the Little Falls dam on the west bank of the Mississippi River, is considered the historic southern edge of Minnesota's extensive pine forest in this region. The upland forested areas within the Little Falls Project Vicinity include forests dominated by oak (*Quercus* spp.), aspen (*Populus* spp.), and jack pine (*Pinus banksiana*), with mixed deciduous floodplains, described in more detail below. Forested areas are generally dominated by hardwoods with coniferous species scattered throughout; however, pine-dominant areas are also present (MP 1991).

Sylvan Project

The Sylvan Project Vicinity is primarily forested but also includes farmland. Areas along the Gull River, south of Highway 210, are developed as seasonal and permanent residences. The rest of the lands bordering the reservoir are primarily undeveloped with rolling topography. The existing Sylvan Project Boundary contains approximately 1,510 acres of forest. The major forest types found at the Sylvan Project and associated timber

harvest practices are described below (MP 2016a). Forest composition (based on 2016 inventory) for the existing Sylvan Project Boundary is provided in Table 4-26. The proposed Sylvan Project Boundary excludes much of the forested lands, as these areas are not required to support Sylvan Project purposes, including operations, public access, or resource protection.

Table 4-26: Existing Sylvan Project Boundary Forest Cover Type Acreage Based on 2016 Inventory

Cover Type	Acreage	Percent (%) Cover
Oak	967	64
Jack pine	195	13
Aspen	188	12
Aspen/birch	76	5
Red/white pine	61	4
Birch	15	1
Swamp conifer	8	1
Total	**1,510**	**100**

Source: MP 2016b

Oak

Oak species are the dominant tree species at the Sylvan Project. The oak type is composed of northern pin oak (*Quercus ellipsoidalis*), northern red oak (*Quercus rubra*), and bur oak (*Quercus macrocarpa*), often growing in association with minor quantities of quaking aspen (*Populus tremuloides*), jack pine, American basswood (*Tilia americana*), and ironwood (*Ostrya virginiana*) (MP 2016b).

In general, the oak forests have an overstory comprised mostly of 70- to 90-year-old red and pin oak. Bur oak of approximately the same age also occupy the overstory but in lesser quantities. Bur oak, considered more shade tolerant than red and pin oak, is the dominant tree in the sub-canopy and represents the majority of the advanced oak regeneration. Other species occur as single trees or in small groups (MP 2016b).

The soils at the Sylvan Project do not provide favorable growing conditions for harvest-quality oak. As a result, most (approximately 90 percent) harvested oak timber at the Sylvan Project is useful only as firewood. The remaining volume is lower quality sawtimber generally found in the butt logs of larger diameter oak trees (MP 2016b).

The Licensee's forest management practices at the Sylvan Project have maintained the oak type and its associated plant and animal species. Management practices included silvicultural techniques designed to produce timber products and enhance wildlife habitat (MP 2016b).

Jack Pine

Jack pine occurs in relatively even-aged stands that either originate from fires or have naturally seeded into sandy soils. The jack pine stands range from 0 to 70 years in age and have an average site index of 50 to 55. This is considered a medium site index for jack pine. Monocultures of jack pine stands growing on medium quality sites will grow an average of 0.4 cords per acre per year over a recommended rotation period of 50 to 60 years, yielding about 20 to 24 cords of timber per acre at the time of harvest (MP 2016b).

The Licensee harvested 102 acres of the total 195 acres in the existing Sylvan Project Boundary in 2015. The harvesting was implemented due to a storm event in July 2015, which blew down much of the over-mature jack pine. Clearcutting is the primary silvicultural technique that is employed in areas dominated by jack pine. These stands will be regenerated to a mixture of red pine (*Pinus resinosa*) and jack pine through tree planting. Stands typed as jack pine that have a substantial component of oak or aspen are managed with a combination of silvicultural techniques that support regeneration of all species in the stand (MP 2016b).

Aspen and Aspen/Birch

The aspen/birch cover type and aspen cover type are considered together because of similar management strategies. These two cover types occupy 264 acres or approximately 17 percent of the forest land in the existing Sylvan Project Boundary. The aspen and aspen/birch cover types occur in even-aged stands from about 1 to 20 acres in size generally scattered throughout the Sylvan Project. Growing conditions are considered poor to medium for aspen on the sandy soils at the Sylvan Project, with an average site

index of about 55 to 60. For comparison, a site index of 70 and above is considered a good site index for aspen (MP 2016b).

The Licensee harvested 67 acres of the total 264 acres in 2015. The harvesting was implemented due to a storm event in July 2015, which blew down much of the mature aspen. Clearcutting is the primary silvicultural technique that was and continues to be employed. Once a stand of aspen is harvested, it regenerates naturally from root suckers. Birch (*Betula sp.*) regenerates from stump sprouts or seed if mineral soil is exposed during the harvest (MP 2016b).

Red/White Pine

Most of the acreage classified as red/white pine in the existing Sylvan Project Boundary is located in a stand next to the Sylvan dam on the north bank of the Crow Wing River. This is an area of high visibility because of hydropower operations and recreational use related with the public boat launch. This stand is actively managed for timber; however, an additional high priority is to protect the scenic quality of the area and to maintain an adequate screen of vegetation for the Sylvan Project facilities. Any timber harvesting in this stand is conducted using silvicultural techniques designed to perpetuate the stand and preserve its aesthetic value (MP 2016b).

Pillager Project

The forest conditions of the area within the existing Pillager Project Boundary are similar to those of the Sylvan Project. The Pillager Project Vicinity is characterized by sandy soils, a mixture of jack pine and oak forests, agricultural land, and plants typically found in prairie and open areas. The Pillager Project Vicinity includes a mixture of uplands and lowlands under various land uses, including seasonal and permanent residences. Both the north and south shores of the Pillager Project reservoir contain residential development. Tree cover around the reservoir area consists of oak, jack pine, red pine, white pine (*Pinus strobus*), and lowland hardwoods in the low-lying shoreline areas. There are two islands located in the Pillager reservoir. The islands in the Pillager reservoir contain a mixture of emergent aquatic vegetation and forested areas. Based on 2016 inventory, the Pillager Project contains approximately 357 acres of productive forest. The four forest types found at the Pillager Project are described below and accompanying acreage is provided in Table 4-27 (MP 2016b).

Table 4-27: Existing Pillager Project Boundary Forest Cover Type Acreage Based on 2016 Inventory

Cover Type	Acreage	Percentage (%) Cover
Aspen/birch	119	33
Mixed pine	110	31
Northern hardwoods	108	30
Lowland hardwoods	20	6
Total	**357**	**100**

Source: MP 2016b

Aspen/Birch

The aspen/birch cover type constitutes roughly 33 percent of the forested acreage in the existing Pillager Project Boundary. Growing conditions are considered poor to medium for aspen on the area's sandy soils, with an average site index of about 55 to 60. For comparison, a site index of 70 and above is considered a good site index for aspen (MP 2016a).

MP harvested mature aspen/birch stands in 2015. Clearcutting was the primary silvicultural technique for this cover type. The aspen trees regenerate from root suckering and the birch trees regenerate from stump sprouts or seed if mineral soil is exposed during harvest (MP 2016a).

Aspen stands provide many benefits to wildlife, particularly white-tailed deer (*Odocoileus virginianus*), ruffed grouse (*Bonasa umbellus*), and woodcock (*Scolopax minor*). These game species thrive in areas that contain a mix of young, old, and medium age aspen stands in close proximity to one another. This varied age structure provides both food and cover during various seasons of the year. MP manages the aspen at the Pillager Project through silvicultural practices that produce forest products, assure renewal of the aspen stands, and create habitat for ruffed grouse, woodcock, deer, and other wildlife (MP 2016a).

Mixed Pine

The mixed pine cover type constitutes roughly 31 percent of the forested acreage in the existing Pillager Project Boundary. This cover type is made up of various ages of red pine, white pine, and jack pine. Roughly 40 acres of jack pine was harvested in 2015 to control a jack pine budworm (*Choristoneura pinus*) infestation. This area was treated in 2016 and was planted to a mixture of red pine, white pine, and jack pine in 2017. Clearcutting was the primary silvicultural technique employed when harvesting jack pine. These stands regenerate to a mixture of red pine and jack pine through natural seeding and tree planting (MP 2016b).

Young jack pine and associated plant species are utilized as browse for deer and other wildlife, and medium aged stands are important cover for a variety of animals. MP maintains the mixed pine cover type at the Pillager Project to produce timber products and maintain wildlife habitat (MP 2016b).

Northern Hardwoods

Oaks are the dominant tree species in the northern hardwoods cover type, which constitutes approximately 30 percent of the forested acreage in the existing Pillager Project Boundary. This cover type is composed of northern pin oak, red oak, and bur oak often growing in association with quaking aspen, jack pine, American basswood, and ironwood (MP 2016a).

In general, the northern hardwood cover type has an overstory comprised mostly of 70- to 90-year-old red and pin oak. Bur oak of approximately the same age also occupies the overstory but in lesser quantities. Bur oak, considered more shade tolerant than red and pin oak, is the dominant tree in the subcanopy and represents the majority of the advanced oak regeneration. Other species occur as single trees or in small groups (MP 2016a).

The sandy soils at the Pillager Project do not provide favorable growing conditions for harvest-quality oak. As a result of the growing conditions, most oaks are relatively small, poorly-formed trees. Approximately 90 percent of the oak timber volume is useful only as firewood. The remaining volume is low quality sawtimber generally found in the butt logs of larger diameter oak trees (MP 2016a).

Lowland Hardwoods

Lowland hardwood forests in Minnesota, such as those that occur within the Pillager Project Boundary occur in floodplains or hardwood swamp communities. Both types of communities exist along the margins of major rivers. Tree canopy species in floodplains include black ash[17] (*Fraxinus nigra*), silver maple (*Acer saccharinum*), reen ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), bur oak (*Quercus macrocarpa*), and basswood. The understory of the floodplains is typically open, with few shrubs or saplings.

Tree canopy species of hardwood swamp forests include black ash, yellow birch (*Betula alleghaniensis*), red maple (*Acer rubrum*), aspens, balsam poplar (*Populus balsamifera*), basswood, elms, and paper birch (*Betula papyrifera*). Conifer species, especially white cedar (*Thuja occidentalis*) and balsam fir (*Abies balsamea*), are sometimes present in the canopy and understory. The understory of hardwood swamps is characterized by patches of shrubs, including speckled alder (*Alnus incana*), mountain maple (*Acer spicatum*), dogwoods (*Cornus* spp.), gooseberries or currants (*Ribes* spp.), and winterberry (*Ilex verticillata*) (Minnesota DNR 2025a).

4.6.1.2 Terrestrial Wildlife Resources

The grasslands, hardwood, pine, and aspen forests, wetlands, and agricultural lands at the Projects offer suitable habitats for a variety of common wildlife. The Mississippi, Crow Wing, and Gull rivers, tributaries, and adjacent woodlands provide habitat for animals adapted to both aquatic and terrestrial life. Wildlife species occupy habitats in the surrounding forests, agricultural lands, and grasslands, including popular game species (MP 1991, 2016a, 2016b). Popular game species include the white-tailed deer, ruffed grouse, wild turkey (*Meleagris gallopavo*), woodcock, rabbits, and squirrels (MP 2016a, 2016b).

The abundance and diversity of birds varies with the seasons and the particular habitat at each of the Projects. Many species are observed only during spring and fall migrations. During the fall and winter months trumpeter swans (*Cygnus buccinator*) utilize areas of open water below the Sylvan and Pillager dams (MP 2016a, 2016b). A variety of songbirds

[17] The emerald ash borer (*Agrilus planipennis*), an invasive insect first detected in Minnesota in 2009, pose a threat to populations of black and green ash within the Pillager Project Boundary. Considered a "serious invasive tree pest" by the Minnesota Department of Agriculture, the Minnesota Department of Agriculture's Plant Protection Division tracks the spread of the emerald ash borer throughout the state.

utilize the grasslands, hardwood, pine, and aspen forests, wetlands, and agricultural lands in the Projects Vicinities. Common songbirds and raptors are listed in Table 4-28. MP's existing raptor protection policy ensures that measures are taken to protect nesting raptors (MP 1991, 2016a, 2016b). Waterfowl and wetland birds at the Projects are discussed in Section 4.7. Rare, threatened, and endangered raptors are discussed further in Section 4.8.

A list of common wildlife species known or likely to occur within the Projects Vicinities is found in Table 4-28. Rare, threatened, and endangered wildlife are discussed in Section 4.8.

Table 4-28: Common Wildlife Known or Likely to Occur within the Little Falls, Sylvan, and Pillager Projects Vicinities

Scientific Name	Common Name
Birds	
Acanthis flammea	common redpoll
Actitis macularius	spotted sandpiper
Agelaius phoeniceus	red-winged black bird
Aix sponsa	wood duck
Anas discors	blue-winged teal
Anas platyrhynchos	mallard
Antrostomus vociferus	eastern whip-poor-will
Archilochus colubris	ruby-throated hummingbird
Ardea alba	great egret
Ardea herodias	great blue heron
Aythya affinis	lesser scaup
Aythya americana	redhead
Aythya collaris	ring-necked duck
Aythya marila	greater scaup
Bombycilla cedrorum	cedar waxwing
*Bonasa umbellus**	ruffed grouse
Branta canadensis	Canada goose
Bubo virginianus	great horned owl
Bucephala albeola	bufflehead
Bucephala clangula	common goldeneye
Buteo jamaicensis	red-tailed hawk

Scientific Name	Common Name
Buteo lagopus	rough-legged hawk
Buteo lineatus[1]	red-shouldered hawk
Buteo platypterus	broad-winged hawk
Butorides virescens	green heron
Cardellina canadensis	Canada warbler
Cardinalis cardinalis	northern cardinal
Cathartes aura	turkey vulture
Catharus fuscescens	veery
Catharus guttatus	hermit thrush
Certhia americana	brown creeper
Chaetura pelagica	chimney swift
Charadrius vociferus	killdeer
Chlidonias niger	black tern
Chordeiles minor	common nighthawk
Chroicocephalus philadelphia	Bonaparte's gull
Cistothorus palustris	marsh wren
Coccyzus erythropthalmus	black billed cuckoo
Colaptes auratus	northern flicker
Columba livia	rock pigeon
Contopus cooperi	olive-sided flycatcher
Contopus virens	eastern wood pewee
Corvus brachyrhynchos	American crow
Corvus corax	common raven
Cyanocitta cristata	blue jay
Cygnus buccinator	trumpeter swan
Dolichonyx oryzivorus	bobolink
Dryocopus pileatus	pileated woodpecker
Dumetella carolinensis	gray catbird
Euphagus carolinus	rusty blackbird
Falco columbarius	merlin
Falco sparverius	American kestrel
Fulica americana	American coot
Gavia immer	common loon
Geothlypis trichas	common yellowthroat
Grus canadensis	sandhill crane

Scientific Name	Common Name
Haemorhous mexicanus	house finch
Haemorhous purpureus	purple finch
Haliaeetus leucocephalus	bald eagle
Hirundo rustica	barn swallow
Hylocichla mustelina	wood thrush
Icterus bullockii	Baltimore oriole
Icterus spurius	orchard oriole
Junco hyemalis	dark-eyed junco
Larus delawarensis	ring-billed gull
Larus smithsonianus	herring gull
Leuconotopicus villosus	hairy woodpecker
Lophodytes cucullatus	hooded merganser
Megaceryle alcyon	belted kingfisher
Melanerpes carolinus	red-bellied woodpecker
Melanerpes erythrocephalus	red-headed woodpecker
*Meleagris gallopavo**	wild turkey
Melospiza georgiana	swamp sparrow
Melospiza melodia	song sparrow
Mergus merganser	common merganser
Mergus serrator	red-breasted merganser
Molothrus ater	brown-headed cowbird
Myiarchus crinitus	great crested flycatcher
Oporornis agilis	Connecticut warbler
Oxyura jamaicensis	ruddy duck
Pandion haliaetus	osprey
Passer domesticus	house sparrow
Passerina cyanea	indigo bunting
Pelecanus erythrorhynchos	American white pelican
Petrochelidon pyrrhonota	cliff swallow
Phalacrocorax auritus	double-crested cormorant
Phasianus colchicus	ring-necked pheasant
Pheucticus ludovicianus	rose-breasted grosbeak
Picoides pubescens	downy woodpecker
Piranga olivacea	scarlet tanager
Podiceps auritus	horned grebe

Scientific Name	Common Name
Podiceps grisegena	red-necked grebe
Podiceps nigricollis	eared grebe
Podilymbus podiceps	pied-billed grebe
Poecile atricapillus	black-capped chickadee
Progne subis	purple martin
Quiscalus quiscula	common grackle
Regulus calendula	ruby-crowned kinglet
Regulus satrapa	golden-crowned kinglet
Sayornis phoebe	eastern phoebe
*Scolopax minor**	woodcock
Seiurus aurocapilla	ovenbird
Setophaga coronata	yellow-rumped warbler
Setophaga palmarum	palm warbler
Setophaga petechia	yellow warbler
Setophaga pinus	pine warbler
Setophaga ruticilla	American redstart
Sialia sialis	eastern bluebird
Sitta canadensis	red-breasted nuthatch
Sitta carolinensis	white-breasted nuthatch
Spatula clypeata	northern shoveler
Sphyrapicus varius	yellow-bellied sapsucker
Spinus tristis	American goldfinch
Spizella passerina	chipping sparrow
Spizelloides arborea	American tree sparrow
Stelgidopteryx serripennis	northern rough-winged swallow
Sterna hirundo	common tern
Strix varia	barred owl
Sturnus vulgaris	European starling
Tachycineta bicolor	tree swallow
Toxostoma rufum	brown thrasher
Tringa flavipes	lesser yellowlegs
Tringa solitaria	solitary sandpiper
Troglodytes aedon	house wren
Turdus migratorius	American robin
Tyrannus tyrannus	eastern kingbird

Scientific Name	Common Name
Vermivora chrysoptera	golden-winged warbler
Vireo flavifrons	yellow-throated vireo
Vireo gilvus	warbling vireo
Vireo olivaceus	red-eyed vireo
Zenaida macroura	mourning dove
Mammals	
Canis latrans	coyote
Castor canadensis	beaver
Eptesicus fuscus	big brown bat
Erethizon dorsatum	porcupine
Geomyidae spp.	pocket gopher
Glaucomys spp.	flying squirrel
Lontra canadensis	otter
Lynx rufus	bobcat
Marmota monax	woodchuck
Mephitis mephitis or *Spilogale putorius*	skunk
Microtus spp.	vole
Mus spp.	mouse
Mustela spp.	weasel
Myotis lucifugus	little brown bat
Neogale vison	mink
*Odocoileus virginianus**	white-tailed deer
Ondatra zibethicus	muskrat
Procyon lotor	racoon
*Sciuridae spp.**	ground squirrel
Sciurus carolinensis	gray squirrel
Sciurus vulgaris	red squirrel
*Sylvilagus floridanus**	cottontail rabbit
Synaptomys cooperi	bog lemming
Tamias striatus or *Neotamias minimus*	chipmunk
Taxidea taxus	badger
Ursus americanus	black bear
Amphibians	
Ambystoma laterale	blue-spotted salamander
Ambystoma tigrinum	tiger salamander

Scientific Name	Common Name
Anaxyrus americanus	American toad
Hyla chrysoscelis	Cope's gray treefrog
Lithobates clamitans	green frog
Lithobates pipiens	northern leopard frog
Lithobates septentrionalis	mink frog
Lithobates sylvaticus	wood frog
Notophthalmus viridescens	eastern newt
Plethodon cinereus[2]	red-backed salamander
Pseudacris crucifer	spring peeper
Pseudacris maculata	boreal chorus frog
Reptiles	
Apalone spinifera	spiny softshell
Chelydra serpentina	snapping turtle
Chrysemys picta	painted turtle
Emydoidea blandingii	Blanding's turtle
Graptemys geographica	northern map turtle
Heterodon nasicus[2]	plains hognose snake
Heterodon platirhinos[1]	eastern hognose snake
Opheodrys vernalis[1]	smooth green snake
Pituophis catenifer[2]	gopher snake
Plestiodon septentrionalis	prairie skink
Storeria occipitomaculata	red-bellied snake
Thamnophis radix	plains garter snake
Thamnophis sirtalis	common garter snake

Sources: MP 1999, 2016a, 2016b; Amphibian and Reptile Survey of Minnesota 2023; eBird 2023a, 2023b, 2023c; USFWS 2025

* game species

[1] Species of greatest conservation need

[2] Special concern

4.6.1.3 Terrestrial Invasive Species

Invasive species are non-indigenous plant or animal species that aggressively compete with native species. These species often out-compete native species, impacting biodiversity, recreation, and human health. Invasive plants tend to appear in disturbed areas, and the most aggressive have the ability to invade existing ecosystems.

Minnesota defines invasive plants as a nonnative species that cause or may cause economic or environmental harm or harm to human health or threatens or may threaten natural resources or the use of natural resources in the state (Minn. Stat. 84D. 2018). Invasive plants are regulated under both Minnesota State Statute Chapter 84D and Minnesota Rule part 6216. The Minnesota Department of Agriculture classifies state prohibited noxious weeds into three categories: (1) "Prohibited-eradicate noxious weeds" include noxious weeds that must be eradicated on all lands within the state, (2) "Prohibited control noxious weeds" include noxious weeds that must be controlled on all lands within the state, and (3) "Restricted noxious weeds" include noxious weeds and their propagating parts that may not be imported, sold, or transported in the state, except as allowed by permit under Section 18.82 (Minnesota Department of Agriculture 2025a).

An analysis using the Early Detection and Distribution Mapping System (EDDMaps) revealed that seven invasive terrestrial plants are known to occur within the Projects Vicinities (Table 4-29).

Table 4-29: Invasive Terrestrial Plants Observed within the Projects Vicinities

Scientific Name	Common Name	Classification Category
Centaurea stoebe	spotted knapweed	Prohibited control
Cirsium arvense	Canada thistle	Prohibited control
Lonicera tatarica	tatarian honeysuckle	Restricted
Pastinaca sativa	wild parsnip	Prohibited control
Rhamnus cathartica	common or European buckthorn	Restricted
Securigera varia	crown vetch	Restricted
Tanacetum vulgare	common tansy	Prohibited control

Source: EDDMaps 2023, Minnesota Department of Agriculture 2025a

MP implements best management practices to prevent the spread of invasive plant species in accordance with Minnesota DNR's Operational Order 113 – Invasive Species Prevention and Management.

The Minnesota DNR has also established a list of terrestrial invasive wildlife species that may pose a threat to ecological communities in Minnesota (Minnesota DNR 2023b). The European starling (*Sturnus vulgaris*) has been observed at the Little Falls dam and the Sylvan dam (eBird 2023a, 2023c). The Japanese beetle (*Popillia japonica*) has been observed within Cass and Crow Wing counties; however, these observations were outside of all Projects Vicinities (EDDMaps 2023).

The emerald ash borer (*Agrilus planipennis*) and spongy moth (*Lymantria dispar*) are invasive insects which are present in the state of Minnesota and may threaten forest species at the Projects. The emerald ash borer causes damage to ash trees by tunneling under the bark of ash trees. Infections quickly spread and lead to the deaths of entire ash tree populations. Since ash trees are present at the Projects, this insect poses a serious threat (Minnesota Department of Agriculture 2025b). Similarly, the spongy moth can infest and kill up to 300 species of deciduous trees, including birches, aspens, and oaks (all of which can be found at the Projects). A spongy moth infestation leads to tree defoliation, which can stress trees and make them more vulnerable to other infections, eventually killing them (Minnesota DNR 2023c).

Although native to North America, the jack pine budworm is a pest insect which caused damage to the jack pine population at the Pillager Project in 2015. This infestation was controlled by clearcutting the infected timber (MP 2016b).

4.6.2 Environmental Effects

Terrestrial wildlife and botanical resources at the Projects are well understood and no issues have been identified. The Projects have been in operation for decades, and the existing terrestrial environment developed in response to the Projects operations. The Projects are operated as run-of-river, which minimizes water level fluctuations in the reservoirs and provides natural river flows downstream and as the Licensee proposes to continue run-of-river operation, it is anticipated that there will be no change to terrestrial wildlife or botanical habitats or species impacts due to Projects operation.

The Licensee is proposing modifications to the Projects' Boundaries as described in Section 3.2.4. Proposed modifications to the Projects' Boundaries primarily involve the removal of lands not necessary for Project purposes and will result in changes to the acreage of lands that support terrestrial wildlife and botanical resources within the Projects' Boundaries, although no physical changes to these resources are proposed. At the Little Falls Project, the proposed Project Boundary would reduce land by approximately 20 acres, resulting in about 57 acres of land remaining in the Little Falls Project Boundary. For the Sylvan Project, land would be reduced by approximately 2,756 acres, resulting in about 427 acres of land remaining in the proposed Sylvan Project Boundary. For the Pillager Project, land would be reduced by approximately 442 acres, resulting in about 452 acres of land remaining in the proposed Pillager Project Boundary. In some locations of the Projects' Boundaries, lands have also been added to the proposed boundaries to better reflect operational needs. In total, over 900 acres of land will remain in the Projects Boundaries, providing habitat for terrestrial wildlife and botanical resources. Overall, the proposed modifications to the Projects Boundaries result in a more accurate representation of each Project's footprint by excluding lands not essential to operations, maintenance, or other FERC-defined purposes.

The proposed changes to the Projects' Boundaries are administrative in nature and do not involve physical changes to the Projects, operations, or terrestrial wildlife and botanical resources. As such, no direct impacts to terrestrial wildlife or botanical resources are expected.

4.6.3 Protection, Mitigation, Enhancement Measures

The Licensee proposes to develop revised Land Management Plans (to replace the existing Land Management Plans) post license issuance for the Sylvan and Pillager Projects to accurately reflect land management in any modified project boundaries throughout the term of the new license. The Licensee will also continue to implement best management practices with respect to commercial logging practices and to prevent the spread of terrestrial invasive species in accordance with Minnesota DNR's Operational Order 113 – Invasive Species Prevention and Management. The Licensee proposes to continue implementation of an NCA designation for portions of company-owned lands at the Pillager Project to retain the shoreline's natural character, which is protective of terrestrial wildlife and botanical resources and their habitat.

4.6.4 Unavoidable Adverse Effects

Continued operation of the Projects as proposed is not anticipated to have unavoidable adverse impacts to terrestrial wildlife or botanical resources.

4.6.5 References

Amphibian and Reptile Survey of Minnesota. 2023. Available online: https://www.mnherps.com/. Accessed: February 16, 2023

Early Detection and Distribution Mapping System (EDDMaps). 2023. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. http://www.eddmaps.org/. Accessed January 11, 2023

eBird. 2023a. Little Falls Dam, Morrison County, Minnesota, US. The Cornell Bird Lab of Ornithology. https://ebird.org/hotspot/L5828036. Accessed February 16, 2023.

eBird. 2023b. Little Falls- Mississippi River, Morrison County, Minnesota, US. The Cornell Bird Lab of Ornithology. https://ebird.org/hotspot/L368396. Accessed February 16, 2023.

eBird. 2023c. Sylvan Dam, Morrison County, Minnesota, US. The Cornell Bird Lab of Ornithology. Available online: https://ebird.org/hotspot/L2714015. Accessed February 16, 2023.

Minnesota Department of Agriculture. 2025a. Minnesota Noxious Weed List. Available online: https://www.mda.state.mn.us/plants-insects/minnesota-noxious-weed-list. Accessed September 2025

Minnesota Department of Agriculture. 2025b. Emerald Ash Borer Program. Available online: https://www.mda.state.mn.us/eab. Accessed September 2025

Minnesota Department of Natural Resources (Minnesota DNR) 2025a. Forest-Lowland Deciduous Factsheet. Available online: https://files.dnr.state.mn.us/assistance/nrplanning/bigpicture/cwcs/habitats/03.pdf. Accessed July 2025

Minnesota Department of Natural Resources (Minnesota DNR) 2023b. Invasive terrestrial animals. Available online: https://www.dnr.state.mn.us/invasives/terrestrialanimals/index.html. Accessed February 16, 2023

Minnesota Department of Natural Resources (Minnesota DNR) 2023c. Spongy Moth. Available online: https://www.dnr.state.mn.us/invasives/terrestrialanimals/spongymoth/index.html. Accessed February 28, 2023.

Minnesota Pollution Control Agency (Minnesota PCA). 2019. Upper Mississippi River-Brainerd Watershed monitoring and Assessment Report. Available online: Available online: https://www.pca.state.mn.us/sites/default/files/wq-ws3-07010104b.pdf. Accessed January 2023.

Minnesota Power (MP). 1999. Application for New License Major Water Power Project 5 Megawatts or Less. Little Falls Hydroelectric Project. FERC Project No. 2532

Minnesota Power (MP). 1995. Application for New License Major Water Power Project 5 Megawatts or Less. Pillager Hydroelectric Project. FERC Project No. 2663

Minnesota Power (MP). 2016a. Sylvan Hydroelectric FERC Project No. 2454 Land Management Plan Update.

Minnesota Power (MP). 2016b. Pillager Hydroelectric FERC Project No. 2663 Land Management Plan Update.

U.S. Fish and Wildlife Service (USFWS). 2025. Information for Planning and Consultation. Available online: https://ecos.fws.gov/ipac/ Accessed September 2025.

4.7 Wetlands, Riparian, and Littoral Habitat

4.7.1 Affected Environment

4.7.1.1 Overview

The USFWS classification scheme for wetlands serves as the national standard for wetland classification and has been used to classify wetlands appearing in the National Wetlands Inventory (USFWS 2025). The National Wetland Inventory (NWI) coverage is developed from aerial photography. USFWS defines wetlands as: "*…lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water. For the purpose of the classification, wetlands must have one or more of these three attributes: (1) at least periodically, the land must support predominantly wetland plants; (2) the substrate is predominantly undrained hydric soil; and (3) rocky, gravelly, or sandy areas that are saturated with or covered by shallow water at some time during the growing season*" (USFWS 1993).

Information regarding the location and spatial extent of wetland resources in the Projects Vicinities were obtained from the NWI. The mapped NWI features within the Projects' existing and proposed boundaries are detailed in Table 4-30, Table 4-31, and Table 4-32. The mapped NWI features in the Little Falls Project Vicinity are presented in Figure 4-23 and the mapped NWI features in the Sylvan Project Vicinity and Pillager Project Vicinity are presented in Figure 4-24.

As depicted on Figure 4-23, the NWI features in the Little Falls Project Vicinity primarily includes a riverine area of the Mississippi River. As depicted on Figure 4-24, in the Sylvan Project Vicinity there are riverine and lacustrine mapped areas at the Crow Wing River and Gull River, and additional freshwater wetland areas are located throughout the Project Vicinity, including NWI mapped wetland areas located just south of the Sylvan reservoir and at the northern end of the Gull River within the Project Vicinity. As depicted on Figure 4-24, in the Pillager Project Vicinity the Pillager reservoir is mapped as lacustrine and the Crow Wing River on the western end of the Project Boundary is mapped as riverine. There are mapped wetland areas in the Pillager Project Vicinity, including a relatively large area mapped as wetland on the southern side of the Project Vicinity.

Table 4-30: USFWS National Wetland Inventory Mapped Wetlands in the Little Falls Existing and Proposed Project Boundary

NWI Wetland Type	Acres in the Existing Project Boundary	Acres in the Proposed Project Boundary	Difference Between Boundaries (Acres)
Freshwater Emergent Wetland	15.7	15.7	0
Freshwater Forested/Shrub Wetland	50.1	25.0	21.5
Freshwater Pond	0.9	1.2	-0.3
Riverine	606.5	458.8	147.7
Total	**673.2**	**500.7**	**172.5**

Source: USFWS 2025

Table 4-31: USFWS National Wetland Inventory Mapped Wetlands in the Sylvan Existing and Proposed Project Boundary

NWI Wetland Type	Acres in the Existing Project Boundary	Acres in the Proposed Project Boundary	Difference Between Boundaries (Acres)
Freshwater Emergent Wetland	564.3	51.9	512.4
Freshwater Forested/Shrub Wetland	473.6	3.9	469.7
Freshwater Pond	60.0	8.2	51.8
Lake	828.5	829.0	-0.5
Riverine	365.3	322.8	42.5
Total	**2,291.7**	**1,215.8**	**1,075.9**

Source: USFWS 2025

Table 4-32: USFWS National Wetland Inventory Mapped Wetlands in the Pillager Existing and Proposed Project Boundary

NWI Wetland Type	Acres in the Existing Project Boundary	Acres in the Proposed Project Boundary	Difference Between Boundaries (Acres)
Freshwater Emergent Wetland	60.9	56.5	4.4
Freshwater Forested/Shrub Wetland	78.3	49.5	28.8
Freshwater Pond	6.5	4.6	1.9
Lake	514.6	515.4	-0.8
Riverine	166.2	161.5	4.7
Total	**826.5**	**787.5**	**39.0**

Source: USFWS 2025

Figure 4-23: NWI Mapped Wetlands in the Little Falls Project Vicinity

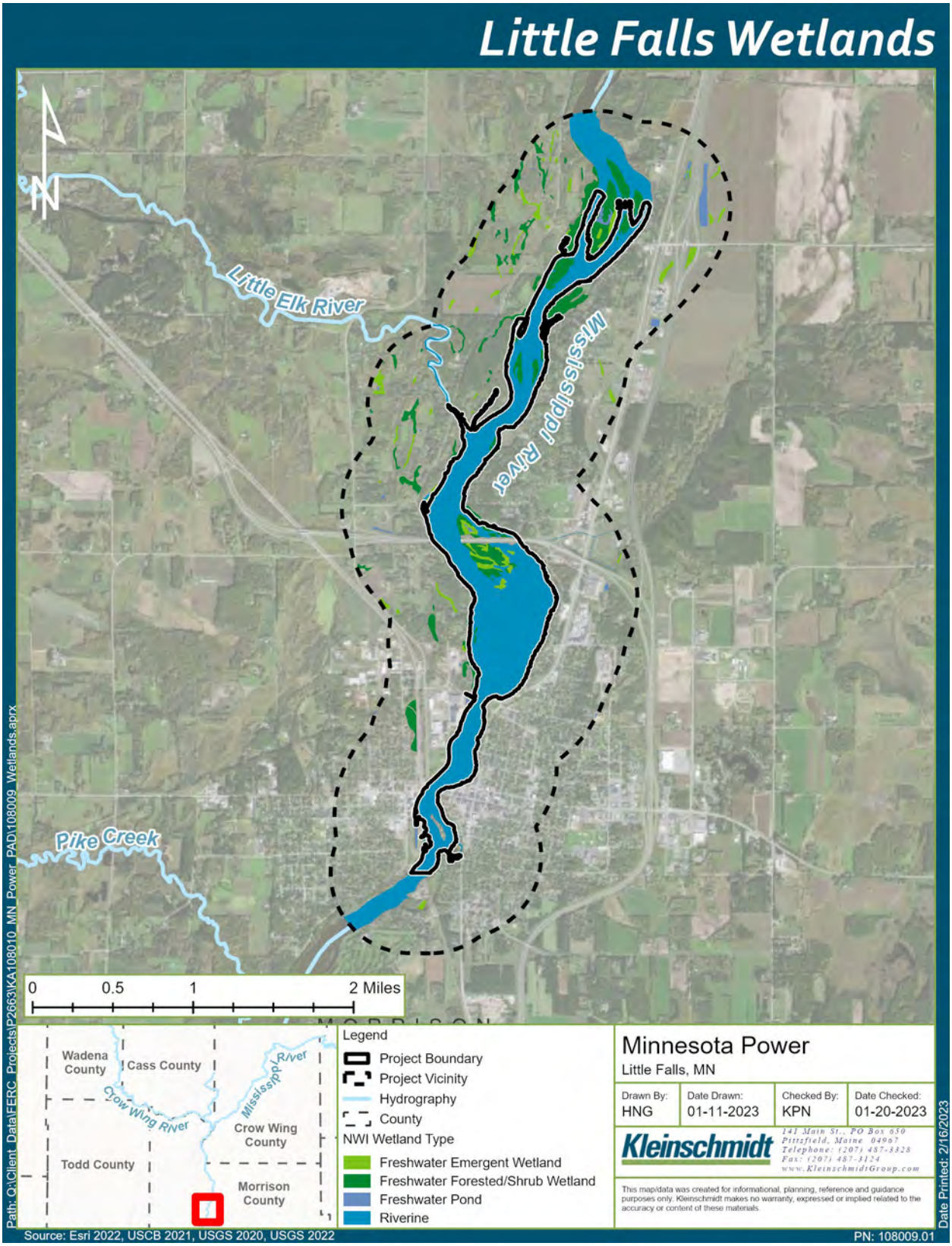
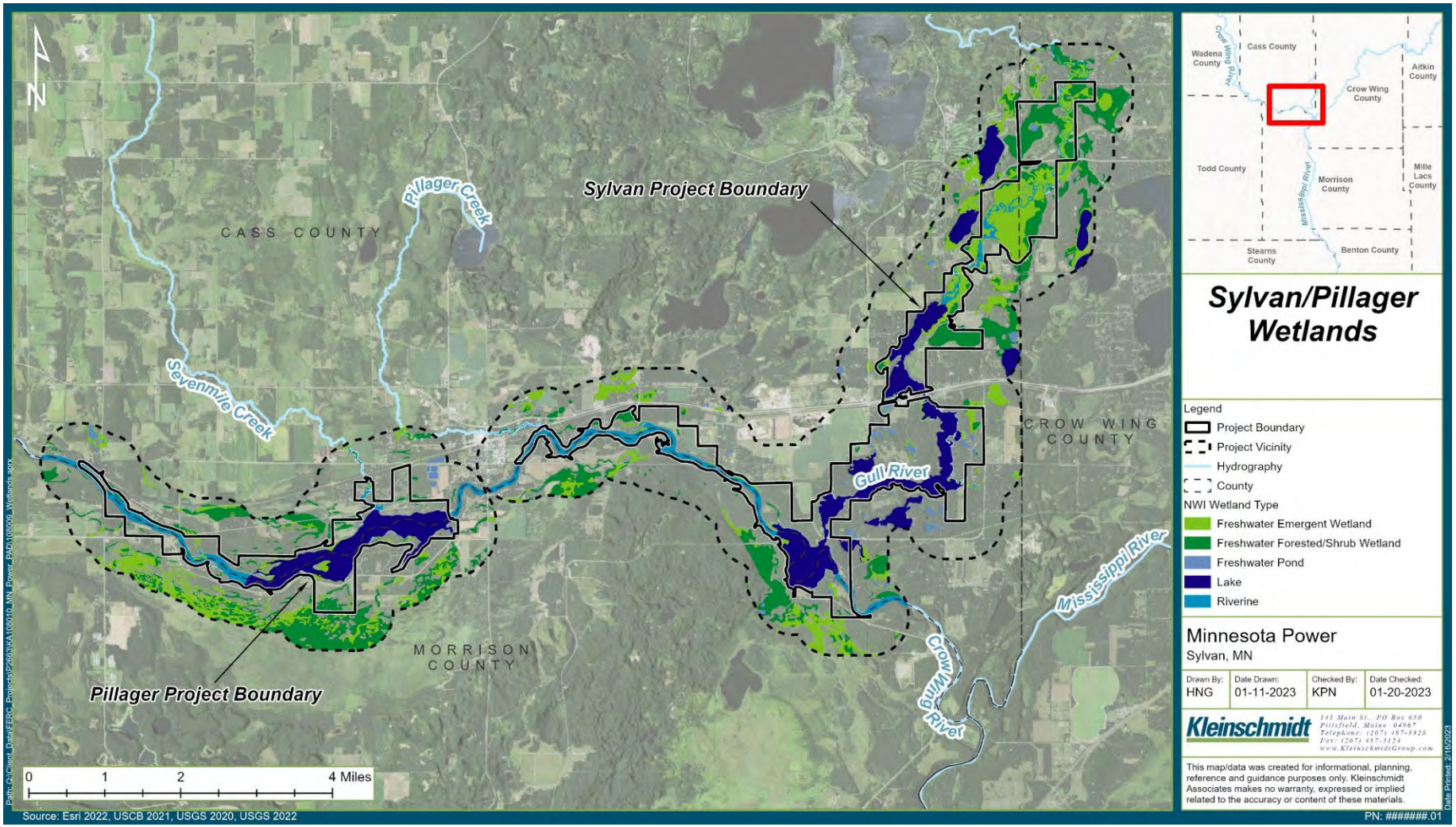


Figure 4-24: NWI Mapped Wetlands in the Sylvan and Pillager Projects Vicinity



4.7.1.2 Riparian and Littoral Habitat

Riparian habitat is located along streams, rivers, and lakes, and provides important ecosystem functions related to hydrology and flooding, nutrient cycling, and plant and wildlife habitat (Mitsch and Gosselink 2000). Riparian habitat within the Projects Vicinities includes land adjacent to the Mississippi River (Little Falls Project), the Crow Wing River (Sylvan Project and Pillager Project), and the Gull River (Sylvan Project) as well as associated tributaries. These riparian habitats are found in the floodplains of the river and associated tributaries. Tributaries are described in more detail in Section 4.1.2.

The Minnesota DNR defines the littoral zone within a lake or pond as "the shallow transition zone between dry land and the open water area of the lake" (Minnesota DNR 2025a). The littoral zone acts as an interface between the open water aquatic environment and the terrestrial environment (Wetzel 2001). The size and extent of the littoral zone within a waterbody varies depending upon geomorphology and sedimentation within the aquatic system (Wetzel 2001). According to the Minnesota DNR, "the littoral zone extends from the shore to a depth of about 15 feet, depending on water clarity," and provides conditions of shallow water, abundant light, and nutrient rich sediment that are ideal for plant growth (Minnesota DNR 2025a). The littoral habitat at the Projects includes the area just below the ordinary highwater mark of the Crow Wing, Gull, and Mississippi rivers. The greatest amount of littoral habitat among the Projects is present along the Gull River shoreline of the Sylvan Project, given that the reservoir in this area is shallow and contains a substantial amount of aquatic vegetation (MP 2016a).

4.7.1.3 Wetland Habitat

Wetlands have the potential to provide a variety of ecological functions including groundwater discharge and recharge, flood-flow alteration, fish and shellfish habitat, sediment, toxicant, and pathogen retention, nutrient removal, retention, and transformation, production export, sediment and shoreline stabilization, and wildlife habitat. Wetlands also support human-defined values such as recreation, educational and scientific use, uniqueness and heritage, visual quality, and threatened and endangered species habitat (USACE 1999). Understanding the distribution and characteristics of wetlands on the landscape is useful for land use planning and management.

Wetland habitat within the Projects Vicinities include freshwater emergent, forested/shrub wetland, and ponds. Emergent wetlands are dominated by grasses, sedges, rushes, and flowering herbaceous plants. Forested/shrub wetlands are characterized by woody vegetation, including an overstory of trees and understory of young trees and/or shrubs, and herbaceous plants. Ponds include areas of open water with vegetative cover less than 30 percent. (Cowardin et al. 1979).

4.7.1.4 Wetland, Riparian, and Littoral Plant and Animal Species

The Mississippi, Crow Wing, and Gull rivers in the Projects Vicinities contain littoral habitat, emergent wetlands, forested/shrub wetlands, and ponds, which offer suitable habitat for wildlife. Littoral zones and wetlands in Minnesota support aquatic plants, which provide habitat to animals such as fishes, frogs, birds, muskrats, turtles, insects, and snails (Minnesota DNR 2025a). Many of the species that utilize terrestrial habitats outlined in Section 4.6 also utilize wetlands.

Waterfowl and Shore Birds

The Projects provide wetland and littoral habitat for waterfowl and shorebirds. Birds that have been observed in the Projects Vicinities are listed in Table 4-28 in Section 4.6.1.2. Bird species diversity increases along the rivers during migration periods. Waterfowl and shore birds which have been observed on the rivers and utilize wetland habitat include mallards (*Anas platyrhynchos*), blue-winged teal (*Anus discors*), wood ducks (*Aix sponsa*), Canada geese (*Branta canadensis*), great blue herons (*Ardea herodias*), and green herons (*Butorides virescens*). During the winter months trumpeter swans have been observed at the Sylvan Project and Pillager Project utilizing areas of open water below the dams (MP 2016a, 2016b).

The Gull River in the Sylvan Project contains an abundance of backwater areas and aquatic vegetation, which provide ideal habitat for nesting opportunities for many species of waterfowl. A Wildlife Lake Habitat Survey Report was prepared by the Minnesota DNR in March 2006 for the Gull River. The survey describes that the Gull River has vegetation that supports waterfowl habitat including several varieties of duck weeds, and abundant wild rice (*Zizania* spp). MP completed aquatic vegetation surveys in 2013, 2014, and 2015, and those surveys also documented abundant wild rice beds and varieties of duck weeds. The 2006 Minnesota DNR report describes observations of wood ducks and great blue herons during the survey, along with a variety of additional wildlife and fish species (MP 2016b).

MP has placed wood duck nesting boxes in the Sylvan and Pillager Projects Vicinities, including along the Gull River in the Sylvan Project Boundary. The purposes of these boxes are to enhance waterfowl nesting conditions for cavity nesting waterfowl. During monthly monitoring on the Crow Wing River in 2013, 2014, and 2015, numerous varieties of waterfowl, including broods of Canada geese gooselings, and various species of ducklings, were observed. Several other wetland birds were observed in abundance along the rivers with sittings of great blue herons, king fishers (*Megaceryle alcyon*), and variety of songbirds (MP 2016b).

Vegetation

Common wetland vegetation observed by MP staff to be present within the emergent, forested, and shrub wetlands in the Projects Vicinities include sedges (*Carex* spp.), cattails (*Typha* spp.), rushes (*Scirpus* and *Juncus* spp.), ash (*Fraxinus* spp.), maples (*Acer* spp.), birches (*Betula* spp.), poplars (*Populus* spp.), and shrubs (*Viburnum* spp., *Cornus* spp., *Alnus* spp.) (USACE 2015, Minnesota DNR 2025b). A list of wetland plants known or likely to occur within the Projects Vicinities is included in Table 4-33 below.

Table 4-33: Wetland Plants Known or Likely to Occur within the Little Falls, Sylvan, and Pillager Projects Vicinities

Scientific Name	Common Name
Abies balsamea	balsam fir
Acer negundo	boxelder
Acer saccharinum	silver maple
Acer spicatum	mountain maple
Alnus incana	speckled alder
Asclepias incarnata	swamp milkweed
Betula alleghaniensis	yellow birch
Betula pumila	bog birch
Bidens cernua	nodding burr marigold
Calamagrostis canadensis	bluejoint grass
Carex spp.	sedges
Cicuta bulbifera	bulblet water hemlock
Cicuta maculata	spotted water hemlock
Cornus amomum	silky dogwood

Scientific Name	Common Name
Cornus racemosa	gray dogwood
Cornus sericea	red-osier dogwood
Eleocharis spp.	spike rushes
Eupatoriadelphus maculatus	spotted Joe-pye weed
Fraxinus nigra	black ash
Fraxinus pennsylvanica	green ash
Glyceria canadensis	rattlesnake manna grass
Glyceria striata	fowl manna grass
Ilex verticillata	winterberry
Juncus spp.	rushes
Larix laricina	tamarack
Leersia oryzoides	rice cut grass
Persicaria pennsylvanica	pinkweed
Picea mariana	black spruce
Pontederia cordata	pickerelweed
Populus balsamifera	balsam poplar
Populus deltoides	cottonwood
Populus tremuloides	quaking aspen
Sagittaria latifolia	broad-leaved arrowhead
Salix amygdaloides	peach-leaved willow
Salix bebbiana	Bebb's willow
Salix discolor	pussy willow
Salix exigua	sandbar willow
Salix nigra	black willow
Sambucus canadensis	American elderberry
Scirpus spp.	bulrushes
Schoenoplectus acutus	hardstem bulrush
Schoenoplectus tabernaemontani	softstem bulrush
Scutellaria galericulata	marsh skullcap
Sium suave	water parsnip
Spirea alba	meadowsweet
Spirea tomentosa	hardhack
Symphyotrichum spp.	asters

Scientific Name	Common Name
Thelypteris palustris	northern marsh fern
Thuja occidentalis	white cedar
Tilia americana	basswood
Typha angustifolia	narrowleaf cattail
Typha latifolia	broadleaf cattail
Ulmus americana	American elm
Verbena hastata	blue vervain
Zizania aquatica	annual wild rice
Zizania palustris	northern wild rice

Sources: Minnesota DNR 2025b; Smith 2008; USACE 2015, 2020

Aquatic vegetation is abundant in the Pillager and Sylvan reservoirs, at the confluence with the Crow Wing River, and in surrounding shoreline and wetland habitats. Plant species with value to wildlife observed at the Sylvan Project and the Pillager Project include wild rice, flat-stem pondweed (*Potamogeton zosteriformis*), coontail, northern watermilfoil, common duckweed (*Lemna minor*), and giant duckweed (*Spirodela polyrhiza*) (MPLC 1991, 1995).

Invasive Species

As outlined in more detail in Section 4.5, invasive carp species are known to occur downstream of the Blanchard Project in the Mississippi River, and faucet snail and zebra mussels are present in the Mississippi River, Gull River, and Crow Wing River (Minnesota DNR 2025c, USGS 2025a).

Invasive aquatic and wetland plant species that have been documented in the Crow Wing watershed include curly-leaf pondweed (*Potamogeton crispus*), Eurasian watermilfoil (*Myriophyllum spicatum*), purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), and plumeless thistle (*Carduus acanthoides*) (EDDMaps 2023; Minnesota DNR 2025d; Minnesota PCA 2014; USGS 2025b).

4.7.2 Environmental Effects

Wetlands, riparian, and littoral habitat at the Projects are well understood and no issues have been identified. The Projects are operated in run-of-river mode, which minimizes water level fluctuations and erosion in wetlands, riparian, and littoral habitat. No changes to the Projects' facilities or operations are proposed; therefore, wetlands, riparian, and littoral habitats are not anticipated to be impacted by the continued operation of the Projects.

Proposed modifications to the Projects' Boundaries primarily involve the removal of lands not necessary for Project purposes and will result in changes to the acreage of wetlands, riparian, and littoral habitats within the Projects' Boundaries, although no physical changes to these resources are proposed. As part of the revisions to the Project Boundaries, the surface areas of the reservoirs for the Little Falls, Sylvan, and Pillager Projects have been adjusted to accurately reflect reservoir elevations within each project's operational band. These updates result in a reduction in reservoir surface area of approximately 95 acres (from about 575 to 420 acres) for Little Falls, 65 acres (from about 1,280 to 1,215 acres) for Sylvan, and 85 acres (from about 700 to 615 acres) for Pillager. The reductions of wetland acreage within the Projects Boundaries (as described in Table 4-30, Table 4-31, Table 4-32) are not considered environmental effects, as those areas were not influenced by project operations due to the operational mode and elevation constraints; instead, the proposed changes are administrative in nature and intended to more accurately reflect the extent of land and water directly influenced by Project activities.

4.7.3 Protection, Mitigation, Enhancement Measures

The Licensee is proposing to continue run-of-river operation at the Projects, which is protective of wetland, riparian, and littoral habitat. The Licensee proposes to develop revised Land Management Plans (to replace the existing Land Management Plans) post license issuance for the Sylvan and Pillager Projects to accurately reflect land management in any modified project boundaries throughout the term of the new license. Specifically, the Licensee is proposing to continue to conduct forest management activities in and near wetlands in accordance with the Minnesota Forest Resource Council Forest Management Guidelines as published by the Minnesota Forest Resource Council in 2005, and any additions or amendments to such guidelines that may occur in the future. These

guidelines include best management practices for timber harvesting around wetlands. The Licensee will continue to implement best management practices to prevent the spread of aquatic and wetland invasive species in accordance with Minnesota DNR's Operational Order 113 – Invasive Species Prevention and Management.

4.7.4 Unavoidable Adverse Effects

Continued operation of the Projects as proposed will have no significant unavoidable adverse impacts to wetland, riparian, or littoral habitat.

4.7.5 References

Cowardin, L.M., V.C. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. United States Fish and Wildlife Service, Washington, D.C. 131 pp.

Early Detection and Distribution Mapping System (EDDMaps). 2023. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. http://www.eddmaps.org/. Accessed January 11, 2023

Minnesota Department of Natural Resources (Minnesota DNR). 2025a. Where aquatic plants grow. Available online: https://www.dnr.state.mn.us/shorelandmgmt/apg/wheregrow.html. Accessed August 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025b. Native Plant Communities. Available online: https://www.dnr.state.mn.us/rys/pg/npc.html. Accessed August 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025c. Infested Waters List. Available online: https://www.dnr.state.mn.us/invasives/ais/infested.html. Accessed August 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025d. Minnesota Invasive Species Laws. Available online: https://www.dnr.state.mn.us/invasives/laws.html. Accessed August 2025.

Minnesota Pollution Control Agency (Minnesota PCA). 2014. Crow Wing River Watershed Monitoring and Assessment Report. Available online: https://www.pca.state.mn.us/sites/default/files/wq-ws3-07010106c.pdf. Accessed August 2025.

Minnesota Power (MP). 2016a. Sylvan Hydroelectric FERC Project No. 2454 Land Management Plan Update

Minnesota Power (MP). 2016b. Pillager Hydroelectric FERC Project No. 2663 Land Management Plan Update

Minnesota Power & Light Company (MPLC). 1991. Application for New License Major Water Power Project. Sylvan Hydroelectric Project. FERC Project No. 2454.

Minnesota Power & Light Company (MPLC). 1995. Application for New License Major Water Power Project. Pillager Hydroelectric Project. FERC Project No. 2663.

Mitsch, W.J. and J.G. Gosselink. 2000. Wetlands. John Wiley & Sons, Inc, New York, New York. 920 pp.

Smith, W.R. 2008. Trees and Shrubs of Minnesota: the complete guide to species identification. University of Minnesota Press, Minneapolis, Minnesota. 703 pp.

U.S. Fish and Wildlife Service (USFWS). 1993. 660 FW 2 Wetlands Classification System. Available online: https://www.fws.gov/policy-library/660fw2. Accessed: August 2025.

U.S. Fish and Wildlife Service (USFWS). 2025. National Wetlands Inventory Mapper – Surface Waters and Wetlands. Available online: https://fws.gov/program/national-wetlands-inventory. Accessed: September 2025.

U.S. Army Corps of Engineers (USACE) New England District. 1999. The Highway Methodology Workbook Supplement. 32 pp.

U.S. Army Corps of Engineers (USACE). 2015. Wetland Plants and Plant Communities of Minnesota and Wisconsin. Version 3.2. Available online:

https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/2801/. Accessed August 2025.

U.S. Army Corps of Engineers (USACE). 2020. National Wetland Plant List. Available online: https://wetland-plants.sec.usace.army.mil. Accessed August 2025.

U.S. Geological Survey (USGS). 2025a. Non-Indigenous Aquatic Species. *Dreissena polymorpha* (zebra mussel). Available online: https://nas.er.usgs.gov/queries/CollectionInfo.aspx?SpeciesID=5&State=MN&HUCNumber=7010106. Accessed August 2025.

U.S. Geological Survey (USGS). 2025b. Non-Indigenous Aquatic Species. *Potamogeton crispus*
(curly-leaf pondweed) Available online: https://nas.er.usgs.gov/queries/SpecimenViewer.aspx?SpecimenID=1686948. Accessed August 2025.

Wetzel, R.G. 2001. Limnology: Lake and River Ecosystems. Academic Press.

4.8 Rare, Threatened, and Endangered Species

4.8.1 Affected Environment

4.8.1.1 Overview

Information on rare, threatened, and endangered species potentially occurring within the Projects Vicinities was obtained from rare species databases maintained by the USFWS Information for Planning and Consultation (IPaC) and the Natural Heritage Information System (NHIS) maintained by the Minnesota DNR (see Appendix E-4, Rare Species Information [Privileged]).

4.8.1.2 Rare, Threatened, and Endangered Wildlife Resources

USFWS's IPAC tool was used to identify federally listed and proposed species with potential to occur in the vicinity of the Projects, as presented on Table 4-34 (USFWS 2025a). The complete reports are provided in Appendix E-4, Rare Species Information.

In the Little Falls Project Vicinity, one federally-listed species, the threatened gray wolf (*Canis lupus*), has the potential to occur. In addition, three species proposed for federal listing may also be present in the Little Falls Project Vicinity: the proposed threatened monarch butterfly (*Danaus plexippus*), the proposed endangered Suckley's cuckoo bumble bee (*Bombus suckleyi*), and the proposed threatened western regal fritillary (*Argynnis idalia occidentalis*). In the Sylvan Project Vicinity, two federally listed species have the potential to occur: the threatened gray wolf (*Canis lupus*) and the endangered northern long-eared bat (*Myotis septentrionalis*). Two species proposed for federal listing have the potential to be present in the Sylvan Project Vicinity: the proposed threatened monarch butterfly (*Danaus plexippus*), and the proposed endangered Suckley's cuckoo bumble bee (*Bombus suckleyi*). In the Pillager Project Vicinity, two federally listed species have the potential to occur: the threatened gray wolf (*Canis lupus*) and the endangered northern long-eared bat (*Myotis septentrionalis*). Two species proposed for federal listing have the potential to be present in the Pillager Project Vicinity: the proposed threatened monarch butterfly (*Danaus plexippus*), and the proposed endangered Suckley's cuckoo bumble bee (*Bombus suckleyi*). There is no designated or proposed critical habitat in the Projects Boundaries. There are currently no recovery plans in place for any of the federally listed or proposed species that have the potential to occur within the Projects Vicinities (USFWS 2025a).

According to the Minnesota NHIS database, eleven state-listed wildlife species potentially occur within the Projects Vicinities as specified in Table 4-35. The NHIS information described herein is based on a query submitted of a buffer of 1 mile around the Projects Boundaries.

Bald eagle (*Haliaeetus leucocephalus*) nests have been identified within the Sylvan Project Vicinity and Pillager Project Vicinity (MP 2016a, 2016b). The exact locations of these nests are being withheld to protect the nesting eagles. Bald eagles are protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (MP 2016a, 2016b).

Gray Wolf

The gray wolf lives near lakes and sub-boreal forests in Minnesota. The gray wolf range in Minnesota has grown from the northeast corner of the state in the 1970s toward the center of the state (2000s). Wolf packs live within territories ranging in size from 50 square miles to more than 1,000 square miles, depending on available prey and their seasonal movements. Their adaptability is reflected in the wide range of habitats which they can occupy, including temperate forests, mountains, tundra, taiga, grasslands, and deserts. The gray wolf does not migrate extensive distances and, therefore, does not have a significant temporal distribution (USFWS 2025b). Wolves require large amounts of space and therefore are sensitive to habitat loss, degradation, and fragmentation caused by the development of urban and agricultural landscapes. Other indirect factors that may impact wolf populations in Minnesota include parasites, disease, or a loss/changing density of prey resources (moose and deer) (Minnesota DNR 2022).

Northern Long-eared Bat

The northern long-eared bat, distinguished from other species of *Myotis* by its long ears, is a wide-ranging species found in a variety of forested habitats in summer and hibernates in caves in winter (USFWS 2025c). The species is found across eastern and north central United States and southern Canada and is generally associated with old-growth forests (NatureServe 2023). Northern long-eared bats overwinter in hibernacula that include caves and abandoned mines (USFWS 2025c). Rarely are there more than 100 individuals per hibernation colony (NatureServe 2025). Mating occurs in late summer or fall prior to hibernation, and each female delivers a single pup in June or early July. In summer, the bats generally are colonial but tend to be more solitary than other *Myotis* species, often

roosting alone in deep cracks and crevices, under bark, or in hollows of live and dead trees. Foraging occurs within forests, along forest edges and clearings, and occasionally over ponds. Principal threats to the species include human disturbance of hibernating bats and mortality due to white-nose syndrome (USFWS 2025c).

Monarch Butterfly

Monarch butterfly is a proposed threatened species for listing under the ESA (USFWS 2024a). In the summer, monarch butterflies are found throughout Minnesota in backyards, parks, and rural areas (Minnesota DNR 2025b). The species is a large and conspicuous butterfly that exhibits long-distance migration and overwinters as adults at forested locations in Mexico and California. Adult monarch butterflies feed on nectar from a wide variety of flowers. Reproduction is dependent on the presence of milkweed (*Asclepias* spp.), the sole food source for larvae. Larvae develop and feed on the milkweed plant, sequestering chemicals as a defense against predators. Adults live up to six to nine months, and multiple generations are produced over the course of the breeding season. Monarch butterflies occur across the continental United States, but populations have been declining over the past 20 years. Primary threats to the species include the loss and degradation of habitat from conversion of grasslands to agriculture, widespread use of herbicides, exposure to insecticides, land-clearing activities in overwintering sites, urban development, and general loss of milkweed and nectar sources across the species' range from various land development activities (USFWS 2020).

Suckley's Cuckoo Bumble Bee

The Suckley's cuckoo bumble bee is a proposed endangered species for listing under the ESA (USFWS 2024b). The Suckley's cuckoo bumble bee is an obligate social parasite, and its habitat requirements are closely tied to the presence of healthy host bumble bee colonies, particularly those of *Bombus occidentalis*. Suitable habitats include areas that support native floral diversity for foraging and nesting sites for host species. The Suckley's cuckoo bumble bee historically occupied a broad range across North America, extending from the Yukon to Arizona and eastward to Newfoundland, and has been documented in Minnesota. Threats contributing to its decline include habitat fragmentation and conversion, pesticide exposure, pathogens, and climate change. The last confirmed sighting in the U.S. occurred in Oregon in 2016. Designation of critical habitat is currently considered "not determinable" due to insufficient data (USFWS 2025d).

Western Regal Fritillary

The western regal fritillary is a proposed threatened species for listing under the ESA (USFWS 2024c). This species, once widespread across the central and northern Great Plains and parts of the Midwest, is found in fragmented native grassland habitats across 14 states. Its survival depends on the availability of three key habitat components: violet host plants for larval development, nectar sources to sustain adult females during the breeding season, and native grasslands with tall vegetation that provide shelter for all life stages. Threats contributing to its decline include habitat loss, pesticide exposure, pathogens, and climate change (USFWS 2024d).

Bald Eagle

The bald eagle was removed from ESA listing on August 8, 2007, but is still protected by the Bald and Golden Eagle Protection Act, which prohibits the unauthorized take, possession, transport, or sale of eagles, their parts, nests, or eggs (USFWS 1940). In Minnesota, bald eagles commonly nest on northern lakes and along major rivers such as the St. Croix and Mississippi. During winter, they migrate to areas with open water that support abundant fish or waterfowl, including the Minnesota and Mississippi Rivers and southern lakes. Bald eagles prefer habitats near large bodies of water where fish, their primary food source, are abundant. They typically nest in tall, sturdy trees that provide a wide view of the surrounding area and proximity to water. Their nests, among the largest of any bird species, are constructed from sticks and lined with softer materials such as moss and feathers (University of Minnesota 2025).

Table 4-34: Federally Listed Wildlife Species with the Potential to Occur in the Projects Vicinities

Scientific Name	Common Name	Federal Status	Project		
			Little Falls	Pillager	Sylvan
Argynnis idalia occidentalis	western regal fritillary	Proposed Threatened	✓		
Bombus suckleyi	Suckley's cuckoo bumble bee	Proposed Endangered	✓	✓	✓
Canis lupus	gray wolf	Threatened	✓	✓	✓
Danaus plexippus	monarch butterfly	Proposed Threatened	✓	✓	✓
Myotis septentrionalis	northern long-eared bat	Endangered		✓	✓

Source: USFWS 2025a
Notes: E=Endangered, T=Threatened, PE=Proposed Endangered, PT=Proposed Threatened

Table 4-35: State-Listed Wildlife Species with the Potential to Occur within 1-mile of Proposed Projects Boundaries

Scientific Name	Common Name	State Status[1]	Project			Habitat
			Little Falls	Pillager	Sylvan	
Buteo lineatus	red-shouldered hawk	SC		✓	✓	Wet Forest, Floodplain Forest, Mesic Hardwood Forest, Fire Dependent Forest
Chondestes grammacus	lark sparrow	SC			✓	Rock Outcrop, Fire Dependent Forest, Savanna, Upland Prairie
Coturnicops noveboracensis	yellow rail	SC			✓	Grass-Dominated Wetlands, Wet Prairie
Cygnus buccinator	trumpeter swan	SC			✓	Small Ponds and Lakes or Bays on Larger Water Bodies with Emergent Vegetation
Emydoidea blandingii	Blanding's turtle	T	✓	✓	✓	Savanna, Large Rivers, Medium Rivers and Streams, Small Rivers and Streams, Marsh, Wet Meadow/Carr, Forested Rich Peatland, Wet Forest, Floodplain Forest, Lowland Prairie, Upland Prairie
Eptesicus fuscus	big brown bat	SC			✓	Buildings, Bridges, Trees, and Forested Areas near Water.
Lasmigona compressa	creek heelsplitter	SC	✓		✓	Small Rivers and Streams
Ligumia recta	black sandshell	SC	✓		✓	Large Rivers, Medium Rivers and Streams
Microtus ochrogaster	prairie vole	SC			✓	Grassy Areas with Well-Drained Soil
Myotis lucifugus	little brown bat	SC			✓	Floodplain Forest, Mesic Hardwood Forest, Floodplain Forest
*Myotis septentrionalis**	northern long-eared bat	SC			✓	Floodplain Forest, Subterranean, Mesic Hardwood Forest, Fire Dependent Forest

Source: NHIS 2025

[1] Notes: E=Endangered, T=Threatened, SC=Special Concern

4.8.1.3 Rare, Threatened, and Endangered Botanical Resources

There are no federally-listed botanical species that potentially occur within the Projects Vicinities according to the USFWS IPaC reports (Appendix E-4) (USFWS 2025a). According to the Minnesota NHIS database, four state-listed botanical species have been identified within the Projects Vicinities as specified in Table 4-36.

Table 4-36: State-Listed Botanical Species with the Potential to Occur in the Projects Vicinities

Scientific Name	Common Name	State Status	Project			Habitat
			Little Falls	Pillager	Sylvan	
Juglans cinerea	butternut	E	✓			Mesic Hardwood Forest
Najas guadalupensis ssp. olivacea	Olive-colored Southern Naiad	SC			✓	Littoral Zone of Shallow, Alkaline Lakes
Poa paludigena	Bog Bluegrass	T			✓	Forested Wetlands with Groundwater Seeps
Potamogeton oakesianus	Oakes' Pondweed	E			✓	Littoral Zone of Small Lakes

Source: NHIS 2025

Notes: E=State Endangered, T=State Threatened, SC=State Species of Special Concern

4.8.2 Environmental Effects

Within the Projects Vicinities, there is the potential for occurrence of two federally listed species, three proposed federally listed species, eleven state-listed or state special concern wildlife species, and four state-listed botanical species. These species are associated with aquatic, wetland, and upland habitats that may be present within or adjacent to the existing and proposed Projects Boundaries.

The Licensee proposes to continue operating the Projects in a run-of-river mode. No changes to the Projects' facilities or operations are proposed. Although the Licensee does not propose operational, management, or facility changes, the proposed modifications to the Projects Boundaries to limit lands and waters to those necessary for Project purposes could have indirect environmental effects on rare, threatened, and endangered or otherwise protected species, if present, if land management practices and/or oversight were to change in the future. However, because no physical alterations or construction activities are proposed, and the Projects will continue operating in a run-of-river mode, no direct adverse impacts to rare, threatened, or endangered species are anticipated due to the proposed action.

4.8.3 Protection, Mitigation, Enhancement Measures

The Licensee proposes to develop revised Land Management Plans (to replace the existing Land Management Plans) post license issuance for the Sylvan and Pillager Projects to accurately reflect land management in any modified project boundaries throughout the term of the new license that may be used by rare, threatened, or endangered species, if present. The Licensee will also continue to implement best management practices with respect to commercial logging practices and to prevent the spread of terrestrial invasive species in accordance with Minnesota DNR's Operational Order 113 – Invasive Species Prevention and Management. The Licensee proposes to continue implementation of an NCA designation for portions of company-owned lands at the Pillager Project to retain the shoreline's natural character, which is protective of terrestrial wildlife and botanical resources and their habitat.

4.8.4 Unavoidable Adverse Effects

Continued operation of the Projects, as proposed, will have no significant unavoidable adverse impacts to rare, threatened, and endangered species.

4.8.5 References

Minnesota Department of Natural Resources (Minnesota DNR) 2022. Minnesota Wolf Management Plan 2023-2032. Available online: https://files.dnr.state.mn.us/wildlife/wolves/wolf-plan.pdf. Accessed August 2025.

Minnesota Department of Natural Resources (Minnesota DNR) 2025a. Tricolored bat - *Perimyotis subflavus*. Available online: https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=AMACC03020 Accessed January 2023.

Minnesota Department of Natural Resources (Minnesota DNR) 2025b. Monarch Butterfly. Available online: https://www.dnr.state.mn.us/insects/monarchbutterfly.html#:~:text=The%20monarch%20butterfly%20is%20a,Minnesota%27s%20most%20well%2Dknown%20insects. Accessed September 2025.

Minnesota Power (MP). 2016a. Land Management Plan Update. Sylvan Hydroelectric FERC Project No. 2454.

Minnesota Power (MP). 2016b. Land Management Plan Update. Pillager Hydroelectric FERC Project No. 2663.

NatureServe. 2025. Northern Long-eared Bat. Available online: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.102615/Myotis_septentrionalis Assessed August 2025.

Natural Heritage Information System (NHIS). 2025, September. NHIS data supplied to Minnesota Power through data sharing agreement with Minnesota DNR.

University of Minnesota. 2025. Bald eagle. Available online: https://raptor.umn.edu/about-raptors/raptors-north-america/bald-eagle. Accessed September 2025.

U.S. Fish and Wildlife Service (USFWS). 1940. Bald and Golden Eagle Protection Act. Available online: https://www.fws.gov/law/bald-and-golden-eagle-protection-act#:~:text=The%20Bald%20and%20Golden%20Eagle,)%2C%20nests%2C%20or%20eggs Accessed September 2025.

U.S. Fish and Wildlife Service (USFWS). 2020, December 17. Endangered and threatened wildlife and plants; 12-month finding for the monarch butterfly. Federal Register 85(23):81813-81822.

Available online: https://www.fws.gov/federal-register-file/endangered-and-threatened-wildlife-and-plants-12-month-finding-monarch. Accessed September 2025.

U.S. Fish and Wildlife Service (USFWS). 2024a, December. Endangered and Threatened Wildlife and Plants; Threatened Species Status With Section 4(d) Rule for Monarch Butterfly and Designation of Critical Habitat. Federal Register, vol. 89, no. 239, 12 Dec. 2024, pp. 100662–100698. Available online: https://www.federalregister.gov/documents/2024/12/12/2024-28855/endangered-and-threatened-wildlife-and-plants-threatened-species-status-with-section-4d-rule-for Accessed September 2025.

U.S. Fish and Wildlife Service (USFWS). 2024b, December. Endangered and Threatened Wildlife and Plants; Endangered Species Status for Suckley's Cuckoo Bumble Bee. Federal Register, vol. 89, no. 242, 17 Dec. 2024, pp. 102074–102088. Available online: https://www.federalregister.gov/documents/2024/12/17/2024-28729/endangered-and-threatened-wildlife-and-plants-endangered-species-status-for-suckleys-cuckoo-bumble Accessed September 2025.

U.S. Fish and Wildlife Service (USFWS). 2024c, August. Endangered and Threatened Wildlife and Plants; Endangered Status for the Eastern Regal Fritillary, and Threatened Status with Section 4(d) Rule for the Western Regal Fritillary. Federal Register, vol. 89, no. 152, 6 Aug. 2024, pp. 63888–63909. Available online: https://www.federalregister.gov/documents/2024/08/06/2024-16982/endangered-and-threatened-wildlife-and-plants-endangered-status-for-the-eastern-regal-fritillary-and Accessed September 2025.

U.S. Fish and Wildlife Service (USFWS). 2024d, August. USFWS Proposes Endangered Species Act Protections for Both Subspecies of the Regal Fritillary Butterfly. Available online: https://www.fws.gov/press-release/2024-08/usfws-proposes-esa-protections-both-subspecies-regal-fritillary-butterfly Accessed September 2025.

U.S. Fish and Wildlife Service (USFWS). 2025a. Information for Planning and Consultation. Available online: https://ecos.fws.gov/ipac/ Accessed September 2025.

U.S. Fish and Wildlife Service (USFWS) 2025b. Gray Wolf. Available online: https://www.fws.gov/species/gray-wolf-canis-lupus. Accessed August 2025.

U.S. Fish and Wildlife Service (USFWS). 2025c. Species Profile: Northern long-eared bat (*Myotis septentrionalis*). Available online: https://ecos.fws.gov/ecp/species/9045 Accessed August 2025.

U.S. Fish and Wildlife Service (USFWS). 2025d. Proposed Rule to List Suckley's Cuckoo Bumble Bee as endangered Q&A. Available online: https://www.fws.gov/page/proposed-rule-list-suckleys-cuckoo-bumble-bee-endangered-qa Accessed September 2025.

4.9 Recreation and Land Use

4.9.1 Affected Environment

4.9.1.1 Recreation

Lands and waters at the Projects provide a variety of public recreational opportunities through formal and informal public recreation sites, as described in the following sections. A Recreation Use and Facility Inventory Study was conducted as part of the relicensing to gather current information on recreation facilities, recreational use, and potential project effects to determine existing and future recreation use and capacity at the Sylvan Project and Pillager Project.[18] The 2025 Recreation Use Assessment is included as Appendix E-3. Because all recreation sites in the Little Falls Project Vicinity are owned and operated by the City of Little Falls, and there are no Commission-approved Little Falls Project recreation sites, the study was administered at the Sylvan Project and Pillager Project. Nonetheless, recreation at the Little Falls Project is also described herein.

Recreation at the Little Falls Project

The Licensee does not directly provide recreational facilities at the Little Falls Project, although there are several sites that provide public access to the Little Falls Project reservoir. Recreation sites in the Little Falls Project Vicinity are listed on Table 4-37 and depicted on Figure 4-25. The Licensee has cooperated with the City of Little Falls in establishing shoreline fishing areas at two city of Little Falls-owned parks near the dam. In addition, the Licensee helps the City of Little Falls maintain a canoe portage around the Little Falls dam. The portage is about 1,000 feet long and parallels the river on the east bank through a City of Little Falls park.

[18] The Recreation Use and Facility Inventory Study was conducted in 2024. The study findings were submitted to FERC; however, on April 4, 2025, FERC issued comments indicating that the recreation use survey was not fully consistent with the approved study plan and requested additional survey dates. In response, MP filed a letter with FERC on May 1, 2025, committing to conduct additional recreational use observations and surveys on six separate days in 2025, with two hours of observation per site per survey day. The surveys were conducted on one weekday and one weekend day in June, July, and August 2025.

Table 4-37: Public Recreation Sites in the Little Falls Project Vicinity

Site Name	Description
Mill Park	615 Lindbergh Drive South. Mill Park is located at the former site of Hennepin Paper Company. Amenities/activities include: walking, fishing, artifacts from the Hennepin Paper Mill, park area, and views of the Mississippi River. Shown on Photo 4-1. (City of Little Falls 2025).
Maple Island Park	59 3rd Avenue SE. Paved walking trails, pavilion, restrooms, and views of the Mississippi River. Shown on Photo 4-2. (City of Little Falls 2025).
James Green Park	38 1st Avenue SE. Paved walking paths and views of the Little Falls Dam on the Mississippi River. Shown on Photo 4-3. (City of Little Falls 2025).
Columbia Park	505 3rd Avenue SE. Playground, picnic area, baseball field, and basketball court. Shown on Photo 4-4. (City of Little Falls 2025).
Veterans Memorial Park	25 Broadway Avenue East. Memorial wall, memorial bricks, picnic area, and views of the Mississippi River. Shown on Photo 4-5. (City of Little Falls 2025).
Memorial Park	26 Broadway Avenue East. Memorials, fountains, and flower beds. Shown on Photo 4-6. (City of Little Falls 2025).
Kiwanis Park	59 1st Avenue NE. Picnic area and fishing pier on the Mississippi River. Shown on Photo 4-7. (City of Little Falls 2025).
Old City Beach Parking Lot	501 1st Street NE. Boat landing on the Mississippi River. Shown on Photo 4-8. (City of Little Falls 2025).
Pine Tree Playground	801 4th Street NE. Playground, baseball field, basketball court, and ice skating and hockey rink. Shown on Photo 4-9. (City of Little Falls 2025).
Canoe Portage	Located at Front Street and Broadway East. Canoe portage around dam. Shown on Photo 4-10. (City of Little Falls 2025).
LeBourget Park	300 Paul Larson Memorial Drive. Amphitheater, kiosks, picnic area, boat landing, and fishing pier on the Mississippi River. Shown on Photo 4-11. (City of Little Falls 2025).
Riverside Park	901 1st Street NE. Picnic area and views of the Mississippi River. Shown on Photo 4-12. (City of Little Falls 2025).

Figure 4-25: Recreation Sites in the Little Falls Project Vicinity

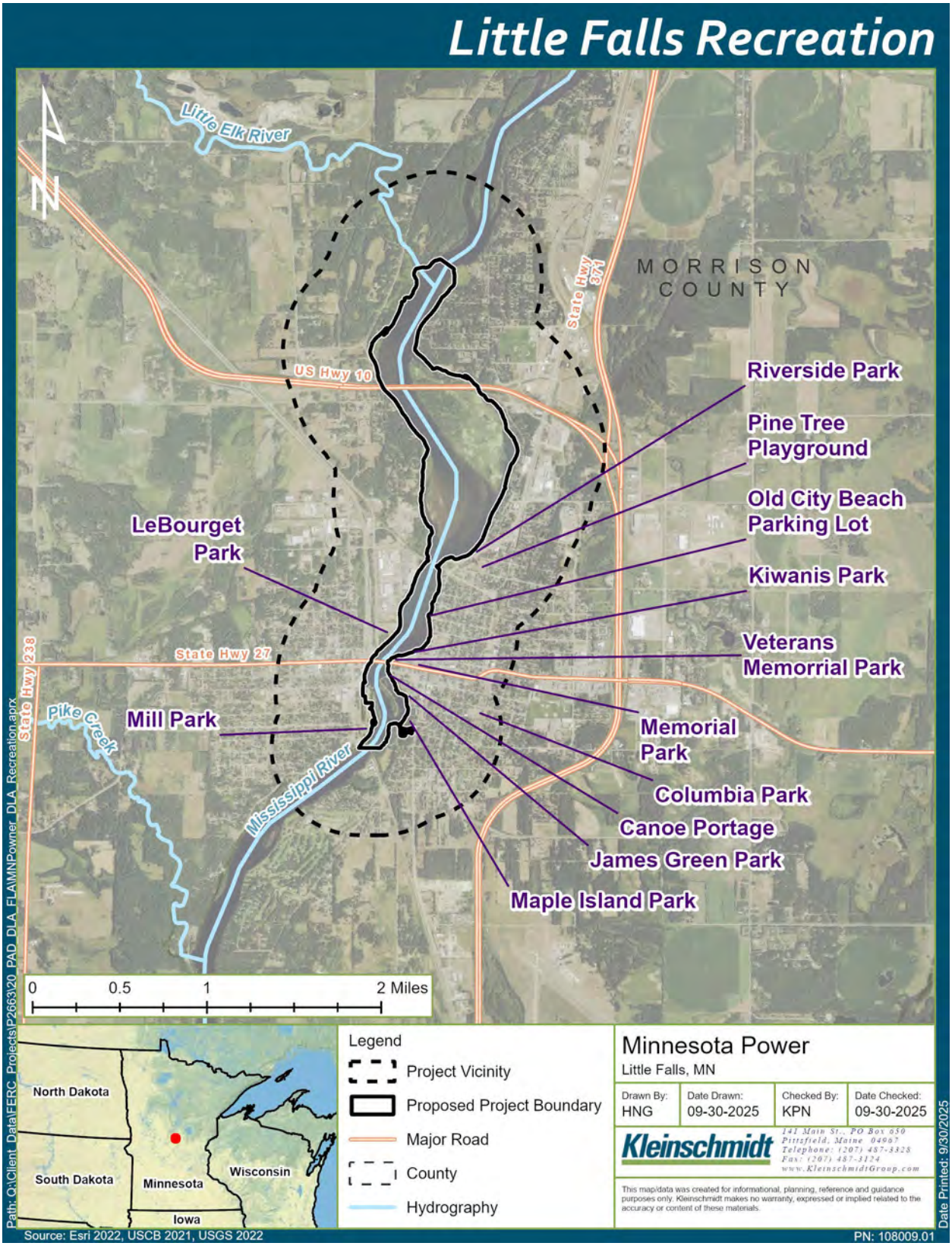


Photo 4-1: Mill Park



Source: City of Little Falls 2025

Photo 4-2: Maple Island Park



Source: City of Little Falls 2025

Photo 4-3: James Green Park



Source: City of Little Falls 2025

Photo 4-4: Columbia Park



Source: City of Little Falls 2025

Photo 4-5: Veterans Memorial Park



Source: City of Little Falls 2025

Photo 4-6: Memorial Park



Source: City of Little Falls 2025

Photo 4-7: Kiwanis Park



Source: City of Little Falls 2025

Photo 4-8: Old City Beach Parking Lot



Source: City of Little Falls 2025

Photo 4-9: Pine Tree Playground



Source: City of Little Falls 2025

Photo 4-10: Canoe Portage at Little Falls Project



Source: City of Little Falls 2025

Photo 4-11: LeBourget Park



Source: City of Little Falls 2025

Photo 4-12: Riverside Park



Source: City of Little Falls 2025

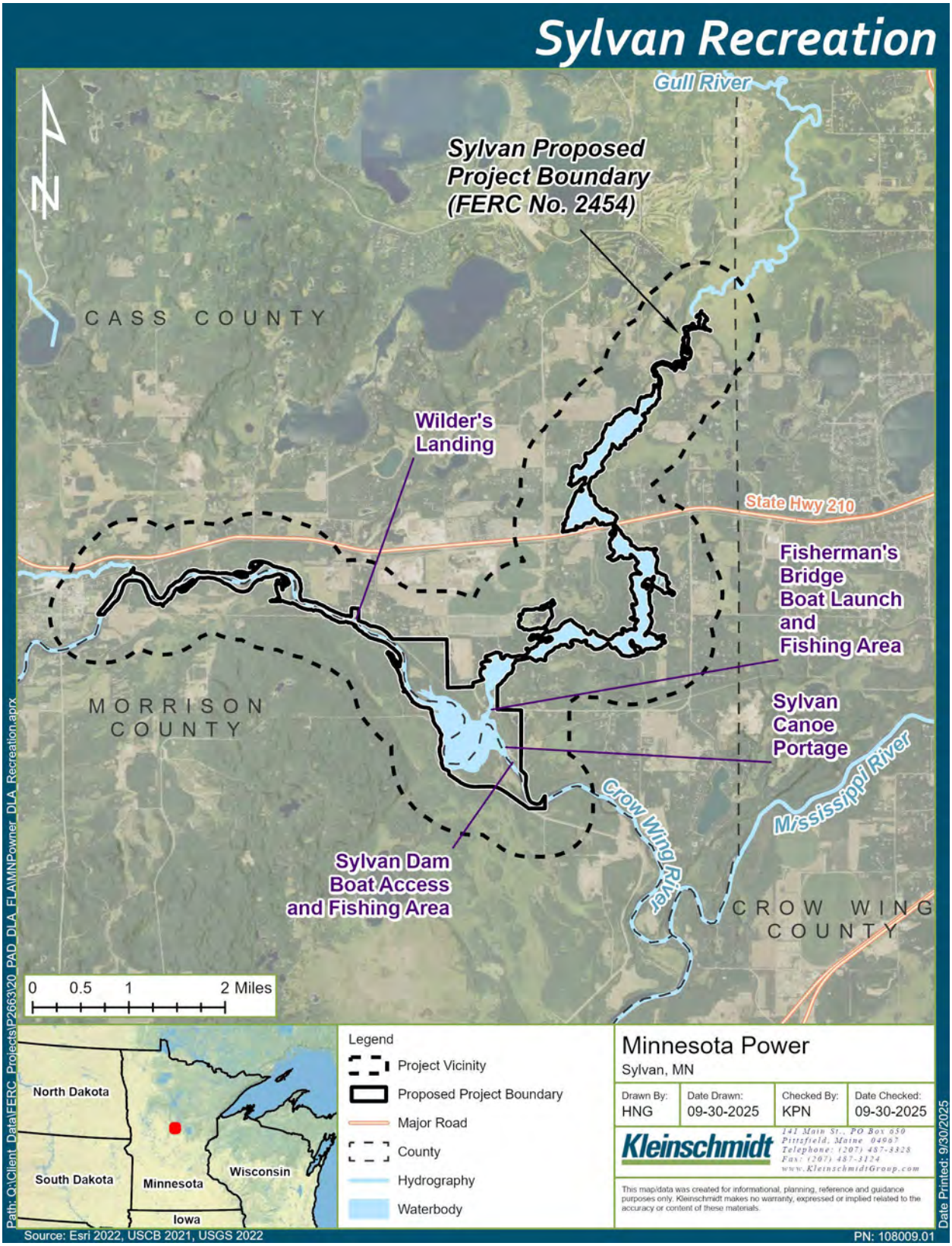
Recreation at the Sylvan Project

There are four Commission-approved Sylvan Project recreation sites: 1) Sylvan Dam Boat Access and Fishing Area, 2) Sylvan Canoe Portage, 3) Wilder's Landing, and 4) Fisherman's Bridge Boat Launch and Fishing Area. Recreation sites at the Sylvan Project are listed in Table 4-38 and depicted on Figure 4-26. MP manages the Canoe Portage while Minnesota DNR maintains the other three Sylvan Project recreation sites.

Table 4-38: Sylvan Project Recreation Sites

Site Name	Description	Operator
Wilder's Landing	Boat launch at the northwest end of the Crow Wing River. Concrete boat ramp and parking for approximately 15 vehicles. Shown on Photo 4-13.	Minnesota DNR
Fisherman's Bridge Boat Launch and Fishing Area	Shorefishing area with parking for approximately 5 vehicles on the east side of the bridge/river, and a two-lane concrete boat launch and dock with parking for approximately 15 vehicles on the west side of the bridge/river. Shown on Photo 4-14, Photo 4-15, and Photo 4-16.	Minnesota DNR. MP leases the site to the Minnesota DNR.
Sylvan Dam Boat Access and Fishing Area	Site facilities includes parking for approximately 20 vehicles (10 spots for anglers and 10 spots for other boaters), a shorefishing area, and a concrete boat ramp. Shown on Photo 4-17.	Minnesota DNR. MP leases the site to the Minnesota DNR.
Sylvan Canoe Portage	Approximately 200-foot-long canoe portage trail around the dam. Site facilities also include an unimproved launch upstream of the dam. Shown on Photo 4-18.	MP

Figure 4-26: Sylvan Project Recreation Sites



The Recreation Use Assessment conducted in 2024 and 2025 included recreation usage observations, spot counts, and visitor surveys to evaluate the types and levels of recreation use at the Commission-approved Sylvan Project recreation sites. Results indicated moderate use of the Sylvan Dam Boat Access and Fishing Area, Wilder's Landing, and Fisherman's Bridge Boat Launch and Fishing Area. Common activities at these three sites included boat launching and fishing, with occasional hiking and nature observation. Minimal recreation use was observed at the Sylvan Canoe Portage, and visitors in that area were typically using amenities at the adjacent boat access and fishing area (Merjent, Inc. 2025a; MP 2025a).

Table 4-39 presents average daily visitor counts and utilization scores for each site, along with the results of the existing capacity analysis. The analysis found that existing capacity was sufficient to meet current demand. While a few visitors reported occasional overcrowding during holiday weekends, overall use levels and available parking indicate that existing capacity is adequate. Projected capacity over the 40-year license term was also determined to be sufficient for all four sites (Merjent, Inc. 2025a; MP 2025a).

Based on the user survey results, the sites were typically identified to be in good condition. This is generally consistent with the findings from the Recreation Facility Inventory and Condition Assessment (Merjent, Inc. 2025a; MP 2025a).

Table 4-39: Existing Use and Capacity at Sylvan Project Recreation Sites

Recreation Site	Average No. of Visitors/Day[1]	Average Site Utilization Score[2]	Existing Capacity
Wilder's Landing	7.6	3.1	Sufficient
Fisherman's Bridge Boat Launch and Fishing Area	36.5	3.2	Sufficient
Sylvan Dam Boat Access and Fishing Area	34	3	Sufficient
Sylvan Canoe Portage	1.5	N/A[3]	Sufficient

Source: MP 2025a

[1] Recreation day assumed to be one 10-hour day; methodology of calculation explained in MP 2025a.

[2] Site utilization scores ranged from 1 to 5, with 1 being underutilized and 5 being overcrowded.

[3] No surveys were completed for this site.

Recreational Lease Management

The Licensee also manages recreational leases on Sylvan Project lands. There are 153 recreational leases on lands in the existing Sylvan Project Boundary. These recreational leases are to private residents. MP communicates with leaseholders through a newsletter, highlighting items of interest and land use policies and activities. Provisions in the lease document require leaseholders to receive approval from MP prior to any construction or earth disturbing activities taking place. This prior approval is required before leaseholders seek signatures by the County and other zoning/permitting agencies for applicable activities, such as building construction and shoreline alterations. The lease document also requires strict adherence to environmental regulations and contains provisions to protect the health, welfare, and safety of the public. The lease also requires leaseholders to maintain their lots and improvements to high aesthetic standards.

Photo 4-13: Wilder's Landing



Photo 4-14: Fisherman's Bridge Boat Launch and Fishing Area – Pedestrian Bridge



Photo 4-15: Fisherman's Bridge Boat Launch and Fishing Area – Boat Launch



Photo 4-16: Fisherman's Bridge Boat Launch and Fishing Area – Shorefishing Area



Photo 4-17: Sylvan Dam Boat Access and Fishing Area



Photo 4-18: Sylvan Canoe Portage



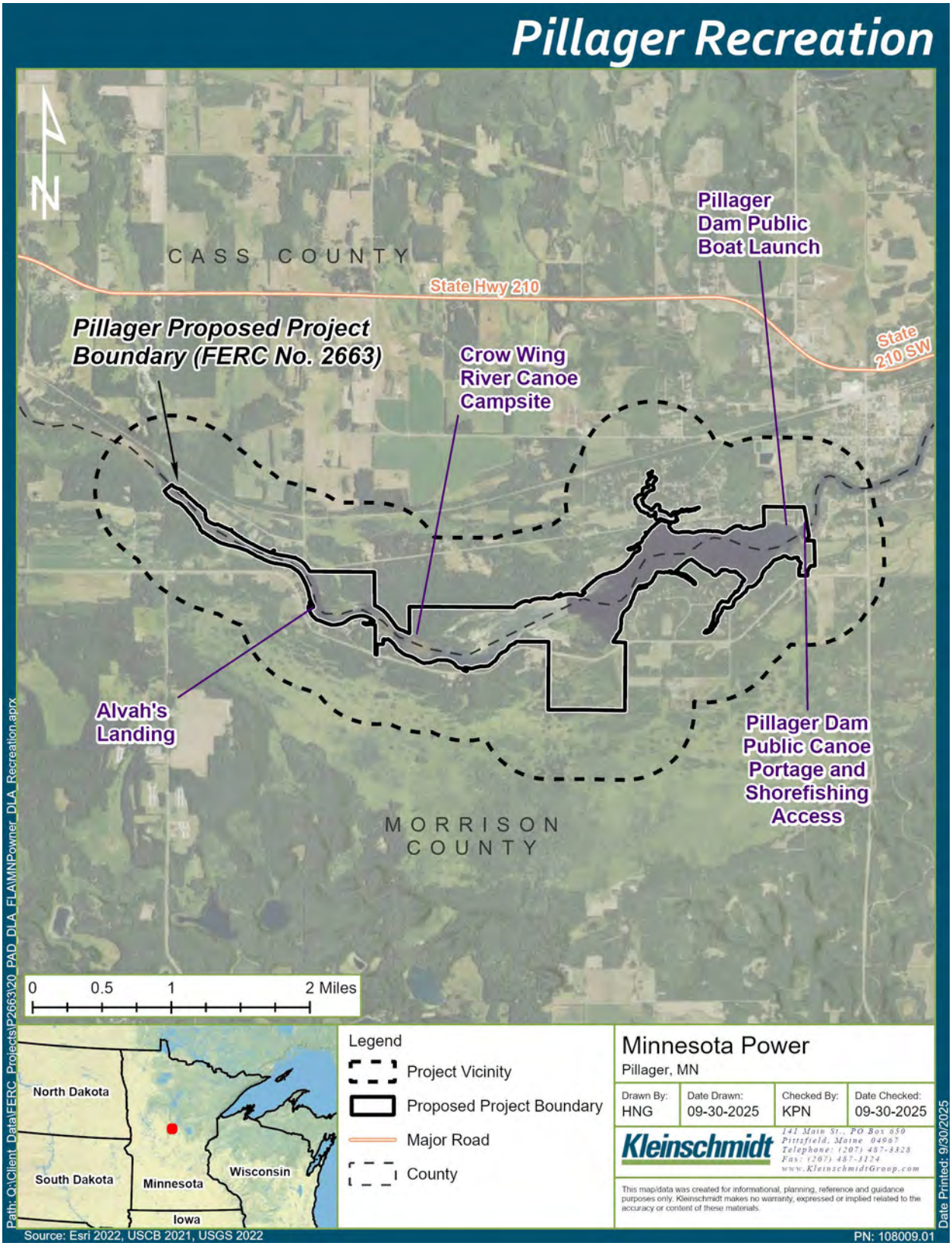
Recreation at the Pillager Project

Recreational opportunities at the Pillager Project include boating, fishing (ice and open water fishing), snowmobiling, hunting, hiking, camping and swimming. Recreational activities occur on specific sites, (such as shore fishing sites), as well as in dispersed locations (such as hunting). Pillager Project recreation sites are listed in Table 4-40 and shown on Figure 4-27.

Table 4-40: Pillager Project Recreation Sites

Site Name	Description	Operator
Alvah's Landing (Minnesota DNR Boat Launch)	Boat launch located approximately 2.5 miles upstream from the Pillager Project dam, on the south shore of the Crow Wing River. Parking for approximately 15 vehicles and a concrete boat ramp. Shown on Photo 4-19.	Minnesota DNR
Pillager Dam Public Boat Launch	Boat launch located on the north shore of Pillager reservoir, adjacent to the dam. Parking for approximately 15 vehicles and a concrete boat ramp. Shown on Photo 4-20 and Photo 4-21.	Minnesota DNR and MP. (MP owns the land, and leases the land to Minnesota DNR)
Pillager Dam Public Canoe Portage and Shorefishing Access	Portage around the south end of Pillager dam. Approximately 300 feet in length. Parking and shore fishing access (south side of dam) in the same location. An additional Americans with Disabilities Act shore fishing access is located on the north side of the dam. Shown on Photo 4-22, Photo 4-23, and Photo 4-24.	MP
Crow Wing River Canoe Campsite	Two canoe-up primitive campsites on the north shore of the Crow Wing River, just downstream of Alvah's Landing. Photos of the entrance to the site and site are provided as and respectively. Shown on Photo 4-25, Photo 4-26, and Photo 4-27.	MP

Figure 4-27: Pillager Project Recreation Sites



The Recreation Use Assessment conducted in 2024 and 2025 included recreation usage observations, spot counts, and visitor surveys to evaluate the types and levels of recreation use at the Commission-approved Pillager Project recreation sites. Results indicated that there is minimal usage of Alvah's Landing. No users were observed or completed a survey at the Crow Wing River Canoe Campsite. Recreation usage at the Pillager Dam Public Canoe Portage & Shorefishing Access was moderate, with all visitors observed to be fishing at the site. The most usage was observed at the Pillager Dam Public Boat Launch. Activities at this site included boating, fishing, and picnicking (Merjent, Inc. 2025b; MP 2025b). Table 4-41 presents average daily visitor counts and utilization scores for each site, along with the results of the existing capacity analysis. The analysis found that existing capacity was sufficient to meet current demand. Overcrowding does not appear to be a concern at the Pillager Project recreation sites. Projected capacity over the 40-year license term was also determined to be sufficient for all four sites (Merjent, Inc. 2025a; MP 2025a).

Based on the user survey results, the sites were typically identified to be in good condition. This is generally consistent with the findings from the Recreation Facility Inventory and Condition Assessment (Merjent, Inc. 2025b; MP 2025b).

Table 4-41: Existing Use and Capacity at Pillager Project Recreation Sites

Recreation Site	Average No. of Visitors/Day[1]	Average Site Utilization Score[2]	Existing Capacity
Alvah's Landing (Minnesota DNR Boat Launch)	3	2.3	Sufficient
Pillager Dam Public Boat Launch	26	2.5	Sufficient
Pillager Dam Public Canoe Portage and Shorefishing Access	14	2.9	Sufficient
Crow Wing River Canoe Campsite	0	NA[4]	Sufficient

Source: MP 2025a

[1] Recreation day assumed to be one 10-hour day; methodology of calculation explained in MP 2025a.

[2] Site utilization scores ranged from 1 to 5, with 1 being underutilized and 5 being overcrowded.

[3] No surveys were completed for this site.

[4] No visitors were observed, and no user surveys were completed for this site.

Recreational Lease Management

MP leases 43 lots on Pillager reservoir. These lots are located on MP lands on the south and north shores of the reservoir on lands in the existing Pillager Project Boundary. MP communicates with all leaseholders, highlighting items of interest and land use policies and activities. Provisions in the lease document require leaseholders to receive approval from MP prior to any construction or earth disturbing activities. This prior approval is required before leaseholders seek signatures by the County and other zoning/permitting agencies for applicable activities, such as building construction and shoreline alterations. The lease document also requires strict adherence to environmental regulations and contains provisions to protect the health, welfare, and safety of the public.

Photo 4-19: Alvah's Landing



Source: Merjent, Inc. 2025b

Photo 4-20: Pillager Dam Public Boat Launch



Source: Merjent, Inc. 2025b

Photo 4-21: Pillager Dam Public Boat Launch Parking Area



Source: Merjent, Inc. 2025b

Photo 4-22: Pillager Dam Public Canoe Portage and Shorefishing Access – Portage Take Out



Source: Merjent, Inc. 2025b

Photo 4-23: Pillager Dam Public Canoe Portage and Shorefishing Access – Portage Trail



Source: Merjent, Inc. 2025b

Photo 4-24: Pillager Dam Public Canoe Portage and Shorefishing Access – Shorefishing Area



Source: Merjent, Inc. 2025b

Photo 4-25: Crow Wing River Canoe Campsite Access



Source: Merjent, Inc. 2025b

Photo 4-26: Crow Wing River Canoe Campsite Fire Pit



Source: Merjent, Inc. 2025b

Photo 4-27: Crow Wing River Canoe Campsite Picnic Table



Source: Merjent, Inc. 2025b

Specially Designated Recreation Areas

Protected River Segments

The Projects are not located on a river designated under the National Wild and Scenic Rivers System (National Wild and Scenic Rivers System 2025). The Projects are not located at a portion of river designated as wild and scenic under the Minnesota's Wild and Scenic Rivers Act (Minnesota DNR 2025a). The Mississippi River is designated as wild and scenic under the Minnesota's Wild and Scenic Rivers Act from St. Cloud to Anoka, Minnesota (Minnesota DNR 2025a). St. Cloud is approximately 30 miles downstream of the Little Falls Project. The Projects are not located at a portion of river listed by the NPS under the Nationwide Rivers Inventory (NRI) (NPS 2025a). The Crow Wing River is listed on the NRI from the city of Motley, Minnesota (less than 5 RMs upstream from the Pillager Project Boundary) for 65 miles to the confluence with the Shell River (NPS 2025a). This segment is listed for the recreational and scenic value and was listed on the NRI in 1982 (NPS 2025a).

National Trails System and Wilderness Areas

There are no trails in the Projects Vicinities that are designated on the NPS National Trails System (NPS 2025b). No areas in the Projects Vicinities have been designated as wilderness areas, recommended for such designation, or designated as wilderness study areas under the Federal Wilderness Act (USDA 2025a).

Recreation Needs Identified in Management Plans

Minnesota's Statewide Comprehensive Outdoor Recreation Plan (SCORP) is a five-year strategic plan that shapes investment by the state and local communities in priority outdoor recreation infrastructure and programming. The most recent SCORP was to cover the years 2020–2024; however, it was extended through December 2025 with approval from the National Park Service (Minnesota DNR 2025c). Minnesota DNR is in the process of preparing the next SCORP for 2026-2030. The SCORP is designed to evaluate ongoing and emerging outdoor recreation trends, needs, and issues and establish priority strategies for achieving outdoor recreation goals. The state and its local outdoor recreation decision-makers and managers utilize the SCORP as a focused set of priorities and suggested actions to guide them as they make decisions about outdoor recreation (Minnesota DNR 2019).

To support the development of the 2020-2024 SCORP, public and stakeholder input was obtained. The Minnesota Outdoor Recreation Household Survey was conducted in 2017. This survey updated a statewide outdoor recreation household survey that had previously been conducted in 2004. The survey invited a random sample of 8,000 Minnesotans to share about their participation in outdoor activities, what motivates them to get outdoors, factors that limit participation, and preferences for communication. A total of 1,987 Minnesotans shared responses online, over the phone, and via paper surveys (Minnesota DNR 2019).

Key findings from the survey indicated that outdoor activities are an increasingly important part of most Minnesotan's lives. The 2017 survey results indicate that from 2004 to 2017, the percentage of Minnesotans who reported that outdoor activities are very important increased from 57 to 70 percent. Most Minnesotans reported that they participate in outdoor activities frequently: nearly two-thirds of Minnesotans reported recreating, on average, more than twice per week over the past year (Minnesota DNR 2019).

Findings also revealed that "Minnesotans see the outdoors as a place to rest and relax, connect with family and friends, and improve their health." Favorite activities were broken up into seasonal categories, with activities such as "relaxing in the outdoors," "walking or hiking," "relaxing by the water," and "picnicking outdoors" identified as highly popular year-round and three-season activities. In winter, top activities were "sledding and snow tubing," and "ice fishing." These findings suggest that Minnesotans prefer activities that require less equipment or advanced skills, and/or that they have not had the opportunity to develop interests and skills to participate in other activities (Minnesota DNR 2019).

In terms of barriers to getting outdoors, findings were consistent with past data suggesting that pests, time, and convenience were primary reasons people are not spending more time outdoors (Minnesota DNR 2019).

4.9.1.2 Land Use

Little Falls Project

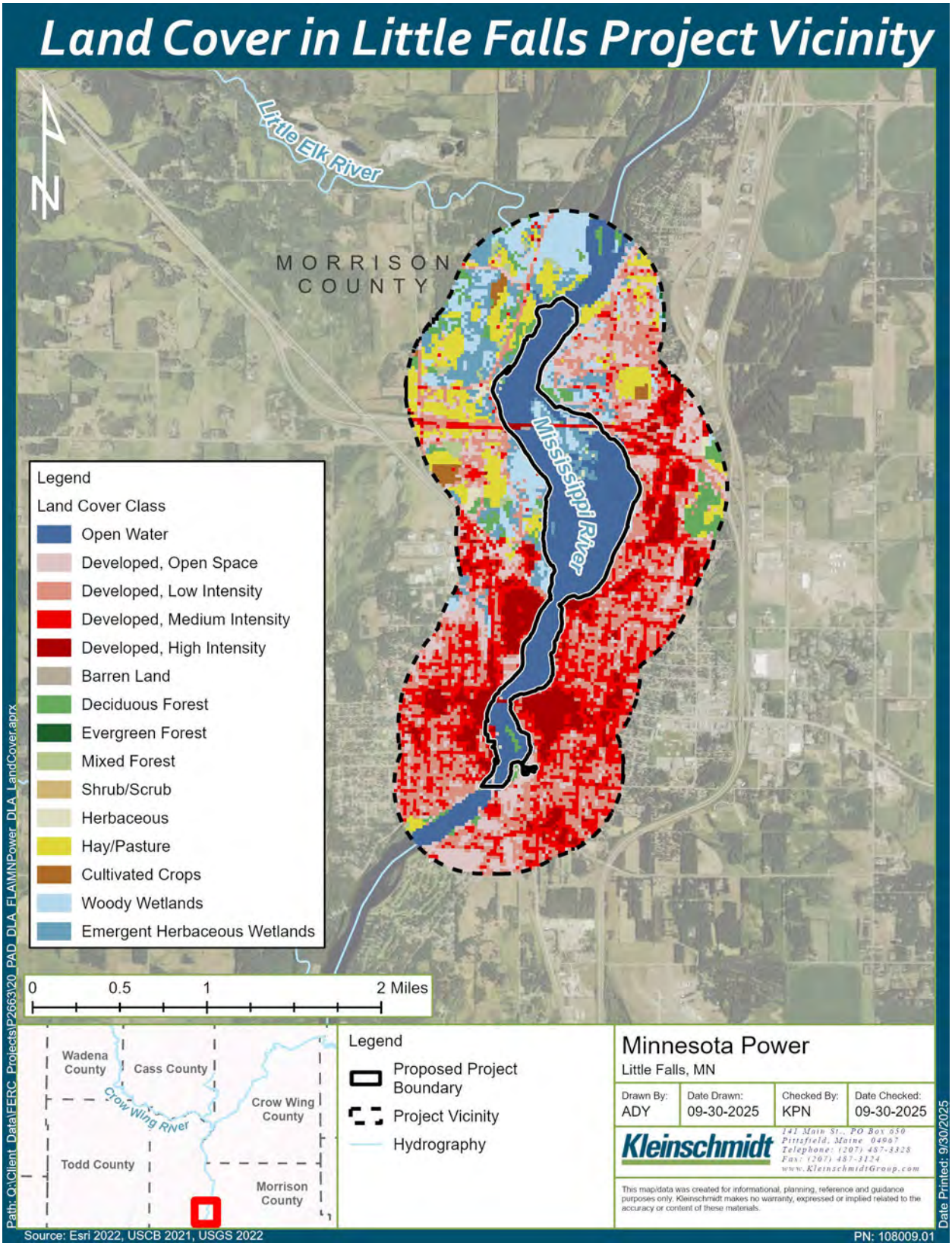
Land cover type in the existing and proposed Little Falls Project Boundary and Little Falls Project Vicinity is provided in Table 4-42 and depicted on Figure 4-28. As shown, land cover in the Little Falls Project Boundary is primarily open water, followed by undeveloped lands including wetlands and forested lands. In the Little Falls Project Vicinity, the majority of the land cover is developed lands, which primarily include the City of Little Falls, Minnesota, which is located on the southern end of the Little Falls Project Boundary.

Table 4-42: Land Cover Type in the Little Falls Existing and Proposed Project Boundary and Little Falls Project Vicinity

National Land Cover Database Class	Existing Project Boundary Acreage	Proposed Project Boundary Acreage	Difference Between Boundaries (Acres)
Open Water	481.7	372.6	109.1
Emergent Herbaceous Wetlands	89.7	66.5	23.2
Woody Wetlands	40.1	21.0	19.1
Deciduous Forest	32.7	15.2	17.5
Developed, High Intensity	11.5	13.8	-2.3
Developed, Medium Intensity	4.6	8.4	-3.8
Developed, Open Space	5.7	7.0	-1.3
Herbaceous	4.6	2.5	2.1
Developed, Low Intensity	12.0	8.9	3.1
Hay/Pasture	6.4	2.2	4.2
Mixed Forest	0.1	0.2	-0.1
Total	**689.1**	**518.3**	**170.7**

Source: USGS 2021

Figure 4-28: Land Cover in Little Falls Project Vicinity



Sylvan Project

Land cover type in the existing and proposed Sylvan Project Boundary and Sylvan Project Vicinity is provided in Table 4-43, and depicted on Figure 4-29. As shown, land cover in the Sylvan Project Boundary is primarily undeveloped land, including deciduous forest and woody wetlands, and open water. In the Sylvan Project Vicinity, much of the land cover is undeveloped, including deciduous forest, woody wetlands, and hay/pasture lands. There is an area of high intensity developed lands by the city of Pillager, Minnesota.

The area surrounding the Sylvan reservoir is primarily forested and includes multiple farms. Areas along the Gull River south of Highway 210 are developed as seasonal and permanent residences. The rest of the lands bordering the reservoir are primarily undeveloped. The Sylvan Project area is best described into two distinct sections: the Crow Wing River and the Gull River (MP 2016a), described below.

Crow Wing River

The south shore of the Crow Wing River, except for the extreme west end in Section 16, lies entirely within the Camp Ripley Military Reservation. Camp Ripley is used for military training and is operated by the Minnesota National Guard. Public access to Camp Ripley is restricted. The private backlands in Section 16 contain both wooded and open field areas (MP 2016a).

The north shore of the Crow Wing River, is a mix of privately owned and MP-owned land. Lands along the north shore are similar in appearance to those on the south shore except for scattered rural residential home development (private) along the westerly three miles of shoreline (MP 2016a).

MP provides access leases to adjacent landowners where home development and shoreline use encroachments onto MP property occur in Sections 15 and 16. These leases contain provisions to enforce MP's rights at the Sylvan Project. The shoreline in this area is generally wooded with a few open fields in Section 14 (MP 2016a).

Gull River

The lands in the Sylvan Project Boundary surrounding the Gull River are divided for purposes of this section into lands located south of Minnesota Highway 210, and the lands located north of the Highway 210 (MP 2016a).

South of Highway 210

The Gull River shoreline south of the Highway 210 is almost entirely owned by MP, with the exception of 0.50 mile of private shoreline (MP 2016a).

North of Highway 210

Approximately two-thirds of the Gull River shoreline north of the bridge is owned by MP, the balance is privately-owned land. The reservoir in this area is shallow and contains substantial aquatic vegetation. In the extreme north end of the Sylvan Project, the Sylvan reservoir becomes a narrow river channel bordered in most areas by wetlands (MP 2016a).

The private lands in this area are forested and also open farmland. Due to private property encroachments, access leases are established from time to time to protect MP's and the Commission's rights (MP 2016a).

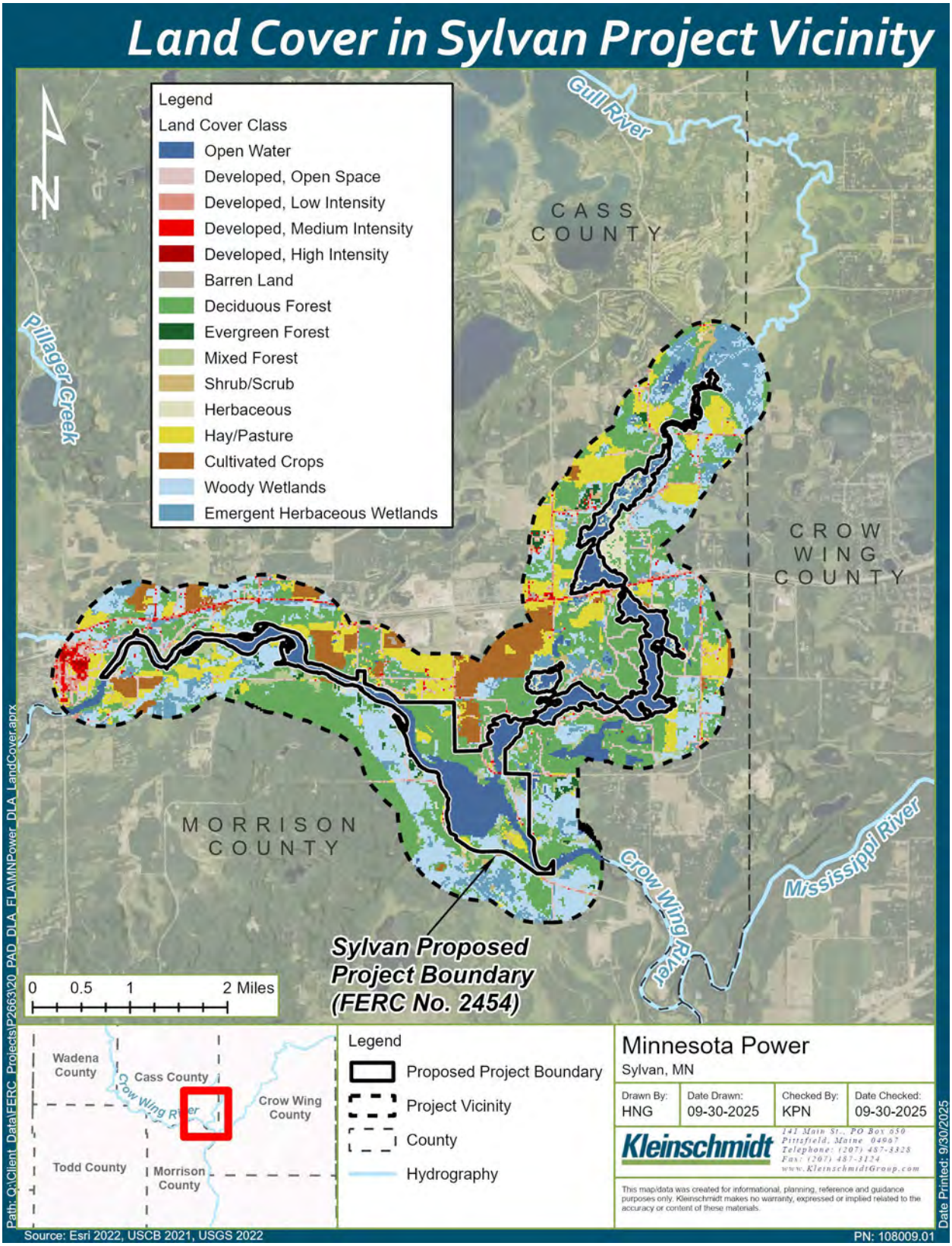
Land is managed at the Sylvan Project through the implementation of a FERC approved Land Management Plan, which was updated in 2016 (MP 2016a). The 2016 Land Management Plan update provided information on the land management activities and public recreation facilities at the Sylvan Project. Specifically, the existing Land Management Plan provides details regarding the management of wildlife, forests and wetlands, listed species, timber, public recreational sites, recreational leases, and cultural resources. The existing Land Management Plan requires revision every 10 years, with the next revision due in 2026. The Licensee proposes to extend the Land Management Plan revision deadline to post-license issuance so lands within the approved FERC Project Boundary is accurately represented.

Table 4-43: Land Cover Type in the Sylvan Existing and Proposed Project Boundary and Sylvan Project Vicinity

National Land Cover Database Class	Existing Project Boundary Acreage	Proposed Project Boundary Acreage	Difference Between Boundaries (Acres)
Deciduous Forest	1,358.5	391.4	967.1
Open Water	950.1	893.4	56.7
Woody Wetlands	735.8	80.3	655.5
Emergent Herbaceous Wetlands	673.2	125.1	548.1
Hay/Pasture	175.0	42.5	132.5
Herbaceous	156.7	31.2	125.5
Developed, Open Space	158.9	43.9	115.0
Shrub/Scrub	83.3	2.9	80.4
Cultivated Crops	66.2	0.6	65.6
Mixed Forest	56.1	45.2	10.9
Developed, Low Intensity	43.4	10.6	32.8
Developed, Medium Intensity	17.0	4.8	12.2
Evergreen Forest	0.5	0.6	-0.1
Barren Land	5.0	0.0	5.0
Total	**4,479.7**	**1,672.5**	**2,807.2**

Source: USGS 2021

Figure 4-29: Land Cover in Sylvan Project Vicinity



Pillager Project

Land cover type in the existing and proposed Pillager Project Boundary and Pillager Project Vicinity is provided in Table 4-44 and depicted on Figure 4-30. As shown, land cover in the Pillager Project Boundary is primarily open water, woody wetlands, and deciduous forest. In the Pillager Project Vicinity, much of the land cover is also undeveloped, including woody wetlands and deciduous forest, as well as open water.

As of 2016, MP managed approximately 650 acres of property in the existing Pillager Project Boundary. Of this, approximately 225 acres are flooded; the remaining 425 acres are a mixture of uplands and lowlands under various land uses. Portions of the Pillager Project lands adjacent to the river and reservoir are developed with seasonal and permanent residences. The remainder of the land is undeveloped (MP 2016b).

The north shore is mostly forested and the least developed shoreline on Pillager reservoir. There are, however, farm fields extending towards the water as well as several homes located near the shore (MP 2016b).

The south shore of the Pillager reservoir is mostly forested with interspersed homes and cabins. The south shore includes MP lots leased for cabin and home sites. MP leases at these locations provide access to the reservoir for adjacent owners of privately-owned back lots. Westward, the shorelines are mostly pine covered. Private home and cabin development also occurs along this shoreline (MP 2016b).

Natural Character Area Designation

MP has designated portions of company-owned lands on the Pillager Project as NCAs to retain the shoreline's present natural character and aesthetics. The Pillager Project Land Management Plan restricts permanent development on these lands, and no development has occurred to date. Active forest and wildlife management continue to occur. In 2015, a 71-acre timber harvest was conducted in response to a jack pine budworm (*Choristoneura pinus*) infestation. The timber harvest was mainly a clearcut; however, a portion was a selective timber harvest (MP 2016b). The NCA is shown on Figure 4-31.

Land is managed at the Pillager Project through the implementation of a FERC approved Land Management Plan, which was updated in 2016 (MP 2016b). The 2016 Land Management Plan update provided information on the land management activities and

public recreation facilities at the Pillager Project. Specifically, the existing Land Management Plan provides details regarding the management of wildlife, forests and wetlands, listed species, timber, public recreational sites, recreational leases, and cultural resources. The existing Land Management Plan requires revision every 10 years, with the next revision due in 2026. The Licensee proposes to extend the Land Management Plan revision deadline to post-license issuance so lands within the approved FERC Project Boundary is accurately represented.

Table 4-44: Land Cover Type in the Pillager Existing and Proposed Project Boundary and Pillager Project Vicinity

National Land Cover Database Class	Existing Project Boundary Acreage	Proposed Project Boundary Acreage	Difference Between Boundaries (Acres)
Open Water	647.2	608.3	38.9
Woody Wetlands	303.6	157.5	146.1
Deciduous Forest	277.8	168.6	109.2
Emergent Herbaceous Wetlands	124.4	61.2	63.2
Hay/Pasture	88.2	13.7	74.5
Developed, Open Space	38.3	9.0	29.3
Developed, Low Intensity	53.8	6.6	47.2
Mixed Forest	22.9	30.7	-7.8
Evergreen Forest	19.3	6.0	13.3
Herbaceous	8.1	3.0	5.1
Developed, Medium Intensity	9.2	4.4	4.8
Shrub/Scrub	0.9	0.0	0.9
Developed, High Intensity	0.0	2.1	-2.1
Total	**1,593.7**	**1,071.1**	**522.6**

Source: USGS 2021

Figure 4-30: Land Cover in Pillager Project Vicinity

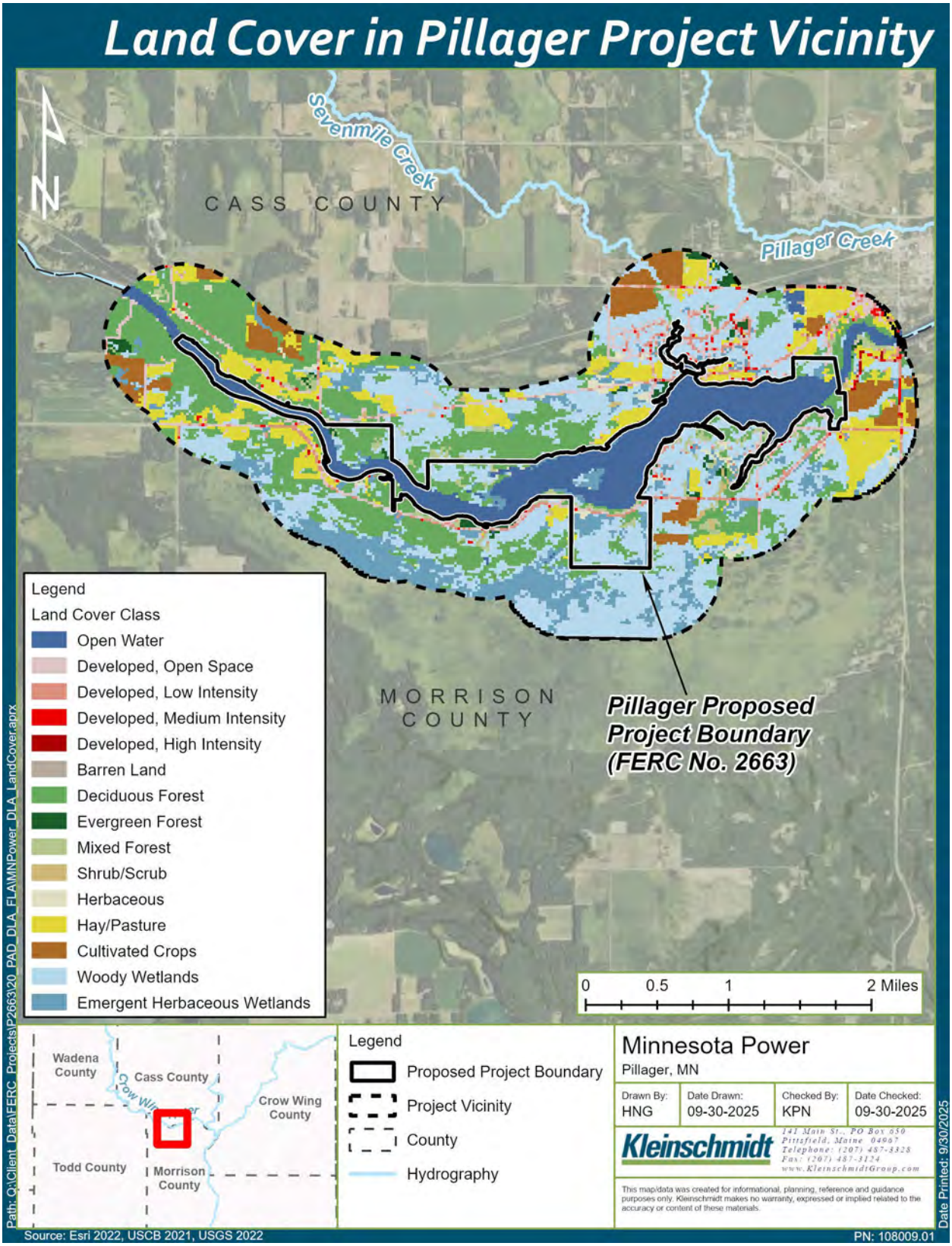
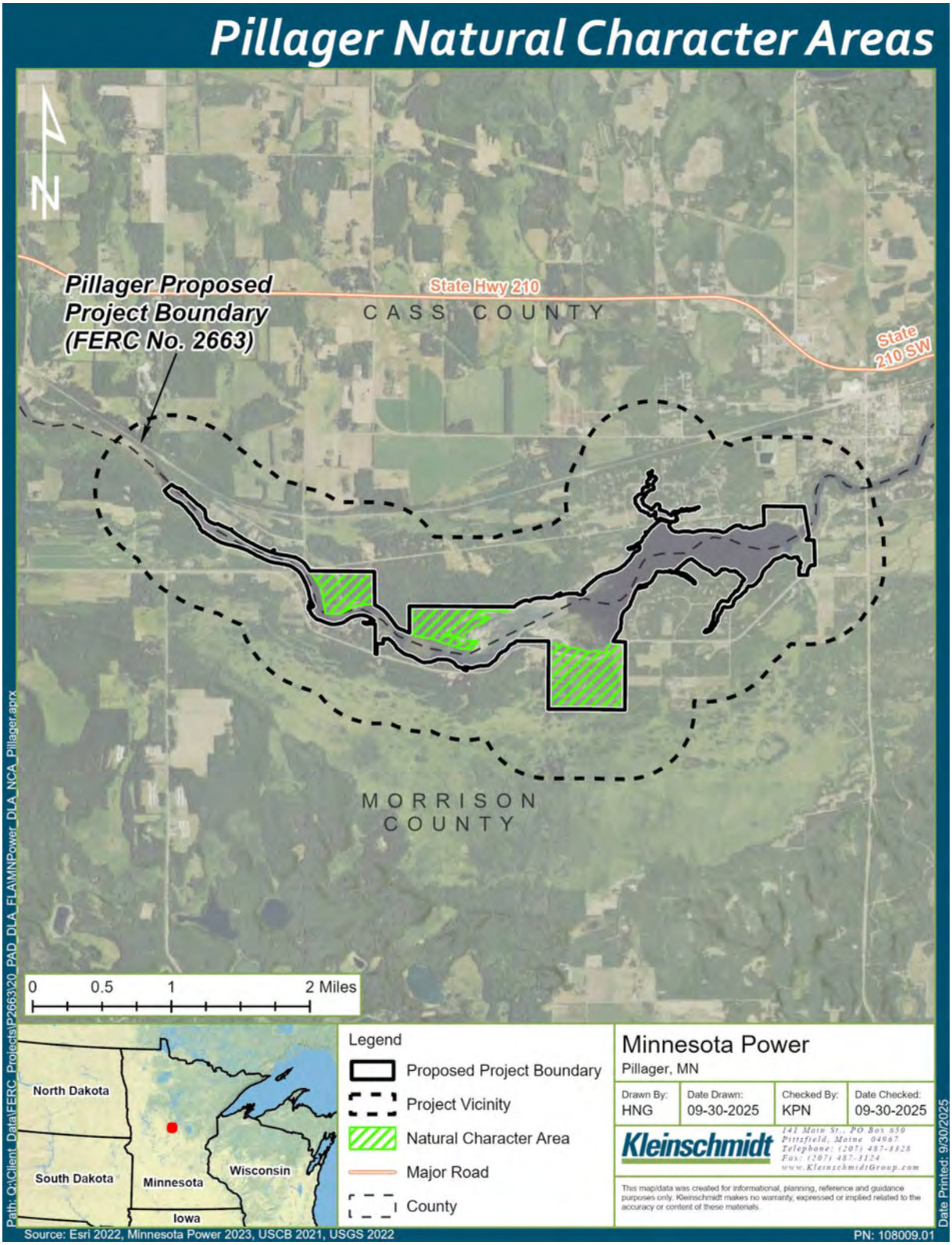


Figure 4-31: Pillager Project Natural Character Area



4.9.2 Environmental Effects

At the Little Falls Project, public access to the reservoir is permitted. There are four Commission-approved recreation sites at the Sylvan Project and four at the Pillager Project. The Licensee proposes to continue operating all three Projects, including allowing access and the operation of the existing Commission-approved recreation sites. Proposed modifications to the Projects Boundaries will not affect access to recreation sites or public use areas and the proposed modifications to the boundaries ensure inclusion of the public access roads to the recreation sites. The proposed modifications to the boundaries involve the removal of lands not necessary for Project purposes. The shoreline areas of the recreational leases at the Sylvan and Pillager Projects will continue to be managed under a revised Land Management Plan. No changes to facilities or operations at the Projects are proposed, and the proposed modifications to the Projects Boundaries ensure continued access to the recreation sites; therefore, no impacts to existing recreational resources or public access opportunities are anticipated.

The Licensee is proposing modifications to the Projects' Boundaries as described in Section 3.2.4. Proposed modifications to the Projects' Boundaries primarily involve the removal of lands and waters not necessary for Project purposes. While acreage of land cover classes within the Projects' Boundaries would change (as described in Table 4-42, Table 4-43, and Table 4-44), no physical changes to these resources or associated land use are proposed. Overall, the proposed modifications to the Projects Boundaries result in a more accurate representation of each Project's footprint by excluding lands and waters not essential to operations, maintenance, recreation, resource protection, or other FERC-defined purposes. For these reasons, no impacts to existing land use at the Projects are anticipated.

4.9.3 Protection, Mitigation, Enhancement Measures

The Licensee does not directly provide recreational facilities at the Little Falls Project, although there are several sites that provide public access to the Little Falls Project reservoir. The Licensee proposes to continue to allow public access to the Little Falls Project reservoir for the purposes of recreation. No new PME measures related to recreation are proposed at the Little Falls Project.

The Licensee will continue to provide public access to the Little Falls Project reservoir and to the Commission-approved recreation sites at the Sylvan and Pillager Projects throughout the term of the new licenses. The Licensee proposes to continue maintenance and vegetation management of the MP operated recreation sites.

Upon license issuance, the Licensee proposes to develop and implement throughout the term of the new license, revised Land Management Plans for the Sylvan and Pillager Projects to accurately reflect land management within any modified project boundaries. The Licensee proposes to maintain the NCA designations on the MP-owned lands at the Pillager Project. These designations will be incorporated into the revised Pillager Project Land Management Plan and the Licensee will continue to restrict permanent development on the NCA lands.

4.9.4 Unavoidable Adverse Effects

Continued operation of the Projects, as proposed, will have no significant unavoidable adverse impacts to recreation resources or land use.

4.9.5 References

City of Little Falls. 2025. Parks Information Public Web Map. Available online: https://www.arcgis.com/apps/MapTour/index.html?appid=54c6563540174669ae061149b76380d0 Accessed: July 2025.

Federal Energy Regulatory Commission (FERC). 2016, July 22. Order Approving Sylvan Project Land Management Plan Update. 156 ¶ 62,059.

Merjent, Inc. 2025a, February. Recreation Use and Facility Inventory Study – Sylvan Hydroelectric Project (FERC P-2663).

Merjent, Inc. 2025b, February. Recreation Use and Facility Inventory Study – Sylvan Hydroelectric Project (FERC P-2663).

Minnesota Department of Natural Resources (Minnesota DNR). 2019, November. Minnesota Statewide Comprehensive Outdoor Recreation Plan, 2020-2024. Available online: https://files.dnr.state.mn.us/aboutdnr/reports/scorp_final_2024.pdf Accessed: July 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025a. Minnesota's Wild & Scenic Rivers Program. Available online: https://www.dnr.state.mn.us/waters/watermgmt_section/wild_scenic/index.html#:~:text=The%20Minnesota%20State%20Wild%20%26%20Scenic,%2C%20cultural%2C%20and%20recreational%20values. Accessed: July 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025b. Crow Wing River State Water Trail. Available online: https://www.dnr.state.mn.us/watertrails/crowwingriver/index.html. Accessed: July 2025.

Minnesota Department of Natural Resources (Minnesota DNR). 2025c. State Comprehensive Outdoor Recreation Plan. Available online: https://www.dnr.state.mn.us/aboutdnr/reports/scorp/index.html. Accessed: September 2025.

Minnesota Power (MP). 2016a. Sylvan Hydroelectric FERC Project No. 2454 Land Management Plan Update.

Minnesota Power (MP). 2016b. Pillager Hydroelectric FERC Project No. 2663 Land Management Plan Update.

Minnesota Power (MP). 2025a, September. 2025 Recreation Use Study – Sylvan Hydroelectric Project (FERC P-2454).

Minnesota Power (MP). 2025b, September. Recreation Use Study – Pillager Hydroelectric Project (FERC P-2663).

Morrison County, MN. 2025. Belle Prairie County Park. Available online: https://www.co.morrison.mn.us/Facilities/Facility/Details/Belle-Prairie-County-Park-1 Accessed: July 2025.

National Park Service (NPS). 2025a. Nationwide Rivers Inventory. Available online: https://www.nps.gov/maps/full.html?mapId=8adbe798-0d7e-40fb-bd48-225513d64977 Accessed: July 2025.

National Park Service (NPS). 2025b. National Trails System. Available online: https://www.nps.gov/subjects/nationaltrailssystem/upload/National-Trails-map.pdf Accessed: July 2025.

National Wild and Scenic Rivers System. 2025. Minnesota. Available online: https://www.rivers.gov/minnesota.php Accessed: July 2025.

U.S. Department of Agriculture (USDA) Forest Service. 2025a. Wilderness & Wild and Scenic Rivers & Wilderness Study Areas. Available online: https://data.fs.usda.gov/geodata/other_fs/wilderness/index.php Accessed: July 2025.

U.S. Geological Survey (USGS). 2021. National Land Cover Database (NLCD) Land Cover Change Index Conterminous United States.

4.10 Aesthetic Resources

4.10.1 Affected Environment

4.10.1.1 Little Falls Project

The Little Falls Project is located in an urban landscape. The dam and lower portion of the reservoir are located in the city of Little Falls, bordered by industrial lands, businesses, residential neighborhoods, and city parks. The lands immediately surrounding the Little Falls Project are typical of central Minnesota scenery. The Little Falls Project is depicted in Photo 4-28 through Photo 4-33.

Photo 4-28: View of Little Falls Project from Reservoir



Photo 4-29: Little Falls Project Spillway Facing East



Photo 4-30: Little Falls Project Spillway



Photo 4-31: Little Falls Project Tailwater



Photo 4-32: Little Falls Project Powerhouses



Photo 4-33: Little Falls Project Powerhouse Units 5 and 6



4.10.1.2 Sylvan Project

The Sylvan Project is located in a rural environment offering views of rolling topography and natural vegetation. The lands surrounding the reservoir are primarily forested. The majority of the south shore of the Crow Wing River is within Camp Ripley, and this area remains undeveloped and visually attractive to recreational users. The lands on the north shore of the Crow Wing River are similar, with the addition of scattered residential home development. Lands along the Gull River shoreline contain seasonal and permanent residences south of the Highway 210 bridge. The Sylvan reservoir in the area north of the Highway 210 bridge is shallow with views of wetlands, and aquatic vegetation. In the northernmost portion of the Gull River, the Sylvan reservoir transitions to a narrow river channel bordered by wetlands. This area is mostly forested or open wetlands, with some open farmland. In general, this area retains its natural, undeveloped character (MP 2016a, 1991b). The Sylvan Project is depicted in Photo 4-34 through Photo 4-39.

Photo 4-34: Sylvan Project Reservoir and Dam



Photo 4-35: Sylvan Project Reservoir



Photo 4-36: View of Sylvan Project Dam



Photo 4-37: View of Sylvan Project from Downstream



Photo 4-38: Sylvan Project Tailwater View from Spillway



Photo 4-39: Sylvan Project Reservoir Shoreline



4.10.1.3 Pillager Project

The Pillager Project is located in a rural setting, offering views of rolling topography and natural vegetation types. The lands surrounding the reservoir are primarily a mixture of forested and open areas, with some agricultural land and areas developed with seasonal or permanent residences (MP 1995, 2016b). MP currently implements an NCA designation for portions of company-owned lands to retain the shoreline's natural character and aesthetics at the Pillager Project. Forest and wildlife management activities are allowed on NCA designated land; however, permanent development is restricted to preserve the aesthetic qualities within the area (MP 2016b). The Pillager Project is depicted in Photo 4-40 and Photo 4-41.

Photo 4-40: View of Pillager Project from Downstream



Photo 4-41: Pillager Project Dam



4.10.2 Environmental Effects

During prefiling consultation, no issues or study requests related to aesthetics were raised by stakeholders. The Licensee proposes to continue operating the Projects in a run-of-river mode. Although the Projects Boundaries are proposed to be modified only include lands and waters necessary for Project purposes, the Licensee has proposed no changes to the Projects' facilities or their operation that would affect the viewshed. Additionally, the Licensee proposes to maintain the NCA designations on certain MP–owned lands at the Pillager Project, which are intended to retain the shoreline's present natural character and aesthetics. The Licensee will continue to restrict permanent development on the NCA lands in accordance with the Pillager Project Land Management Plan.

4.10.3 Protection, Mitigation, Enhancement Measures

The Licensee proposes to maintain the NCA designations on the MP-owned lands at the Pillager Project. These designations, which aim to preserve the shoreline's natural character and aesthetics, will be incorporated into a revised Pillager Project Land Management Plan that the Licensee intends to develop following license issuance. No other PME measures regarding aesthetic resources are proposed.

4.10.4 Unavoidable Adverse Effects

Continued operation of the Projects as proposed will have no significant unavoidable adverse impacts to aesthetic resources.

4.10.5 References

Minnesota Power (MP). 1991a. Application for New License Major Water Power Project. Little Falls Hydroelectric Project. FERC Project No. 2352, Morrison County, Minnesota.

Minnesota Power (MP). 1991b. Application for New License Major Water Power Project. Sylvan Hydroelectric Project. FERC Project No. 2454, Cass, Crow Wing and Morrison Counties, Minnesota.

Minnesota Power (MP). 1995. Application for New License Major Water Power Project. Pillager Hydroelectric Project. FERC Project No. 2663, Cass and Morrison Counties, Minnesota.

Minnesota Power (MP). 2016a. Land Management Plan Update. Sylvan Hydroelectric FERC Project No. 2454.

Minnesota Power (MP). 2016b. Land Management Plan Update. Pillager Hydroelectric FERC Project No. 2663.

4.11 Cultural Resources

4.11.1 Affected Environment

4.11.1.1 Prehistoric Context

The archaeological record of Minnesota dates back to approximately 12,000 years ago (before present [B.P.]) (Forsberg 2003). Archaeologists have divided the Minnesota record into five main periods known as the Early Paleoindian, Late Paleoindian, Archaic, Initial Woodland, and Terminal Woodland cultural periods (Table 4-45).

Table 4-45: Minnesota's Cultural Periods

Year Range	Cultural Period
12,000 B.P. 10,000 B.P.	Early Paleoindian
10,000 B.P. 8,000 B.P.	Late Paleoindian
8,000 B.P. 2,500 B.P.	Archaic Period
2,500 B.P. 1,500 B.P.	Initial Woodland Period
1,500 B.P. 360 B.P.	Terminal Woodland Period

Source: Forsberg 2003

* B.P. = "Before Present"

Paleoindian Period (12,000 B.P. – 8,000 B.P.)

Paleoindian people are the earliest prehistoric inhabitants in the region, and throughout North America. Paleoindian people are likely the first people to migrate into North America in their pursuit of large game. The hallmark of Paleoindian people is the fluted spear point, used to hunt large game species, some of which are now extinct. These spear points possess a long, groove-like scar caused by a flake struck from their base on both faces.

The Early Paleoindian Period is poorly understood in Minnesota, as no archaeologic sites are identified (Forsberg 2003). It is thought that Paleoindian people began occupying Minnesota as the last glaciers retreated. These Paleoindian people likely lived in small, highly mobile bands, with little sense of regional identity, hunting large now extinct animals such as the mammoth, mastodon, or camel (Forsberg 2003).

During the Late Paleoindian Period, cultural changes seemed to coincide with climatic and subsequent environmental shifts in the landscape of Minnesota (Forsberg 2003). What was initially tundra vegetation, turned into boreal forest dominated by spruce as the climate warmed. The Late Paleoindian habits very much resembled those of the Early Paleoindians as these peoples moved frequently and depended primarily upon hunting for sustenance (Forsberg 2003). However, as the communities of plants and animals changed in response to changing climate conditions, so too did food sources. As the mammoth, camel and other megafauna became extinct, the Late Paleoindian people increasingly turned towards bison and other smaller animals as well as plants for food (Forsberg 2003).

Archaic Period (8,000 B.P. – 2,500 B.P.)

During Archaic times, Minnesota's occupants continued to adapt to ongoing changes in climate and vegetation, as the trend towards a warmer and drier climate continued, along with the northeasterly expansion of prairie vegetation (Forsberg 2003). In general, changes in subsistence and settlement patterns differentiate the Archaic tradition from the preceding Late Paleoindian period. Archaic people became somewhat sedentary, as they learned to use more diverse plant and animal resources for subsistence, and their tool technology changed and diversified (Forsberg 2003). They used grinding stones to process plant foods and made tools from metamorphic or igneous rocks for cutting and chopping wood. By approximately 7,000-years B.P., Archaic people began to develop copper tool technology, using pieces of native copper mined from the Lake Superior region or found locally in glacial drift (Forsberg 2003). They fashioned knives, projectile points, gouges, other tools, and decorative items from copper. In the past, archaeologists thought that copper artifacts from the Midwest represented part of an "Old Copper" industry dating to later Archaic times (ca. 5,000-3,000-years B.P.); however, archaeologists now recognize evidence that Native Americans used copper before and after this period (Forsberg 2003).

In parts of the Midwest where greater numbers of Archaic sites are identified and excavated, archaeologists divide the Archaic tradition chronologically into three periods: Early, Middle, and Late (Forsberg 2003). Known Archaic sites are rare in Minnesota, and it has not yet been possible to assign this chronology to the region with any confidence. Moreover, because the environment influenced the lifeways and material culture of Archaic people, their differences in the subsistence, settlement strategies, and toolkits are

likely a product of their environment (Forsberg 2003). Excavations of Archaic sites in western Minnesota at the Itasca Bison Kill site, in Itasca County, and the Canning site, in Norman County, indicate a subsistence pattern that focused on hunting bison but also exploited smaller animals and plant foods. Farther to the east, in areas that were continuously forested during Archaic times, a different adaptive pattern is evident. Here, subsistence focused on riverine resources (like fish and freshwater clams), nuts, and deer (Forsberg 2003).

Woodland Period (2,500 B.P. – 360 B.P.)

During the Woodland era, the climate continued moving toward current conditions (Forsberg 2003). Prairie vegetation decreased while forest vegetation (pine and oak) increased, the prairie/forest border reached its present location, and lake levels rose across the region. Although the hunter-gatherer way of life continued in the Woodland Period, the introduction of pottery and the construction of earthen mounds for burial of the dead are hallmarks of the time. These innovations were not adopted in all areas of the state at the same time or necessarily together (Gibbon et al. 2002). The result was overlap in time between Late Archaic and early Initial Woodland cultures, just as there had been an earlier period of transition between Paleoindian and Archaic cultures.

Because Initial Woodland sites are not as deeply buried as earlier sites and burial mounds frequently mark their presence, they are more easily found and more frequently excavated by archaeologists. They have also been grouped together into archaeological cultures. This greater degree of attention is reflected in the presence, for the first time, of the names of regional archaeological cultures including the Howard Lake, Fox Lake, Malmo, and Laurel (Gibbon et al. 2002).

Terminal Woodland people were hunters and gatherers (Gibbon et al. 2002). However, their economy in the mixed hardwood forests to the north was increasingly supplemented by the harvesting of wild rice. The number of people in the region rose dramatically, and major abrupt changes occurred in ceramics and other artifact forms and in settlement patterns. Archaeologists have generally relied on the geographic distribution of the distinctive ceramics and burial practices of the period to identify archaeological cultures in this northern region of the state (Gibbon et al. 2002). Three Terminal Woodland complexes have been identified to have existed in what is now northern Minnesota: Kathio, Blackduck, and Psinomani.

In the southern part of the state covered by deciduous forests and prairies, some Terminal Woodland people gradually began growing maize (Gibbon et al. 2002). Some people built distinctive effigy mounds having the shape of birds, bears, and other animals. Most of these southern Terminal Woodland societies abruptly adopted new life ways and artifact assemblages. Archaeologists group these transformed societies together and regard them as a northern expression of a "Mississippian" way of life. Mississippian sites are easily distinguished from Woodland sites by their distinctive ceramics, the larger size and greater artifact density and by the presence of maize fragments. Three Mississippian complexes have been identified in what is now southern Minnesota: Silvernale, Oneota, and Plains Village (Gibbon et al. 2002).

It was Mississippian people to the south and Terminal Woodland people to the north who met the first Europeans to visit the state in the middle of the seventeenth century (Gibbon et al. 2002).

4.11.1.2 Historic Context

According to most accounts, the first Europeans to arrive in Minnesota were two Frenchmen, Sieur des Groseilliers and Sieur de Radisson (Gibbon et al. 2002). Although the details are open to dispute, they entered Minnesota between 1659 and 1660. Like other Europeans and Americans who followed them, they came in small numbers in search of natural resources, such as furs. By 1678, merchants in Quebec and Montreal had formed a company to trade with the Dakota, the dominant Native American people in the state of Minnesota at the time. These fur trade-related activities initiated the French period of exploration and occupation in Minnesota, which lasted into the early 1760s (Gibbon et al. 2002).

Following the Treaty of Paris in 1763, the British began their half-century of activity in Minnesota (Gibbon et al. 2002). Like the French, their primary interest was exploration and the fur trade. During this period, the British built many fur trade posts across the state. It was also during this time that major changes occurred in the distribution of Native American people in the region.

4.11.1.3 Area of Potential Effects

In a letter dated June 18, 2024 (prior to conducting Cultural Resource studies), MP requested review and concurrence of the Area of Potential Effects (APE)[19] from the Minnesota SHPO, Tribes, and other applicable state agencies for the Projects. On July 15, 2024, Minnesota SHPO concurred that the APEs for each Project, defined as the existing FERC Project Boundary, were appropriate to take into account the potential direct and indirect effects of the federal undertaking. The APEs (encompassing the existing FERC approved Project Boundaries) were the areas studied for the Cultural Resource Studies for the relicensing process (study results discussed in Sections 4.11.1.4 and 4.11.1.5).

MP is proposing to modify the APEs for the new license term to reflect the proposed Project Boundary modifications (detailed in Section 3.2.4). MP's proposed Project Boundary modifications fully encompass the geographic area in which the Projects' relicensing and continued operation may directly or indirectly cause alterations in the character or use of historic properties, and there is no justification for including additional land in the APE beyond land needed for Project purposes. Accordingly, MP is proposing to modify the Projects' APEs to only include the land that is needed for Project purposes. MP is requesting concurrence on the proposed APEs for the Projects from Minnesota SHPO and participating Tribes within the 90-day DLA comment period. Effects of the proposed Project Boundary modifications on NRHP-listed, eligible, potentially eligible, or unevaluated cultural resources are discussed in Section 4.11.2.

4.11.1.4 Architectural Review

On behalf of MP, Merjent, Inc. (Merjent) conducted a historic architectural resources study during the Projects' relicensing. Merjent performed a Desktop Historic Architectural Resources Survey (literature review), conducted a reconnaissance survey, and provided an evaluation of the potential effects the Projects may have on historic architectural resources. Phase I Architectural History Reconnaissance Surveys were filed with the ISR on February 7, 2025. Revised reports incorporating stakeholder comments are provided in Appendix E-5 (Cultural Resources Information [Privileged]).

[19] The APE is the geographic area within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist.

Little Falls Project

Merjent performed a literature review in 2024 and identified 852 previously recorded historic architectural resources within a 1-mile radius of the existing Little Falls Project APE.[20] Of these, nine aboveground resources intersected the existing Little Falls Project APE. Merjent performed a reconnaissance level field survey on September 9, 2024, which included the Little Falls Hydroelectric dam and surrounding facilities and related buildings. Overall, 11 previously recorded historic architectural resources were surveyed by Merjent during fieldwork, eight of which were previously recommended not eligible for listing on the NRHP (Merjent 2025a). Table 4-46 summarizes the historic architectural resources surveyed by Merjent and associated recommendations for listing on the NRHP within the existing Little Falls Project APE. Merjent (2025a) recommended a finding of no effect to historic properties related to the relicensing of the Little Falls Project, and no further investigation or mitigation was recommended.

Table 4-46: Historic Architectural Resources Surveyed by Merjent within the Existing Little Falls Project APE

Inventory Number	Previously Recorded NRHP Eligibility	Merjent NRHP Eligibility Recommendation
MO-GRE-00191	Not Eligible	Not Eligible
MO-GRE-00196	Not Eligible	Not Eligible
MO-LFC-00026	Eligible	Not Eligible
MO-LFC-00076	Listed	Listed
MO-LFC-00130	Eligible	Eligible
MO-LFC-00161	Not Eligible	Not Eligible
MO-LFC-00837[1]	Not Eligible	Not Eligible
TO-RRD-00001	Not Eligible	Not Eligible
XX-ROD-00040	Not Eligible	Not Eligible
XX-ROD-00180	Not Eligible	Not Eligible
XX-RRD-NPR022	Not Eligible	Not Eligible

Source: Merjent 2025a

[1] This resource was later determined in September 2025 to have been demolished and replaced by a modern structure (Merjent 2025a).

[20] A separate archaeological report evaluates and describes the belowground resources (discussed in Section 4.11.1.5).

The Little Falls Hydroelectric Development (hydroelectric facilities) was partially constructed in 1887 and rebuilt or completed between 1912 and 1920. The hydroelectric facilities were inventoried and evaluated in 1991 for listing on the NRHP. The facilities reviewed included the switchyard structure, powerhouse units, gates, spillways, log sluice, piers, and east bank retaining wall. Most of the components, as contributing resources, are part of the dam and electrical generation plant. Within the development area, one shop/garage building erected in 1983 is considered a non-contributing resource. The 1991 application suggests the entire complex might be NRHP-eligible under both Criterion A and Criterion C. The Minnesota SHPO deemed the facilities eligible for listing on the NRHP in 1991 (IMA 1996a). Merjent (2025a) recommended the hydroelectric station significant under Criterion A for its contribution to the history of Little Falls and Morrison County.

Sylvan Project

Merjent performed a literature review in 2024 and identified 12 previously recorded historic architectural resources within a 1-mile radius of the existing Sylvan Project APE.[21] Of these, six aboveground resources intersected the existing Sylvan Project APE. Merjent performed a reconnaissance level field survey on September 10, 2024, which included the Sylvan Hydroelectric dam and surrounding facilities and related buildings, identifying additional historic architectural resources within the existing Sylvan Project APE. Overall, 13 historic architectural resources were surveyed by Merjent during fieldwork, six of which were previously recorded (Merjent 2025b). Table 4-47 summarizes the historic architectural resources surveyed by Merjent and associated recommendations for listing on the NRHP within the existing Sylvan Project APE.[22] Merjent (2025b) recommended a finding of no effect to historic properties related to the relicensing of the Sylvan Project, and no further investigation or mitigation was recommended.

[21] A separate archaeological report evaluates and describes the belowground resources.

[22] Merjent identified seven historic-aged resources for survey after reviewing historic aerial imaging. However, Merjent was unable to survey the resources from the public right-of-way due to mature vegetation and trees blocking the buildings from view. Merjent was unable to clearly evaluate their eligibility for the NRHP and are unevaluated.

Table 4-47: Historic Architectural Resources Surveyed by Merjent within the Existing Sylvan Project APE

Inventory Number	Previously Recorded NRHP Eligibility	Merjent NRHP Eligibility Recommendation
CA-SLV-00003	Eligible	Eligible
CA-SLV-00005	Not Eligible	Not Eligible
CW-UOG-00001	Not Eligible	Not Eligible
CA-SLV-0012	-	Unevaluated
CA-SLV-0013	-	Unevaluated
CA-SLV-0014	-	Unevaluated
CA-SLV-0015	-	Unevaluated
CA-SLV-0016	-	Unevaluated
CA-SLV-0017	-	Unevaluated
CA-SLV-0018	-	Unevaluated
XX-ROD-00153	Not Eligible	Not Eligible
XX-RRD-NPR007[1]	Unevaluated	Eligible
XX-RRD-NPR021[1]	Eligible	Eligible

[1] XX-RRD-NPR021 is a duplicate of XX-RRD-NPR007.

Source: Merjent 2025b

Construction of the Sylvan dam and hydroelectric facilities began in 1912 by the Cuyana Range Power Company and was completed in 1913 (IMA 1996b). The Sylvan Project was acquired by Minnesota Power and Light (now known as Minnesota Power) in 1924. The hydroelectric facilities were inventoried and evaluated in 1991 for listing on the NRHP (IMA 1996b). The facilities reviewed included the powerhouse, gates, spillways, embankments, and dikes. The dam and electrical generation plant (headworks and powerhouse) are considered contributing resources. The 1991 application suggests the entire complex might be NRHP-eligible under Criterion A. The Minnesota SHPO deemed the facilities eligible for listing on the NRHP in 1991 (IMA 1996b). Merjent (2025b) recommended the hydroelectric station significant under Criterion A as it retains sufficient integrity to portray historical importance.

Pillager Project

Merjent performed a literature review in 2024 and identified 12 previously recorded historic architectural resources within a 1-mile radius of the existing Pillager Project APE.[23] Of these, five aboveground resources intersected the existing Pillager Project APE. Merjent performed a reconnaissance level field survey on September 11, 2024, which included the Pillager Hydroelectric dam and surrounding facilities and related buildings, identifying additional historic architectural resources within the existing Pillager Project APE. Overall, 17 historic architectural resources were surveyed by Merjent during fieldwork, five of which were previously recorded (Merjent 2025c). Table 4-48 summarizes the historic architectural resources surveyed by Merjent and associated recommendations for listing on the NRHP within the existing Pillager Project APE.[24] Merjent (2025c) recommended a finding of no effect to historic properties related to the relicensing of the Pillager Project, and no further investigation or mitigation was recommended.

Table 4-48: Historic Architectural Resources Surveyed by Merjent within the Existing Pillager Project APE

Inventory Number	Previously Recorded NRHP Eligibility	Merjent NRHP Eligibility Recommendation
CA-MAY-00003	Unevaluated	Unevaluated
CA-PLC-00002	Eligible	Eligible
CA-SLV-00002	Unevaluated	Unevaluated
CA-SLV-00019	-	Unevaluated
CA-SLV-00020	-	Unevaluated
CA-SLV-00021	-	Unevaluated
CA-SLV-00022	-	Unevaluated
MO-MOT-00004	-	Not Eligible
MO-MOT-00005	-	Not Eligible
MO-MOT-00006	-	Unevaluated
MO-ROS-00003	-	Unevaluated

[23] A separate archaeological report evaluates and describes the belowground resources (discussed in Section 4.11.1.5).

[24] Merjent identified 10 historic-aged resources for survey after reviewing historic aerial imaging. However, Merjent was unable to survey the resources from the public right-of-way due to mature vegetation and trees blocking the buildings from view. Merjent was unable to clearly evaluate their eligibility for the NRHP and are unevaluated.

Inventory Number	Previously Recorded NRHP Eligibility	Merjent NRHP Eligibility Recommendation
MO-ROS-00004	-	Unevaluated
MO-ROS-00005	-	Unevaluated
MO-ROS-00006	-	Unevaluated
MO-ROS-00007	-	Unevaluated
XX-RRD-NPR007[1]	Unevaluated	Eligible
XX-RRD-NPR021[1]	Eligible	Eligible

[1] XX-RRD-NPR021 is a duplicate of XX-RRD-NPR007.

Source: Merjent 2025c

Construction of the Pillager dam and hydroelectric facilities began in 1916 and was completed in 1917. The hydroelectric facilities were inventoried and evaluated in 1994 for listing on the NRHP. The facilities reviewed included the powerhouse, gates, spillways, embankments, and dikes. The dam and electrical generation plant (headworks and powerhouse) are considered contributing resources. The 1991 application suggests the entire complex might be NRHP-eligible under Criterion A. The Minnesota SHPO deemed the facilities eligible for listing on the NRHP in 1994 (IMA 1999). Merjent (2025c) recommended the hydroelectric station significant under Criterion A as it retains moderate to high integrity to portray historical importance.

4.11.1.5 Archaeological Review

On behalf of MP, Merjent conducted a Desktop Archaeological Resources Survey (literature search), a reconnaissance survey to identify unrecorded archaeological resources, a conditions assessment (field survey) to document the current condition of archaeological resources, and provided an evaluation of the potential effects the Projects may have on archaeological resources. Phase I Archaeological Investigation and Conditions Assessments were filed with the ISR on February 7, 2025. Revised reports incorporating stakeholder comments are provided in Appendix E-5 (privileged).

Little Falls Project

Merjent conducted a literature search in 2024 that focused on previously identified archaeological sites, cemeteries, and previous archaeological surveys/inventories. Merjent identified 31 previous archaeological surveys conducted within a 1-mile radius of the existing Little Falls Project APE, 20 of which intersected the existing APE. The literature

search identified 46 previously identified archaeological sites within a 1-mile radius of the existing Little Falls Project APE, 24 of which intersected the existing APE. One site (21MO0294) was previously determined not eligible for listing on the NRHP and was removed from further assessment. Merjent conducted a reconnaissance survey of the existing APE to determine if unrecorded archaeological resources are present and no new sites were identified; however, the boundaries of 21MO0115 were expanded. Merjent also performed a conditions assessment (field visit) to document the current condition of eligible or potentially eligible archaeological resources within the existing APE.[25] Merjent (2025d) did not identify any project-related adverse effects on the surveyed archaeological resources within the existing APE.[26] In addition, there were no instances of project-induced erosion observed for the sites within the existing APE (Merjent 2025d). Table 4-49 summarizes the archaeological resources surveyed by Merjent within the existing Little Falls Project APE, associated recommendations for listing on the NRHP, and potential Project effects.[27]

[25] Eighty-five percent of the existing APE is within the Mississippi River. The terrestrial portion of the existing APE is composed of the islands within the river and small portions of the shoreline. Much of the land within the existing APE is privately owned. MP contacted landowners for permission to survey parcels within the existing APE; MP either owns or was granted access to 17 percent of the land within the existing APE (Merjent 2025d).

[26] Merjent identified an adverse effect occurring when a historic property's or archaeological site's characteristics that qualify it or may potentially qualify it for the NRHP are affected in a way that diminishes its integrity of location, design, setting, materials, workmanship, feeling, or association. This can include physical destruction, incompatible alterations, removal of the property from its location, changes to its use or setting, or the introduction of negative visual or auditory elements. A non-adverse effect is when a non-Project or Project effect exists but does not diminish a historic property's or archaeological site's qualifying or potentially qualifying characteristics or integrity. Non-adverse effects occur when a non-Project or Project effect has had a minor impact.

[27] Project effects are defined as impacts or alterations to archaeological sites such as but not limited to shoreline erosion, land development and management, pedestrian trails, recreational use and development, or vandalism on properties caused by project-related activities, regardless of land ownership.

Table 4-49: Archaeological Resources Surveyed by Merjent within the Existing Little Falls Project APE

Site Number	Previously Recorded NRHP Eligibility	Merjent NRHP Eligibility Recommendations	Potential Project Effects[1]
21MO0006	Unevaluated	Remain Unevaluated	Non-adverse effect
21MO0007	Unevaluated	Remain Unevaluated	No effect
21MO0020	Listed	Listed	No effect
21MO0033	Unevaluated	Remain Unevaluated	No effect
21MO0034	Unevaluated	Remain Unevaluated	No effect
21MO0035	Unevaluated	Remain Unevaluated	No effect
21MO0036	Determined Eligible	Remain Determined Eligible	No effect
21MO0037	Unevaluated	Remain Unevaluated	No effect
21MO0038	Unevaluated	Remain Unevaluated	No effect
21MO0102	Unevaluated	Remain Unevaluated	Non-adverse effect
21MO0103	Unevaluated	Not Eligible	Non-adverse effect
21MO0108[2]	Unevaluated	Remain Unevaluated	No effect
21MO0111	Determined Eligible	Remain Determined Eligible	No effect
21MO0115	Determined Eligible	Remain Determined Eligible	No effect
21MO0116	Determined Eligible	Remain Determined Eligible	No effect
21MOad	Unevaluated	Remain Unevaluated	No effect
21MOaf	Unevaluated	Remain Unevaluated	Non-adverse effect
21MOag	Unevaluated	Remain Unevaluated	No effect
21MOah	Unevaluated	Remain Unevaluated	No effect
21MOo	Unevaluated	Remain Unevaluated	Non-adverse effect
21MOp	Unevaluated	Remain Unevaluated	No effect
21MOq	Unevaluated	Remain Unevaluated	Non-adverse effect
21MOr[2]	Unevaluated	Remain Unevaluated	No effect

Source: Merjent 2025d

[1] The table does not include non-Project effects identified by Merjent 2025d. No effect indicates that no Project effects were identified by Merjent 2025d.

[2] Conditions assessment was inferred as there was no land and/or river access for close inspection of shoreline.

Sylvan Project

Merjent conducted a literature search in 2024 that focused on previously identified archaeological sites, cemeteries, and previous archaeological surveys/inventories. Merjent identified 59 previous archaeological surveys conducted within a 1-mile radius of the existing Sylvan Project APE, 44 of which intersected the existing APE. The literature search identified 99 previously identified archaeological sites within a 1-mile radius of the existing Sylvan Project APE, 52 of which intersected the existing APE. Merjent conducted a reconnaissance survey of the existing APE to determine if unrecorded archaeological resources are present and no new sites were identified. Merjent also performed a conditions assessment (field visit) to document the current condition of eligible or potentially eligible archaeological resources within the existing APE.[28] Merjent (2025e) did not identify any project-related adverse effects on the surveyed archaeological resources within the existing APE. One isolated incident of limited (as opposed to moderate or major) erosion was observed within the Chippewa Agency component of the 21CA0055 historic district. However, the erosion may be related to natural drainage along the shoreline. MP has installed No Camping and Habitat Restoration signs along the shoreline to prevent public use that could further erode soil within the site (Merjent 2025e). Table 4-50 summarizes the archaeological resources surveyed by Merjent within the existing Sylvan Project APE, associated recommendations for listing on the NRHP, and potential Project effects.

[28] Fifty-five percent of the existing APE is surface water. The terrestrial portion of the existing APE is composed of forested areas, developed land, National Wetlands Inventory (NWI)-defined wetlands and marshlands, and agricultural fields. Much of the land within the existing APE is privately owned. MP contacted landowners for permission to survey parcels within the existing APE; MP either owns or was granted access to 60 percent of the land within the existing APE (Merjent 2025e).

Table 4-50: Archaeological Resources Surveyed by Merjent within the Existing Sylvan Project APE

Site Number	Previously Recorded NRHP Eligibility	Merjent NRHP Eligibility Recommendation	Potential Project Effects[1]
21CA0055 (CA-SLV-00006)	Listed	Remain Listed	Non-adverse effects
21CA0065	Determined Eligible	Remain Determined Eligible	Unassessed; no land access
21CA0189	Determined Eligible	Remain Determined Eligible	Unassessed; no land access
21CA0190[2]	Portion of site Listed/ Portion of site Determined Eligible	Remain Listed/ Determined Eligible	No effect
21CA0191	Determined Eligible	Remain Determined Eligible	No effect
21CA0192	Determined Eligible	Remain Determined Eligible	No effect
21CA0193[2]	Portion of site Listed/ Portion of site Determined Eligible	Remain Listed/ Determined Eligible	No effect
21CA0194	Determined Eligible	Remain Determined Eligible	No effect
21CA0195	Determined Eligible	Remain Determined Eligible	No effect
21CA0196	Determined Eligible	Remain Determined Eligible	No effect
21CA0199	Determined Eligible	Remain Determined Eligible	No effect
21CA0200	Determined Eligible	Remain Determined Eligible	No effect
21CA0202	Determined Eligible	Remain Determined Eligible	No effect
21CA0230	Unevaluated	Not Eligible	No effect
21CA0231	Unevaluated	Not Eligible	No effect
21CA0504[2]	Listed	Remain Listed	No effect
21CA0507	Unevaluated	Not Eligible	No effect
21CAe	Unevaluated	Remain Unevaluated	Unassessed; no land access
21CAf	Unevaluated	Remain Unevaluated	No effect
21CAg	Unevaluated	Site not present and/or mis-plotted	No effect

Site Number	Previously Recorded NRHP Eligibility	Merjent NRHP Eligibility Recommendation	Potential Project Effects[1]
21CAdz	Unevaluated	Remain Unevaluated	No effect
21MO0091	Unevaluated	Remain Unevaluated	Unassessed; no land access
21MO0099	Unevaluated	Remain Unevaluated	Unassessed; no land access
21MO0109	Determined Eligible	Remain Determined Eligible	Unassessed; no land access
21MO0110	Determined Eligible	Remain Determined Eligible	No effect
21MO0144	Unevaluated	Remain Unevaluated	No effect
21MO0145	Unevaluated	Remain Unevaluated	Unassessed; no land access
21MO0258	Unevaluated	Remain Unevaluated	Unassessed; no land access
21MO0260	Unevaluated	Remain Unevaluated	Unassessed; no land access
21MO0261	Unevaluated	Remain Unevaluated	Unassessed; no land access
21MO0271	Unevaluated	Remain Unevaluated	No effect
21MO0318	Determined Eligible	Remain Determined Eligible	Unassessed; no land access
21MO0319	Determined Eligible	Remain Determined Eligible	No effect
21MO0321	Determined Eligible	Remain Determined Eligible	No effect
21MO0322	Determined Eligible	Remain Determined Eligible	No effect
21MO0323	Determined Eligible	Remain Determined Eligible	No effect
21MO0335	Unevaluated	Remain Unevaluated	No effect
21MO0377	Unevaluated	Remain Unevaluated	Unassessed; no land access
21MO0386	Unevaluated	Remain Unevaluated	Unassessed; no land access
21MO0387	Unevaluated	Remain Unevaluated	Unassessed; no land access
21MO0388	Unevaluated	Remain Unevaluated	Unassessed; no land access

Site Number	Previously Recorded NRHP Eligibility	Merjent NRHP Eligibility Recommendation	Potential Project Effects[1]
21MO0391	Unevaluated	Remain Unevaluated	No effect
21MO0392	Unevaluated	Remain Unevaluated	No effect
21MO0393	Unevaluated	Remain Unevaluated	No effect
21MO0394	Unevaluated	Remain Unevaluated	No effect
21MO0395	Unevaluated	Remain Unevaluated	No effect
21MO0396	Unevaluated	Remain Unevaluated	No effect
21MO0397	Unevaluated	Remain Unevaluated	No effect
21MO0399	Unevaluated	Remain Unevaluated	No effect
21MO0400	Unevaluated	Remain Unevaluated	Unassessed; no land access
21MO0401	Unevaluated	Remain Unevaluated	Unassessed; no land access
21MO0402	Unevaluated	Remain Unevaluated	Unassessed; no land access

[1] The table does not include non-Project effects identified by Merjent 2025e. No effect indicates that no Project effects were identified by Merjent 2025e.

[2] Within or partially within the NRHP-listed Chippewa Agency Historic District (CA-SLV-00006).

Pillager Project

Merjent conducted a literature search in 2024 that focused on previously identified archaeological sites, cemeteries, and previous archaeological surveys/inventories. Merjent identified 30 previous archaeological surveys conducted within a 1-mile radius of the existing Pillager Project APE, 24 of which intersected the existing APE. The literature search identified 33 previously identified archaeological sites within a 1-mile radius of the existing Pillager Project APE, 25 of which intersected the existing APE. Merjent conducted a reconnaissance survey of the APE to determine if unrecorded archaeological resources are present and no new sites were identified; however, the boundaries of 21MO0121 were expanded. Merjent also performed a conditions assessment (field visit) to document the current condition of eligible or potentially eligible archaeological resources within the

existing APE.[29] Merjent (2025f) did not identify any project-related adverse effects on the surveyed archaeological resources within the existing APE. In addition, there were no instances of project-induced erosion observed for the sites within the existing APE (Merjent 2025f). Table 4-51 summarizes the archaeological resources surveyed by Merjent within the existing Pillager Project APE, associated recommendations for listing on the NRHP, and potential Project effects.

Table 4-51: Archaeological Resources Surveyed by Merjent within the Existing Pillager Project APE

Site Number	Previously Recorded NRHP Eligibility	Merjent NRHP Eligibility Recommendation	Potential Project Effects[1]
21CA0237	Unevaluated	Not eligible	Non-adverse effect
21CA0238	Unevaluated	Potentially eligible	No effect
21CA0239	Unevaluated	Not eligible	Non-adverse effect
21CA0240	Unevaluated	Unevaluated[2]	No effect
21CA0241	Unevaluated	Potentially eligible	No effect
21CA0242	Unevaluated	Unevaluated[2]	No effect
21CA0243	Unevaluated	Not eligible	No effect
21CA0244	Unevaluated	Unevaluated[2]	No effect
21CA0245	Unevaluated	Not eligible	No effect
21CA0246	Unevaluated	Unevaluated	Unassessed; no land access
21CA0247	Unevaluated	Unevaluated	Unassessed; no land access
21CA0248	Unevaluated	Unevaluated	Unassessed; no land access
21CA0249	Unevaluated	Unevaluated	Unassessed; no land access
21CAdy	Unevaluated	Unevaluated[2]	No effect
21MO0121	Unevaluated	Potentially eligible	No effect

[29] Forty percent of the existing APE is surface water. The terrestrial portion of the existing APE is composed of the portions of the shoreline. Much of the land within the existing APE is privately owned. MP contact landowners for permission to survey parcels within the existing APE; MP either owns or was granted access to 56 percent of the land within the existing APE (Merjent 2025f).

Site Number	Previously Recorded NRHP Eligibility	Merjent NRHP Eligibility Recommendation	Potential Project Effects[1]
21MO0123	Unevaluated	Not eligible	No effect
21MO0124	Unevaluated	Not eligible	No effect
21MO0125	Unevaluated	Unevaluated	No effect
21MO0126	Unevaluated	Unevaluated	Unassessed; no land access
21MO0131	Unevaluated	Unevaluated	Unassessed; no land access
21MO0132	Unevaluated	Unevaluated	Unassessed; no land access
21MO0133	Unevaluated	Unevaluated	Unassessed; no land access
21MO0134	Unevaluated	Unevaluated[2]	Unassessed; no land access
21MO0135	Unevaluated	Unevaluated	Unassessed; no land access
21MO0435	Unevaluated	Potentially eligible	No effect

[1] The table does not include non-Project effects identified by Merjent 2025f. No effect indicates that no Project effects were identified by Merjent 2025f.

[2] Non-contributory portion within existing Project APE.

4.11.2 Environmental Effects

Hydropower facilities can affect cultural resources as a result of modifications to project facilities or project operations, project-related ground-disturbing activities (such as construction, modification, or maintenance of project recreation facilities and use of such facilities by visitors), project-induced shoreline erosion, and vandalism. The following summarizes the NRHP-listed, NRHP-eligible, and potentially eligible cultural resources identified at the Projects and potential effects related to the relicensing of the Projects.

Little Falls Project

There are seven NRHP-listed or NRHP-eligible for listing resources within the existing Little Falls Project APE: two historic architectural resources and five archaeological resources. In addition, there are 17 unevaluated archaeological resources within the existing Little Falls Project APE.

The Licensee is not proposing any changes to facilities or operations that would adversely affect cultural resources at the Little Falls Project. Specifically, the proposed relicensing of the Little Falls Project would have no effect on the NRHP-listed or NRHP-eligible historic architectural resources and their ability to portray significance (Merjent 2025a). Merjent (2025d) determined that the proposed relicensing of the Little Falls Project poses no effects to archaeological sites that are listed or determined eligible for listing in the NRHP. In addition, for archaeological sites that are unevaluated for listing in the NRHP and for which Merjent had access to survey, Merjent (2025e) determined that the relicensing of the Little Falls Project poses no effects to these resources should they be found eligible for listing in the NRHP in the future. Continuing to operate the Little Falls Project in a run-of-river mode would minimize erosion and effects to archaeological sites along the Little Falls Project's reservoir shorelines; thus, relicensing the Little Falls Project is not anticipated to have an adverse effect on archaeological resources.

MP is proposing to modify the existing FERC-approved Project Boundaries for the Projects (detailed in Section 3.2.4). No known sites would be added to the Little Falls Project Boundary. According to a filing from the Advisory Council,[30] FERC's jurisdiction over hydroelectric projects does not constitute "federal ownership or control" as meant in federal regulations,[31] and therefore, removing land once within a licensee's project boundary would not result in an adverse effect to the historic properties on that land in and of itself. As such, the proposed removal of land from the Little Falls Project Boundary is not anticipated to have an adverse effect on historic properties.

Sylvan Project

There are 23 NRHP-listed or NRHP-eligible for listing resources within the existing Sylvan Project APE: two historic architectural resources and 21 archaeological resources. In addition, there are seven unevaluated historic architectural resources and 27 unevaluated archaeological resources within the existing Sylvan Project APE.

The Licensee is not proposing any changes to facilities or operations that would adversely affect cultural resources at the Sylvan Project. Specifically, the proposed relicensing of the

[30] Letter filed on May 14, 2024, concerning the draft Programmatic Agreement for the Azusa Powerhouse Hydroelectric Project, FERC P-1250-020.

[31] 36 C.F.R. § 800.5(a)(2)(vii) (2024).

Sylvan Project would have no effect on the NRHP-listed or NRHP-eligible historic architectural resources and their ability to portray significance (Merjent 2025b). Merjent (2025e) determined that the proposed relicensing of the Sylvan Project poses no effects to archaeological sites that are listed or determined eligible for listing in the NRHP. In addition, for archaeological sites that are unevaluated for listing in the NRHP and for which Merjent had access to survey, Merjent (2025e) determined that the relicensing of the Sylvan Project poses no effects to these resources should they be found eligible for listing in the NRHP in the future. Continuing to operate the Sylvan Project in a run-of-river mode would minimize erosion and effects to archaeological sites along the Sylvan Project's reservoir shorelines, thus relicensing the Sylvan Project is not anticipated to have an adverse effect on archaeological resources.

MP is proposing to modify the existing FERC-approved Project Boundaries for the Projects (detailed in Section 3.2.4). No known sites would be added to the Sylvan Project Boundary. According to a filing from the Advisory Council, FERC's jurisdiction over hydroelectric projects does not constitute "federal ownership or control" as meant in federal regulations, and therefore, removing land once within a licensee's project boundary would not result in an adverse effect to the historic properties on that land in and of itself. As such, the proposed removal of land from the Sylvan Project Boundary is not anticipated to have an adverse effect on historic properties.

Pillager Project

There are six NRHP-eligible or potentially eligible for listing resources within the existing Pillager Project APE: two historic architectural resources and four archaeological resources. In addition, there are 12 unevaluated historic architectural resources and 15 unevaluated archaeological resources within the existing Pillager Project APE.

The Licensee is not proposing any changes to facilities or operations that would adversely affect cultural resources at the Pillager Project. Specifically, the proposed relicensing of the Sylvan Project would have no effect on the NRHP-eligible historic architectural resources and their ability to portray significance (Merjent 2025c). Merjent (2025f) determined that the proposed relicensing of the Pillager Project poses no effects to archaeological sites. In addition, for archaeological sites that are unevaluated for listing in the NRHP and for which Merjent had access to survey, Merjent (2025f) determined that the relicensing of the Pillager Project poses no effects to these resources should they be

found eligible for listing in the NRHP in the future. Continuing to operate the Pillager Project in a run-of-river mode would minimize erosion and effects to archaeological sites along the Pillager Project's reservoir shorelines, thus relicensing the Pillager Project is not anticipated to have an adverse effect on archaeological resources.

MP is proposing to modify the existing FERC-approved Project Boundaries for the Projects (detailed in Section 3.2.4). No known sites would be added to the Pillager Project Boundary. According to a filing from the Advisory Council, FERC's jurisdiction over hydroelectric projects does not constitute "federal ownership or control" as meant in federal regulations, and therefore, removing land once within a licensee's project boundary would not result in an adverse effect to the historic properties on that land in and of itself. As such, the proposed removal of land from the Pillager Project Boundary is not anticipated to have an adverse effect on historic properties.

4.11.3 Protection, Mitigation, Enhancement Measures

The Licensee is proposing to continue run-of-river operation at the Projects, which would minimize erosion and potential effects to archaeological sites along the Projects' reservoir shorelines. The Projects' existing CRMPs require general annual shoreline monitoring to determine if the operation of the Projects had observable impacts to cultural resources. As reported annually, the Projects generally exhibit stable shorelines with no active erosion observed. In addition, the conditions assessment performed by Merjent (2025d 2025e, 2025f) did not identify areas of active project-induced erosion. Therefore, MP does not propose to continue general annual shoreline monitoring. In accordance with Merjent's recommendations, the Licensee proposes to conduct monitoring of historic properties prior to or in conjunction with maintenance activities that could cause ground disturbance at the Projects. In addition, the Licensee proposes to cease land-clearing and land-disturbing activities at the Projects upon discovery of unknown archaeological resources and consult with the Minnesota SHPO to determine the need for any cultural resources studies or measures. The Licensee is proposing to continue to maintain boulders (in various locations) to prevent vehicular and/or ATV access inside the Chippewa Agency Historic District (21CA0055 and CA-SLV-00006) located within the existing and proposed Sylvan Project APE. In addition, the Licensee is proposing to continue to maintain No Camping and Habitat Restoration signs along the shoreline of the Chippewa Agency component of the 21CA0055 historic district. Upon license issuance,

MP proposes to develop and implement HPMPs to manage historic properties throughout the term of the new license.

4.11.4 Unavoidable Adverse Effects

Continued operation of the Projects will result in no unavoidable adverse effects on cultural resources.

4.11.5 References

Forsberg, D. 2003. River of History: A Historic Resources Study of the Mississippi National River and Recreation Area - Chapter 2: Early Native American Life in the MNRRA Corridor. Hemisphere Field Services. Available online: https://www.nps.gov/miss/learn/historyculture/river-of-history-chapter-2.htm. Accessed July 2025.

Gibbon, G., et al. 2002. Minnesota's Environment and Native American Culture History. Minnesota Department of Transportation. Available online: http://www.dot.state.mn.us/mnmodel/P3FinalReport/chapter3.html. Accessed July 2025.

Institute for Minnesota Archaeology (IMA) Consulting. 1996a. Cultural Resource Management Plan for the Little Falls Hydroelectric Project on the Mississippi River, Morrison County, Minnesota.

Institute for Minnesota Archaeology (IMA) Consulting. 1996b. Cultural Resource Management Plan for the Sylvan Hydroelectric Project on the Crow Wing River in Cass, Crow Wing, and Morrison County, Minnesota.

Institute for Minnesota Archaeology (IMA). 1999. Cultural Resources Management Plan for the Pillager Hydroelectric Project on the Crow Wing River in Cass and Morrison Counties, Minnesota.

Merjent, Inc. 2025a. Phase I Architectural History Reconnaissance Survey for the Little Falls Hydroelectric Relicensing Project (FERC License No. P-2532). Revised September 2025. Morrison County, Minnesota.

Merjent, Inc. 2025b. Phase I Architectural History Reconnaissance Survey for the Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454). Revised September 2025. Cass, Crow Wing, and Morrison Counties, Minnesota.

Merjent, Inc. 2025c. Phase I Architectural History Reconnaissance Survey for Pillager Hydroelectric Relicensing Project (FERC License No. P-2663). Revised September 2025. Cass and Morrison Counties, Minnesota.

Merjent, Inc. 2025d. Phase I Archaeological Investigation and Conditions Assessment of Archaeological Sites for the Little Falls Hydroelectric Relicensing Project (FERC License No. P-2532). Revised September 2025. Morrison County, Minnesota.

Merjent, Inc. 2025e. Phase I Archaeological Investigation and Conditions Assessment of Archaeological Sites for the Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454). Revised September 2025. Cass, Crow Wing, and Morrison Counties, Minnesota.

Merjent, Inc. 2025f. Phase I Archaeological Investigation and Conditions Assessment of Archaeological Sites for the Pillager Hydroelectric Relicensing Project (FERC License No. P-2663). Revised September 2025. Cass and Morrison Counties, Minnesota.

4.12 Socioeconomic Resources

4.12.1 Affected Environment

4.12.1.1 Overview

The Little Falls Project is located on the Mississippi River near the city of Little Falls in Morrison County, Minnesota. The Sylvan Project is located on the Crow Wing River between the cities of Pillager and Baxter, in Cass, Crow Wing, and Morrison counties, Minnesota. Located upstream of the Sylvan Project, the Pillager Project is located on the Crow Wing River near the city of Pillager, on the border of Morrison and Cass counties, Minnesota (upstream of the confluence with the Gull River). The following sections describe socioeconomic conditions in the Projects Vicinities (including the cities of Little Falls, Pillager; Baxter, Morrison, Crow Wing, and Cass counties; and the state of Minnesota).

4.12.1.2 General Land Use Patterns

Primary land use within Morrison County, Minnesota, is agricultural, and the county ranks high in poultry, milk, and livestock production within the state (Morrison County 2022). Land use within Cass and Crow Wing counties, Minnesota, is mostly forested. Land use specific to the Projects is discussed in Section 4.9.1.2.

4.12.1.3 Population Patterns

Morrison County is approximately 1,125 square miles, Crow Wing County is approximately 998 square miles, and Cass County is approximately 2,021 square miles (U.S. Census Bureau 2025a). Based on population estimates from 2020, the population densities of Morrison, Crow Wing, and Cass counties were 30.2, 66.2, and 14.9 people per square-mile, respectively. Based on the 2020 census, the estimated population of Morrison County was 34,010, representing a 2.4 percent increase from the 2010 census. The cities of Little Falls, Pillager, and Baxter experienced an increase in population from the 2010 to 2020 census (U.S. Census Bureau 2025b, 2025c). Table 4-52 summarizes the population estimates for cities of Little Falls, Pillager, and Baxter, Morrison, Crow Wing, and Cass counties, and the state of Minnesota.

Table 4-52: Estimated Population of Applicable Cities, Counties, and the State of Minnesota

Relevant Project	Census Tract/ City/ County/State	2010 Census[1]	2020 Census[2]	Percent (%) Change 2010-2020	2023 Estimates[3]	Percent (%) Change 2020-2023
Little Falls Project	Little Falls, MN	8,343	9,140	9.6	9,094	-0.5
Sylvan and Pillager Projects	Pillager, MN	469	507	8.1	494	-2.6
Sylvan Project	Baxter, MN	7,610	8,612	13.2	8,804	2.2
Little Falls and Pillager Projects	Morrison County, MN	33,198	34,010	2.4	34,131	0.4
Sylvan Project	Crow Wing County, MN	62,500	66,123	5.8	67,113	1.5
Sylvan and Pillager Projects	Cass County, MN	28,567	30,066	5.2	30,688	2.1
Little Falls, Sylvan, and Pillager Projects	Minnesota	5,303,925	5,706,494	7.6	5,713,716	0.1

U.S. Census Bureau 2025b[1], 2025c[2], 2025d[3]

4.12.1.4 Economic Indicators and Employment

The 2023 estimated median household income was $68,640 for Morrison County, $71,343 for Crow Wing County, $64,937 for Cass County, $46,284 for city of Little Falls, $66,771 for city of Pillager, and $71,272 for city of Baxter. The 2023 poverty rate was 10.0 percent in Morrison County, 9.7 percent in Crow Wing County, 12.7 percent in Cass County, 16.1 percent in city of Little Falls, 8.5 percent in city of Pillager, and 10.8 percent for city of Baxter (U.S. Census Bureau 2025h). Table 4-53 provides household and family distribution for Morrison, Crow Wing, and Cass counties, cities of Little Falls, Pillager, and Baxter, and the state of Minnesota.

The largest employment industries in 2023 in the city of Little Falls, Minnesota, were health care and social assistance, manufacturing, retail trade, and other services (except public administration) (Data USA 2025a). The largest industries in 2023 in the city of Pillager, Minnesota, were health care and social assistance, construction, retail trade, and education services (Data USA 2025b). The largest industries in 2023 in the city of Baxter, Minnesota, were health care and social assistance, retail trade, educational services, and accommodation and food services (Data USA 2025c). Table 4-54 provides additional data on employment industry distribution in the cities of Little Falls, Pillager, and Baxter compared to Morrison, Crow Wing, and Cass counties, Minnesota.

Table 4-53: Household and Family Distribution

	Morrison County, MN	Crow Wing County, MN	Cass County, MN	Little Falls, MN	Pillager, MN	Baxter, MN	Minnesota
2023 Estimate Number of Households[1]	13,860	28,778	12,768	3,998	197	3,772	2,282,967
2023 Estimate Approximate Number of Persons per Household[1]	2.42	2.29	2.37	2.17	2.48	2.29	2.44
2023 Estimate Percentage of Population in Labor Force[2]	63.8%	60.2%	55.7%	54.6%	67.5%	61.3%	68.5%
2023 Estimate Median Household Income[3]	$68,640	$71,343	$64,937	$46,284	$66,771	$71,272	$87,556
2023 Estimate Population Below Poverty Level[4]	10.0%	9.7%	12.7%	16.1%	8.5%	10.8%	9.2%

Sources: U.S. Census 2025e[1], 2025f[2], 2025g[3], 2025h[4]

Table 4-54: Top Employment Sectors in 2023 for the Cities of Little Falls, Pillager, and Baxter, and Morrison, Crow Wing, and Cass Counties, Minnesota

Employment Sector	Little Falls, MN[1] (%)	Pillager, MN[2] (%)	Baxter, MN[3] (%)	Morrison County, MN[4] (%)	Crow Wing County, MN[5] (%)	Cass County, MN[6] (%)
Manufacturing	14.3	4.7	6.6	14.5	9.5	10.4
Health Care & Social Assistance	21.0	27.5	20.1	17.0	19.1	15.5
Retail Trade	9.7	12.9	17.3	10.9	12.0	12.3
Accommodation & Food Services	5.4	6.7	6.7	3.8	8.4	8.5
Public Administration	6.8	8.6	3.9	5.2	3.6	5.7
Administrative & Support & Waste Management Services	4.1	1.2	2.3	3.8	3.2	3.0
Other Services, Except Public Administration	8.7	5.9	4.8	5.9	4.4	4.8
Professional, Scientific, and Technical Services	6.2	1.6	5.2	3.9	4.7	3.6
Educational Services	7.7	9.4	9.9	7.4	6.6	7.6
Wholesale Trade	2.1	3.1	0.5	2.3	1.8	2.3
Construction	3.5	13.7	5.3	8.7	9.7	10.6
Arts, Entertainment, & Recreation	2.6	-	2.4	1.4	2.3	2.4
Finance & Insurance	1.3	0.8	6.2	2.9	4.6	3.6
Real Estate & Rental & Leasing	1.9	0.8	1.7	0.7	2.5	1.1
Utilities	-	-	-	0.8	0.8	-
Mining, Quarrying, and Oil and Gas Extraction	0.4	-	0.2	-	-	-
Transportation and Warehousing	4.0	1.2	4.7	5.0	3.9	3.0
Agriculture, Forestry, Fishing & Hunting	-	2.0	0.5	5.4	1.2	2.8
Information			1.8	0.5	1.4	1.8

Sources: Data USA 2025a[1], 2025b[2], 2025c[3], 2025d[4], 2025e[5], 2025f[6]

4.12.2 Environmental Effects

The Projects provide positive benefits to the surrounding communities. Benefits include access to recreation sites and opportunities. Further, the Licensee pays local taxes, which benefit the region. The proposed action, including the continued run-of-river operation of the Projects and no changes to the Projects' facilities, will not affect socioeconomic resources. The Projects will continue to provide positive benefits to the community, including recreational opportunities, as well as contributions to the local tax base.

4.12.3 Protection, Mitigation, Enhancement Measures

No PME measures are being proposed specific to socioeconomic resources.

4.12.4 Unavoidable Adverse Effects

The continued operation of the Projects would result in no unavoidable adverse effects to the socioeconomics of the region.

4.12.5 References

Data USA. 2025a. Little Falls, MN. Available online: https://datausa.io/profile/geo/little-falls-mn. Accessed August 2025.

Data USA. 2025b. Pillager, MN. Available online: https://datausa.io/profile/geo/pillager-mn. Accessed August 2025.

Data USA. 2025c. Baxter, MN. Available online: https://datausa.io/profile/geo/baxter-mn. Accessed August 2025.

Data USA. 2025d. Morrison County, MN. Available online: https://datausa.io/profile/geo/morrison-county-mn. Accessed August 2025.

Data USA. 2025e. Crow Wing County, MN. Available online: https://datausa.io/profile/geo/crow-wing-county-mn. Accessed August 2025.

Data USA. 2025f. Cass County, MN. Available online: https://datausa.io/profile/geo/cass-county-mn. Accessed August 2025.

Morrison County. 2022. Morrison County, MN: Feedlots. Available online: https://www.co.morrison.mn.us/289/Feedlots. Accessed January 2023.

U.S. Census Bureau. (U.S. Census). 2025a. GEOINFO. Annual Geographic Information Table. Available online: https://data.census.gov/table?q=Geography&g=040XX00US27_050XX00US27021,27035,27097_060XX00US2702150902,2703504042,2709737556. Accessed August 2025.

U.S. Census Bureau. (U.S. Census). 2025b. P1 Total Population. 2010: DEC Redistricting Data (PL-171). Available online: https://data.census.gov/table/DECENNIALPL2010.P1?q=P1:+TOTAL+POPULATION&g=040XX00US27_050XX00US27021,27035,27097_060XX00US2702150902,2703504042,2709737556. Accessed August 2025.

U.S. Census Bureau. (U.S. Census). 2025c. P1 Total Population. 2020: DEC Redistricting Data (PL-171). Available online: https://data.census.gov/table/DECENNIALPL2020.P1?q=P1:+TOTAL+POPULATION&g=040XX00US27_050XX00US27021,27035,27097_060XX00US2702150902,2703504042,2709737556. Accessed August 2025.

U.S. Census Bureau. (U.S. Census). 2025d. S0101 Age and Sex. 2023: ACS 5-Year Estimates Subject Tables. Available online: https://data.census.gov/table/ACSST5Y2023.S0101?q=S0101&g=040XX00US27_050XX00US27021,27035,27097_060XX00US2702150902,2703504042,2709737556. Accessed August 2025.

U.S. Census Bureau. (U.S. Census). 2025e. DP02 Selected Social Characteristics in the United States. 2023: ACS 5-Year Estimates Data Profiles. Available online: https://data.census.gov/table/ACSDP5Y2023.DP02?q=DP02&g=040XX00US27_050XX00US27021,27035,27097_060XX00US2702150902,2703504042,2709737556. Accessed August 2025.

U.S. Census Bureau. (U.S. Census). 2025f. S2301 Employment Status. 2023: ACS 5-Year Estimates Subject Tables. Available online: https://data.census.gov/table/ACSST5Y2023.S2301?q=S2301&g=040XX00US27_050XX00US27021,27035,27097_060XX00US2702150902,2703504042,2709737556. Accessed August 2025.

U.S. Census Bureau. (U.S. Census). 2025g. S1901 Income in the Past 12 Months (in 2023 Inflation-Adjusted Dollars). 2023: ACS 5-Year Estimates Subject Tables. Available online: https://data.census.gov/table/ACSST5Y2023.S1901?q=S1901&g=040XX00US27_050XX00US27021,27035,27097_060XX00US2702150902,2703504042,2709737556. Accessed August 2025.

U.S. Census Bureau. (U.S. Census). 2025h. S1701 Poverty Status in the Past 12 Months. 2023: ACS 5-Year Estimates Subject Tables. Available online: https://data.census.gov/table/ACSST5Y2023.S1701?q=S1701&g=040XX00US27_050XX00US27021,27035,27097_060XX00US2702150902,2703504042,2709737556. Accessed August 2025.

4.13 Tribal Resources

4.13.1 Affected Environment

On December 4, 2024, MP consulted with interested Tribes regarding the potential presence of archaeological resources and Traditional Cultural Properties (TCPs) within the Projects' APEs (see Appendix E-1, Consultation Documentation). On January 25, 2025, the Leech Lake Band of Ojibwe stated they do not have any recorded historic properties within the Projects' APEs (Appendix E-1). As of the date of this DLA filing, no other response to information on TCPs has been received from the Tribes and no TCPs have been identified within the Projects' APEs.

The Projects include no Tribal lands. Although no specific Tribal interest has been identified by the Licensee at the Projects, the Tribes listed in Table 4-55 are included in Licensee's Distribution List for the Projects relicensing processes.

Table 4-55: Tribes Included on Projects Distribution List

Tribe
Apache Tribe of Oklahoma
Bad River Band of Lake Superior Chippewa Indians of the Bad River Reservation, Wisconsin
Cheyenne and Arapaho Tribes of Oklahoma
Flandreau Santee Sioux Tribe of South Dakota
Fort Belknap Indian Community of the Fort Belknap Reservation of Montana
Iowa Tribe of Kansas and Nebraska
Keweenaw Bay Indian Community, Michigan
Lac du Flambeau Band of Lake Superior Chippewa Indians of the Lac du Flambeau Reservation of Wisconsin
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Lower Sioux Indian Community in the State of Minnesota
Menominee Indian Tribe of Wisconsin
Minnesota Chippewa Tribe - Bois Forte Band (Nett Lake)
Minnesota Chippewa Tribe - Fond du Lac Band
Minnesota Chippewa Tribe - Grand Portage Band

Tribe
Minnesota Chippewa Tribe - Leech Lake Band of Ojibwe
Minnesota Chippewa Tribe - Mille Lacs Band
Minnesota Chippewa Tribe, Minnesota
Minnesota Chippewa Tribe - White Earth Band
Prairie Island Indian Community in the State of Minnesota
Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin
Red Lake Band of Chippewa Indians
Santee Sioux Nation, Nebraska
Shakopee Mdewakanton Sioux Community of Minnesota
Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota
Sokaogon Chippewa Community, Wisconsin
Spirit Lake Tribe, North Dakota
Standing Rock Sioux Tribe of North & South Dakota
Rosebud Sioux Tribe of the Rosebud Indian Reservation, South Dakota
Turtle Mountain Band of Chippewa Indians of North Dakota
Upper Sioux Community of Minnesota

4.13.2 Environmental Effects

There are no known impacts of the Projects on Tribal resources. The Projects do not occupy Tribal lands. The Licensee will continue to include any potentially interested Tribes on the distribution list for the relicensing process.

4.13.3 Protection, Mitigation, Enhancement Measures

No PME measures regarding Tribal resources are proposed.

4.13.4 Unavoidable Adverse Effects

As there are no known impacts of the Projects on Tribal resources, continued operation of the Projects is not anticipated to result in unavoidable adverse effects on Tribal resources.

5.0 DEVELOPMENTAL ANALYSIS

5.1 Costs and Value of PME Measures Affecting Developmental Resources

The Licensee proposes no changes to Projects operation that will result in lost generation or generation value. Under the proposed continued operations, the Licensee will continue to generate electricity consistent with historical performance, with average annual net generation of 30,408 MWh for the Little Falls Project, 9,853 MWh for the Sylvan Project, and 8,110 MWh for the Pillager Project, based on data from the 2020–2024 period.

5.2 Costs and Value of PME Measures Affecting Non-Developmental Resources

Estimated annual operation and maintenance expenses associated with proposed environmental measures for the Projects are described in Exhibit H.

Total License Application development costs are described in Exhibit A.

5.3 Project Value and Term of License

The overall cost and value of the licensed Projects is presented in Exhibit A. The Licensee requests FERC to issue new licenses for the Projects with terms of 40 years.

6.0 CONSISTENCY WITH COMPREHENSIVE PLANS

6.1 Relevant Qualifying Federal and State or Comprehensive Waterway Plans

Section 10(a)(2)(A) of the FPA, 16 U.S.C § 803(a)(2)(A), requires FERC to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways potentially affected by the proposed project. On April 27, 1988, FERC issued Order No. 481-A revising Order No. 481, issued October 26, 1987, establishing that FERC will accord FPA Section 10(a)(2)(A) comprehensive plan status to any federal or state plan that:

- Is a comprehensive study of one or more of the beneficial uses of a waterway or waterways;
- Specifies the standards, the data, and the methodology used; and
- Is filed with the Secretary of the Commission.

FERC currently lists 32 comprehensive plans for the state of Minnesota (FERC 2023). Of these plans, 15 are potentially relevant to the Projects, listed below (Table 6-1). These plans may be useful in the relicensing proceeding for characterizing desired conditions.

Table 6-1: List of Qualifying Comprehensive Plans Potentially Relevant to the Projects

Resource	Comprehensive Plan
Water Resources	Minnesota Department of Natural Resources. 1977. A management plan for the Crow Wing River. St. Paul, Minnesota. February 1977.
Water Resources	Minnesota Department of Natural Resources. 1983. Statewide outstanding rivers inventory. St. Paul, Minnesota. March 1983.
Recreation and Land Use	Minnesota Department of Natural Resources. 2015. Minnesota State Parks and Trails System Plan. St. Paul, Minnesota.
Terrestrial Wildlife and Botanical Resources	Minnesota Department of Natural Resources. 2016. Minnesota's Wildlife Action Plan, 2015-2025. St. Paul, Minnesota.
Recreation and Land Use	Minnesota Department of Natural Resources. n.d. Canoe and boating route program. St. Paul, Minnesota. 39 pamphlets.
Recreation and Land Use	Minnesota Department of Natural Resources. n.d. Minnesota's Statewide Comprehensive Outdoor Recreation Plan (SCORP): 2014-2018. St. Paul, Minnesota.

Resource	Comprehensive Plan
Water Resources, Fish and Aquatic Resources, Terrestrial and Botanical Resources	Minnesota Department of Natural Resources. n.d. Strategic Conservation Agenda: The DNR's 10-year Strategic Plan, 2015-2025. St. Paul, Minnesota.
Water Resources	Mississippi Headwaters Board. 1981. A management plan for the Upper Mississippi River. Grand Rapids, Minnesota. January 1981.
Water Resources	National Park Service. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993.
Water Resources	Upper Mississippi River Basin Commission. 1981. Comprehensive master plan for the management of the Upper Mississippi River system - environmental report. Minneapolis, Minnesota. September 1981.
Water Resources	Upper Mississippi River Basin Commission. 1982. Comprehensive master plan for the management of the Upper Mississippi River system. Minneapolis, Minnesota. January 1, 1982.
Terrestrial Wildlife and Botanical Resources	U.S. Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American waterfowl management plan. Department of the Interior. Environment Canada. May 1986.
Terrestrial Wildlife and Botanical Resources	U.S. Fish and Wildlife Service. 1993. Upper Mississippi River & Great Lakes Region joint venture implementation plan: A component of the North American waterfowl management plan. March 1993.
Fish and Aquatic Resources	U.S. Fish and Wildlife Service. n.d. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C.

Source: FERC 2023

6.2 References

Federal Energy Regulatory Commission (FERC). 2023, September 14. List of Comprehensive Plans. Office of Energy Projects, 20426. Washington, D.C. Available online: https://www.ferc.gov/media/comprehensive-plans Accessed: May 2025.

APPENDIX E-1

CONSULTATION DOCUMENTATION

List of files included[1]:

2023_03_31 MP PAD Distribution.pdf
2023_03_31 Sylvan Township Comments.pdf
2023_06_29 Friends of Old Crow Wing call notes.pdf
2023_07_22 SHPO PAD comments.pdf
2023_07_24 Sylvan Township PAD Comments.pdf
2023_07_25 CWCHS Letter of Support.pdf
2023_07_25 Friends of Old Crow Wing comments.pdf
2023_07_25 NCC Letter in Support for Archaeological Survey.pdf
2023_07_27 Friends Old Crow Wing comments.pdf
2023_07_27 Friends Old Crow Wing Consulting Party Request.pdf
2023_07_28 DNR letter.pdf
2023_07_28 DNR letter attachments.pdf
2023_08_16 SHPO study meeting scheduling request.pdf
2023_08_30 SHPO PSP meeting notes.pdf
2023_09_08 MP PSP Distribution.pdf
2023_09_12 MP Request OSA Review of PSP.pdf
2023_09_12 SHPO comments on Sec 106 consultation req.pdf
2023_09_20 SHPO PSP Consultation Letter from MP.pdf
2023_09_21 MP to SHPO consultation request.pdf
2023_09_22 Friends of the Old Crow Wing Ray Nelson call.pdf
2023_09_26 MP email invite of PSP meeting.pdf
2023_09_27 PSP Meeting invitation responses.pdf
2023_10_10 USACE Contact update.pdf
2023_10_11 PSP Meeting notes and powerpoint.pdf
2023_10_11 USACE Contact update call.pdf
2023_10_12 MP to BIA PSP meeting presentation.pdf
2023_10_13 MP PSP Distribution to MIAC.pdf
2023_11_13 MIAC comments.pdf
2023_11_22 OSA Comments on PSP.pdf
2023_12_18 SHPO comments.pdf
2024_01_09 MP RSP Distribution.pdf
2024_01_17 Friends of Old Crow Wing email.pdf
2024_01_31 SHPO emails on RSP comment period.pdf
2024_02_05 Little Falls RSP Comment.pdf
2024_04_09 MIAC emails.pdf
2024_06_17 MP to SHPO and Tribes APE request.pdf
2024_06_17 SHPO automatic reply receipt confirmation.pdf
2024_06_18 DNR email 1.pdf

[1] Portions of the following documents: 1) 2023_07_25 Friends of Old Crow Wing comments.pdf, 2) 2023_11_22 OSA Comments on PSP.pdf, and 3) 2025_05_16 SHPO ISR Cultural Report Comments.pdf contain privileged information and have been redacted from this public filing. The full, unredacted versions are included in Privileged Volume III.

2024_06_18 DNR email 1 attachment 1.pdf
2024_06_18 DNR email 1 attachment 2.pdf
2024_06_18 DNR email 2.pdf
2024_07_15 SHPO Comments on APE.pdf
2024_12_04 City of Little Falls recreation data 1.pdf
2024_12_04 City of Little Falls recreation data 2.pdf
2025_01_13 City of Little Falls recreation data email.pdf
2025_01_29 Leech Lake.pdf
2025_02_07 MP ISR Distribution.pdf
2025_02_07 SHPO automatic reply receipt confirmation.pdf
2025_02_10 MIAC review of ISR.pdf
2025_02_19 MPCA ISR meeting presentation email.pdf
2025_02_19 Sylvan Township ISR Meeting Question.pdf
2025_02_27 MP to SHPO ISR Meeting Summary review form.pdf
2025_05_16 SHPO ISR Cultural Report Comments.pdf
2025_06_02 MP Response to SHPO Comments on ISR CR reports.pdf
2025_06_17 Crow Wing County Hist. Society letter to FERC re Chipp Agency Site.pdf
2025_08_05 CZMA Request.pdf

Subject: FW: Notice of Intent and Pre-Application Document for Little Falls, Sylvan, and Pillager Projects

---

From: Gregory Prom (MP) <gprom@mnpower.com>
Sent: Friday, March 31, 2023 9:41 AM
To: 'timothy.lapointe@bia.gov' <timothy.lapointe@bia.gov>; 'Nanette.m.bischoff@usace.army.mil' <Nanette.m.bischoff@usace.army.mil>; 'Simpkins, Darin' <Darin_Simpkins@fws.gov>; 'durellcooper05@gmail.com' <durellcooper05@gmail.com>; 'MikeW@badriver-nsn.gov' <MikeW@badriver-nsn.gov>; 'rwassana@c-a-tribes.org' <rwassana@c-a-tribes.org>; 'jeffery.stiffarm@ftbelknap.org' <jeffery.stiffarm@ftbelknap.org>; 'trhodd@iowas.org' <trhodd@iowas.org>; 'doreen@kbic-nsn.gov' <doreen@kbic-nsn.gov>; 'jjohnson@ldftribe.com' <jjohnson@ldftribe.com>; 'jim.williams@lvd-nsn.gov' <jim.williams@lvd-nsn.gov>; 'chairman@mitw.org' <chairman@mitw.org>; 'cchavers@boisforte-nsn.gov' <cchavers@boisforte-nsn.gov>; 'kevindupuis@fdlrez.com' <kevindupuis@fdlrez.com>; 'robertdeschampe@grandportage.com' <robertdeschampe@grandportage.com>; 'faron.jackson@llojibwe.org' <faron.jackson@llojibwe.org>; 'melanie.benjamin@millelacsband.com' <melanie.benjamin@millelacsband.com>; 'Michael.Fairbanks@whiteearth-nsn.gov' <Michael.Fairbanks@whiteearth-nsn.gov>; 'gfrazer@mnchippewatribe.org' <gfrazer@mnchippewatribe.org>; 'Chris.Boyd@redcliff-nsn.gov' <Chris.Boyd@redcliff-nsn.gov>; 'dseki@redlakenation.org' <dseki@redlakenation.org>; 'robert.vanzile@scc-nsn.gov' <robert.vanzile@scc-nsn.gov>; 'kevinj@uppersiouxcommunity-nsn.gov' <kevinj@uppersiouxcommunity-nsn.gov>; 'john.jaschke@state.mn.us' <john.jaschke@state.mn.us>; 'Sarah.Beimers@state.mn.us' <Sarah.Beimers@state.mn.us>; 'shannon.geshick@state.mn.us' <shannon.geshick@state.mn.us>; 'Jill.Townley@state.mn.us' <Jill.Townley@state.mn.us>; Boyle, Jason (DNR) (Jason.Boyle@state.mn.us) <Jason.Boyle@state.mn.us>; 'thorleif@umn.edu' <thorleif@umn.edu>; 'Jesse.Anderson@state.mn.us' <Jesse.Anderson@state.mn.us>; 'OShea, Daniel T (DNR)' <daniel.oshea@state.mn.us>; 'Bonnie.finerty@state.mn.us' <Bonnie.finerty@state.mn.us>; 'william.wilde@state.mn.us' <william.wilde@state.mn.us>; 'Dan.Wolf@state.mn.us' <Dan.Wolf@state.mn.us>; 'josh.stevenson@casscountymn.gov' <josh.stevenson@casscountymn.gov>; 'CoAdmin@crowwing.us' <CoAdmin@crowwing.us>; 'mattl@co.morrison.mn.us' <mattl@co.morrison.mn.us>; 'wzylka@cityoflittlefalls.com' <wzylka@cityoflittlefalls.com>; 'jonr@cityoflittlefalls.com' <jonr@cityoflittlefalls.com>; 'jrklein@brainerd.net' <jrklein@brainerd.net>; 'info@sylvantwp.com' <info@sylvantwp.com>; 'lblumke@brainerd.net' <lblumke@brainerd.net>; 'dbadeaux@ci.brainerd.mn.us' <dbadeaux@ci.brainerd.mn.us>; 'timt@mississippiheadwaters.org' <timt@mississippiheadwaters.org>; nrosemore@mnpower.com; Gregory Prom (MP) <gprom@mnpower.com>; David Moeller (ALLETE) <dmoeller@allete.com>; Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Matthew Radzak (MP) <mradzak@mnpower.com>
Subject: RE: Notice of Intent and Pre-Application Document for Little Falls, Sylvan, and Pillager Projects

Good afternoon,

On March 30, 2023, Minnesota Power, a subsidiary of ALLETE, Inc. filed with the Federal Energy Regulatory Commission (FERC) a Notice of Intent and Pre-Application Document for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663). The electronic file can be downloaded through FERC's website using the link provided: https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20230330-5330

If you have any questions regarding this filing, please contact me at gprom@allete.com.

Sincerely,

Greg Prom

Senior Environmental Compliance Specialist
Minnesota Power/ALLETE
30 West Superior Street
Duluth, Minnesota 55802

Office: 218-355-3191
Cell: 218-461-6856
Email: gprom@allete.com



Please mail the completed form and required material to:

ENReviewSHPO@state.mn.us

DEPARTMENT OF ADMINISTRATION

Request for Project Review by the State Historic Preservation Office (SHPO)

◉ This is a new submittal

○ This is additional information relating to SHPO Project #: _____ **DATE:** 3/30/2023

I. GENERAL PROJECT INFORMATION

Project Title: Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663) Hydroelectric Projects Pre-Application Document (PAD)

Project Address (or Location): Please see Section 4.1 of PAD for exact location of Projects.

City / Township (circle one): See attachment Zip: See attachment County: Morrison, Crow Wing, Cass

Legal Description: Township Attachment Range Attachment E/W (circle one) Section Attachment Quarter-section Attachment

II. PROJECT CONTACT INFORMATION

Project Contact Name: Greg Prom Title: Senior Environmental Compliance Specialist

Company/Agency: ALLETE, Inc., d.b.a Minnesota Power

Street Address: 30 West Superior Street Phone Number: 218-355-3191

City: Duluth State: MN Zip: 55802-2093 Email: gprom@allete.com

III. FEDERAL AND/OR STATE INVOLVEMENT

Federal Agency (if applicable): Federal Energy Regulatory Commission (FERC) relicensing
(Agency providing funds, licenses, or permits)
Permit or Project Reference #: P-2532, P-2454, P-2663

State Agency (if applicable): N/A
(Agency providing funds, licenses, or permits)
Permit or Project Reference #: N/A

Local Agency (if applicable): N/A

(Continued on Reverse Side)

Please refer to *Instructions for Completing the Request for Project Review* form on our website. Submit one *Request for Project Review* form for each project. For questions regarding the SHPO review process, please visit our website or contact Kelly Gragg-Johnson (651-201-3285) or Leslie Coburn (651-201-3286) or by email at ENReviewSHPO@state.mn.us.

IV. PROJECT DESCRIPTION AND BOUNDARIES

A) REQUIRED FOR ALL PROJECTS

☑ Write a detailed description of the proposed project. (See attached.)

See attached. Minnesota Power filed with the FERC a NOI and PAD (attached) for the relicensing of the Little Falls Project, Sylvan Project, and Pillager Project (Projects). No changes to operations proposed.

☑ Attach a map of project location, with project area(s) clearly marked. Road names must be included and legible.

B) Architecture

Are there any buildings or structures within the project area? ◉ Yes ○ No

If **No**, continue to the Archaeology section below. If **Yes**, submit all of the following information:

☑ List all buildings and structures within the project area and the year they were built. (See attached.)

Please see the attached PAD, Section 5.9.

☐ Photographs of ***each*** building and structure located within the project area, along with a photo key. Include streetscape images, if applicable. All photographs must be clear, crisp, focused, and taken at ground level. Aerial photos are insufficient.

☑ List known historic buildings or structures located within the project area (i.e., individual properties or districts which are listed in the National Register or which meet the criteria for listing in the National Register). (See attached.)

Please see the attached PAD, Section 5.9.

C) Archaeology

Does the proposed undertaking involve ground-disturbing activity? ○ Yes ◉ No

If **No**, this form is complete. If **Yes**, submit all of the following information:

☐ Attach the relevant portion of a 1:24000-scale USGS topographic map (photocopied or computer generated) ***with the project boundary marked***.

☑ Description of current and previous land use and disturbances: (See attached.)

Please see the attached PAD. Projects are hydroelectric generating facilities.

☑ Any available information concerning known or suspected archaeological resources within the project area. (See attached.)

Please see the attached PAD.

From: Gregory Prom (MP) <gprom@mnpower.com>
Sent: Friday, March 31, 2023 11:16 AM
To: 'Clerk' <clerk@sylvantwp.com>
Cc: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>
Subject: RE: [EXTERNAL MAIL] RE: Notice of Intent and Pre-Application Document for Little Falls, Sylvan, and Pillager Projects

Thanks for bringing this to our attention. Future documents will have this changed and I will save this in our correspondence records.

Sincerely,

Greg Prom

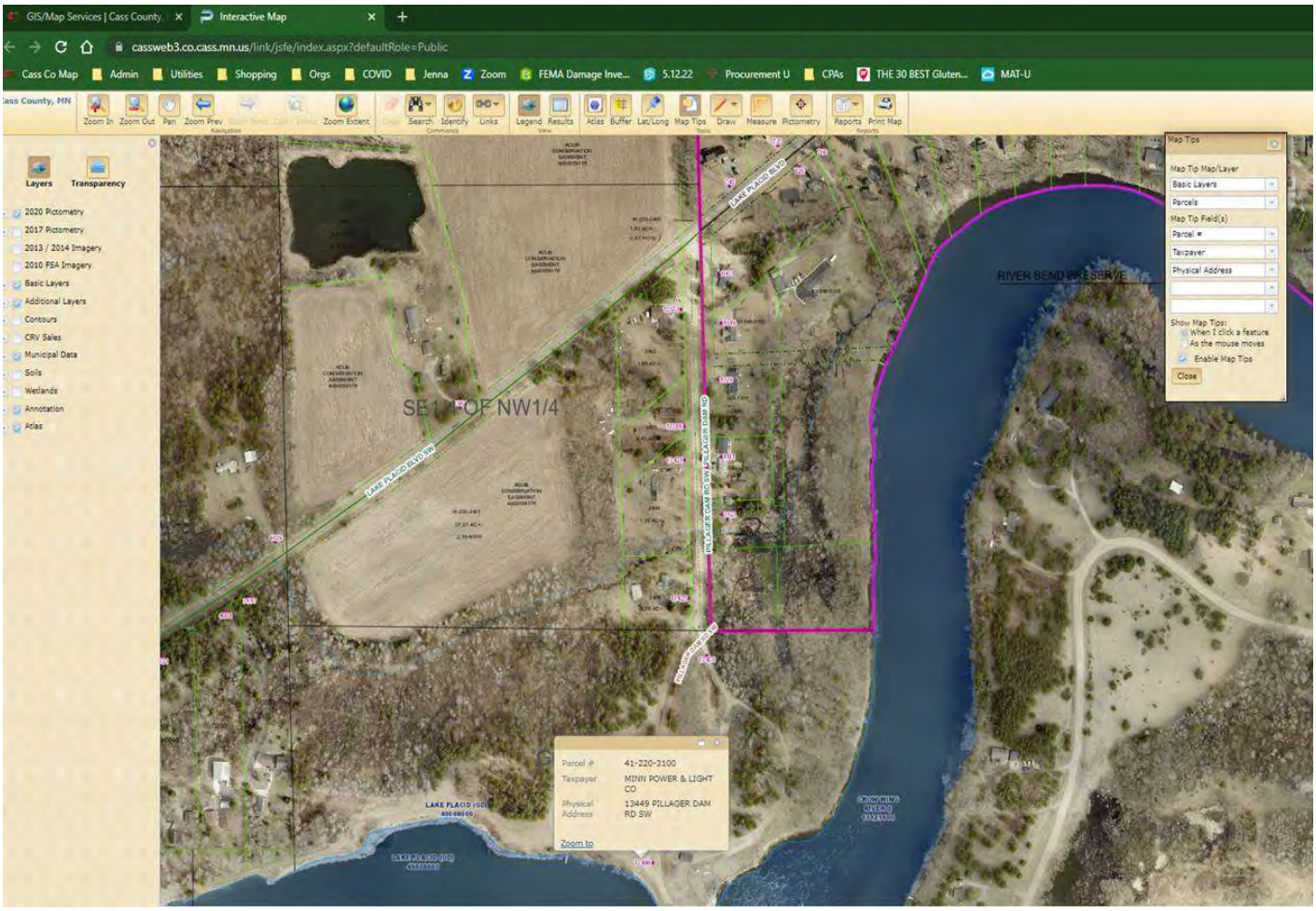
Senior Environmental Compliance Specialist
Minnesota Power/ALLETE
30 West Superior Street
Duluth, Minnesota 55802

Office: 218-355-3191
Cell: 218-461-6856
Email: gprom@allete.com

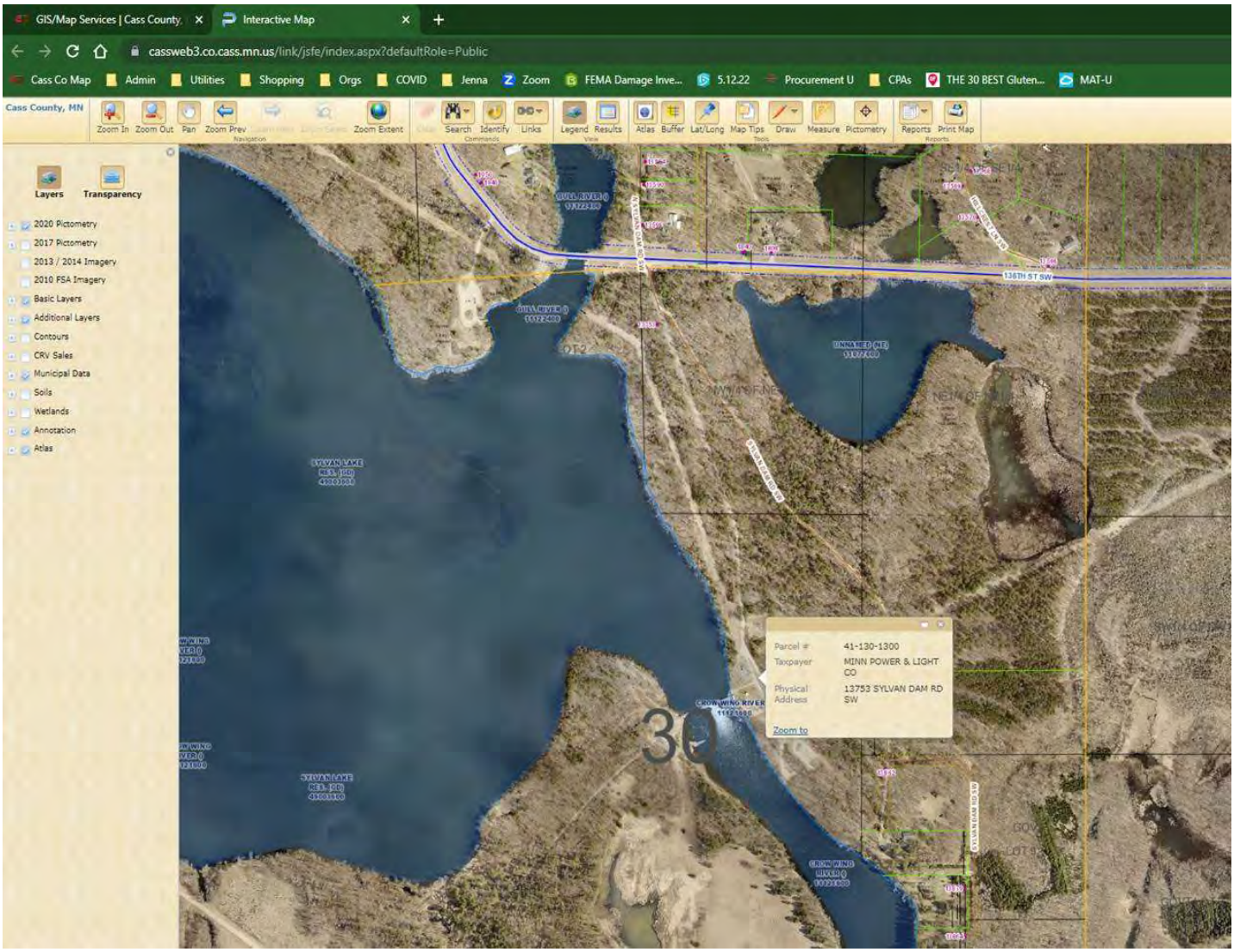
From: Clerk [mailto:clerk@sylvantwp.com]
Sent: Friday, March 31, 2023 10:12 AM
To: Gregory Prom (MP) <gprom@mnpower.com>
Subject: [EXTERNAL MAIL] RE: Notice of Intent and Pre-Application Document for Little Falls, Sylvan, and Pillager Projects

Hi Greg, thanks for chatting with me on the phone. I am going to bring this to my Town Board for more review. But if I look at the Cass County map – the Pillager Dam is also located in Sylvan Township and not in the City of Pillager. Josh Stevenson would probably know best – but as I see it the parcel ids are Sylvan ID numbers. So, if this is true then both the Sylvan and Pillager Dams are located in Sylvan Township.

PILLAGER DAM


GIS/Map Services | Cass County
Interactive Map
cassweb3.co.cass.mn.us/link/jsfe/index.aspx?defaultRole=Public
Cass Co Map
Admin
Utilities
Shopping
Orgs
COVID
Jenna
Zoom
FEMA Damage Inve...
5.12.22
Procurement U
CPAs
THE 30 BEST Gluten...
MAT-U
Zoom In
Zoom Out
Pan
Zoom Prev
Zoom Extent
Search
Identify
Links
Legend
Results
Atlas
Buffer
Lat/Long
Map Tips
Draw
Measure
Pictometry
Reports
Print Map
Layers
Transparency
2020 Pictometry
2017 Pictometry
2013 / 2014 Imagery
2010 FSA Imagery
Basic Layers
Additional Layers
Contours
CRV Sales
Municipal Data
Soils
Wetlands
Annotation
Atlas
SE 1/4 OF NW1/4
LAKE PLACID BLVD
LAKE PLACID BLVD NW
PILLAGER DAM RD NW
PILLAGER DAM RD
RIVER BEND PRESERVE
Map Tips
Map Tip Map/Layer
Basic Layers
Parcels
Map Tip Field(s)
Parcel #
Taxpayer
Physical Address
Show Map Tips:
When I click a feature
As the mouse moves
Enable Map Tips
Close
Parcel #
41-220-3100
Taxpayer
MINN POWER & LIGHT CO
Physical Address
13449 PILLAGER DAM RD SW
Zoom to
LAKE PLACID (100)
RIVER (0)

SYLVAN DAM



I have a Board meeting on April 6th, and we will discuss this more. Please pass on other dates and more details as you have them.

Thanks,

Jenna Ruggles
Clerk/Treasurer, Sylvan Township
clerk@sylvantwp.com
218.746.3652

Little Falls Hydroelectric Project (FERC Project No. 2532)
Sylvan Hydroelectric Project (FERC Project No. 2454)
Pillager Hydroelectric Project (FERC Project No. 2663)
Relicensing Consultation Documentation

Date	6/29/2023
Person documenting conversation	Matthew Radzak, Minnesota Power
Discussion participants	Ray Nelson, Friends of Old Crow Wing River
Subject of conversation	Chippewa Agency Site at Sylvan

Summary of Conversation:

Briefly discussed Chippewa Agency Site and past attempt for Minnesota Power to convey the property to the Trust for Public Land with a final donation being made to the State of MN with management of the Site falling under the jurisdiction of Crow Wing State Park. Ray asked if MN Power had a copy of the Crow Wing State Park Management Plan from 2002 because the Plan references the Agency Site and the DNR's desire to manage the property. Ray said he could send me a copy or told me I could find a copy online. I told him that I would pull a copy from online and share it with our relicensing consultant.

Document Accession #: 20230724-5043 Filed Date: 07/24/2023

DEPARTMENT OF ADMINISTRATION
STATE HISTORIC PRESERVATION OFFICE

July 22, 2023

Kimberly D. Bose
Secretary, Federal Energy Regulatory Commission
12225 Wilkins Avenue
Rockville MD 20852

RE: Project No. 2532-094 Little Falls Hydroelectric Project
Project No. 2454-085 Sylvan Hydroelectric Project
Project No. 2663-064 Pillager Hydroelectric Project
Notice of Intent to File License Applications, Filing of Pre-Applications Documents, Commencement of ILP Pre-Filing Process, and Scoping
Cass and Morrison Counties, Minnesota
SHPO Number: 2023-1267

Dear Kimberly Bose:

The *Notice of Intent to File License Applications, Filing of Pre-Application Document (PAD), Commencement of ILP Pre-Filing Process, and Scoping; Request for Comments on the PAD and Scoping Document, and Identification of Issues and Associated Study Requests* (Notice) dated May 26, 2023 was received in our office on May 26, 2023.

By this Notice, which primarily addresses the environmental review process under the National Environmental Policy Act (NEPA), it is our understanding that the Federal Energy Regulatory Commission (FERC) is initiating "informal" Section 106 consultation with our office regarding the proposed re-licensing of the three (3) hydroelectric projects listed above (Projects) and the Notice has also designated the applicant, ALLETE, as the non-federal representative for the purpose of "carrying out informal consultation" with our office pursuant to Section 106 of the National Historic Preservation Act.

Pursuant to 36 CFR 800.3-5 it is the Federal agency's responsibility to define the federal undertaking, initiate consultation with identified consulting parties, plan to involve the public in the Section 106 review, define the Area of Potential Effect (APE) for the federal undertaking, identify and evaluate historic properties that may be affected by the proposed federal undertaking, and assess adverse effects to historic properties, if any.

With your agency's designation of the non-federal applicant, it will be critical to align licensing review and comment steps with the Section 106 regulatory framework at an early stage. We look forward to meaningful consultation and an effective review of the proposed Projects between our office and the ALLETE. Since ALLETE has not yet initiated informal consultation with our office, we provide the following comments with the intent to inform the Projects' review under Section 106.

Definition of the Undertaking
ALLETE will need to provide our office and consulting parties with a clearly defined undertaking consistent with 36 CFR 800.16(y), specifically to clarify whether the three (3) Projects are to be considered as a single federal undertaking, or 3 separate undertakings.

Definition of the Area of Potential Effect
A definition of the Area of Potential Effects (APE) for the Projects is provided on Table 5-49 of the Pre-Application Document (PAD). Corresponding APE boundary maps have not been provided. We recommend that ALLETE prepare and distribute clearly delineated APE maps to our office and other consulting parties as the Section 106 review process moves

forward. As part of the APE mapping effort, please provide clarification regarding the lease lots described in the PAD and whether or not they are part of the APE for the undertaking.

Based upon the narrative description provided in the PAD, it is our opinion that the APE determinations, separated for each of the 3 Projects, are generally appropriate to take into account the potential direct and indirect effects of the proposed undertaking as we currently understand it. As the undertaking's scope and nature is further defined, or if it is significantly altered from the current scope, additional consultation with our office may be necessary in order to revise the current APE.

Consulting Parties
Based on the PAD, we understand that FERC has notified, and ALLETE is coordinating the Projects' review, with twenty (20) Native American tribes who may have an interest in the project location. Our understanding is that the following ten (10) Native American tribes may (or may not) also have an interest in the project location; Lower Sioux Community, Shakopee Mdewakanton Sioux (Dakota) Community, Prairie Island Indian Community, Flandreau Santee Sioux Tribe, Santee Sioux Nation, Sisseton-Wahpeton Oyate, Spirit Lake Nation, Turtle Mountain Band of Chippewa Indians, Standing Rock Sioux Tribe, and Rosebud Sioux Tribe.

We also understand that you are consulting with the Minnesota Indian Affairs Council (MIAC) and that MIAC staff Dylan Goetsch attended the Interagency Meeting in January 2023. We noticed that you did not include his last name in the list of attendees and wanted to make sure you have that information. We recommend including Melissa Cerda of MIAC on future communications and meeting invitations.

We also recommend consultation with the Office of the State Archaeologist under Minnesota Statutes 138.40 and 307.08.

Based on the project's proximity to the Little Elk Heritage Preserve, we recommend including the Morrison County Historical Society, the current owners of the preserve, as a consulting party. The Little Elk Heritage Preserve may be affected by the undertaking.

Identification of Historic Properties
Historic/Architectural
The PAD correctly identifies the currently recorded historic status of dams and associated facilities at each of the 3 Projects which are assumed to be within the APE:

- Little Falls – The **Little Falls Hydroelectric Facilities [MO-LFC-00130]** is a historic property determined eligible for listing in the National Register of Historic Places (NRHP) in 1991 as part of the Project's previous federal relicensing Section 106 review;
- Sylvan – The **Sylvan Hydroelectric Powerplant Facilities [CA-SLV-003]** is a historic property determined eligible for listing in the NRHP in 1991 as part of the Project's previous federal relicensing Section 106 review;
- Pillager - The **Pillager Hydroelectric Generating Plant [CA-PLC-002]** is a historic property determined eligible for listing in the NRHP in 1992 as part of the Project's previous federal relicensing Section 106 review

Because the above-referenced historic properties were last surveyed over 30 years ago, and it is likely that they may have experienced modifications and changes that are not recorded in our files, in order to meet current state survey guidelines and adequately inform the Section 106 review moving forward, we recommend completion of updated survey and evaluation documentation for the 3 hydroelectric Projects. The updated documentation should be prepared consistent with the Secretary of the Interior's *Standards for Identification* and *Evaluation*, and our current survey guidelines.

The PAD does not mention proposed efforts to identify other historic/architectural properties within the APE. As a first step, following APE definition and map documentation in consultation with our office, ALLETE should then take steps to complete a literature review to determine whether there are any other properties 45 years or older within the APE.

Archaeology
Based on the PAD, we understand that ALLETE has indicated that they will perform a desktop cultural resources evaluation (Phase IA) of the APEs for the Projects. The study is intended to "verify known sites in the APEs." After the preparation of

this document, the Licensee will then consult with our office and interested tribes to determine whether field survey is necessary.

At this time, we recommend a desktop review of the cultural resources within the APEs of the Projects combined with a field visit to assess the conditions of the previously identified archaeological sites within the APEs. We recommend the field visit be performed at a time of low water to best assess the conditions of sites that have been repeatedly documented in annual monitoring visits as inundated due to their investigation during times of high water. Additionally, due to the passage of time, changes in archaeological science and methodology, we recommend a comprehensive Phase I archaeological survey be performed by a qualified archaeologist. If, as a result of the combined desktop review, field visit, and Phase I survey, archaeological sites are identified that have not been evaluated for NRHP eligibility, we recommend conducting an evaluation of those sites. We would be happy to consult on the development of research designs for the evaluation effort. These studies will best inform the development of a Historic Properties Management Plan that will be developed during the relicensing effort.

According to the previously executed Programmatic Agreements and corresponding Cultural Resources Management Plans for these Projects, there were several provisions for the protection of historic properties identified in the previous relicensing effort that we cannot find any evidence were completed in our records. Please provide information on the status of the following provisions:

- Little Falls – 1) Phase IIb Investigations at Mill Island to determine the need for mitigation or protection of the Mill Island Site (21MO0115) and evaluate the site for data recovery. 2) Stabilize sites as determined appropriate using measures. 3) Conduct mitigation if stabilizing sites would result in an adverse effect.

- Pillager – 1) Complete inventory forms for all archaeological sites documented within the Pillager APE by the literature review and Phase I field surveys. 2) Seek permission to conduct Phase II investigations (on land not owned by Minnesota Power) and conduct Phase II investigations at Pillager Dam North (21CA0236), the Gerrels Site (21CA0237), the Mitchell site (21CA0238), the Deer Site West Site (21CA0240), Fishermens' Pines site (21CA0241), Swedberg Landing (21MO0123), Kominek Landing Site (21MO0124), Fundine Site (21MO0125), Twin Pines (21MO0129), Peterson (21MO0131), and Pepin Point (21MO0134). 3) Stabilize sites if necessary for sites determined eligible for listing on the NRHP. 3) Mitigate any unavoidable adverse effects on historic properties, if necessary.

- Sylvan – 1) Conduct Phase IIb investigations at the River Bend Site (21CA0195), the Sylvan Portage-Deaver's Ford-Root site complex (21CA0194), and the habitation area of the Agency Mounds and Habitation Site (21CA0055) to evaluate needs for data recovery and stabilization. Consult with MnOSA or MIAC/MnOSA regarding the Agency Mounds Site. 2) Evaluate management activities and stabilization techniques needed to protect historic properties and integrate the recommendations of the MnOSA/MIAC for the Agency Mounds. 3) Stabilize sites if necessary for sites determined eligible for listing on the NRHP. 4) Conduct Phase IIb investigations of any sites identified in the Phase I survey. 5) If a drawdown of the reservoir is anticipated, conduct an archaeological survey during the drawdown. 6) The development of a data recovery plan in consultation with our office.

We look forward to continuing consultation on this Project. Please feel free to contact me if you have any questions or concerns regarding this comment letter. I can be reached at 651-259-3456 or by e-mail at sarah.beimers@mnhs.org.

Sincerely,

Sarah J. Beimers
Environmental Review Program Manager

Cc via email:
Greg Prom, ALLETE

Jenna Ruggles, PILLAGER, MN.
Sylvan Township
July 20, 2023

To Whom It May Concern
RE: Re-licensing of Minnesota Powerâ€™s Sylvan Hydroelectric Dam 2454-0285

In regard to the re-licensing of the Sylvan Hydroelectric Dam, located in Sylvan Township, the Sylvan Town Board wishes to comment on the preservation of the Chippewa Agency Site, an important historic site owned by Minnesota Power, an ALLETE company. The site is located within Sylvan Township.

The Chippewa Agency site is included in the National Register of Historic Places (Chippewa Agency Historic District 73000967-R). The site includes artifacts, prehistoric mounds, the Red River Oxcart Trail, the location of the Chippewa Indian Agency, and was the location of the assassination of the important Ojibwe Chief Hole-In-The-Day in 1868. It is of great significance to the Native American community in the region. The district needs protection to prevent further degradation from off-road vehicles, artifact hunters and other harmful activity that has damaged the site over the past years.

Sylvan Township, through its Board of Supervisors, has a long history of supporting the preservation of the Chippewa Agency Historic District by its inclusion in Crow Wing State Park. The purpose of these comments is to once again emphasize our support for preserving this important cultural and historic area within the boundaries of the Park. The Township has offered broad support for identifying and preserving important cultural resources, including the recent sponsorship of a $127,000 archeological study, the Camp Ripley Sentinel Landscape Cultural Resource Assessment project. Sylvan Township was the fiscal agent for the study, funded by an appropriation to the Minnesota Historical Society from the Minnesota Arts and Cultural Heritage Fund.

Past Sylvan Town Boards have supported the acquisition of the Chippewa Agency site by the State Park in order to use State Park resources to oversee and protect the site. The land containing the site could be transferred from Minnesota Power to Crow Wing State Park, a transfer that has been widely supported for many years.

If a land transfer does not happen, then we recommend the Chippewa Agency site be included in the Crow Wing State Park management plan in order to protect important cultural history and artifacts.

Thank you for your consideration of these comments.

Sincerely,

Greg Booth
Sylvan Township Chairman

CROW WING COUNTY
HISTORICAL SOCIETY
MUSEUM & LIBRARY - EST. 1927

Email:
history@crowwing.us

Website:
www.crowwinghistory.org

Street Address:
320 Laurel Street
Brainerd, MN 56401

Phone:
(218) 829-3268

July 21, 2023

Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Re: Little Falls Hydroelectric Project No. 2532-094, Sylvan Hydroelectric Project No. 2454-085, and/or Pillager Hydroelectric Project No. 2663-064.

Dear Commissioners:

The Crow Wing County Historical Society of Brainerd, Minnesota has been preserving the history of the area since 1927. We would like to express our concerns about the protection of the National Historic Place and National Historical Landmark known as the "Chippewa Agency Historic District (73000967_R)". This site has significant prehistory and historic information that needs to be protected. On July 17, 2023, the Crow Wing County Historical Society met and made a motion to support the protection of this historic district. It also authorized a letter of support to be filed supporting the comments and recommendation of the Friends of Old Crow Wing.

Regards,

Hillary Swanson
Executive Director

Listed on the
National Register
of Historic Places

Comments and Recommendations related to relicensing of Sylvan Hydroelectric Project 2454-0285

Submitted by

Non-profit organization “Friends of Old Crow Wing” in conjunction with Crow Wing County Historical Society, and Crow Wing State Park

The goal of these comments by Friends of Old Crow Wing is to protect the National Register of Historic Places site known as “Chippewa Agency Historic District 73000967_R”. The site has been degraded over the years by artifact hunters, ATV activity, unauthorized public use, and general lack of enforcement. A funded archaeological investigation in conjunction with this goal can review and investigate new sites.

This site contains an incredibly significant array of ancient and historic cultural properties that are important to our understanding of early settlement and transportation history in the Mississippi Headwaters. The district also has deep connections with the Ojibwe community. It is the location of the eventful Chippewa Indian agency from 1851–1869 a hub of the region's mid-19th-century activity.

The district also includes prehistoric mounds, a village, Woods Red River Ox cart trail, first logging camp on the Crow Wing River, and Hole in the Day Younger’s assassination in 1868.

During the mid-nineteenth century, the Agency conducted yearly Ojibwe annuity payments, government education programs, treaty negotiations, and other business as needed. These activities fueled commercial and residential developments in the nearby town of Crow Wing, making it, at the time, the largest settlement in northern Minnesota. These frontier affairs at the Agency and Crow Wing required the building of Fort Ripley with troops in 1847 to closely monitor tense Indian relations.

To meet the goal of protecting the site, three objectives have been outlined that should attain better protection of the site and ensure that the integrity of the site is maintained.

Objective One: To have the site transferred from the present ownership of Minnesota Power (ALLETE) to Crow Wing State Park, State of Minnesota. This site is located within the statutory boundaries of Crow Wing State Park. This results in Crow Wing Park’s cultural management plan managing the site. The State Park staff would monitor and protect the site. There is history of this transfer proposal having an agreement to do this, but final approval was denied by FERC. The current relicensing process for the Sylvan Hydroelectric Project was suggested to be the appropriate time to review that decision.

Objective Two: If a transfer of the land site to the Crow Wing State Park does not happen then protective conditions should become an important management requirement in the relicensing permit for Minnesota Power (ALLETE) to implement. This should be a management plan that is equal to the cultural management plan Crow Wing State Park would be required to enforce.

Objective Three: If neither objective 1 nor 2 becomes implemented, the hydroelectric dam should be decommissioned with the site no longer considered a necessary holding for Minnesota Power. The property would become available for inclusion in Camp Ripley’s Sentinel Landscape project or even acquired by Crow Wing State Park in that event.

Historical Summary:

A brief history of this site and the activities related to protection of the area are described in the following summary. The confluence of the Gull River, Crow Wing River, and Mississippi River has been a critical area for tribal people since time immemorial. This includes village sites, hunting camps, cultural activities, and burial mounds. The Dakota people occupied this region until about the 1750's and the Ojibwe took control of the region.

The establishment and entry of the United States Government some 60 years later developed a new relationship in the area with treaties to define this area. The treaty of 1837 used the point where the Crow Wing River enters the Mississippi River as the northwestern most point of the 12-million-acre land cession. This area was an active site of fur trade, and the Red River Oxcart Trail called the Woods trail.

In 1851 the United States established the Chippewa Agency as the formal site for the government's interaction with the Mississippi Ojibwe. The town of Crow Wing grew in conjunction with the development of the agency. The Chippewa Agency remained a focal point for the government's interaction with Ojibwe until 1872. The establishment of the White Earth Reservation in 1867 began the movement of the Ojibwe from the reservations at Gull Lake, Rabbit Lake, Pokegama, Sandy Lake and Rice Lake to White Earth. The government closed the Gull Agency at this time.

Because of the unique historic and cultural aspects of the area, Crow Wing State Park was established in 1959. Cultural resource management brought about a review of the Chippewa Agency site and significant research discoveries resulted meriting a request to place the site on the National Register of Historic Places and National Historic Landmark register. May of 1973 the site was placed on the register (Chippewa Agency Historic District 73000967_R).

Since 1972, this Minnesota Power owned site has had several people observe the site being harmed by artifact hunters, abuses by ATV, erosion from boat landings, and general unregulated public use. The Friends of Old Crow Wing and the tribal government at Mille Lacs Reservation began a discussion with Minnesota Power about providing better protection of the site. This led to the exterior boundaries of Crow Wing State Park being extended to include the site. This required Minnesota Legislature to approve extending the statutory boundaries to include the Chippewa Agency for a future land transaction.

The Minnesota Indian Affairs Council worked with the organization "Lands for Public" Trust to acquire the land from Minnesota Power which was denied by FERC in 2007. In 2018 FERC issued a letter to Congressman Richard Nolan stating that the land transfer should wait until the relicensing process was developed in 2023. This current request to transfer this land site to Crow Wing State Park during this license process hopefully will initiate a positive result moving forward in response to protection concerns and completely address the issues as a result.

Supplemental Request to Scoping Document:

FERC SCOPING DOCUMENT Sylvan Hydroelectric Project (P2454)

STUDY PLAN CRITERIA 18 C.F.R. Section 5.9(b)

Any information or study request must contain the following:

Study Request: Re-evaluate the resources on 267.45 acres known as the "Chippewa Agency" Historic District site (National Register of Historic Places known 73000967_R") and determine if this acreage is necessary to Sylvan Hydroelectric Project (P2454) purpose and operation.

1. The goal of this study should determine: (1) is this specified 267.45 acres known as the "Chippewa Agency" acreage for Sylvan Hydroelectric Project (P2454) needed for future Sylvan Hydroelectric Project operations to acquire licensure. This study can factually re-open the 2007 land transaction proposal to transfer the site to Crow Wing State Park; (2) fund an archaeological study to evaluate the current condition of NHRS 1971 recorded sites and include non-intrusive investigation of potential sites that are visible on lidar imagery; (3) the end result should determine the best protection measures in a management action plan that can be measured for success and/or failure.
2. The objectives are:
   a. To acquire proper protection of all historical cultural site interests within these boundaries by either Minnesota Power (ALLETTE) fully complying with FERC's written Shoreline Management of Hydroelectric Projects guidance. Or, by a legal transfer of property to an appropriate agency i.e., Minnesota Crow Wing State Park where this property has already been put within the park's current statutory boundary. These steps could address the desired protection issue.
   b. The relevant resource management goals of state parks for Cultural resources differ in at least one incredibly significant way in managing these resources: once cultural sites are disturbed or destroyed, they are lost forever.

      The 2002 Crow Wing State Park Management Plan's goals address cultural resource protection and have archaeological funds available for the NHPS Chippewa Agency site to:

< Identify, evaluate, protect, and preserve the archaeological and historical resources.

< Follow state and federal laws that govern cultural resource management.

< Provide interpretive opportunities for the park's cultural resources.

< Work with Division of Parks and Recreation archaeologists to ensure that site development activities do not negatively impact cultural resources.

< Develop an ongoing research and monitoring program.

3. The Friends of Old Crow Wing is a non-profit group established in 1987 as a revitalization of the Crow Wing State Park Association which began in 1959. The primary purpose of the group is to work with the park manager on park projects related to Crow Wing and the surrounding area. Members of this group are active participants supporting current and future projects important to park goals and objectives.

4. Historically, Friends of Old Crow Wing and the tribal government at Mille Lacs Reservation opened discussion with Minnesota Power (ALLETTE) about providing better protection of this culturally important site. The exterior boundaries of Crow Wing State Park were extended to include the site. This required Minnesota Legislature to approve the statutory boundaries to include the Chippewa Agency.

4a. The Minnesota Indian Affairs Council worked with the organization “Lands for Public” Trust to acquire the land from Minnesota Power in 2007. This transaction was denied by FERC at that time.

4b. FERC issued a letter in 2018 to Congressman Richard Nolan stating that the land transfer question could wait until the relicensing process occurs in 2023. The Minnesota Department of Natural Resources land acquisition personnel will negotiate with ALLETTE a legal and agreeable land transfer of the Agency acreage to Crow Wing State Park upon FERC approval to do so.

4c. New lidar technology imagery of the site shows some possible previously unidentified cultural mound groups within the site boundaries. A properly funded archaeological study should be implemented to identify and record these new sites as to their existence, which again points to an immediate urgency to have protective measures put in place and enforced.

5. Sylvan Hydroelectric Dam operations would not endure any adverse direct, indirect, or cumulative effects from this requested action. This study proposal reviewing the Agency acreage realistically should determine if the site is necessary for operation of the Sylvan Dam Hydroelectric project. In all years of operations, this Agency acreage should have been receiving land management/protection care of historic cultural resources addressed in FERC’s Shoreline Management of Hydroelectric Projects Guidelines. Funding and enforcement should be a standard practice in administering an effective protection of cultural resources. The study should address maintaining cultural integrity and clarify ALLETTE’S appropriate protection measures or transfer this site responsibility to State Parks. A positive result could make the license requirements in future re-licensing evaluations easier to approve.

6. The proposed desktop review of the cultural resources at this project will not do justice to the current landscape. A professional archaeological study using methods not available 50 years ago can collect the new data that updates this historically significant site. A site study would provide a review and evaluations that reflect answering these noted concerns. The earliest appropriate study season for this project proposal point would be summer and fall of 2024 lasting 3-6 months. Tribal considerations are imperative and tribal professionals will be active participants in this entire study.

7.. Efforts must be undertaken in concert with local Tribal authorities to discuss the potential to designate this area as a Traditional Cultural Place. The completion of a systematic archaeological survey in concert with local Tribal authorities should occur. Future evaluation efforts of the previously identified agency buildings, burial mounds, or village area features would begin with a modern survey including a pedestrian survey, shovel testing in appropriately areas, geophysical survey, LiDAR analysis with multiple hill shading efforts, and overhead (drone) survey.

Based on current industry pricing this work could easily cost more than $100,000.00 for an initial survey and consultation. A desktop review of this site would not be sufficient or do justice to this significant site historic value. In conclusion…These 267.45 acres known as the Chippewa Agency Historic District site (National Register of Historic Places known as “Chippewa Agency Historic District 73000967_R”) deserves a mutually agreeable win-win effort to conclusively determine a future of best protective management.

Attachments:

1. Comments on the NEPA and Scoping Document 1 (completed)
2. A map of the boundaries of Crow Wing State Park and identification National Register Historic Place and Historic Landmark as to what is transferred. (develop)
3. Description of Chippewa Agency site. (complete)
4. Correspondence related to the transfer of the site. (compile)
5. Statement of inability to protect the site from damage.
6. Crow Wing State Park's Cultural Management Plan.
7. Fort Ripley comments and Camp Ripley Sentinel Landscape comments (being developed)
8. Letters of support for project. (gather)

5. Statement of inability to protect the site from damage.

In 2007 I personally observe damage done to the site by ATV. This included a trail running over potential burial mounds and general erosion from ATV's use of the Red River Cart Trail. It was also observed at separate locations on the site where equipment was hidden that was used to screen material for artifacts. There were locations where holes were dug, and material had been screened. In discussion with Minnesota Power staff, they identified that they would not be able to provide more protection to the site due to cost. They felt that signing the property and asking enforcement to check on the was the most that could be done. This was recorded July 16, 2023 by Don Wedll.

6. Crow Wing State Park's Cultural Management Plan:

Crow Wing State Park Management Plan

2. A map of the boundaries of Crow Wing State Park and identification National Register Historic Place and Historic Landmark as to what is transferred.



Sketch of the Chippewa Agency by 8th Regiment Soldier

Privileged Information Redacted

Privileged Information Redacted

Privileged Information Redacted

Privileged Information Redacted

4. Correspondence related to the transfer of the site.

Paul Roth - project area map

From: "Becca Nash" <Becca.Nash@tpl.org>
To: <Teresa.Thews@state.mn.us>
Date: 7/26/2006 10:50 AM
Subject: project area map

Hi Teresa,

I want to be sure you have this map of the proposed Crow Wing State Park addition at the confluence of the Crow Wing and Gull Rivers. This shows the property Minnesota Power is interested in selling to TPL, which we would intend to eventually convey to DNR State Parks.

Please note the property boundary would be established by the contour line at 1177' on the southern side; it would extend to but not across County Road 36 in the SESW Section 19; and it would not include the public access currently being leased to DNR T&W.

I'd like to confirm this property as shown is of interest to you for possible future inclusion into Crow Wing State Park; provided yes, this will likely be the general depiction shown in TPL's option agreement with the landowner, which we are moving ahead quickly to secure. Confirmation from you as soon as possible would be great.

Thank you,

Becca Nash
Project Manager
The Trust for Public Land
Minnesota State Office
2610 University Avenue, Suite 300
St. Paul, MN 55114
tel. 651.999.5325

The Trust for Public Land - Conserving land for people since 1972. Because everyone needs a place to play outdoors. www.tpl.org

minnesota power
/ 30 west superior street / duluth, minnesota 55802 / telephone 218-722-2641

October 22, 2007

Sylvan Township
c/o Brenda Silgjord
Deputy Clerk
12956 24th Ave. SW
Pillager, MN 56473

Re: Conveyance of Minnesota Power land in Cass County, MN to the Trust for Public Land

Dear Superintendent:

Minnesota Power (MP) is requesting your written comments on the conveyance of company owned land, within the boundary of the Sylvan Hydroelectric Project (Federal Energy Regulatory Commission Project #2454) to the Trust for Public Land; which is a national, non-profit land conservation organization that conserves land for public enjoyment. After the conveyance is complete, the Trust for Public Land intends on conveying the property to the State of Minnesota, at which time the property will then be incorporated into the Crow Wing State Park.

The land to be conveyed is approximately 200 acres in size and is located in southern Cass County. This parcel exists immediately west of the Gull River's confluence to the Crow Wing River; specifically along the north side of the Crow Wing River directly across from Camp Ripley Military Reservation (please see attached maps for further detail).

The geographic region in which this parcel lies is rich in cultural resources, and the property to be conveyed is no exception. The cultural resources located on this piece of property are important historical links to Native American culture, and also to the settlement of the area in the mid 1800's. These resources include the remnants of a Government Indian Agency site, other signs of use by Native Americans, and parts of a historic ox cart trail.

The land to be conveyed is also used for public recreation. A Minnesota Department of Natural Resources (MDNR) maintained boat launch and picnic area are located on the southern tip of the parcel, where the Gull River enters the Crow Wing River; some shore fishing also takes place at this location. Other permissive and non-permissive recreation that is occurring includes hiking, camping, hunting, and ATV use. It's intended that public uses will continue to be managed by TPL and Crow Wing State Park in a way that protects the integrity of the land and its resources.

As the hydroelectric project is currently operated, there is no shoreline erosion on the property related to the operations of the reservoir. It is intended that erosion considerations will continue to

be monitored and appropriate action will be taken by the state park to ensure that any future erosion problems be remedied.

For purposes of documentation, MP respectfully requests a written response on this consultation to assure that your interests are fully understood. We request that written responses be received no later than November 23, 2007.

You may submit your written comments to the following address: Minnesota Power c/o Matthew Radzak, Land Management Specialist, 30 West Superior Street, Duluth, MN 55802.

Please feel free to call me at 218-722-5642, extension 3543, or E-mail me at mradzak@allete.com if you have questions.

Thank you,

Matthew Radzak
Minnesota Power

Enclosed: 2 maps



WHITE EARTH LAND RECOVERY PROJECT
NATIVE HARVEST
607 Main Avenue Callaway, Minnesota 56521
WELRP: 800-973-9870 or 218-375-2600 Fax: 218-375-2603
NH: 888-274-8318 or 218-375-2600 Fax: 218-375-4605

19 Gashkadino-giizis (Freezing Moon) 2007

Matthew Radzek, Land Management Specialist
Minnesota Power
30 West Superior Street
Duluth, MN 55802

Dear Mr. Radzek.

Anlin from the White Earth Reservation. I write today in support of the transfer of land from Minnesota Power to the Minnesota Department of Natural Resources, specifically Crow Wing State Park. The land in question was once the site of the Crow Wing Chippewa Agency, which was active between 1851 and 1869. The agency was a site where native Anishinaabeg (also known as the Ojibwe or Chippewa) and mixed-blood people lived—after their displacement by white settlers—under the jurisdiction of government agents who disbursed rations and acted as liaisons. The agency closed when the Anishinaabeg were moved to allotments at White Earth, Leech Lake, or Wisconsin reservations. Though the period of history is not a happy one for the Anishinaabeg, the site is still of great value.

According to the Minnesota Archeological Society's Summer 2005 Newsletter, this particular parcel of land "is incredibly rich in archaeological components and context, including agency building and field sites, a Woodland period village site, prehistoric Indian cemeteries, [and] the location of Hole-in-the-Day II's murder site" (www.mnarchaelogicicalsociety.org). The fact that the land contains graves makes it particularly important to Native American people. We wish to protect and honor the burial sites of our ancestors, just as you would your own.

Unfortunately, the land at present is not protected in any way and has already experienced degradation due to all-terrain vehicle use and looting for artifacts. Such degradation is a loss for all Minnesotans interested in preserving our history as well as an insult to Native American people.

Transferring the land could facilitate its protection from such activities and preserve it for future generations who will learn from its many stories. I urge you to move forward with the transfer and thank you for your consideration.

Miigwech!

Winona LaDuke, Executive Director
White Earth Land Recovery Project

Sylvan Township
12956 24th Avenue SW, Pillager, MN 56473
phone: (218) 746-3652 / fax: (218) 746-3612 / e-mail: sylvan@brainerd.net

RESOLUTION #2004-10

CHIPPEWA AGENCY SITE – CROW WING STATE PARK

WHEREAS, residents of Sylvan Township value the rural character and green spaces of Sylvan Township, and

WHEREAS, Sylvan Township recognizes the significance of its historical and cultural resources, and,

WHEREAS, Sylvan Township desires to expand its recreational and tourism base, and

WHEREAS, the Chippewa Agency Site is on the National Register of Historic Places and provides valuable green space conserving the Crow Wing River, and

WHEREAS, Sylvan Township supports the Camp Ripley buffer program; and

WHEREAS, the Chippewa Agency Site buffers Camp Ripley, and

WHEREAS, the Chippewa Agency Site is owned by Minnesota Power and managed for compatible uses with the operation of Sylvan Reservoir for hydroelectric generation, and

WHEREAS, the Crow Wing State Park Management Plan identifies the Chippewa Agency Site as a desirable acquisition to the Park, and

WHEREAS, the historical and cultural resources of the Chippewa Agency Site are at risk from unregulated public uses, and

WHEREAS, incorporating the Chippewa Agency Site into Crow Wing State Park would preserve the cultural and historical resources endemic to the site and would be compatible with the operation of Sylvan Reservoir,

THEREFORE, Sylvan Township hereby supports the acquisition and incorporation of the Chippewa Agency Site into Crow Wing State Park.

10 August 2015

To:
The Honorable Representative Rick Nolan
2366 Rayburn House Office Building
Washington D.C. 20515

From:
Ron Miles, on behalf of:

The Ad Hoc Committee for CROW WING AGENCY (21CA55*, NRHP#7300967) Stewardship
9980 Ponderosa Lane SW
Nisswa, MN 56468
218-330-3708

Re: A bill to allow state park ownership of the historic CROW WING/ CHIPPEWA AGENCY site
***("21CA55" is national-standard site nomenclature for the 55th site officially registered in Minnesota's Cass County)**

We are grateful for your stalwart and exemplary leadership in cultural and environmental issues in the public interest. It is in this light, Representative Nolan, that we seek your assistance in an important matter that very much needs a proper and early resolution.

In recognition of the extraordinary significance of the CROW WING/CHIPPEWA AGENCY (1850-1869) and its multi-component environs (21CA55) to the natural and cultural history of Minnesota and the United States, this area was officially added to the National Register of Historic Places (NRHP#7300967) in 1972. So designated, it remains arguably the most important such listing in Minnesota not presently in public ownership.

Acknowledging the propriety of adding this property to Crow Wing State Park (CWSP) for resource management and interpretation, such action was proposed in that state park's most recent Unit Management Plan, completed in 2004 (Jade Templin, Chief Planner, jade.templin@state.mn.us). Accordingly, two years later, an act of the Minnesota Legislature drafted by Senator Don Samuelson placed the area into the Statutory Boundaries of CWSP, ostensibly enabling the transfer of its present ownership from Minnesota Power (ALLETE) by gift or sale.
(https://www.revisor.mn.gov/laws/?id=236&year=2006&type=0)

For a decade, a series of bureaucratic and/or budgetary glitches has thwarted this orderly public interest process. Meanwhile, accelerating and irreversible threats and damages to the natural and cultural integrity of the area continue unabated due to the lack of active enforcement and ongoing resource management. Hopefully, the pageant of non-action in this regard becomes clearer in the enclosed packet of documents and information.

We seek a bill that would exempt the CROW WING/CHIPPEWA AGENCY Site from all federal regulatory restrictions that prohibit Minnesota Power (ALLETE) from conveying this property to the State of Minnesota to be included in Crow Wing State Park.

Agencies and entities who have heretofore expressed strong support for these urgently-needed measures include, but are not limited to, the following; and updated expressions of such may be obtained at any time:

A. Heritage Preservation Department, Minnesota Historical Society
B. White Earth Ojibwe Nation
C. Episcopal Church in Minnesota; Rt. Rev. Brian Prior, Bishop
D. Crow Wing County Historical Society; Don Samuelson, President
E. Friends of Old Crow Wing; Ray Nelson, President
F. Sylvan Township, Cass County, Minnesota; Greg Booth, Chairman
G. State Historic Preservation Officer, David Mather
H. Minnesota Archaeological Society (MAS); Rod Johnson, President
I. Minnesota Indian Affairs Council (MIAC); Jim Jones, Jr., Cultural Resources Director
J. Office of the State Archaeologist (OSA); Scott Anfinson
K. Council for Minnesota Archaeology (CMA), Bruce Koenen, OSA
L. Mille Lacs Band of Ojibwe
M. Leech Lake Band of Ojibwe
N. Crow Wing State Park; Paul Roth, Manager
O. Camp Ripley, Patrick Neumann, Archaeologist
P. Minnesota Power (ALLETE); Ross Dudzik, Land Management Specialist

Members of The **Ad Hoc Committee for CROW WING AGENCY (21CA55, NRHP) Stewardship** include:

David Mather, National Register Archaeologist, Minnesota Historical Society (david.mather@mnhs.org)
Douglas Birk, Archaeologist, Nominator of CWA to NRHP (dabirk@q.com)
Don Samuelson, President of Crow Wing County Historical Society, former President of the Minnesota Senate (donsam@brainerd.net)
Don Wedll, former Commissioner of Natural Resources, Mille Lacs Band of Ojibwe (dwedll@hotmail.com)
Ron Miles, retired Regional Naturalist and Cultural Resource Specialist for MnDNR Division of Parks & Recreation, and current board member of the Minnesota Archaeological Society (MAS) (rem@brainerd.net)
Canon Stephen Schaitberger, local Episcopal Church historian and priest (stephenschaitberger@charter.net)
Greg Booth, Sylvan Township Chairman, Cass County, Minnesota, and Manager, Sunup Ranch (greg@sunupranch.com)
Ray Nelson, President of Friends of Old Crow Wing, and retired site manager and historian for the Cross Lake Dam Recreation Area., USACE (rnnelson13@hotmail.com)
Dr. Nicholas Bernier, MD, local interpreter of pioneer life in the area (mnarrows@hotmail.com)
Michael North, Landowner adjacent to 21CA55, Sylvan Township, and Ecologist (michael.north@state.mn.us)

Document Accession #: 20230725-5137 Filed Date: 07/25/2023

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426

August 14, 2018

OFFICE OF THE CHAIRMAN

Honorable Richard M. Nolan
U.S. House of Representatives
Washington, D.C. 20515

Dear Congressman Nolan:

Thank you for your July 25, 2018, letter regarding the potential transfer by Minnesota Power's (ALLETE) to the Trust for Public Land of lands that are currently part of ALLETE's Sylvan Hydroelectric Project (Docket No. P-2454). In 2008, Commission staff issued an order denying ALLETE's request to transfer the lands, based on the finding that the lands are needed for project purposes including recreation, cultural resource protection, and erosion control, and the Commission's policy that a licensee must have sufficient rights in project lands to meet the current and future needs of the project and the public. ALLETE has not made any further request to transfer the lands in question. Should it do so, the Commission will consider the matter on its merits.

Your letter has been placed in the Commission's official record. Please let me know if I can be of further assistance in this or any other Commission matter.

Sincerely,

Anthony J. Pugliese
Chief of Staff

Document Accession #: 20230725-5137 Filed Date: 07/25/2023

CROW WING COUNTY
HISTORICAL SOCIETY
MUSEUM & LIBRARY - EST. 1927

Email:
history@crowwing.us

Website:
www.crowwinghistory.org

Street Address:
320 Laurel Street
Brainerd, MN 56401

Phone:
(218) 829-3268

July 21, 2023

Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Re: Little Falls Hydroelectric Project No. 2532-094, Sylvan Hydroelectric Project No. 2454-085, and/or Pillager Hydroelectric Project No. 2663-064.

Dear Commissioners:

The Crow Wing County Historical Society of Brainerd, Minnesota has been preserving the history of the area since 1927. We would like to express our concerns about the protection of the National Historic Place and National Historical Landmark known as the "Chippewa Agency Historic District (73000967_R)". This site has significant prehistory and historic information that needs to be protected. On July 17, 2023, the Crow Wing County Historical Society met and made a motion to support the protection of this historic district. It also authorized a letter of support to be filed supporting the comments and recommendation of the Friends of Old Crow Wing.

Regards,

Hillary Swanson
Executive Director

Listed on the
National Register
of Historic Places

Nienow Cultural Consultants
200 Plato Blvd. East
St. Paul, MN 55107

July 19, 2023

Ray Nelson
Friends of Old Crow Wing

RE: Letter of Support for Systematic Archaeological Survey, 21CA55, Chippewa Agency

Mr. Nelson,

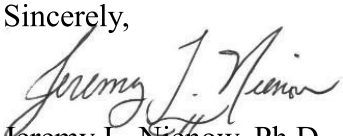
The following is a letter in support for Friends of Old Crow Wing to have the National Register of Historic Places designated Chippewa Agency property, 21CA55, turned over by Minnesota Power and Light Company and incorporated into Crow Wing State Park. If this is not feasible, Minnesota Power and Light should make immediate efforts to preserve and protect 21CA55. The first step in this process, based on my 30 years of Cultural Resource Management experience, is the completion of a systematic archaeological survey in concert with local Tribal authorities.

Based on a careful reading of the archaeological site form for 21CA55 including efforts by Birk (1971, 1972), Kluth (1998), and Rothaus (2010) no systematic archaeological identification survey has ever been completed of the 267-acre parcel. Any future evaluation efforts of previously identified agency buildings, burial mounds, or village area features must first begin with a modern survey and should include pedestrian survey, shovel testing in appropriately areas, geophysical survey, LiDAR analysis with multiple hill shading efforts, and overhead (drone) survey.

All efforts must be undertaken in concert with local Tribal authorities, including discussion of the potential to designate the area as a Traditional Cultural Place. These efforts should include the Minnesota Office of the State Archaeologist, the Minnesota State Historical Preservation Office, Minnesota Indian Affairs Office, and any Tribal Historic Preservation Officers who are interested in engaging with the work after meaningful consultation has been undertaken.

No Scope of Work has been undertaken to my knowledge, however, based on current industry pricing this work could easily cost more than $100,000.00 for initial survey and consultation. If you have any additional questions or comments, do not hesitate to reach out to me. I am available to assist in crafting a suitable Scope of Work (SOW) for any archaeological services.

Sincerely,



Jeremy L. Nienow, Ph.D., RPA; Owner Principal Investigator
Nienow Cultural Consultants LLC; 651-296-3744; Jeremy.Nienow@gmail.com

To:
The Honorable Representative Rick Nolan
2366 Rayburn House Office Building
Washington D.C. 20515

From:
Ron Miles, on behalf of:
The Ad Hoc Committee for CROW WING AGENCY (21CA55, NRHP) Stewardship
9980 Ponderosa Lane SW
Nisswa, MN 56468
218-330-3708

Re: A bill to allow state park ownership of the historic CROW WING/ CHIPPEWA AGENCY site (21CA55, NRHP)

We are grateful for your stalwart and exemplary leadership in cultural and environmental issues in the public interest. It is in this light, Representative Nolan, that we seek your assistance in an important matter that very much needs a proper and early resolution.

In recognition of the extraordinary significance of the CROW WING/CHIPPEWA AGENCY (1850-1869) and its multi-component environs (21CA55) to the natural and cultural history of Minnesota and the United States, this area was officially added to the National Register of Historic Places (NRHP) in 1972. So designated, it remains arguably the most important such listing in Minnesota not presently in public ownership.

Acknowledging the propriety of adding this property to Crow Wing State Park (CWSP) for resource management and interpretation, such action was proposed in that state park's most recent Unit Management Plan, completed in 2004 (Jade Templin, Chief Planner, jade.templin@state.mn.us). Accordingly, two years later, an act of the Minnesota Legislature drafted by Senator Don Samuelson placed the area into the Statutory Boundaries of CWSP, ostensibly enabling the transfer of its present ownership from Minnesota Power (ALLETE) by gift or sale.
(https://www.revisor.mn.gov/laws/?id=236&year=2006&type=0)

For a decade, a series of bureaucratic and/or budgetary glitches has thwarted this orderly public interest process. Meanwhile, accelerating and irreversible threats and damages to the natural and cultural integrity of the area continue unabated due to the lack of active enforcement and ongoing resource management. Hopefully, the pageant of non-action in this regard becomes clearer in the enclosed packet of documents and information.

We seek a bill that would exempt the CROW WING/CHIPPEWA AGENCY Site from all federal regulatory restrictions that prohibit Minnesota Power (ALLETE) from conveying this property to the State of Minnesota to be included in Crow Wing State Park.

Agencies and entities who have heretofore expressed strong support for these urgently-needed measures include, but are not limited to, the following; and updated expressions of such may be obtained at any time:

A. Heritage Preservation Department, Minnesota Historical Society
B. White Earth Ojibwe Nation
C. Episcopal Church in Minnesota; Rt. Rev. Brian Prior, Bishop
D. Crow Wing County Historical Society; Don Samuelson, President
E. Friends of Old Crow Wing; Ray Nelson, President
F. Sylvan Township, Cass County, Minnesota; Greg Booth, Chairman
G. State Historic Preservation Officer, David Mather
H. Minnesota Archaeological Society (MAS); Rod Johnson, President
I. Minnesota Indian Affairs Council (MIAC); Jim Jones, Jr., Cultural Resources Director
J. Office of the State Archaeologist (OSA); Scott Anfinson
K. Council for Minnesota Archaeology (CMA), Bruce Koenen, OSA
L. Mille Lacs Band of Ojibwe
M. Leech Lake Band of Ojibwe
N. Crow Wing State Park; Paul Roth, Manager
O. Camp Ripley, Patrick Neumann, Archaeologist
P. Minnesota Power (ALLETE); Ross Dudzik, Land Management Specialist

Members of The **Ad Hoc Committee for CROW WING AGENCY (21CA55, NRHP) Stewardship** include:

David Mather, National Register Archaeologist, Minnesota Historical Society (david.mather@mnhs.org)
Douglas Birk, Archaeologist, Nominator of CWA to NRHP (dabirk@q.com)
Don Samuelson, President of Crow Wing County Historical Society, former President of the Minnesota Senate (donsam@brainerd.net)
Don Wedll, former Commissioner of Natural Resources, Mille Lacs Band of Ojibwe (dwedll@hotmail.com)
Ron Miles, retired Regional Naturalist and Cultural Resource Specialist for MnDNR Division of Parks & Recreation, and current board member of the Minnesota Archaeological Society (MAS) (rem@brainerd.net)
Canon Stephen Schaitberger, local Episcopal Church historian and priest (stephenschaitberger@charter.net)
Greg Booth, Sylvan Township Chairman, Cass County, Minnesota, and Manager, Sunup Ranch (greg@sunupranch.com)
Ray Nelson, President of Friends of Old Crow Wing, and retired site manager and historian for the Cross Lake Dam Recreation Area., USACE (rnnelson13@hotmail.com)
Dr. Nicholas Bernier, MD, local interpreter of pioneer life in the area (mnarrows@hotmail.com)
Michael North, Landowner adjacent to 21CA55, Sylvan Township, and Ecologist (michael.north@state.mn.us)

Ron Miles

From: Radford, Dave S (DNR) [dave.radford@state.mn.us]
Sent: Wednesday, April 08, 2015 1:20 PM
To: Magner, Mike (DNR)
Cc: Ron Miles
Subject: Chippewa Indian Agency

Mike:

There have been many attempts in the past to add the NR listed Chippewa Indian Agency located at the confluence of the Crow Wing and Gull rivers to Crow Wing State Park. It is owned by Minnesota Power and FERC will not allow them sell this property because it is in the flood plain. Under private ownership, the site is getting abused by ATVs and other means and apparently the only way for MnDNR conservation officers or other MnDNR staff to patrol the site is for it to be leased by MnDNR Wildlife. Can't be leased as part of Crow Wing State Park because state law prohibits state parks from lease property within a state park boundary. It is a mess. Anyway, I thought I'd share this information with you. You may see reference to it in the near future.

I'm copying Ron Miles, former MnDNR Brainerd Regional Naturalist, with this email since Ron is involved with trying to protect the site and is a great source of information.

Dave

dave.radford@state.mn.us

North, Michael R (DNR)

From: Hauck, Mark (DNR)
Sent: Tuesday, October 04, 2011 4:33 PM
To: Olfelt, Dave P (DNR); Maurer, Paul B (DNR)
Cc: Roth, Paul H (DNR); Kovacovich, Michael J (DNR)
Subject: Chippewa Agency Site near Crow Wing State Park - Cass County parcel
Attachments: crow wing state park lease.jpg; Management Plan Excerpt.pdf; The Gull River Corridor ACUB Project Area.pdf

Dave and Paul,
I spoke with Mike Kovacovich at a recent NW RMT meeting where I described the opportunity below, and he recommended that I connect with you to help determine next steps.

As you may know, I work with Camp Ripley and am the project manager for the ACUB (Army Compatible Use Program) that purchases land and easements to reduce encroachment on Camp Ripley from residential homes.

In 2006 I became aware of an ACUB / Parks acquisition that was underway on the Chippewa Agency site, a 200 acre parcel upstream from where the Gull River meets the Crow Wing River in Cass County. The site contains an assemblage of rich cultural heritage artifacts and landforms including:
Middle and late Woodland American Indian habitation, and cemetery sites,
The Chippewa Agency – Cellar depressions, boat landing sites and archaeological deposits
An early logging camp
The Crow Wing to Ottertail Trail and the Red River Ox Cart Trail
Location of the murder of Chief Hole-In-the-Day II.
The site has been added to the National Register of Historic Places as the Chippewa Agency Historic District, (added 1973 - - #73000967) after a comprehensive site evaluation by Douglas Birk in 1972. Since then, the site has been degraded by members of the public using ATVs on areas including the Oxcart Trail and from artifact hunters.

You also may be aware that there was an effort to acquire 200 acres in fee from Allete (Minnesota Power and Light) for inclusion in the Crow Wing State Park in 2007. TPL was negotiating the deal, the parcel was included in the park boundary by the legislature (I believe it was 2006), and the last approval that was required of Allete was approval from the Federal Energy Regulatory Commission. The FERC denied approval of the sale to DNR as part of a blanket nationwide policy to restrict land sales by licensees for any purposes, including conservation purposes. They are still adhering to that policy today.

In the last year, Allete approached DNR directly and indicated that they are still interested in the concept of public management of this important historic site and have offered a very low cost, or no cost, lease to the DNR on the Chippewa Agency site. The FERC has indicated strong support for a lease.

In summary, it is a very high quality cultural site in keeping with the historic themes at Crow Wing State Park, preparations have been made for acquisition (within park boundary and part of management plan), the landowner is willing, a lease already exists on this parcel for the public water access that could be modified to include the remainder of the parcel, the acquisition costs would be minimal, and the important interpretive potential in the site can add significant value to Crow Wing State Park.

I will be attending the NE region RMT on October 17th to review the overall ACUB Biennial Acquisition Plan and would be very interested to speak with you about this opportunity in preparation for the RMT meeting.
Thank you,
Mark

The Crow Wing River / Gull River Corridor ACUB Project

April, 2011

Rarely does one project area hold as much opportunity as the Crow Wing River / Gull River Corridor ACUB Project. First and foremost, corridor is adjacent to the rapidly growing City of Baxter. At the height of the building boom in the mid 1990's, State Demographer Tom Gillespay estimated that the Brainerd / Baxter area was the fastest growing non-metro area in the nation. There is more collective pressure for development in this area than anywhere else around the Camp Ripley ACUB. Secondly, the project holds very significant cultural resources from pre-historic Native American times as well as artifacts from what was called the "Chippewa Agency" from the 1850's. Finally, the region holds very high quality aquatic and terrestrial natural resources.

The Project Area:

The Northeast region of the Camp Ripley ACUB buffer including approximately 6.5 miles of the Crow Wing River and 11 miles of the Gull River covering approximately 35,000 acres (see map). This region is a mosaic of natural spaces and rural development that is mostly privately owned and bordered by Pillsbury State Forest to the Northwest and by the Crow Wing State Park to the Southeast. The largest landowner in this region is Minnesota Power and Light (aka Allete). A hydroelectric power facility near the confluence of the Crow Wing and Gull Rivers created the land interests of Minnesota Power and Light. Historic remnants that exist on the site span several thousand years beginning the Middle and Late Woodland American Indian habitation and cemetery sites. Through the Allete ownership runs a historic pathway called the 'Red River Oxcart Trail', where settlers traveled up the Mississippi River and crossed at the nearby town of Crow Wing. As a result, portions of the MP&L land contain both prehistoric artifacts and 1850's artifacts from the Native American and early American communities that document the existence of the "Chippewa Agency". The Agency was a collection of buildings that at the time served as a trading post of sorts where Native Americans that inhabited the eastern part of the State of Minnesota received a payment from the Federal Government for their land interests and were relocated to the northwest. From 1851 until 1869 the Agency was in existence and now all that remains are cellar depressions, boat landing sites and many artifacts. Many burial mounds exist on this site, marking the final resting place for Native Americans. This is also the site where the famed Chief Hole-in-the-Day II was murdered. In addition to these high quality cultural features, the corridor boasts rare natural features include numerous sightings of Blandings Turtle (threatened), also Creek Heelsplitter (special concern), Bald Eagle (special concern), and Eastern hognose snake.

In the past and in this project area, Allete has leased to individuals land upon which single family homes were built. For now, this practice is not permitted by the Federal Energy Regulatory Commission, however, without further development of alternative uses, such as this project proposal, these sites may be vulnerable to future leasing for single family homes. Targeting the ACUB program in this project area, therefore, will not only yield great benefits for the protection of training activities on Camp, but will provide other benefits including the preservation of significant historic places, preservation of

existing high quality wildlife habitat and the provision of open space benefits to the residents of the area.

Past ACUB Activities in the Project Area:

A 444-acre conservation easement was acquired in 2008 from Victoria Kettlewell and Greg Booth that protects the parcel from development and is on the banks of the Gull River. In 2010, a 181 acre conservation easement with 0.8 miles of shoreline on the Crow Wing River was acquired from John Simon. It is important to highlight that Minnesota Power and Light owns 2,300 acres along the Gull River, which includes the Chippewa Agency Site. In 2006, Minnesota Power and Light had offered 1,120 acres of their ownership to the Minnesota Department of Natural Resources to improve protection of the natural and cultural resources and to protect the mission of Camp Ripley. The proposal would have had the State of Minnesota acquire in fee, 220 acres that included the site of the Chippewa Agency for adoption into the nearby Crow Wing State Park. The remainder, nearly 1,000 acres, would have been acquired in fee by the State of Minnesota for the establishment of the Gull River Wildlife Management Area. The project was fully developed with all necessary approvals secured except for the final approval from the Federal Energy Regulatory Commission. The Commission denied Minnesota Power and Light the approval to sell the property in fee to the State of Minnesota in cooperation with the ACUB program and the acquisition stopped there.

Recent Activity in the Project Area:

Recently, there have been changes within the Department of Natural Resources and new information provided by the FERC that may allow the previously attempted proposal to proceed, however with the land being leased to the State of Minnesota rather than being sold in fee. Initial discussions with Minnesota Power and Light have been very positive and it appears that there will be the possibility to lease all of the previously offered properties. In addition, there may be the possibility of new properties offered in fee.

Core Project Area: The Gull River Wildlife Management Area / Chippewa Agency Preservation Site

The core protection area consists of the acquisition by lease, the 220 acres known as the 'Chippewa Agency Site' and the approximately 786 acres known as the 'Gull River Wildlife Management Area'.

The Chippewa Agency Site is proposed to be added to the nearby Crow Wing State Park at the confluence of the Crow Wing and Mississippi Rivers. The site has been thoroughly evaluated for cultural resources in 1972. Protection of the prehistoric and early American sites are a key management strategy of the Minnesota Department of Natural Resources, which included the area into their statutory park boundary in 2007. The primary vulnerabilities of the site include theft of artifacts and damage to cultural and natural features by all terrain vehicles. Discussions with Allete in April of 2011 revealed management goals between the MN Department of Natural Resources and Allete that were not only compatible, but that were identical. All organizations that are a party to the transaction, including the Federal Energy Regulatory Commission have agreed in principle to the leasing of land by the MN Department of Natural Resources from Allete. This transaction can be completed in short order

and at little cost, but will provide a substantial foothold for long term protection from home development.

Document Accession #: 20230725-5137 Filed Date: 07/25/2023

Minnesota Department of Natural Resources

500 Lafayette Road
St. Paul, Minnesota 55155-40...

November 16, 2007

Minnesota Power
ATTN: Matthew Radzak
30 West Superior Street
Duluth, MN 55802

Re: Conveyance of Minnesota Power land in Cass County, Minnesota to The Trust for Public Land

Dear Mr. Radzak :

I write to join the many other voices in support of the transfer of Allete land in Cass County, Minnesota known as the "Chippewa Agency Site" to the Trust for Public Land, so that it may be protected as part of Minnesota's Crow Wing State Park.

The Department of Natural Resources (DNR) is extremely interested in this site because of its unique cultural, biological and recreational resources. The historic Chippewa Agency, located on this 211 - acre property, was a pivotal government installation during the early years of EuroAmerican settlement in Minnesota. Its history is of great importance to native and non-native peoples alike. As an archeological site, the Chippewa Agency retains physical integrity to an extent not often seen. With over 1.5 miles of shoreline on the Crow Wing and Gull Rivers (and roughly 6 miles upstream from the Crow Wing's confluence with the Mississippi River), this site also provides habitat for such state and federally listed species as Blanding's turtle, red shouldered hawk, bald eagle, and hognose snake.

While we commend Allete for their careful stewardship of these lands, we believe the unique features present here warrant public ownership, protection, and interpretation that only Minnesota's excellent State Park system can provide. Stewardship of this property is a perfect fit with the State Parks' mission to preserve and manage Minnesota's natural, scenic and cultural resources for present and future generations while providing appropriate recreational and educational opportunities.

The DNR has already taken steps to allow for the acquisition of this land. In 2005, we requested and were granted approval by the Minnesota Legislature to amend the boundary of the Crow Wing State Park to include this parcel. We appreciated Allete's support of this action, as well as that by Sylvan township, the Cass County Board, the Minnesota Archeological Society, and the Minnesota Historical Society.

As you know, The Trust for Public Land (TPL) currently holds an option to purchase the property, contingent upon FERC approval of its sale by you. The Department of Natural Resources is working with TPL on due diligence matters (appraisal, title review, survey, environmental review, and FERC approval) and fundraising so that if and when FERC approval is granted, the DNR would be in a position to purchase the land from The Trust for Public Land.

We fully support the disposition of this land by Allete to the Trust for Public Land. We encourage FERC to approve this disposition as soon as possible so that, in turn, the DNR's Division of Parks and Recreation can provide the additional protective measures this site truly warrants.

Sincerely,

Courtland Nelson, Director
DIVISION OF PARKS AND RECREATION

Privileged Information Redacted

Document Accession #: 20230725-5137 Filed Date: 07/25/2023

WHITE EARTH LAND RECOVERY PROJECT
NATIVE HARVEST
607 Main Avenue Callaway, Minnesota 56521

WELRP: 800-973-9870 or 218-375-2600 **Fax:** 218-375-2603
NH: 888-274-8318 or 218-375-2600 **Fax:** 218-375-4605

19 Gashkadino-giizis (Freezing Moon) 2007

Matthew Radzek, Land Management Specialist
Minnesota Power
30 West Superior Street
Duluth, MN 55802

Dear Mr. Radzek:

Aniin from the White Earth Reservation. I write today in support of the transfer of land from Minnesota Power to the Minnesota Department of Natural Resources, specifically Crow Wing State Park. The land in question was once the site of the Crow Wing Chippewa Agency, which was active between 1851 and 1869. The agency was a site where native Anishinaabeg (also known as the Ojibwe or Chippewa) and mixed-blood people lived—after their displacement by white settlers—under the jurisdiction of government agents who disbursed rations and acted as liaisons. The agency closed when the Anishinaabeg were moved to allotments at White Earth, Leech Lake, or Wisconsin reservations. Though the period of history is not a happy one for the Anishinaabeg, the site is still of great value.

According to the Minnesota Archeological Society's Summer 2005 Newsletter, this particular parcel of land "is incredibly rich in archaeological components and context, including agency building and field sites, a Woodland period village site, prehistoric Indian cemeteries, [and] the location of Hole-in-the-Day II's murder site" (www.mnarchaelogicicalsociety.org). The fact that the land contains graves makes it particularly important to Native American people. We wish to protect and honor the burial sites of our ancestors, just as you would your own.

Unfortunately, the land at present is not protected in any way and has already experienced degradation due to all-terrain vehicle use and looting for artifacts. Such degradation is a loss for all Minnesotans interested in preserving our history as well as an insult to Native American people.

Transferring the land could facilitate its protection from such activities and preserve it for future generations who will learn from its many stories. I urge you to move forward with the transfer and thank you for your consideration.

Miigwech!

Winona LaDuke

Winona LaDuke, Executive Director
White Earth Land Recovery Project

Summary of State Law passed by the Minnesota Legislature in 2006 putting the Historic Crow Wing Old Agency property now owned by Minnesota Power and Light into the geographic boundary of Crow Wing State Park:

CHAPTER 236--S.F.No. 2851

An act relating to state lands; modifying state park permit provisions; providing for easements for cartways; adding to and deleting from state parks, forests, and recreation areas; providing for public and private sales, conveyances, and exchanges of certain state lands; providing a certain conservation easement for wetlands restoration; regulating the sale, lease, or contracting of certain historic publicly owned buildings; providing for a Grand Mound State Historic site study; providing for the classification of certain waters; authorizing removal of certain land from, and modifying certain provisions of, the sustainable forest incentive program; providing for disposition of certain proceeds from tax-forfeited land sales in Itasca County; modifying prior sale provisions; amending Minnesota Statutes 2004, sections 85.053, by adding a subdivision; 290C.02, subdivisions 3, 7, 8; 290C.04; Laws 1999, chapter 161, section 31, subdivision 5, as amended; Laws 2005, chapter 161, section 19; proposing coding for new law in Minnesota Statutes, chapters 15; 435.

Sec. 6.

ADDITIONS TO STATE PARKS.

Subdivision 1. [85.012] [Subd. 14.]

Crow Wing State Park, Crow Wing, Cass, and Morrison Counties.

The following areas are added to Crow Wing State Park, Cass County:

(1) Government Lots 3, 4, and 5, the Southeast Quarter of the Northeast Quarter, and the Northeast Quarter of the Southeast Quarter, all in Section 24, Township 133 North, Range 30 West;

(2) that part of Government Lot 4 lying southerly of Cass County State-Aid Highway 36 and that part of the Southeast Quarter of the Southwest Quarter lying southerly and westerly of Cass County State-Aid Highway 36 and also lying westerly of the Gull River, all in Section 19, Township 133 North, Range 29 West; and

(3) that part of Government Lot 2 lying westerly of the Gull River, Section 30, Township 133 North, Range 29 West.

From: Gary Drotts
To: Dave Olfelt; Jeff Lightfoot; Paul Telander
CC: Brainerd Area Wildlife Staff
Date: 10/12/2005 9:13 AM
Subject: Re: Fwd: Gull River Acquisition/Chippewa Agency Acq. 10-10-05
Attachments: Re: Fwd: Gull River Acquisition 10-10-05

FYI, good summary by Teresa of where this project is currently at. As Teresa states, as soon as exact parcel descriptions are defined and agreed to, I'll draft our WMA paperwork and package up a presentation for the project to R1 and 2 RMTs.

This is going to be a long and complex process, patience is truly going to be a virtue.

>>> Teresa Thews 10/11/05 5:07 PM >>>
FYI - The attached message is from the area Wildlife Manager who has been the main contact with TPL regarding the MN Power Lands along the Gull River/Mississippi River. The majority of the MN Power lands would go to the WMA/AMA programs. The 334 acres along the Mississippi River is proposed to go to Parks.

In e-mails from the DNR WMA staff, the whole project (including the Chippewa Agency Lands) has been referred to the Gull River Project.

Today, the acquisition coordinators for Wildlife and Fisheries, the Lands and Minerals real estate specialist and I had a meeting with Becca Nash from TPL. We talked about timing of the acquisition, the importance of getting additional information on the lands now, instead of later and about funding.

I said that Parks was supportive of the project and we plan to add the Chippewa Agency parcel (334 ac.) to the Crow Wing SPK statutory boundary in 2006.

Becca said TPL will probably make an arrangement with MN Power to acquire the identified lands for the DNR over a period of 2-4 years. They have not finalized their negotiations yet. Also, the first acquisition will probably occur no sooner than next fall.

If Parks were to purchase the whole 334 acres, I said we would hope to have "some" funds available through Bonding 06, but - I expect we would not be able to afford more than half or less of the purchase price ($1MIL+). Therefore, we would hope for ACUB funds (the Chippewa Agency site is ranked #1 for next round of ACUB funds) and possible RIM match $. We emphazised the importance of TPL acquired at a bargain price so they could pass that bargain on to the DNR to tap into RIM $. The soonest there may be ACUB $ available would be March, 2007.

Once we know values (TPL will appraise within next 6 months), we can work out the funding scenarios. It is possible we would get help from Wildlife too.

In the meantime, Gary Drotts, Area Wildlife Manager, Brainerd is planning to make a presentation to RMT Region I and RMT Region II once he has the land better identified. His presentation will include all lands within this Interdisciplinary project. He will notify Parks when he is scheduled to present.

From: Gary Drotts
To: CB Bylander; Dave Schad
CC: Greg Kvale; Michael North
Date: 2/5/2001 4:31 PM
Subject: Gull River MP acquisition

Myself, Greg Kvale, Mike North and Marty Anderson met with Bob Bohm from Minnesota Power this afternoon to hold exploratory discussions on acquisition of Minnesota Power properties along the Gull and Crow Wing rivers. In short, we 1) firmed up which tracts and acreage may be available (revised map coming out shortly), 2) discussed Federal Energy Regulatory Commission (FERC?) hurdles, and, 3) discussed general acquisition parameters.

Next step is for Bob to run a request up and down Minnesota Power's chain of command in the next month and return a letter of interest to us. If it's a go, I will get it before our Brainerd Area NR Team meeting in March to discuss and frame a project that can be proposed and carried by someone from the Team.

I'm not sure what time lines or needs you have at the RMT level on this, but this is probably the best I can do at this time. If you have some pointers or needs that should happen on this before I can get it to the Area Team, please let me know.

As Greg will probably tell you two, I had a serious discussion with him about my concern on this turning into an RMT run and not Area run project. My concern is that RMT may tend to meddle and hog headlines on something that is a basic Area field operation and one that RMT would not give as much attention to if: 1) it was in Hinckley instead of Brainerd, and, 2) did not have the glory of a potential Conservation Connection project. All I ask is that we discuss and clarify our roles up front.

Sylvan Township
12956 24th Avenue SW, Pillager, MN 56473
phone: (218) 746-3652 / fax: (218) 746-3612 / e-mail: sylvan@brainerd.net

RESOLUTION #2004-10

CHIPPEWA AGENCY SITE – CROW WING STATE PARK

WHEREAS, residents of Sylvan Township value the rural character and green spaces of Sylvan Township, and

WHEREAS, Sylvan Township recognizes the significance of its historical and cultural resources, and,

WHEREAS, Sylvan Township desires to expand its recreational and tourism base, and

WHEREAS, the Chippewa Agency Site is on the National Register of Historic Places and provides valuable green space conserving the Crow Wing River, and

WHEREAS, Sylvan Township supports the Camp Ripley buffer program; and

WHEREAS, the Chippewa Agency Site buffers Camp Ripley, and

WHEREAS, the Chippewa Agency Site is owned by Minnesota Power and managed for compatible uses with the operation of Sylvan Reservoir for hydroelectric generation, and

WHEREAS, the Crow Wing State Park Management Plan identifies the Chippewa Agency Site as a desirable acquisition to the Park, and

WHEREAS, the historical and cultural resources of the Chippewa Agency Site are at risk from unregulated public uses, and

WHEREAS, incorporating the Chippewa Agency Site into Crow Wing State Park would preserve the cultural and historical resources endemic to the site and would be compatible with the operation of Sylvan Reservoir,

THEREFORE, Sylvan Township hereby supports the acquisition and incorporation of the Chippewa Agency Site into Crow Wing State Park.

ADOPTED BY THE SYLVAN TOWNSHIP BOARD OF SUPERVISORS THIS 16TH DAY OF SEPTEMBER 2004.

TOWN OF SYLVAN

ATTEST:

Faith C. Broberg
Clerk/Treasurer,
Sylvan Township

Greg Booth
Chair
Sylvan Township

Document Accession #: 20230725-5137 Filed Date: 07/25/2023

CROW WING AGENCY FIELD TRIP

6 July 2004
Ron Miles
218.746.3930

General Scenario

As an economic expedient, Minnesota Power and Light (MPL) has in recent years assessed their considerable real estate properties to prioritize divestiture of lands now deemed nonessential to their operations. In Central Minnesota, much of this land is of such extremely high natural and cultural amenity and quality that public ownership is decidedly the most desirable stewardship. In at least one key situation (Kramer Lake), MPL has chosen to develop some lakeshore properties.

The Department of Natural Resources has expressed several divisional interests in area MPL lands; *i.e.*, Wildlife (particularly in lands along the Gull River), Trails and Waterways (in potential water accesses and trail corridors), and Parks and recreation (Crow Wing Agency site). For various legal and fiscal reasons, the DNR is not presently able to address its wide and keen interests at this time. The urgency of this issue is further underscored by noted interests of many public entities, highlighted below, and by the unprecedented pace and extent of private development now occurring in the region.

Immediate Objectives

Today's field trip focuses on the 130-acre parcel which is designated as the Crow Wing Agency site (1851 to 1869) on the National Register of Historic Places . The Crow Wing Agency site is a key element in the history of the nation, Minnesota, and the Brainerd Lakes region .

Of particular issue are the interests of Crow Wing State Park in the Crow Wing Agency, and current illegal activities on the site which critically threaten significant aspects of its resource identity. For a site description, see "A Revised Preliminary Report on the Chippewa Agency Sites, Cass County, Minnesota" (Douglas A Birk, MHS, 8 November 1972).

Crow Wing State Park's unit management plan, completed in June 2002 by Jade Templin (651.297.5644), proposed that present statutory boundaries be modified to include the Crow Wing Agency site. To date, there has been no legislative activity effecting this recommended change.

inform, and provide the basis for, effective strategies to separate these MPL parcels and provide for their purchase. The Land Department at MPL is headed by John Paulson (218.722.2641); Dave Marciniak (218.393.8511) is in charge of the grounds at the Crow Wing Agency site. For current information, contact Michael North, DNR Environmental Assessment Ecologist (218.828.2433).

Critical Negative Impacts

Primary, accelerating damage is presently occurring at the Crow Wing Agency site by (1) promiscuous ATV trespass throughout the property, and (2) would-be looters of *in situ* archaeological evidence. Such illegal uses have visibly damaged, and continue to degrade, prehistoric cemeteries (burial mounds), the Agency site and grounds, Red River and Sandy Lake trails, and intact archaeological stratigraphy.

MPL has made considerable efforts to protect the resource integrity of the area. However, it is restricted in this regard to the short-term options of signing and fencing. These efforts have, unfortunately, proven ineffectual. There is no on-site enforcement.

Trespassers are brazen in the disregard of, even physical removal of signs and barricades. Digging tools were recently stashed at various points on the property. At the request of MPL, these tools were confiscated. Nonetheless, it is felt that the present vulnerability will persist until the Crow Wing Agency is included in Crow Wing State Park, at which point increased enforcement measures may be applied in the public interest.

Key Aspects of Site Resource Identity

- Archaeologically-intact Crow Wing Agency site and environs
- High quality vestiges of the Red River Woods and Sandy Lake historic trails
- American Indian burial mounds
- Confluence of the Gull and Crow Wing rivers
- Probable site of Hole-in-the-Day II's murder
- Manageable native prairie
- Agency farm sites

- Manageable native prairie
- Agency farm sites
- Recorded Woodland period villages

Some Ancillary Interests

- American Indian cemeteries deserve the protection afforded by law.
- The Minnesota Historical Society recommended the protection of this site in public ownership in 1972.
- Minnesota Power and Light deserves public support for their considerable efforts to protect the highest resource interests of the property.
- Camp Ripley, an adjacent landowner, wants the area protected as an undeveloped buffer.
- Cass County's Sylvan Township is interested in protecting the area as part of a comprehensive planning vision.
- Protection affords the community of Pillager, as well as Sylvan Township, future options to connect trails with the Paul Bunyan trail system.
- This property is a key element in the concept of green space in presently burgeoning area development.

Document Content(s)

Final Submittial for Sylvan Hydroelectric project 2454-0285 1.pdf.....1
2 Descriotion by maps.pdf.....6
4 Correspondence.pdf.....11
CWCHS Letter of Support.pdf.....19
NCC Letter in Support for Systematic Archaeological Survey for 21CA55[12751].pdf.....20
Crow Wing Agency Stewardship 2015 Ros Miles.pdf.....21

Nienow Cultural Consultants
200 Plato Blvd. East
St. Paul, MN 55107

July 19, 2023

Ray Nelson
Friends of Old Crow Wing

RE: Letter of Support for Systematic Archaeological Survey, 21CA55, Chippewa Agency

Mr. Nelson,

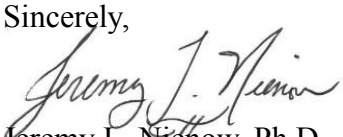
The following is a letter in support for Friends of Old Crow Wing to have the National Register of Historic Places designated Chippewa Agency property, 21CA55, turned over by Minnesota Power and Light Company and incorporated into Crow Wing State Park. If this is not feasible, Minnesota Power and Light should make immediate efforts to preserve and protect 21CA55. The first step in this process, based on my 30 years of Cultural Resource Management experience, is the completion of a systematic archaeological survey in concert with local Tribal authorities.

Based on a careful reading of the archaeological site form for 21CA55 including efforts by Birk (1971, 1972), Kluth (1998), and Rothaus (2010) no systematic archaeological identification survey has ever been completed of the 267-acre parcel. Any future evaluation efforts of previously identified agency buildings, burial mounds, or village area features must first begin with a modern survey and should include pedestrian survey, shovel testing in appropriately areas, geophysical survey, LiDAR analysis with multiple hill shading efforts, and overhead (drone) survey.

All efforts must be undertaken in concert with local Tribal authorities, including discussion of the potential to designate the area as a Traditional Cultural Place. These efforts should include the Minnesota Office of the State Archaeologist, the Minnesota State Historical Preservation Office, Minnesota Indian Affairs Office, and any Tribal Historic Preservation Officers who are interested in engaging with the work after meaningful consultation has been undertaken.

No Scope of Work has been undertaken to my knowledge, however, based on current industry pricing this work could easily cost more than $100,000.00 for initial survey and consultation. If you have any additional questions or comments, do not hesitate to reach out to me. I am available to assist in crafting a suitable Scope of Work (SOW) for any archaeological services.

Sincerely,



Jeremy L. Nienow, Ph.D., RPA; Owner Principal Investigator
Nienow Cultural Consultants LLC; 651-296-3744; Jeremy.Nienow@gmail.com

Comments and Recommendations related to relicensing of Sylvan Hydroelectric Project 2454-0285

Submitted by

Non-profit organization “Friends of Old Crow Wing” in conjunction with Crow Wing County Historical Society

The goal of these comments by Friends of Old Crow Wing is to protect the National Register of Historic Places site known as “Chippewa Agency Historic District 73000967_R”. The site has been degraded over the years by artifact hunters, ATV activity, unauthorized public use, and general lack of enforcement.

This site contains a very significant array of ancient and historic cultural properties that are important to our understanding of early settlement and transportation history in the Mississippi Headwaters. The district also has deep connections with the Ojibwe community. It is the location of the eventful Chippewa Indian agency from 1851–1869 a hub of the region's mid-19th-century activity.

The District also includes prehistoric mounds, a village, Woods Red River Ox cart trail, first logging camp on the Crow Wing River, and Hole in the Day Younger’s assassination in 1868.

During the mid-nineteenth century, the Agency conducted yearly Ojibwe annuity payments, government education programs, treaty negotiations, and other business as needed. These activities fueled commercial and residential developments in the nearby town of Crow Wing, making it, at the time, the largest settlement in northern Minnesota. These frontier affairs at the Agency and Crow Wing required the building of Fort Ripley in 1847 to closely monitor tense relations with nearby troops.

To meet the goal to protect the site, three objectives have been outlined that should attain better protection of the site and ensure that the integrity of the site is maintained.

Objective One: To have the site transferred from the present ownership of Minnesota Power (ALLETE) to Crow Wing State Park, State of Minnesota. This site is located within the statutory boundaries of Crow Wing State Park. This results in Crow Wing Park’s Management Plan applying to the site. This property would be subject to rules and statutes of Park Lands. There is history of this transfer proposal having an agreement to do this but final approval was denied. The relicensing review process of the Sylvan Hydroelectric Project was suggested to be the appropriate time to review that decision.

Objective Two: If a transfer the land site to the Crow Wing State Park again does not happen then protective conditions should become an important management requirement in the relicensing permit for Minnesota Power (ALLETE) to implement. This should be a management plan that is equal to the cultural management plan Crow Wing State park would be required to enforce.

Objective Three: If neither objective 1 or 2 becomes implemented, the hydroelectric dam should be decommissioned with the site no longer considered a necessary holding for Minnesota Power. The property would become available for inclusion in Camp Ripley’s Sentinel Landscape project or even acquired by Crow Wing State Park in that event.

Historical Summary

A brief history of this site and the activities related to protection of the area are described in the following summary. The confluence of the Gull River, Crow Wing River, and Mississippi River has been an important area for tribal people since time immemorial. This includes village sites, hunting camps, cultural activities, and burial mounds. The Dakota people occupied this region until about the 1750's and the Ojibwe took control of the region.

The establishment of the United States Government some 25 years later developed new relationship in the area with treaties to define this area. The treaty of 1837 used the point where the Crow Wing River enters the Mississippi River as the northwestern most point of the 1837, 12-million-acre land cession. This area became an active site of fur trade, and the Red River Oxcart Trail called the Woods trail. In 1851 the United States established the Chippewa Agency as the formal site for the government's interaction with the Mississippi Ojibwe. The town of Crow Wing grew in conjunction with the development of the agency. The Chippewa Agency remained a focal point for the government's interaction with Ojibwe until 1872. The establishment of the White Earth Reservation in 1867 beginning the movement of the Ojibwe from the reservations at Gull Lake, Rabbit Lake, Pokegama, Sandy Lake and Rice Lake to White Earth. The government closed the Gull Agency at this time.

Because of the unique historic and cultural aspects of the area Crow Wing State Park was established in 1959. Previous management brought about review of the Chippewa Agency site and the significant research discoveries resulted in a request to place the site on the National Register of Historic Places and National Historic Landmark register. May of 1973 the site was placed on the register (Chippewa Agency Historic District 73000967_R).

Since 1972, this Minnesota Power owned site has seen several people observe the site being harmed by artifact hunters, abuses by ATV, erosion from boat landings, and general unregulated public use. The Friends of Old Crow Wing and the tribal government at Mille Lacs Reservation began a discussion with Minnesota Power about providing better protection of the site. This led to the exterior boundaries of Crow Wing State Park being extended to include the site. This required Minnesota Legislature to approve extending the statutory boundaries to include the Chippewa Agency in the future.

The Minnesota Indian Affairs Council worked with the organization "Lands for Public" Trust to acquire the land from Minnesota Power which was denied by FERC in 2007. In 2018 FERC issued a letter to Congressman Richard Nolan stating that the land transfer should wait until the relicensing process was developed in 2023. This current request to transfer this land site to Crow Wing State Park during this license process hopefully will initiate a positive result moving forward in response to protection concerns and completely address the issues as a result.

Supplemental Request to Scoping Document:

FERC SCOPING DOCUMENT Sylvan Hydroelectric Project (P2454)

STUDY PLAN CRITERIA 18 C.F.R. Section 5.9(b)

Any information or study request must contain the following:

Study Request: Re-evaluate the resources on 267.45 acres known as the "Chippewa Agency" Historic District site (National Register of Historic Places known 73000967_R") and determine if this acreage is necessary to Sylvan Hydroelectric Project (P2454) purpose and operation.

1. The goal of this study should determine' (1) if this specified acreage for Sylvan Hydroelectric Project (P2454) is needed for future Sylvan Hydroelectric Project operations to acquire licensure; (2) a conclusive study would evaluate the condition of current cultural site, the value of better protection measures and recommend a future management action that includes addressing the 2007 land transaction proposal to Crow Wing State Park.

2. The objectives are:
   a. To acquire proper protection of all historical cultural site interests within these boundaries by either Minnesota Power (ALLETTE) fully complying with FERC's written Shoreline Management of Hydroelectric Projects guidance. Or, by a legal transfer of property to an appropriate agency i.e. Minnesota Crow Wing State Park where this property has already been put within the parks current statutory boundary. These steps could address the desired protection issue.
   b. The relevant resource management goals of state parks for Cultural resources differ in at least one very significant way in managing these resources: once cultural sites are disturbed or destroyed, they are lost forever.

      The 2002 Crow Wing State Park Management Plan's goals address cultural resource protection that will include the NHPS Chippewa Agency:

< Identify, evaluate, protect, and preserve the archaeological and historical resources.

< Follow state and federal laws that governing cultural resource management.

< Provide interpretive opportunities for the park's cultural resources.

< Work with Division of Parks and Recreation archaeologists to ensure that site development activities do not negatively impact cultural resources.

< Develop an ongoing research and monitoring program.

3. The Friends of Old Crow Wing is a non-profit group established in 1987 as a revitalization of the Crow Wing State Park Association which began in 1959. The primary purpose of the group is to work with the park manager on park projects related to Crow Wing and the surrounding area. Members of this group are active participants supporting current and future projects important to park goals and objectives.

4. Historically, Friends of Old Crow Wing and the tribal government at Mille Lacs Reservation opened discussion with Minnesota Power (ALLETTE) about providing better protection of this cultural important site. The exterior boundaries of Crow Wing State Park were extended to include the site. This required Minnesota Legislature to approve the statutory boundaries to include the Chippewa Agency.

4a. The Minnesota Indian Affairs Council worked with the organization "Lands for Public" Trust to acquire the land from Minnesota Power in 2007. This transaction was denied by FERC at that time.

4b. FERC issued a letter in 2018 to Congressman Richard Nolan stating that the land transfer question could wait until the relicensing process was occurring in 2023. The Minnesota Department of Natural Resources land acquisition personnel will negotiate with ALLETTE a legal and agreeable land transfer of the Agency acreage to Crow Wing State Park upon FERC approval to do so.

4c. Recent lidar technology mapping of the site shows some possible previously unidentified cultural mound groups within the site boundaries. An archaeological study should be implemented to identify and record these new sites as to their existence, which again points to an immediate urgency to have protective measures put in place and enforced.

5. Sylvan Hydroelectric Dam operations would not endure any adverse direct, indirect or cumulative effects from this requested action. This study proposal reviewing the Agency acreage realistically should determine if the site is necessary for operation of the Sylvan Dam Hydroelectric project. In all years of operations, this Agency acreage should have been receiving land management/protection care of historic cultural resources addressed in FERC's Shoreline Management of Hydroelectric Projects guidelines. Funding and enforcement should be a standard practice in administering an effective protection of cultural resources. The final study should address cultural integrity concerns and clarify ALLETTE'S protection measures to be appropriate or transfer this site responsibility to State Parks. A positive result could make the license requirements in future re-licensing evaluations easier to approve.

6. The proposed desk top review of the cultural resources at this project will not do justice to the current landscape. A professional archaeological study using methods not available 50 years ago can collect the new data that updates this historical significant site. A site study would provide the review and evaluations that reflect answering these noted concerns. The earliest appropriate study season for this project proposal would be summer and fall of 2024 lasting 3-6 months. Tribal considerations are imperative and tribal professionals will be active participants in this entire study.

7. Efforts must be undertaken in concert with local Tribal authorities to discuss the potential to designate this area as a Traditional Cultural Place. The completion of a systematic archaeological survey in concert with local Tribal authorities should occur. Future evaluation efforts of the previously identified agency buildings, burial mounds, or village area features would begin with a modern survey including a pedestrian survey, shovel testing in appropriately areas, geophysical survey, LiDAR analysis with multiple hill shading efforts, and overhead (drone) survey.

Based on current industry pricing this work could easily cost more than $100,000.00 for an initial survey and consultation. A desktop review of this site would not be sufficient or do justice to this significant site historic value. In conclusion…These 267.45 acres known as the Chippewa Agency Historic District site (National Register of Historic Places known as "Chippewa Agency Historic District 73000967_R") deserves a mutually agreeable win-win effort to conclusively determine a future of best protective management.

Attachments:

1. Comments on the NEPA and Scoping Document 1 (completed)
2. A map of the boundaries of Crow Wing State Park and identification National Register Historic Place and Historic Landmark as to what is transferred. (develop)
3. Description of Chippewa Agency site. (complete)
4. Correspondence related to the transfer of the site. (compile)
5. Statement of inability to protect the site from damage. (need to develop)
6. Crow Wing State Park's Cultural Management Plan. (copy and attach)
7. Fort Ripley comments and Camp Ripley Sentinel Landscape comments (being developed)
8. Letters of support for project. (gather)

5. Statement of inability to protect the site from damage.

In 2007 I personally observe damage done to the site by ATV. This included a trail running over potential burial mounds and general erosion from ATV's use of the Red River Cart Trail. It was also observed at different locations on the site where equipment was hidden that was used to screen material for artifacts. There were locations where holes were dug, and material had been screened. In discussion with Minnesota Power staff, they identified that they would not be able to provide more protection to site due to cost. They felt that signing the property and asking enforcement to check on the was the most that could be done.

6. Crow Wing State Park's Management Plan:

Crow Wing State Park Management Plan

FRIENDS OF OLD CROW WING

c/o Crow Wing County Historical Society
P.O. BOX 722
Brainerd, Minnesota 56401

July 27, 2023

Kimberly D. Bose
Secretary, Federal Energy Regulatory Commission
12225 Wilkins Avenue
Rockville MD 20852

RE: Project No. 2532-094 Little Falls Hydroelectric Project
Project No. 2454-085 Sylvan Hydroelectric Project
Project No. 2663-064 Pillager Hydroelectric Project
Notice of Intent to File License Applications, Filing of Pre-Applications Documents, Commencement of ILP
Pre-Filing Process, and Scoping Cass and Morrison Counties, Minnesota

Dear Kimberly Bose

This is a request for Friends of Old Crow Wing, a non-profit organization authorized under Minnesota State law, to become a consulting party as it relates to the NEPA document NHPA Section 106. Friends of Old Crow Wing has been involved in the protection of the National Register Historic Place identified as "Chippewa Agency Historic District 73000967_R" for over 50 years and as such feel that we would have a unique interest in this site as it relates to the relicensing of the Project No. 2454-085 Sylvan Hydroelectric Project. The relicensing of Project No. 2454-085 is directly related and effects the Chippewa Agency Historic District. For additional information see attachments.

Thank you for your consideration and look forward to continuing working with you on this project.

Sincerely

Paul Roth

Paul Roth, Chairperson

DEPARTMENT OF NATURAL RESOURCES

Division of Ecological and Water Resources
Region 3 Headquarters
1200 Warner Road
Saint Paul, MN 55106

Transmitted By Email

July 28, 2023

Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
12225 Wilkins Avenue
Rockville, Maryland 20852

RE: Little Falls Hydroelectric Project No. 2532-094, Sylvan Hydroelectric Project No. 2454-085, and Pillager Hydroelectric Project No. 2663-064

Dear Secretary,

Thank you for the opportunity to review and provide input on the Federal Energy Regulatory Commission's (FERC) Scoping Document regarding the relicensing of the Little Falls Hydroelectric Project (No. 2532-094), the Sylvan Hydroelectric Project (No. 2454-085), and the Pillager Hydroelectric Project (No. 2663-064). The Minnesota Department of Natural Resources (DNR) appreciates the thoughtful consideration of ongoing impacts to wildlife, river ecology, and fish passage as the relicensing process moves forward, and respectfully submits the following comments for your consideration:

General Comments

The upcoming National Environmental Policy Act (NEPA) document should fully acknowledge the broad impacts the dams have had on the entire river system for nearly 100 years with effects that go well beyond impacts to wildlife, including threatened and endangered species, in the direct vicinity and footprint of the structures themselves. Cumulative effects (Section 4.1.1) for each of the three dams should not be limited to potential changes to the existing dam structures only. The scope of the NEPA document should consider the ongoing impacts these dams have on the entire river system and species that it supports, as well as water quality, sediment accumulation, and recreational opportunities. The NEPA document should also weigh the benefits of the quantity of power produced versus the resource impacts for these projects, including the cost of providing fish passage, fish protection, and ongoing dam maintenance. Relicensing occurs infrequently enough in the life of the dam that this opportunity to assess the overall effect of the dam on the river system should be fully utilized to improve the overall quality of the environment in the public interest.

Section 4.2 Resources Issues

Section 4.2.1 *Aquatic Resources* should include analysis of providing upstream and downstream fish and other aquatic organisms passage through modification of the dams, likely via a fishway type structure. We also recommend that fish entrainment protection enhancement be updated to current standards and recommendations that utilize the most up-to-date fish impingement/entrainment technologies. State-listed species should be considered in addition to federally listed species, and addressed in the NEPA document.

Section 4.2.3 *Threatened and Endangered Species* should also include a discussion of the ongoing impact to these species as a result of the dam system and alteration to river ecology.

Fish Passage

Dams have known impacts to fish and mussel migration and can impact overall population health in addition to acting as sediment sinks that can impact channel health downstream. The Mississippi River boasts 41 species of fish, all of which inherently move both up and downstream in high and low flows at various times of the year. Fish and invertebrate populations depend on free-flowing systems with connectivity to function effectively over time. Disjunct populations can lead to genetic fitness being reduced over generations. All three dams in question were constructed in the early 1900's, which restricted fish populations to select downstream movement only, with ongoing impacts to fish and mussel populations across this stretch of the Mississippi River.

Connection around dams has become a widely recognized issue, and varying entities across the country, and in Minnesota, have pursued solutions such as removing or lowering (modifying) dams with varied heights, or creating nature like fish bypass channels around them. These removals and modifications facilitate fish and mussel passage effectively, while in some cases allowing for improved sediment transport. Each one of the dams in question, has a "waste gate" capacity that allows excessive flows to bypass the generation turbines. Virtually all flows other than extremely low, allow waste gate operation. As part of waste gate operations for each dam, we would like to request that flow duration analysis, in relation to project capacity, be considered from previous years of record through current, daily and monthly. Bypass channel areas could be developed to accommodate fish and mussel passage using bypass flows to maintain bypass discharges within acceptable ranges.

Fish passage should be considered as a significant piece of relicensing terms given the following general principles:

- Intolerant and imperiled fish and mussel species generally have a high vulnerability to extirpation from barriers whereas tolerant species have a relatively low vulnerability, which has significant implications for ecosystem health.
- Dams have directly contributed to declines in native mussels making them one of the most imperiled groups of organisms in North America. The decline in native mussel populations has resulted in reduced water filtration, stream bed stabilization, and density and diversity of benthic invertebrates.
- At the same time, invasive and/or tolerant species are often adapted to live in impounded rivers, where plankton production is elevated, water temperatures are warmer, and waters are often more eutrophic.

- Presence of a fish or mussel species upstream of a barrier does not confirm that its population is healthy or viable (as some species are very long lived or are stocked). Mussel reproduction is a symbiotic process that depends on access to its host fish species.
- As was articulated in Barrier Effects on Native Fishes of Minnesota (Aadland 2015): "Since 1) protection of native species is a primary objective of invasive species management and 2) this and other studies suggest that barriers are the single most definitive cause of declines in native biodiversity, barriers on naturally connected rivers and streams should not be considered a viable invasive species control strategy. Rather, reconnecting rivers by removing barriers has been shown to increase the diversity and resilience of native species while decreasing the prevalence of invasive species. Restoration of free-flowing, resilient ecosystems is likely to be the most effective means of increasing native biodiversity and preventing dominance by non-native species."

Relevant Studies, Plans, and Documents

Each of the three dams (as others around the country) have aging infrastructure and limited generation capacity when compared to other green energy solutions. As part of the relicensing opportunity, studies to verify integrity within and around each facility should be performed. If cost/benefit ratios become unmanageable, considerations for modifications or removals may be justified.

The list of comprehensive plans in Section 8.0 *Comprehensive Plans* is poor and outdated. The DNR recommends including the following reports and comprehensive plans:

- The Crow Wing River Watershed Report (https://www.pca.state.mn.us/watershed-information/crow-wing-river);
- The Mississippi-Brainerd Watershed Report (https://www.pca.state.mn.us/watershed-information/mississippi-river-brainerd);
- DNR Fisheries Mississippi River –Brainerd Dam to Little Falls Dam – Stream Management Plan (attached)
- DNR Fisheries Placid (Pillager Reservoir) Lake Management Plan (attached)
- DNR Fisheries Sylvan Reservoir Lake Management Plan (attached)
- Crow Wing River Gamefish and Fish IBI Assessment Report (Marod, 2010) (attached)
- And, The Camp Ripley Sentinel Landscape Plan (https://sentinellandscapes.org/landscapes/camp-ripley/).

The DNR would also like to recommend incorporating more relevant research and data from the following documents, which have been provided via links to a website or as an attachment:

- *Assessment of population characteristics and genetic origin of Muskellunge in a section of the Mississippi River, Minnesota* (Carlson, A. J., O. E. Baird, and L. M. Miller. 2017; Pages 565-582);
- *Barrier Effects on Native Fishes of Minnesota* (Aadland, 2015) (https://www.dnr.state.mn.us/eco/streamhab/barrier_pub.html);

- And, *Reconnecting Rivers: Natural Channel Design in Dam Removals and Fish Passage* (Aadland, 2010) (https://www.dnr.state.mn.us/eco/streamhab/reconnecting_rivers.html).

Little Falls Hydroelectric Project No. 2532-094

For the Little Falls Hydroelectric Project NEPA document, the DNR would like to see a detailed discharge analysis and flow duration analysis from previous years of record through current that specifically examines waste gate operation or any discharge beyond generation capacity. We request confirmation of infrastructure, particularly in the west bypass channel area (former mill site), as previous analysis and discussion viewed this as a high potential for bypass with relatively low cost to high ecological benefit. Consideration of fish bypass has also been discussed within DNR fisheries management planning documents for some time. While there are no particular species of concern, general system health for 41 species found in the Mississippi River stand to benefit with migration potential. Species such as walleye, muskellunge, northern pike, smallmouth bass, bigmouth buffalo, white sucker, silver redhorse and shorthead redhorse have all been documented to have significant upstream migrations for spawning and downstream migrations for winter refuge.

Published DNR research found the Mississippi River from the Brainerd Dam downstream to Little Falls supports a self-sustaining Muskellunge population that is genetically unique. Related but unpublished DNR individual Muskellunge tagging and recaptured data in the Mississippi and the lower Crow Wing River (below the Sylvan Dam) show that Muskellunge often use the lower Crow Wing River and seasonally move between the Crow Wing and Mississippi rivers. See the attached publication for details on the muskie genetics and population assessment: *Assessment of population characteristics and genetic origin of Muskellunge in a section of the Mississippi River, Minnesota* (Carlson, A. J., O. E. Baird, and L. M. Miller. 2017).

Prior to construction of the dams on the Crow Wing River most fish found in the area, including Muskellunge, likely freely moved between the Mississippi and Crow Wing rivers, including the Gull River. With the blocked access to the Crow Wing River upstream of the Sylvan Dam, self-sustaining local origin Muskellunge are not present in the Crow Wing River system above the Sylvan Dam. The lower Crow Wing River likely provides some important habitat diversity in the Mississippi-Crow Wing system as the Crow Wing has a little higher gradient with more gravel-rock substrates and less silt with less turbidity than the Mississippi in this area and may be important for lithophilic spawning fish.

The City of Little Falls has continued to express interest in park development around a bypass channel and has been supportive of its creation (see attached Park Concept Plan). During previous discussions, some expressed fear of invasive carp from downstream, but since 2012 conversations were brought up, invasive carp have not been found above Coon Rapids Dam. The Lock and Dam at Upper St. Anthony Falls has been permanently closed and three unpassable dams (St. Cloud, Sartell and Blanchard) exist above Coon Rapids dam. In addition, historical accounts of the passable rapids at Little Falls were found from Nicollet and Oliphant (attached with highlights), further suggesting the fully connected nature of the Mississippi River through the area.

The NEPA document should address sedimentation as a result of the dam and determine the sediment filling rate within the reservoir. The sediment fill rate can provide some indication of the potential lifespan of the dam. A detailed map was created by DNR Fisheries of the reservoir pool in 2016, and a

similar effort should be given to determine the rate of change since that mapping effort was completed.

Sylvan Hydroelectric Project No. 2454-085

For the Sylvan Hydroelectric Project NEPA document, the DNR would like to see a detailed discharge analysis and flow duration analysis from previous years of record through current that specifically examines waste gate operation or any discharge beyond generation capacity. We request confirmation of infrastructure. Consideration of fish bypass has been stated within fisheries management planning documents for some time, and while there are no species of concern, general system health for 41 species found in the Mississippi River and Crow Wing River, stand to benefit with migration potential. Species such as walleye, muskellunge, northern pike, smallmouth bass, bigmouth buffalo, white sucker, silver redhorse and shorthead redhorse have all been documented to have significant upstream migrations for spawning and downstream migrations for winter refuge.

An opportunity may exist to create a nature like fish way around the dam along the west boundary in Camp Ripley, or consideration could be given to drop the structure to the existing sediment wedge (decommissioning), creating a step down riffle to accommodate the change in elevation. Including a rock ramp riffle structure on the Gull River arm to maintain a potential reservoir area where the majority of homes currently are could also be a serious consideration.

The NEPA document should address sedimentation as a result of the dam, and determine the sediment filling rate within the reservoir. The sediment fill rate can provide some indication of the potential lifespan of the dam.

A large concentration of mussel shells are currently found below Sylvan Dam, which is inherent with longitudinally disconnected river systems. Mussels tend to use several native species of fish as hosts for propagation, and if the fish are unable to migrate, the mussel populations become concentrated where the fish congregate. Black Sandshell mussels (*Ligumia recta*), a state-listed species of special concern, have also been documented in the vicinity of the dam, though not directly adjacent.

Pillager Hydroelectric Project No. 2663-064

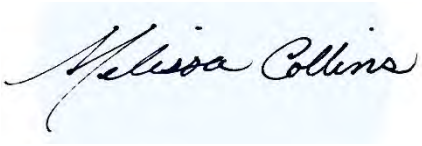
For the Pillager Hydroelectric Project NEPA document, the DNR would like to see a detailed discharge analysis and flow duration analysis from previous years of record through current that specifically examines waste gate operation or any discharge beyond generation capacity. We request confirmation of infrastructure. Consideration of fish bypass has been stated within fisheries management planning documents for some time, and while there are no particular species of concern, general system health for 41 species found in the Mississippi River and Crow Wing River, stand to benefit with migration potential. Species such as walleye, muskellunge, northern pike, smallmouth bass, bigmouth buffalo, white sucker, silver redhorse and shorthead redhorse have all been documented to have significant upstream migrations for spawning and downstream migrations for winter refuge.

The NEPA document should address sedimentation as a result of the dam and determine the sediment filling rate within the reservoir. The sediment fill rate can provide some indication of the potential lifespan of the dam. We also request that a detailed bathometric map of the sediment wedge change, from historic impoundment data, be included in the analysis.

There is some potential for a nature-like fish bypass channel along the east (North) edge of the dam (on current MN Power property), which would allow for fish and invertebrate passage around the pillager project having access to over 90 miles of main stem Crow Wing River.

Thank you again for the opportunity to review this document and provide input on the upcoming NEPA documents for the FERC relicensing process. Please let me know if you have any questions.

Sincerely,



Melissa Collins
Regional Environmental Assessment Ecologist | Ecological and Water Resources
Minnesota Department of Natural Resources
1200 Warner Road
St. Paul, MN 55106
Phone: 651-259-5755
Email: melissa.collins@state.mn.us

CC: Jay Summers, FERC
Owen Baird, DNR Regional Environmental Assessment Ecologist
Jessica Parson, DNR Regional Environmental Assessment Ecologist
Brian Nerbonne, DNR Regional Fisheries Manager
Eric Altena, DNR Area Fisheries Manager
Derek Bahr, DNR Acting Area Fisheries Supervisor

Minnesota Department of Natural Resources, *Division of Ecological and Water Resources*

Barrier Effects on Native Fishes of Minnesota

Luther Aadland

April 2015

MNDNR

Attachment

Abstract

To evaluate the effects of barriers on aquatic biodiversity, fish distributions upstream and downstream of 32 barrier dams on the mainstem or tributaries of the Mississippi, Minnesota, St. Croix, St. Louis, Missouri, and Red River of the North were assessed. Recolonization was assessed for eleven dams that were subsequently removed and had adequate post removal surveys. On average, species richness declined by 41% for complete barriers, 37% for near-complete barriers and 20% for barriers that are/were inundated at bankfull flows. A detailed assessment of the Cottonwood River Watershed indicated that a single barrier near the mouth of the river caused a watershed-wide loss of species richness.

Habitat generalists, tolerant (e.g., common carp, fathead minnow, black bullhead, white sucker) lake-oriented, headwater, and widely stocked species were the least likely to be absent upstream of barriers. Sensitive, stream-dependent, and imperiled species were the most likely to be absent upstream of barriers. Blue sucker, mooneye, paddlefish, sauger, shovelnose sturgeon, and flathead catfish were among 27 species absent upstream of all assessed barriers for watersheds in which they were present. A number of small-bodied species, like the carmine shiner, were also sensitive to fragmentation. Channel catfish and freshwater drum, hosts to 13 and 11 mussels were absent upstream of 61% and 64% of barriers, respectively.

Subsequent removal of 11 barriers resulted in upstream recolonization of an average of 66% of the species that had been absent. Removal also resulted in substantially higher catch per unit effort for a number of species, suggesting that an impact of fragmentation is reduced abundance of remaining riverine species. Removal of the Appleton Dam on the Pomme de Terre River resulted in recolonization of elktoe, deertoe, and plain pocketbook mussels; species that had been found only as dead shells in surveys prior to the dam's removal. These findings suggest that barrier dams, while often ineffective for control of common carp, are among the most profound and definitive causes of native biodiversity losses in Minnesota waters.

The fragmentation of North American Rivers is extensive with more than 87,000 U.S. dams over 6 feet high registered in the 2013 National Dam Inventory. Of these 1,078 dams are fragmenting Minnesota streams. Additional small dams, impassable culverts, and other barriers further fragment rivers and streams throughout the nation.

The effects of dams on fish migrations and the decline of migratory species have been acknowledged for over 300 years. In France, design of fish passage facilities began by the 17th century (McDonald 1887; Rajararnam and Katopodis 1984). In North America, conflicts between dam builders and commercial fisherman became intense by 1780 with the "shad wars" as new dams extirpated anadromous American Shad from East Coast rivers (Watson 1996). In Minnesota, Woolman (1895) recommended installation of fish passage for all dams. Most of this early awareness of barrier effects was centered on anadromous game species, such as salmon (those that migrate from the ocean to freshwater or upstream to spawn).

A number of more recent studies have associated barriers with the extirpation of strictly freshwater species and with reduced biodiversity in the North Central United States and Canada (Aadland et al. 2005; Santucci et al. 2005; Catalano et al. 2007). Santucci et al. (2005) found higher fish IBI scores, higher macroinvertebrate condition index scores, higher quality habitat, and more consistent compliance with water quality standards in free-flowing reaches of the Fox River, Illinois than was found in impounded reaches.

Migration of fish is associated with spawning; optimal foraging; seasonal changes in habitat needs and accessing winter habitat; and recolonization following drought or water quality related mortality. Migration may be especially critical in northern latitudes due to harsh winter conditions that can a) cause anoxia, reduction of habitat volume, super-cooled water, frazil and anchor ice and b) result in increased stress, prevalence of disease, and mortality. For example, the majority of species found in a west central Minnesota watershed were observed making seasonal migrations through fishways on the Otter Tail River

Attachment

and fish densities of all species in an upstream reach declined substantially in mid-winter suggesting downstream migration out of the reach (Aadland 2010).

As with fish, the role of dam construction in the decline of mussels has been acknowledged for over a century. In an assessment of mussels in Minnesota, Wilson and Danglade (1913) state, "A dam or natural fall, impassable for fish, may mean the entire absence of mussels in the river above." Dam construction has been cited as the primary cause of all recent (roughly 20 species) mussel extinctions in North America (Haag 2009). North America is analogous to tropical rainforests in terms of mussel species richness, with more species than any other continent, but 71.7% are listed as special concern, threatened, or endangered (Williams et al. 1993). The ecological implications of mussel declines are extensive due to their roles in stabilizing stream beds (Zimmerman and de Szalay 2007), increasing diversity of other benthic invertebrates (Gutierrez et al. 2003; Spooner and Vaughn 2006), and water filtration (Newton et al. 2011).

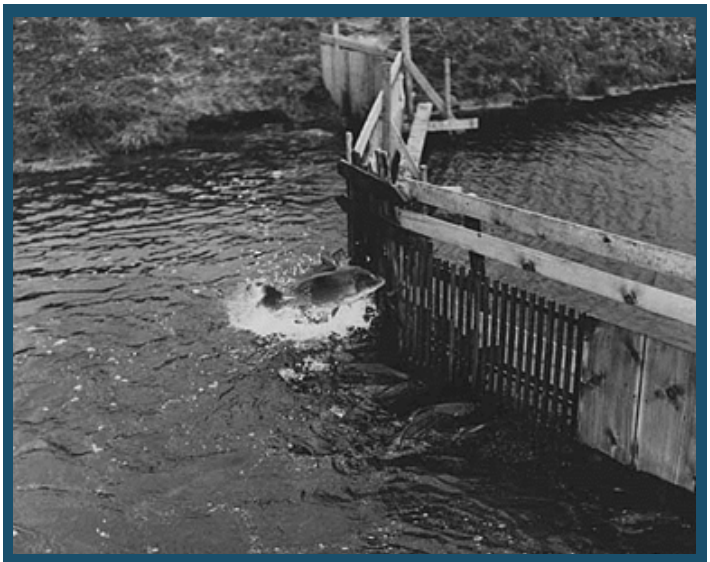
In addition to the loss of biodiversity, dam construction and fragmentation have also been shown to increase the prevalence and dispersal of aquatic introduced species. Johnson et al. (2008) found invasive species to be 2.4 to 300 times more likely to occur in reservoirs than in natural lakes. For example, the Illinois River has been channelized, has had severe water quality impairments throughout its history, and is entirely impounded by dams. It is also believed to have the highest densities of silver carp in the world, which became established in the river around 2000 (Sass et al. 2010).

For clarity, we are defining a species as **native** (indigenous) if its presence is the result of only natural processes, with no human intervention. In contrast, a species is **introduced** (non-native, alien, exotic, non-indigenous) if it is living outside its native range and has arrived there by human activity, either deliberate or accidental.

Diagnosis of barriers as the cause of reduced biodiversity is verified where barriers have been removed and species recolonize. Kanehl et al. (1997) found moderate declines in carp abundance and major increases in smallmouth bass abundance following removal of the Woolen Mills Dam, Wisconsin. Removal of the Stronach Dam, Michigan resulted in recolonization of 8 species found only downstream of the dam and an increase in abundance of 18 of 25 species sampled (Burroughts et al. 2010). The removal of dams has increased recently due to structural instability of aging dams and increased awareness of the ecological damages associated with them (Aadland 2010).

The introduction of common carp in the 1880s and later declines in their popularity initiated construction of fish barriers as early as 1927 (Hoffbeck 2001). Subsequently, numerous carp barriers have been constructed across Minnesota including dams, electric barriers, screens, and high velocity culverts. These provide the opportunity to evaluate barriers targeting common carp in terms of effects on common carp and native assemblages.

Since the effects of introduced carp and other aquatic introduced species on native species is a primary cited concern, the evaluation of barriers on native species is fundamental to evaluating the efficacy of barriers as an introduced species deterrent. Nationally, most studies have focused on the effects of barriers on game species with relatively few evaluations of the effects of barriers on aquatic biodiversity.



A fish screen on Six Mile Creek near Lake Minnetonka in 1965. *Credit Minnesota Historical Society.*

The Methods

The Effects of Dams on Fish Diversity

As a means of addressing the effects of barriers on native fishes in Minnesota, the presence/absence of fish species in the upstream versus downstream watersheds of 32 dams throughout Minnesota was analyzed. The dams assessed are, or were, located in tributaries and mainstems of the Minnesota, Red River of the North, St. Croix, St. Louis, Missouri and Mississippi river watersheds (Figure 1). Geo-referenced fish records from the Minnesota DNR-Fisheries, MN DNR-Ecological and Water Resources, Pollution Control Agency, university collections, the Bell Museum, and other reliable sources were used to tabulate the presence and absence of fish above and below the barriers. Much of the data is available through the Department's "Fish mapper" tool (Fish Mapper website: www.dnr.state.mn.us/maps/fom/index.html) but more recent Stream Habitat Program and Fisheries records were acquired directly from Area Offices.

Dams that are frequently inundated and passable during high flow conditions were not included in this assessment. Of the 32 dams assessed, nineteen were complete blockages, nine were near-complete blockages (may be passable during 10 year or larger floods), and four were moderate blockages (may be passable during 2 year or larger floods). Two of the complete blockage dams were built on natural barriers, Redwood Falls and St. Anthony Falls. Fourteen of the dams have been subsequently removed or modified for fish passage and safety.

Major floods can inundate even relatively large dams making them passable for a brief yet key period of time; therefore, the results needed to be put in context for the occurrence of these large floods. Many dams also have experienced partial or complete failures during their existence - some dams have failed multiple times. Flood and failure events were considered in the analysis. Inundation may or may not create passable conditions for a long enough duration or at the right time of year for recolonization by a given species.

Only the downstream-most major barriers on the chosen tributaries were assessed. Several rivers had a series of closely spaced dams with little or no sampling effort in between them so the potential affect by each barrier could not be assessed.

Since fish records comprised a wide range of gear types and sampling effort, sample abundance was not quantified in the analysis and was handled as "present" or "absent". While presence/absence data handling was necessary, barriers can substantially reduce population size without extirpating the species entirely or major floods may allow a few individuals to pass. As a result, many species identified as "present" may not represent viable populations.

Unfortunately, for most cases, the historic pre-barrier species diversity and abundance is unknown because dams were built as early as the 1850s which pre-dates fish sampling by trained fisheries biologists or taxonomists.

For each barrier dam fish distributions were handled on a watershed basis upstream and downstream. If there were records of a species within the contributing watershed upstream of a barrier, it was considered "present". The exceptions to this were a couple of cases where a native species was known to have been stocked in a relatively isolated lake in the watershed but was absent from the rest of the basin, it was considered "absent".

Only species found in the river or tributary being assessed were included in the analysis as potential species for that tributary. Species found in larger mainstem rivers downstream were not included in the analysis for that tributary. This was done to avoid inclusion of species that may require larger river habitat that may not exist in the tributary. In several cases this limited the list of potential species where dams were close to the mouth of the tributary because few samples were collected between the barrier and the mouth.

Downstream effects on fish diversity were not quantitatively assessed due to the complexities of assessing effects attributable to a single barrier. Migration barriers have caused downstream basin-wide extirpations when they block access to critical spawning habitat. Large rivers, however, may have multiple tributaries that provide suitable spawning habitat so effects were evaluated only for the tributary watershed.

Distribution after removal or failure of a dam was also assessed for some structures to separate habitat or water quality effects from those attributable to the barrier. Since most dam removals have been relatively recent, several tributaries have had no surveys since removal. For most sites, significantly less sampling effort was available post-removal than for pre-removal. Pre and post dam construction records of species that were absent upstream following dam construction

Attachment

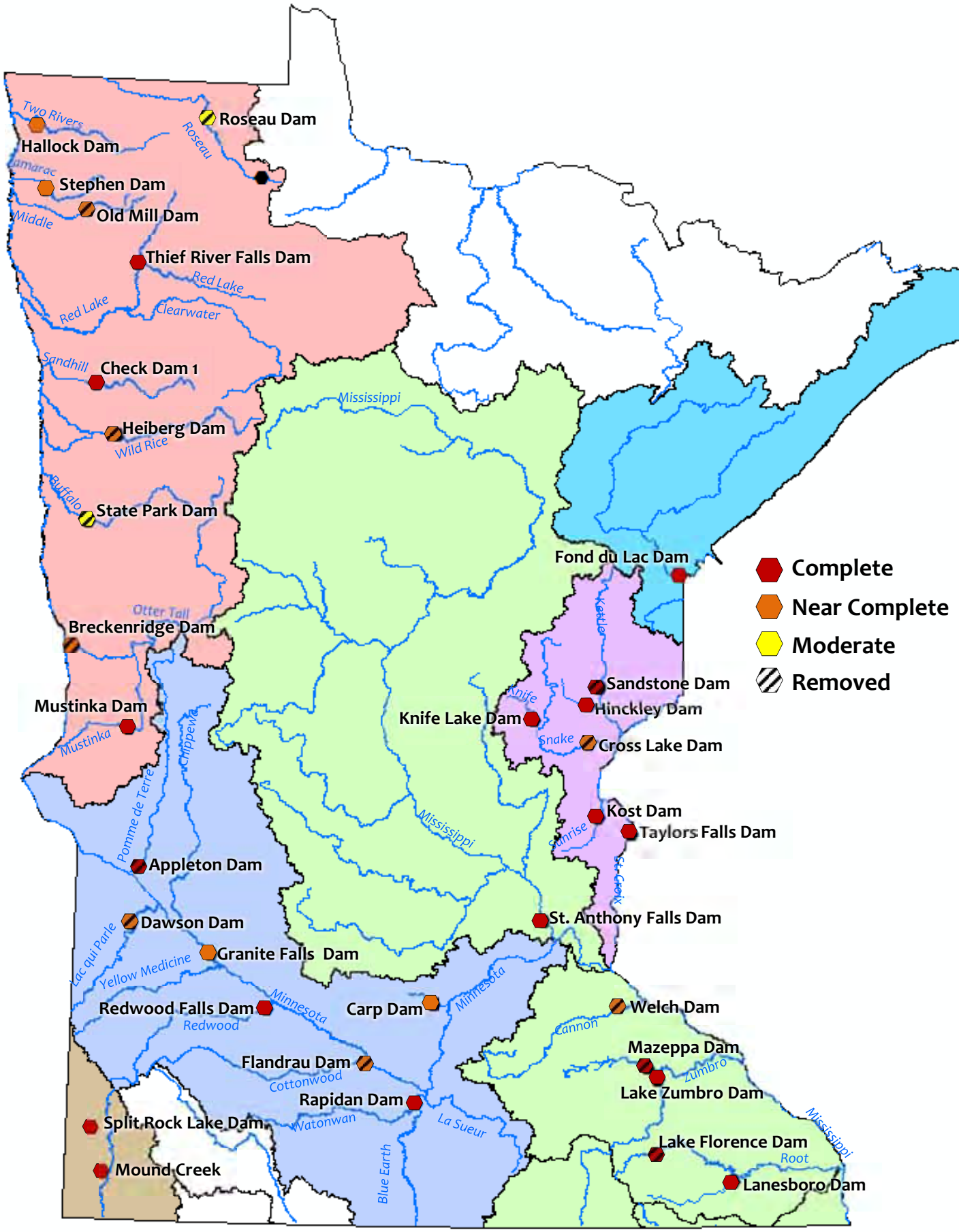


Figure 1. The locations, effectiveness, and current status of the 32 dams included in the barrier assessment.

were also considered as evidence that the barrier-caused the extirpation.

Relative vulnerability of species to barrier-caused extirpation was assessed as a percentage of watersheds where they were present in the watershed but were not found upstream of the barrier. This was put in the context of habitat, thermal regimes, introductions or stocking and other factors. Relative vulnerability was also assessed as a function of environmental tolerance (tolerant/intolerant species) and imperiled status (special concern, threatened, and endangered).

The Effects of a Dam on Watershed Scale Fish Diversity

To address relationships between watershed area, biodiversity, and barrier effects, a detailed assessment of the Cottonwood River Watershed was completed. Flandrau Dam, originally built in 1937 near the mouth of the Cottonwood River, blocked most of the watershed from the Minnesota River. The dam failed in 1947 and was rebuilt the following year but a number of fish surveys were conducted in 1948 during the time when the dam was passable. The dam also failed in 1965 and 1969 but was rebuilt each time and no available fish surveys were conducted upstream of the dam site during these dam breaches. The dam was finally removed in 1995. This dam and fish sampling history provided assessment of a short duration open river condition followed by nearly 50 years of fragmentation then a final period of surveys following the dam's removal. Watershed area and stream mile distance from the mouth of the Cottonwood River were measured for each site and associated with general habitat type and species composition.

Results and Discussion

Barrier Effects on Upstream Fish Diversity

Of the 32 barriers evaluated, an average of 37% (3% to 78%) of the species sampled in the watershed were absent from collections upstream of the barrier (Table 1 and Table 2). The fish records analyzed included a total of 150 species including 16 non-native and 134 species that are considered native to Minnesota. The extent of species absent upstream was higher among the more effective barriers.

Table 1. Summary of Barrier Effects on Species Richness

Barrier Effectiveness	# of Dams Assessed	Average % Absence
Complete	19	41%
Near Complete	9	37%
Moderate	4	20%
Overall Average	***32***	***37%***

The percentage of species absent above natural barriers at St. Anthony Falls (50%) and Redwood Falls (36%), which have likely been barriers for thousands of years, were within the range of that for complete barrier dams (15-73%). This suggests that barrier-caused extirpation can happen within a short time frame (decades). Rivers upstream of natural barriers tend to have lower species richness. It is unknown if absent species were never able to colonize upstream of the barrier or if some fish species were historically there then extirpated.

The absence of a species from surveys upstream of a barrier has several potential explanations:

1) The species was extirpated as a result of the barrier.
2) The species is present but was not collected in the surveys.
3) The upstream reach lacks suitable habitat for the species.

Significant sampling effort, a diversity of habitat upstream of the dams, and the abrupt upstream extent of the species at the dam site favors barrier-induced extirpation as the explanation of species absences for most sites and most species. However, a number of factors need to be considered in determining whether the upstream absence of a species is attributable to the barrier or if habitat, water quality, stream size, temperature regimes, hydrology, statistical probabilities, or other

Attachment

Watershed	Barrier Name Year Built, Year Removed	Dam height at low flow (ft) Barrier Effectiveness	Watershed area (mi^2) upstream of dam / total % of watershed upstream of dam	Total # of native species observed in watershed Additional introduced species	# of Native MN species absent upstream of barrier (% of total)
Red River of the North Basin					
Otter Tail River	**Breckenridge Dam** 1935. Replaced with rock ramp in 2007	8 Near Complete	1,910 / 1,952 97.8%	75 1	9 (12%)
Mustinka River	**Mustinka Dam** 1940	18 Complete	163 / 861 18.9%	30 1	15 (50%)
Buffalo River	**State Park Dam** Pre-1893, 1937 Removed in 2002	3.5 Moderate	325 / 975 33.3%	58 1	21 (36%)
Wild Rice River	**Heiberg Dam** 1875. Removed in 2006	8 Near Complete	934 / 1,560 59.9%	61 1	16 (26%)
Sand Hill River	**Check Dam 1** 1955	10 Complete	308 / 420 73.3%	36 1	15 (42%)
Red Lake River	**Thief River Falls Dam** 1946	16.75 Complete	3,450 / 5,680 60.7%	64 3	13 (20%)
Middle River	**Old Mill Dam** 1886, 1938. Removed in 2001	8.5 Near Complete	225 / 779 28.9%	32 1	25 (78%)
Tamarac River	**Stephen Dam** 1975	12 Near Complete	283 / 397 71.3%	37 1	9 (24%)
Roseau River	**Roseau Dam** 1932. Replaced with rock ramp in 2001	5 Moderate	474 / 1,420 33.4%	44 1	10 (23%)
South Branch Two Rivers	**Hallock Dam** 1938	8 Near Complete	592 / 1,100 53.8%	42 1	13 (31%)
St. Croix River Basin					
St. Croix River	**Taylors Falls Dam** 1890, 1907	50 Complete	6,240 / 7,650 81.6%	106 5	31 (29%)
Snake River	**Cross Lake Dam** 1800s, 1938, 1963. Modified with rock ramp in 2013	2 Moderate	974 / 1,009 96.5%	68 1	2 (3%)
Knife/Snake River	**Knife Lake Dam** 1983	14 Complete	92/1,009 9.1%	68 1	33 (49%)
Kettle River	**Sandstone Dam** 1908. Removed in 1995	20 Complete	868 / 1,060 81.9%	64 5	22 (34%)
Grindstone River	**Hinckley Dam** 1955	10 Complete	77 / 1,060 7.3%	64 5	30 (47%)
Sunrise River	**Kost Dam** 1885	13 Complete	268 / 283 94.7%	64 2	19 (30%)

Table 2. Watersheds assessed for barrier effects on fish species richness. Barrier effectiveness is based on dam height and frequency of inundation by floods; Complete = complete barrier, Near Complete = near complete barrier that may be passable during large floods (10-year or larger), Moderate = moderate flood barrier that may be passable during moderate floods (2-year or larger).

Watershed	Barrier Name Year Built, Year Removed	Dam height at low flow (ft) Barrier Effectiveness	Watershed area (mi^2) upstream of dam / total % of watershed upstream of dam	Total # of native species observed in watershed Additional introduced species	# of Native MN species absent upstream of barrier (% of total)
Lower Mississippi River Basin					
Mississippi River (upstream of Iowa border)	**St. Anthony Falls Dam** 1848, 1963	49 Complete	19,100 / 65,000 29.4%	127 8	64 (50%)
South Branch Root River	**Lanesboro Dam** 1868	28 Complete	284 / 1,250 22.7%	93 4	57 (61%)
North Branch Root River	**Lake Florence Dam** 1857. Removed in 1993	12 Complete	119 / 1,250 9.5%	92 4	65 (70%)
Zumbro River	**Lake Zumbro Dam** 1919	55 Complete	845 / 1.150 73.5%	89 4	27 (30%)
North Fork Zumbro River	**Mazeppa Dam** 1922. Removed in 2001	20 lowered to 10 Complete	174 /1,150 15.1%	89 4	65 (73%)
Cannon River	**Welch Dam** 1900. Removed in 1994	8 Near Complete	1,340 / 1,440 93.1%	82 5	19 (23%)
Minnesota River Basin					
Minnesota River	**Granite Falls Dam** 1911	17 Near Complete	6,180 / 16,200 38.1%	97 4	39 (40%)
High Island Creek	**Carp Dam** 1958	6 Near Complete	206 / 241 85.5%	47 1	30 (64%)
Blue Earth River	**Rapidan Dam** 1910	55 Complete	2,410 / 3,486 69.1%	66 1	26 (39%)
Cottonwood River	**Flandrau Dam** 1937, Was repeatedly damaged by floods & was removed in 1995	28 lowered to 12 Near Complete	1,310 / 1,313 99.8%	65 2	24 (37%)
Redwood River	**Redwood Falls Dam** 1902	34 Complete	630 / 665 94.7%	53 2	19 (36%)
Pomme de Terre River	**Appleton Dam** 1872. Removed in 1999	13 – 16 Complete	905 / 915 98.9%	65 1	17 (26%)
Lac qui Parle River	**Dawson Dam** 1913. Replaced with rock ramp in 2009	8 Moderate	472 / 1,156 40.8%	41 1	8 (20%)
Missouri River Basin					
Mound Creek	**South Dam** 1936	14 Complete	16.8 / 17.2 97.7%	29 1	9 (31%)
Split Rock Creek	**Split Rock Dam** 1937	24 Complete	45 / 320 13.9%	26 1	10 (38%)
Lake Superior Basin					
St. Louis River	**Fond du Lac Dam** 1924	78 Complete	3.600 / 3,634 99.1%	62 11	9 (15%)

Attachment

factors are responsible. Conversely, the presence of an individual does not necessarily indicate that the species is unaffected by the barrier or representative of a viable population. A number of species are routinely stocked, masking barrier effects on a population. Ultimately, historical pre-barrier records or those following removal of barriers indicate the ability of a species to exist or thrive in the river reach. These considerations warrant further discussion given their implications for barrier effects.

Considerations in Fragmentation Assessment

Historical Context of Fish Distribution Data It was not possible to comprehensively determine species distributions prior to watershed fragmentation since most of the watersheds evaluated had barrier dams by the mid- to late 1800s and did not have systematic fish surveys until the mid-1900s. Archeological surveys, some early explorers like Alexander Henry (1799 – 1808), George Featherstonhaugh (1835), and others who took detailed notes provide useful historical data on easily identified food fishes like lake sturgeon, walleye, channel catfish, and freshwater drum. Most species were not targeted until much later when biological surveys started. Woolman (1895) surveyed the upper Minnesota and Red River watersheds in the 1890s to 1910s. Surber (1923) primarily surveyed eastern Minnesota streams in the 1920s. However, most fish surveys did not occur until after 1940.

The late timing of initial surveys makes the early distribution data a baseline for a significantly impaired condition, not pre-human influence, in most watersheds. Land-use changes, dam construction, unregulated overfishing, and severe water pollution likely limited or extirpated many of the pre-settlement species prior to any surveys. The Mississippi River was an anoxic "dead zone" from the Twin Cities to Hastings from the about 1885 to the 1980s due to raw sewage effluent until the Clean Water Act and other legislation forced construction of water treatment plants. Release of raw sewage was typical for municipalities located on rivers and streams. The St. Louis, Rainy, and other relatively undeveloped watersheds were heavily polluted with paper mill effluent and massive logging drives. The Otter Tail River had repeated fish kills due to discharges of whey and other cheese by-products into the early 1990s. As a result, it is likely that many species absent from early records probably existed in Minnesota waters prior to these changes. Improved treatment of human waste does appear to be allowing some species to return to Minnesota waters.

Climate change will likely have implications for what species will be here in the future as it has in the past. As a result of the relatively recent glaciation of most of Minnesota and subsequent warming of waters over the past 14,000 years, most of our fish assemblage would have been invaders as thermal regimes and habitat changed. River systems of Northern Europe are less diverse than similar sized rivers in North America due, in part, to the north-south orientation of the Mississippi River that allowed recolonization from southern refugia compared to the East-West orientation of the Danube and other European rivers that would not have had southern un-glaciated refugia (Oberdorff et al. 1997). Under current anthropogenic climate change, southern species may expand into Minnesota waters while cold-water species may decline as thermal regimes change (Stefan and Hondzo 1991). Some species have already shown changes in abundance, northerly extent of range, and timing of spawning attributable to climate change (Schneider 2010).

Species Introductions and Stocking A number of the game and bait species native to Minnesota are widely stocked and this includes water to which they may not have historically been native to. Routine stocking likely masked the effects of fragmentation for walleye, channel catfish, smallmouth bass, and other species. Walleyes are migratory and likely susceptible to effects of fragmentation but are so widely and regularly stocked that these effects are very difficult to assess. Many of these occurrences do not represent viable populations or meta-populations as indicated by the need for ongoing stocking. Stocking is less common where natural reproduction occurs.

Habitat Type, Habitat Diversity, and Length of Free-Flowing River Fish distributions are defined by habitat, which is a function of geology, watershed size, slope, hydrology, climate, and other factors. Habitat also can be defined by temporal (diurnal, seasonal, annual), life stage (spawning, eggs, fry, juvenile, adult) and spatial (microhabitat, mesohabitat, watershed) scales. For many stream fish species, habitat overlaps large spatial areas and includes a diversity of microhabitat types for successful completion of life cycles (Aadland and

Kuitunen 2006). The length of stream required is likely to be dependent on the availability of the full suite of habitats needed to complete each life history stage. Since year to year climate and hydrology can dramatically affect habitat suitability and reproductive success, a network of connected habitats increases resilience to drought and poor spawning conditions.

Lake sturgeon may require 155 to as many as 620 miles of free-flowing river to maintain a healthy population (Auer 1996). Sturgeon have been observed visiting multiple spawning rapids before actually spawning. This likely increases reproductive success as the suitability of individual rapids varies with the flows and water temperatures each year. The fact that the St. Croix River has retained a viable lake sturgeon population upstream of the St. Croix Falls dam may be due to the availability of spawning rapids, large river habitat and considerable length of free-flowing river in the watershed upstream of the dam. However, a number of species have disappeared from the St. Croix and similar watersheds despite the presence of diverse habitats. Blue sucker maintained a presence upstream of the St. Croix Falls Dam until the 1970s but haven't been sampled there since.

Conversely, tolerant, generalized species are often able to maintain populations within much shorter river reaches. For example, common carp, black bullheads, fathead minnows, and a number of other tolerant lake species can complete life histories within a single isolated lake.

Stream and Watershed Size It is logical that large fish would require a minimum stream and watershed size but amazingly large fish are found in small streams and watersheds when they have access to them. For the largest fish species, presence in smaller streams may only occur during spawning and high flows or as juveniles. Large-bodied fish like flathead catfish risk stranding or predator attacks if present or trapped in small streams as flows recede. As shown in the picture below, a large flathead was found stranded in a riffle in the Yellow Medicine River in July 2009. This fish may have been killed by the eagle observed feeding on it. The presence of connected lakes or deep pools in a watershed can provide vital refugia for these large bodied fishes.

Interestingly, the smallest watershed assessed in this study, the Grindstone River (77 mi^2), had historical records of MN's largest fish species, the lake sturgeon (which can grow to 10 feet and 400 pounds), found in Grindstone Lake (20 mi^2 watershed). Since lake sturgeon spawn in rapids, these fish, at some point in their life, would have had to leave the lake and swim up the Grindstone River, which is about 20 feet wide at the lake outlet. Lake sturgeon have been observed spawning in the Moose Horn River where the drainage area is 112 mi^2. The largest paddlefish on record was 85 inches long and weighed 198 pounds. It was speared in Lake Okoboji, Iowa where they were once abundant, but are now extirpated, likely due to barrier dams. Paddlefish also spawn in rivers (riffles and rapids) so would have needed to ascend the Little Sioux River and the outlet creek, which is about 50 feet near the lake outlet (141 mi^2). These small streams and watersheds may be very important migratory pathways as well as spawning and nursery habitat for large-bodied fish, even though spawning adults may only be present briefly during high spring flows to spawn.

Watershed size and the location of the dam in the watershed also had statistical implications due to relative sampling effort. Several of the assessed barriers were near the mouth of the watershed being assessed so that most of the sampling effort and watershed area was upstream of the barrier. The limited number of samples downstream of the barrier results in a low number of potential species listed as "absent" upstream of the barrier (as it reduced the number of potential species considered present in the watershed). For instance, 99.8% of the Cottonwood River's watershed is upstream of the Flandrau Dam site, so only samples from a very short reach downstream of the dam and upstream of the Minnesota River confluence added species to the watershed total that were inferred to potentially exist upstream in the absence of the barrier. Despite the short segment of free-flowing river in the watershed downstream of the dam, 24 species (37% of the watershed total) were collected downstream of Flandrau Dam that were not collected above it.

Partial Barriers Four of the 32 dams assessed in this study are not complete barriers during moderate floods. Furthermore, some of these and others assessed have failed periodically over their history. The occasional flood flows and dam failures potentially allowed individuals of extirpated species to migrate upstream of the barrier. This may explain the relatively intact fish community upstream of the Cross Lake Dam on the Snake River. This dam was only 2 feet high but since it was built on natural rapids with steeper slopes over bedrock, velocities were high during major floods. The fact that only



A dead flathead catfish, apparently killed by a bald eagle, in a riffle in the Yellow Medicine River, July 2009. Fingerling flathead catfish have been caught at this site suggesting that the small river, though generally lacking deep water adult habitat, may be important for reproduction. *Credit DNR Stream Habitat Program.*

2 species were absent upstream of the dam may indicate that fish were able to pass this barrier recurrently during bankfull and higher flows. Lake sturgeon, extirpated above most barrier dams, have maintained a presence upstream of this dam. However, the photo below of sturgeon caught in rapids below the upstream Bean Dam suggest that historic sturgeon populations were much higher. Sturgeon were observed below the Cross Lake Dam unsuccessfully attempting to migrate upstream. It has since been modified for fish passage.

Locks & Dams The lock & dam system on the Mississippi River is a series of partial barriers that provide limited passage through the lock chambers or during high flows when the gates are open. Passage may vary by species and by lock & dam size and height. Tagged silver carp moved upstream through lock & dam #26 through #20, up to #19, during "closed" gate conditions almost as readily as during open gate conditions and were able to pass under gates that were not entirely closed (Brooks et al. 2009). Native species generally had much lower success in passing the dams. Paddlefish and blue catfish were impeded more than other fish species. The near-extirpation of skipjack herring and declines of other native species have been attributed primarily to the construction of the 36 foot-high Lock & Dam 19, which is a complete barrier except through the lock chambers (was completed in 1913 and is located at southern tip of Iowa).

Current fish assemblages of the Upper Mississippi River, and as a result potential assemblages of Minnesota tributaries, are likely limited by the lock & dam system and the associated habitat fragmentation and inundation (when compared to historic assemblages). This is especially significant when the anoxic dead zone between the Twin Cities and Hastings is considered since all current fish and mussel species in that reach would have needed to recolonize after sewage treatment plants improved water quality in the 1980s. The limited passage of native species through the Lock & Dam System likely allows more species to exist upstream that would not be present if they were complete barriers. Improved passage through these lock and dams would allow species like skipjack herring, American eel, paddlefish, and many others to increase in abundance. Conceptual designs for nature-like fish passage through the entire lock & dam system was proposed in 2006. Commercial fisherman described catching large "shovelnose sturgeon" over 50 pounds in Minnesota waters of the Mississippi (Mike Davis, DNR ecologist, personal communications). These likely would not have been shovelnose sturgeon, which do not get that large, but similar looking pallid sturgeon. Blue catfish (for which early records exist), pallid sturgeon and other species that may have been part a free-



A large pile of sturgeon speared in rapids below Bean Dam on the Snake River in 1912. *Photo taken by Herman Schmidt.*

flowing fish assemblage in Minnesota waters may also recolonize with improved connectivity of the Mississippi River.

Presence versus Viable Population The presence of a species upstream of a barrier does not confirm that the population is maintaining a viable population. For instance, surveys on the Red Lake River in 1996 and 2001 each collected a single channel catfish upstream of the Crookston Dam. Surveys following its removal (2005) in 2005 and 2011 collected 222 and 255 catfish respectively. Some long lived species can retain a presence long after functional extirpation. Lake sturgeon can live over 150 years. Large adults were caught in large lakes of the Red River Basin as late as 1947, which is over 50 years after suitable spawning habitat had been largely eliminated or blocked. Some mussel species have been aged to over 200 years so can also retain a presence many years after they can no longer reproduce due to the loss of their host species. Following the definitions used in this study, a single individual caught anywhere in the watershed upstream of a dam precluded the species from being considered "absent".

Thermal Regimes Many tributaries to the Mississippi River in southeastern MN have cold-water headwater reaches with warm-water downstream reaches. Some of these streams have warm headwaters starting in the plains, followed by cold, groundwater-fed middle reaches through the bluffs, and finally warmer lower reaches near their confluence with the Mississippi. These thermal regimes dictate the presence, range and migratory boundaries of coldwater species during the summer months. During winter, all Minnesota waters are cold and may allow dispersal of these coldwater species to other groundwater-fed streams. Generally, headwater species associated with cold water were not absent above barriers assessed here.

Downstream Effects Downstream effects of barriers on fish diversity were not directly assessed due to the difficulty of determining whether a specific dam was the causative factor. The decline of many species, however, has been attributed to the loss of upstream spawning habitat. Since dams are frequently built in high gradient reaches (Minnesota Falls, Granite Falls, Rapidan, Taylors Falls, etc.) they not only block migrations but inundate these critical habitats. In addition, many are known to make seasonal spring migrations up smaller tributaries to spawn followed by downstream migrations back into the larger river. This short but critical presence in the stream makes them unlikely to be collected, especially since most stream surveys are done in late summer. By eliminating spawning habitat it is likely that many of the barriers assessed have substantial effects on downstream fish communities that, based on observed migration distances, may extend hundreds of miles.

Access to Refugia To maintain populations, species require available microhabitat for all life stages (spawning, fry, juvenile, and adult). They also need to be able to survive droughts and extreme winter conditions that may reduce or eliminate available habitat. Hydrologically stable streams and those with numerous lakes that maintain suitable dissolved oxygen levels through winter in their watersheds (such as the Otter Tail, Red Lake, and Cannon Rivers) generally retained more species upstream of barriers than those prone to low flows or that have few or no lakes. The lakes or stable base flows may provide habitat refugia during drought conditions that would not exist in stream reaches that stop flowing. Lakes that become anoxic in winter, like many in the agricultural watersheds of southern Minnesota, generally do not provide suitable refugia except for species tolerant of very low oxygen. Northern pike have been shown to migrate out of winterkill lakes and into connected streams as oxygen refugia (Tonn and Magnuson 1983). These lake–stream interactions may be very important to sustaining biodiversity in these watersheds.

Relative Vulnerability to Barrier-Caused Extirpation by Species

Of the 32 dams and 150 species evaluated, most native species were found to be vulnerable to extirpation by barriers. All 134 native fish species for which there were records were ranked according to vulnerability to barrier-caused extirpation. This was determined by the percentage of barriers upstream of which they were absent divided by the number of watersheds in which they were present (Table 3. and Table 4. starting on page 28). A total of 27 native fish species were absent upstream of every barrier (100%) for watersheds where they were found. Sixty-six native species were absent upstream of at least half of the barriers for which they were assessed. As already discussed, these results must be tempered by sample size and influence of the factors discussed previously.

The data suggest that imperiled species (special concern, threatened, and endangered) are particularly vulnerable to fragmentation by barriers (Figure 2). Species that have imperiled status in Minnesota and are imperiled or extirpated in adjacent states were most prevalent in the upper quartile of vulnerability (75-100 % absence) to barriers. This is consistent with other studies that have cited dams as a primary threat to imperiled species and native biodiversity (Rinne et al. 2005).

Species designated as "intolerant" or "sensitive" to impairment of water quality (EPA) were also vulnerable to barrier-caused extirpation while "tolerant" species were generally among the least vulnerable. The ability to survive anoxia in eutrophic lakes and agricultural watersheds allows tolerant species to maintain populations through winter and drought while other species must periodically migrate out of these watersheds or are killed. For example, black bullheads held in enclosures in Lake Christina, Minnesota were able to survive both rotenone treatment and anoxia by burying themselves in lake sediments (Thomas Carlson, retired DNR Shallow Lakes Biologist, personal communications). There may be interaction effects in addition to direct barrier effects that are responsible for this trend. The suppression or extirpation of sensitive species and decreased biodiversity due to barriers would give tolerant species a competitive advantage. Thus, tolerant species may actually benefit from fragmentation in some systems. Prominent tolerant species included common carp, fathead minnow, black bullhead, white sucker, and creek chub. These findings are

Table 3. Summary of Barrier-caused Extirpation Fish Data

# of dams/watersheds analyzed	32
# of native fish species present in these watersheds	134
# of introduced species present in these watersheds	16
# of native species absent above every dam for watersheds in which they were present	27 (20%)
# of species listed (Endangered, Threatened, Special Concern) in MN	27 (20%)
# of species listed in MN and neighboring states and province	69 (51%)
# of sensitive species	48 (36%)

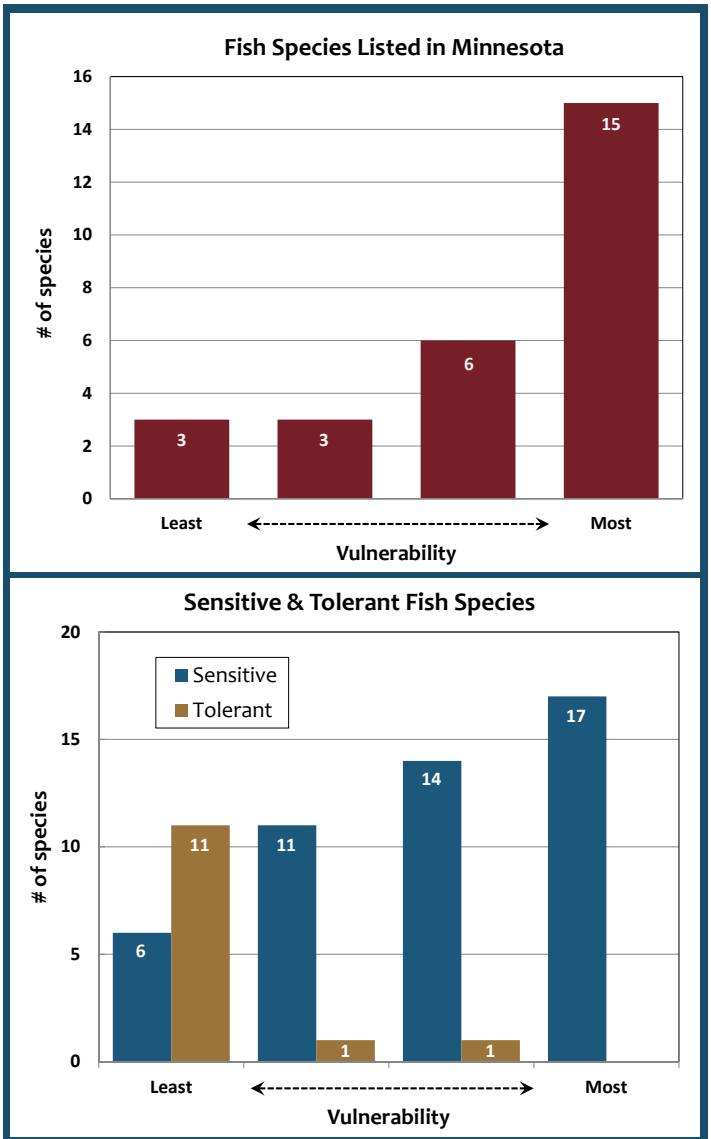


Figure 2 (top) Total number of listed species in Minnesota in percent absence quartiles. (bottom) Number of sensitive and tolerant native fish species (including naturalized common carp) in percent absence quartiles.

consistent with those of Santucci et al. (2005) in comparisons of free-flowing and fragmented reaches of the Fox River, Illinois.

While the absence of a species upstream of a dam does not prove that it was due to the barrier, historical records prior to the dam construction and later records following dam removal do substantiate a barrier effect. The likelihood of a species return to an upstream reach following a barrier removal can also be inferred by the presence of suitable habitat and comparisons to similar-sized connected streams and watersheds. Thirteen of the 32 dams were subsequently removed. Eleven dam removals have enough post-removal sampling effort to evaluate biodiversity effects, enabling greater certainty in defining barrier effects (Table 4). A summary of the species that returned following removal is shown in Table 4.

The general lack of spring surveys limits assessment of river reaches used for spawning but not for other life stages. Many species are known to ascend smaller rivers and streams in the spring followed by post-spawning downstream migrations back into larger river reaches. While juveniles of some species will remain near spawning areas as they mature, others will drift downstream as fry. Only 1 of 54 upstream surveys following removal of Flandrau Dam was done in May, with one in June, and none in April (a peak spawning month for many species). Most surveys were done in July, August or September. Some large-bodied species like flathead catfish and lake sturgeon that may only be present for a short but critical period in smaller river reaches are likely to be missed by summer surveys.

As expected, species known to migrate long distances and large-bodied fishes were among the most likely to be absent or extirpated upstream of dams. However, the list of species sensitive to fragmentation also included a number of small-bodied species as well as a disproportionate number of species listed as endangered, threatened or special concern in Federal, Minnesota and adjacent state listings.

The least likely species to be absent upstream of barriers were tolerant habitat generalists, stocked game and bait species, headwater fishes, and species that complete all life history stages in lakes. The absence of common carp upstream of barriers was relatively rare (25%) as it was for black bullhead (6%). Interestingly, these are two species typically targeted by fish barriers in Minnesota. Common carp were most likely to be absent upstream of complete barriers on cold-water streams, watersheds lacking lakes, or in watersheds that were relatively pristine.

Barrier Effects on Specific Fish Species

The sturgeons and paddlefishes of Order Acipenseriformes are the most vulnerable group in terms of extinction (85% of this group are critically endangered) because they are long distance migrants and their habitat needs are especially vulnerable to fragmentation (IUCN, 2004).

Lake sturgeon *Acipenser fulvescens* (*Special Concern in MN, WI, ON; Endangered in IA*) were absent above 80% of assessed dams (12 of 15). The exceptions were the St. Croix River upstream of St. Croix Falls Dam, and two of its tributaries, the Kettle River upstream of Sandstone Dam and the Snake River upstream of the Cross Lake Dam, which maintained the presence of lake sturgeon, but the species appears to be much less abundant than it was historically. The Cross Lake Dam may be passable for sturgeon during moderate floods helping to maintain a metapopulation, and the St. Croix, Kettle, and Snake rivers all have high quality spawning habitat connected to lakes and deep pools that would provide adult refugia and habitat from drought and winter conditions.

Lake sturgeon were extirpated from the entire Red River Basin and from the Minnesota River watershed upstream of Granite Falls where they were historically abundant to the headwaters of both watersheds. Dams in these basins inundated or blocked access to rapids where this species spawns like Rapidan (Blue Earth River), Minnesota Falls and Granite Falls (Minnesota River), Red Lake Falls (Red Lake River), and Fergus Falls (Otter Tail/ Red River).



A lake sturgeon caught below Minnesota Falls Dam before it was removed in 2013. *Credit Ken Peterson.*

Lake sturgeon will migrate hundreds of miles to spawn. A juvenile lake sturgeon tagged in Lake Pepin

Attachment

Barrier	Native fish species absent in upstream watershed while dam was present then found upstream of dam site after removal or modification or when dam was breached	# of species returned
Breckenridge Dam Otter Tail River Built in 1935 Replaced with rock ramp in 2007	silver lamprey[L], longnose gar[L], goldeye[L,I], mooneye[L,I], stonecat[I], white bass, sauger, lake sturgeon[MN,L]*	8 species (89% of 9 absent species)
State Park Dam Buffalo River Built pre 1893 & 1937 Removed in 2002	silver lamprey[L], goldeye[L,I], spotfin shiner, carmine shiner[L,I], sand shiner, northern redbelly dace[L], blacknose dace, quillback[L], silver redhorse, channel catfish, green sunfish, smallmouth bass[I], sauger, freshwater drum	14 species (67% of 21 absent species)
Heiberg Dam Wild Rice River Built in 1875 Removed in 2006	goldeye[L,I], brassy minnow, emerald shiner, carmine shiner[L,I], finescale dace[L], quillback[L], silver redhorse, channel catfish, tadpole madtom, smallmouth bass[I], sauger, freshwater drum, lake sturgeon[MN,L]*	13 species (81% of 16 absent species)
Sandstone Dam, Kettle River Built in 1905 Removed in 1995	southern brook lamprey[MN,I], blackchin shiner[I], blacknose shiner[L,I], mimic shiner[I], northern redbelly dace[L], bluntnose minnow, tullibee, banded killifish[L], gilt darter[MN,L,I], blackside darter[L], slimy sculpin[I], emerald shiner	12 species (55% of 22 absent species)
Welch Dam Cannon River Built in 1900 Removed in 1994	paddlefish[MN,L,I], mooneye[L,I], gizzard shad, speckled chub[L,I], silver chub[L], mimic shiner[I], river carpsucker, highfin carpsucker[I], river redhorse[L,I], flathead catfish[L], Muskellunge[I], brook trout[I], sauger, lake sturgeon[MN,L]	14 species (74% of 19 absent species)
Minnesota Falls Dam Minnesota River Built in 1871 & 1904 Removed winter 2013	shovelnose sturgeon[L], lake sturgeon[MN,L], flathead catfish[L], paddlefish[MN,L,I], mooneye[L,I], American eel[MN,L], gizzard shad, highfin carpsucker[I], blue sucker[MN,L,I], black buffalo[MN,L,I], sauger, silver lamprey[L] Notes: Removal was very recent so sampling effort has been limited and focused on the large species. American eel made it around dam during 2007 flood.	12 species (31% of 39 absent species) preliminary
Lake Florence Dam North Branch Root River Built in 1857 Removed in 1993	slenderhead darter[L,I], banded darter[I], smallmouth bass[I], bluegill, greater redhorse[L,I], golden redhorse[L], black redhorse[MN,L,I], smallmouth buffalo, northern hogsucker[L,I], longnose dace[I], sand shiner, gravel chub[MN,L,I], spotfin shiner, largescale stoneroller, chestnut lamprey[L]	15 species (23% of 65 absent species
Flandrau Dam, Cottonwood River Built in 1937. Dam was damaged by floods in 1947, was rebuilt in 1960, damaged again in 1965 and 1969, finally was fully removed in 1995	shovelnose sturgeon[L], mooneye[L,I], gizzard shad, golden shiner, river shiner[L], mimic shiner[I], river carpsucker, highfin carpsucker[I], black buffalo[MN,L,I], yellow bullhead[L], brown bullhead, channel catfish, white bass, Iowa darter[I], logperch[L], sauger, carmine shiner[L,I], freshwater drum, Mississippi silvery minnow[MN,I], speckled chub[L,I], silver chub[L] Note: Returned either while dam was passable or after it was removed.	21 species (88% of 24 absent species)
Dawson Dam Lac qui Parle River Built in 1913 Replaced with rock ramp in 2009	bigmouth buffalo[L], greater redhorse[L,I], channel catfish, bluegill, walleye	5 species (63% of 8 absent species)
Appleton Dam Pomme de Terre River Built in 1872 Removed in 1999	emerald shiner, carmine shiner[L,I], quillback[L], silver redhorse, greater redhorse[L,I], channel catfish, white bass, banded darter[I], freshwater drum	9 species (53% of 17 absent species)
Carp Barrier Dam, Drywood Creek, a tributary of the Pomme de Terre River Built in 1930s, failed, built taller in 1971. Failed in 2001	spotfin shiner, spottail shiner[I], common shiner, golden shiner, quillback[L], white sucker, shorthead redhorse, channel catfish, stonecat[I], Iowa darter[I], Johnny darter, banded darter, freshwater drum	13 species (72% of 18 absent species)

Average = 66%

Table 4. Native fish species that returned to the watershed upstream of dam barriers after the dams were removed or modified or while the dam was passable. MN = listed in Minnesota, L = listed in neighboring state or province, I = intolerant (sensitive), * lake sturgeon were re-introduced since extirpation in the Red River Basin. The average does not include Minnesota Falls Dam since the removal was recent and post-removal data is limited.

was later caught below the Minnesota Falls dam in 2012, which is a distance of 300 miles. Lake sturgeon have been reintroduced to the Red River of the North since 1998. This has occurred concurrently with dam removal and fish passage projects to reconnect spawning rapids to the mainstem Red River and large lakes. Fish survey data confirm that this combined effort has been successful as sturgeon are becoming abundant in several of the large lakes.

Shovelnose sturgeon *Scaphirhynchus platorynchus* (*Federally Threatened*) were absent upstream of all assessed barriers (7). Shovelnose were absent upstream of Minnesota Falls Dam but returned to the rapids shortly after its removal. They were also absent upstream of Flandrau Dam but were caught about 25 miles upstream of the dam after its removal. Like other sturgeon species, shovelnose spawn in rapids and riffles over large substrates.

Paddlefish *Polyodon spathula* (*Threatened in MN and WI, Special Concern in ND, Extirpated in ON*) The paddlefish is a large river planktivore that spawns in riffles and rapids. Paddlefish were absent above all barriers assessed (4) but returned to the Minnesota River above Minnesota Falls Dam shortly after its removal in 2013 and to the Cannon River above Welch Dam following its removal in 1995. Fragmentation has been widely acknowledged as a primary cause of declines in this species (Unkenholz 1986). Paddlefish have been studied with particular attention as a planktivorous species which could be affected by bigheaded carp. The largest documented paddlefish, a 198 pound individual, was speared in Lake Okoboji, Iowa in 1916 where they were historically abundant. The species was extirpated from the lake, likely due to barrier dams on the Little Sioux River. Ironically an electric barrier recently installed on the outlet creek of Lake Okoboji, Iowa to prevent introduced carp from migrating into the lake also precludes reestablishment of paddlefish in the lake.

Restoration of the previously inundated Minnesota Falls should provide potential spawning habitat for paddlefish. Several paddlefish have been caught immediately downstream of the Minnesota Falls Dam over the years. Paddlefish have declined over their range due to dam construction that has blocked migrations and inundated spawning habitat.

Sauger *Sander canadensis* were absent upstream of all dams assessed (20). The closely related walleye may be nearly as sensitive to fragmentation, but widespread stocking masks possible barrier effects. Both species spawn in riffles and rapids in rivers or less commonly in clean wave-swept gravel or rubble shoals in lakes. Sauger returned to a number of river reaches following dam removal including: the Otter Tail after removal of Breckenridge Dam, the Cottonwood River after removal of Flandrau Dam, the Canon River after removal of Welch Dam, the Wild Rice River after



A shovelnose sturgeon. *Credit DNR Fisheries.*



(top) A paddlefish caught in the Minnesota River near Granite Falls in 2005. *Credit DNR Fisheries.* (bottom) Paddlefish caught in 1957 just below Minnesota Falls Dam. *Credit Ken Peterson.*

Attachment



A sauger upstream of dam site after removal of Heiberg dam on the Wild Rice River. *Credit DNR Fisheries.*



An American eel. *Credit DNR Fisheries.*

removal of Heiberg Dam and the Minnesota River after removal of Minnesota Falls Dam. Walleyes similarly increased in abundance in these river reaches and successfully spawned in upstream reaches following removal of these dams.

American eel *Anguilla rostrata* (*Special Concern in MN, WI, SD, and ON*) were absent above 86% of assessed dams (6 of 7). This species is MN's only ocean-dependent species. These fish spawn in the Sargasso Sea then the catadromous (migrate from freshwater to the sea to spawn) females migrate back up the Mississippi River watershed. They have the unusual ability to occasionally pass some barriers by "swimming" out of water (usually in wet grass) and there is a single record in 1957 as far upstream as St. Anthony Falls prior to construction of the Lock. Another eel, caught by Area Fisheries staff made it past Minnesota Falls Dam in 2007, a year that lacked a flood large enough to inundate the dam. With the exception of these two individuals, they were absent above barriers for all of the assessed watersheds for which records exist. Since they spawn in the ocean, it follows that any complete barrier would extirpate them from the watershed. This has proven to be the case since American eel have declined over most of their range due to dam construction



A skipjack herring. *Credit Konrad Schmidt.*

Skipjack herring *Alosa chrysochloris* (*Endangered in MN and WI, Special Concern in SD*) was absent above all barriers assessed (3). This species was historically found in Bigstone Lake at the headwaters of the Minnesota River. They were largely extirpated from all Minnesota waters following construction of Lock and Dam 19 in 1913. This dam inundated Keokuk Rapids, which would have been an important spawning area for sturgeon, paddlefish and other rapid dependent species. It is also the tallest, 36 feet, lock & dam on the Mississippi. The loss of skipjack herring resulted in the near extirpation of elephant-ear *Elliption crassidens* and ebonyshell *Fusconaia ebena* mussels, for which skipjack herring are the sole host. Historically, ebonyshell mussels were the dominant mussel species in the Upper Mississippi and Lower Minnesota rivers of Minnesota. A few skipjack herring were caught in Lake Pepin in 1986 for the first time since 1928 and subsequently in 1993, 2001, and 2008. These fish would have had to pass through the lock chamber at Dam 19. The endangered skipjack herring and the dependent ebonyshell and elephant-ear mussels illustrate the importance of fish passage on the Mississippi River and the cascading fragmentation effects on biodiversity. Skipjack herring are also a piscivore that feed within the water column and may be an effective predator on bigheaded carp eggs, larvae, and juveniles.

Blue sucker *Cycleptus elongatus* (*Special Concern in MN, ND and SD, Threatened in WI*) were absent upstream of 100% of the barriers assessed (6). They maintained a population upstream of St. Croix Falls Dam on the St. Croix until the late 1970s. The large, relatively pristine watershed upstream of St. Croix Falls provides a suite of habitat, particularly rapids that this species prefers. Blue suckers maintained a metapopulation for a period of decades after



A blue sucker collected while electrofishing Minnesota Falls following removal of the Minnesota Falls Dam. *Credit DNR Stream Habitat Program.*



A longnose gar (left) and shortnose gar (right) caught upstream of Minnesota Falls Dam. Gar were absent from the reach above the dam prior to its removal. *Credit DNR Fisheries.*

the dam was built, but the species was ultimately lost from the reach by the late 1970s. Blue sucker were absent upstream of Minnesota Falls Dam, but an individual was caught following the 2011 flood that largely inundated the dam. The species was caught in numbers following removal of the dam in 2013. Blue sucker are a fast water species found predominantly in rapids.

Shortnose gar *Lepisosteus platostomus* and **longnose gar** *Lepisosteus osseus* (*Special Concern in SD*) both were absent upstream of 73% of barriers assessed (8 of 11). Gar may be an important predator on juvenile bigheaded carp (Duane Chapman, USGS, personal communications). The ability of juvenile bighead and silver carp to grow



A mooneye caught above Minnesota Falls dams site after dam removal. *Credit DNR Stream Habitat Program.*

vascularized lip extensions enable them to use atmospheric oxygen and inhabit warm, backwaters with low dissolved oxygen where most predators can't survive. Gar are also able to gulp oxygen due to lung-like vascularized swim bladders enabling them to live and hunt in these warm anoxic backwaters.

Mooneye *Hiodon tergisus* (*Concern in SD*) were absent upstream of all barriers assessed (15) while the closely related **goldeye** *Hiodon alosoides* (Endangered in WI) were absent above 92% of barriers (12 of 13). Both species returned to a number of river reaches following dam removal (Table 4). Mooneye and goldeye feed in the water column and at the surface on a variety of insects and small fishes. Their pelagic feeding behavior may equip them to be important predators on bigheaded carp fry and small juveniles.

Flathead catfish *Pylodictis olivaris* (*Concern in ND*) were absent upstream of all barriers assessed (11). They did return to the Canon River following removal of the Welch Dam and to the Mississippi River above St. Anthony Falls following construction the lock in 1963. Flathead catfish need deep pools, usually in larger rivers, for wintering but often migrate upstream to spawn in smaller streams. Flathead adults and fingerlings (indicating reproduction) have been found in the free-flowing Yellow Medicine River, which has an average flow of only 154 cfs and average August flows of only 66 cfs. Flathead catfish are the largest predatory fish in Minnesota and are capable of eating carp up to 30% of their body weight. Davis (1985) reported that stocked flatheads caused a 90% reduction in common carp abundance in Richardson Lake. It is known that these fish can grow very large, as a 157 pound flathead was illegally taken from the Minnesota River near Redwood Falls in 1930. Flatheads are capable of preying on adult carp and may be an important biological control.

Attachment



A flathead catfish caught on the Minnesota River during Fisheries surveys. *Credit DNR Fisheries.*



A channel catfish caught on the Red River of the North. *Credit DNR Stream Habitat Program.*

Channel catfish *Ictalurus punctatus* absent upstream of 61% of assessed barriers (19 of 31), and **freshwater drum** *Aplodinotus grunniens* absent upstream of 64% of barriers (18 of 28), are two species that are especially important hosts for freshwater mussels. Freshwater drum are hosts for at least 11 species of native mussels, of which they are the sole hosts for 8 species (Figure 3). Channel catfish are hosts for at least 13 species of mussels and are the primary hosts for 6 species. Both fish species were extirpated from the Cottonwood watershed by Flandrau dam. Attempts to re-establish channel catfish by stocking failed.



A freshwater drum. *Credit DNR Stream Habitat Program.*

Following the removal of Flandrau Dam channel catfish and freshwater drum returned almost to the headwaters, 112 miles upstream of dam.

Small-bodied fish While tagging studies have shown that large-bodied fish are migratory, these results and fishway data indicate that many small fish species also migrate and are impacted by barriers.

Shiners & minnows

Shiners are a keystone forage species. Many shiner species are not tolerant of low dissolved oxygen, which may make them vulnerable to extirpation due to barriers. Their vulnerability to extirpation has obvious implications on the productivity of fisheries and for the bait industry. The following species were often absent upstream of barriers:

- **speckled chub** *Macrhybopsis aestivalis* (Threatened in WI) 100% of 11 barriers,
- **Mississippi silvery minnow** *Hybognathus nuchalis* (*Special Concern in MN*) 100% of 7,
- **gravel chub** *Erimystax x-punctatus* (*Threatened in MN, Endangered in WI, Extirpated from Canada*) 100% of 3,
- **silver chub** *Macrhybopsis storeriana* (*Special Concern in WI, SD, ND, and Canada*) 92%, 12 of 13,
- **slimy sculpin** *Cottus cognatus* 70%, 7 of 10
- **river shiner** *Notropis blennius* (*Special Concern in SD*) 70%, 7 of 10,
- **carmine shiner** *Notropis rubellus* (*Threatened in Canada, Concern in ND and SD*) 59%, 13 of 22, and
- **emerald shiner** *Notropis atherinoides* 52%, 12 of 23
- **spotfin shiner** *Notropis spiloptera* 44%, 12 of 27.
- **sand shiner** *Notropis stramineus* 40%, 12 of 30
- **spottail shiner** *Notropis hudsonius* 37%, 7 of 19.

Darters

Darter diversity is an important indicator of ecosystem health and a metric for the index of biological integrity.

The following species tended to be absent upstream of barriers:

- **western sand darter** *Ammocrypta clara* (*Threatened in IA, Special Concern in WI*) 100% of 7 barriers,
- **crystal darter** *Crystallaria asprella* (*Endangered in MN & WI, Extirpated from IA*) 100% of 6,
- **river darter** *Percina shumardi* (*Special Concern in ND*) 88%, 7 of 8,
- **mud darter** *Etheostoma asprigene* (*Special Concern in WI*) 75%, 3 of 4
- **gilt darter** *Percina evides* (*Threatened in WI, Special Concern in MN, Extirpated from IA*) 71%, 5 of 7,
- **banded darter** *Etheostoma zonale* 64%, 7 of 11.

Mussels Mussel surveys were more limited than those for fish but followed similar trends. Since most mussels require fish hosts, extirpation of the host will ultimately result in the extirpation of the mussel. However, due to the long life span of mussels, up to 200 years for one species (Haag and Rypel 2011), individuals may persist well after being functionally extirpated. Still, mussel diversity has decreased in many waters, particularly in the Minnesota River watershed where 23 of 41 species no longer exist. Unlike fish, historic mussel communities can be determined by the presence of dead shells. Like fish, poor water quality, sedimentation, and habitat alteration and changes in hydrology can adversely affect mussels.

The recolonization of 3 mussel species following removal of the Appleton Dam, on the Pomme de Terre River, is evidence that fragmentation was the cause of their extirpation. Pre-dam removal surveys found only dead shells of elktoe *Alasmidonta marginata*, deertoe *Truncilla truncate* and plain pocketbook *Lampsilis cardium* mussels upstream of the dam. Archeological surveys along the shores of Lake Christina, near the headwaters of the Pomme de Terre River, found plain pocketbook mussel shells indicating that this species was historically found in the headwaters of this watershed. Extirpation of these mussels upstream of the dam and their subsequent recolonization following the dam's removal may have different explanations based on the presence or extirpation of host fish species.

Freshwater drum, also extirpated upstream of the dam, are the sole host for deertoe mussels (Figure 3). The disappearance of this fish species would have led to the extirpation of this mussel species by the inability to reproduce. Return of the drum following removal of the dam is the likely explanation for the recolonization of deertoe mussels.

Rock bass and three sucker species (shorthead redhorse, white sucker, and northern hogsucker) have been identified as hosts (naturally infected; successful transference has not yet been determined) for elktoe mussels. Except for northern hog sucker, these species were present upstream of the dam. However, northern hogsucker and three additional sucker species (greater redhorse, silver redhorse, and quillback carpsucker) that were absent upstream of the dam recolonized following its removal. The return of these species may have been important in the recolonization of elktoe mussels. Functional mussel hosts need to be physiologically compatible, but habitat preferences and behavior also determine the success of mussel reproduction.

Plain pocketbook mussels also use species (walleye, black bass, and several sunfish species) that were present prior to the dam's removal. This suggests that the two latter species may have died out due to drought or other factors and lacked the ability to recolonize due to the dam. Like many rivers, the Pomme de Terre River has stopped flowing during droughts in several periods including the 1934, 1936, 1976, 1988, and 1989. Host fish cannot facilitate reproduction unless they can be infected by glocidia released by viable adults. Removal of the dam would have enabled both existing host fishes and extirpated hosts to become infected in downstream mussel beds and facilitate mussel recolonization of reaches upstream of the dam.

Watershed Scale Biodiversity Effects

Fish diversity was assessed along the Cottonwood River and its tributaries for periods with and without the presence of Flandrau Dam (see Figure 4).

Biodiversity effects of the dam extended to the entire watershed. Cumulative species richness and species per survey are shown in Figure 5. The species richness of the free-flowing Cottonwood River compared to the fragmented river was significantly greater based on a randomization t-test ($t = 2.998$, $\rho = .0016$).

In the absence of the dam, species richness increased by an average of 35% in the watershed and this increase extended to upper reaches of the watershed. For instance, channel catfish and freshwater drum were sampled in Double Lake (drainage area of 2.2 mi^2 , 112 miles upstream of the dam); these two species were not collected in any

Attachment

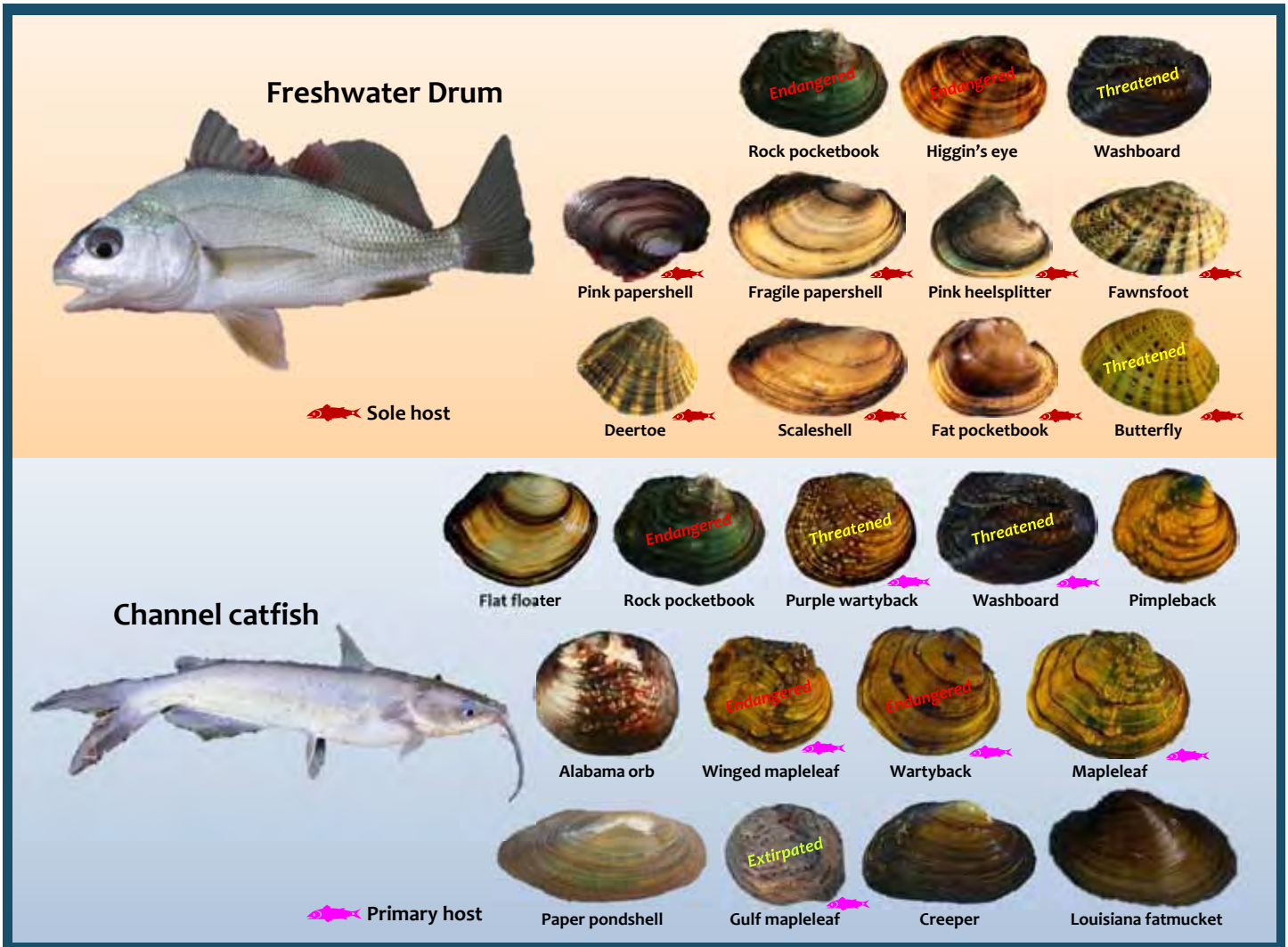


Figure 3. Freshwater drum and channel catfish and the mussels for which they are hosts.

samples upstream of Flandrau Dam prior to the dam's removal. The lake flows into Highwater Creek so these fish would have needed to ascend the creek, which is only about 10 feet wide at the lake's outlet. Removal of the dam also provided access to boulder rapids that are key spawning habitat for walleye, sauger, paddlefish, lake sturgeon, blue sucker, black buffalo and others.

Twenty-one of the twenty-four species that were absent upstream of Flandrau Dam were collected upstream of the dam site during the period when it was breached in 1948 or after it was removed in 1995 (Table 4).

Silver chub, Mississippi silvery minnow, and carmine shiner were present upstream of the dam in 1948 when it was breached, but have not yet been caught upstream of the dam site since removal. Land use changes like ditching, tiling, wetland drainage, use of nitrogen and phosphorous fertilizer, and pesticide use have caused significant habitat and water quality changes that may be unsuitable for these species. These minnows tend to migrate later in the spring and may still be blocked by low-head dams like Kuhar Dam near Lamberton, which is submerged during high spring flows, but would become a barrier as flows decrease. Rates of recolonization likely vary with species as well and these species are relatively rare. In addition to those already mentioned, flathead catfish, shortnose gar and longnose gar, speckled chub, and black buffalo, caught downstream of the dam, have not yet been collected upstream of the dam.

The presence or absence of species does not provide a full perspective of fragmentation effects since it does not show changes in abundance. A number of riverine species that were present in small proportions of the surveys while the river was dammed increased in prevalence (percent occurrence) when the main stem was free-flowing (Figure 6). For instance, the proportion of samples

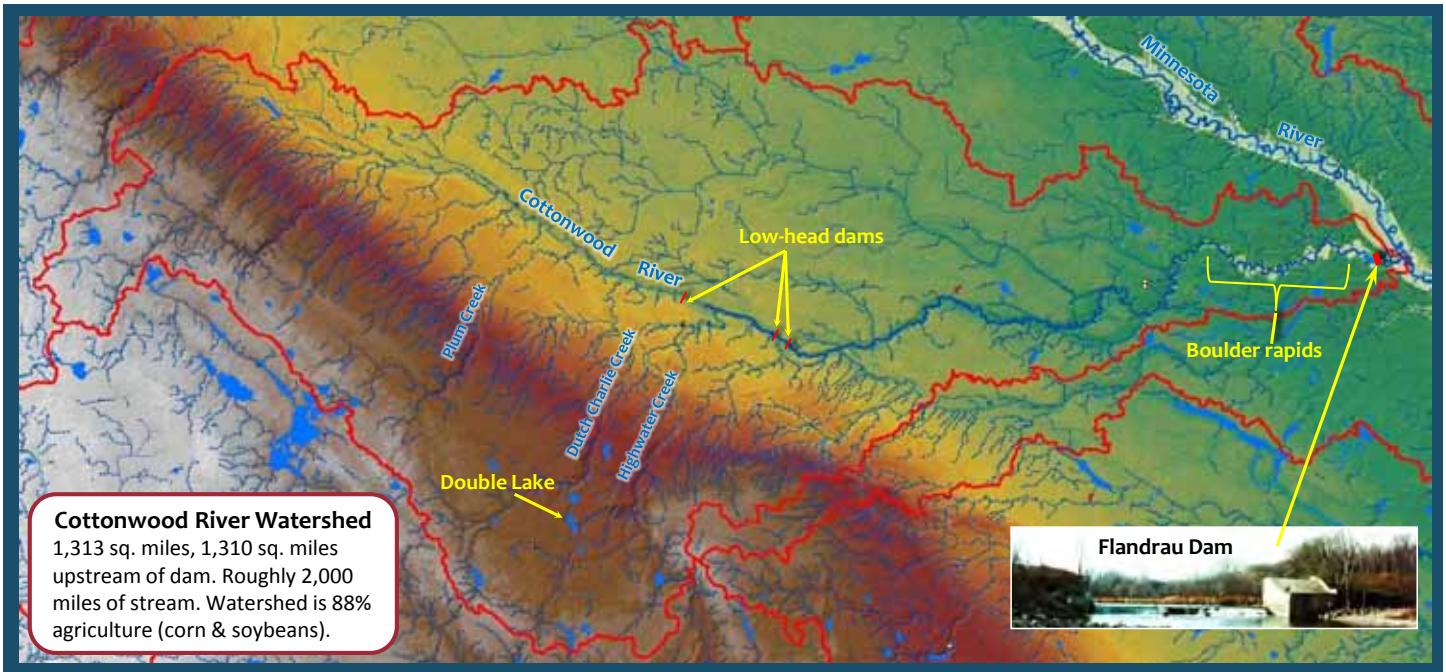


Figure 4. The Cottonwood River watershed.

in which river-oriented suckers were caught increased for all species. Percent occurrence of shorthead redhorse was 330% higher, silver redhorse 182% higher, golden redhorse 325% higher, northern hogsucker 236% higher, quillback 247% higher, and highfin carpsucker were 240% higher in the free-flowing compared to the dammed condition. Among facultative riverine game species, the proportion of samples in which smallmouth bass were caught was 88% higher in the free-flowing condition and walleye were 105% higher while sauger and channel catfish were absent in the dammed condition but were found in 8% and 24% of free-flowing samples. Abundant tolerant species like white sucker, fathead minnow, and black bullhead did not appear to be affected by fragmentation and tended to be present in virtually the same proportion of samples during the free-flowing and dammed condition.

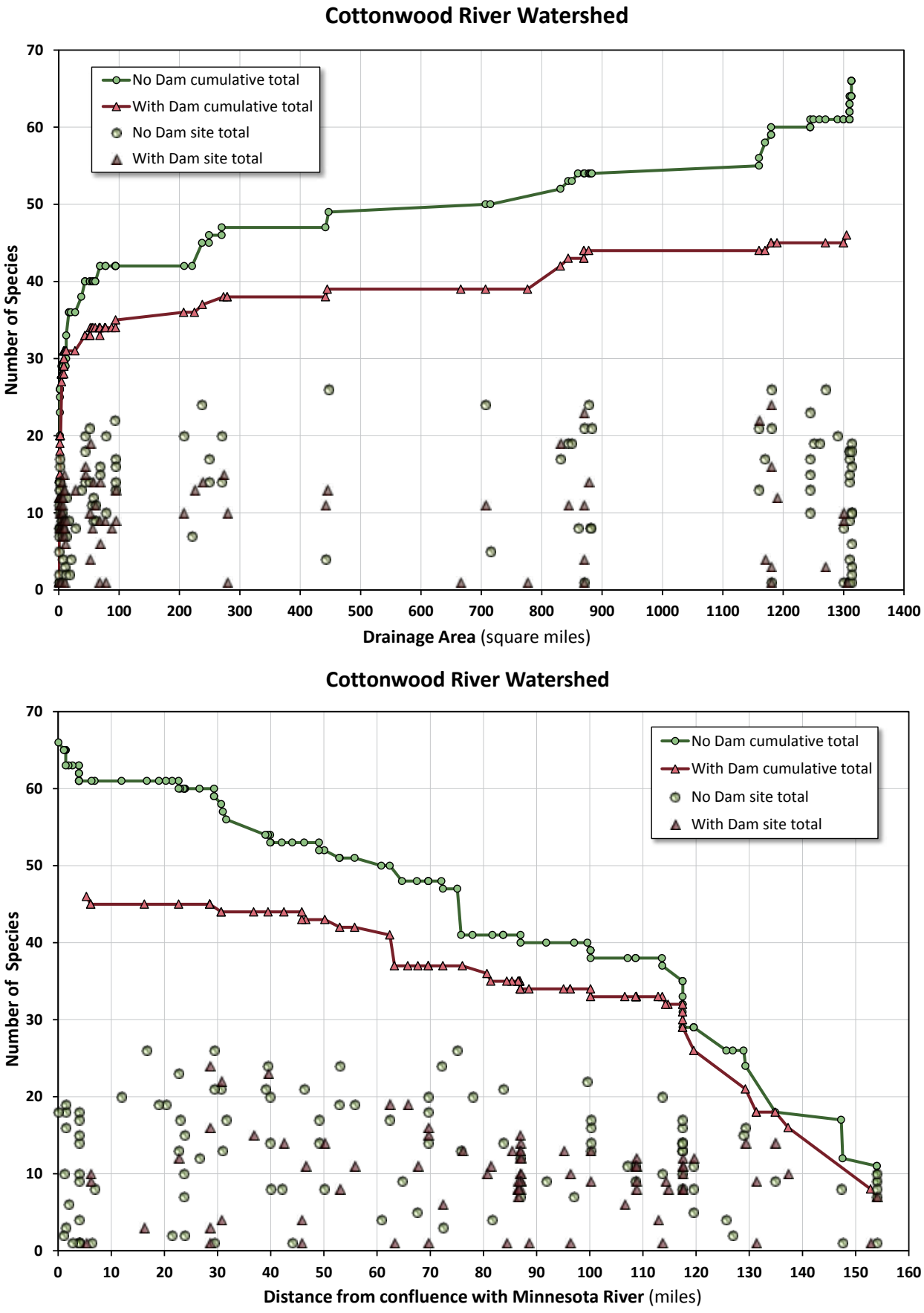


Figure 5. Number of species found in the Cottonwood River watershed. Points are the total number of species collected at a site. The line is the cumulative total. (top) Species richness is correlated with drainage area (bottom) Species richness correlated with distance from the mouth of the Cottonwood River.

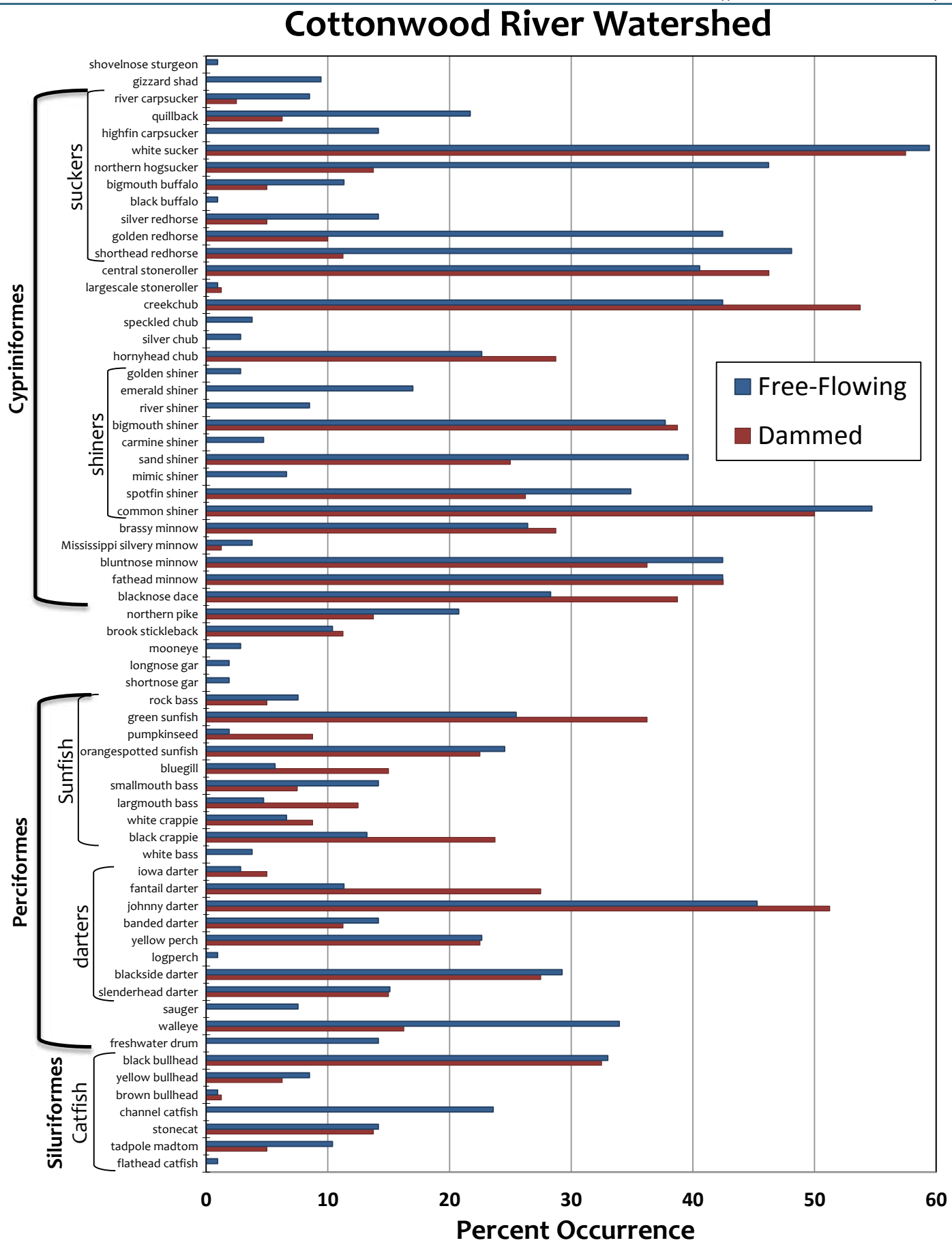


Figure 6. Percent occurrence of fish species from fish surveys in the Cottonwood River watershed separated into periods when Flandrau Dam was a barrier - dammed and when the dam was breached or removed - free flowing.

Summary and Conclusions

There are few impairments that have been shown to have as dramatic an influence on aquatic biodiversity as does the construction of barriers. To summarize:

1) Complete and near complete barriers reduced upstream species richness by an average of 41% and 37 % respectively.
2) Moderate barriers (may be passable during 2-year or larger floods) also reduced species richness by 20%. This is evidence that even partial barriers have an upstream impact.
3) Loss of species richness due to barriers extended watershed-wide.
4) Imperiled and sensitive species were the most vulnerable to extirpation by barrier dams.
5) Tolerant species, including common carp, were among the species least affected by barriers.
6) An average of 66% of species absent above barrier dams returned after the barrier was removed.
7) Based on this analysis and other studies the ability to migrate (or connectivity of migration pathways) is equally important to fish as it is to neotropical birds.

Ecological Implications of Dams The implications of barrier effects extend to fundamental elements of ecological health. Dams can have additional effects by interrupting sediment transport causing reservoir sedimentation and downstream incision, altering nutrient dynamics and causing cyanobacteria blooms, propagating non-native species, inundating important river habitat, altering flow regimes, altering temperature regimes, propagating fish diseases and parasites, and causing massive erosion when they fail. However, the effects on native species shown by this analysis are primarily due to the blockage of fish migrations since most of the reservoirs were relatively small in comparison the watershed-wide effects. Blocking seasonal fish migrations directly affects nutrient processing and water quality since fish carry these nutrients in their bodies and eggs. While this paper assessed barrier dams, any type of barrier that is effective in blocking fish migrations should be expected to cause significant declines in the diversity of fish and mussels.

This analysis has shown that barriers have direct negative effects on recreation as a number of game fish species were vulnerable to barrier related extirpation. Flathead catfish, sauger, white bass, yellow bass, and paddlefish were absent upstream of all barriers evaluated while lake sturgeon, channel catfish, and white bass were absent upstream of most barriers in watersheds where they were present. Smallmouth bass, in spite of being artificially maintained by stocking in some watersheds, were absent upstream of a number of barriers. The return of these species following dam removal supports fragmentation as the cause of their extirpation. Walleye may also be vulnerable to barrier extirpation, based on spawning habitat needs and the sensitivity of sauger (a close relative to walleye) to fragmentation, but walleyes are artificially maintained by extensive stocking.

Predatory game species are also affected by barrier effects on forage species. Several shiner and minnow species were frequently extirpated by barrier dams (again validated by their return following dam removal). Mimic shiner, emerald shiner, carmine shiner, weed shiner, silver chub, Ozark minnow, pugnose minnow, and river shiner were all absent upstream of half or more of the barrier dams in watersheds they were present.

The extirpation of native mussels that follows the loss of host fish species above dams eliminates the water filtration role of these mussels. Water filtration by mussels of the Upper Mississippi River has been estimated at 53.1 million cubic meters per day or 76 times the capacity of the Minneapolis - St. Paul metropolitan wastewater treatment plant, one of the largest in the USA (Newton et al. 2011). Mussels also stabilize stream beds (Zimmerman and de Szalay 2007) and increase the density and biodiversity of other benthic invertebrates (Spooner and Vaughn 2006; Gutierrez et al. 2003). Mussels are declining globally and this catastrophic loss in biomass may significantly alter river ecosystem functions (Spooner and Vaughn 2006). The recolonization of three extirpated mussel species following removal of the Appleton dam suggests that this trend is reversible for the species that have not yet gone extinct.

The Minnesota River The Minnesota River, one of the watersheds for which invasive species barriers are being considered, has been well documented for its water quality and sediment impairments. Nevertheless, the river between Granite Falls and its confluence with the Mississippi River is the longest reach of free-flowing, undammed river in Minnesota, a distance of 240 miles. Where free-

flowing, the river mainstem and tributaries have a remarkable diversity of fish, with records of 98 native species. While the watershed has lost much of its mussel diversity, dam removal has proven to be an effective strategy in reestablishing extirpated species of fish and mussels.

While landuse impacts on water quality, hydrology, and channel erosion continue to degrade habitat in the Minnesota River and other watersheds, it is notable that where dams have been removed, the loss of biodiversity has actually been reversed and has resulted in substantial increases in species richness. This demonstrates the necessity of migration for reproduction, accessing changing habitat needs with seasons and life stage, and recolonization following drought, anoxia and water quality related mortality. Connectivity may be particularly important in watersheds subject to low winter flows, anoxia, and high summer water temperatures associated with drought since the fish and mussel assemblages of these streams depend on frequent recolonization.

Vulnerability to Fragmentation Tolerant native and introduced species have been successful in fragmented, degraded, and altered systems. These species can survive drought and often concurrent warm water temperatures and low dissolved oxygen, in addition to other water quality impairments. Tolerant species are often generalized and adapted to homogenized, silt laden microhabitat. Common carp were abundant upstream of most barriers, especially in eutrophic watersheds. This included barriers specifically designed to target carp. The extirpation of native species by barriers may actually increase the success of invasive species by eliminating competition and predation influences associated with a diverse, free-flowing river.

The high vulnerability of sensitive and imperiled species and relatively low vulnerability of tolerant species to extirpation by barriers has significant implications for ecosystem health and biological assessments. The Index of Biological Integrity, IBI (Karr et al. 1986), widely used as a measure of biological health and water quality, uses metrics that include the number of sensitive species, darter species, and sucker species as positive metrics. This study supports the usefulness of the IBI as a measure of biological health but suggests that fragmentation may significantly reduce scores. A fragmented system is more likely to be dominated by tolerant species that can survive periods of poor water quality, while a free-flowing system allows periodic recolonization by sensitive species.

Since 1) protection of native species is a primary objective of invasive species management and 2) this and other studies suggest that barriers are the single most definitive cause of declines in native biodiversity, barriers on naturally connected rivers and streams should not be considered a viable invasive species control strategy. Rather, reconnecting rivers by removing barriers has been shown to increase the diversity and resilience of native species while decreasing the prevalence of invasive species. Restoration of free-flowing, resilient ecosystems is likely to be the most effective means of increasing native biodiversity and preventing dominance by non-native species.

Literature Cited

Aadland, L.P. 2010. Reconnecting Rivers: Natural Channel Design in Dam Removals and Fish Passage. Minnesota Department of Natural Resources. St. Paul. 208 pp.

Aadland, L.P., T.M. Koel, W.G. Franzin, K. W. Stewart, and P. Nelson. 2005. Changes in fish assemblages of the Red River of the North. American Fisheries Society Symposium. 45:293-321.

Aadland, L.P. and A. Kuitunen. 2006. Habitat suitability criteria for stream fishes and mussels of Minnesota. Minnesota Department of Natural Resources. Special Publication 162.

Auer, N.A. 1996. Importance of habitat and migration to sturgeons with emphasis on lake sturgeon. Canadian Journal of Fisheries and Aquatic Sciences. 53(suppl. 1):152-160.

Brooks, R.C. J.E. Garvey, M.Hill, S.J. Tripp, and H.A. Calkins. 2009. Fish passage in the Upper Mississippi River System. Department of Zoology. Southern Illinois University. Carbondale, IL.

Burroughs, B. A., D.B. Hayes, K.D. Klomp, J.F. Hansen, and J. Mistak. 2010. The effects of the Stronach Dam Removal on fish in the Pine River, Manistee County, Michigan. Transactions of the American Fisheries Society 139: 1595-1613.

Catalano, M.J., M.A. Bozek, and T.D. Pellett. 2007. Effects of Dam Removal on fish assemblage structure and spatial distributions in the Baraboo River, Wisconsin. North American Journal of Fisheries Management 27:519-530.

Davis, R.A. 1985. Evaluation of flathead catfish as a predator in a Minnesota lake. Minnesota Department of Natural Resources Division of Fish and Wildlife. Investigational Report Number 384. 26 Pages.

Garvey, J.E., G.G. Sass, J. Trushenski, D. Glover, P.M. Charlebois, J. Levengood, B. Roth, G. Whitledge, B.C. Small, S.J. Tripp, and S. Secchi. 2012. Fishing down the bighead and silver carps: reducing the risk of invasion to the Great Lakes. U.S. Fish and Wildlife Service and the Illinois Department of Natural Resources. Research Summary.

Gutierrez, J.L., C.G. Jones, D.L. Strayer, and O.O. Iribarne. 2003. Mollusks as ecosystem engineer: the role of shell production in aquatic habitats. Oikos 101:79-90.

Haag, W.R. 2009. Past and future patterns of freshwater mussel extinctions in North America during the Holocene. Chapter 5 in, S.T. Turvey editor. Holocene Extinctions. Oxford University Press.

Haag, W.R. and A.L. Rypel. 2011. Growth and longevity in freshwater mussels: evoluntionary and conservation implications. Biological Reviews 86:225-247.

Hoffbeck, S.R. 2001. "Without careful consideration": Why carp swim in Minnesota's waters. Minnesota History. Summer 2001. Pp. 305-320.

IUCN (International Union for Conservation of Nature and Natural Resources). 2004. IUCN Red List of Threatened Species: A Global Species Assessment. http://cmsdata.iucn.org/downloads/species__status_and_population_trend_of_sturgeon_on_the_red_list.pdf . J. Baillie, C. Hilton-Taylor, and S.N. Stuart, editors. Thanet Press Limited, Margate, UK.

Johnson, P.T., J.D. Olden, and M.J. Vander Zanden. 2008. Dam invaders: impoundments facilitate biological invasions into freshwaters. Frontiers in Ecology and the Environment 6(7):357-363.

Kanehl, P.D., J. Lyons, and J.E. Nelson. 1997. Changes in the habitat and fish community of the Milwaukee River, Wisconsin, following removal of the Woolen Mills Dam. North American Journal of Fisheries Management. 17:387-400.

Karr, J.R., K.D. Fausch, P.L. Angermeier, P.R. Yant, and I.J. Schlosser. 1986. Assessing biological integrity in running waters: A method and its rationale. Illinois Naturl History Survey. Special Publication 5. 28 p.

McDonald, M. 1887. The river fisheries of the Atlantic States: The rivers of Florida, Georgia, and South Carolina. Report of the U.S. Commission of Fish & Fisheries. Mis. Doc. 124. Pp. 613-625.

Newton, T.J., S.J. Zigler, J.T. Rogala, B.R. Gray, and M.Davis. 2011. Population assessment and potential roles of native mussels in the Upper Mississippi River. Aquatic Conservation: Marine and Freshwater Ecosystems 21:122-131.

Oberdorff, T., B. Hugueny, and J. Guegan. 1997. Is there an influence of historical events on contemporary fish species richness in river? Comparisons between Western Europe and North America. Journal of Biogeography 24:461-467.

Rajararnam, N. and C. Katopodis. 1984. Hydraulics of Denil fishways. Hydraulics of Engineering 110: 1219-1233.

Rinne, J.N., R.M. Hughes, and B. Calamusso. 2005. Historical changes in large river fish assemblages of the Americas. American Fisheries Society, Symposium 45. Bethesda, Maryland.

Santucci, V.J., S.R. Gephard, and S.M. Pesscitelli. 2005. Effects of multiple low-head dams on fish, macroinvertebrates, habitat, and water quality in the Fox River, Illinois. North American Journal of Fisheries Management 25:975-992.

Sass, G.G., T.R. Cook, K.S. Irons, M.A. McClelland, N.N. Michaels, T.M. O'Hara, and M.R. Strough. 2010. Biological Invasions 12(3):433-436.

Schneider, K.N. 2010. Biological indicators of climate change: Trends in fish communities and the timing of walleye spawning runs in Minnesota. M.S. Theseis. Unviersity of Minnesota.

Spooner, D.E. and C.C. Vaughn. 2006. Context-dependent effects of freshwater mussels on stream benthic communities. Freshwater Biology 51:1016-1024.

Stefan, H.G. and M. Hondzo. 1991. Predicted effects of global climate change on fishes of Minnesota Lakes. University of Minnesota St. Anthony Falls Laboratory. Project Report No. 334.

Surber, T. 1923. Biological surveys and investigations in Minnesota. Transactions of the American Fisheries Society 1:225-238.

Tonn, W.M. and J.J. Magnuson. 1983. Community analysis in fishery management: an application with northern Wisconsin Lakes. Transactions of the American Fisheries Society. 112:368-377.

Unkenholz, D. G. 1986. Effects of dams and other habitat alterations on Paddlefish sport fisheries. Pages 54-61 in J. G. Dillard, L. K. Graham, and T. R. Russell, editors. The Paddlefish: status, management and propagation. North Central Division, American Fisheries Society, Special Publication Number 7

Watson, H.L. 1996. The common Rights of mankind: subsistence, shad, and commerce in the Early Republican South. Journal of American History 83(1):13-43.

Williams, J.D., M.L. Warren, Jr., K.S. Cummings, J.L. Harris, and R.J. Neves. 1993. Conservation status of freshwater mussels of the United States and Canada. Fisheries 18(9):6-22.

Wilson, C.B. and E. Danglade. 1913. The mussel fauna of Central and Northern Minnesota. Appendix V to the Report of the U.S. Commissioner of Fisheries for 1913. 27 pp.

Woolman, A.J. 1895. A report upon ichthyological investigations in Western Minnesota and Eastern NorthDakota. United States Commission on Fish and Fisheries. Part XIX. Government Printing Office, Washington, D.C.

Zimmerman, G.F. and F. A. de Szalay. 2007. Influence of unionid mussels (Mollusca: Unionidae) on sediment stability: an artificial stream study. Fundamental and Applied Limnology 168(4):299-306.

Most Vulnerable Species : 75% to 100% Absence

Common Name *Scientific Name*	Adult Habitat *Spawning Habitat*	Adult Feeding Habits	% Absent Upstream of Barriers # Absent / Sample size	Conservation Status *Tolerance* Management (if any)
shovelnose sturgeon *Scaphirhynchus platorynchus*	pools in rivers **rapids in rivers & streams**	benthic invertivore	**100%** 7/7	**Federally Threatened** **Intermediate**
paddlefish *Polyodon spathula*	pools in large rivers **riffles & rapids in rivers**	planktivore/benthic invertivore	**100%** 4/4	**T** (MN, WI), **SCP2** (ND), **Ext** (ON) **Intolerant**
mooneye *Hiodon tergisus*	pools in rivers, connected lakes **pelagic, rivers**	surface & water column invertivore/piscivore	**100%** 15/15	**SU** (SD) **Intolerant**
skipjack herring *Alosa chrysochloris*	pools in rivers, connected lakes **pelagic, rivers**	surface & water column invertivore/piscivore	**100%** 3/3	**E** (MN, WI), **S3** (SD) **Intermediate**
gizzard shad *Dorosoma cepedianum*	pools in rivers, connected lakes **pelagic, rivers**	surface & water column planktivore/invertivore	**100%** 12/12	**Intermediate**
Mississippi silvery minnow *Hybognathus nuchalis*	pools & backwater in rivers & streams **glides, riffles, hornyhead chub nests**	benthic invertivore	**100%** 7/7	**SC** (MN) **Intolerant**
gravel chub *Erimystax s-punctatus*	riffles in coolwater rivers **glides, riffles**	herbivore, filamentous algae, diatoms	**100%** 3/3	**T** (MN), **E** (WI), **Ext** (ON) **Intolerant**
speckled chub (shoal chub) *Macrhybopsis aestivalis*	sandy riffles in rivers **semi-pelagic**	benthic invertivore	**100%** 11/11	**T** (WI) **Intolerant**
Topeka shiner *Notropis topeka*	streams **sunfish nests**	generalized invertivore	**100%** 2/2	**Federally Endangered**, **T** (IA), **SC** (MN), **S3** (SD) **not rated**
channel shiner *Notropis wickliffi*	pools in rivers **glides, riffles**	generalized invertivore	**100%** 3/3	**Intermediate**
ghost shiner *Notropis buchanani*	eddies & backwaters in rivers **glides, riffles**	generalized invertivore	**100%** 3/3	**Intolerant**
pugnose minnow *Opsopoeodus emiliae*	clear vegetated streams **under objects**	omnivore	**100%** 4/4	**SC** (IA, WI, ON) **Intolerant**
longnose sucker *Catastomus catastomus*	streams, Great Lakes, brackish water **riffles and shoals**	benthic invertivore	**100%** 1/1	**T** (SD) **Intermediate**
blue sucker *Cycleptus elongatus*	rapids in rivers **glides, riffles & rapids**	benthic invertivore	**100%** 6/6	**T** (WI), **SC** (MN), **SCP1** (ND), **S3** (SD) **Intolerant**
black buffalo *Ictiobus niger*	runs & pools in coolwater rivers **backwaters & floodplains**	benthic invertivore	**100%** 3/3	**T** (MN, WI), **SC** (ON), **PSC** (Canada), **SU** (SD) **Intolerant**
spotted sucker *Minytrema melanops*	clearwater rivers **glides, riffles & rapids**	benthic invertivore	**100%** 5/5	**SC** (Canada, ON) **Intolerant**
slender madtom *Noturus exilis*	riffles in streams **under rocks**	generalized invertivore	**100%** 1/1	**E** (MN, WI) **Intolerant**
flathead catfish *Pylodictis olivaris*	deep pools in rivers **nests in cavities**	piscivore, top predator	**100%** 11/11	**SCP3** (ND) **Intermediate**

Table 4. Fish species listed by percent absence upstream of dam barriers analyzed and listed in Table 1. Table is sorted by percent absence. Fish habitat and feeding data from Aadland & Kuitunen 2005 and Becker 1983. Conservation status: **E** = Endangered, **T** = Threatened, **SC** = Special Concern, **Ext** = Extirpated from Minnesota DNR (MN), Iowa DNR (IA), Wisconsin Natural Heritage Working List (WI), North Dakota Game & Fish Department (ND) Species of Conservation Priority, **SCP**, Levels 1 - 3), South Dakota Game Fish & Parks (SD, State Rank **S1 - S5**), U.S. Fish & Wildlife Service, and Government of Canada (Canada, Ontario=ON, **PSC**=Proposed Special Concern). Species tolerance ratings from US EPA.

Most Vulnerable Species : 75% to 100% Absence

Common Name *Scientific Name*	Adult Habitat *Spawning Habitat*	Adult Feeding Habits	% Absent Upstream of Barriers # Absent / Sample size	Conservation Status *Tolerance* Management (if any)
pirate perch *Aphredoderus sayanus*	sluggish streams, backwaters, wetlands **nest in vegetation**	generalized invertivore	**100%** 1/1	**SC** (MN, IA, WI) **Intermediate**
plains topminnow *Fundulus sciadicus*	streams **vegetation**	generalized invertivore	**100%** 1/1	**T** (MN), **S3** (SD) **not rated**
starhead topminnow *Fundulus dispar*	vegetated streams & backwaters **vegetation**	generalized invertivore	**100%** 1/1	**E** (WI) **Intolerant**
threespine stickleback *Gasterosteus aculeatus*	streams, lakes, and brackish bays **nest in shallow water**	generalized invertivore	**100%** 1/1	**E** (Canada) **Intermediate**
yellow bass *Morone mississippiensis*	pools in rivers, connected lakes **glides & riffles in streams**	planktivore, piscivore	**100%** 5/5	**SC** (MN) **Intermediate**
white perch *Morone americana*	rivers, lakes, and brackish bays **broadcast in rivers**	piscivore	**100%** 1/1	**Intermediate**
western sand darter *Ammocrypta clara*	sandy riffles in rivers **glides & riffles, sand**	generalized invertivore	**100%** 7/7	**T** (IA), **SC** (WI) **Intolerant**
crystal darter *Crystallaria asprella*	sandy riffles in rivers & streams **glides & riffles**	generalized invertivore	**100%** 6/6	**E** (MN, WI), **Ext** (IA) **Intolerant**
sauger *Sander canadensis*	pools in rivers, lakes **glides, riffles & shoals**	piscivore	**100%** 20/20	**Intermediate** Occasionally stocked game species
goldeye *Hiodon alosoides*	pools in rivers, connected lakes **pelagic, rivers**	surface & water column invertivore/piscivore	**92%** 12/13	**E** (WI) **Intolerant**
silver chub *Macrhybopsis storeriana*	pools in rivers **semi-pelagic**	benthic invertivore	**92%** 12/13	**SC** (WI, Canada) **S2** (SD), **SCP2** (ND) **Intermediate**
highfin carpsucker *Carpiodes velifer*	runs & pools in rivers & streams **backwaters**	omnivore	**91%** 10/11	**Intolerant**
bullhead minnow *Pimephales vigilax*	rivers & backwaters **underside of objects**	omnivore	**88%** 7/8	**Intermediate**
river darter *Percina shumardi*	riffles in rivers & streams **glides & riffles**	generalized invertivore	**88%** 7/8	**SCP3** (ND) **Intermediate**
American eel *Anguilla rostrata*	rivers (females) **Sargasso Sea**	piscivore	**86%** 6/7	**SC** (MN, WI, ON), **S3** (SD) **Intermediate**
silver lamprey *Ichthyomyzon unicuspis*	pools in rivers **glides, riffles**	parasite on fish	**82%** 14/17	**SCP3** (ND) **Intermediate**
lake sturgeon *Acipenser fulvescens*	pools in rivers, connected lakes **rapids in rivers & streams**	benthic invertivore	**80%** 12/15	**E** (IA), **SC** (MN, WI, ON) **Intermediate** Reintroduced in some waters
smallmouth buffalo *Ictiobus bubalus*	pools in rivers, lakes **backwaters & floodplains**	generalized invertivore	**80%** 8/10	**Intermediate**
black redhorse *Moxostoma duquesnei*	fast riffles & runs in streams **glides, riffles**	benthic invertivore	**80%** 4/5	**E** (WI), **T** (IA, Canada, ON), **SC** (MN) **Intolerant**
mud darter *Etheostoma asprigene*	rivers & backwaters **riffles on gravel or vegetation**	generalized invertivore	**75%** 3/4	**SC** (WI) **Intermediate**

Attachment

Vulnerable Species : 50% to 74% Absence

Common Name *Scientific Name*	Adult Habitat *Spawning Habitat*	Adult Feeding Habits	% Absent Upstream of Barriers # Absent / Sample size	Conservation Status *Tolerance* Management (if any)
longnose gar *Lepisosteus osseus*	pools in rivers, connected lakes **vegetated backwaters & bays**	piscivore	**73%** 8/11	**S3** (SD) **Intermediate**
shortnose gar *Lepisosteus platostomus*	pools in rivers, connected lakes **vegetated backwaters**	piscivore	**73%** 8/11	**Intermediate**
brook silverside *Labidesthes sicculus*	ubiquitous in rivers, connected lakes **nearshore over vegetation or gravel**	surface & water column invertivore, fish fry	**73%** 8/11	**Intermediate**
gilt darter *Percina evides*	fast riffles in rivers & streams **glides & riffles**	generalized invertivore	**71%** 5/7	**T** (WI), **SC** (MN), **Ext** (IA) **Intolerant**
white bass *Morone chrysops*	pools in rivers, connected lakes **glides & riffles in streams, shoals**	planktivore, piscivore	**71%** 12/17	**Intermediate**
river shiner *Notropis blennius*	slow riffles in rivers & streams **glides, riffles**	generalized invertivore	**70%** 7/10	**S2** (SD) **Intermediate**
river carpsucker *Carpiodes carpio*	pools in rivers & streams **near banks or backwaters**	omnivore	**70%** 7/10	**Intermediate**
slimy sculpin *Cottus cognatus*	riffles in rivers & streams **nest under rocks in glides & riffles**	generalized invertivore	**70%** 7/10	**Intolerant**
southern brook lamprey *Ichthyomyzon gagei*	riffles in streams **glides, riffles**	do not eat, juveniles filter feed	**67%** 4/6	**SC** (MN) **Intolerant**
Ozark minnow *Notropis nubilus*	riffles in rivers & streams **glides, riffles, hornyhead chub nests**	omnivore, mostly vegetation	**67%** 4/6	**T** (WI), **SC** (MN) **Intolerant**
warmouth *Lepomis gulosus*	pools in low gradient streams, lakes **nest near wood or vegetation**	generalized invertivore, piscivore	**67%** 2/3	**SC** (MN, Canada, ON) **Intermediate**
freshwater drum *Aplodinotus grunniens*	pools in river, lakes **pelagic**	generalized invertivore, piscivore	**64%** 18/28	**Intermediate**
largescale stoneroller *Campostoma oligolepis*	slow riffles in rivers & streams **glides, riffles**	herbivore/benthic invertivore	**64%** 7/11	**SCP3** (ND) **Intermediate**
banded darter *Etheostoma zonale*	riffles in rivers & streams **glides & riffles**	generalized invertivore	**64%** 7/11	**Intolerant**
American brook lamprey *Lethenteron appendix*	riffles in streams **glides, riffles**	do not eat, juveniles filter feed	**63%** 5/8	**T** (IA) **Intolerant**
channel catfish *Ictalurus punctatus*	pools in rivers **nests in cavities**	piscivore, generalized invertivore	**61%** 19/31	**Intermediate** Occasionally stocked game species
bigmouth buffalo *Ictiobus cyprinellus*	pools in rivers & streams, lakes **backwaters & floodplains**	planktivore, benthic invertivore	**61%** 11/18	**SC** (Canada), **Intermediate**
mimic shiner *Notropis volucellus*	shallow pools in rivers & streams **vegetation**	generalized invertivore	**61%** 14/23	**Intolerant**
quillback *Carpiodes cyprinus*	pools in rivers & streams **backwaters**	omnivore	**60%** 15/25	**S3** (SD) **Intermediate**

Table 4 (cont.). Fish species listed by percent absence upstream of dam barriers analyzed and listed in Table 1. Table is sorted by percent absence. Fish habitat and feeding data from Aadland & Kuitunen 2005 and Becker 1983. Conservation status: **E** = Endangered, **T** = Threatened, **SC** = Special Concern, **Ext** = Extirpated from Minnesota DNR (MN), Iowa DNR (IA), Wisconsin Natural Heritage Working List (WI), North Dakota Game & Fish Department (ND) Species of Conservation Priority, **SCP**, Levels 1 - 3), South Dakota Game Fish & Parks (SD, State Rank **S1 - S5**), U.S. Fish & Wildlife Service, and Government of Canada (Canada, Ontario=ON, **PSC**=Proposed Special Concern). Species tolerance ratings from US EPA.

Common Name *Scientific Name*	Adult Habitat *Spawning Habitat*	Adult Feeding Habits	% Absent Upstream of Barriers # Absent / Sample size	Conservation Status *Tolerance* Management (if any)
carmine shiner *Notropis percobromus*	riffles in rivers & streams **glides, riffles**	omnivore	**59%** 13/22	**T** (Canada), **S2** (SD), **SCP3** (ND) **Intolerant**
river redhorse *Moxostoma carinatum*	fast runs in rivers **glides, riffles**	benthic invertivore	**55%** 6/11	**T** (WI), **SC** (Canada, ON) **Intolerant**
brook trout *Salvelinus fontinalis*	coldwater rivers & lakes **glides & riffles in rivers & streams**	generalized invertivore, piscivore	**54%** 7/13	**Intolerant** Widely stocked game species
emerald shiner *Notropis atherinoides*	shallow pools in rivers & streams **glides, riffles**	generalized invertivore	**52%** 12/23	**Intermediate**
northern brook lamprey *Ichthyomyzon fossor*	pools in streams **glides, riffles**	don't eat, juveniles filter feed	**50%** 2/4	**SC** (MN, ON), **PSC** (Canada) **Intolerant**
red shiner *Cyprinella lutrensis*	ubiquitous in rivers & streams **sunfish nests in vegetated backwaters**	omnivore	**50%** 1/2	**Tolerant**
redside dace *Clinostomus elongatus*	riffles & raceways in streams **glides, riffles, creek chub nests**	benthic invertivore	**50%** 3/6	**T** (ON), **SC** (MN, WI), **PSC** (Canada) **Intolerant**
weed shiner *Notropis texanus*	pools in clearwater streams & lakes **unknown**	omnivore	**50%** 5/10	**E** (IA), **SC** (WI) **Intolerant**
silver redhorse *Moxostoma anisurum*	runs, glides & pools in rivers & streams **glides, riffles**	benthic invertivore	**50%** 14/28	**Intermediate**
Muskellunge *Esox masquinongy*	pools in rivers, lakes **vegetated backwaters & side channels**	piscivore, top predator	**50%** 6/12	**Intolerant** Widely stocked game species
ninespine stickleback *Pungitius pungitius*	headwater streams, shoals of large lakes **nests of vegetation between rocks**	omnivore	**50%** 1/2	**Intermediate**
greater redhorse *Moxostoma valenciennesi*	runs & glides in rivers & streams **glides, riffles**	benthic invertivore	**47%** 7/15	**T** (WI) **Intolerant**
mottled sculpin *Cottus bairdii*	riffles in rivers & streams **nest tunnel under rocks in riffles**	generalized invertivore, piscivore	**46%** 6/13	**Intolerant**
spotfin shiner *Cyprinella spiloptera*	slow riffles in rivers & streams **crevices, glides, riffles**	generalized invertivore	**44%** 12/27	**Intermediate**
blackchin shiner *Notropis heterodon*	shallow pools, clearwater streams, lakes **vegetation**	generalized invertivore	**43%** 6/14	**Intolerant**
burbot *Lota lota*	rivers (pools) & lakes **pelagic over gravel or rocks**	piscivore	**42%** 8/19	**T** (IA), **SCP2** (ND) **Intermediate**
slenderhead darter *Percina phoxocephala*	fast riffles in rivers & streams **glides & riffles**	generalized invertivore	**42%** 8/19	**SX** (SD) **Intolerant**
sand shiner *Notropis stramineus*	slow riffles in rivers & streams **glides, riffles**	surface and water column invertivore	**40%** 12/30	**Intermediate**
redfin shiner *Lythrurus umbratilis*	pools in headwater streams **nests in glides & riffles**	benthic invertivore	**40%** 2/5	**T** (WI), **SC** (MN) **Intermediate**

Vulnerable Species : 50% to 74% Absence

Somewhat Vulnerable Species : 25% to 49% Absence

Attachment

Somewhat Vulnerable Species : 25% to 49% Absence

Common Name *Scientific Name*	Adult Habitat *Spawning Habitat*	Adult Feeding Habits	% Absent Upstream of Barriers # Absent / Sample size	Conservation Status *Tolerance* Management (if any)
orangespotted sunfish *Lepomis humilis*	pools in rivers, streams **nest in backwaters & bays**	generalized invertivore	**39%** 7/18	**SC** (ON), **PSC** (Canada) **Intermediate**
spottail shiner *Notropis hudsonius*	slow riffles, rivers & streams **glides, riffles**	generalized invertivore	**37%** 7/19	**Intolerant** Common bait species
shorthead redhorse *Moxostoma macrolepidotum*	runs & glides in rivers & streams **glides, riffles**	benthic invertivore	**34%** 11/32	**Intermediate**
blacknose shiner *Notropis heterolepis*	pools in clearwater streams & lakes **vegetation**	generalized invertivore	**33%** 5/15	**E** (SD), **T** (IA), **SCP3** (ND) **Intolerant**
suckermouth minnow *Phenacobius mirabilis*	slow riffles in rivers & streams **glides, riffles**	generalized invertivore	**33%** 2/6	**SC** (MN), **SH** (SD) **Intermediate**
golden redhorse *Moxostoma erythrurum*	runs & pools in rivers & streams **glides, riffles**	benthic invertivore	**33%** 10/30	**SH** (SD) **Intermediate**
stonecat *Noturus flavus*	riffles & runs in rivers & streams **glides, riffles**	generalized invertivore, piscivore	**33%** 10/30	**Intolerant**
trout-perch *Percopsis omiscomaycus*	pools in rivers, large lakes **glides & riffles in streams**	generalized invertivore	**33%** 5/15	**SCP2** (ND), **S2** (SD) **Intermediate**
rainbow darter *Etheostoma caeruleum*	fast riffles in rivers & streams **glides and riffles**	generalized invertivore	**33%** 4/12	**Intolerant**
blackside darter *Percina maculata*	slow riffles in rivers & streams **glides & riffles**	generalized invertivore	**33%** 10/30	**S2** (SD) **Intermediate**
bowfin *Amia calva*	pools in rivers, connected lakes **nest, vegetated backwaters**	piscivore	**31%** 4/13	**Intermediate**
northern redbelly dace *Chrosomus eos*	clear, headwater streams & ponds **filamentous algae**	herbivore	**29%** 6/21	**T** (SD), **SCP2** (ND) **Intermediate**
least darter *Etheostoma microperca*	clearwater streams, lakes & ponds **vegetation, roots or rubble**	generalized invertivore	**29%** 2/7	**E** (IA), **SC** (MN, WI) **Intolerant**
logperch *Percina caprodes*	fast riffles in rivers & streams, large lakes **glides, riffles, shoals**	generalized invertivore	**29%** 6/21	**SCP3** (ND), **S3** (SD) **Intermediate**
smallmouth bass *Micropterus dolomieu*	raceways in rivers, lakes **nest in backwaters and bays**	generalized invertivore, piscivore	**27%** 6/22	**Intolerant** Widely stocked game species
fantail darter *Etheostoma flabellare*	fast riffles in rivers & streams **glides & riffles**	generalized invertivore	**27%** 3/11	**Intermediate**
Iowa darter *Etheostoma exile*	shallow pools in rivers & streams, lakes **nest in riffles or in vegetation**	generalized invertivore	**26%** 7/27	**Intolerant**
chestnut lamprey *Ichthyomyzon castaneus*	riffles & pools in rivers & streams **glides, riffles**	parasite on fish	**25%** 4/16	**T** (IA), **SCP3** (ND), **PSC** (Canada) **Intermediate**
central stoneroller *Campostoma anomalum*	slow riffles in rivers & streams **glides, riffles**	herbivore/benthic invertivore	**25%** 5/20	**SCP3** (ND) **Intermediate**

Table 4 (cont.). Fish species listed by percent absence upstream of dam barriers analyzed and listed in Table 1. Table is sorted by percent absence. Fish habitat and feeding data from Aadland & Kuitunen 2005 and Becker 1983. Conservation status: **E** = Endangered, **T** = Threatened, **SC** = Special Concern, **Ext** = Extirpated from Minnesota DNR (MN), Iowa DNR (IA), Wisconsin Natural Heritage Working List (WI), North Dakota Game & Fish Department (ND) Species of Conservation Priority, **SCP**, Levels 1 - 3), South Dakota Game Fish & Parks (SD, State Rank **S1 - S5**), U.S. Fish & Wildlife Service, and Government of Canada (Canada, Ontario=ON, **PSC**=Proposed Special Concern). Species tolerance ratings from US EPA.

Somewhat Vulnerable

Least Vulnerable Species : 0% to 24% Absence

Common Name *Scientific Name*	Adult Habitat *Spawning Habitat*	Adult Feeding Habits	% Absent Upstream of Barriers # Absent / Sample size	Conservation Status *Tolerance* Management (if any)
finescale dace *Chrosomus neogaeus*	cool, headwater streams & ponds **logs & branches in backwaters or bays**	generalized invertivore	**25%** 4/16	**E** (SD), **SCP3** (ND) **Intermediate**
lake whitefish *Coregonus clupeaformis*	deepwater lakes **glides& riffles in streams, lake shoals**	water column invertivore, piscivore	**25%** 1/4	**Intermediate**
walleye *Sander vitreus*	pools in rivers, lakes **glides, riffles & shoals**	piscivore	**25%** 8/32	**Intermediate** Widely stocked game species
Northern pearl dace *Margariscus nachtriebi*	pools in cool, headwater streams **glides, riffles**	omnivore	**24%** 4/17	**E** (IA), **T** (SD), **SCP1** (ND) **Intermediate**
bigmouth shiner *Notropis dorsalis*	shallow pools in rivers & streams **unknown**	generalized invertivore	**23%** 7/31	**Intermediate**
pugnose shiner *Notropis anogenus*	clearwater streams & lakes **vegetation**	herbivore, crustaceans	**22%** 2/9	**E** (IA, Canada, ON), **T** (MN, WI), **SCP3** (ND) **Intolerant**
banded killifish *Fundulus diaphanus*	backwaters in clear rivers, lakes **vegetation**	generalized invertivore	**21%** 3/14	**E** (SD), **SC** (Canada) **Tolerant**
northern hogsucker *Hypentelium nigricans*	fast runs in rivers & streams **glides, riffles & rapids**	benthic invertivore	**21%** 4/19	**SH** (SD) **Intolerant**
white crappie *Pomoxis annularis*	pools in river, & lakes **nest in backwaters & bays**	planktivore, piscivore	**21%** 4/19	**Intermediate** Widely stocked game species
central mudminnow *Umbra limi*	headwater streams **flooded ephemeral wetlands**	generalized invertivore, piscivore	**20%** 5/25	**S1** (SD) **Tolerant**
tulllibee *Coregonus artedi*	deepwater lakes **pelagic over lake shoals**	water column invertivore, piscivore	**20%** 2/10	**Intermediate**
lake trout *Salvelinus namaycush*	deepwater lakes **deep shoals**	piscivore	**20%** 1/5	**Intermediate** Occasionally stocked game species
brassy minnow *Hybognathus hankinsoni*	pools in rivers & streams **vegetated backwaters**	herbivore/benthic invertivore	**19%** 5/27	**Intermediate**
yellow bullhead *Ameiurus natalis*	clear rivers, streams, lakes, & ponds **nests in cavities**	generalized invertivore, piscivore	**17%** 4/23	**SCP3** (ND) **Intermediate***
tadpole madtom *Noturus gyrinus*	pools in streams **under rocks**	generalized invertivore	**17%** 5/29	**Intermediate**
rock bass *Ambloplites rupestris*	pools in rivers & streams, lakes **nest in backwaters & bays**	generalized invertivore, piscivore	**17%** 5/29	**Intolerant**
golden shiner *Notemigonus crysoleucas*	pools in rivers, lakes & ponds **vegetated backwaters & bays**	omnivore	**17%** 4/24	**Tolerant** Widely stocked bait species
southern redbelly dace *Chrosomus erythrogaster*	clear, headwater streams & ponds **glides, riffles**	herbivore	**17%** 1/6	**S1** (SD) **Intermediate**
blacknose dace *Rhinichthys atratulus*	riffles and pools in rivers & streams **glides, riffles**	generalized invertivore	**17%** 5/30	**Tolerant**
bluntnose minnow *Pimephales notatus*	slow riffles in rivers & streams, lakes, ponds **underside of objects**	omnivore	**16%** 4/25	**Tolerant**

Attachment

Least Vulnerable Species : 0% to 24% Absence

Common Name *Scientific Name*	Adult Habitat *Spawning Habitat*	Adult Feeding Habits	% Absent Upstream of Barriers # Absent / Sample sizee	Conservation Status *Tolerance* Management (if any)
common shiner *Luxilus cornutus*	pools in rivers & streams **glides, riffles, hornyhead chub nests**	omnivore	**16%** 5/32	**Intermediate** Common bait species
brown bullhead *Ameiurus nebulosus*	rivers, streams, lakes, & ponds **nests in cavities**	generalized invertivore, piscivore	**13%** 3/23	**Intermediate***
johnny darter *Etheostoma nigrum*	ubiquitous in rivers, streams & lakes **nest in backwaters in vegetation**	generalized invertivore	**13%** 4/32	**Intermediate**
green sunfish *Lepomis cyanellus*	pools in rivers & streams, lakes **nest in backwaters & bays**	generalized invertivore, piscivore	**12%** 3/25	**Tolerant**
brook stickleback *Culaea inconstans*	shallow pools in streams, wetlands **nests in vegetation**	omnivore	**10%** 3/30	**Intermediate**
bluegill *Lepomis macrochirus*	pools & backwater in river, lakes **nest in backwaters & bays**	generalized invertivore	**10%** 3/30	**Intermediate** Widely stocked game species
longnose dace *Rhinichthys cataractae*	fast riffles in rivers & streams **glides, riffles**	generalized invertivore	**10%** 2/21	**Intolerant**
northern pike *Esox lucius*	pools in rivers & streams, lakes **vegetated backwaters & wetlands**	piscivore, top predator	**9%** 3/32	**Intermediate** Widely stocked game species
hornyhead chub *Nocomis biguttatus*	ubiquitous in streams **gravel nests in glides, riffles**	benthic invertivore	**8%** 2/25	**SCP3** (ND), **S3** (SD) **Intolerant** Common bait species
largemouth bass *Micropterus salmoides*	pools & backwaters in rivers, lakes **nest in backwaters & bays**	top predator, piscivore	**7%** 2/30	**Intermediate** Widely stocked game species
yellow perch *Perca flavescens*	pools in rivers & lakes **vegetation & brush**	generalized invertivore, piscivore	**7%** 2/30	**Intermediate**
black bullhead *Ameiurus melas*	rivers, streams, lakes, & ponds **nests in cavities**	generalized invertivore, piscivore	**6%** 2/31	**Tolerant***
white sucker *Catostomus commersonii*	rivers, streams, & lakes **glides, riffles**	omnivore	**6%** 2/32	**Tolerant** Widely stocked bait species
creek chub *Semotilus atromaculatus*	pools in rivers and streams **glides, riffles**	generalized invertivore, piscivore	**6%** 2/32	**Tolerant**
pumpkinseed *Lepomis gibbosus*	pools in rivers, lakes **nest in backwaters & bays**	generalized invertivore	**5%** 1/22	**Intermediate**
black crappie *Pomoxis nigromaculatus*	pools in rivers, lakes **nest in backwaters & bays**	planktivore, piscivore	**3%** 1/29	**Intermediate** Widely stocked game species
fathead minnow *Pimephales promelas*	rivers, streams, lakes, & ponds **underside of objects**	omnivore	**3%** 1/31	**Tolerant** Widely stocked bait species
lake chub *Couesius plumbeus*	Great Lakes **streams and shoals**	omnivore	**0%** 0/1	**SC** (MN), **S1** (SD) **Intermediate**
Northern longear sunfish *Lepomis peltastes*	clearwater lakes **nest in bays**	generalized invertivore	**0%** 0/3	**T** (WI), **SC** (MN) **Intolerant**

Table 4 (cont.). Fish species listed by percent absence upstream of dam barriers analyzed and listed in Table 1. Table is sorted by percent absence. Fish habitat and feeding data from Aadland & Kuitunen 2005 and Becker 1983. Conservation status: **E** = Endangered, **T** = Threatened, **SC** = Special Concern, **Ext** = Extirpated from Minnesota DNR (MN), Iowa DNR (IA), Wisconsin Natural Heritage Working List (WI), North Dakota Game & Fish Department (ND) Species of Conservation Priority, **SCP**, Levels 1 - 3), South Dakota Game Fish & Parks (SD, State Rank **S1 - S5**), U.S. Fish & Wildlife Service, and Government of Canada (Canada, Ontario=ON, **PSC**=Proposed Special Concern). Species tolerance ratings from US EPA.

American Fisheries Society Symposium 85:xxx–xxx, 2017
© 2017 by the American Fisheries Society

Assessment of Population Characteristics and Genetic Origin of Muskellunge in a Section of the Mississippi River, Minnesota

Andrew J. Carlson* and Owen E. Baird
Minnesota Department of Natural Resources
1601 Minnesota Drive, Brainerd, Minnesota 56401, USA

Loren M. Miller
Minnesota Department of Natural Resources
135 Skok Hall, 2003 Upper Buford Circle, St. Paul, Minnesota 55108, USA
and
Department of Fisheries, Wildlife, and Conservation Biology, University of Minnesota
2003 Upper Buford Circle, St. Paul, Minnesota 55108, USA

Abstract.—Minnesota actively manages Muskellunge *Esox masquinongy* in 90 waters throughout the state. The vast majority of angling effort and subsequent assessments of these fisheries is focused within 80 lentic systems while relatively little is known about populations within lotic systems. As part of a collaborative effort with local volunteer anglers, a population assessment was conducted for the first time in a section of the Mississippi River known to support a self-sustaining fishery. In an effort to establish a complementary fishery in the section of river upstream, Leech-strain Muskellunge fingerlings were stocked annually beginning in 2006 and downstream migration was suspected. To evaluate the Muskellunge population within the downstream reach, boat electrofishing and trained volunteer anglers were used to sample fish. Fish were genetically assigned as stocked (Leech strain) or local (Mississippi) origin fish using microsatellite DNA analyses. Subsequently, estimates of adult Muskellunge abundance were generated across 3 years of study for both local and stocked fish using a multiple census mark–recapture method. Abundance averaged 191 individuals or 0.44 fish/ha over 3 years, of which approximately 80% were determined to be of local origin. Anglers contributed data from 115 individual captures while 92 captures were by electrofishing; electrofishing captured a wider range and smaller average size than angling. The average growth for recaptured individuals was 12 mm/year total length. Integrating data collected by trained volunteer anglers expanded the temporal and spatial breath of the sampling while helping verify the local fishery was relatively stable and similar to Minnesota lake fisheries.

* Corresponding author: andrew.carlson@state.mn.us

Introduction

Muskellunge *Esox masquinongy* populations can thrive in both lakes and river systems throughout their range (Crossman 1986; Kerr 2011). Currently, lentic systems constitute approximately 75% of populations (Kerr 2011), although the species may have originated from riverine environments (Crossman 1986). Riverine systems where Muskellunge are currently present range from small streams (Parsons 1959) to some of the largest rivers in North America (Crossman 1986). The productive capacity of lotic systems may provide opportunities for faster growth (Parsons 1959) and can favor Muskellunge in competitive interactions with other species (Harrison and Hadley 1978).

Although the majority of Muskellunge fisheries are supported from lentic populations, the quantitative data needs for lotic population assessment and monitoring are similar. Within mid-sized riverine systems (average discharge ~100 m^3/s; stream order 5–7), Muskellunge seasonally move between habitat types but generally are found in or near sections of water with depths greater than 2–4 m (Brenden et al. 2006; Younk et al. 1996). Consequently, there may be aggregations of fish near areas with this deepwater habitat and vast sections of river with low densities of fish. Typical spring assessments methods in lentic environments (large-frame trap nets at spawning locations) can have limited success in riverine environments, and consequently, alternative methods are needed to assess lotic populations. Boat electrofishing during low flows has been used to collect individuals from these environments (Brewer 1980; Younk et al. 1996; Brenden et al. 2007). Angler collected data has also been utilized to gain population information on Muskellunge fisheries (Casselman and Crossman 1986; Kerr 2007; Miller et al. 2015) and may offer a cost-efficient method to assess populations. While both of these gears can sample fish, potential biases specific to each method are largely unknown.

Understanding the underlying genetics of native, naturalized, and introduced populations is important as this can affect population dynamics and recruitment to a fishery (Miller et al. 2012), especially where stocked fish may interact with native or naturalized populations. Within riverine systems, downstream dispersal of stocked individuals is possible (Stocek et al. 1999; Wolter et al. 2013) where migrants may negatively impact the genetic integrity of locally adapted Muskellunge populations. Understanding how local populations fit into the rangewide genetic structure may provide insight to advance management and conservation (Crane et al. 2015). Additionally, evaluating the genetic implications of fish stocking as part of local population enhancement activities or new population establishment may provide a further understanding of how the resulting fisheries contribute to management goals (Miller et al. 2012).

Within Minnesota, eight rivers within three major basins are managed for Muskellunge (MNDNR 2008). Within each of these basins, there are lentic upstream populations that could move downstream through the interconnected waterways, but limited gene flow has been observed between lentic populations in these systems (Miller et al. 2012). The Mississippi River between the Blandin Dam (near Grand Rapids, river kilometer [rkm] 1,907 [U.S. Army Corps of Engineers Upper Mississippi River Miles upstream from confluence of Ohio and Mississippi rivers extended upstream from Coon Rapids Dam by the Minnesota Department of Natural Resources {MNDNR}]) and Coon Rapids Dam (upstream of Minneapolis, rkm

1,395) has historically supported local stocks of Muskellunge and is managed as one of two catch-and-release fisheries within Minnesota. Within this reach of the river, there are local populations, which may be influenced by downstream migrants from the upstream lakes (e.g., Leech Lake and Lake Winnibigoshish). Muskellunge habitat within this area varies by season and flow, but in the more riverine sections, fish utilize less than 40% of the available area and often are spatially aggregated near areas with relatively deep habitat (Younk et al. 1996). In past efforts to expand angling opportunities within this section of river, the MNDNR stocked Muskellunge intermittently from the 1960s through the 1990s (MNDNR, unpublished stocking database). Prior to 1981, the MNDNR stocked the Shoepack strain, derived from Shoepack Lake in the Hudson Bay drainage of northern Minnesota. In a subsequent 4-year period between 1988 and 1991, the MNDNR used fingerlings produced from adults obtained directly from the Mississippi River between the Brainerd and Little Falls dams (Figure 1). Muskellunge abundance remained low upstream of the Brainerd Dam and annual stocking resumed in this reach in 2006 using the Leech strain derived from Leech Lake, which is located 380 rkm upstream of the dam on a tributary of the Mississippi River.

The section of river downstream of the Brainerd Dam and the lower part of the Crow Wing River tributary supports one of the better known Muskellunge fisheries in the upper Mississippi River in Minnesota. This section has characteristics of a natural flowing river with approximately 90% of the area in run and pool habitat and includes a few higher-gradient rapids (Younk et al. 1996). Local stakeholder interest in this fishery prompted a more thorough evaluation of the Muskellunge population. Subsequently, a collaborative project with volunteer anglers began during the summer of 2013 and continued through the fall of 2015. The objectives of this work were to (1) determine the genetic composition of the Muskellunge population below the Brainerd Dam in relation to stocking source populations, (2) estimate abundance and associated demographic parameters for the population, and (3) compare the size distribution, growth, and genetic origin of Muskellunge captured by angling and electrofishing.

Methods

Study Area

The field assessment was conducted on the Mississippi and Crow Wing rivers in central Minnesota (Figure 1) in 2013 through 2015. The upper end of the reach on the Mississippi was at the Brainerd Dam and the upper end of the reach on the Crow Wing River was at the Sylvan Dam. Both dams represent barriers to upstream fish movement, but downstream passage through overflow or turbines is possible. The downstream end of the sampling reach is 14 km downstream of the confluence of the Crow Wing and Mississippi, 35 km downstream from the Brainerd Dam (30 km upstream of the Little Falls Dam) and encompasses the middle and upper stretches of Section 1, defined by Younk et al. (1996). At the downstream end of the study reach, the river transitions into a wider, lower-gradient river with fewer riverine pools (Younk et al. 1996) with a corresponding lower density of Muskellunge (Steve Marod, MNDNR, personal communication). The Mississippi River at the Brainerd Dam has an average annual discharge of 99 m3/s and a bank-full channel width of 150 m (Baird 2009). The section of the Crow Wing River

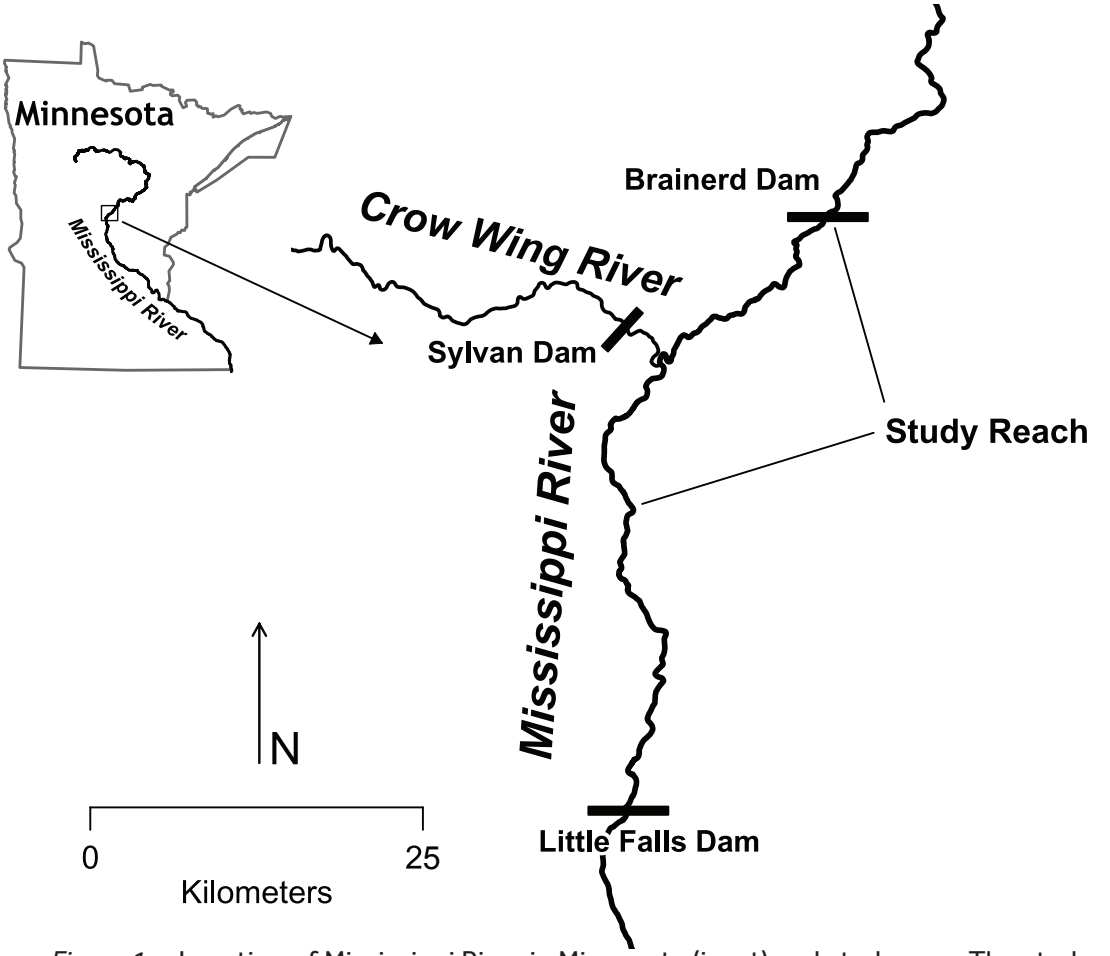


Figure 1.—Location of Mississippi River in Minnesota (inset) and study area. The study area extended downstream from the Brainer Dam 35 to 14 km past the confluence with the Crow Wing River and also included the lower Crow Wing River below the Sylvan Dam.

between the Sylvan Dam and the confluence of the Mississippi River is 5.9 km with an average channel width of 97 m and has an average annual discharge of 43 m3/s. The surface area of the study site (433 ha) was calculated during moderate summer flow conditions from Farm Service Agency 2013 aerial photographs in a geographic information system (ArcMap version 10.2).

Fish Collection

Boat electrofishing (Smith Root GPP 5.0) was used during moderate to low flow conditions (28–112 m^3/s) in the summer and fall of 2013, 2014, and 2015. Effort was made to sample all habitat within the study area, but captures were often concentrated where gear was most effective and fish presumably seasonally resided. Volunteer anglers were also recruited and trained to assist with fish data collection in the summer and fall of 2013, 2014, and 2015. Passive integrated transponders (PIT; uniquely coded radio-frequency identification tags) were used for unique identification of fish following the methods of Younk et al. (2010). As part of the evaluation of upstream reintroduction efforts, upstream stocked Leech-

strain Muskellunge (fall fingerlings) were PIT-tagged between 2013 and 2015. All fish captured by anglers or electrofishing crews were scanned (Biomark 601 reader) for a PIT tag (Biomark BIO12), were implanted with a PIT tag if needed, and had several scales removed and air dried for genetic analysis. Total length was recorded for each individual along with a time, date, location, and capture method.

Genetic Composition of the Population and Identification of Stocked Fish

Scales were the source of DNA for genetic analyses. Individuals were genotyped at 13 microsatellite DNA markers (Sloss et al. 2008) using the methods described in Miller et al. (2012). Data from the Leech Lake population (the recent stocking source) was included by genotyping a collection of archived scales from a 2010 population assessment (n = 73) and using 1987–1988 data (n = 29) from Miller et al. (2012). Data from the Shoepack Lake population (a historical stocking source; n = 40) were included from Miller et al. (2012).

The program STRUCTURE (Pritchard et al. 2000) was used to determine the genetic composition of the Mississippi River Muskellunge population and identify putative stocked fish based on the microsatellite genotype data. Initial runs of STRUCTURE were used to determine the number of genetically distinct populations (K) contributing to the samples. Ten replicate analyses for all K from K = 1 to K = 7 were performed with a burn-in length of 50,000 steps, a run length of 200,000 steps, and a model that allowed admixture. The most likely K was identified using the Evanno et al. (2005) method, as implemented in STRUCTURE HARVESTER (Earl and vonHoldt 2012). Based on initial results that indicated negligible genetic contribution by the historically stocked Shoepack strain to the Mississippi River population, the Shoepack Lake data were removed. A final evaluation to identify Leech-strain fish was then run at K = 2 using only the data from Leech Lake and the Mississippi River. A model with no admixture was used because stocking age-0 Leech strain fish upstream of the study reach began in 2006, so there would have been insufficient time for these stocked fish to mature, spawn with fish from the local Mississippi population, and produce admixed offspring that would have grown large enough to be sampled by the time of this study. The no-admixture model is more powerful at detecting structure, and the results can be interpreted as the posterior probability an individual belongs to a population. A probability of greater than 0.95 was used as a criterion to assign individuals to either of the two final groups (designated as stocked Leech strain or Mississippi origin).

Population and Demographic Parameter Estimation

Abundance of Muskellunge greater than 762 mm within the study reach over the three sampling years was estimated with a Robust Design model (Pollock 1982; Kendall and Nichols 1995; Kendall et al. 1997). Robust Design population models have longer primary sampling periods that have relatively short time span secondary sampling periods nested within them. The primary periods span longer time periods (in this case, the three primary periods corresponding to the years of sampling: 2013, 2014, and 2015) when abundance may change between primary periods and when apparent survival between years is estimated. Populations are assumed closed within each primary sampling period. The secondary samples were

the daily Muskellunge captures that were used to estimate abundance within each year with closed population models. The assumption of population closure within sampling periods was evaluated ($\alpha = 0.05$) using Stanley and Richards (2011) CloseTest software. Population estimates were made separately for the Mississippi-origin and Leech-strain fish due to differences in angler and electrofishing captures between the groups. Angling and electrofishing captures were pooled within groups. The few fish with unassigned genotypes (10) or no genotype determined (3) were excluded. Three candidate models for each group were fit and evaluated by Akaike information criterion corrected for small sample size (AICc; Hurvich and Tsai 1989; Sugiura 1978) using Program Mark v 8.1 (White and Burnham 1999). Initial capture probability within the secondary samples was assumed to be equal to recapture probability, but capture probability varied over sampling occasions for all candidate models. For the candidate models, emigration and immigration (gamma parameters) either were allowed to vary among primary sampling periods (allows for heterogeneous movement into or out of the sampled population), were set to be equal (movement into or out of sampled population independent of previous availability and is a random sample of a superpopulation, often referred to as random movement [Kendall et al. 1997]) or were fixed to indicate no temporary emigration or immigration (no movement). Within the three primary periods, the Mississippi-origin fish had a total of 65 capture occasions with 26, 29, and 10 secondary capture occasions in 2013, 2014, and 2015, while Leech-strain fish had a total of 33 capture occasions with 7, 14, and 12 secondary capture occasions over the three sample years.

Size Distribution, Growth, and Genetic Origin between Gears

To evaluate changes in length between recapture events (e.g., potential growth or systematic gear bias), we used all capture–recapture events for individuals recaptured at least once over the course of the study (99 events on 41 individuals). We compared the complete suite of mixed-effects models predicting length at recapture using length at capture, day of capture, genetic group, and gear type as fixed effects and each unique fish and year as random effects. Analyses were conducted using statistical program R version 3.2.3 (R Development Core Team 2013) using the lmer function included in the lme4 (Bates et al. 2015) package and the best model was selected using the Bayesian information criterion (BIC).

To evaluate patterns in gear and genetic group bias on the lengths of fish captured, all unique fish captured within a specific year were included once (between-year recaptures were included but not within-year recaptures). We compared the complete suite of mixed-effects models, predicting total lengths using genetic group and sampling gear as factors and year as a random effect. Analyses were conducted using statistical program R version 3.2.3 (R Development Core Team 2013) using the lmer function included in the lme4 (Bates et al. 2015) for the mixed-effects models, and subsequent linear models were run using the lm function as part of the base package within R. Models were evaluated using BIC.

Results

Fish Collection

Between 2013 and 2015, 146 unique fish were sampled in 207 encounters. Angling produced 53% of the initial encounters and

61% of the recaptures. Captured Muskellunge ranged from 339 to 1,321 mm, with an average length of 1,022 mm (Figure 2). Muskellunge were captured in July through November each year, with one capture in December 2013 (Muskellunge angling season is open from early June through December 1; Figure 3). Forty-three percent of electrofishing captures were made in August while 65% of angling captures were made in November (Figure 3). For Muskellunge captured multiple times, movement between capture locations ranged from less than 200 m to a maximum of 20.8 km (average 4.8 km), with five fish moving between the Crow Wing and Mississippi rivers. Muskellunge were recaptured from 1 to 730 d after the previous capture, with the average time between captures being 223 d. The maximum duration between all captures was 755 d for a fish that was initially captured in September 2013 and last captured in October 2015. This individual was also captured in August and September 2015 (one of two fish to be captured four times). Over the course of the study, one PIT-tagged individual was sampled that was part of the upstream stocking the previous year.

Genetic Composition of the Population

Genotyping was attempted on 145 individuals captured within the study area (all sampled fish except a stocked PIT-tagged individual) and 74 individuals from the 2010 Leech Lake sample. Individuals were included in further analyses if at least 9 of 13 genetic markers were scored, although 67% of individuals had data for all 13 genetic markers. Initially, approximately 10% of samples failed, but due to reanalysis of the initial samples or new samples from recaptured individuals, all but three fish (2%) were successfully genotyped and used in assessing genetic composition and identifying stocked fish.

The Evanno et al. (2005) method strongly supported the presence of three genetically

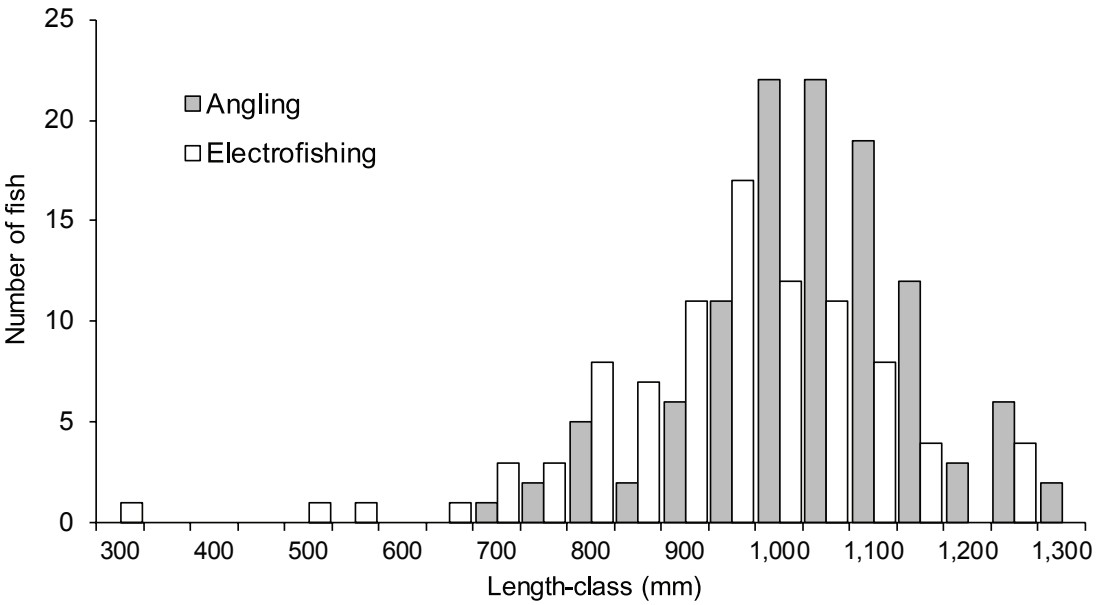


Figure 2.—Length distribution of Muskellunge captured by electrofishing and angling from the Mississippi River near Brainerd, Minnesota in 2013 through 2015.

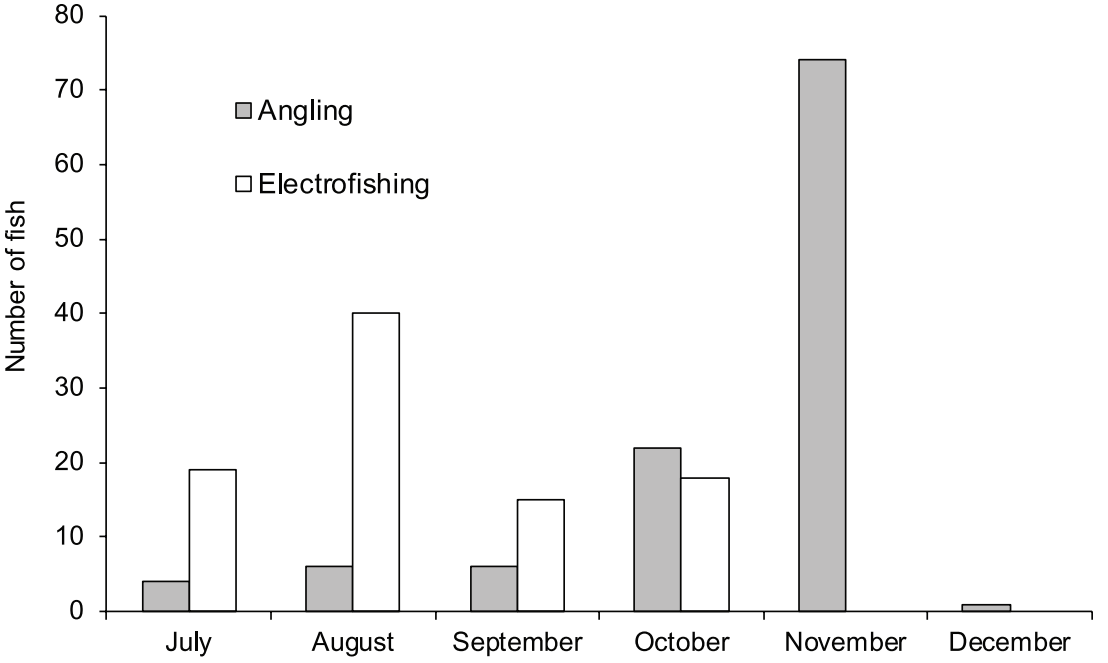


Figure 3.—Monthly distribution of Muskellunge captured by electrofishing and angling in the Mississippi River near Brainerd, Minnesota in 2013 through 2015.

distinct populations (i.e., $K = 3$) from the initial STRUCTURE analysis with data from the Mississippi River, Leech Lake and Shoepack Lake samples. The individuals from the Leech Lake and Shoepack Lake samples strongly associated with distinct population clusters, with estimated ancestry averaging 0.95 and 0.99, respectively (Figure 4A). Of the samples collected within the study reach, some individuals strongly associated with the Leech Lake cluster, but numerous individuals associated with a third population cluster. More than 95% of Mississippi River individuals associated with one of these two clusters with an estimated ancestry of greater than 0.75, while more than 88% had an estimated ancestry of greater than 0.9. For all Mississippi River samples, estimated ancestry from the Shoepack Lake cluster averaged only 0.01 and only two individuals had estimates exceeding 0.05 (Figure 4A).

The second round of STRUCTURE analysis, using $K = 2$ and assuming no admixture, effectively assigned most individuals as Mississippi origin or Leech strain (Figure 4B). In the samples from the Mississippi River, 93% of individuals were assigned to one of the two groups; the remaining 7% (10 fish) were removed from comparisons by genetic group because they assigned with probabilities of less than 0.95 to either group.

Population Estimate and Associated Demographic Parameters

For both Muskellunge genetic groups, the no-movement model was selected as the best based on AIC_c. The Stanley and Burnham (1999) closure tests for both genetic groups rejected the null model that the populations were not closed within secondary sampling periods (Mississippi $P = 0.52$ and Leech $P = 0.12$). Annual abundance estimates for Mississippi-origin Muskellunge ranged

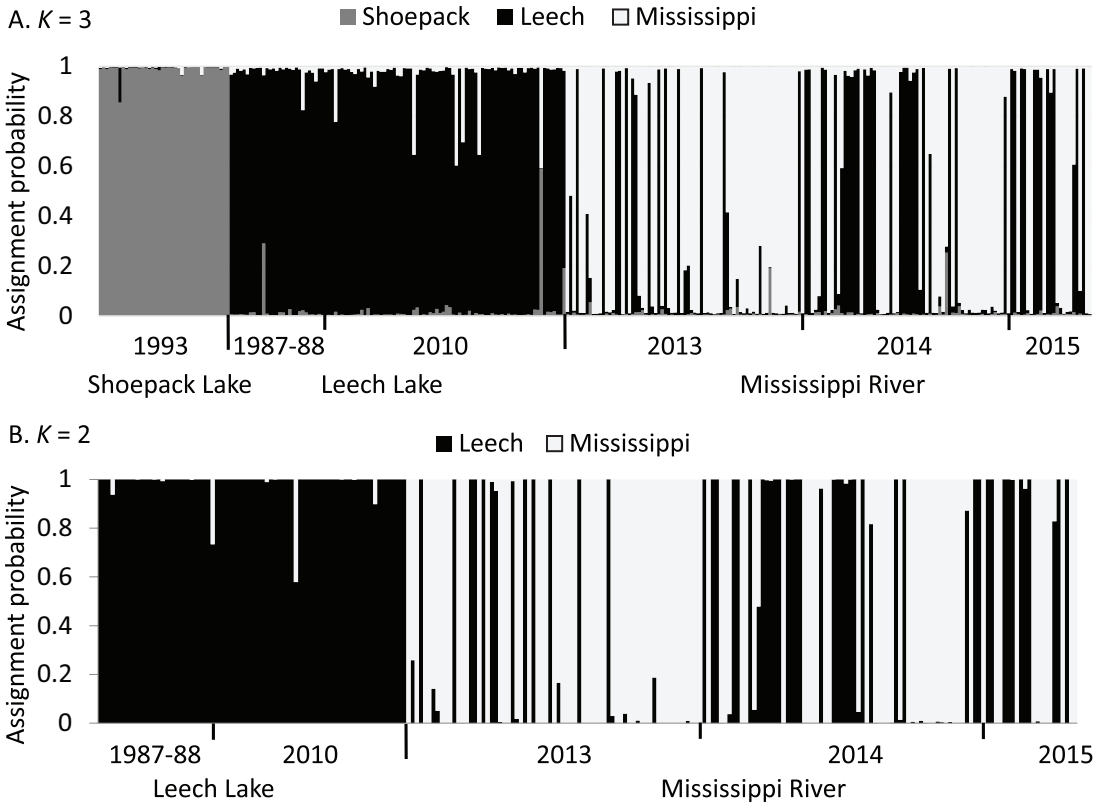


Figure 4.—Bayesian assignment probabilities of individual Muskellunge to stocked strains or the Mississippi River population for samples collected in 2013 through 2015. Sample collections of the two known source populations from Shoepack Lake and Leech Lake were also included. Panel A: assignment probabilities using *K* (number of genetically distinct populations) = 3 for samples from the two source populations and the Mississippi River. Panel B: assignment probabilities using *K* = 2 and only the Leech Lake and Mississippi River samples.

from 131 to 178 fish greater than 762 mm, with an average annual abundance of 154 fish, and annual abundance estimates for Leech strain fish ranged from 13 to 43 fish, with an average annual abundance of 37 fish (Table 1). The abundance of Leech-strain Muskellunge was lower than the Mississippi-origin fish in 2013 and 2015, but the estimated abundances did not differ in 2014. Estimated survival of Mississippi-origin fish was high (1.0), indicating little mortality or permanent emigration between 2013 and 2014 and between 2014 and 2015. Estimated survival of Leech strain fish was high from 2013 to 2014 (1.0) but was low (0.13) from 2014 to 2015.

Total adult abundance (combined Mississippi origin and Leech strain) averaged 191 fish over the three annual estimates. This average abundance is equivalent to 5.5 Muskellunge per river kilometer or 0.44 fish/ha in the study reach, which is similar to Minnesota lake densities (Figure 5).

Size Distribution, Growth, and Genetic Origin between Gears

The best model explaining length at recapture of Muskellunge was a linear mixed-

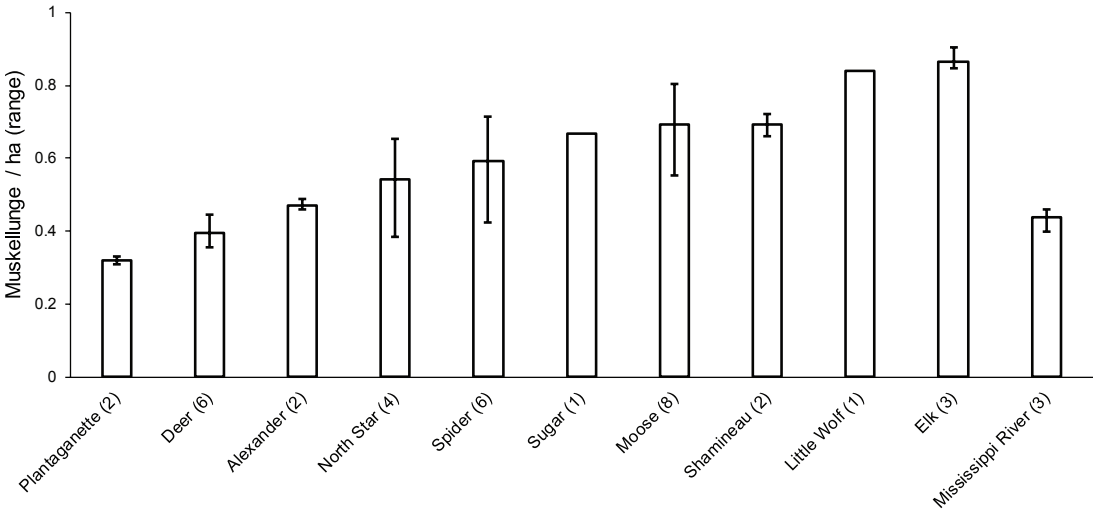


Figure 5.—Estimated densities of Muskellunge ≥762 mm in 10 Minnesota lakes and the Mississippi River. Error bars reflect the range in the estimates and the number of abundance estimates is given for each water in parentheses. Lake data summarized from the Minnesota Department of Natural Resources' Long Range Plan for Muskellunge and Large Northern Pike Management through 2020 (MNDNR 2008).

effects model that included day of capture and capture gear as fixed effects and a random effect of individual fish. As day of capture improved model fit, a positive change in total length is also implied (daily coefficient 0.03377, SE 0.01441) between recapture events after accounting for capture gear and individual fish. Over the course of a year, fish were on average approximately 12 mm longer. Capture gear also explained the changes in length between recaptures, where angled fish were, on average, 32 mm (SE = 8.27) longer than fish sampled with electrofishing.

The best model explaining variation in total length was a linear model that included sampling gear ($P < 0.001$) and genetic group ($P = 0.02$) and did not include a significant random effect of year. On average, electrofishing collected shorter (–96 mm) fish and the Mississippi-origin fish were longer (+66 mm) (Figure 6).

Discussion

The Mississippi River downstream of the Brainerd Dam supports a popular Muskellunge fishery composed of both a genetically unique local population and fish from upstream sources. Local angler interest and subsequent participation in monitoring efforts provided a valuable source of data to assess this population. Relatively little information has been reported from other Muskellunge populations in mid-sized lotic systems (but see Brenden et al. [2007]; Brenden et al. [2006]; Brewer [1980]; Younk et al. [1996] for three similar-sized systems). Genetic analysis indicated the presence of putative stocked Leech-strain fish, but the long-term impact on the genetic composition of the local Mississippi River population is unknown because they had yet to mature and potentially reproduce with Mississippi-origin fish. The population density was similar to that of other Muskellunge populations in the region

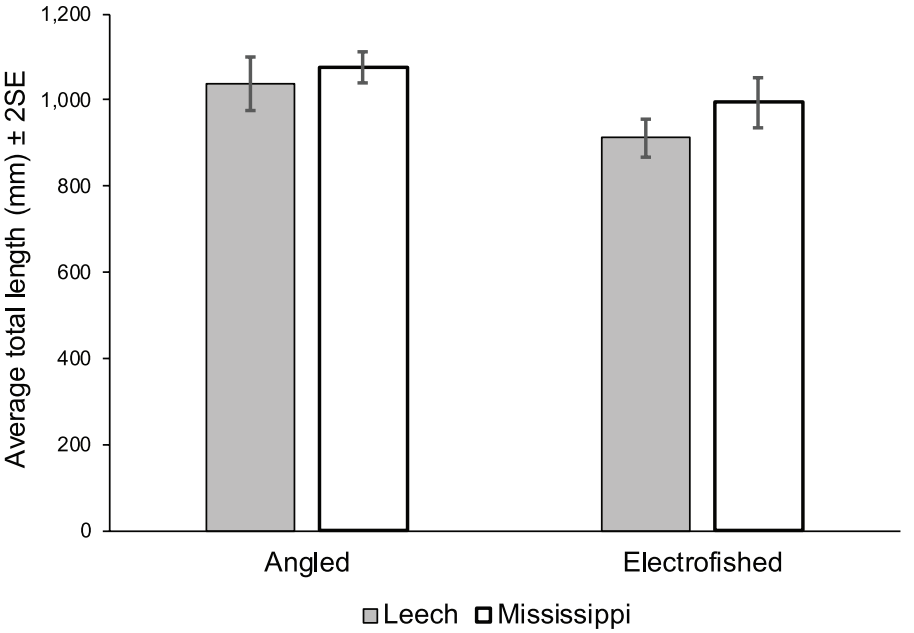


Figure 6.—Average length (mm) ± 2SE of Muskellunge of Leech (stocked) or Mississippi River (local) genetic grouping by sampling gear (angling or electrofishing) collected downstream of the Brainerd Dam between in 2013 through 2015.

(Figure 5). Anglers contributed a substantial proportion of the samples in this study; however, lengths of Muskellunge sampled by anglers had a narrower size distribution and were longer relative to fish sampled by electrofishing. Utilizing multiple capture methods provided insights beyond what would have been apparent using only electrofishing.

Fish Collection

Angler-collected data have been shown to be useful for managing Muskellunge populations (Kerr 2007), but little work has been conducted comparing angler-derived metrics from those derived from traditional techniques. As with most sampling gears, samples are assumed to be representative of the target population, and if not, the potential systematic biases should be accounted for before relating collected metrics back to the population. The key components that anglers contributed were capturing individuals, processing PIT tags, collecting genetic samples, and measuring lengths.

The trained volunteer anglers provided the majority (56%) of Muskellunge captures in this study. Annually, five anglers encountered, on average, 17% of the estimated population once and 2% of the population multiple times. While angler effort was not explicitly quantified, anglers provided capture information an average of 21 d per year. This effort concentrated during the fall (Figure 3) and included a time period when water levels and field conditions were not suitable for electrofishing. Additionally, this effort often was targeted in habitats where electrofishing efficiency would be suboptimal (e.g., waters >2 m). Anglers were proficient at processing PIT tags and collecting genetic samples. They had a relatively low error rate (approximately 4%) in translating

PIT tag data, and errors were often able to be corrected by downloading all scanned records from the readers or working backwards from subsequent recaptures and their genetics (Miller et al. 2015). Anglers collected and provided genetic samples from 98% of the fish that they captured. Overall, the addition of angled fish clearly expanded the temporal breadth and physical habitats sampled while increasing the overall number of the fish surveyed as part of this work.

Boat electrofishing was productive in shallower (<2 m) pools and runs and in some deeper water habitat with confining structures (e.g., vertical walls associated with the dam) during moderate to low flow conditions. Between 6 and 10 sampling trips were conducted annually, which collectively encountered 13% of the yearly estimated population once and 1% multiple times throughout the year.

Genetic Composition of the Population

Distinguishing the genetic groups of Muskellunge allowed differentiation between the local fish and migrants originating from upstream stocking. A genetically distinct population has resisted genetic impacts from Shoepack-strain fish, a strain that has exhibited poor persistence when stocked elsewhere (Miller et al. 2012). The period of stocking from a Mississippi River source may have contributed to the population but would not have altered genetic structure because of the local origin of stocked fish.

Upstream stocking of approximately 3,000 Muskellunge fingerlings each fall from 2006 through 2015 is the most likely source of the Leech-strain fish found in the study reach. One PIT-tagged, age-1 Muskellunge that was stocked upstream of the Brainerd Dam during the fall of 2013 was subsequently captured by electrofishing 1 km downstream of the Brainerd Dam during the summer of 2014, verifying downstream passage of stocked fish. Stocek et al. (1999) also documented downstream movement of stocked Muskellunge from headwater systems within the St. John River basin in Quebec. In a Muskellunge population in an Illinois reservoir, Wolter et al. (2013) estimated an annual escapement of 25%, while in a West Virginia reservoir, 29% of the acoustically tagged Muskellunge moved downstream over a dam during 4 years of monitoring (Morrison and Warren 2015). During most years of recent Mississippi River stocking, more than 60% of fingerlings were stocked within 43 km upstream of the Brainerd Dam, with the closest stocking site being only 2.5 km upstream of the dam.

Although the recent upstream stocking likely accounts for most Leech-strain individuals, some Leech-strain fish found in the study area could have been older than the 2006 year-class and emigrated from Leech Lake or other upstream stocked locations. Two lines of evidence suggest that Leech-strain immigration is likely infrequent other than from recent stocking. First is the long distances between possible sources of migrants and our study area. Leech Lake is 390 rkm from the Brainerd Dam and other stocked lakes are a minimum of 60 rkm upstream on smaller connected tributaries. Second, if Leech-strain immigration has been ongoing, the genetic distinctiveness of the populations should have eroded and made population assignment difficult. Admixture between local fish and past immigrants could account for the few individuals that did not assign to a population; however, there was imperfect assignment of the Leech Lake samples to the Leech-strain genetic group (96% success; Figure 4B), indicating incomplete resolution of populations that may not reflect recent migration. Structure

runs at $K = 3$, which allowed for possible admixture, strongly assigned most individuals to one cluster (Figure 4A), further indicating that past migration and admixture was uncommon.

Population Estimate and Associated Demographic Parameters

Muskellunge density (fish/ha) within the study area was within the range of densities found within Minnesota lake populations (Figure 5, lake data from MNDNR [2008]). In nine Wisconsin lakes, Schoenebeck and Hansen (2005) reported an average density of 0.86 fish/ha (range 0.29–1.36 fish/ha), similar to Minnesota lakes and the Mississippi River estimates (Table 1; Figure 5). While there was some level of permanent downstream movement into our study reach (especially of the stocked Leech strain) and an unknown amount of temporary immigration/emigration at the downstream limit of the study site, the best models for estimating abundance had fixed gamma parameters (suggesting limited temporary movement into and out of the study reach) and the closure tests supported the assumption of a closed population over secondary sampling periods. Within our study reach there are multiple interspersed habitats where Muskellunge overwinter, and Younk et al. (1996) found that individuals within this section overwintered in habitat that was within or adjacent to the boundaries of their summer range.

Estimating Muskellunge abundance separately by genetic group detected the apparent high mortality or permanent emigration of Leech-strain fish from 2014 to 2015 in contrast to the high survival of the Mississippi-origin fish throughout the study period. If the groups were combined for population estimates, the lower survival from 2014 to 2015 would have falsely been attributed to the local Mississippi population. The low estimated survival of Leech-strain fish may be due to permanent emigration out of the study area between sampling periods. Our population model allowed the population to be open between December and June each year, a time period covering Muskellunge spawning and the highest river discharge events. Wolter et al. (2013) observed the highest levels of emigration during this time period. While natural mortality could have been the reason for poor survival, it is likely that stocked Leech fish continued to move downstream.

Size Distribution, Growth, and Genetic Origin between Gears

Anglers collected larger individuals than electrofishing for either genetic group, likely due to anglers' methods (techniques, timing, and targeted habitat) specifically targeting the largest individuals in the population. To a lesser degree, this may also be in part due to systematic measurement error. Anglers have been known to exaggerate (e.g., Sullivan 2003) and their measurements can be more variable (Ferguson et al. 1984; Page et al. 2004). Muskellunge anglers often strive to limit the time out of water in an effort to minimize stress to the captured fish. Active fish or boat-side cradle netting could contribute to the higher variability in length measurements that anglers recorded relative to measurements taken by staff while electrofishing. After accounting for growth between measurements, angled fish were measured on average to be 32 mm larger than electrofishing-collected individuals (~3% of the average length), but there was relatively wide variation among anglers and repeatedly captured fish. Five anglers using different measuring techniques and possibly having differing perspectives and biases in measuring fish were

combined together and compared with one set of equipment used by an experienced electrofishing crew. Angler measurement error could have been reduced by standardizing the length measurement technique among anglers, potentially resulting in more accurate measurements that could assess finer-scale changes in length (e.g., growth).

There were small (~12 mm/year) but detectable changes in the total lengths of recaptured individuals over the duration of the study. This may partially reflect slow growth after maturity and measurement error. Faust et al. (2015) examined 305 cleithra from Wisconsin waters and found that growth curves inflected between ~762 and ~889 mm. Only one (~2% of samples) of our recaptured fish was less than 762 mm and an additional five recaptures were less than 889 mm (~9% of samples), the thresholds where growth rates begin to plateau (Faust et al. 2015). One notable exception to the relatively slow growth was a Muskellunge of local origin that was captured during an electrofishing survey in the summer of 2013 and recaptured by the same angler during the fall of 2014 and again in 2015. Originally captured at 810 mm, this fish grew 130 mm during 2014 and another 64 mm during 2015. Understanding growth and recruitment of these smaller (likely immature) fish may provide further insight into the implications of the two genetic groups within this system and their ultimate contribution to the population and its fishery.

There was substantially more variability in measurements due to measurement error compared to annual growth. It is important to understand the precision and accuracy of differing methods and evaluate questions that fit within the limitations of the data (Bunch et al. 2013). While utilizing two techniques to capture fish greatly expanded the sample size of fish included within this study, evaluating growth of these mostly adult fish is likely beyond the capabilities of angler collected data.

Management Implications

Stocking Muskellunge upstream of a presumably locally adapted population resulted in downstream movement of the stocked fish into the area occupied by the local population, with unknown consequences. Despite historic and recent stockings and movement of Leech-strain fish into the study reach, a genetically distinct Muskellunge population continued to persist in the Mississippi River below the Brainerd Dam. The future impact of the recent large influx of the Leech strain on the genetic composition of this population is unknown. Ongoing genetic monitoring will be needed to determine if the unique population will be lost through admixture (Epifanio and Philipp 2000) or if it will continue to resist introgression from exogenous sources. At the first Muskellunge symposium, Koppelman and Philipp (1986) cautioned against mixing stocks of Muskellunge because of the possibility of reduced fitness due to outbreeding depression (Edmands 2007). Our techniques based on neutral genetic markers do not reveal genetically based fitness differences among populations, but they do indicate reproductive isolation that could lead to adaptive differences. Conservation genetic guidelines often consider genetically similar populations within the same watershed as candidate sources for stocking programs (Jennings et al. 2010; Miller et al. 2003). The Leech Lake and Mississippi River population are clearly distinct based on our high-resolution genetic markers, but they are similar in the context of the species range because they share a history in the same watershed. We hope that any loss of the genetic distinctiveness of the Mississippi River popu-

lation will not be accompanied by a substantial loss of fitness.

Acknowledgments

Partial funding support for this project was provided by the Hugh C. Becker Trust. Volunteer anglers from the Brainerd Lakes Chapter of Muskies, Inc. provided the angler capture data. Field equipment and staff assistance were provided by the Minnesota Department of Natural Recourses Brainerd Field Office. The Minnesota Pollution Control Agency Brainerd Field Office assisted by providing capture data from Muskellunge they encountered as part of work assessing the fish community in the Mississippi River. Derek Bahr, Matt Ward, and Charles Anderson provided comments on analytical methods and earlier versions of this manuscript.

References

Baird, O. 2009. Mississippi River survey report. Minnesota Department of Natural Resources, Brainerd.

Bates, D., M. Maechler, B. Bolker, and S. Walker. 2015. Fitting linear mixed-effects models using lme4. Journal of Statistical Software 67:1–48.

Brenden, T. O., E. M. Hallerman, B. R. Murphy, J. R. Copeland, and J. A. Williams. 2007. The New River, Virginia, Muskellunge fishery: population dynamics, harvest regulation modeling, and angler attitudes. Environmental Biology of Fishes 79:11–25.

Brenden, T. O., B. R. Murphy, and E. M. Hallerman. 2006. Effect of discharge on daytime habitat use and selection by Muskellunge in the New River, Virginia. Transactions of the American Fisheries Society 135:1546–1558.

Brewer, D. L. 1980. A study of native Muskellunge populations in eastern Kentucky streams. Kentucky Department of Fish and Wildlife Resources, Fisheries Bulletin 64, Frankfort.

Bunch, A. J., C. J. Walters, and L. G. Coggins. 2013. Measurement error in fish lengths: evaluation and management implications. Fisheries 38:320–326.

Casselman, J. M., and E. J. Crossman. 1986. Size, age, and growth of trophy Muskellunge and Muskellunge–Northern Pike hybrids—The Cleithrum Project 1979–1983. Pages 93–110 *in* G. E. Hall, editor. Managing muskies: a treatise on the biology and propagation of Muskellunge in North America. American Fisheries Society, Special Publication 15, Bethesda, Maryland.

Crane, D. P., L. M. Miller, J. S. Diana, J. M. Casselman, J. M. Farrell, K. L. Kapuscinski, and J. K. Nohner. 2015. Muskellunge and Northern Pike ecology and management: important issues and research needs. Fisheries 40:258–267.

Crossman, E. J. 1986. The noble Muskellunge: a review. Pages 1–13 in G. E. Hall, editor. Managing muskies: a treatise on the biology and propagation of Muskellunge in North America. American Fisheries Society, Special Publication 15, Bethesda, Maryland.

Earl, D. A., and B. M. vonHoldt. 2012. STRUCTURE HARVESTER: a website and program for visualizing STRUCTURE output and implementing the Evanno method. Conservation Genetics Resources 4:359–361.

Edmands, S. 2007. Between a rock and a hard place: evaluating the relative risks of inbreeding and outbreeding for conservation and management. Molecular Ecology 16:463–475.

Epifanio, J., and D. Philipp. 2000. Simulating the extinction of parental lineages from introgressive hybridization: the effects of fitness, initial proportions of parental taxa,

and mate choice. Reviews in Fish Biology and Fisheries 10:339–354.

Evanno, G., S. Regnaut, and J. Goudet. 2005. Detecting the number of clusters of individuals using the software structure: a simulation study. Molecular Ecology 14:2611–2620.

Faust, M. D., D. A. Isermann, M. A. Luehring, and M. J. Hansen. 2015. Muskellunge growth potential in northern Wisconsin: implications for trophy management. North American Journal of Fisheries Management 35:765–774.

Ferguson, M. O., A. W. Green, and G. C. Matlock. 1984. Evaluation of the accuracy and precision of volunteered size data from tagged Red Drum returns. North American Journal of Fisheries Management 4(2):181–185.

Harrison, E. J., and W. F. Hadley. 1978. Ecological separation of sympatric Muskellunge and Northern Pike. Pages 129–134 *in* R. L. Kendall, editor. A symposium on selected coolwater fishes of North America. American Fisheries Society, Special Publication 11, Bethesda, Maryland.

Hurvich, C. M., and C.-L. Tsai. 1989. Regression and time series model selection in small samples. Biometrika 76:297–307.

Jennings, M. J., B. L. Sloss, G. R. Hatzenbeler, J. M. Kampa, T. D. Simonson, S. P. Avelallemant, G. A. Lindenberger, and B. D. Underwood. 2010. Implementation of genetic conservation practices in a Muskellunge propagation and stocking program. Fisheries 35:388–395.

Kendall, W. L., and J. D. Nichols. 1995. On the use of secondary capture–recapture samples to estimate temporary emigration and breeding proportions. Journal of Applied Statistics 22:751–762.

Kendall, W. L., J. D. Nichols, and J. E. Hines. 1997. Estimating temporary emigration using capture–recapture data with Pollock's robust design. Ecology 78:563–578.

Kerr, S. J. 2007. Characteristics of Ontario Muskellunge (*Esox masquinongy*) fisheries based on volunteer angler diary information. Environmental Biology of Fishes 79:61–69.

Kerr, S. J. 2011. Distribution and management of Muskellunge in North America: an overview. Ontario Ministry of Natural Resources, Peterborough.

Koppelman, J. B., and D. P. Philipp. 1986. Genetic applications in Muskellunge management. Pages 111–121 *in* G. E. Hall, editor. Managing muskies: a treatise on the biology and propagation of Muskellunge in North America. American Fisheries Society, Special Publication 15, Bethesda, Maryland.

Miller, L. M., A. R. Kapuscinski, and E. Hallerman. 2003. Genetic guidelines for hatchery supplementation programs. Pages 329–355 *in* E. M. Hallerman, editor. Population genetics: principles and applications for fisheries scientists. American Fisheries Society, Bethesda, Maryland.

Miller, L. M., S. W. Mero, and J. A. Younk. 2012. The impact of stocking on the current ancestry in twenty native and introduced Muskellunge populations in Minnesota. Transactions of the American Fisheries Society 141:1411–1423.

Miller, L. M., M. C. Ward, and D. W. Schultz. 2015. Using genetic markers as individual tags: a case study of a mark–recapture estimate of adult Muskellunge population size. North American Journal of Fisheries Management 35:210–215.

MNDNR (Minnesota Department of Natural Resources). 2008. Long range plan for Muskellunge and large Northern Pike management through 2020. MNDNR, Division of Fish and Wildlife, St. Paul.

Morrison, S. F., and L. H. Warren. 2015. Seasonal movements of Muskellunge in North Bend Lake, West Virginia. Journal of the Southeastern Association of Fish and Wildlife Agencies 2:42–49.

Page, K. S., G. C. Grant, P. Radomski, T. S. Jones, and R. E. Bruesewitz. 2004. Fish total length measurement error from recreational anglers: causes and contribution to noncompliance for the Mille Lacs Walleye fishery. North American Journal of Fisheries Management 24:939–951.

Parsons, J. W. 1959. Muskellunge in Tennessee streams. Transactions of the American Fisheries Society 88(2):136–140.

Pollock, K. H. 1982. A capture–recapture design robust to unequal probability of capture. The Journal of Wildlife Management 46:752–757.

Pritchard, J. K., M. Stephens, and P. Donnelly. 2000. Inference of population structure using multilocus genotype data. Genetics 155:945–959.

R Development Core Team. 2013. R: a language and environment for statistical computing. R Foundation for Statistical Computing, Vienna. Available: www.R-project.org. (December 2015).

Schoenebeck, C. W., and M. J. Hansen. 2005. Electrofishing catchability of Walleyes, Largemouth Bass, Smallmouth Bass, Northern Pike, and Muskellunge in Wisconsin lakes. North American Journal of Fisheries Management 25:1341–1352.

Sloss, B. L., R. P. Franckowiak, and E. L. Murphy. 2008. Development of new microsatellite loci and multiplex reactions for Muskellunge (*Esox masquinongy*). Molecular Ecology Resources 8:811–813.

Stanley, T. R., and K. P. Burnham. 1999. A closure test for time-specific capture–recapture data. Environmental and Ecological Statistics 6(2):197–209.

Stanley, T. R., and J. D. Richards. 2011. CloseTest. U.S. Geological Survey Fort Collins Science Center. Available: www.fort.usgs.gov/legacy-products/23746. (September 2016).

Stocek, R. F., P. J. Cronin, and P. D. Seymour. 1999. The Muskellunge (*Esox masquinongy*), distribution and biology of a recent addition to the ichthyofauna of New Brunswick. Canadian Field Naturalist 113:230–234.

Sugiura, N. 1978. Further analysts of the data by Akaike' s information criterion and the finite corrections. Communications in Statistics: Theory and Methods 7(1):13–26.

Sullivan, M. G. 2003. Exaggeration of Walleye catches by Alberta anglers. North American Journal of Fisheries Management 23:573–580.

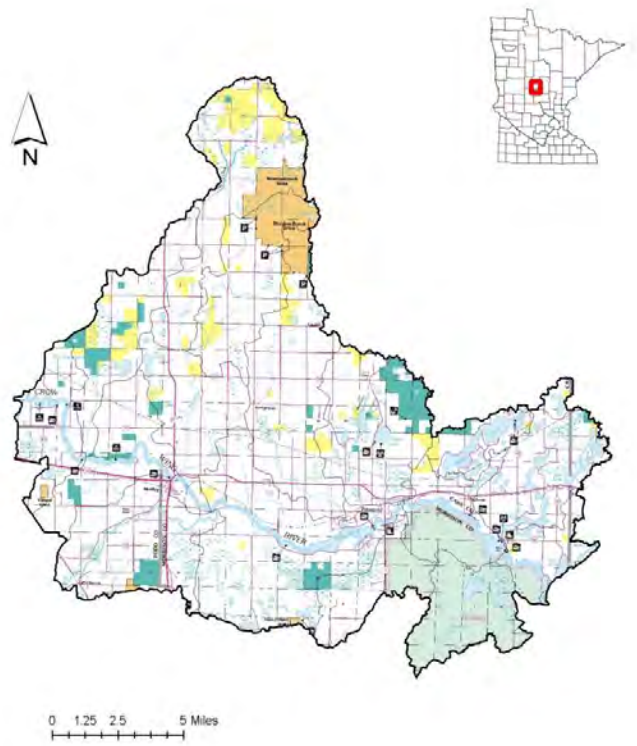
White, G. C., and K. P. Burnham. 1999. Program MARK: survival estimation from populations of marked animals. Bird Study 46(Supplement 1):S120–S139.

Wolter, M. H., C. S. DeBoom, and D. H. Wahl. 2013. Field and laboratory evaluation of dam escapement of Muskellunge. North American Journal of Fisheries Management 33:829–838.

Younk, J. A., M. F. Cook, T. J. Goeman, and P. D. Spencer. 1996. Seasonal habitat use and movements of Muskellunge in the Mississippi River. Minnesota Department of Natural Resources, Division of Fish and Wildlife, Investigational Report 449, St. Paul.

Younk, J. A., B. R. Herwig, and B. J. Pittman. 2010. Short- and long-term evaluation of passive integrated transponder and visible implant elastomer tag performance in Muskellunge. North American Journal of Fisheries Management 30:281–288.

MINNESOTA DEPARTMENT OF NATURAL RESOURCES



Crow Wing River Gamefish and Fish IBI

Assessment Report

Spring Gamefish and Summer Fish IBI Assessment on the Crow Wing River from Staples, MN to the Mississippi River

May 19 through May 20, 2010

River Miles 0 to 25

By: Steve Marod

Little Falls Area Fisheries

TABLE OF CONTENTS

List of Tables 3

List of Figures 4

Abstract 5

Study Area 6

Methods 7

- Spring Gamefish Assessment 7
- Summer IBI Assessment 8

Results and Discussion 8

- Spring Gamefish Assessment 8
- Summer IBI Assessment 9
- Hydrology 10

LIST OF TABLES

Table 1. 2001 NLCD Land use percentages for the Crow Wing River Watershed.....11

Table 2. 2001 NLCD land use percentages for minor watersheds adjacent to the Crow Wing River from Staples, MN to the confluence with the Mississippi River ..11

Table 3. IBI scores for all summer stations on the Crow Wing Rive from Staples, MN to the confluence with the Mississippi River 12

Table 4. Catch per unit of effort (CPUE) for gamefish captured at each site during spring sampling on the Crow Wing River from Staples, MN to Pillager, MN 13

Table 5. Number caught and minimum, maximum and mean length of all gamefish captured during spring sampling on the Crow Wing River from Staples, MN to Pillager, MN.....13

Table 6. Length frequency distribution of gamefish species sampled on the Crow Wing River from Staples, MN to Pillager, MN.....14

Table 7. Age and mean length at annulus formation for a subsample of gamefish sampled on the Crow Wing River from Staples, MN to Pillager, MN.....15

Table 5. Species list of fishes sampled in the Crow Wing River during summer 2010 IBI sampling from Staples, MN to the confluence with the Mississippi River 16

LIST OF FIGURES

Figure 1. Crow Wing River Major Watershed showing 30 meter digital elevation model, DNR 24K Perennial Streams, surveyed lakes and the Crow Wing River study area in the Little Falls Area 17

Figure 2. Crow Wing River watershed showing STATSGO Soil types in the watershed 18

Figure 3. Crow Wing River Watershed showing geomorphic sedimentary associations 19

Figure 4. Crow Wing River Watershed showing NLCD land cover and DNR 24K perennial streams.....20

Figure 5. Crow Wing River Watershed showing 100K USGS topographic map coverage 21

Figure 6. Crow Wing River Watershed showing FSA 2008 color aerial photography ..22

Figure 6. Crow Wing River Watershed showing Strahler Stream Order for the Crow Wing River 23

Figure 6. Adjacent minor watersheds to the Crow Wing River in the Little Falls Area showing spring and summer electrofishing stations 24

Figure 6. 2010 mean daily discharge versus historical mean daily discharge for the period of record (1968 through 2009) on the Crow Wing River at Pillager, MN USGS Gage Station #05247500.....25

ABSTRACT

A special spring gamefish assessment of the Crow Wing River (M-096) from Staples, MN to the Mississippi River confluence was conducted April 23 and 26, 2010 in response to constituent's complaints of a lack of gamefish, specifically walleye, and because a spring gamefish assessment had never been completed. Population data was gathered as baseline data and for purposes of monitoring walleye, smallmouth bass and other gamefish populations. Walleye were targeted although an attempt was made to capture all gamefish encountered during sampling. A total of 65 walleye, 48 smallmouth bass and 34 northern pike were sampled in two electrofishing stations totaling 3.56 hours of effort. Catch per unit of effort (CPUE) for walleye, smallmouth bass and northern pike was 18.3/hour, 13.5/hour and 9.6/hour respectively. Walleye from seven different year classes were sampled.

STUDY AREA

The Crow Wing River Watershed is a major watershed that covers approximately 1,983 square miles in Becker, Cass, Clearwater, Crow Wing, Hubbard, Morrison, Todd and Wadena Counties in north central Minnesota (Figure 1). The Crow Wing River flows south through the watershed from Akeley, MN in the north to Staples, MN where it bends east to its confluence with the Mississippi River south of Brainerd, MN. The river covers approximately 115 miles from source to mouth and is a state designated canoe route. The source of the river is Eleventh Crow Wing Lake which is included in a chain of eleven interconnected lakes. Major tributaries that enter the Crow Wing River include the Shell, Redeye, Partridge, Long Prairie and Gull Rivers.

Soils in the Crow Wing watershed were predominately sand, sandy loam and loamy sand (Figure 2). Dominant geomorphic sedimentary associations in the watershed were outwash, till plain, supraglacial drift complex and lacustrine (Figure 3).

Land use in the watershed was dominated by forest with deciduous and evergreen forest types comprising 38.8% and 12.7% of the landscape respectively (Figure 4). Agricultural hay, pasture and crop lands covered 21.9% of lands in the watershed. Developed lands comprised a small percentage of the watershed (Table 1). Topography is nearly level to gently rolling hills with glacial moraines and drumlins common (Figure 5). Aerial photographs of the watershed helped in documenting land use and cover types (Figure 6). The Crow Wing River was classified as a 6th order stream according to the Strahler Stream Order classification system (Figure 7).

According to the Ecological Classification System (ECS) there were two ECS provinces within the Crow Wing River major watershed associated with the study area including, Eastern Broadleaf Forest Province and Laurentian Mixed Forest Province. Two ECS Subsections were within the major watershed including Pine Moraines and Outwash Plains and Hardwood Hills subsections. Pre-settlement vegetation types were primarily jack pine barrens and openings, aspen-birch (tending to conifers), mixed white pine and red pine, and conifer bogs and swamps. The dominant pre-settlement vegetation type in the Partridge River watershed in northern Todd County was big woods hardwoods (oak, maple, basswood, hickory).

The Crow Wing River in the Little Falls Fisheries work area stretches from near Staples, MN to the confluence with the Mississippi River and covers approximately 25.6 miles (Figure 1). Two dams owned by Minnesota Power Company impact connectivity of the lower Crow Wing River; Sylvan Dam located near river mile 4, and Pillager Dam located within river mile 10. In general, this section of the river contained pool, riffle and run type habitat with coarse substrate types from Staples, MN to approximately one mile below the confluence of the Long

Prairie River where Placid Reservoir begins to impact gradient. Sand substrates begin to dominate into the reservoir to Pillager Dam. The Pillager Dam tailwater is again dominated by coarse substrates for less than a mile before Sylvan Reservoir impacts gradient and flow, and sand substrates again dominate. From the Sylvan Dam tailwater to the confluence with the Mississippi River, gradient is significant and boulder, rubble, gravel, and sand substrates dominate.

This section of the Crow Wing River flows through riparian lands dominated by forest. Riparian lands along both banks were lightly developed. Natural scenic quality was high and cover types along the river were primarily upland and bottomland forest. Bottomland forest consisted of ash, silver maple and willow while uplands were primarily oak forest. Land use in the minor watersheds adjacent to this study area was primarily deciduous forest (43.0%). Pasture/hay (16.8%) and cultivated crops (7.7%) were agricultural land uses common in adjacent watersheds and development, in general, was light (Table 2).

Electrofishing during the spring assessment was directed in suspected walleye, smallmouth bass and northern pike habitats. All species were captured in backwater areas, current breaks and deeper runs with woody or boulder cover types. Summer sampling was coordinated with the Minnesota Pollution Control Agency (MPCA) and was part of the agency's comprehensive Crow Wing River Watershed Biological Monitoring Assessment. The entire fish community was targeted at summer stations and all species of fish were netted.

METHODS

Spring Gamefish Assessment

Two long daytime electrofishing runs were conducted in suspected gamefish habitats (Figure 8). In general, as the boom shocker was driven downstream, operators visually assessed habitat and shocking occurred in current breaks, backwaters and deep runs with woody or boulder cover types. Timing of electrofishing was after the walleye and northern pike spawning season but prior to smallmouth bass spawning. A Smith-Root GPP 5.0 boom shocker boat rigged with two spider array dropper type anodes and hull cathode was used to sample fish. An attempt was made to capture all gamefish encountered. Gamefish captured were identified, enumerated and measured. In addition, a scale sample was removed from walleye for age determination prior to release. Electrofishing on-time was recorded to determine catch per unit of effort (CPUE).

Crow Wing River discharge information was obtained for the Pillager, MN USGS Gage Station #05247500 from the USGS Water Resources website.

Summer IBI Assessment

Summer electrofishing occurred at four stations; river mile 25 near Staples, MN (Sp_EF1), river mile 15 near Al Vah's Landing upstream of Lake Placid (Sp_EF2), river mile 10 near Pillager, MN (Sp_EV3), and river mile 3 downstream of Sylvan Dam (Sp_EF4) (Figure 8). Electrofishing stations were selected by MPCA as part of their biological monitoring program. Each station was 500 meters in length and consisted of three runs in the downstream direction, one along each bank and one down the center of the station. An attempt was made to capture every fish shocked that was within reach. All fish captured were identified, enumerated by species, measured for maximum and minimum length of each species, bulk weighed by species, and examined for deformities. IBI scores were calculated by MPCA and were based on nine metrics established for moderate to large sized rivers in northern Minnesota (Table 3). IBI methodology was recently updated by MPCA and is unpublished at the time of this writing.

RESULTS AND DISCUSSION

Spring Gamefish Assessment

A total of four different gamefish species were sampled in 3.56 hours of electrofishing effort at two stations combined on April 23 and 26, 2010. Species captured included northern pike, smallmouth bass, bluegill and walleye. Walleye were a targeted species of concern as local anglers had been complaining of a decline of the walleye population in the river. A total of 65 walleye were sampled in 2010 for a CPUE of 18.3/hour (Table 4). Adult walleye were sampled primarily in deeper runs with boulder and woody cover. Juvenile walleye were captured in deeper runs and on sand flats in riffles. Mean total length of walleye captured in the 2010 assessment was 15.0 inches (Table 5) and individuals ranged from 5.9 inches to 27.9 inches (Table 6). Seven different year classes were present indicating fairly consistent natural recruitment is occurring in the river. Ages 1, 4, and 6 were most common in the catch (Table 7). Length at annulus data suggested growth was normal when compared to other area walleye populations. All but one female walleye were spent indicating that spawning season was nearly complete at the time of the assessment. Most males were still ripe.

Smallmouth bass were targeted in backwaters, current breaks and deeper runs. A total of 48 smallmouth were captured for a total CPUE of 13.5/hour (Table 4). Mean length was 14.2 inches (Table 5) and bass ranged from 8.6 inches to 18.9 inches in total length (Table 6). The calculated PSD value for bass on the Crow Wing River was 95.8 and was probably biased high due to sampling near the spawning season when mature fish dominate the catch.

A total of 34 northern pike were captured during the 2010 assessment for a catch rate or 6.6/hour (Table 4). Northerns caught averaged 15.5 inches (Table 5) and ranged from 8.3 inches to 29.1 inches and (Table 6). Six year classes were present in an aged subsample of northern pike. Ages 2 through 6 and 8 were present in the sample with ages 2 (n=4) and 3 (n=4) most common (Table 7).

Gamefish populations in the Crow Wing River are self-sustaining and natural reproduction appears to be adequate to maintain healthy populations. While there are no prior spring gamefish assessments to compare this survey to, catch rates for walleye were more than four times higher than the highest catch rate observed in spring surveys conducted on the Mississippi River from Brainerd to Little Falls, MN. Northern pike numbers appear to be similar to what is generally sampled on the Mississippi River. Smallmouth bass populations in the Crow Wing River appear lower than that in the Mississippi River although it appears numbers are increasing in the system. Very few bass have been sampled upstream of Pillager Dam in four prior summer fish population assessments.

Summer IBI Assessment

A total of 32 species were sampled in four electrofishing stations during the 2010 assessment on the Crow Wing River between Staples, MN and its confluence with the Mississippi River (Table 7). Five species including brassy minnow, bigmouth shiner, northern redbelly dace, fathead minnow, and trout-perch had never been sampled in the Crow Wing River and were added to the historical species list. A total of 42 different species of fish have been sampled in this and four prior population assessments combined.

IBI scores ranged from 60 at stations Su_EF1 and Su_EF3 to 42 at Su_EF2. All stations had IBI scores that exceeded the upper confidence limit for moderate to large sized rivers in northern Minnesota (Table 3). According to MPCA, IBI scores above the 90% confidence limits reflect “good” biological condition. In general, all stations received high scores for having a low percentage of individuals that were detritivores or exotic species, and moderate to low scores for all other metrics (Table 3).

Gamefish species captured during summer IBI sampling included northern pike, rock bass, bluegill, smallmouth bass, largemouth bass, black crappie, yellow perch and walleye (Table 7). All gamefish species were captured in at least three of four electrofishing stations except for black crappie which was identified in only one station. Two muskellunge were observed during electrofishing runs at Su_EF4 downstream of Sylvan Dam, but were not captured. A comprehensive Crow Wing Watershed Biological Monitoring Report describing IBI sampling methodology and data will be available from MPCA in the next two years.

Hydrology

Crow Wing River discharge information was obtained from the USGS Water Resources website. Daily discharge has been monitored at Pillager, MN at Station #05247500 since 1968. Historical low and high flows measured at Pillager, MN were 60 cfs on August 10, 1976 and 18,300 on April 14, 1965 respectively. Discharge in 2010 followed typical patterns with high flows in spring, low flows during summer and increased flows during fall. Peak flows during spring were higher than average and occurred earlier than normal. Discharge was normal during early summer and above normal from late July through fall. Fall flows were much higher than normal in 2010 (Figure 9). Peak discharge was 10,300 cfs and occurred on March 17, 2010. Minimum flow was 714 cfs and was recorded on February 6, 2010. Discharge during the spring gamefish assessment was 1,740 to 1,660 cfs on April 23 and 26, 2010 respectively. Discharge during summer IBI sampling was 1,630 cfs on 6/29/10, 1,580 cfs on 6/30/10, and 1,250 cfs on 7/1/10.

Table 1. 2001 NLCD land use percentages for the Crow Wing River Watershed.

Land Use	Area (acres)	Percentage
Open Water	84,129	6.63
Developed, Open Space	37,909	2.99
Developed, Low Intensity	4,639	0.37
Developed, Medium Intensity	733	0.06
Developed, High Intensity	326	0.03
Barren Land (Rock/Clay/Sand)	467	0.04
Deciduous Forest	492,237	38.80
Evergreen Forest	160,791	12.67
Mixed Forest	2,008	0.16
Shrub/Scrub	45,318	3.57
Grassland/Herbaceous	26,997	2.13
Pasture/Hay	147,988	11.66
Cultivated Crops	129,445	10.20
Woody Wetlands	44,616	3.52
Emergent Herbaceous Wetlands	90,972	7.17
Total	1,268,575	100.00

Table 2. 2001 NLCD land use percentages for minor watersheds adjacent to the Crow Wing River from Staples, MN to the confluence with the Mississippi River.

Land Use	Area (acres)	Percentage
Open Water	5,384	4.79
Developed, Open Space	3,735	3.32
Developed, Low Intensity	603	0.54
Developed, Medium Intensity	90	0.08
Developed, High Intensity	29	0.03
Barren Land (Rock/Clay/Sand)	13	0.01
Deciduous Forest	45,992	40.96
Evergreen Forest	5,614	5.00
Mixed Forest	44	0.04
Shrub/Scrub	4,897	4.36
Grassland/Herbaceous	3,677	3.27
Pasture/Hay	17,719	15.78
Cultivated Crops	9,921	8.84
Woody Wetlands	7,713	6.86
Emergent Herbaceous Wetlands	6,875	6.12
Total	112,306	100.00

Table 3. IBI scores for all summer stations on the Crow Wing River from Staples, MN to the confluence with the Mississippi River.

	SpEF1	SpEF2	SpEF3	SpEF4
Metric	0 - 100 Score	0 - 100 Score	0 - 100 Score	0 - 100 Score
Percent individuals that are detritivores	9	7	8	8
Percent individuals that are exotic species	11	11	11	11
Percent individuals that are insectivore species	5	5	5	1
Percent individuals that are non-lithophilic nest-guarders	11	5	1	10
Percent of individuals that are sensitive species	5	3	1	2
Percent of taxa that are sensitive	8	7	3	6
Percent of taxa that are simple lithophilic spawners	5	7	3	6
Percent of taxa that are serial spawners	3	8	6	4
Percent of taxa that are very tolerant species	3	6	4	7
Total IBI Score	60	59	42	55

Table 4. Catch per unit of effort (CPUE) for gamefish captured at each site during spring sampling on the Crow Wing River from Staples, MN to Pillager, MN.

	Station		
	Spr_EF1	Spr_EF2	Combined
River Mile	21-25	14-17	14-25
Effort (hrs)	1.70	1.86	3.56
Species	CPUE		
Bluegill	0.0	0.5	0.3
Northern pike	7.1	11.8	9.6
Smallmouth bass	2.4	23.7	13.5
Walleye	24.1	12.9	18.3

Table 5. Number caught and minimum, maximum and mean length of all gamefish captured during spring sampling on the Crow Wing River from Staples, MN to Pillager, MN.

Species	Number Caught	Minimum Length	Maximum Length	Mean Length
Bluegill	1	8.0	8.0	8.0
Northern pike	34	8.3	29.1	15.5
Smallmouth bass	48	8.6	18.9	14.2
Walleye	65	5.9	27.9	15.0

Table 6. Length frequency distribution of gamefish species sampled on the Crow Wing River from Staples, MN to Pillager, MN.

Length Group (inches)	Species			
	NOP	SMB	WAE	BLG
< 5.0				
5.0-5.4				
5.5-5.9			1	
6.0-6.4			1	
6.5-6.9			4	
7.0-7.4			1	
7.5-7.9			4	
8.0-8.4	3		2	1
8.5-8.9		1	1	
9.0-9.4	2			
9.5-9.9	1			
10.0-10.4	1			
10.5-10.9	1	1		
11.0-11.4	2	5		
11.5-11.9	2	4	1	
12.0-12.4	3	6	2	
12.5-12.9		3	1	
13.0-13.4		1	9	
13.5-13.9		3	4	
14.0-14.9	2	6	7	
15.0-15.9	3	5		
16.0-16.9	1	4	2	
17.0-17.9	1	5	2	
18.0-18.9	2	4	3	
19.0-19,9	4		8	
20.0-20.9			4	
21.0-21.9			1	
22.0-22.9	2		2	
23.0-23.9	1		3	
24.0-24.9	2			
25.0-25.9			1	
26.0-26.9				
27.0-27.9			1	
28.0-28.9				
29.0-29.9	1			
Total	34	48	65	1

Table 7. Age and mean length at annulus formation for a subsample of gamefish sampled on the Crow Wing River from Staples, MN to Pillager, MN.

		Age/Year Class								
Species		Age 1/2009	Age 2/2008	Age 3/2007	Age 4/2006	Age 5/2005	Age 6/2004	Age 7/2003	Age 8/2002	Age 9/2001
Northern pike	n=12		4	4	1	1	1		1	
	Mean length at age		13.2	18	18.1	22.4	23.6		29.1	
Smallmouth bass	n=4				1	1	1	1		
	Mean length at age				12.1	14.6	16	15.9		
Walleye	n=41	12		3	14	2	6	2		2
	Mean length at age	7.3		12.4	14.1	17.2	19.1	20.5		21.8

Table 8. Species list of fishes sampled in the Crow Wing River during summer 2010 IBI sampling from Staples, MN to the confluence with the Mississippi River.

Common Name	Scientific Name	Sum_EF1	Sum_EF2	Sum_EF3	Sum_EF4
Bowfin	*Amia calva*			x	
Central mudminnow	*Umbra limi*	x	x	x	
Northern pike	*Esox lucius*	x	x	x	x
Common carp	*Cyprinus carpio*	x		x	
Brassy minnow	*Hybognathus hankinsoni*	x		x	
Hornyhead chub	*Nocomis biguttatus*	x	x	x	x
Common shiner	*Luxilus cornutus*	x	x	x	x
Bigmouth shiner	*Notropis dorsalis*	x			x
Blacknose shiner	*Notropis heterolepis*		x	x	
Spotfin shiner	*Cyprinella spiloptera*	x	x	x	x
Northern redbelly dace	*Phoxinus eos*	x			
Bluntnose minnow	*Pimephales notatus*	x	x	x	x
Fathead minnow	*Pimephales promelas*			x	
Longnose dace	*Rhinichthys cataractae*	x			x
Creek chub	*Semotilus atromaculatus*	x	x	x	
White sucker	*Catostomus commersoni*	x	x	x	x
Silver redhorse	*Moxostoma anisurum*	x	x	x	x
Shorthead redhorse	*Moxostoma macrolepidotum*	x	x	x	x
Greater redhorse	*Moxostoma valenciennesi*	x	x	x	
Trout-perch	*Percopsis omiscomaycus*				x
Burbot	*Lota lota*	x	x		x
Rock bass	*Ambloplites rupestris*	x	x	x	x
Pumpkinseed	*Lepomis gibbosus*			x	x
Bluegill	*Lepomis machrochirus*	x		x	x
Smallmouth bass	*Micropterus dolomieui*	x	x	x	x
Largemouth bass	*Micropterus salmoides*		x	x	x
Black crappie	*Pomoxis nigromaculatus*			x	
Johnny darter	*Etheostoma nigrum*	x	x	x	x
Yellow perch	*Perca flavescens*	x	x	x	x
Logperch	*Percina caprodes*	x	x	x	x
Walleye	*Sander vitreum*	x	x	x	x
Mottled sculpin	*Cottus bairdi*	x			x

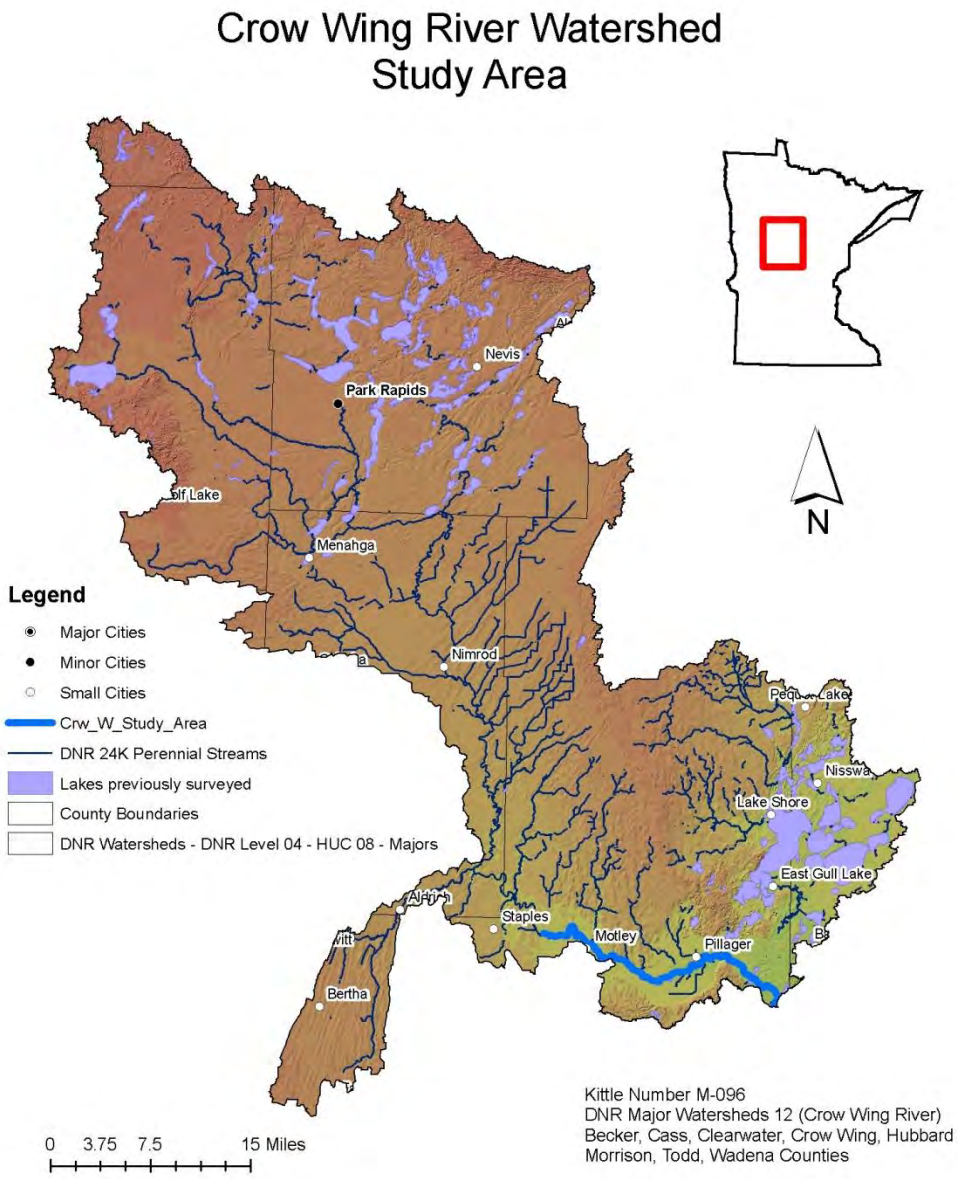


Figure 1. Crow Wing River Major Watershed showing 30 meter digital elevation model, DNR 24K Perennial Streams, surveyed lakes and the Crow Wing River study area in the Little Falls Area.

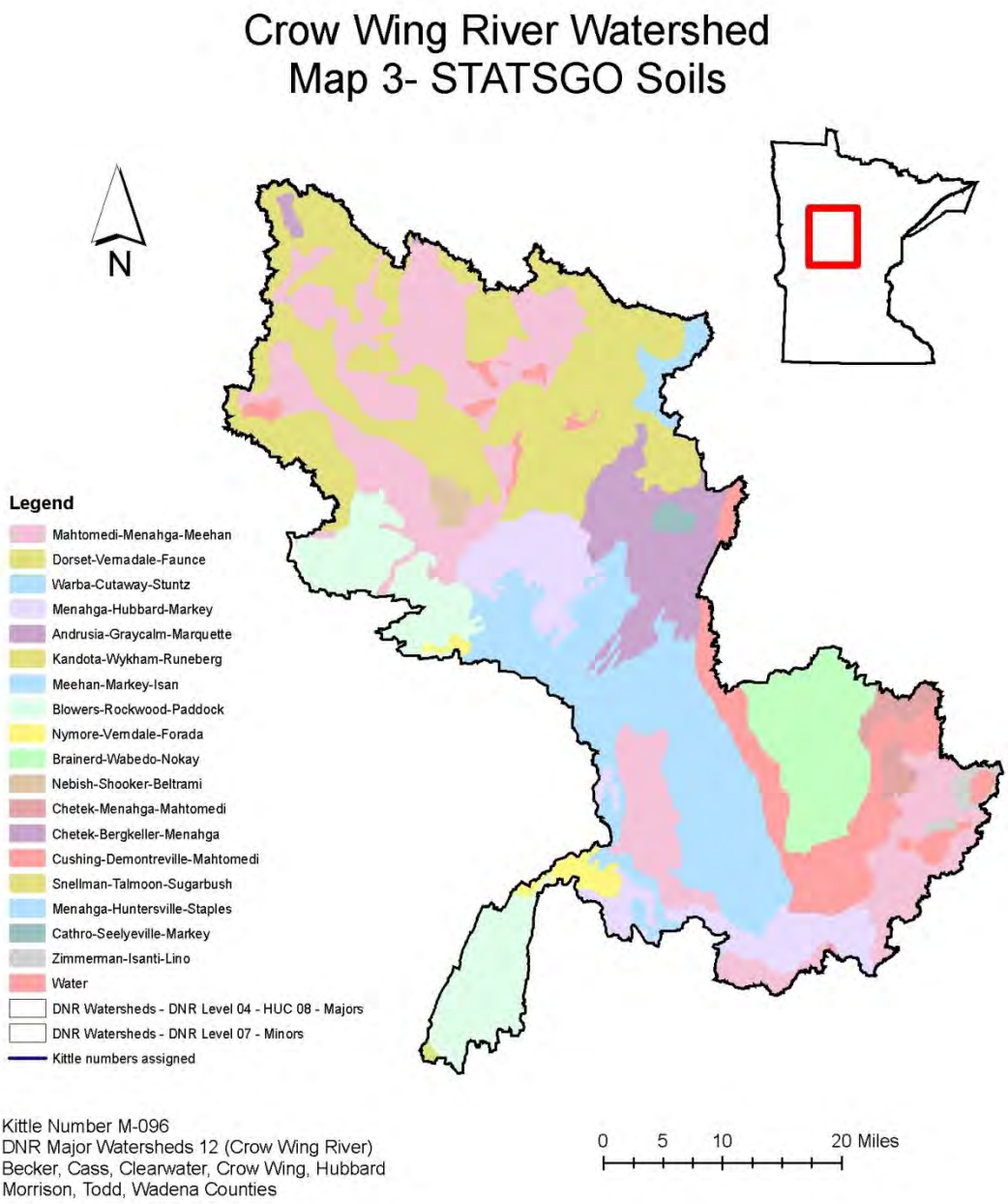


Figure 2. Crow Wing River watershed showing STATSGO Soil types in the watershed.

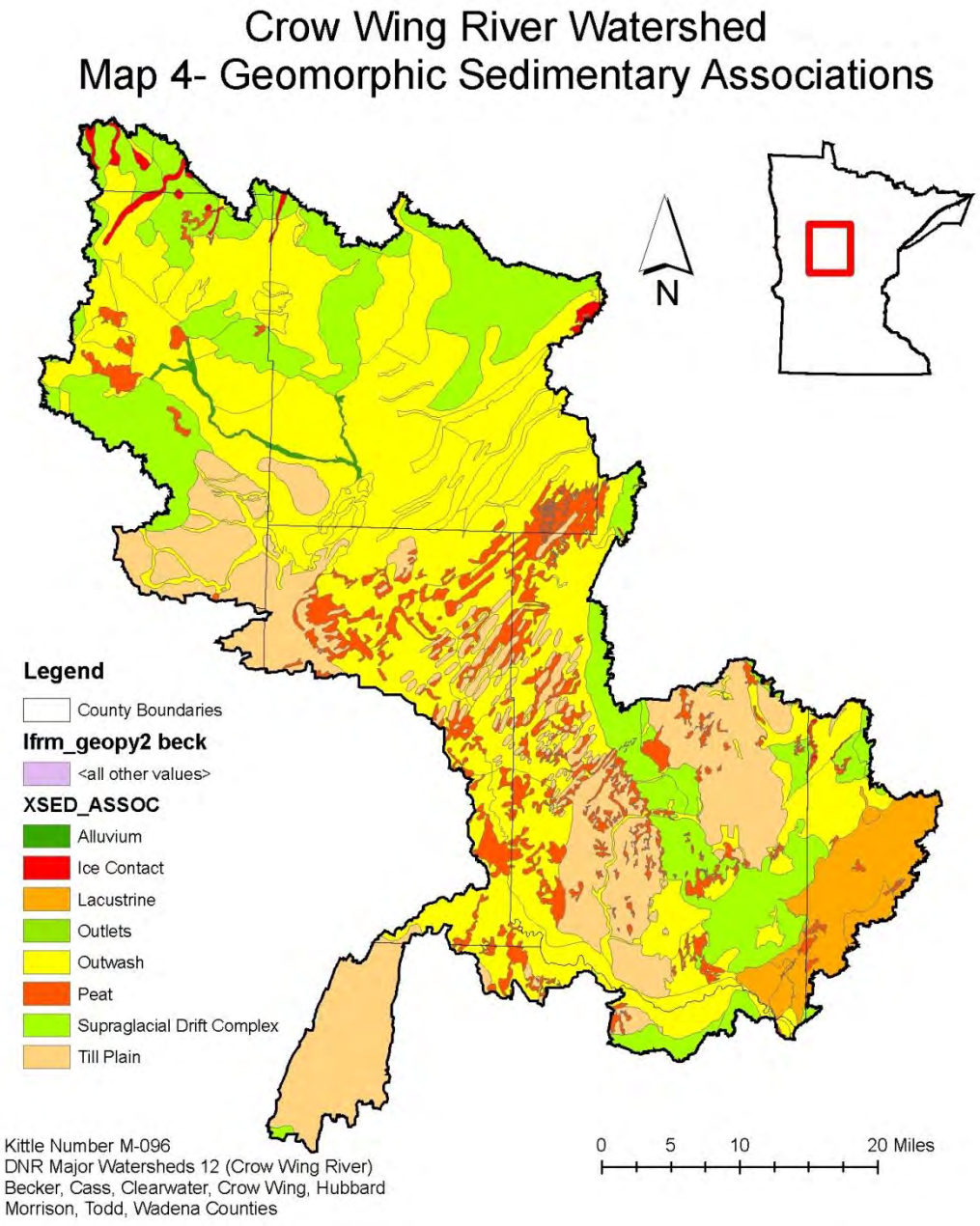


Figure 3. Crow Wing River Watershed showing geomorphic sedimentary associations.

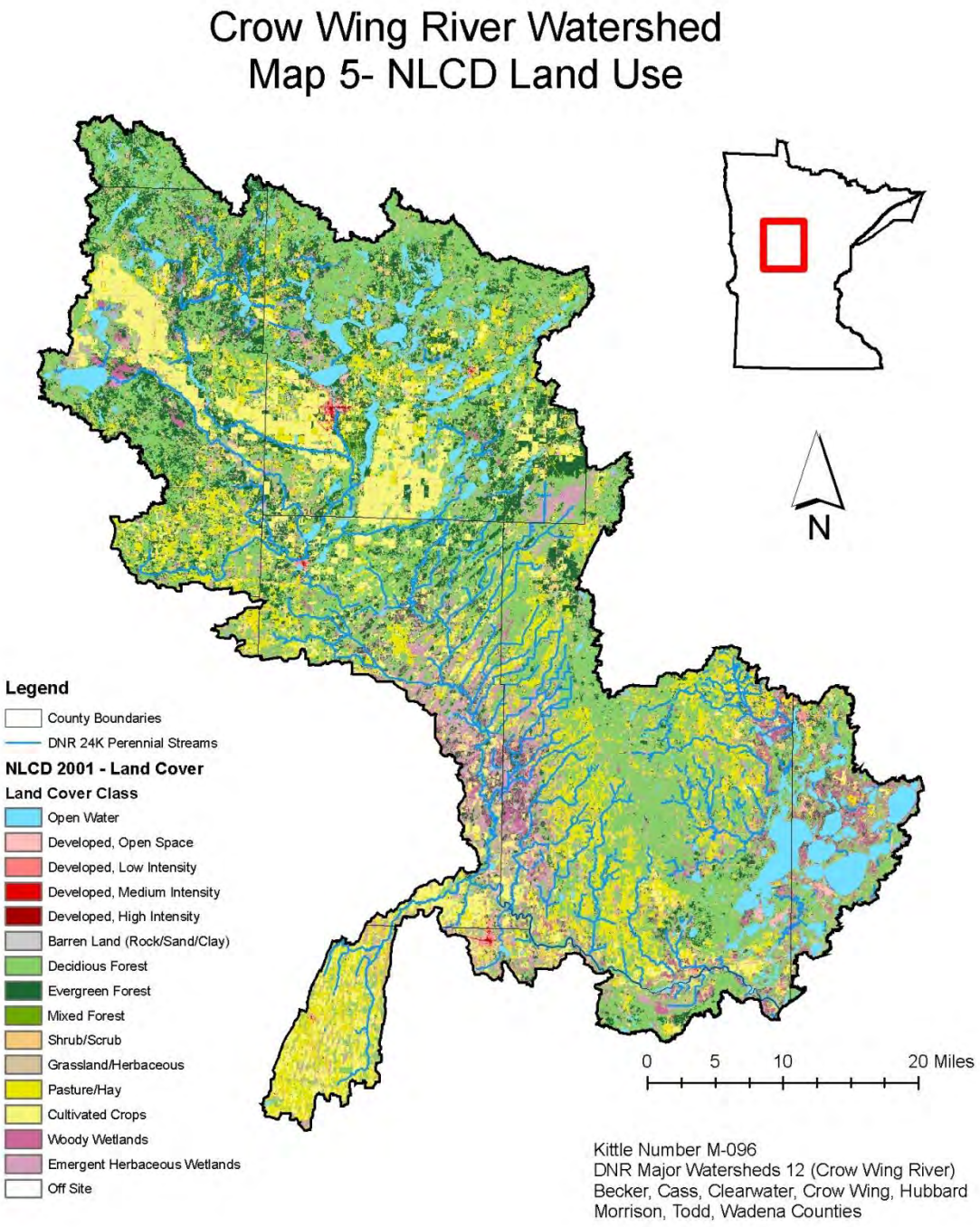


Figure 4. Crow Wing River Watershed showing NLCD 2001 land cover and DNR 24K perennial streams.

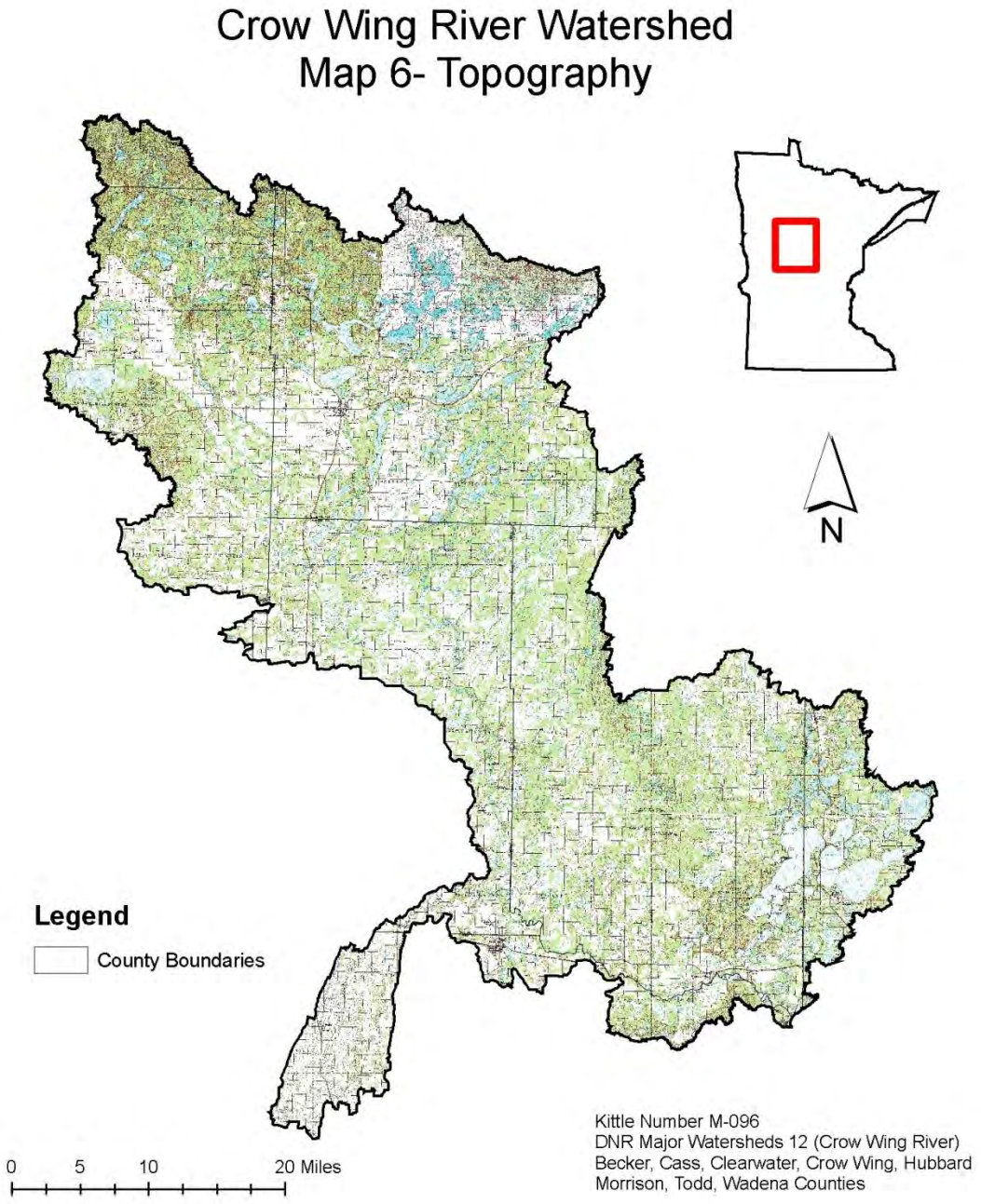


Figure 5. Crow Wing River Watershed showing 100 K USGS topographic map coverage.

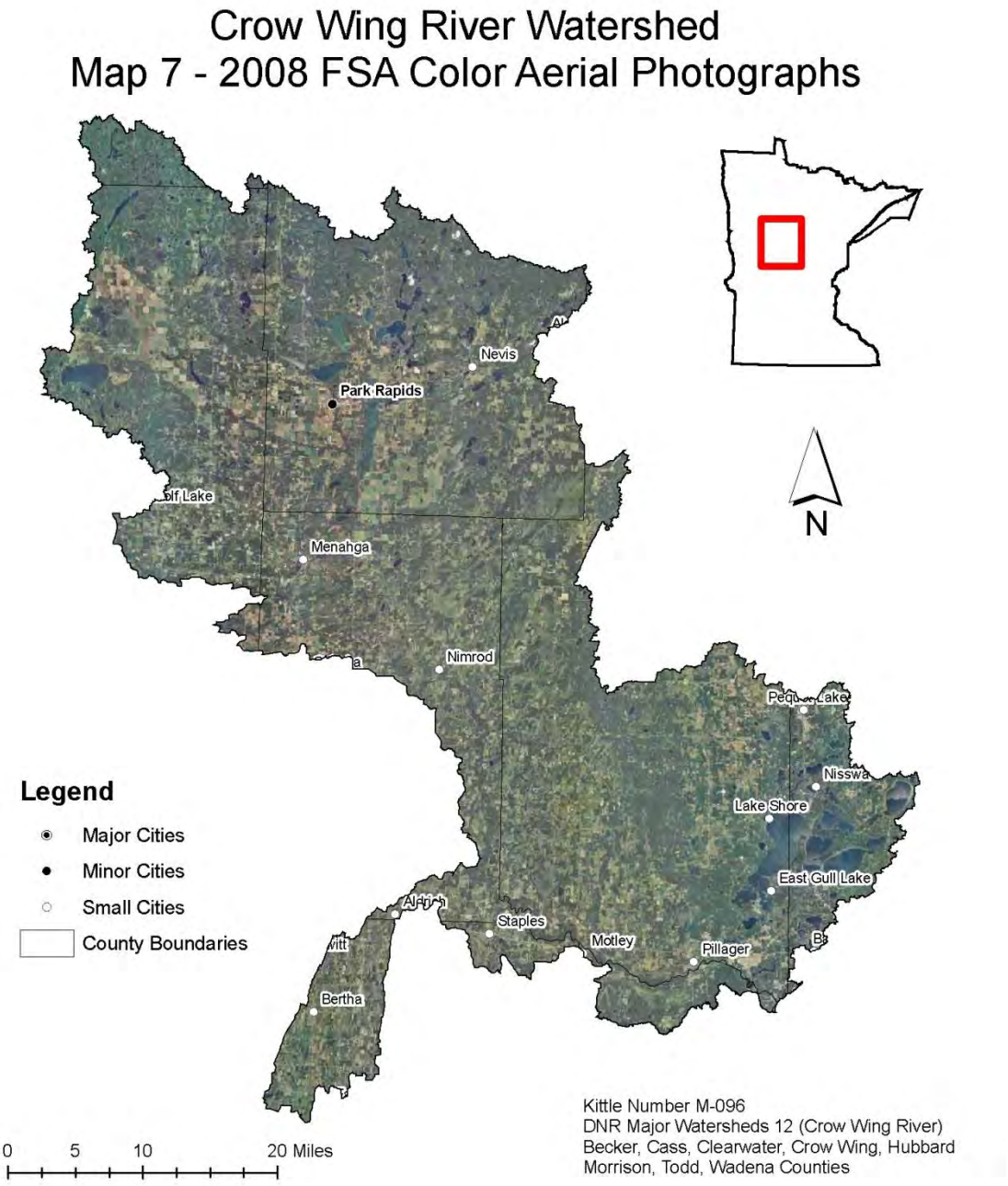


Figure 6. Crow Wing River Watershed showing FSA 2008 color aerial photography.

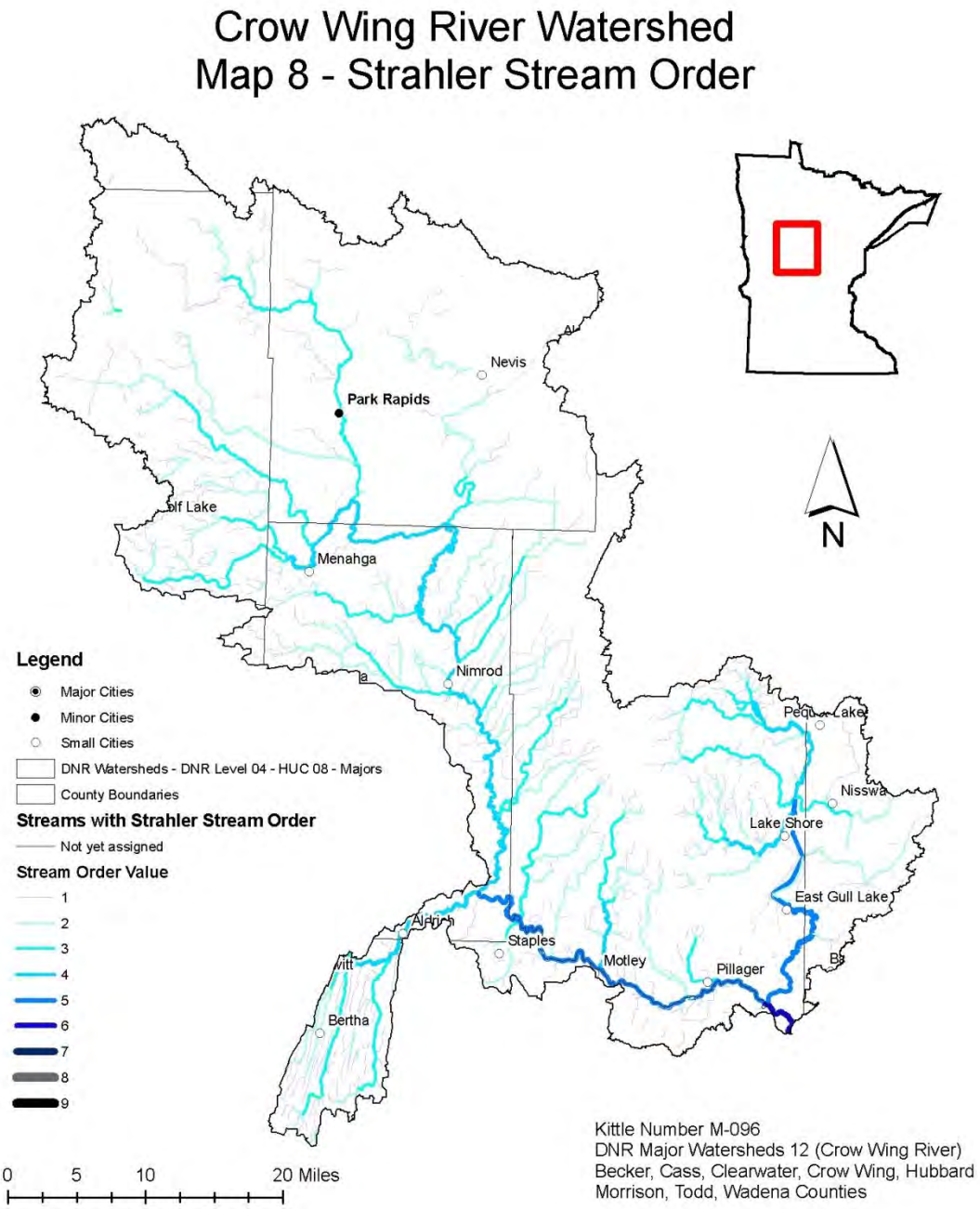


Figure 7. Crow Wing River Watershed showing Strahler Stream Order for the Crow Wing River.

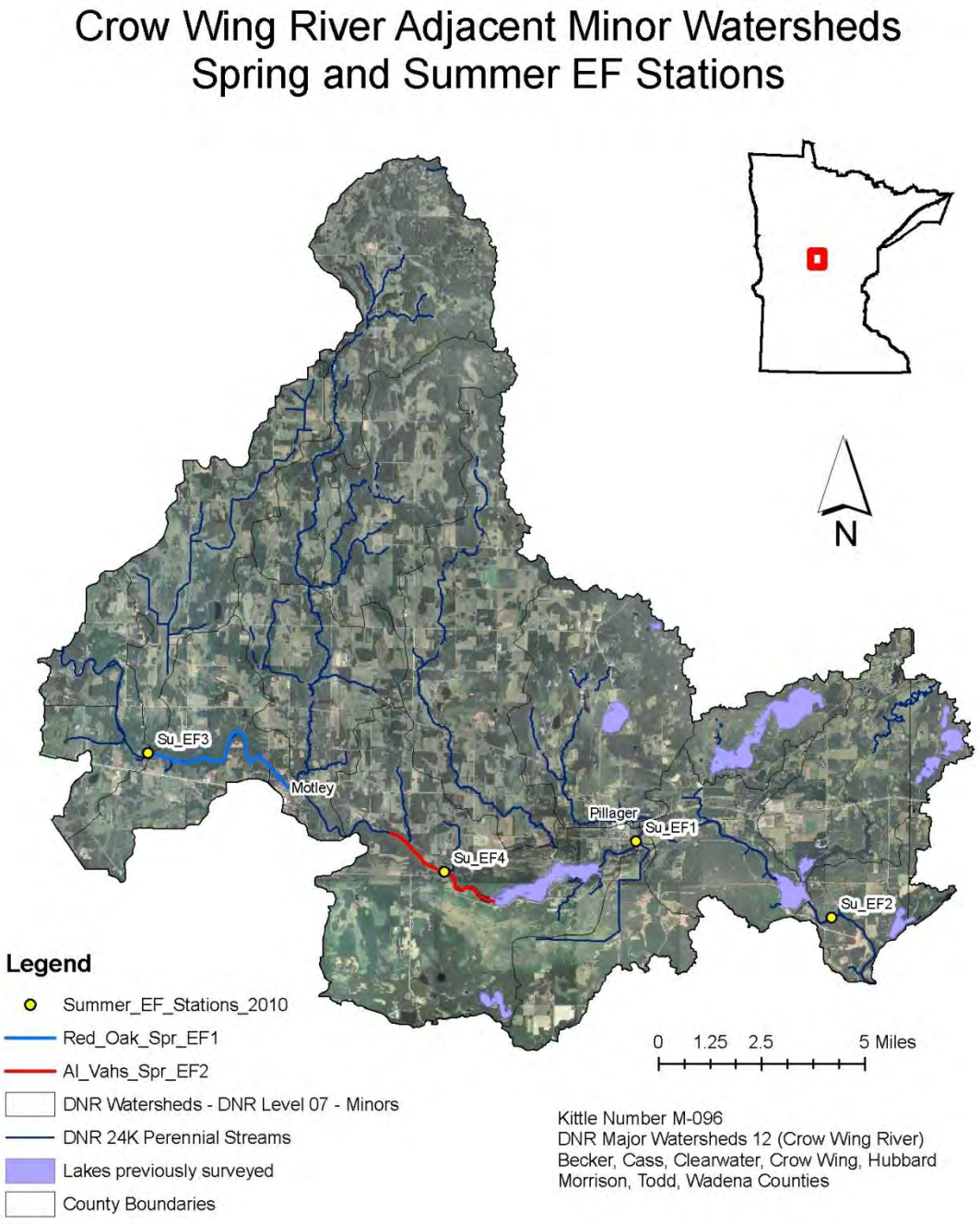


Figure 8. Adjacent minor watersheds to the Crow Wing River in the Little Falls Area showing spring and summer electrofishing stations.

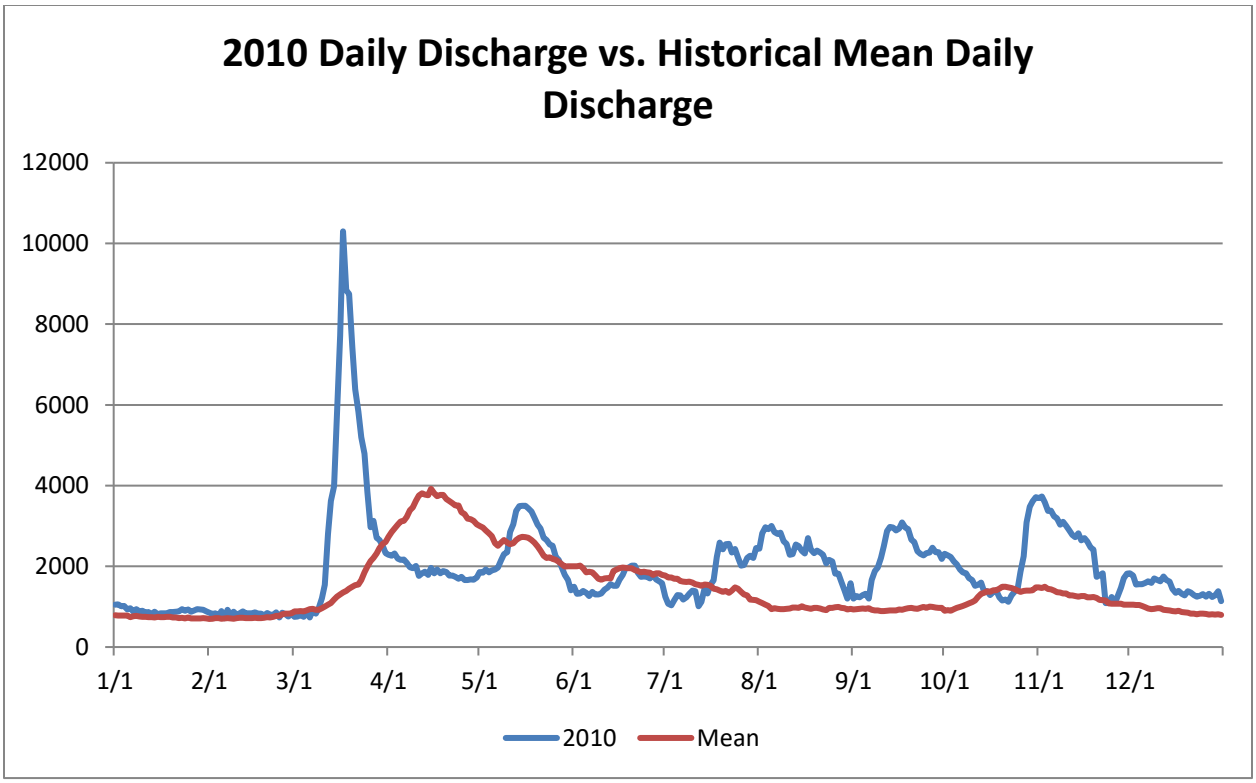


Figure 9. 2010 mean daily discharge versus historical mean daily discharge for the period of record (1968 through 2009) on the Crow Wing River at Pillager, MN USGS Gage Station #05247500.

Crow Wing River Gamefish and Fish IBI

Assessment Report

Spring Gamefish and Summer Fish IBI Assessment on the Crow Wing River

from Staples, MN to the Mississippi River

May 19 through May 20, 2010

River Miles 0 to 25

By: Steven M. Marod

Little Falls Area Fisheries

Minnesota Dept. of Natural Resources

Division of Fish and Wildlife

Central Region, Little Falls, MN

2011

Approved by:  _____ Date: 4/19/10

Area Fisheries Supervisor

Approved by: _____ Date: _____

Regional Fisheries Supervisor

Stream Management Plan

Stream Name: Mississippi River		**Reach:** Brainerd Dam to Little Falls Dam (39.5 miles)	**Tributary Number:** M-1
Region: III	**Area:** 350	**Ecological Classification:** Class II – SMB, MUE, WAE	**County (ies):** Crow Wing, Morrison

Long Range Goal: Protect and improve water quality, stream habitat, and flow regimes within the stream and its watershed to provide adequate conditions for the maintenance of self-sustaining populations of smallmouth bass, muskellunge, walleye and northern pike and to maintain species diversity within the fish community. Maintain spring electrofishing CPUE of 25 to 45 per hour and RSD-15 of 25 or greater for smallmouth bass. Maintain spring muskellunge electrofishing CPUE of 0.2 per hour or 0.02 per hour by angling with 25% being 40 inches or larger. Maintain the presence of muskellunge over 50 inches and protect the genetic integrity of the population. Maintain spring electrofishing CPUE of 3 to 6 per hour or greater for walleye age I and older. Maintain Index or Biotic Integrity (IBI) scores in full surveys and population assessments of 60 or greater.

Operational Plan:

1) Work with riparian landowners, citizen groups, agencies such as the Mississippi Headwaters Board; National Resources Conservation Service (NRCS); Crow Wing and Morrison County SWCDs; MPCA; watershed districts; local water planners; local planning and zoning; U.S. Army Corp of Engineers; USFWS; county and municipal governments; MNDOT; high schools and colleges; Camp Ripley personnel; other DNR sections and planners; and other state agencies to plan and implement proper watershed and riparian land use practices.
2) Support regulatory authority of Mississippi Headwaters Board (MHWB) to maintain uniform protective shoreline development regulations. Encourage the adoption of alternative shoreland standards.
3) Support and provide technical assistance to Crow Wing and Morrison SWCD staff in bank stabilization projects, livestock fencing, and off-river watering sites on the river and its tributaries.
4) Work in coordination with MHWB, MPCA, county SWCDs, local high schools, and colleges and universities to evaluate and monitor water quality using biotic and physical indicators. Work to include water quality monitoring on major tributaries.
5) Investigate D.O.W. and A.P.M. permits to ensure protection of riparian and in-stream habitat within the watershed and maintain ecological integrity of the stream corridor.
6) Document and monitor riparian land use and land use changes using available GIS layers.
7) Provide input to Army COE's Reservoir Operating Plan Evaluation (ROPE) so that resources are protected or enhanced due to changes in upper Mississippi reservoir operations.

Mississippi River –Brainerd Dam to Little Falls Dam - Stream Management Plan

Operational Plan (continued):

8) Pursue construction of proposed fish passage around Little Falls Dam.
9) Provide fish samples requested by the Department of Public Health and the USFWS for continued contaminant monitoring.
10) Conduct stream resurvey in cooperation with other DNR Area Offices every 10 years with the next survey scheduled for 2017.
11) Conduct a directed spring smallmouth bass and gamefish electrofishing assessment every four years with the next occurring in 2009.
12) Review hydropower re-licensing documents in coordination with DNR Ecological Resources Division to minimize flow fluctuations by requiring specific guidelines are followed for "run-of-the-river" operation. Monitor compliance of hydropower operations by requesting and analyzing hydrographic data from operators.
13) Area Fisheries staff will actively participate in the development of the Mississippi River Low Flow Water Plan.
14) Protect critical spawning and wintering habitats identified in the muskellunge telemetry study.
15) Educate riparian landowners of river resource ecology and the importance of instituting best management practices (BMPs) on their lands to protect shoreline and near shore habitats.
16) Support WCA and wetland improvement/restoration projects proposed by USFWS, DU, MWA, and county and state conservation agencies within the watershed.
17) Support efforts by other DNR sections, private land trusts, and local government agencies to establish, protect and connect sensitive and outstanding resources by helping to identify potential "greenways" or natural corridors worth protecting for their habitat and wildlife value in the watershed. Actively participate in this process by purchasing AMAs or conservation easements along the river when opportunities arise. Also, support above mentioned groups interested in purchasing lands or conservation easements along the river.
18) Partner with Camp Ripley's ACUB Plan to help purchase lands and conservation easements to protect riparian lands.
19) Provide input to Army COE's Reservoir Operation Plan Evaluation (ROPE) so that resources are protected or enhanced due to changes in upper Mississippi reservoir management/manipulation.

Mid Range Objectives:

1) Monitor shoreline habitat and determine whether protective development standards are being followed in the riparian corridor.
2) Determine if improvements and protection of water quality and habitat have been achieved through the development of partnerships with other agencies and organizations.
3) Collation of pertinent biological, limnological, and physical information relative to the stream and watershed.

Mississippi River –Brainerd Dam to Little Falls Dam - Stream Management Plan

Mid Range Objectives (continued):

4) Adequate inventory of fish populations to assess progress toward management goals.
5) Determine if conservation corridors (greenways) are being established through land purchases and conservation easement purchases.
6) Monitor operation of upstream and downstream dams to determine that compliance to specific "run-of-river" operational guidelines is occurring.
7) Establish plan to protect important smallmouth bass and muskellunge spawning habitat.

Potential Plan:

1. Assist in the design and development of a fish passage around Little Falls Dam through Mill Park at the former Hennepin Paper Company property.	**$750,000.00+**
2. Purchase AMAs or conservation easements when desirable riparian lands become available.	**$250,000.00+**
Total Cost:	**$1,000,000.00+**

Mississippi River –Brainerd Dam to Little Falls Dam - Stream Management Plan

Primary Species Management: Smallmouth bass, Muskellunge	**Secondary Species Management:** Walleye, Northern pike
Area Supervisor Signature:	**Date:** 4/28/2009
Regional Manager Signature: Dirk L. Peterson	**Date:** 06/01/09

Mississippi River –Brainerd Dam to Little Falls Dam
Stream Management Plan – Narrative

Past Surveys: Stream surveys were conducted in 1965, 1985 and 2007-2008. Population assessments were completed in 1987, 1992, 1993 and 1995. Annual aerial fish house counts were taken from 1985 through 1993. DNR Fisheries Research performed a muskellunge telemetry study from 1990 to 1993 and a muskellunge strain study was conducted in 1990. Spring smallmouth bass assessments were completed in 1994 through 1998, and in odd years from 2001 through 2007. Smallmouth bass

reproduction checks were completed each fall from 1992 through 2000. A smallmouth bass movement study was completed in 1993 along with a creel survey on the lower nine

Past Surveys (continued):
miles of this stretch of the river. An aerial recreational use survey was conducted in 1995. A creel survey was completed on the entire stretch of the river in 1996. Riverwatch (a.k.a. Aquatech) assessed water quality from 1991 through 2000. DNR Ecological Resources conducted research on mussels in 1993 and purple loosestrife in the vicinity of the Highway 10 Bridge in 1995. St. Anthony Falls Laboratory conducted a flow/hydrology study in the vicinity of the Highway 10 Bridge in 1998. Army COE completed a dredging feasibility study for the east channel at the Highway 10 Bridge site in 1999. DNR and the Army COE completed environmental assessments for dredging at the Highway 10 east channel site in 1999. Dredging and modification of the main and east channels near Highway 10 was completed in 2001. A voluntary angler diary to assess muskellunge population characteristics was done in 1999 and 2000. MPCA has monitored water quality at the Co. 115 bridge since 1967.

Past Management: A total of 3,259 muskellunge fingerlings (unknown strain) were stocked from 1970-1975 and 1977. Stocking of Mississippi River strain muskellunge amounted to 1,000 in 1988, 100 in 1990 and 500 (right pelvic fin clip) in 1991. A total of 240 pounds of fingerling walleye were stocked in 1984. In 1989, 20 brood stock smallmouth bass were removed and sold to a private fish hatchery. A total of 35 adult smallmouth bass were collected in 1992 for introduction into the Otter Tail River (Fergus Falls Area). An erosion control and habitat improvement project occurred along 2000 feet of shoreline at Le Bourget Park in Little Falls. Limited commercial fishing for bullheads has occurred in the reservoir. An Aquatic Management Area was purchased on the west side of the river across from Fletcher Creek in 1996 to protect muskellunge spawning habitat. Morrison SWCD completed a bank stabilization project north of the Little Elk River confluence. Bank stabilization was completed at Crow Wing State Park in 2005. New public access sites were constructed in Little Falls at Le Bourget Park in 1999 and on the east side south of the railroad bridge in 2003. A riparian planting of wild grasses and flowers occurred along the river in 2001 at Le Bourget Park. Wild rice was planted on the southeast side of the Highway 10 Bridge crossing in the fall of 2003. Several conservation easements have been obtained by the U.S. Army at Camp Ripley under the Army's ACUB program. Catch and release regulations for muskellunge were instituted in 2007. Crow Wing State Park has expanded by purchasing additional land north on both sides of the Mississippi River.

Stream and Watershed Alterations:

1) Four hydropower dams affect this stretch of the Mississippi River and its watershed. Brainerd Dam (owned by Wausau Paper Company) and Little Falls Dam (MP&L) in Little Falls are located at opposite ends of this stretch of river. Two other dams owned by MP&L, Pillager and Sylvan are located on the Crow

Wing River. All four dams have associated reservoirs which have altered stream communities and are barriers to fish movement.

Mississippi River – Brainerd Dam to Little Falls Dam - Stream Management Plan

Stream and Watershed Alterations (continued):

2) Agriculture is a major land use in the watershed and has impacts including: nutrient loading, erosion, sedimentation, pesticide runoff, channelization and wetland drainage. The use of center pivot irrigation within the Mississippi Watershed is common. There has been a renewed interest in ditch cleaning by farmers in the watershed.
3) Municipal and residential development continues to increase along the stream corridor especially near Brainerd and Little Falls. The Cities of Brainerd and Little Falls and the town of Fort Ripley are located along the river.
4) Timber harvesting is an important industry in the Mississippi River Watershed and can have impacts including increased runoff, erosion, sedimentation, and loss of riparian cover.
5) Stream channels and banks have been modified at bridge crossings.
6) Camp Ripley Military Reservation has altered riparian lands by constructing roads, picnic areas, a bridge construction training site, and ditches along the river.
7) A channel feeding the Hennepin Paper Mill breeched in 1998 blowing sediment and debris from the mill into the Mississippi River below Little Falls Dam.
8) A dredging project near the Highway 10 Bridge altered stream flows in the east channel. The east shoreline upstream and downstream of the east channel bridge was armored and a rock wall/pier was constructed on the west side of the east channel to direct flows and impeded drift of vegetation from the main channel. A rock weir and a wing dam were built at the upstream end of the east channel to manipulate flow.
9) Highway 371 improvements along this stretch of the river have impacted all tributaries flowing from the east. A new Highway 371 Bridge was constructed over the river south of Brainerd.
10) Riverbanks have been altered in the city of Little Falls to accommodate roads, parks and buildings.
11) Ditching of Fletcher Creek has caused flooding problems in Belle Prairie Township. Fletcher Creek has been altered near the confluence with the Mississippi River to abate flooding.

Social Considerations:

1) The cities of Brainerd and Little Falls and the town of Fort Ripley are located on the banks of this river section. The City of Little Falls has been a cooperative partner on some projects but has shown poor riparian land stewardship at times.
2) The MHWB and county planning and zoning offices have jurisdiction regarding shoreland ordinances within this stretch. Conflicts have occurred with riparian landowners disputing the need for restrictive ordinances.

3) Sedimentation is a major issue in the lower reservoir from Highway 10 to Little Falls Dam. Landowners downstream of the Highway 10 Bridge along the east channel demanded and received a major dredging project that altered the natural course of the Mississippi River in that area.

Mississippi River – Brainerd Dam to Little Falls Dam – Stream Management Plan

Social Considerations (continued):

4) Dam owners/operators such as Wausau Paper Company and Minnesota Power have potential fisheries impacts and should be closely monitored.
5) Agricultural land and water use practices greatly impact the watershed. Working with agencies and landowners is vital to proper watershed management. Urban and rural land use planning will become increasingly important to river management.
6) This portion of the river is a state designated canoe route.
7) The Mille Lacs Band of Ojibwe has an interest in the management of the Mississippi River and its watershed.
8) Camp Ripley Military Reservation is located along the west side of the river. Camp Ripley is currently attempting to purchase an Army Compatible Use Buffer (ACUB) within a 3 mile radius of the reservation. This includes riparian lands along the Mississippi and Crow Wing Rivers. Goals are to purchase or obtain conservation easements within three miles of Camp Ripley to reduce conflicts with training activities and preserve wild lands.
9) Crow Wing State Park is located on the east bank of the river at the confluence of the Crow Wing and Mississippi Rivers. The park has expanded its boundaries north along the east shore of the Mississippi River and west along the north shore of the Crow Wing River.
10) Municipal and residential development continues to increase near the cities of Brainerd and Little Falls and also along all the privately owned riparian land. Enforcement of shoreland ordinances is needed to minimize the impacts of development on the riparian corridor. Proper land use planning will be necessary to adequately protect water quality, habitat quality and watershed health.
11) The city of Brainerd and Camp Ripley have wastewater treatment facilities within this reach of the river.
12) Spill containment sites have been identified along this section of the Mississippi River by the U.S. Army Corp of Engineers.
13) Several public access sites exist along this stretch of the river and include: Brainerd, Crow Wing State Park, Nokasippi River, Fletcher Creek, Belle Prairie Park and Little Falls. Access is also available below Sylvan Dam on the Crow Wing River.
14) A public fishing pier is located at the Kiwanis Park in Brainerd. A fishing structure is also available in Little Falls upstream of the dam on the east bank.
15) Fishing pressure is light but may be increasing with new jetboat technology and increased exposure of this stretch on fishing shows. Muskellunge and smallmouth bass may be vulnerable to any pressure increases.

16) Recreational use is low in most areas due to inaccessibility or remoteness. Moderate recreational use occurs near municipalities.
17) Commercial fishing has taken place on a very limited basis for bullheads. Commercial harvest of turtles has also taken place.
18) The Smallmouth Alliance has been very active in pursuing management activities on the Mississippi River although there has been little recent activities.

Social Considerations (continued):

19) Catch and release regulations for muskellunge were implemented in 2007.
20) Zebra mussels have been present in the river since 2007.

Cultural and Natural Elements:

1) Camp Ripley and the original Fort Ripley are located along the river.
2) Crow Wing State Park is located along the riverbank near the confluence of the Crow Wing and Mississippi Rivers. A small portion of Lindberg State Park is located on the west bank north of Little Falls.
3) Camp Ripley environmental personnel and the County Biological Survey have worked together to complete an inventory of mussels, non-gamefish, reptiles, amphibians and aquatic invertebrates.
4) Much of this stretch is undeveloped and has a higher scenic value compared to other more heavily developed and impacted areas.
5) Rare animals in the vicinity of the river include: bald eagle, red-shouldered hawk, blanding's turtle, and eastern hognose snake. Two unique mussel sampling sites were also identified.
6) Rare vegetation types in the vicinity include: wet meadow, willow swamp, mixed pine-hardwood forest, oak forest, and dry prairie sand-gravel subtype (include rare plant: Drummond's campion).

Limiting Factors:

1) Water level fluctuations and seasonal flow regimes created by hydropower operations and natural events can limit fish populations and cause changes to habitat. Climatic factors such as precipitation and temperature have major impacts on populations of certain species. Large year classes of smallmouth bass have been correlated with low water and warm temperatures.
2) Water quality in the Mississippi River and its tributaries is impacted by agricultural activities in the watershed through nutrient loading, pesticide runoff, erosion and sedimentation. Irrigation, ditching, channelization of tributaries, and wetland drainage may also affect stream flows.
3) Industrial impacts to the river include changes in stream characteristics and fish migrations due to dams, and release of contaminants and toxic substances.
4) Tributaries drain primarily agricultural lands and are a major contributor of excess nutrients.
5) Inconsistent recruitment of smallmouth bass results in fluctuating populations and variable fishing success. Growth of smallmouth bass is good up to the 16-18 inch range but slows considerably once the fish reach spawning age. The potential of

bass to reach 20 inches is low as few of the oldest fish (10+ years) ever achieve this size.

6) Increased development, impervious surface, municipal runoff and septic systems drainage creates additional nutrient and chemical input and sedimentation impacts to the river.

Mississippi River –Brainerd Dam to Little Falls Dam – Stream Management Plan

Limiting Factors (continued):

7) Purple loosestrife, an exotic plant, has become established in the vicinity of Highway 10 north of Little Falls. Release of Asian beetles appears to have reduced its abundance to a low level.
8) Zebra mussels were observed on this stretch of the river in 2008 and may threaten to displace native mussels and be a nuisance to property owners and city utilities.

Survey Needs and Evaluation Plans:

1) A comprehensive river survey, in conjunction with other DNR Fisheries Areas, will be conducted every 10 years with the next survey in 2017.
2) Special gamefish assessments will be conducted every four years with the next to be completed in 2009.
3) Past statewide muskie angler diary research has been valuable for monitoring catch rates and population trends on this stretch of the river.
4) Water quality monitoring of the Mississippi and its tributaries by local schools, colleges, and universities; MPCA; or county SWCD offices.
5) Fish contaminant monitoring will be conducted when requested by DNR and USFWS.
6) Evaluate and utilize results of muskellunge telemetry study and spring smallmouth bass assessments to document locations of critical muskie and smallmouth bass spawning habitat and muskie winter habitat.

Land Acquisition Needs: Acquisition of riparian lands (AMAs) critical to fish management will be pursued if such sites become available. Lands valuable to form connections with other significant natural resources will be pursued for outright purchase or purchase of conservation easements. We will also support other agencies and land trusts pursuing conservation easements along the river corridor. Partnering with Camp Ripley on their ACUB program will be a priority.

Habitat Development Needs: The need for erosion and sedimentation control, pollution abatement and habitat development projects will be identified from stream inventories and GIS generated maps in partnership with individuals and agencies listed in the operational plan. Technical advice and professional guidance will be provided to Crow Wing and Morrison County and City of Brainerd and Little Falls officials pertaining to erosion control measures for impacted sites. Protecting forested riparian areas along the river and on tributaries will help reduce erosion and sedimentation. Use of "Best Management Practices" in riparian zones on this section of the Mississippi River and its tributaries will minimize impacts and maintain or improve in-stream habitat. Funding

procured by the counties within the Mississippi River watershed has been instrumental in the implementation of proper land use practices. Strong efforts should be made to continue to pursue funding for these practices. A greater emphasis needs to be placed on comprehensive watershed management planning to initiate projects of this type. Shoreline improvement and restoration sites need to be identified and actions taken to repair them. Plans to include a fish passage through the proposed Mill Park at the former

Habitat Development Needs (continued):
Hennepin Paper Mill site would join river sections that have been disconnected for approximately 100 years. This could benefit fish species such as smallmouth bass, redhorse sp., muskellunge, walleye, and white sucker by expanding available habitat. An in-depth river contour map using GIS would be valuable for evaluating and enumerating important fish habitats.

Habitat Protection Needs: Working with the Mississippi Headwaters Board, counties and city of Brainerd and Little Falls planners to ensure maintenance and enforcement of shoreland ordinances that protect riparian areas will be done to protect habitat. Protecting riparian habitat will also be accomplished by providing recommendations to the MHB, cities of Brainerd and Little Falls, Local Water Planners, the NRCS, county SWCDs, and other agencies. Critical review of DNR D.O.W. and A.P.M. permits and other private and public permits will also be done to minimize the impacts of increased development. GIS watershed mapping will be useful in identifying and documenting habitat protection needs. Implementation of proper land use practices is critical to maintaining habitat and water quality in the Mississippi River and should be continued and expanded. Appropriate posting off acquired AMA's will help protect these areas. Analysis of stream discharge data is essential to monitor compliance by hydropower facilities and evaluate affects of flow regimes on fish populations and habitat. Critical review of FERC dam relicensing documents is essential to protect fish and habitat from dam operations. Restoration of Fletcher Creek to abate erosion, flooding and sedimentation issues should be supported. Support of Camp Ripley's ACUB proposal would expand opportunities to institute BMP's in a significant portion of the watershed on the east side of the Mississippi River and provide many resource conservation opportunities. Fisheries may assume management or oversight responsibilities on riparian river sites purchased as AMA's or under permanent easement.

Stocking: None needed.

Regulations: Catch and release regulations for muskellunge have been in effect since 2007. Protective smallmouth bass regulations will be considered if an increase in fishing pressure causes a decline in the quality of the population.

Mississippi River – Brainerd Dam – Little Falls Dam
Fish Population Description

A diverse fish community exists on the Mississippi River from Brainerd Dam to Little Falls Dam with 41 different species sampled in five different surveys/population assessments. A stream survey utilizing boat and barge electrofishing and trapnetting in 2007-2008, sampled 34 different species including eight species defined as intolerant by the MPCA. Non-gamefish species most commonly encountered in electrofishing sampling included spotfin shiner, common shiner, hornyhead chub, white sucker, shorthead redhorse, Johnny darter and logperch. Biomass was dominated by catostomids, primarily white sucker, shorthead redhorse and silver redhorse.

Species richness in this section of the Mississippi River is indicative of "fair" to "good" water and habitat quality. IBI scores were calculated at nine electrofishing stations and ranged from 53 to 79. Seven of nine stations had IBI scores between 60 and 79 indicating "good" biotic integrity. Two stations had scores between 40 and 59 indicating "fair" biotic integrity.

A special smallmouth bass assessment conducted in 2007 effectively sampled gamefish on this stretch of the river. A total of eight different gamefish species were sampled in 4.7 hours of electrofishing effort in four stations combined on May 17-22, 2007. Species captured included: black crappie, bluegill, channel catfish, largemouth bass, smallmouth bass, muskellunge, northern pike and walleye. Smallmouth bass were the targeted species and were the most abundant species in the catch. A total of 205 smallmouth were sampled in 2007 for a CPUE of 43.62/hour. Catch rates in prior assessments from 1994 through 1998, and odd years from 2001 through 2005 ranged from 19.10/hour in 2001 to 58.93/hour in 1995. The mean catch rate for all years was 36.51/hour. Ages 1 through 12 were present in the electrofished sample. The 2000 year class was the largest comprising 18.17% of the aged sample. Though not an impressive year class, this cohort was also most common in 2003 and 2005 comprising over 40% of the catch both years. Low flow and precipitation patterns predominated during the spring and summer months of 2000, creating conditions favorable for smallmouth recruitment. Similar conditions were present in 2006 and 2007 with more yearling smallmouth (18 fish) sampled in 2007 than in any previous spring assessment. Smallmouth bass captured in the 2007 assessment ranged from 3.3 to 20.3 inches in length with 64.7% of the sample exceeding 16.0 inches. PSD values are typically high in this section of the river ranging from 93 in 1996 to 100 in 1994. The calculated PSD value for smallmouth bass captured in 2007 was 95.0. Growth was fast with individuals reaching 16.1 inches at age 5. Trophy individuals in the 19.0 and 20.0-inch ranges comprised 12.7% of the catch.

A total of 13 walleye were captured during this assessment ranging from 6.9 to 20.2 inches. The catch rate (2.77/hour) was in the typical range for this stretch of the Mississippi River. Catch rates in prior assessments ranged from 1.4/hour in 1997 to 8.99/hour in 2001. Low water may have negatively influenced walleye vulnerability to our gear. Walleyes sampled in the 2007 assessment were ages 1 and 3 through 6. Yearling walleye comprised over ½ of the sample. Fifty-two northern pike ranging from 10.3 to 28.8 inches were captured. The 2007 northern pike catch rate was 11.1/hour with past catch rates ranging from 1.1 to 14.5 per hour. Ages 1 through 7 were present and age 1 pike were most common comprising 36.5% of the sample. Twenty-eight bluegills

ranging from 2.8 to 8.5 inches were captured during the assessment for a catch rate of 5.96/hour. Catch rates for bluegills have ranged from 0.00/hour in 1994, 1995, 1998 and 2001 to 6.26/hour in 2005. One muskellunge was observed but not captured during the assessment. Channel catfish were sampled for the first time in spring assessments in 2007. A total of six catfish between 21 and 24 inches were electrofished. Thirteen largemouth bass of various sizes were also sampled.

THE JOURNALS OF JOSEPH N. NICOLLET

A Scientist on the Mississippi Headwaters With Notes on Indian Life, 1836-37

TRANSLATED FROM THE FRENCH BY
André Fertey

EDITED BY
Martha Coleman Bray

Martha Bray

MINNESOTA HISTORICAL SOCIETY · ST. PAUL

©1970

he does not name them. The numerous instances of negligence I have noted on this map from St. Peter to here prove that good science cannot be accomplished by traveling a hundred miles a day. Why go to the trouble of mustering a national expedition and end up throwing confusion over the work done by the brave Major Pike thirty years earlier? I hope the country I have yet to cover in the course of this expedition will give me the opportunity of restoring the high regard I had acquired for Lieutenant Allen while reading his report to Major [General Alexander] Macomb.

I left the second of the Two Rivers at 12:08. Soon we began to feel the force of the current caused by the rapids we would have to negotiate that day. After a mile's navigation we met a succession of small rapids that merely make furrows through the river for half a mile, and after another half a mile we reached the foot of the big rapids called by the Canadians: *Rapide Coûteau*, or Cutting Rapids, (rapids cutting up the canoes as it were).[12] We made no portage, but we all disembarked so as to lighten the weight in the canoes.

Désiré, the young Missâbays[13] and Nankanâbitauk began to tow while Brunia, his brother, and Chagobay labored in water up to their waists, pushing the canoe over the crests of the impetuous waves swelled here by the sudden drop of the water level. We carried out this passage near the left bank of the river where rock-formed channels, the easiest to clear, are to be found.

During the halt we made at the foot of the rapids to prepare for the ascent, I noticed on the bank trickles of water oozing from under the rocks, suspending a kind of blue sand, brilliant, very fine, and sustaining afloat a matter very soft and oily to the touch when one stirred the liquid. It is a talcous sand resulting from the dissolution of a steatitic schist, rich in infinitely small talcum flakes, all filtering the oozing water referred to above. This steatite is crossed by veins of quartz and it seems to rest on the shales forming the bed of the river in these parts.[14]

This simple circumstance brings with it the opportunity of

[12] This is shown as Knife Rapids on Nicollet's 1843 map.

[13] Here and below (p. 48) Nicollet's use of this term is unexplained. He apparently referred to several young Chippewa who were members of the party and may have meant to use the word *missinabés* (see p. 114). Elsewhere he defines *missabay* as giant (Appendix 5, p. 255), and *missabé* as the manito of hunters (p. 212). Baraga (2:252) gives *missâbe* as giant.

[14] Nicollet used the French word *schist* which means both schist and shale, but here and elsewhere in the diary he meant shale.

reflecting upon the relative value attached by the human species to objects supplied by nature for its needs. The discovery of this sand caused me to reflect on the progress of the sciences and arts which are useful to society. William, the trader, the merchant, saw in it a veritable gold mine, and among the natives it awakened ideas of pleasure and vanity, inciting them to knead the sand, thus creating colors with which they daubed their faces, arms, and hair and smeared their foreheads, their clothing, and their canoes. Chagobay, in particular, drew on his cheeks a series of strokes equal to the number of illustrious deeds he had accomplished and decorated his chest with symbols of the medals of honor that had successively been granted to his ancestors and himself by the kings of France and England and the presidents of the United States. Brunia alone, an interesting man, a being halfway between the savage and the civilized man, remained calm and neutral in the middle of the three different orders of enthusiasm caused by this event.

It was in this new fashion, now entirely barbarian, that our canoes passed *Rapide-coûteau*, Knife Rapids or Cutting Rapids. Immediately after these rapids, two lovely brooks made their appearance, one after the other.[15] Their entrance into the river is concealed by tall grass, but their murmur is audible. I visited the first, which formed a cascade seven to eight feet high in a very wild site ten to fifteen feet away from the left bank of the river. For a mile after Cutting Rapids we met, in turn, places of uniform and gentle currents, then places where the currents are quickened by sudden changes in the river level. Whenever there is a little bay or curve one must use extra strength to maneuver the canoes.

Finally, during a fourth mile, we undertook and passed the rapids of the River of the Swans [*Pike Rapids*], the last ones on this part of the river. Here again the left bank is the side permitting an easier passage. It was nearly 5 o'clock when we reached the mouth of Swan River. Therefore we spent five hours coming from Two Rivers to Swan River. One and a half hours were devoted to resting and making the necessary preparations for each ascent. This left three and a half hours used traveling a distance I estimate to be four good miles, climbing up rapids and strong, free currents.[16]

[15] These brooks are shown but not named on the 1836 map. They do not appear on the 1843 map, and they are unidentifiable today.

[16] According to modern measurements this distance is 7 miles. See United

Blanchard

They offered me a basket full of blueberries. I took it, saddened by the thought that there was certainly nothing in their hut for breakfast and that there had probably been nothing there for supper the day before—the weather had been so bad and the men away. I was sorry I had given away ribbons when there must have been hopes for something more substantial. My heart was bleeding. And I had just scolded Désiré, so what could I do? I did find a way without his knowing about it. Then I climbed aboard the little canoe and my two little guardian angels, who seemed to be so happy because they had made me happy, led me toward the lightning-struck trees so that I could examine them. They dropped me off carefully on the shore, holding back the canoe by hanging on to reeds with their little hands, and returned safely across the river, although the south wind continued to blow strongly.

During my travels in America, I have often admired the precocious skill with which the children of the natives living along the shores of lakes and rivers maneuver their canoes; but I have to admit I did not expect as much on a river such as the Mississippi. Only yesterday, it was evident how afraid I was, although it was the women who manned the canoes. But this is what one observes every day and at any time of the day on the Mississippi wherever Sioux and Chippewa Indians are to be found.

At 11 o'clock the clouds seemed about to disperse. I took the necessary steps to measure the meridian sun and requested that our departure be organized. All went well. I had hardly finished making my observations when the sky clouded over again, and it stayed cloudy for the rest of the day. At 12:30 we bade farewell to Mr. Cravasson and Mr. William. The latter's mother was on her way to Red Lake so we took her with us. And so we left Swan River. It is marked on Tanner's map as the place where Major Pike spent the winter of 1805 to 1806.[27] I am anxious to read the diary of Pike's expedition. For the past three years I have been traveling in the South and West, but I have never been able to lay my hands on it.

Two miles after Swan River on the right bank there emerges a stream called Little Falls [*Pike*] Creek. It is named thus because of the presence of a waterfall three miles above. At this point, five

[27] See Tanner, *New American Atlas*. Folwell gives Pike's wintering ground of 1805–06 as "four miles south of Little Falls on the west bank of the Mississippi, 80 rods below the mouth of the Swan River." (*History of Minnesota*, 1:95.)

miles from Swan River, that is, there are indeed some rapids extending across the full width of the river [*Little Falls*]. They are less difficult than the previous ones, and they are the last of the series of obstacles of this nature in the way of steam or sailboat navigation on the upper Mississippi. The western extremity of these rapids is unmanageable because of a waterfall four or five feet high made up of an accumulation of pebbles, but the passage can be easily negotiated along the left bank where a canal is formed by an island and the bank, avoiding all danger and sparing the strength of the crew.

A quarter of a mile below the rapids, a rock eight to ten feet high is to be seen on the left bank. Its vertical façade bears Indian inscriptions drawn with red chalk.[28] Brunia volunteered first to give an interpretation of the hieroglyphic escutcheon: there were two bars more or less vertically parallel, followed by a circle under which was drawn a closed hand seizing something. Brunia believed this meant a party of Chippewa were descending the river to negotiate some important matter either with the Indian agent who represents the American government at St. Peter or with the Sioux they were hoping to meet. In which case, the circle represented the sun, the bars indicated two suns, hence two days, and the hand completed the statement which was that in two days the party descending the river would shake hands with the people they were going to see. This discourse from Brunia brought an ironical smile to Chagobay's lips. He could not conceive of Brunia's inattentiveness and assailed him severely. There followed between the two a discussion which made for me an interesting parody of the lofty literary criticisms exchanged between the young Champollion and Claprott on the subject of Egyptian hieroglyphics.[29] The two bars, insisted

[28] The existence of this rock had been noted by others. According to Pike the place was known as the Rapids of the Painted Rock, and Beltrami designated it "the Great Rock." In 1820 Schoolcraft reported a "Painted Rock upon which the Indians have drawn a number of hieroglyphics and rude designs." He located it, however, between Elk River and the Little Falls on the west or right bank of the Mississippi. The feature was described in detail by Warren Upham in the state geological survey. He confirms Nicollet's location, placing it "on the east shore of the Mississippi, about a half mile south of the middle of Little Falls village, and about a fifth of a mile south from the end of Mill Island." See Coues, ed., *Expeditions of Pike*, 1:316; Beltrami, *A Pilgrimage in Europe and America*, 2:466; Schoolcraft, *Narrative Journal of Travels*, 267; Newton H. Winchell and Warren Upham, *The Geology of Minnesota*, 2:596 (St. Paul, 1888).

[29] Jean François Champollion (1790–1832) was an illustrious French Egyptologist. The editor has been unable to further identify his colleague, Claprott.



Day & Son Lith.rs to The Queen.

L. Oliphant, del.

FALLS OF STANTHONY.

MINNESOTA

AND

THE FAR WEST

BY

LAURENCE OLIPHANT, ESQ.

LATE CIVIL SECRETARY AND SUPERINTENDENT-GENERAL OF INDIAN AFFAIRS IN CANADA

Author of "The Russian Shores of the Black Sea," &c.

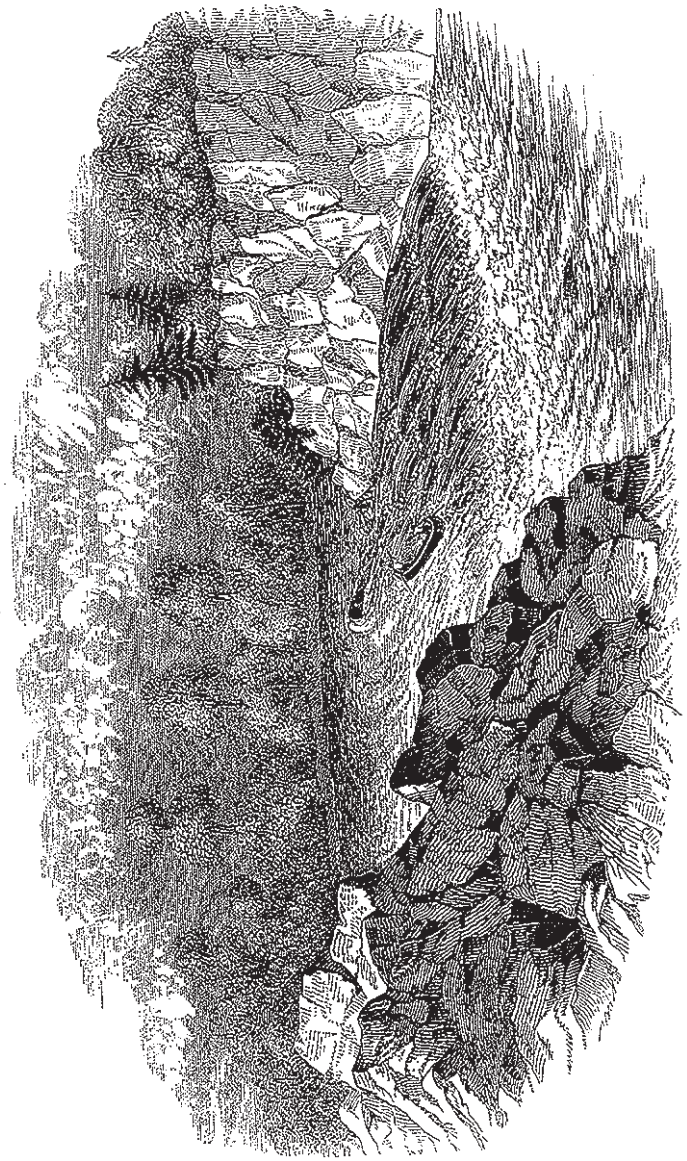
WILLIAM BLACKWOOD AND SONS

EDINBURGH AND LONDON

MDCCCLV

pitous wall of rock projecting into the stream, and forming an angle, round which it sweeps with great impetuosity.

The excitement of this part of the voyage was somewhat increased by the confession of our voyageurs, that it was so long since either of them had made it, that they had nothing but their instinct and good luck to trust to. They therefore told us that they would not risk shooting the Little Falls, but make a portage; so we drew to land and jumped ashore, shouldering our usual packs, and left them to follow with the canoe. Instead of doing so, however, to our surprise and disgust we found that they had no sooner got rid of us than they shoved off. It was an exciting moment to watch them, as they neared the head of the foaming torrent, tighten their waistbands, make good their footing, and, standing one at the bows and the other at the stern, dash headlong with their fragile bark into the breakers. We ran along the rocky bank watching the canoe tossing like a cork upon the waves, and escaping destruction against some pointed rock by virtue of the vigilance and dexterity of the men; and in three or four minutes it was safely moored in the backwater, and we arrived breathless, to scold our voyageurs for their rashness in risking our boat, and their perfidy in not risking us along with it. We determined, however, to profit by experience, and amused ourselves, while the tea was being made for luncheon, by jumping in about half-way up the rapid, and



Page 224.

LITTLE FALLS OF THE MISSISSIPPI.


FISH PASSAGE CONTINUATION TO DAM
(COOPERATITIVE WITH DAM OPERATOR)
PRAIRIE / OAK SAVANNA
RESTORATION/RECLAMATION INTERPRETATION
FISH PASSAGE (FORMER RACEWAY CANNEL)
ROCK RIFFLE (TYPICAL)
INTERPRETATION OF RAILLINE
SALVAGED WALLS
TURF
HENNEPIN PAPER WORKERS MEMORIAL
INTERPRETATION OF CANAL & FISH PASSAGE
SALVAGED PEDESTRAIN BRIDGE
SALVAGED HISTORIC BRIDGE FROM COUNTY HWY PROJECT
SAFETY FENCE
SALVAGED CIRCULAR STAIRS
OVERLOOK (HISTORY OF LITTLE FALLS & THE MISSISSIPPI RIVER)
SALVAGE ARCHES (MACHINE SHOP BASEMENT FLOOR)
SMOKESTACK INTERPRETATION
SALVAGED WALL (TYPICAL)
SALVAGED DRYER (MACHINE SHOP OPERATING FLOOR)
MOWED TURF
INTERPRETATION OF MILL OPERATIONS
PRAIRIE / OAK SAVANNA
NEW MULTIPURPOSE STRUCTURE
(PICNIC; RESTROOM; WARMING HOUSE; MAINTENANCE)
- CONSTRUCTED WITH STEEL TRUSSES FROM BOILER ROOM
MOWED TURF
RAINGARDEN
PRAIRIE / OAK SAVANNA
24 - STALL PARKING LOT
RAINGARDEN
LINDBERG DRIVE
RAILROAD EASEMENT
6' PAVED PEDESTRIAN PATH
SHORELINE STABILIZATION
WATER QUALITY POND &
WINTER ICE SKATING RINK
FISHING PIER
NATIVE AMERICAN INTERPRETATION
5' WOODCHIP TRAILS
REHABILITATED FLOODPLAIN FOREST
MISSISSIPPI RIVER
BOARDWALK
RESTORED BACKWATER WETLANDS
OVERLOOK
FISHING PIER
MILL STONE (INTERPRETATION OF WATER POWER)
INTERPRETATION OF POLLUTION & CLEAN-UP
SALVAGED SEAT WALL (TYPICAL)
10' PEDESTRIAN TRAIL / MAINTENANCE ROAD
STAGE
GRASS AMPITHEATER (MACHINE SHOP)
SALVAGE CIRCULAR STAIRS
PAPER HANDLING ROOM (GROUND FLOOR)
SHORELINE STABILIZATION
EXISTING RAILROAD UNDERPASS
DROP-OFF / TURN-AROUND
RAINGARDEN
CANOE LAUNCH / FISHING PIER
0
50
100
EMMONS & OLIVIER RESOURCES
Park Concept Plan
Hennepin Paper Site
December 17, 2003 — DRAFT


Miss/Crow Wing Passage
Project consideration of three MN Power dams
Legend
Bypass Channel
Feature 1
Feature 2
Pillager
Pillager Dam Rd SW
Placid Dam Bypass
Riverview Rd
Google Earth
©2020 Google
N
600 ft

Region	Area	DOW Number	County	Lake Name	Acreage	Littoral Acres	Lake Class
3	Little Falls	49-0080	Morrison-Cass	Placid (Pillager Reservoir)	537	340	34

NA-01570-01

LAKE MANAGEMENT PLAN

MINNESOTA
DEPARTMENT OF
NATURAL RESOURCES

Long Range Goal:

- Maintain a naturally reproduced Walleye population with specific goals developed from future electrofishing/and or ice out trap netting results.
- Maintain an electrofishing catch rate for Smallmouth Bass at over 50/hr. with at least 5 age classes represented.
- Maintain an electrofishing catch rate for Largemouth Bass at over 25/hr. with a PSD above 30.
- Maintain a Bluegill trap net catch with 30% or more exceeding 7 inches long.

Operational Plan:

- Conduct ice-out and panfish trap net assessments in 2024 and at least once every eight years thereafter.
- Perform spring electrofishing assessments targeting Walleye and bass in 2024 and at least once every eight years thereafter.
- Encourage increased water clarity and water quality monitoring through the MnPCA and Citizen Lake Monitoring Program to better assess trends.
- Review discharge data provided by the Pillager hydropower facility to evaluate compliance to run-of-the-river operations and other licensing criteria, provide pertinent comments during the re-licensing period.
- Monitor emergent vegetation abundance and riparian land use through videotaping within the next 10 years.
- Roughfish removal will be permitted under "B" permits as deemed appropriate.
- Provide technical assistance and professional guidance to lakeshore property owners, other resource agencies, and county officials regarding watershed, water quality, and riparian habitat issues.

Midrange Objective:

- Complete trap net assessment and electrofishing to monitor fish community trends. Evaluate success of Walleye natural reproduction and determine specific long-range goals for Walleye using ice-out trap net and spring electrofishing information. Refine indices developed for Largemouth and Smallmouth Bass based on electrofishing data. Refine indices developed for Bluegill from targeted panfish trap netting. Monitor hydropower operations, vegetation and riparian land use and determine impacts to the reservoir fish community and habitat

Potential Plan:

- GPS/GIS mapping of emergent vegetation, substrates, and riparian features. $ 2,000
- Pursue easements along property owned by the Lake Placid Bible Camp if such acquisitions become available. $ 50,000
- Seasonal temporary drawdown of reservoir to improve water quality and habitat. $ 75,000
- Construct a bypass channel to provide connectivity to upstream and downstream habitats. A nature like fish bypass channel should be constructed to alleviate concerns over connectivity. ~ $2,000,000

Total = $2,120,000

TOTAL $2,000-2,120,000

Primary Species Management	Secondary Species Management	FOR CENTRAL OFFICE USE ONLY	
WAE, BLG	SMB, LMB		
Area Supervisors Signature	**Date**	**Entry date**	**Year Resurvey**

Region	Area	DOW Number	County	Lake Name	Acreage	Littoral Acres	Lake Class
3	Little Falls	49-0080	Morrison-Cass	Placid (Pillager Reservoir)	537	340	34

Regional Supervisors Signature	Date	Stock species - Size - Number per Acre Pr./Sec	
NARRATIVE: (Historical perspectives - various surveys; past management; social considerations; present limiting factors; survey needs; land acquisition; habitat development and protection;commercial fishery; stocking plans; other management tools; and evaluation plans)		**Schedule**	**Year Beginning**
		Population Manipulation YES/NO; Year:	
		Development YES/NO; Year:	
		Creel or Use Survey YES/NO; Year:	
		Other	

Region	Area	DOW Number	County	Lake Name	Acreage	Littoral Acres	Lake Class
3	Little Falls	49-0080	Morrison-Cass	Placid (Pillager Reservoir)	537	340	34

Surveys:

The initial fisheries lake survey on Placid Lake was completed in 1958 with resurveys occurring in 1985, 1996 and 2008 and 2014. The 2008 and 2014 lake surveys included daytime electrofishing. Spring daytime electrofishing was attempted in 2020 resulting in very low catches, no report was generated. No gill nets were set in 2014. Population assessments were conducted in 1990 and 2002. Fall electrofishing assessments were performed in 1996, 2000, 2002 and 2009 to assess natural reproduction of Walleye. A spring electrofishing assessment targeting fingerling Walleye was performed in 1987. Video taping of emergent vegetation and shoreline use was conducted in 1996 and 2016. Minnesota Biological Survey completed a plant survey in 2010. Aerial fish house counts were taken each winter from 1981 to 1993 and in 1997-98 and 2000-01. Water quality data was collected by MPCA in 1999.

Past Management:

Walleye fry stocking was initiated in 1986 and occurred on an annual basis until 1991. Walleye fingerlings were stocked in 1992 and 1994. Neither fry nor fingerling stocking have proven to be successful in enhancing the Walleye population in the reservoir. Significant natural recruitment of Walleye fingerlings has been documented by fall electrofishing. Channel catfish fingerlings were stocked in 1971 and 1973 but failed to produce a fishery in the reservoir. Survivors from these catfish introductions may have established the populations now existing in downstream reaches of the Mississippi River. Smallmouth Bass were stocked into the Long Prairie River (part of the Crow Wing River watershed) by Glenwood DNR Fisheries during the late 1990's. Smallmouth Bass have been sampled in Placid Reservoir by various gear types since that time suggesting that a well-developed and fishable population is present.

Limited commercial removal of roughfish has taken place with the most recent effort in 1990 when 1,000 pounds of bullheads were removed under "B" permit. The Pillager Hydroelectric Project was relicensed in the late 1990's.

Social Considerations:

The shoreline of Placid Lake is characterized by a moderate level of development. A total of 51 cabins/homes were counted on the reservoir during the 1996 survey as compared to 61 homes counted in 2008. The Lake Placid Bible Camp is located on the north shore. Roughly 60% of the shoreline consists of undeveloped forest land, however large portions of the south shore have been platted for development. Minnesota Power and Light Company retains ownership of much of the remaining undeveloped shoreline.

Agricultural impacts are minimal in the immediate watershed which is predominantly forest and wetland (51%), however this reservoir is on the downstream end of a large watershed drained by the Crow Wing and Long Prairie Rivers. Placid Lake is on the border between mesotrophic and eutrophic classification with total phosphorous levels above the expected range for the ecoregion. Summer secchi disc readings are usually in the 4 to 6 foot range. Sedimentation and nutrient loading from this large watershed have considerable impacts on the condition of Placid Lake. Future management of the reservoir will require that the impacts of hydropower operations, residential development, and land use practices within the watershed are minimized. The Crow Wing River watershed has undergone comprehensive planning as part of MPCA's Upper Mississippi River Basin Planning process. DNR Fisheries was an active participant in these planning efforts, which included a broad spectrum of private interests and public

agencies.

A state owned access is located on the northeast end of the lake and an additional state owned landing (Al Vah's) is located on the Crow Wing River just upstream of the reservoir. Recreational use is moderate. Swimming and canoeing are popular activities for the Placid Bible Camp clients. Fishing pressure is light to moderate with most effort directed at Bluegill and Walleye. Bluegill are a primary target throughout the open water season and usually provide good results. In general, reports have suggested poor Walleye fishing for many years. Local anglers have suggested that DNR Fisheries stock Placid Reservoir and the Crow Wing River upstream of the Placid Dam in an effort to improve Walleye fishing. The reservoir's history of considerable natural reproduction of Walleye indicates stocking is not necessary. Sampling efforts outlined in the Operational Plan should provide additional information to help address the stocking issue.

Fall appears to be the most successful Walleye fishing period, possibly due to downstream migration of riverine gamefish to the deeper wintering areas in the lake. Fish have unobstructed access to lengthy stretches of the Crow Wing and Long Prairie Rivers. The fish community of Placid Lake is strongly influenced by the presence of these rivers in terms of species composition and seasonal movements of fish. Spring electrofishing will be useful in monitoring the prevalence of Smallmouth Bass and Walleye in the system.

No formal lake association has been formed. Frequent written correspondence occurred during the mid-1980's with a few lakeshore property owners who shared our response letters with other property owners. Lakeshore residents expressed concerns regarding poor fishing, submergent weed growth, and cattail expansion. Placid Lake is located adjacent to the City of Pillager.

Limiting Factors:

Placid Lake is a reservoir, therefore it is subject to an aging process hastened by sedimentation and nutrient loading from its extensive watershed. The lake is filling in and the flow of nutrients is increasing vegetation growth. The lake has total phosphorous concentrations as measured in 1999 above the expected range for lakes in the ecoregion. Curley-leaf Pondweed was found to be present in the lake in 1996, however, this non-native species has not yet become a dominant component of the plant community. Habitat conditions are changing, potentially making the upstream riverine environments more attractive to Walleye and Smallmouth Bass than the reservoir. Species such as Bluegill, Black Crappie, and Largemouth Bass find the reservoir as more suitable habitat due to the available vegetation. Spring electrofishing efforts in 2014 and 2020 found few if any Largemouth Bass which was surprising as significant areas of suitable habitat are present. The status of the Largemouth Bass population warrants attention when conducting future sampling efforts. Zebra Mussels and Faucet Snails are two additional non-native species residing in the Crow Wing River system, their impacts to the reservoir are largely unknown but should be monitored.

Our past netting surveys appear to indicate the lake is not heavily used by adult Walleye during the summer. Most use of the lake by adult Walleye likely occurs during the winter as movement occurs out of the river and into deep water habitats. Small scale winterkills of redhorse have been documented upstream of Pillager Dam. Redhorse are highly susceptible to mortality from low oxygen and it is not suspected that winterkill is a significant limiting factor for gamefish. Due to the river influence and the abundance and diversity of prey species, food

abundance is not believed to be a critical factor in limiting gamefish populations. All gamefish and panfish species displayed normal to fast growth when compared to other area lakes.

Carp were first sampled in the lake in 1990 and have likely been present in the system for many years. Carp have been sampled in subsequent surveys (1996 and 2002), but not in alarmingly high numbers. No carp were sampled in nets in 2008. As reservoirs age, carp often tend to assume a more dominant position in the fish community. Carp abundance and their impacts on habitat should be monitored.

Survey Needs:

Gill nets will no longer be used to sample fish in Placid Reservoir according to this management plan. Lake survey gill nets have been ineffective in sampling Walleye in the reservoir. During the 2008 survey, the gill nets became heavily laden with filamentous algae reducing their efficiency and requiring considerable additional maintenance. Only four of nine gill net sets were completed in 2008 due to filamentous algae.

Trap net assessments including ice-out and targeted panfish efforts will take place at least once every eight years with the next sampling scheduled for 2024. Spring electrofishing will coincide with the trap netting schedule commencing in 2024. Video documentation of shoreline use and emergent vegetation will be performed within the next ten years. Mapping of the lake's important habitat features including emergent vegetation, substrates, and riparian land use would provide important habitat data. Future "Score the Shore" surveys may also prove useful in monitoring changes to the riparian zone and should be considered. Discharge data from the Pillager Dam will be reviewed on an annual basis to ensure compliance to licensing requirements. Water quality/clarity data is severely lacking especially for a lake of this size with an extensive watershed. Additional water quality and/or clarity monitoring by the MnPCA, local schools or local citizens would be beneficial in evaluating trends.

Stocking:

No stocking is planned as adequate natural reproduction for walleye, smallmouth bass, bluegill and crappie appears to sustain fishable levels.

Land Acquisition:

No acquisition is pending at this time, however DNR Fisheries maintains an interest in obtaining conservation easements along property owned by the Lake Placid Bible Camp.

Habitat Protection and Development:

Critical review of DOW and APM permits and hydropower operations will be beneficial in ensuring protection of habitat. The Morrison County Water Plan will continue to receive support and technical guidance.

Use of best management practices should be encouraged throughout the reservoir's watershed (including river systems) to protect water quality and shoreline habitat and reduce sedimentation. Reservoir drawdowns have the potential to improve water quality and fish and wildlife habitat if performed during the appropriate season. Protection of the terrestrial and aquatic plant communities along shoreline areas should provide many benefits including fish and wildlife habitat, nutrient tie-up, erosion abatement and lake soil stability. Potential exists to improve fish and wildlife habitat along some of the developed shoreline. Educational efforts and project funding should be directed at improving and protecting riparian areas. Basin planning efforts also have potential to positively impact the habitat of Placid Reservoir and its watershed.

Region	Area	DOW Number	County	Lake Name	Acreage	Littoral Acres	Lake Class
3	Little Falls	49-0080	Morrison-Cass	Placid (Pillager Reservoir)	537	340	34

Video documentation will be utilized to monitor changes in emergent vegetation and shoreline use. GPS/GIS mapping of the lake's habitat features would facilitate habitat protection and improvement. The acquisition of conservation easements would provide permanent protection to specified areas of the riparian zone. Consideration for a bypass nature like fish way or dam removal should be an option to encourage connectivity and sediment transport. As previously mentioned, aging reservoirs tend to favor invasive species like common carp. One needed element to both invertebrates like mussels and some fish, is mitigation of barriers to migration. Construction of a nature-like fish way around Placid Dam may be a feasible alternative with recent funding opportunities.

Commercial Fishery:

Placid Lake has limited potential to provide an economically viable commercial fishery for roughfish.

Other Management Tools:

Educating lakeshore home owners and land users within the watershed of best management practices would help maintain water quality and healthy fish habitat.

Region	Area	DOW Number	County	Lake Name	Acreage	Littoral Acres	Lake Class
3	Little Falls	49-0080	Morrison-Cass	Placid (Pillager Reservoir)	537	340	34

Table 1. Historical net catches of some important species (1st - 3rd quartile values are for lake class 34):

Species	Gear	1996	2002	2008	2014	2020	Avg. Catch	Quartiles
Northern Pike	G	1.70	3.00	0.00	N/A	No GN	1.56	2.3-9.2
Walleye	G	1.00	0.67	0.25	N/A	Or TN	0.64	1.2-5.3
Yellow Perch	G	2.80	8.22	0.00	N/A	Set	3.67	3.7-28.4
Bluegill	T	N/A	18.67	14.11	1.22	Covid	11.33	5.9-43.3
Black Crappie	T	N/A	0.22	0.44	0.56		0.40	0.8-8.4
White Sucker	G	3.10	6.22	0.50	N/A		3.27	0.5-3.3
Largemouth Bass	EF	N/A	N/A	28.50	0.00		N/A	N/A
Smallmouth Bass	EF	N/A	N/A	58.50	20.90		39.70	N/A

Only 4 gillnets were completed in 2008 vs. 9 gillnets used in other years. No gill nets were used in 2014.

Catch rates from spring electrofishing: Limited results were observed in 2020 bass EF.
Fall electrofishing catch rates for juvenile Walleye:
1996 = 130/hr., 2000 = 93/hr., 2002 = 9/hr. 2009 = 51/hr.

Region	Area	DOW Number	County	Lake Name	Acreage	Littoral Acres	Lake Class
3	Little Falls	49-0036	Morrison-Cass	Sylvan (Reservoir)	321		35

NA-01570-01

LAKE MANAGEMENT PLAN

MINNESOTA
DEPARTMENT OF
NATURAL RESOURCES

Long Range Goal:

- Maintain Northern Pike and Walleye populations with specific goals developed from future electrofishing/and or ice out trap netting.
- Maintain a Bluegill trap net catch with at least 30% exceeding 7 inches.
- Maintain the Black Crappie trap net catch within the lake class interquartile range (0.7-4.3/set) with at least 25% exceeding 9 inches.
- Maintain an electrofishing catch rate for Largemouth Bass above 40/hr. with a PSD over 50.
- Encourage fish and organism passage further up the Crow Wing River. Consider all options available to alleviate fish passage and sediment issues within Sylvan Reservoir.

Operational Plan:

- Conduct ice-out and panfish trap net assessments in 2024 and at least once every eight years thereafter.
- Perform spring electrofishing assessments targeting Walleye and bass in 2024 and at least once every eight years thereafter.
- Review discharge data provided by the Sylvan hydropower facility to evaluate compliance to run-of-the-river operations and other licensing criteria, provide pertinent comments during the re-licensing period.
- Monitor emergent vegetation abundance and riparian land use through videotaping at least once every 10 years.
- Roughfish removal will be permitted under "B" permits as deemed appropriate.
- Provide technical assistance and professional guidance to lakeshore property owners, Camp Ripley, and county officials regarding watershed, water quality, and riparian habitat issues. Encourage increased water quality and water clarity monitoring by MnPCA and Citizen Lake Monitoring Program to better assess trends.
- Stock with 200,000 Walleye fry during odd numbered years. Maintain correspondence with Brainerd DNR Fisheries in assessing the magnitude of Walleye spawning runs in the Gull River and to determine the necessity of stocking in the long term.

Midrange Objective: Complete trap net assessment and electrofishing to monitor fish community trends. Evaluate success of Walleye natural reproduction and fry stocking and determine specific long-range goals for Walleye and Northern Pike using ice-out trap net and spring electrofishing information. Refine indices developed for Largemouth Bass based on electrofishing data. Refine indices developed for Bluegill and Black Crappie from targeted panfish trap netting. Monitor hydropower operations, riparian land use, and vegetation and determine impacts to the reservoir fish community and habitat.

Potential Plan:

- GPS/GIS mapping of emergent vegetation, substrates, and riparian features.
  $ 2,000
- Seasonal temporary drawdown of reservoir to improve water quality and habitat.
  $ 100,000
- Construct a bypass channel or other available options to provide connectivity to upstream and downstream habitats. $ 2,750,000

TOTAL $170,000-3,000,000

Primary Species Management	Secondary Species Management	FOR CENTRAL OFFICE USE ONLY	
WAE, BLC	NOP, LMB, BLG		
Area Supervisors Signature	**Date**	**Entry date**	**Year Resurvey**

Region	Area	DOW Number	County	Lake Name	Acreage	Littoral Acres	Lake Class
3	Little Falls	49-0036	Morrison-Cass	Sylvan (Reservoir)	321		35

Regional Supervisors Signature	Date	Stock species - Size - Number per Acre Pr./Sec	
NARRATIVE: (Historical perspectives - various surveys; past management; social considerations; present limiting factors; survey needs; land acquisition; habitat development and protection;commercial fishery; stocking plans; other management tools; and evaluation plans)		**Schedule**	**Year Beginning**
		Population Manipulation YES/NO; Year:	
		Development YES/NO; Year:	
		Creel or Use Survey YES/NO; Year:	
		Other	

Region	Area	DOW Number	County	Lake Name	Acreage	Littoral Acres	Lake Class
3	Little Falls	49-0036	Morrison-Cass	Sylvan (Reservoir)	321		35

Surveys:

The initial fisheries lake survey on Sylvan Lake was completed in 1958 with resurveys occurring in 1985, 1996 and 2008. Population assessments were conducted in 1990, 2002, and 2014 (no gill nets). Daytime electrofishing was performed as part of the 2008 and 2014 surveys, and in 2020. Videotaping of emergent vegetation and shoreline use was conducted in 1996 and 2016. Fall electrofishing assessments were performed in 1996 and 2000 to assess natural reproduction of Walleye. Spring electrofishing assessments were performed in 1986 and 1987 with the 1986 assessment targeting Largemouth Bass and fingerling Walleye evaluated in 1987. Fish were collected by Fisheries staff and analyzed for contaminants in 2014 with results provided to the Minnesota Department of Health. Aerial fish house counts were taken each winter from 1981 to 1993 and in 1997-98 and 2000-01. Water quality data was collected by MPCA in 1999, 2008 and 2009. The lake was mapped in 1958.

Past Management:

Walleye fry stocking was initiated in 1986 and occurred on an annual basis until 1991. Walleye fingerlings were stocked in 1992 and 1994. Neither fry nor fingerling stocking have proven to be successful in enhancing the Walleye gill net catches in the reservoir. However, correspondence with Brainerd Area Fisheries staff suggests that past fry stocking efforts may have been responsible for popular Walleye fisheries that developed below the Federal Dam on the Gull River and in the Placid Dam tailwaters. Walleye fry stocking was re-initiated in 2006 and took place on an annual basis until 2009. Walleye fry have been stocked during odd numbered years since 2013 by the Brainerd Fisheries office staff. Significant natural recruitment of Walleye fingerlings was documented during fall electrofishing in 1996, although no juvenile walleye were observed in similar sampling in 2000. The Sylvan Hydroelectric Project was relicensed in 1993 and the current license expires in 2023. The reservoir was drawn down several feet during late summer in 2002 for dam repair purposes. Limited commercial removal of roughfish has taken place with the most recent effort in 1990 when 600 pounds of bullheads were removed under "B" permit.

Social Considerations:

The shoreline of Sylvan Lake is characterized by light development as approximately 90% remains classified as undeveloped forest. A total of 35 cabins/homes were counted on the lake during the 2008 survey while 29 homes were observed in 1996. All of these residences were located upstream of the Fishermen's Bridge. Minnesota Power and Light Company and the Camp Ripley Military Reservation retain ownership of much of the remaining undeveloped shoreline limiting the potential for future residential development.

Agricultural impacts are minimal in the immediate watershed which is predominantly forest and wetland (51%) however, this reservoir is on the downstream end of a large watershed drained by the Crow Wing and Long Prairie Rivers. Sylvan Lake is classified as eutrophic with nutrient levels above the expected range for the ecoregion. Summer secchi disc readings are generally in the 6-7 foot range. Sedimentation and nutrient loading from this large watershed have considerable impacts on the condition of Sylvan Lake. The impacts of sedimentation and nutrient loading to Sylvan Lake are somewhat mitigated by the presence of the Pillager Hydroelectric Dam several miles upstream. Future management of the reservoir will require that the impacts of hydropower operations, residential development, and land use practices within the watershed are minimized. The Crow Wing River watershed has undergone comprehensive planning as part of MPCA's Upper Mississippi River Basin Planning program. DNR Fisheries was an active participant in these planning efforts, which included a broad

spectrum of public agencies and private groups.

A state owned access is located on the north end of the lake. The public access has a dock, two concrete ramps, and ample parking. The Fishermen's Bridge is a popular shorefishing site and receives significant pressure. This bridge was upgraded in the past to facilitate fishing from the bridge itself (walkway) and along the east shore. Fishing accounts for a large portion of the lake's recreational use. Fishing pressure is light to moderate with most effort directed at Bluegill from late spring through summer. Winter fishing for Bluegill appears to have gained popularity, especially upstream of the Fisherman's Bridge.

Limiting Factors:

Sylvan Lake is a reservoir, therefore it is subject to an aging process hastened by sedimentation and nutrient loading from its extensive watershed. The lake is filling in and the flow of nutrients is increasing vegetation growth. Dense mats of submergent vegetation are found in the middle of the main basin where sediment has been deposited due to the dam. Curly-leaf Pondweed, a non-native species, is a major component of plant community. Sylvan Lake is classified as eutrophic with nutrient concentrations higher than a majority of the lakes in the ecoregion.

Our summer gill netting surveys appear to indicate the lake is not heavily used by adult Walleye. Most use of the lake by adult Walleye likely occurs during the winter as movement occurs out of the rivers and into deep water habitats. Species such as Northern Pike, Bluegill, Black Crappie, and Largemouth Bass find the reservoir as more suitable habitat due to the available vegetation. Walleye and Northern Pike reproduction are good within the system suggesting adequate evaluation of Walleye fry stocking practices is warranted. Due to the river influence and the abundance and diversity of prey species, food availability is not believed to be a critical factor in limiting gamefish populations. Growth rates are in the normal range for most year classes of crappie, Northern Pike, and Walleye. Bluegill growth rates are moderate for fish up to Age 5 which average 6 inches. These growth rates are not sustained as few 7-10 year old Bluegill attain 8 inches.

Carp were captured in lake survey nets for the first time in 1996, although it is suspected they have been present in the system for many years. Trap nets captured carp in 2002 (4 fish) and in 2008 (7 fish). As reservoirs age, carp often tend to assume a more dominant position in the fish community. Carp abundance and their impacts on habitat should be monitored. Zebra Mussels and Faucet Snails are two additional non-native species residing in the Crow Wing River system, their impacts to the reservoir are largely unknown but should be monitored.

Survey Needs:

Gill nets will no longer be used to sample fish in Sylvan Reservoir according to this management plan. Lake survey gill nets have been ineffective in sampling Walleye in the reservoir. Trap net assessments including ice-out and targeted panfish efforts will take place at least once every eight years with the next sampling scheduled for 2024. Spring electrofishing will coincide with the trap netting schedule commencing in 2024. Video documentation of shoreline use and emergent vegetation will be performed within the next ten years. Mapping of the lake's important habitat features including emergent vegetation, substrates, and riparian land use would provide important habitat data. Future "Score the Shore" surveys may also prove useful in monitoring changes to the riparian zone and should be considered. discharge data from the Sylvan Dam will be reviewed on an annual basis to ensure compliance to licensing requirements. Water quality/clarity data is lacking especially for a lake of this size with an extensive watershed. Additional water quality and/or clarity monitoring by the MnPCA, local

schools or local citizens would be beneficial in evaluating trends.

Stocking:

Walleye fry will stocked during odd numbered years with the lake receiving 200,000 fry during each stocking. The primary function of this stocking is to restore the fisheries below the Federal Dam on the Gull River and in the Placid Dam tailwaters. These fisheries appeared to be more significant when Sylvan Reservoir was stocked in the past. Evaluation of fry stocking will occur via electrofishing and trap netting as outlined in the Operational Plan. Additional evaluation of the Gull River spawning run should be conducted by Brainerd Fisheries staff.

Land Acquisition:

No acquisition is pending at this time.

Habitat Protection and Development:

Critical review of DOW and APM permits and hydropower operations will be beneficial in ensuring protection of habitat. The Morrison County Water Plan will continue to receive support and technical guidance. Use of best management practices should be encouraged throughout the reservoir's watershed (including river systems) to protect water quality and shoreline habitat and reduce sedimentation. Reservoir drawdowns have the potential to improve water quality and fish and wildlife habitat if performed during the appropriate season. Protection of the terrestrial and aquatic plant communities along shoreline areas should provide many benefits including fish and wildlife habitat, nutrient tie-up, erosion abatement and lake soil stability.

Potential exists to improve fish and wildlife habitat along some of the developed shoreline. Educational efforts and project funding should be directed at improving and protecting riparian areas. Basin planning efforts also have potential to positively impact the habitat of Sylvan Reservoir and its watershed. Video documentation will be utilized to monitor changes in emergent vegetation and shoreline use. GPS/GIS mapping of the lake's habitat features would facilitate habitat protection and improvement. Consideration should be made and comments offered for a fish bypass channel or dam removal of Sylvan Dam as infrastructure ages and safety considerations are involved with FERC Relicensing.

Commercial Fishery:

Sylvan Lake has limited potential to provide an economically viable commercial fishery for roughfish.

Other Management Tools:

Educating lakeshore home owners and land users within the watershed of best management practices would help maintain water quality and healthy fish habitat.

Region	Area	DOW Number	County	Lake Name	Acreage	Littoral Acres	Lake Class
3	Little Falls	49-0036	Morrison-Cass	Sylvan (Reservoir)	321		35

Table 1. Historical net catches of some important species (1st - 3rd quartile values are for lake class 41):

Species	Gear	1996	2002	2008	2014	2020	Avg. Catch	Quartiles
Northern Pike	G	3.80	4.25	3.50	N/A	No GN	3.85	3.6-11.0
Walleye	G	0.10	0.13	0.13	N/A	Or TN	0.12	1.0-3.2
Yellow Perch	G	10.30	13.50	8.25	N/A	Set	10.6	3.8-22.8
Bluegill	T	35.60	69.50	24.58	19.83	Covid	37.38	4.0-28.1
Black Crappie	T	1.75	1.50	2.58	0.67		1.63	1.0-10.5
White Sucker	G	3.50	3.38	0.75	N/A		2.54	0.7-3.5
Largemouth Bass	EF	N/A	N/A	48.40	49.00	22.00	39.80	N/A

* Initial spring electrofishing assessment consisted of daytime shocking in 2008(new boat). Largemouth Bass catch rate=48.4/hr in 2008, 49/hr. in 2014, and 22/hr. in 2020.

Catch rates for fall electrofishing (juvenile Walleye):
1987=(4 fish total), 1996= 36/hr., 2000= none sampled

From: Gregory Prom (MP) <gprom@mnpower.com>
Sent: Wednesday, August 16, 2023 9:36 AM
To: Beimers, Sarah (ADM)
Cc: Lesley Brotkowski; nrosemore@mnpower.com
Subject: RE: RE: MP discussion about studies for Little Falls, Pillager, and Sylvan hydros.

Good morning Sarah,

I hope your summer is going well. I am just following up to see if you had some availability to have a quick discussion the end of the month or the first week of September to discuss the proposed arch studies for the Little Falls, Pillager, and Sylvan hydros.

Thanks and have a great day,

Greg Prom

From: Gregory Prom (MP)
Sent: Tuesday, August 8, 2023 9:38 AM
To: Beimers, Sarah (ADM) <Sarah.Beimers@state.mn.us>
Cc: 'Lesley Brotkowski' <Lesley.Brotkowski@kleinschmidtgroup.com>; Nora Rosemore (MP) <NRosemore@mnpower.com>
Subject: RE: MP discussion about studies for Little Falls, Pillager, and Sylvan hydros.

Good morning Sarah,

I appreciate you providing comments for the relicensing efforts at Little Falls, Pillager and Sylvan hydros. Minnesota Power (MP) and Kleinschmidt are going to be preparing the proposed study plan for the relicensing of these hydros. I wanted to see if we can set up a brief meeting at the end of the month to discuss our proposed study plans prior to filing with the FERC.

I have the afternoon of Monday August 28, the morning or after 2 pm on Wed Aug 29, or Thursday after 1pm open. Please let me know if any of those dates and time might work and I can send out an invite for a 1 hour discussion. I will also include Lesley from Kleinschmidt on the invite.

Thanks and have a great day,

Greg Prom

Senior Environmental Compliance Specialist
Minnesota Power/ALLETE
30 West Superior Street
Duluth, Minnesota 55802

Office: 218-355-3191
Cell: 218-461-6856
Email: gprom@allete.com

Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects

Minnesota SHPO Proposed Study Plan Discussion Meeting

August 30, 2023, 2:00 Central Time

Meeting Summary

1) **Introductions – meeting attendees:**
   - Sarah Beimers, Minnesota State Historic Preservation Office (Minnesota SHPO)
   - Lucy Harrington, Minnesota SHPO
   - Greg Prom, Minnesota Power (MP), Project lead
   - Matt Radzak, MP
   - Lesley Brotkowski, Kleinschmidt Associates (Kleinschmidt), Project Manager
   - Sandra Wash, Kleinschmidt, Assistant Licensing Coordinator
2) **Overview of Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects (Projects) and MP's Proposed Study Plan (PSP) for Cultural Resources**
   - Greg Prom kicked off the meeting and described basic information on the three Projects and summarized the Federal Energy Regulatory Commission (FERC) Study Plan Process, highlighting additional comment periods on the study plan. The PSP will be filed with FERC and distributed to stakeholders in early September 2023. Greg noted that we appreciate their time to meet with MP prior to finalizing the PSP to get clarification on Minnesota SHPO's study request and discuss proposed methodology.
   - Greg summarized cultural studies that have been conducted to date at the Projects and initial thoughts for the cultural resources studies for the relicensings.
3) **Clarification of Minnesota SHPO's July 22, 2023 study request letter**
   - Lesley Brotkowski reviewed items from Minnesota SHPO's study request letter.
   - Area of Potential Effects (APE)
     - Participants discussed the Projects APEs, and the group agreed that the FERC project boundary is typically used to define the APE for FERC relicensing proceedings.
     - Lucy Harrington requested confirmation that the lease lots at the Sylvan Project and Pillager Project were included in the Projects APEs. Lesley confirmed they are included.
     - Lucy noted that the Chippewa Agency Historic District site is of particular interest at the Sylvan Project.
     - Lucy requested MP include maps of the proposed Projects APEs in the PSP. In addition, Minnesota SHPO requested the APE shapefiles.
   - Historic Architectural Resources
     - Sara Beimers confirmed that the Projects Facilities are considered eligible for listing in the National Register of Historic Places (NRHP), and that the Minnesota SHPO is requesting updated historic architectural resources surveys and documentation for the Projects, as the existing documentation is dated greater than 10 years.

- Archaeological Resources
    - Lucy stated that MP's proposal to start with a desktop evaluation, followed by fieldwork, is a good idea.
    - Lucy noted that the use of "phases" to describe a study can be confusing due to inconsistencies amongst different entities and recommended MP focus on identifying historic properties and exclude phase designations.
    - Lucy noted that there are provisions in the previous Projects' Cultural Resource Management Plans (CRMPs) that were not in Minnesota SHPO's files and was unclear if those provisions have been completed. The desktop evaluation could help clarify the status of those items.
    - Lucy suggested MP conduct a desktop evaluation combined with a conditions assessment (field visit) to document the current condition of known archaeological sites and perform a reconnaissance survey of the Projects APEs to determine if unrecorded archaeological resources are present.
    - In addition, Lucy suggested MP make an effort to identify tribal resources such as Traditional Cultural Properties (TCPs) within the APEs by consulting with applicable Tribal Historic Preservation Offices (THPOs).

4) Timeline and Next Steps

- Provide Minnesota SHPO shapefiles of the Projects APEs when MP files the PSP.
- Lesley reviewed the study plan timeline and next steps in the FERC relicensing process.

5) End of Meeting

- Greg and Lesley thanked everyone for their time and the Minnesota SHPO noted their appreciation for MP's proactive efforts consulting on the PSP.

From: Lesley Brotkowski
Sent: Friday, September 8, 2023 5:31 PM
To: timothy.lapointe@bia.gov; Nanette.m.bischoff@usace.army.mil; darin_simpkins@fws.gov; dave_thomson@nps.gov; durellcooper05@gmail.com; MikeW@badriver-nsn.gov; rwassana@c-a-tribes.org; Anthony.Reider@fsst.org; jeffery.stiffarm@ftbelknap.org; trhodd@iowas.org; doreen@kbic-nsn.gov; jjohnson@ldftribe.com; jim.williams@lvd-nsn.gov; robert.larsen@lowersioux.com; chairman@mitw.org; cchavers@boisforte-nsn.gov; kevindupuis@fdlrez.com; robertdeschampe@grandportage.com; faron.jackson@llojibwe.org; melanie.benjamin@millelacsband.com; Michael.Fairbanks@whiteearth-nsn.gov; gfrazer@mnchippewatribe.org; Sbartell@piic.org; nicole.boyd@redcliff-nsn.gov; dseki@redlakenation.org; alonzo.denney@ssndakota.com; annette.krebsbach@shakopeedakota.org; Chairman@swo-nsn.gov; robert.vanzile@scc-nsn.gov; lonnas@spiritlakenation.com; info@standingrock.org; kevinj@uppersiouxcommunity-nsn.gov; john.jaschke@state.mn.us; Sarah.Beimers@state.mn.us; ENReviewSHPO@state.mn.us; shannon.geshick@state.mn.us; melissa.cerda@state.mn.us; Jill.Townley@state.mn.us; daniel.oshea@state.mn.us; jason.boyle@state.mn.us; eric.altena@state.mn.us; thorleif@umn.edu; mn.osa@state.mn.us; Jesse.Anderson@state.mn.us; Bonnie.finerty@state.mn.us; william.wilde@state.mn.us; dan.wolf@state.mn.us; josh.stevenson@casscountymn.gov; CoAdmin@crowwing.us; mattl@co.morrison.mn.us; wzylka@cityoflittlefalls.com; jonr@cityoflittlefalls.com; jrklein@brainerd.net; info@sylvantwp.com; lblumke@brainerd.net; dbadeaux@ci.brainerd.mn.us; timt@mississippiheadwaters.org; staff@morrisoncountyhistory.org
Cc: nrosemore@mnpower.com; gprom@allete.com; dmoeller@allete.com; Matthew Radzak (MP) <mradzak@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@KleinschmidtGroup.com>
Subject: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Good afternoon,

On September 8, 2023, ALLETTE, Inc., doing business as Minnesota Power, filed with the Federal Energy Regulatory Commission (FERC) a Proposed Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663). The electronic files can be downloaded through FERC's website using the link provided: https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20230908-5158

If you have any questions regarding this filing, please contact me at the contact information below, or Greg Prom, ALLETE, Inc. Senior Environmental Compliance Specialist at gprom@allete.com.

Thank you,

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt
Office: 715-318-3729
lesley.brotkowski@kleinschmidtgroup.com
www.KleinschmidtGroup.com

Kleinschmidt

We provide practical **solutions** *for complex renewable energy, water, and environmental projects.*

September 8, 2023

Little Falls Hydroelectric Project, Sylvan Hydroelectric Project, and Pillager Hydroelectric Project
Distribution List Recipient

RE: Little Falls Hydroelectric Project, FERC Number P-2532
Sylvan Hydroelectric Project, FERC Number P-2454
Pillager Hydroelectric Project, FERC Number P-2663
Proposed Study Plan for Little Falls, Sylvan, and Pillager Projects

Dear Distribution List Recipient:

ALLETE, Inc., doing business as Minnesota Power (Licensee), has submitted to the Federal Energy Regulatory Commission (FERC) a Proposed Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663).

The electronic files are available at FERC's eLibrary https://elibrary.ferc.gov/eLibrary/ under the docket numbers P-2532, P-2454, and P-2663.

If you have questions concerning this filing, would like to be removed from this distribution list, or have an updated email address or alternative contact information, please contact Lesley Brotkowski at Lesley.Brotkowski@KleinschmidtGroup.com.

Sincerely,

Lesley Brotkowski

Ms. Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt Associates

From: postmaster@state.mn.us
To: dan.wolf@state.mn.us
Sent: Friday, September 8, 2023 5:31 PM
Subject: Undeliverable: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Delivery has failed to these recipients or groups:

dan.wolf@state.mn.us (dan.wolf@state.mn.us)
The email address you entered couldn't be found. Please check the recipient's email address and try to resend the message. If the problem continues, please contact your email admin.

Diagnostic information for administrators:

Generating server: G46PAWEXCH06.ead.state.mn.us

dan.wolf@state.mn.us
Remote Server returned '550 5.1.10 RESOLVER.ADR.RecipientNotFound; Recipient not found by SMTP address lookup'

Original message headers:


```
Received: from G46PAWEXCH06.ead.state.mn.us (10.216.27.91) by
 G46PAWEXCH06.ead.state.mn.us (10.216.27.91) with Microsoft SMTP Server
 (version=TLS1_2, cipher=TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384) id
 15.2.1258.25; Fri, 8 Sep 2023 16:30:42 -0500
Received: from GCC02-BL0-obe.outbound.protection.outlook.com (104.47.64.108)
 by G46PAWEXCH06.ead.state.mn.us (10.216.27.91) with Microsoft SMTP Server
 (version=TLS1_2, cipher=TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384) id
 15.2.1258.25 via Frontend Transport; Fri, 8 Sep 2023 16:30:42 -0500
ARC-Seal: i=3; a=rsa-sha256; s=arcselector9901; d=microsoft.com; cv=pass;

b=fhRuM50fhsXQs81xLAIuO46qBcRYU8gsc4YzV7UMw58WOKqWHhERwVquOmLMWjFHd+07cxI2tEcwUfK8IK3TGp4
6FWR30qDws1WcWoNSKTNWzzo6Zgxi2qsGKdmSd2OOl1j6sHMJSRjUbq0FhKp2SXvovLg5ZrGGWuQMnwA0nHPj9eUU
3AueXLMt2WjoEgpf+UlovpspI3k9HLQ+VGNZSVzgG3MnmPXKHKcgFkCi9BMrJSOA1+GZMm7IW7z+rzO3gvhauri9L
nkRfbLZfFU1spvOFbyZSdQJNdlCMUuvwB6/zYO3qelvmnVW1x9dpkP+f0HQouVX79yA0YMuphOiiQ==
ARC-Message-Signature: i=3; a=rsa-sha256; c=relaxed/relaxed; d=microsoft.com;
 s=arcselector9901;
 h=From:Date:Subject:Message-ID:Content-Type:MIME-Version:X-MS-Exchange-AntiSpam-
MessageData-ChunkCount:X-MS-Exchange-AntiSpam-MessageData-0:X-MS-Exchange-AntiSpam-
MessageData-1;
 bh=BHugVoR8xO6LuTLCS3XFvkGNd0GH2YhNMpU4QDW4cbA=;

b=J5pp1xpSrhQJSduPQs0xqCJbIPmpP7lVhXhMc16s3fCz0jROt/P6FLuVAagVuW7lr4b8FjQXexq9kj2rc3rEG8I
0XvAIawuyNv9dcnQey3fccu5ldhICGxdVmXGweqhzvVljUZLCpnpR8pSPxf9fjAHIAXt0Z3sJNZg1KDItwPZFeZQz
iXWafcuQzxz+0Hq6oaOIRhT/Wzgdzui732f0mQ72WwYl60UcMR50VIy+L4zBeIH45A/Nm3+X+5Ltklb0zZS/YCLR5
GE/Sxtb7v9g6o87kQdoMThqCjSzkL7VX2WYgXP+5LrkaBVfhsLRe2WwCYaFtoiIxECaxu3sAawcNA==
```

From: Mail Delivery System <Mailer-Daemon@w3.paulbunyan.net>
To: gfrazer@mnchippewatribe.org
Sent: Friday, September 8, 2023 5:31 PM
Subject: Undeliverable: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Delivery has failed to these recipients or groups:

gfrazer@mnchippewatribe.org
A problem occurred while delivering your message to this email address. Try sending your message again.

Diagnostic information for administrators:

Generating server: w3.paulbunyan.net

gfrazer@mnchippewatribe.org
Remote server returned '554 5.0.0 < #5.0.0>'

Original message headers:

```
Return-path: <lesley.brotkowski@kleinschmidtgroup.com>
Received: from filter11.paulbunyan.net ([209.191.220.187]:59171
helo=filtermx10.paulbunyan.net)
        by w3.paulbunyan.net with esmtps  (TLS1.2) tls
TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384
        (Exim 4.96)
        (envelope-from <lesley.brotkowski@kleinschmidtgroup.com>)
        id 1qej3v-000srp-1M
        for gfrazer@mnchippewatribe.org;
        Fri, 08 Sep 2023 16:30:44 -0500
Received: from NAM02-DM3-obe.outbound.protection.outlook.com ([40.107.95.85])
          by filtermx10.paulbunyan.net ({36c8e029-dda1-448a-9764-1bb0dce0d780})
          via TCP (inbound) with ESMTPS id 20230908213043104_0000
          for <gfrazer@mnchippewatribe.org>;
          Fri, 08 Sep 2023 16:30:43 -0500
X-RC-FROM: <lesley.brotkowski@kleinschmidtgroup.com>
X-RC-RCPT: <gfrazer@mnchippewatribe.org>
ARC-Seal: i=1; a=rsa-sha256; s=arcselector9901; d=microsoft.com; cv=none;

b=bMXItFEPNEZ9EGEMNS1Eaqp5pY0RC5hLvEX1UgB+gu7ZD2K4YnzMj9VXv5TGZKkU1VELEjcwXs8CVtyaAc3Qyd4
zq8cMrpJnDGbN0XShAnIggFDawyN74ocC/3jGynoUJFtxKrzvU7FPdbaQSKp6vicWB3af/lgnuWPfkX/bhtnuG6A5
8il4jmU9qnEgbFAtc+33f2hD3jqbDn88ODejTEtt8PaIxjHN5s1gW4REiugHVoEf7t3dXFu4tNw/GHM6GDmk0bCC7
GA+JkpP6lLI/4Zy6VUXmwgT6HA+SgHovLvEG+2VA5R04ZS+bmlJPS3yJAWDW5Z69dh9RId6mbOR2A==
ARC-Message-Signature: i=1; a=rsa-sha256; c=relaxed/relaxed; d=microsoft.com;
 s=arcselector9901;
```

From: Microsoft Outlook
To: jjohnson@ldftribe.com
Sent: Friday, September 8, 2023 5:31 PM
Subject: Undeliverable: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects



Your message to jjohnson@ldftribe.com couldn't be delivered.

jjohnson wasn't found at ldftribe.com.

Lesley.Brotkowski	**Office 365**	**jjohnson**
Action Required		Recipient

Unknown To address

How to Fix It

The address may be misspelled or may not exist. Try one or more of the following:

- Send the message again following these steps: In Outlook, open this non-delivery report (NDR) and choose **Send Again** from the Report ribbon. In Outlook on the web, select this NDR, then select the link "**To send this message again, click here.**" Then delete and retype the entire recipient address. If prompted with an Auto-Complete List suggestion don't select it. After typing the complete address, click **Send**.
- Contact the recipient (by phone, for example) to check that the address exists and is correct.
- The recipient may have set up email forwarding to an incorrect address. Ask them to check that any forwarding they've set up is working correctly.
- Clear the recipient Auto-Complete List in Outlook or Outlook on the web by following the steps in this article: Fix email delivery issues for error code 5.1.1 in Office 365, and then send the message again. Retype the entire recipient address before selecting **Send**.

From: Mail Delivery System <Mailer-Daemon@eigbox.net>
To: faron.jackson@llojibwe.org
Sent: Friday, September 8, 2023 5:31 PM
Subject: Undeliverable: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Delivery has failed to these recipients or groups:

faron.jackson@llojibwe.org
A problem occurred while delivering your message to this email address. Try sending your message again.

Diagnostic information for administrators:

Generating server: bosmailscan03.eigbox.net

faron.jackson@llojibwe.org
Remote server returned '554 5.0.0 < #5.0.0>'

Original message headers:

```
Return-path: <lesley.brotkowski@kleinschmidtgroup.com>
Received: from [10.115.3.3] (helo=bosimpinc03)
        by bosmailscan03.eigbox.net with esmtp (Exim)
        id 1qej3n-000134-0O
        for faron.jackson@llojibwe.org; Fri, 08 Sep 2023 17:30:39 -0400
Received: from NAM02-DM3-obe.outbound.protection.outlook.com ([40.107.95.69])
        by bizsmtp with ESMTP
        id ej3lqkbD4xO2hej3mqfMaN; Fri, 08 Sep 2023 17:30:38 -0400
X-EN-OrigIP: 40.107.95.69
X-EN-IMPSID: ej3lqkbD4xO2hej3mqfMaN
ARC-Seal: i=1; a=rsa-sha256; s=arcselector9901; d=microsoft.com; cv=none;

b=bMXItFEPNEZ9EGEMNS1Eaqp5pY0RC5hLvEX1UgB+gu7ZD2K4YnzMj9VXv5TGZKkU1VELEjcwXs8CVtyaAc3Qyd4
zq8cMrpJnDGbN0XShAnIggFDawyN74ocC/3jGynoUJFtxKrzvU7FPdbaQSKp6vicWB3af/lgnuWPfkX/bhtnuG6A5
8il4jmU9qnEgbFAtc+33f2hD3jqbDn88ODejTEtt8PaIxjHN5s1gW4REiugHVoEf7t3dXFu4tNw/GHM6GDmk0bCC7
GA+JkpP6lLI/4Zy6VUXmwgT6HA+SgHovLvEG+2VA5R04ZS+bmlJPS3yJAWDW5Z69dh9RId6mbOR2A==
ARC-Message-Signature: i=1; a=rsa-sha256; c=relaxed/relaxed; d=microsoft.com;
 s=arcselector9901;
 h=From:Date:Subject:Message-ID:Content-Type:MIME-Version:X-MS-Exchange-AntiSpam-
MessageData-ChunkCount:X-MS-Exchange-AntiSpam-MessageData-0:X-MS-Exchange-AntiSpam-
MessageData-1;
 bh=NB1aW5hCL230BYZ/ETdHI1I+rJKRbBQ0PiXEMWaOi5Y=;

b=NpAgfKR8UfuOl57eqGLWmj+shXES8CR2W7YkyCkWVRE+mweGtvv2eyWWGVmUS5srvJquNOkSdPSlSTqSuHCHvlA
WbJK9QN7UVqFpSpFIMUbvgi9Uturz8D+tgEr/NboGoVwqn8hUM5I19TIcqUDz9Ks+61rnpXvcSiKbcgRgKxb91+cu
```

From: postmaster@state.mn.us
To: Bonnie.finerty@state.mn.us
Sent: Friday, September 8, 2023 5:31 PM
Subject: Undeliverable: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Delivery has failed to these recipients or groups:

Bonnie.finerty@state.mn.us (Bonnie.finerty@state.mn.us)
The email address you entered couldn't be found. Please check the recipient's email address and try to resend the message. If the problem continues, please contact your email admin.

Diagnostic information for administrators:

Generating server: G46PAWEXCH06.ead.state.mn.us

Bonnie.finerty@state.mn.us
Remote Server returned '550 5.1.10 RESOLVER.ADR.RecipientNotFound; Recipient not found by SMTP address lookup'

Original message headers:


```
Received: from G46PAWEXCH06.ead.state.mn.us (10.216.27.91) by
 G46PAWEXCH06.ead.state.mn.us (10.216.27.91) with Microsoft SMTP Server
 (version=TLS1_2, cipher=TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384) id
 15.2.1258.25; Fri, 8 Sep 2023 16:30:42 -0500
Received: from GCC02-BL0-obe.outbound.protection.outlook.com (104.47.64.108)
 by G46PAWEXCH06.ead.state.mn.us (10.216.27.91) with Microsoft SMTP Server
 (version=TLS1_2, cipher=TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384) id
 15.2.1258.25 via Frontend Transport; Fri, 8 Sep 2023 16:30:42 -0500
ARC-Seal: i=3; a=rsa-sha256; s=arcselector9901; d=microsoft.com; cv=pass;

b=AIxGNTQ3Kkrk7CwqNin+mbJNf6EwcONHcXc45JGdbvbnXSwF8MZcRzNSXBR2JmfaECg3C74CN4jUwvuevmN0vq0
GylDWEH0Uv9VJKc9ingp/tvpexoJ6A7dVNzdZTEQ5lkZWqDxg8+TAxsvoeah0mTLohC4KdWg5roYGfU6S5y6nNFcw
Pq+v9DyEIrdwPR6p6HheZtVUOq1CjSd5iUOL0/xPP4oaPbqH3g6OErT9QfHSt4i+hr/j6FqzP4aCNDWeh2azdZr0/
RyVc6rgBu3/GCeFBgPVrWbSrqefkPd0sTyu8sNcLSRZ6Nvqyruh6TDlk7b5hp82uSl6jAEO0m4pNg==
ARC-Message-Signature: i=3; a=rsa-sha256; c=relaxed/relaxed; d=microsoft.com;
 s=arcselector9901;
 h=From:Date:Subject:Message-ID:Content-Type:MIME-Version:X-MS-Exchange-AntiSpam-
MessageData-ChunkCount:X-MS-Exchange-AntiSpam-MessageData-0:X-MS-Exchange-AntiSpam-
MessageData-1;
 bh=Wzs7+X9OBlcwH3vTUKoRSna967u4x5Q1jm+L4wNREjY=;

b=dDoQluodXzYL1z0qabtKvdPEOPh8xPCBPemIq0SMvTTA1D5gSulRDNDQYw5B/9NBOEECrshSx5wLvab8brL0BP0
LfZuxgsmyaC+9LyCGFghe8W9W2FS2TfFatSsoP/iQQQIS/PJY21FfzySTpP/SRcGRXEq1qYqzcCZt6YiSfaIEjHBo
++7PTUdeKxuBYhLU0qWLtdhynLnTzATriu1RaXrVl2nQ7ukTRECphVoR7we88++tLNdaDm9APvE+t6QSVcrBp8JBp
d4BAD8I4aqc/JCP4PWGjZlvdxgxSehF670Sj7c/GTeXKadMf/v1/JuPEqZRlAswMnYtAYC60m0xBw==
```

From: Lesley Brotkowski
Sent: Monday, September 11, 2023 10:56 AM
To: bonnie.finnerty@state.mn.us
Subject: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Good morning,

On September 8, 2023, ALLETTE, Inc., doing business as Minnesota Power, filed with the Federal Energy Regulatory Commission (FERC) a Proposed Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663). The electronic files can be downloaded through FERC's website using the link provided: https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20230908-5158

If you have any questions regarding this filing, please contact me at the contact information below, or Greg Prom, ALLETE, Inc. Senior Environmental Compliance Specialist at gprom@allete.com.

Thank you,

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt
Office: 715-318-3729
lesley.brotkowski@kleinschmidtgroup.com
www.KleinschmidtGroup.com

From: Lesley Brotkowski
Sent: Monday, September 11, 2023 11:19 AM
To: jbruce@mnchippewatribe.org
Subject: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Good morning,

On September 8, 2023, ALLETTE, Inc., doing business as Minnesota Power, filed with the Federal Energy Regulatory Commission (FERC) a Proposed Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663). The electronic files can be downloaded through FERC's website using the link provided: https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20230908-5158

If you have any questions regarding this filing, please contact me at the contact information below, or Greg Prom, ALLETE, Inc. Senior Environmental Compliance Specialist at gprom@allete.com.

Thank you,

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt
Office: 715-318-3729
lesley.brotkowski@kleinschmidtgroup.com
www.KleinschmidtGroup.com

From: Lesley Brotkowski
Sent: Monday, September 11, 2023 11:02 AM
To: will.seuffert@state.mn.us
Subject: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Good morning,

On September 8, 2023, ALLETTE, Inc., doing business as Minnesota Power, filed with the Federal Energy Regulatory Commission (FERC) a Proposed Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663). The electronic files can be downloaded through FERC's website using the link provided: https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20230908-5158

If you have any questions regarding this filing, please contact me at the contact information below, or Greg Prom, ALLETE, Inc. Senior Environmental Compliance Specialist at gprom@allete.com.

Thank you,

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt
Office: 715-318-3729
lesley.brotkowski@kleinschmidtgroup.com
www.KleinschmidtGroup.com

From: Lesley Brotkowski
Sent: Monday, September 11, 2023 1:50 PM
To: diane.thompson@llojibwe.net
Subject: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Good afternoon,

On September 8, 2023, ALLETTE, Inc., doing business as Minnesota Power, filed with the Federal Energy Regulatory Commission (FERC) a Proposed Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663). The electronic files can be downloaded through FERC's website using the link provided: https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20230908-5158

If you have any questions regarding this filing, please contact me at the contact information below, or Greg Prom, ALLETE, Inc. Senior Environmental Compliance Specialist at gprom@allete.com.

Thank you,

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt
Office: 715-318-3729
lesley.brotkowski@kleinschmidtgroup.com
www.KleinschmidtGroup.com

From: Lesley Brotkowski
Sent: Monday, September 11, 2023 11:07 AM
To: ldfthpo@ldftribe.com
Subject: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Good morning,

On September 8, 2023, ALLETTE, Inc., doing business as Minnesota Power, filed with the Federal Energy Regulatory Commission (FERC) a Proposed Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663). The electronic files can be downloaded through FERC's website using the link provided: https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20230908-5158

If you have any questions regarding this filing, please contact me at the contact information below, or Greg Prom, ALLETE, Inc. Senior Environmental Compliance Specialist at gprom@allete.com.

Thank you,

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt
Office: 715-318-3729
lesley.brotkowski@kleinschmidtgroup.com
www.KleinschmidtGroup.com

Subject: FW: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects
Attachments: 20230908 SHPO Rev Form w maps_Little Falls Sylvan Pillager PSP.pdf; ProjectBoundary_LittleFalls_P2532.zip; ProjectBoundary_Sylvan_P2454.zip; ProjectBoundary_Pillager_P2663.zip

---

From: Lesley Brotkowski
Sent: Friday, September 8, 2023 5:37 PM
To: Beimers, Sarah (ADM) <sarah.beimers@state.mn.us>
Cc: lucy.harrington@state.mn.us; ENReviewSHPO@state.mn.us; Gregory Prom (MP) <gprom@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@KleinschmidtGroup.com>
Subject: FW: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Hi Sarah,

You were copied below on the email distribution of the Minnesota Power Proposed Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663), which included a link to the FERC filing.

Attached is the SHPO Request for Project Review Form and associated maps for the Projects. We've also attached shapefiles for the FERC Project Boundaries, which are the same boundaries for the proposed APEs.

Please let me know if you have any questions regarding this filing.

Have a nice weekend!
Lesley

Please mail the completed form and required material to:

ENReviewSHPO@state.mn.us

DEPARTMENT OF ADMINISTRATION

Request for Project Review by the State Historic Preservation Office (SHPO)

◉ This is a new submittal

○ This is additional information relating to SHPO Project #: 2023-1267 **DATE:** 9/8/2023

I. GENERAL PROJECT INFORMATION

Project Title: Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663) Hydroelectric Projects Pre-Application Document (PAD)

Project Address (or Location): Please see attached maps and Proposed Study Plan for details

City / Township (circle one): See attachment Zip: See attachment County: Morrison, Crow Wing, Cass

Legal Description: Township Attachment Range Attachment E/W (circle one) Section Attachment Quarter-section Attachment

II. PROJECT CONTACT INFORMATION

Project Contact Name: Greg Prom Title: Senior Environmental Compliance Specialist

Company/Agency: ALLETE, Inc., d.b.a Minnesota Power

Street Address: 30 West Superior Street Phone Number: 218-355-3191

City: Duluth State: MN Zip: 55802-2093 Email: gprom@allete.com

III. FEDERAL AND/OR STATE INVOLVEMENT

Federal Agency (if applicable): Federal Energy Regulatory Commission (FERC) relicensing
(Agency providing funds, licenses, or permits)
Permit or Project Reference #: P-2532, P-2454, P-2663

State Agency (if applicable): N/A
(Agency providing funds, licenses, or permits)
Permit or Project Reference #: N/A

Local Agency (if applicable): N/A

(Continued on Reverse Side)

Please refer to *Instructions for Completing the Request for Project Review* form on our website. Submit one *Request for Project Review* form for each project. For questions regarding the SHPO review process, please visit our website or contact Kelly Gragg-Johnson (651-201-3285) or Leslie Coburn (651-201-3286) or by email at ENReviewSHPO@state.mn.us.

IV. PROJECT DESCRIPTION AND BOUNDARIES

A) REQUIRED FOR ALL PROJECTS

☑ Write a detailed description of the proposed project. (See attached.)

See attached. Minnesota Power filed with the FERC a Proposed Study Plan for the Little Falls Project, Sylvan Project, and Pillager Project (Projects) relicensing process. No changes to operations proposed.

☑ Attach a map of project location, with project area(s) clearly marked. Road names must be included and legible.

B) Architecture

Are there any buildings or structures within the project area? ◉ Yes ○ No

If **No**, continue to the Archaeology section below. If **Yes**, submit all of the following information:

☑ List all buildings and structures within the project area and the year they were built. (See attached.)

Please see the attached

☐ Photographs of ***each*** building and structure located within the project area, along with a photo key. Include streetscape images, if applicable. All photographs must be clear, crisp, focused, and taken at ground level. Aerial photos are insufficient.

☑ List known historic buildings or structures located within the project area (i.e., individual properties or districts which are listed in the National Register or which meet the criteria for listing in the National Register). (See attached.)

Please see the attached

C) Archaeology

Does the proposed undertaking involve ground-disturbing activity? ○ Yes ◉ No

If **No**, this form is complete. If **Yes**, submit all of the following information:

☐ Attach the relevant portion of a 1:24000-scale USGS topographic map (photocopied or computer generated) ***with the project boundary marked***.

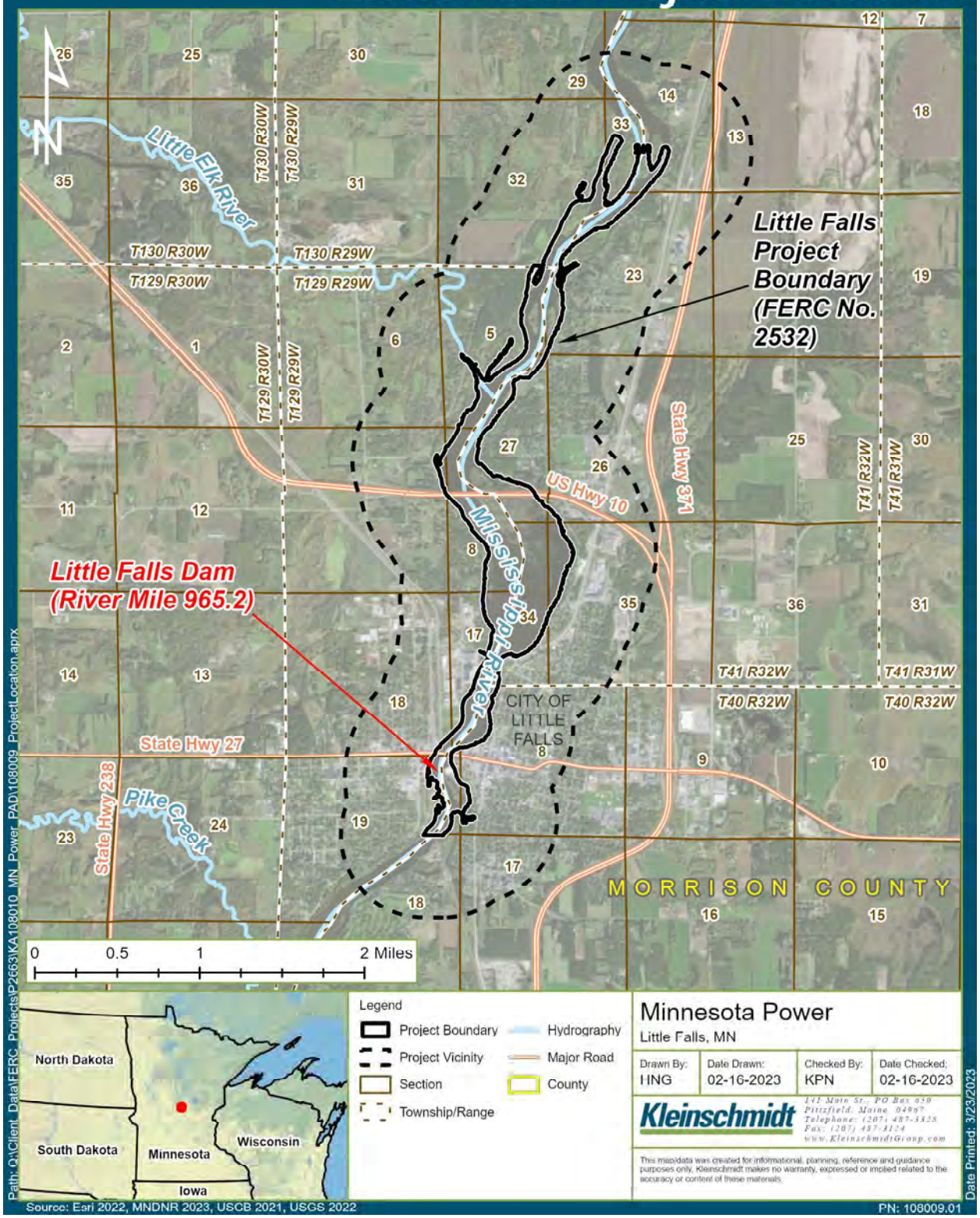
☑ Description of current and previous land use and disturbances: (See attached.)

Please see the attached Proposed Study Plan.

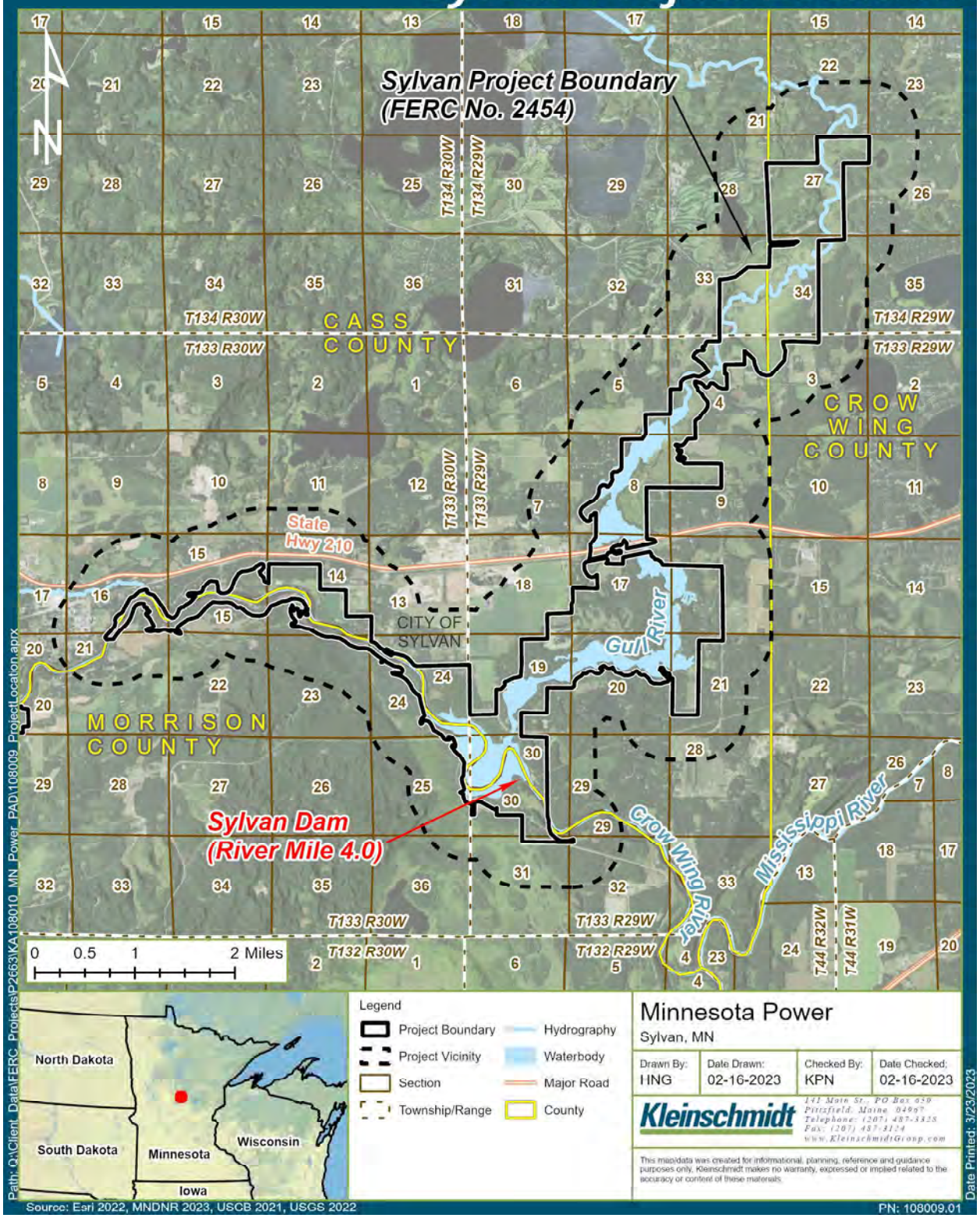
☑ Any available information concerning known or suspected archaeological resources within the project area. (See attached.)

Please see the attached Proposed Study Plan.

Little Falls Project Location



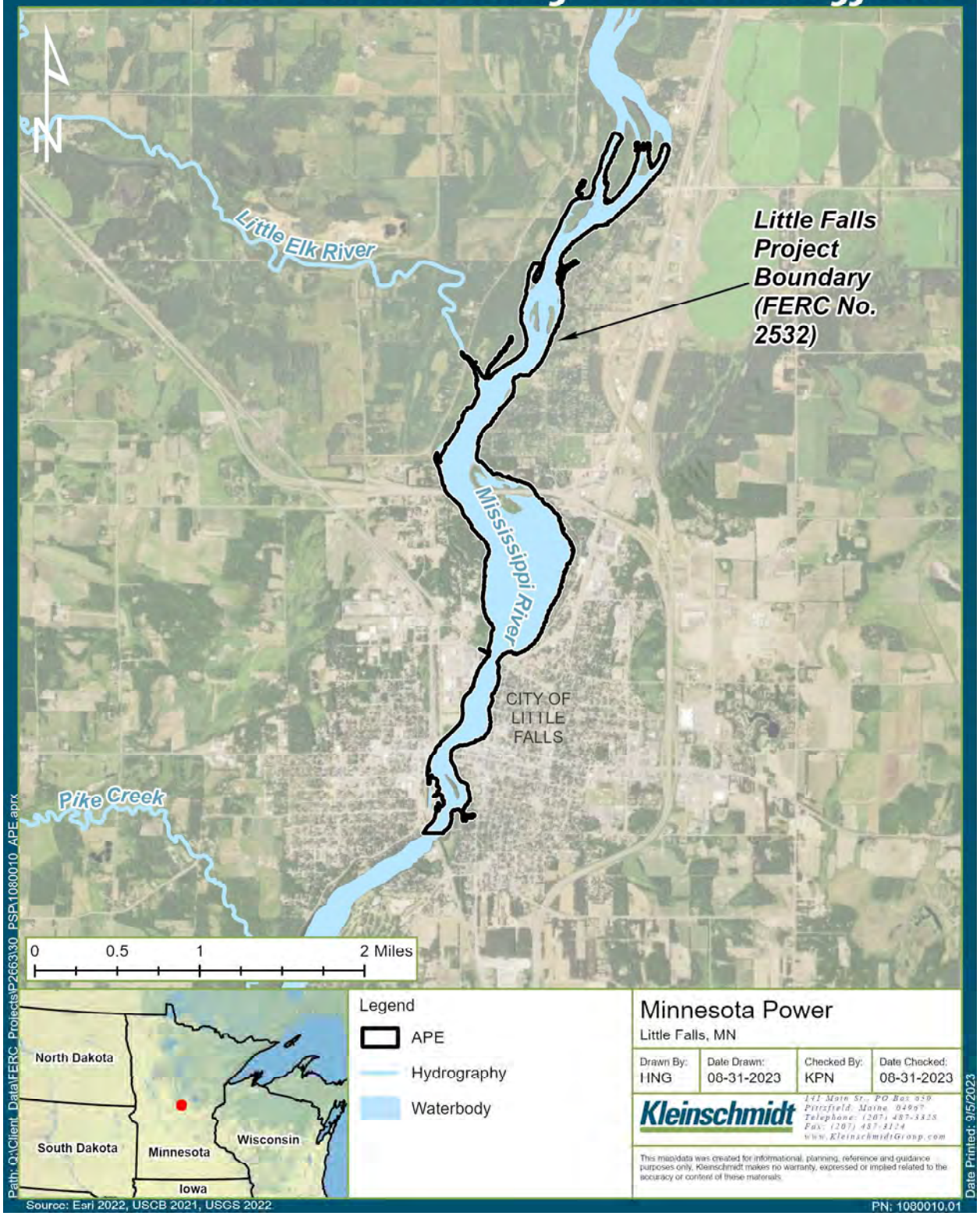
Sylvan Project Location



Pillager Project Location



Little Falls Area of Potential Effects



Minnesota Power
Little Falls, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 659
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

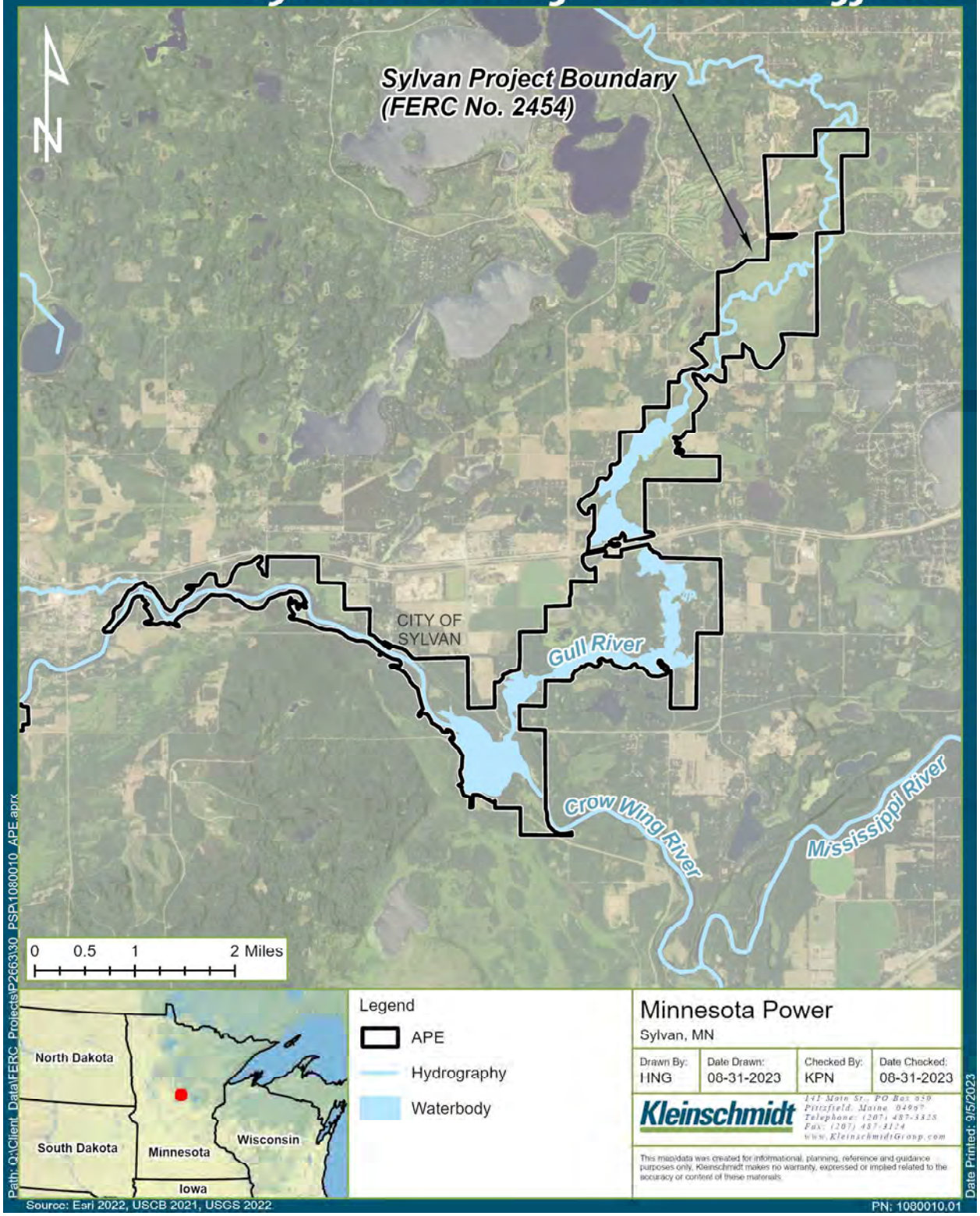
Path: Q:\Client_Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Date Printed: 9/5/2023

Sylvan Area of Potential Effects



Minnesota Power
Sylvan, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 659
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

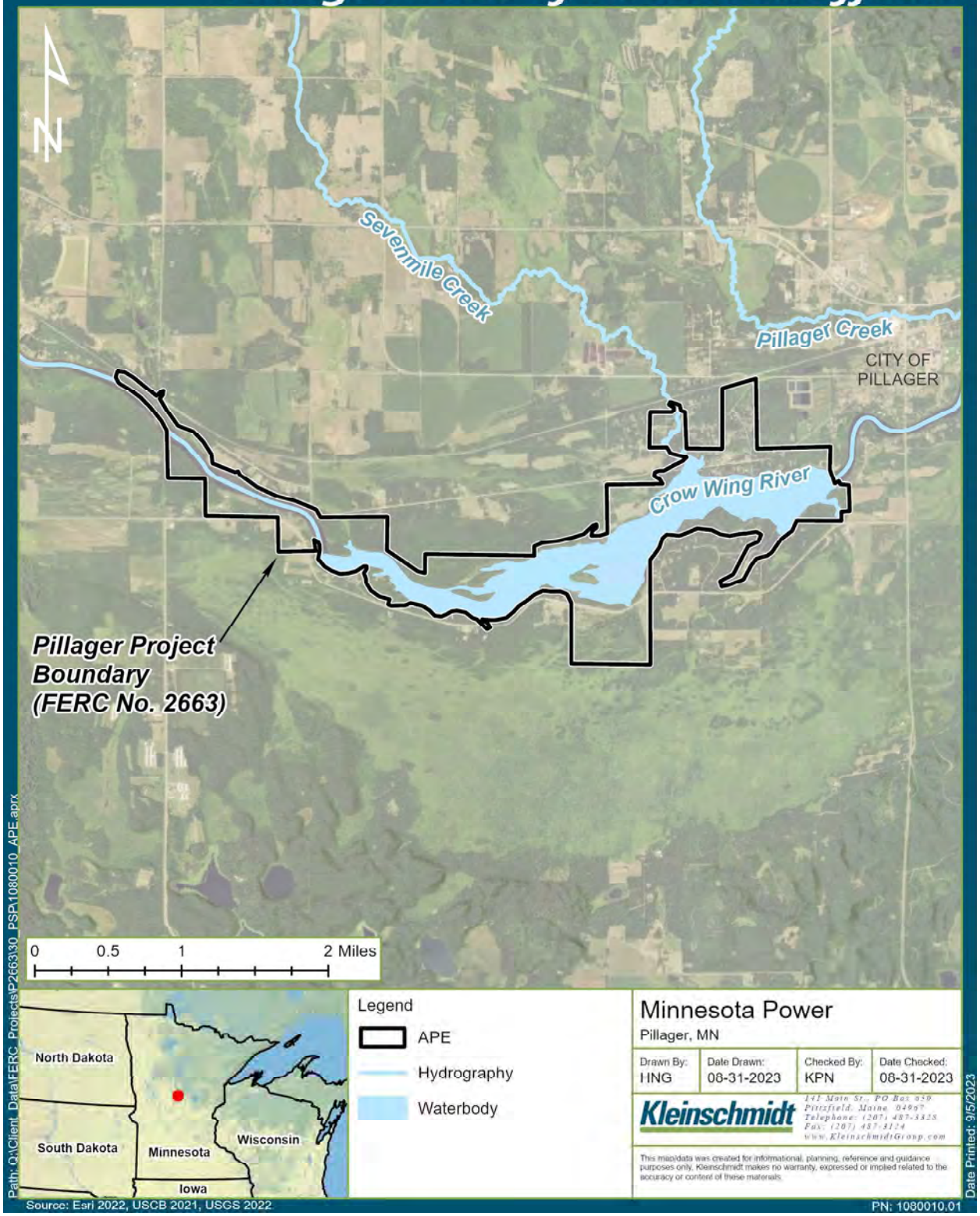
Path: Q:\Client_Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Date Printed: 9/5/2023

Pillager Area of Potential Effects



From: Lesley Brotkowski
Sent: Tuesday, September 12, 2023 1:41 PM
To: Tworzyanski, Jennifer (ADM) <Jennifer.Tworzyanski@state.mn.us>; osa.project.reviews.adm@state.mn.us
Cc: Gregory Prom (MP) <gprom@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@KleinschmidtGroup.com>
Subject: RE: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Hi Jennifer,

ALLETE, Inc., doing business as Minnesota Power (MP), is in the process of relicensing three of their hydroelectric projects, Little Falls, Sylvan, and Pillager, with the Federal Energy Regulatory Commission (FERC). MP has developed a Proposed Study Plan in support of the relicensings, which includes a proposed cultural resources study. MP is requesting review and comment on the Proposed Study Plan (link to document filed with FERC below).

The requested Office of the State Archaeologist review form is attached, along with maps of the project locations and proposed Area of Potential Effects boundaries.

Please let me know if you have any questions or need additional information.

Thank you,
Lesley

From: Tworzyanski, Jennifer (ADM) <Jennifer.Tworzyanski@state.mn.us>
Sent: Monday, September 11, 2023 3:30 PM
To: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>
Subject: RE: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Hi Lesley,

Are you submitting these projects for review by the Minnesota Office of the State Archaeologist? If so, please let me know and fill out the attached form for ease of entering the project(s) into our project review tracking system.

Thanks,
-Jennifer

Jennifer Tworzyanski *(she/her/hers)*
Assistant to the State Archaeologist
Office of the State Archaeologist
328 West Kellogg Blvd
St Paul, MN 55102
651.201.2265



DEPARTMENT OF ADMINISTRATION
STATE ARCHAEOLOGIST

PROJECT REVIEW FORM

Please complete all the fields marked with an asterisk (*).

This form is a fillable document. After completing this form, please send your request to:
OSA.Project.Reviews.adm@state.mn.us

REVIEW INFORMATION

1. **PROJECT NAME*:** Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663) Hydroelectric Projects Relicensings
2. **PROJECT ID:** Click or tap here to enter text.
3. **REASON FOR REVIEW*:** **FERC Relicensing**
4. **REVIEW TYPE*: Review Request**
5. **FUNDING*: Private**
6. **ORGANIZATION NAME:** **ALLETE, Inc., doing business as Minnesota Power**
7. **SUBMITTING ORGANIZATION TYPE: Private**

PROJECT INFORMATION

8. **PROJECT DESCRIPTION*:** Minnesota Power filed with the FERC a Proposed Study Plan (PSP) for the Little Falls Project, Sylvan Project, and Pillager Project hydropower relicensing process. The PSP includes a proposed cultural resources study.
9. **ARCHAEOLOGICAL SITE NUMBERS (if known – if not, leave blank)** (Separate counties with commas)**:** Click or tap here to enter text.
10. **COUNTY***(Add multiples by separating with a comma)**:** Morisson, Crow Wing, Cass

11. BACKGROUND RESEARCH DONE (Check the appropriate box if any research has been completed or is in progress. If no research has been done, leave blank):

☐OSA Portal Query

☐MnDOT GIS

☐MnModel

☐Legacy Historic cemeteries

12. KNOWN RESOURCES ADJACENT TO REVIEW AREA (if known – if not, leave blank):

☐Cemeteries

☐Burials

☐Archaeological Sites

13. ADDITIONAL INFORMATION: FERC has designated Allete as the non-federal representative for Section 106 consultation

LOCATION INFORMATION* (If there are additional PLSS entries, please add a continuation sheet)

14. LOCATION INFORMATION (Complete this or Project Address if PLSS is not known):

Little Falls Hydroelectric Project:

PLSS - Township:130 Range:29 Range Direction (E or W):W Section:5, 32, 33
PLSS - Township:41 Range:32 Range Direction (E or W):W Section:13, 14, 23, 26, 27, 34, 35
PLSS - Township:40 Range:32 Range Direction (E or W):W Section:8, 18
PLSS - Township:129 Range:29 Range Direction (E or W):W Section:5, 6, 7, 8, 17, 18, 19

Sylvan Hydroelectric Project:

PLSS - Township:134 Range:29 Range Direction (E or W):W Section:21, 27, 28, 33, 34
PLSS - Township: 133 Range:29 Range Direction (E or W):W Section:3, 4, 5, 8, 9, 16, 17, 18, 19, 20, 21, 30, 31, 32
PLSS - Township:133 Range:30 Range Direction (E or W):W Section:13, 14, 15, 16, 21, 15, 24, 25

Pillager Hydroelectric Project:

PLSS - Township:133 Range:31 Range Direction (E or W):W Section:16, 21,,22, 23, 24, 25, 26, 27,
PLSS - Township:133 Range:30 Range Direction (E or W):W Section:19, 20, 29, 30
PLSS - Township: Range: Range Direction (E or W): Section:
PLSS - Township: Range: Range Direction (E or W): Section:

15. ADDRESS (if PLSS is not known, please enter your project address):
Address Line 1: Click or tap here to enter text.
Address Line 2: Click or tap here to enter text.
City: Click or tap here to enter text.
State: Click or tap here to enter text.
Zip Code: Click or tap here to enter text.

16. Maps of the project locations and proposed Area of Potential Effects/FERC project boundaries are attached.

REQUESTOR INFORMATION

17. REQUESTED BY* (name): Greg Prom

18. REQUESTOR's EMAIL ADDRESS*: gprom@allete.com

19. REQUESTOR's PHONE NUMBER: 218-355-3191

20. REQUESTOR's PHYSICAL ADDRESS:
Address Line 1: 30 West Superior Street
City: Duluth
State: MN
Zip Code: 55802-2093

21. Please also copy Allete's relicensing consultant on correspondence:

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt Associates
233403 Stettin Ridge Court
Wausau, WI 54401
Lesley.brotkowski@kleinschmidtgroup.com
715-318-3729

ADDITIONAL INFORMATION AND ATTACHMENTS

Please add and attach any pertinent photos, maps, or documents that will help us complete the review.

Maps of the project locations and proposed Area of Potential Effects/FERC project boundaries are attached. A link to the Proposed Study Plan is provided in the email text.

From: Beimers, Sarah (ADM) <sarah.beimers@state.mn.us>
Sent: Tuesday, September 12, 2023 4:55 PM
To: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>
Cc: Harrington, Lucy (She/Her/Hers) (ADM) <Lucy.Harrington@state.mn.us>; Gregory Prom (MP) <gprom@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>
Subject: RE: Proposed Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Lesley,
Thank you for sending this documentation.
While the SHPO review form is fine, for any reviews that are intended to meet Section 106 we need a corresponding letter from FERC's authorized agent as well. As discussed at our recent meeting, the letter should respond to comments we provided to FERC in our 7/22/2023 letter, specifically at this point in Section 106 consultation:

- Definition of the federal undertaking subject to review under Section 106 per 36 CFR 800.16(y) – specifically whether there are 3 undertakings or 1 undertaking and describe the scope and nature of the undertaking e.g. "federal license to …"
- Definition of the Area of Potential Effect corresponding to the undertaking's definition and to provide narrative to the maps you sent on 9/8.
- Does the Proposed Study Plan provide responses to comments included in our 7/22 letter as well? If not, then the cover letter should also provide an overview of what is proposed in the study plan in terms of meeting Section 106 responsibilities for identification of historic properties and responses to comments we have already provided.

We will hold off on logging this new material in for review until we receive the ALLETE/Minnesota Power cover letter.
Sarah

Sarah Beimers (she/her) **| Environmental Review Program Manager**
State Historic Preservation Office
Minnesota Department of Administration

minnesota power
AN ALLETE COMPANY

September 20, 2023

Sarah Beimers
State Historic Preservation Office
Minnesota Department of Administration
203 Administration Building
50 Sherburne Avenue
Saint Paul, Minnesota 55155

Subject: Consultation under Section 106 of the National Historic Preservation Act
Proposed Study Plan for the relicensing of the Little Falls Hydroelectric Project (FERC Project No. 2532), Sylvan Hydroelectric Project (FERC Project No. 2454), and Pillager Hydroelectric Project (FERC Project No. 2663)

Dear Sarah Beimers:

Herein, Minnesota Power (MP) is initiating informal consultation under Section 106 of the National Historic Preservation Act of 1966,[1] requesting review of the Proposed Study Plan (PSP)[2] associated with the relicensing of the Little Falls Hydroelectric Project (Little Falls Project) (FERC No. 2532), Sylvan Hydroelectric Project (Sylvan Project) (FERC No. 2454), and Pillager Hydroelectric Project (Pillager Project) (FERC No. 2663), and responding to the questions outlined in the September 12, 2023, email from Sarah Beimers of the Minnesota State Historic Preservation Office (Minnesota SHPO). Doing business as MP, ALLETE, Inc. is the Licensee of the Little Falls Project, Sylvan Project, and Pillager Project, herein collectively referred to as the "Projects." The FERC licenses for Projects expire on March 31, 2028. The Licensee is using the Commission's Integrated Licensing Process (ILP) to relicense the Projects.

On September 8, 2023, a single PSP for the Projects was filed with the Federal Energy Regulatory Commission (Commission or FERC), as well as distributed with the Tribes, agencies, and stakeholders, as listed on the Distribution List. On September 12, 2023, Sarah Beimers of the Minnesota SHPO requested a separate letter from FERC's authorized agent prior to logging and reviewing the PSP, in accordance with consultation requirements of Section 106 of the National Historic Preservation Act of 1966. In the September 12, 2023, Minnesota SHPO correspondence, it was requested that MP provide a response to comments provided in Minnesota SHPO's July 22, 2023, letter. Specifically, the Minnesota SHPO asked the following questions (*italicized*), which MP has answered below:

[1] The FERC designated the Licensee as the Commission's non-federal representative for carrying out informal consultation pursuant to Section 106 of the National Historic Preservation Act in the FERC's May 26, 2023 issuance (FERC accession number: 20230526-3003).
[2] The PSP is available through FERC's website: https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20230908-5158

minnesota power
AN ALLETE COMPANY

1. *Definition of the federal undertaking subject to review under Section 106 per 36 CFR 800.16(y) – specifically whether there are 3 undertakings or 1 undertaking and describe the scope and nature of the undertaking e.g. "federal license to …"*

The Little Falls Project, Sylvan Project, and Pillager Project are operated under separate FERC licenses. The Licensee filed three separate Notice of Intents to relicense each of the Projects on March 30, 2023. Each of the Projects are undergoing relicensing using the Commission's Integrated Licensing Process (ILP). For efficiency and due to the proximity of the Projects, the Licensee is engaging in concurrent relicensing efforts for the Projects with combined documents, meetings, and a single schedule for the relicensings. As there are officially three separate relicensing processes (albeit being run concurrently), there are three separate federal undertakings: 1) the federal relicensing of the Little Falls Hydroelectric Project (FERC No. 2532); 2) the federal relicensing of the Sylvan Hydroelectric Project (FERC No. 2454); and 3) the federal relicensing of the Pillager Hydroelectric Project (FERC No. 2663).

2. *Definition of the Area of Potential Effect corresponding to the undertaking's definition and to provide narrative to the maps sent on 9/8/2023.*

Section 5.4 of the PSP describes the proposed Cultural Resources Study. One objective of the study is to identify the Area of Potential Effects (APE) for each of the Projects in consultation with the Minnesota SHPO and interested tribes. MP is proposing to define the APEs as follows: 1) the APE for the relicensing of the Little Falls Project as the area within the Little Falls FERC Project Boundary; 2) the APE for the relicensing of the Sylvan Project as the area within the Sylvan FERC Project Boundary; and 3) the APE for the relicensing of the Pillager Project as the area within the Pillager FERC Project Boundary. Additional descriptions and figures of the proposed APEs are provided in Section 5.4 of the PSP. Per request, the shapefiles of the APEs for the Projects were provided to the Minnesota SHPO via email on September 8, 2023.

3. *Does the Proposed Study Plan provide responses to comments included in our 7/22/2023 letter as well? If not, then the cover letter should also provide an overview of what is proposed in the study plan in terms of meeting Section 106 responsibilities for identification of historic properties and responses to comments we have already provided.*

The PSP presents the studies that are being proposed by MP, which includes the identification of Historic Properties in accordance with Section 106 responsibilities. The Historic Architectural Resources Study and Archaeological Resources Study proposed are consistent with Minnesota SHPO's request outlined in the July 22, 2023 letter. The Archaeological Resources Study includes a desktop survey, which will compile existing information and status of the provisions outlined in the previously executed Programmatic Agreements and Cultural Resources Management Plans for the Projects.

The Licensee updated the Distribution List for the relicensings of the Projects to include the consulting parties identified in Minnesota SHPO's July 22, 2023, letter. The PSP was distributed on September 8, 2023, to the Distribution List, including those additional parties identified by the Minnesota SHPO.

MP requests Minnesota SHPO review of the PSP for the Projects. MP requests comments on the PSP by December 11, 2023 in accordance with the ILP Process Plan and Schedule outlined in FERC's Scoping Document 2.[3]

Please direct any questions pertaining to the relicensing of the Projects to me by phone at (218) 355-3191 or e-mail at gprom@allete.com.

Best Regards,



Greg Prom
Senior Environmental Compliance Specialist
ALLETE, Inc., d.b.a Minnesota Power
30 West Superior Street
Duluth, Minnesota 55802-2093

[3] FERC's Scoping Document 2 was issued on September 8, 2023 (FERC accession number: 20230908-3041). The PSP comment due date outlined in the ILP Process Plan and Schedule is December 10, 2023, but as the date falls on the weekend, the comments are due the following business day.

From: Gregory Prom (MP)
To: Beimers, Sarah (ADM)
Cc: Lesley Brotkowski; Matthew Radzak (MP)
Subject: RE: Consultation Request
Date: Thursday, September 21, 2023 11:18:45 AM
Attachments: image001.png
Little Falls Sylvan Pillager PSP SHPO Consultation Letter 2023_09_20.docx

---

Sarah,

I have attached a letter requesting consultation between SHPO and Minnesota Power for the relicensing process of the Little Falls, Sylvan, and Pillager hydroectric projects.

If you have any questions in regards to the consultation request letter, please let me know.

Thanks,

Greg Prom

Senior Environmental Compliance Specialist
Minnesota Power/ALLETE
30 West Superior Street
Duluth, Minnesota 55802

Office: 218-355-3191
Cell: 218-461-6856
Email: gprom@allete.com



minnesota power
AN ALLETE COMPANY

September 20, 2023

Sarah Beimers
State Historic Preservation Office
Minnesota Department of Administration
203 Administration Building
50 Sherburne Avenue
Saint Paul, Minnesota 55155

Subject: Consultation under Section 106 of the National Historic Preservation Act
Proposed Study Plan for the relicensing of the Little Falls Hydroelectric Project (FERC Project No. 2532), Sylvan Hydroelectric Project (FERC Project No. 2454), and Pillager Hydroelectric Project (FERC Project No. 2663)

Dear Sarah Beimers:

Herein, Minnesota Power (MP) is initiating informal consultation under Section 106 of the National Historic Preservation Act of 1966,[1] requesting review of the Proposed Study Plan (PSP)[2] associated with the relicensing of the Little Falls Hydroelectric Project (Little Falls Project) (FERC No. 2532), Sylvan Hydroelectric Project (Sylvan Project) (FERC No. 2454), and Pillager Hydroelectric Project (Pillager Project) (FERC No. 2663), and responding to the questions outlined in the September 12, 2023, email from Sarah Beimers of the Minnesota State Historic Preservation Office (Minnesota SHPO). Doing business as MP, ALLETE, Inc. is the Licensee of the Little Falls Project, Sylvan Project, and Pillager Project, herein collectively referred to as the "Projects." The FERC licenses for Projects expire on March 31, 2028. The Licensee is using the Commission's Integrated Licensing Process (ILP) to relicense the Projects.

On September 8, 2023, a single PSP for the Projects was filed with the Federal Energy Regulatory Commission (Commission or FERC), as well as distributed with the Tribes, agencies, and stakeholders, as listed on the Distribution List. On September 12, 2023, Sarah Beimers of the Minnesota SHPO requested a separate letter from FERC's authorized agent prior to logging and reviewing the PSP, in accordance with consultation requirements of Section 106 of the National Historic Preservation Act of 1966. In the September 12, 2023, Minnesota SHPO correspondence, it was requested that MP provide a response to comments provided in Minnesota SHPO's July 22, 2023, letter. Specifically, the Minnesota SHPO asked the following questions (*italicized*), which MP has answered below:

[1] The FERC designated the Licensee as the Commission's non-federal representative for carrying out informal consultation pursuant to Section 106 of the National Historic Preservation Act in the FERC's May 26, 2023 issuance (FERC accession number: 20230526-3003).
[2] The PSP is available through FERC's website: https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20230908-5158

minnesota power
AN ALLETE COMPANY

1. *Definition of the federal undertaking subject to review under Section 106 per 36 CFR 800.16(y) – specifically whether there are 3 undertakings or 1 undertaking and describe the scope and nature of the undertaking e.g. "federal license to …"*

The Little Falls Project, Sylvan Project, and Pillager Project are operated under separate FERC licenses. The Licensee filed three separate Notice of Intents to relicense each of the Projects on March 30, 2023. Each of the Projects are undergoing relicensing using the Commission's Integrated Licensing Process (ILP). For efficiency and due to the proximity of the Projects, the Licensee is engaging in concurrent relicensing efforts for the Projects with combined documents, meetings, and a single schedule for the relicensings. As there are officially three separate relicensing processes (albeit being run concurrently), there are three separate federal undertakings: 1) the federal relicensing of the Little Falls Hydroelectric Project (FERC No. 2532); 2) the federal relicensing of the Sylvan Hydroelectric Project (FERC No. 2454); and 3) the federal relicensing of the Pillager Hydroelectric Project (FERC No. 2663).

2. *Definition of the Area of Potential Effect corresponding to the undertaking's definition and to provide narrative to the maps sent on 9/8/2023.*

Section 5.4 of the PSP describes the proposed Cultural Resources Study. One objective of the study is to identify the Area of Potential Effects (APE) for each of the Projects in consultation with the Minnesota SHPO and interested tribes. MP is proposing to define the APEs as follows: 1) the APE for the relicensing of the Little Falls Project as the area within the Little Falls FERC Project Boundary; 2) the APE for the relicensing of the Sylvan Project as the area within the Sylvan FERC Project Boundary; and 3) the APE for the relicensing of the Pillager Project as the area within the Pillager FERC Project Boundary. Additional descriptions and figures of the proposed APEs are provided in Section 5.4 of the PSP. Per request, the shapefiles of the APEs for the Projects were provided to the Minnesota SHPO via email on September 8, 2023.

3. *Does the Proposed Study Plan provide responses to comments included in our 7/22/2023 letter as well? If not, then the cover letter should also provide an overview of what is proposed in the study plan in terms of meeting Section 106 responsibilities for identification of historic properties and responses to comments we have already provided.*

The PSP presents the studies that are being proposed by MP, which includes the identification of Historic Properties in accordance with Section 106 responsibilities. The Historic Architectural Resources Study and Archaeological Resources Study proposed are consistent with Minnesota SHPO's request outlined in the July 22, 2023 letter. The Archaeological Resources Study includes a desktop survey, which will compile existing information and status of the provisions outlined in the previously executed Programmatic Agreements and Cultural Resources Management Plans for the Projects.

The Licensee updated the Distribution List for the relicensings of the Projects to include the consulting parties identified in Minnesota SHPO's July 22, 2023, letter. The PSP was distributed on September 8, 2023, to the Distribution List, including those additional parties identified by the Minnesota SHPO.

MP requests Minnesota SHPO review of the PSP for the Projects. MP requests comments on the PSP by December 11, 2023 in accordance with the ILP Process Plan and Schedule outlined in FERC's Scoping Document 2.[3]

Please direct any questions pertaining to the relicensing of the Projects to me by phone at (218) 355-3191 or e-mail at gprom@allete.com.

Best Regards,



Greg Prom
Senior Environmental Compliance Specialist
ALLETE, Inc., d.b.a Minnesota Power
30 West Superior Street
Duluth, Minnesota 55802-2093

[3] FERC's Scoping Document 2 was issued on September 8, 2023 (FERC accession number: 20230908-3041). The PSP comment due date outlined in the ILP Process Plan and Schedule is December 10, 2023, but as the date falls on the weekend, the comments are due the following business day.

Little Falls Hydroelectric Project (FERC Project No. 2532)

Sylvan Hydroelectric Project (FERC Project No. 2454)

Pillager Hydroelectric Project (FERC Project No. 2663)

Relicensing Consultation Documentation

Date	9/22/2023
Person documenting conversation	Greg Prom (Minnesota Power)
Discussion participants	Ray Nelson (Friends of the Old Crow Wing), Greg Prom (Minnesota Power)
Subject of conversation	Recreation Data

Summary of Conversation:

Greg Prom spoke with Ray Nelson to explain that Minnesota Power (MP) is currently in the study plan development stage of the relicensing process. He informed Mr. Nelson that the Proposed Study Plan for the Chippawa Agency Site has been filed with FERC and is now open for public comment. Greg provided an overview of the relicensing process, noting that the draft license application (DLA), the stage at which project boundary adjustments could be requested, is still several years away. He emphasized that MP will continue to evaluate all options for the Chippawa Agency Site in the meantime. During the call, Mr. Prom invited Mr. Nelson to participate in a virtual public meeting scheduled for October 11, 2023. Mr. Nelson expressed interest and asked to be added to the distribution list, providing his email address. He thanked Greg for the explanation and appreciated the follow-up.

From:	Lesley Brotkowski
To:	timothy.lapointe@bia.gov; Nanette.m.bischoff@usace.army.mil; darin_simpkins@fws.gov; dave_thomson@nps.gov; Jay Summers; Patrick Ely; durellcooper05@gmail.com; MikeW@badriver-nsn.gov; rwassana@c-a-tribes.org; Anthony.Reider@fsst.org; jeffery.stiffarm@ftbelknap.org; trhodd@iowas.org; doreen@kbic-nsn.gov; ldfthpo@ldftribe.com; jim.williams@lvd-nsn.gov; robert.larsen@lowersioux.com; chairman@mitw.org; cchavers@boisforte-nsn.gov; kevindupuis@fdlrez.com; robertdeschampe@grandportage.com; diane.thompson@llojibwe.net; melanie.benjamin@millelacsband.com; Michael.Fairbanks@whiteearth-nsn.gov; jbruce@mnchippewatribe.org; Sbartell@piic.org; nicole.boyd@redcliff-nsn.gov; dseki@redlakenation.org; Scott.herman@rst-nsn.gov; jamie.azure@tmbci.org; alonzo.denney@ssndakota.com; annette.krebsbach@shakopeedakota.org; Chairman@swo-nsn.gov; robert.vanzile@scc-nsn.gov; lonnas@spiritlakenation.com; info@standingrock.org; kevinj@uppersiouxcommunity-nsn.gov; "john.jaschke@state.mn.us"; Beimers, Sarah (ADM); Harrington, Lucy (She/Her/Hers) (ADM); shannon.geshick@state.mn.us; melissa.cerda@state.mn.us; Jill.Townley@state.mn.us; daniel.oshea@state.mn.us; jason.boyle@state.mn.us; eric.altena@state.mn.us; thorleif@umn.edu; mn.osa@state.mn.us; Jesse.Anderson@state.mn.us; Bonnie.finnerty@state.mn.us; william.wilde@state.mn.us; will.seuffert@state.mn.us; josh.stevenson@casscountymn.gov; CoAdmin@crowwing.us; mattl@co.morrison.mn.us; wzylka@cityoflittlefalls.com; jonr@cityoflittlefalls.com; jrklein@brainerd.net; info@sylvantwp.com; lblumke@brainerd.net; dlobaxter@charter.net; dbadeaux@ci.brainerd.mn.us; timt@mississippiheadwaters.org; staff@morrisoncountyhistory.org; Rnnelson13@hotmail.com; royandjoann@hotmail.com; dwedll@hotmail.com; stephenschaitberger@charter.net
Cc:	nrosemore@mnpower.com; gprom@allete.com; mradzak@mnpower.com; dmoeller@allete.com; Elizabeth Krchnavek; Jared Porter
Subject:	Proposed Study Plan Meeting - Little Falls (P-2532), Sylvan (P-2454), & Pillager (P-2663) Hydroelectric Projects
Attachments:	image001.gif PSP Meeting Agenda.pdf

On September 8, 2023, ALLETTE, Inc., doing business as Minnesota Power, filed with the Federal Energy Regulatory Commission (FERC) a Proposed Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663). The electronic files can be downloaded through FERC's website using the link provided: https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20230908-5158

You are cordially invited to attend the Proposed Study Plan Meeting on Wednesday, October 11, 2023 at 9:00 AM Central Time. The meeting will be held virtually through the link below. The purpose of the meeting will be to review the Proposed Study Plan, share any additional information or responses to proposed studies, and discuss outstanding issues with respect to the Proposed Study Plan. The meeting agenda is outlined below and attached.

Agenda:

1) Meeting kickoff and introductions
2) FERC schedule review
3) Purpose of PSP meeting
4) Proposed Studies
5) Requested Studies Not Adopted
6) Additional Information Requested
7) Overview of Next Steps
8) Questions and Discussion

Please contact me if you have any questions regarding this meeting.

Thank you,

Lesley Brotkowski

Senior Licensing Coordinator

Email: Lesley.Brotkowski@kleinschmidtgroup.com <mailto:Lesley.Brotkowski@kleinschmidtgroup.com>

Office: 715-318-3729

Microsoft Teams meeting

Join on your computer, mobile app or room device

Click here to join the meeting <https://teams.microsoft.com/l/meetup-join/19%3ameeting_MjYxZWU1YmYtOGM4Ni00NTRiLWJkNDItY2Q1MDE5NjQ1MzEy%40thread.v2/0?context=%7b%22Tid%22%3a%22adc6e70c-c575-40a4-9676-24da4a1fdce9%22%2c%22Oid%22%3a%22a489fc63-7f65-4adf-ba2c-44a79f01a20e%22%7d>

Meeting ID: 226 744 414 475
Passcode: oR66ep

Download Teams <https://www.microsoft.com/en-us/microsoft-teams/download-app> | Join on the web <https://www.microsoft.com/microsoft-teams/join-a-meeting>

Or call in (audio only)

+1 207-248-8024,,455079613# <tel:+12072488024,,455079613#> United States, Portland

Phone Conference ID: 455 079 613#

Find a local number <https://dialin.teams.microsoft.com/d08180aa-712f-4098-8161-d183ecab7d97?id=455079613> | Reset PIN <https://dialin.teams.microsoft.com/usp/pstnconferencing>

<https://www.kleinschmidtgroup.com/wp-content/themes/ironstrap/dist/images/logo-footer.gif>

Learn More <https://aka.ms/JoinTeamsMeeting> | Meeting options <https://teams.microsoft.com/meetingOptions/?organizerId=a489fc63-7f65-4adf-ba2c-44a79f01a20e&tenantId=adc6e70c-c575-40a4-9676-24da4a1fdce9&threadId=19_meeting_MjYxZWU1YmYtOGM4Ni00NTRiLWJkNDItY2Q1MDE5NjQ1MzEy@thread.v2&messageId=0&language=en-US>

Little Falls (P-2532), Sylvan (P-2454), Pillager (P-2663) Hydroelectric Projects

Proposed Study Plan Meeting Agenda

Date and Time: October 11, 2023, 9:00 – 11:00 AM Central Time

Meeting Location: Virtual Meeting, Microsoft Teams

Purpose of the meeting:

- Review the Proposed Study Plan (PSP)
- Share any additional information or responses to proposed studies
- Discuss outstanding issues with respect to the PSP

Agenda:

1) Meeting kickoff and introductions
2) FERC schedule review
3) Purpose of PSP meeting
4) Proposed Studies
5) Requested Studies Not Adopted
6) Additional Information Requested
7) Overview of Next Steps
8) Questions and Discussion

From: Lesley Brotkowski
Sent: Wednesday, September 27, 2023 1:53 PM
To: Jay Summers <Jay.Summers@ferc.gov>
Cc: Gregory Prom (MP) <gprom@mnpower.com>
Subject: RE: Proposed Study Plan Meeting - Little Falls (P-2532), Sylvan (P-2454), & Pillager (P-2663) Hydroelectric Projects

Good afternoon Jay,

I've added the staff requested below. I see some new names. Can you please let us know which resource areas each staff person is covering?

Have a good day!
Lesley

From: Jay Summers <Jay.Summers@ferc.gov>
Sent: Wednesday, September 27, 2023 8:29 AM
To: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>
Subject: RE: Proposed Study Plan Meeting - Little Falls (P-2532), Sylvan (P-2454), & Pillager (P-2663) Hydroelectric Projects

Good morning Lesley,

Could you please send a meeting invitation to the following FERC staff:

David A. Graefe David.Graefe@ferc.gov
Michael Davis Michael.Davis@ferc.gov
Paul Makowski paul.makowski@ferc.gov
Colleen Corballis Colleen.Corballis@ferc.gov

Thanks,

-----Original Appointment-----
From: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>
Sent: Tuesday, September 26, 2023 5:44 PM
To: timothy.lapointe@bia.gov; Nanette.m.bischoff@usace.army.mil; darin_simpkins@fws.gov; dave_thomson@nps.gov; Jay Summers; Patrick Ely; durellcooper05@gmail.com; MikeW@badriver-nsn.gov; rwassana@c-a-tribes.org; Anthony.Reider@fsst.org; jeffery.stiffarm@ftbelknap.org; trhodd@iowas.org; doreen@kbic-nsn.gov; ldfthpo@ldftribe.com; jim.williams@lvd-nsn.gov; robert.larsen@lowersioux.com; chairman@mitw.org; cchavers@boisforte-nsn.gov; kevindupuis@fdlrez.com; robertdeschampe@grandportage.com; diane.thompson@llojibwe.net; melanie.benjamin@millelacsband.com; Michael.Fairbanks@whiteearth-nsn.gov; jbruce@mnchippewatribe.org; Sbartell@piic.org; nicole.boyd@redcliff-nsn.gov; dseki@redlakenation.org; Scott.herman@rst-nsn.gov; jamie.azure@tmbci.org; alonzo.denney@ssndakota.com; annette.krebsbach@shakopeedakota.org; Chairman@swo-nsn.gov; robert.vanzile@scc-nsn.gov; lonnas@spiritlakenation.com; info@standingrock.org; kevinj@uppersiouxcommunity-nsn.gov;

'john.jaschke@state.mn.us'; Beimers, Sarah (ADM); Harrington, Lucy (She/Her/Hers) (ADM); shannon.geshick@state.mn.us; melissa.cerda@state.mn.us; Jill.Townley@state.mn.us; daniel.oshea@state.mn.us; jason.boyle@state.mn.us; eric.altena@state.mn.us; thorleif@umn.edu; mn.osa@state.mn.us; Jesse.Anderson@state.mn.us; Bonnie.finnerty@state.mn.us; william.wilde@state.mn.us; will.seuffert@state.mn.us; josh.stevenson@casscountymn.gov; CoAdmin@crowwing.us; mattl@co.morrison.mn.us; wzylka@cityoflittlefalls.com; jonr@cityoflittlefalls.com; jrklein@brainerd.net; info@sylvantwp.com; lblumke@brainerd.net; dlobaxter@charter.net; dbadeaux@ci.brainerd.mn.us; timt@mississippiheadwaters.org; staff@morrisoncountyhistory.org; Rnnelson13@hotmail.com; royandjoann@hotmail.com; dwedll@hotmail.com; stephenschaitberger@charter.net
Cc: nrosemore@mnpower.com; gprom@allete.com; mradzak@mnpower.com; dmoeller@allete.com; Elizabeth Krchnavek; Jared Porter
Subject: Proposed Study Plan Meeting - Little Falls (P-2532), Sylvan (P-2454), & Pillager (P-2663) Hydroelectric Projects
When: Wednesday, October 11, 2023 9:00 AM-11:00 AM (UTC-06:00) Central Time (US & Canada).
Where: Microsoft Teams Meeting

On September 8, 2023, ALLETTE, Inc., doing business as Minnesota Power, filed with the Federal Energy Regulatory Commission (FERC) a Proposed Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663). The electronic files can be downloaded through FERC's website using the link provided: https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20230908-5158

You are cordially invited to attend the Proposed Study Plan Meeting on Wednesday, October 11, 2023 at 9:00 AM Central Time. The meeting will be held virtually through the link below. The purpose of the meeting will be to review the Proposed Study Plan, share any additional information or responses to proposed studies, and discuss outstanding issues with respect to the Proposed Study Plan. The meeting agenda is outlined below and attached.

Agenda:

1) Meeting kickoff and introductions
2) FERC schedule review
3) Purpose of PSP meeting
4) Proposed Studies
5) Requested Studies Not Adopted
6) Additional Information Requested
7) Overview of Next Steps
8) Questions and Discussion

Please contact me if you have any questions regarding this meeting.

Thank you,

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt
Email: Lesley.Brotkowski@kleinschmidtgroup.com
Office: 715-318-3729

Microsoft Teams meeting

From: Lesley Brotkowski
Sent: Wednesday, September 27, 2023 1:56 PM
To: Wilde, William (MPCA)
Cc: Gregory Prom (MP)
Subject: RE: Proposed Study Plan Meeting - Little Falls (P-2532), Sylvan (P-2454), & Pillager (P-2663) Hydroelectric Projects

Good afternoon Bill,

Thank you for your response. Hopefully you are able to make the meeting. We'll be sure to keep you updated on project progress.

Have a good day!
Lesley

-----Original Appointment-----
From: Wilde, William (MPCA) <william.wilde@state.mn.us>
Sent: Wednesday, September 27, 2023 8:57 AM
To: Lesley Brotkowski
Subject: Tentative: Proposed Study Plan Meeting - Little Falls (P-2532), Sylvan (P-2454), & Pillager (P-2663) Hydroelectric Projects
When: Wednesday, October 11, 2023 9:00 AM-11:00 AM (UTC-06:00) Central Time (US & Canada).
Where: Microsoft Teams Meeting

Good morning Lesley,

Thank you for the invite to this Minnesota Power/FERC study plan meeting.

I have [meeting] conflicts at this time but will attempt to attend if possible.

Please keep me in the loop of any outcomes, next steps, and FERC schedule as this hydroelectric relicensing process proceeds.

Kind regards,
---Bill

Bill Wilde
Minnesota Pollution Control Agency
401 Program
520 Lafayette Road
St. Paul, Minnesota 55155
(651) 757-2825

NOTICE: This email (including attachments) is covered by the Electronic Communications Privacy Act, 18 U.S.C. 2510-2521. This email may be confidential and may be legally privileged. If you are not the intended recipient, you are hereby notified that any retention, dissemination, distribution, or copying of this communication is strictly prohibited. Please reply to the sender that you have received this message in error, then delete it. Thank you.

From: Lesley Brotkowski
Sent: Wednesday, September 27, 2023 2:02 PM
To: Beimers, Sarah (ADM)
Cc: Gregory Prom (MP)
Subject: RE: Proposed Study Plan Meeting - Little Falls (P-2532), Sylvan (P-2454), & Pillager (P-2663) Hydroelectric Projects

Hi Sarah,

Thank you for letting me know. I did send the invitation to Lucy in case she is able to attend.

Lesley

-----Original Appointment-----
From: Beimers, Sarah (ADM) <sarah.beimers@state.mn.us>
Sent: Wednesday, September 27, 2023 10:13 AM
To: Lesley Brotkowski
Subject: Declined: Proposed Study Plan Meeting - Little Falls (P-2532), Sylvan (P-2454), & Pillager (P-2663) Hydroelectric Projects
When: Wednesday, October 11, 2023 9:00 AM-11:00 AM (UTC-06:00) Central Time (US & Canada).
Where: Microsoft Teams Meeting

Sorry I will not be able to attend this meeting.
Sarah Beimers
MN SHPO

From: CEMVP-PA <CEMVP-PA@usace.army.mil>
Sent: Tuesday, October 10, 2023 8:56 AM
To: Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>
Subject: RE: Contact update - FERC Coordinator - Nanette Bischoff

Hi Elizabeth. I forwarded your voicemail last week to the folks in her former department, but it's been a long holiday weekend, so you should be hearing from them soon.

Dave

From: Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>
Sent: Monday, October 9, 2023 8:25 PM
To: CEMVP-PA <CEMVP-PA@usace.army.mil>
Subject: [Non-DoD Source] Contact update - FERC Coordinator - Nanette Bischoff

Good Evening,
Is Nanette Bischoff still at the St. Paul District of USACE? I sent an email to Nanette.m.bischoff@usace.army.mil but it bounced back. I am looking to update a distribution list for a FERC hydroelectric project for a relicensing. Is there a new FERC Coordinator at the St. Paul District or another appropriate replacement contact?
Thank you,

Elizabeth Krchnavek
Licensing Coordinator
Kleinschmidt
Cell: 571-230-6830
Office: 984-389-1086
www.KleinschmidtGroup.com

Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects

Proposed Study Plan Meeting

Date and Time: October 11, 2023, 9:00 – 11:00 AM Central Time

Meeting Location: Virtual Meeting, Microsoft Teams

Purpose of the meeting:

- Review the Proposed Study Plan (PSP)
- Share any additional information or responses to proposed studies
- Discuss outstanding issues with respect to the PSP

Attendees:

- Jay Summers, Federal Energy Regulatory Commission (FERC)
- Colleen Corballis, FERC
- Michael Davis, FERC
- Patrick Ely, FERC
- Dave Graefe, FERC
- Paul Makowski, FERC
- Carrie Ng, FERC
- Shane Drift, Bois Forte Band of Chippewa
- Mary Manydeeds, Bureau of Indian Affairs
- Greg Kimman, City of Little Falls, MN
- Jon Radermacher, City of Little Falls, MN
- Jeremy Jackson, Friends of Old Crow Wing
- Bryan Johnson, Friends of Old Crow Wing
- Don Wedll, Friends of Old Crow Wing
- Susan Klapel, Minnesota Chippewa Tribe - Mille Lacs Band
- Eric Altena, Minnesota Department of Natural Resources (Minnesota DNR)
- Dan O'Shea, Minnesota DNR
- Bryan Johnson, Sylvan Township, MN
- Jenna Ruggles, Sylvan Township, MN
- Greg Prom, Minnesota Power (MN Power)
- Matthew Radzak, MN Power
- Nora Rosemore, MN Power
- Lesley Brotkowski, Kleinschmidt Associates (Kleinschmidt)
- Elizabeth Krchnavek, Kleinschmidt
- Jared Porter, Kleinschmidt

Meeting Summary

1) **Meeting Kickoff and Introductions**
   - Greg Prom (MN Power) kicked off the meeting.
   - Attendees introduced themselves and stated the entity they are representing.
2) **FERC Schedule Review**
   - Greg Prom described the licensing schedule, including completed milestones and immediate next steps.
3) **Purpose of Proposed Study Plan Meeting**
   - Greg Prom described the purpose of the Proposed Study Plan (PSP) meeting.
4) **Projects Overview**
   - Greg Prom provided an overview of the Little Falls Project (P-2532), Sylvan Project (P-2454), and the Pillager Project (P-2663), collectively known as the "Projects."
   - Jenna Ruggles (Sylvan Township) explained that the Pillager Project is in the Sylvan Township. There is no Pillager Township. Greg Prom responded that this will be corrected in future documents.
5) **Proposed Studies**
   - Lesley Brotkowski (Kleinschmidt) provided an overview of the studies proposed and proposed timing.
   - Water Quality Study
     - Jared Porter (Kleinschmidt) described the proposed study.
   - Desktop Fish Entrainment and Impingement Study
     - Jared Porter described the proposed study.
   - Recreation Use and Facility Inventory Study
     - Lesley Brotkowski described the proposed study.
   - Historic Architectural Resources Study
     - Lesley Brotkowski described the proposed study.
   - Archaeological Resources Study
     - Lesley Brotkowski described the proposed study.
6) **Requested Studies Not Adopted**
   - Lesley Brotkowski described reasonings provided in the PSP regarding not including the specific request of re-evaluation of the Chippewa Agency Historic District Site. She explained that that the area within the FERC Project Boundary, including the parcel of this site, will be studied in the Archaeological Resources Study using the methods proposed in the PSP.
   - Jared Porter explained the reasoning that MN Power is not proposing to conduct a fish passage feasibility study at the Little Falls Project as MN Power does not believe that there has been a demonstrated biological need for fish passage at the Little Falls Project, there are biological risks associated with fish passage, and MN Power does not believe that the costs of the installation and maintenance of fish passage facilities at the Little Falls Project are reasonable or justifiable.
7) **Additional Information Requested**
   - Lesley Brotkowski explained that FERC requested additional information, which was provided in the PSP or will be provided in the Initial Study Report (ISR).

8) **Overview of Next Steps**
   - Lesley Brotkowski provided an overview of the next steps and reminded the group that PSP comments are due on December 10, 2023.
9) **Questions and Discussion**
   - Don Wedll (Friends of Old Crow Wing)
     - Don stated that he doesn't believe there is adequate protection of the Chippewa Agency Historic District Site.
   - Dan O'Shea (Minnesota DNR)
     - Regarding the fish passage feasibility study, Dan O'Shea stated that the justification given in the PSP are the perspective of MN Power, and that the Minnesota DNR does not agree with the reasons given for not evaluating fish passage.
   - Patrick Ely (FERC)
     - Regarding the fish passage feasibility study, stated that it is likely that the Minnesota DNR will request fish passage. Stated that for FERC's evaluation, a cost estimate for fish passage installation and maintenance of a fish passage facility will be needed for FERC's National Environmental Policy Act (NEPA) review.
   - Jon Radermacher (City of Little Falls, MN)
     - Stated that the City of Little Falls rejects the justification included in the PSP for not studying fish passage feasibility at Little Falls.
   - Greg Kimman (City of Little Falls, MN)
     - Agreed with Jon Radermacher and reiterated that the City of Little Falls rejects the justification included in the PSP for not studying fish passage feasibility at Little Falls. Also added that fish passage is needed for improving recreation in the area. Lesley Brotkowski asked that he expand on this comment. Greg Kimman explained that he believes fish passage will improve fishing opportunities at Mill Park and in the area. Jon Radermacher added that they have begun community engagement to provide feedback to inform a master plan of the Mill Park area, which is being developed, and that part of that engagement has been looking at interest in fish passage at Mill Park.
   - Bryan Johnson (Sylvan Township, MN)
     - Asked about the possibility of decommissioning and what would be the impacts of decommissioning (including water levels).
     - Greg Prom responded that MN Power is currently proposing to relicense and continue operations of the Projects. He explained that if there were proposed decommissioning, this would go through a separate FERC process, which would involve NEPA analysis as well as public input.
   - David Graefe (FERC)
     - Provided comments and questions on the proposed Recreation Study.
       - Regarding the proposed duration of time for the user survey, David Graefe asked if besides allowing time for a single surveyor to conduct surveys during a single day, is there additional justification for limiting the standard time?

- Lesley explained that additionally, based on the current level of use of the sites, MN Power anticipates that the proposed amount of time will be adequate to survey users at the sites.

  - Stated that although the study season is proposed in the PSP to occur in 2025, it could be helpful to conduct this during the first season (2024).
  - Regarding the survey questionnaire for the canoe campsite, David Graefe asked if there is a reason why the form requests names of the respondents. Lesley Brotkowski stated that the purpose of this to avoid duplicity of parties if multiple members of the party respond, that can be difficult to tease out during analysis. Lesley Brotkowski stated that MN Power can look at alternative ways to obtain this information without requesting names. David Graefe suggested potentially only having one member of each party fill out the form.
  - Commented that in regard to the Spot Count form, there is no space to record the number of vehicles.
  - Stated that additional minor comments will be provided in written PSP comments.

- Dan O'Shea (Minnesota DNR)
  - Regarding the Desktop Fish Entrainment and Impingement Study, he stated that it is important to know if any of the studies have been done on the upper Mississippi River (especially in Northern or Central Minnesota). Jared Porter explained that he knows that there have been studies in the basin, but he is not sure if the other parameters of the projects and studies line up; this will be assessed in the proposed study.

10) End of Meeting

- Greg Prom thanked everyone for their time and provided contact information. Meeting ended at 10:01 AM.

Little Falls, Sylvan, Pillager Hydroelectric Projects

FERC P-2532, P-2454, P-2663

Proposed Study Plan Meeting

October 11, 2023

*Meeting will be recorded



Agenda

1) Meeting Kickoff and Introductions
2) FERC Schedule Review
3) Purpose of PSP Meeting
4) Proposed Studies
5) Requested Studies Not Adopted
6) Additional Information Requested
7) Overview of Next Steps
8) Questions and Discussion



Kickoff and Introductions

- Introduction of meeting participants
- Reminder to please turn camera on, if available, and mute speaker if not speaking
- Please note that the meeting will be recorded



FERC Licensing Schedule Overview

- Relicensing of the Little Falls Project (P-2532), Sylvan Project (P-2454), Pillager Project (P-2663)
- FERC Licenses expire 3/31/2028
- Using FERC's Integrated Licensing Process (ILP)
- FERC relicensing 5 – 5.5 year long process:

  Year 1: Pre-Application Document (PAD) and Notice of Intent (NOI), Public Meeting, Study Requests

  Years 2 – 3: Studies

  Year 3: Submit Draft and Final License Applications

  Years 4 – 5: FERC Application Review and NEPA Process

  Year 5: License Issuance

FERC Licensing Schedule Overview

- 3/30/2023 – Filed the Notices of Intent (NOIs) and Pre-Application Document (PAD)
- 5/26/2023 – FERC issued Scoping Document 1 (SD1)
- 6/21 and 6/22/2023 – Scoping Meetings and Site Visit
- 7/28/2023 – Due date for Study Requests and PAD/SD1 Comments
- 9/8/2023 – Proposed Study Plan (PSP) submitted
- 9/8/2023 – FERC issued Scoping Document 2 (SD2)
  - Includes ILP Process Plan and Schedule
- 10/11/2023 – PSP Meeting

Next Steps

FERC Licensing Schedule Overview

- **12/10/2023 – PSP Comments Due**
- 1/9/2024 – Revised Study Plan (RSP) will be filed
- 1/24/2024 – RSP Comments Due
- 2/8/2024 – FERC will issue a Study Plan Determination (SPD)

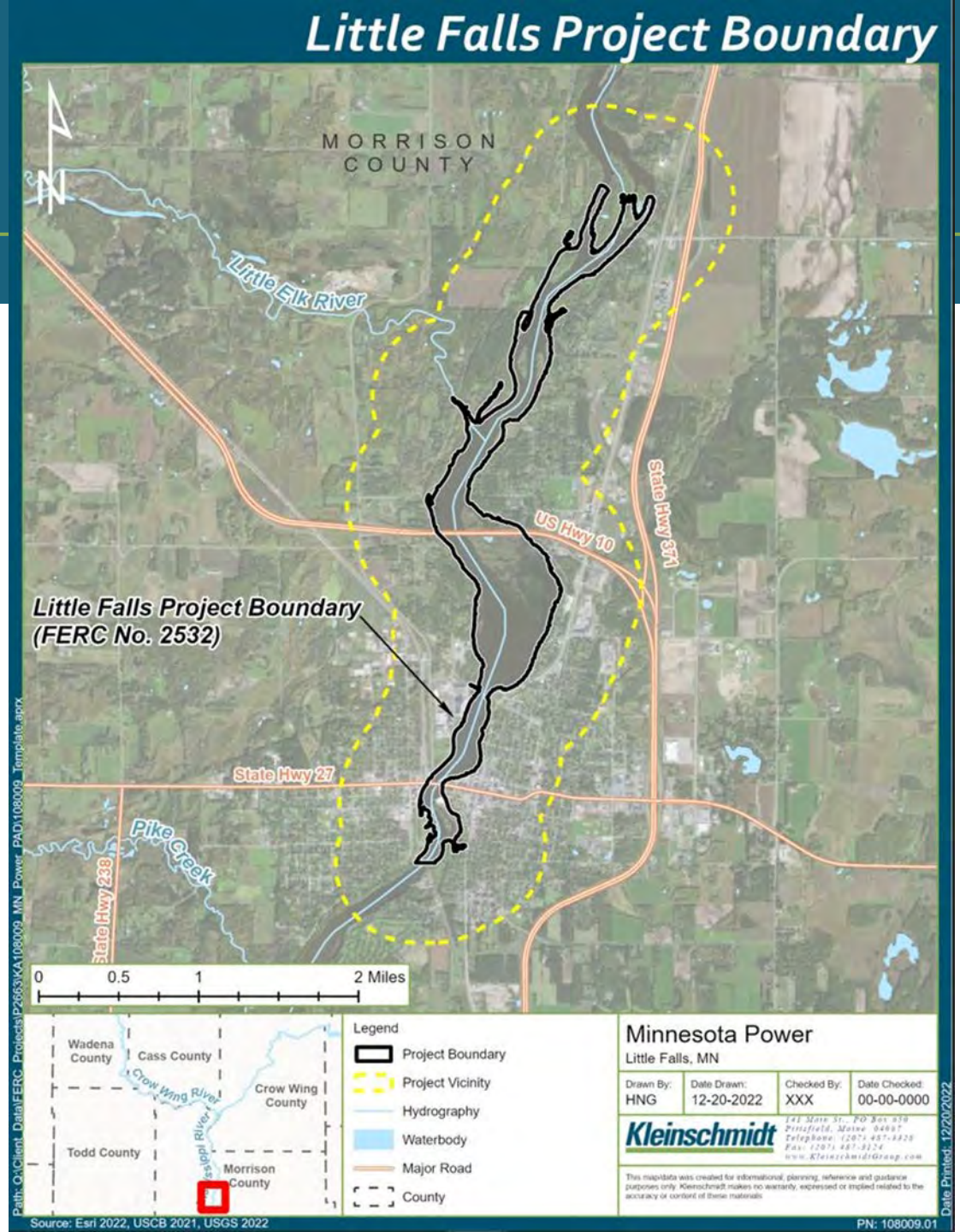
Purpose of PSP Meeting

- Review the Proposed Study Plan (PSP)
- Share any additional information or responses to proposed studies
- Discuss outstanding issues with respect to the PSP

Projects Overview

Little Falls Project (P-2532)

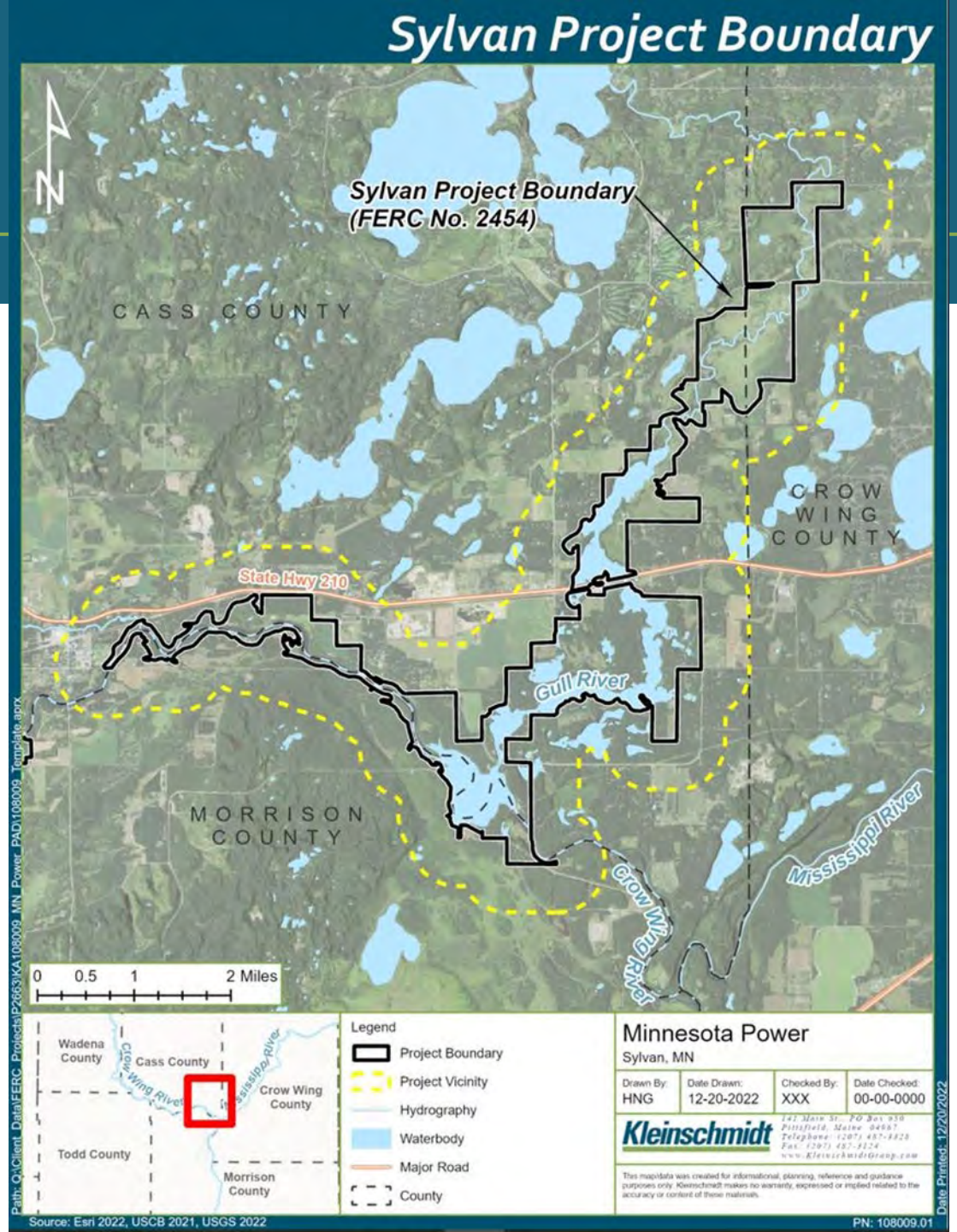
- Location: Little Falls, MN (Morrison County)
- Mississippi River
- 4.72 megawatt existing project
- Run-of-river operations
- No federal lands



Projects Overview

Sylvan Project (P-2454)

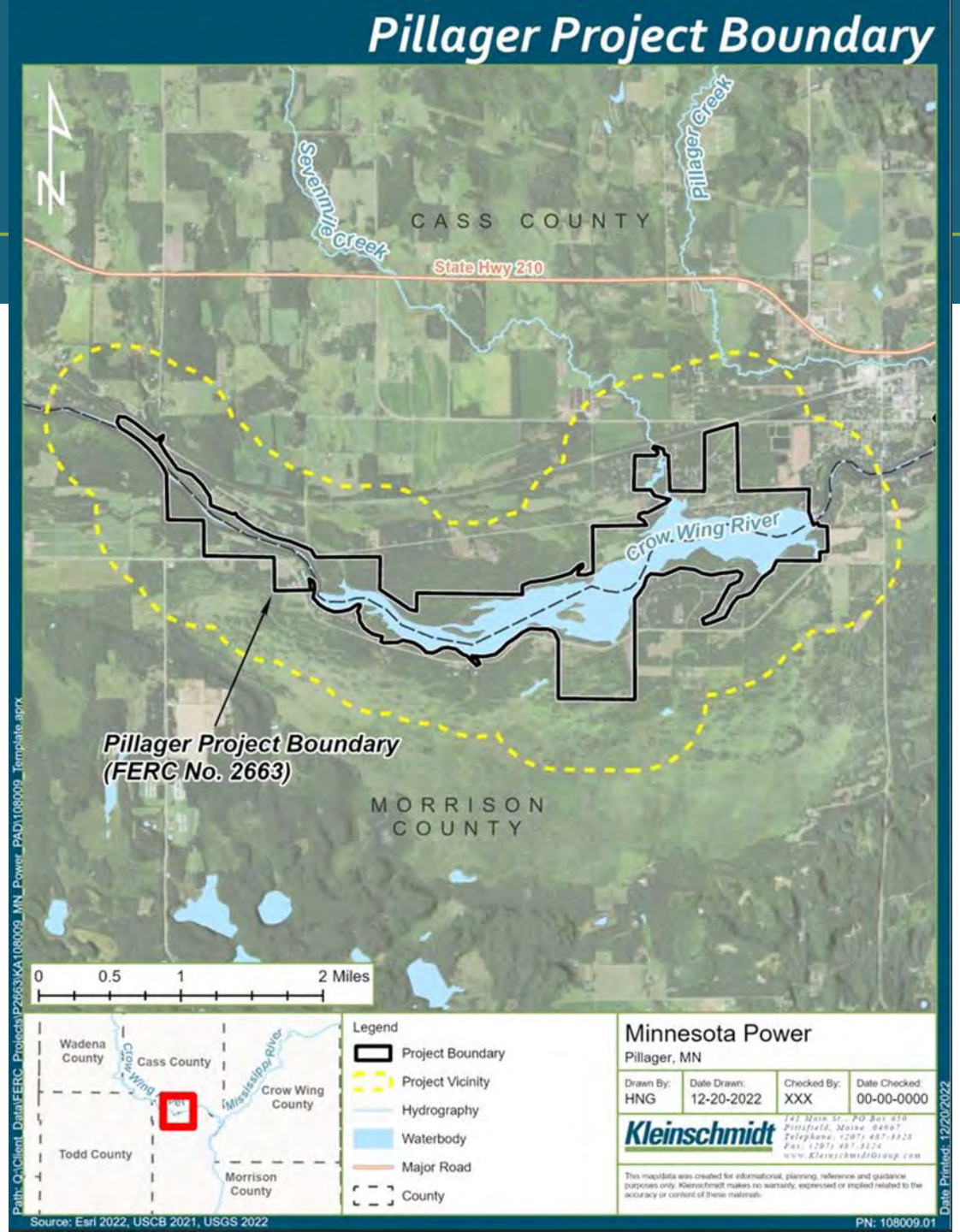
- Location: Sylvan Township, MN (Cass, Crow Wing, and Morrison Counties)
- Crow Wing River and Gull River
- 1.8 megawatt existing project
- Run-of-river operations
- No federal lands



Projects Overview

Pillager Project (P-2663)

- Location: Pillager Township, MN (Cass and Morrison Counties)
- Crow Wing River
- 1.52 megawatt existing project
- Run-of-river operations
- No federal lands



Proposed Studies

Proposed Study	Estimated Start Date	Estimated Completion Date
Water Quality Study	June 2025	October 2025
Desktop Fish Entrainment and Impingement Study	May 2024	September 2024
Recreation Use and Facility Inventory Study	May 2025	October 2025
Historic Architectural Resources Survey	May 2024	September 2024
Archaeological Resources Survey	May 2024	September 2024

Water Quality Study

Methods:

- Monitor dissolved oxygen (DO) and water temperature at the Little Falls Project and Sylvan Project, biweekly sample collection with handheld DO/temperature meter.

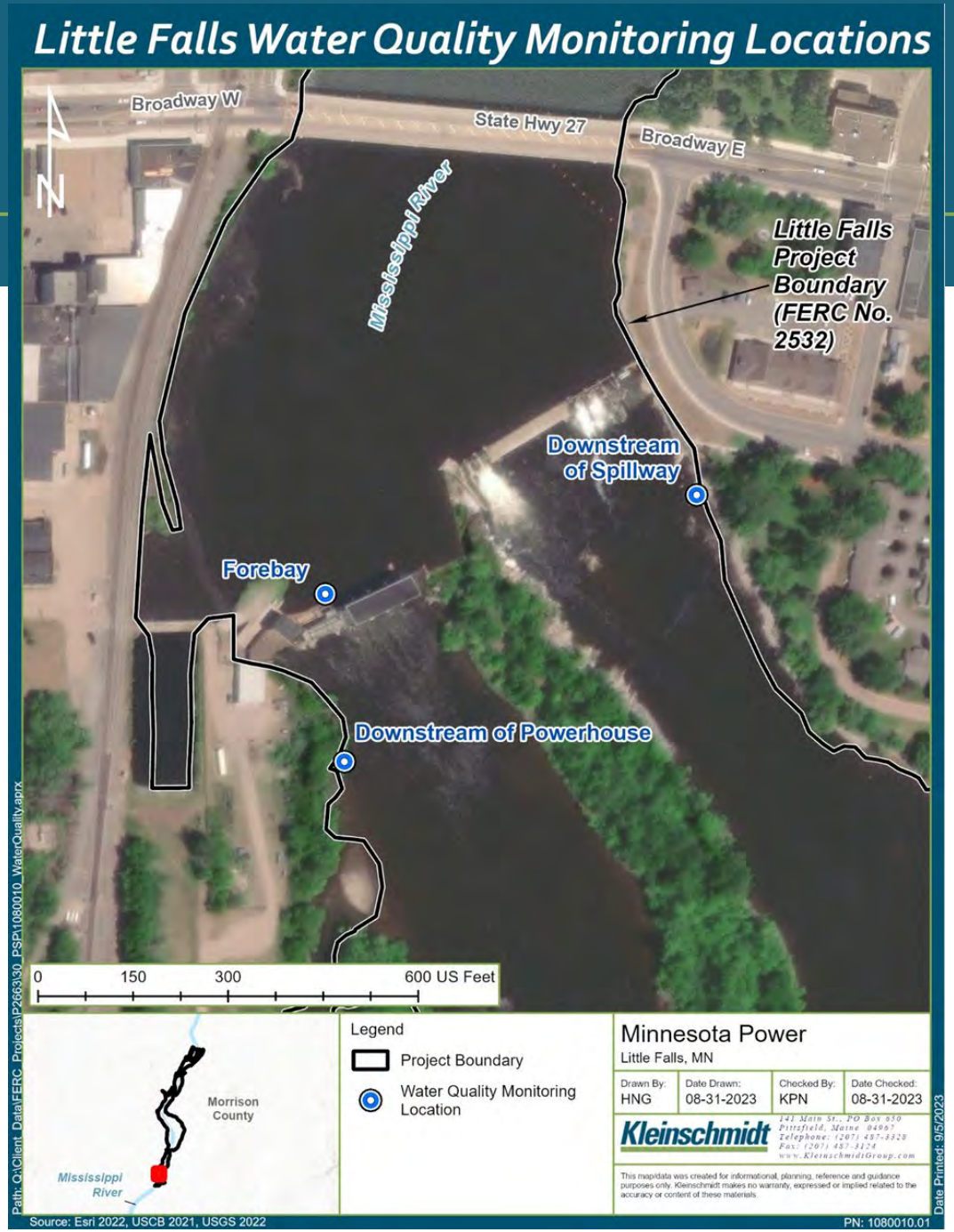
Objectives:

- Document the DO concentration and temperature of water entering the intakes;
- Identify the degree and timing of any stratification that may occur;
- Identify temporal variations in DO and water temperature;
- Identify instances where and when DO and water temperature levels may not meet applicable state standards; and
- Identify differences in DO and water temperature in the river downstream.

Water Quality Study

Little Falls Project Monitoring Locations

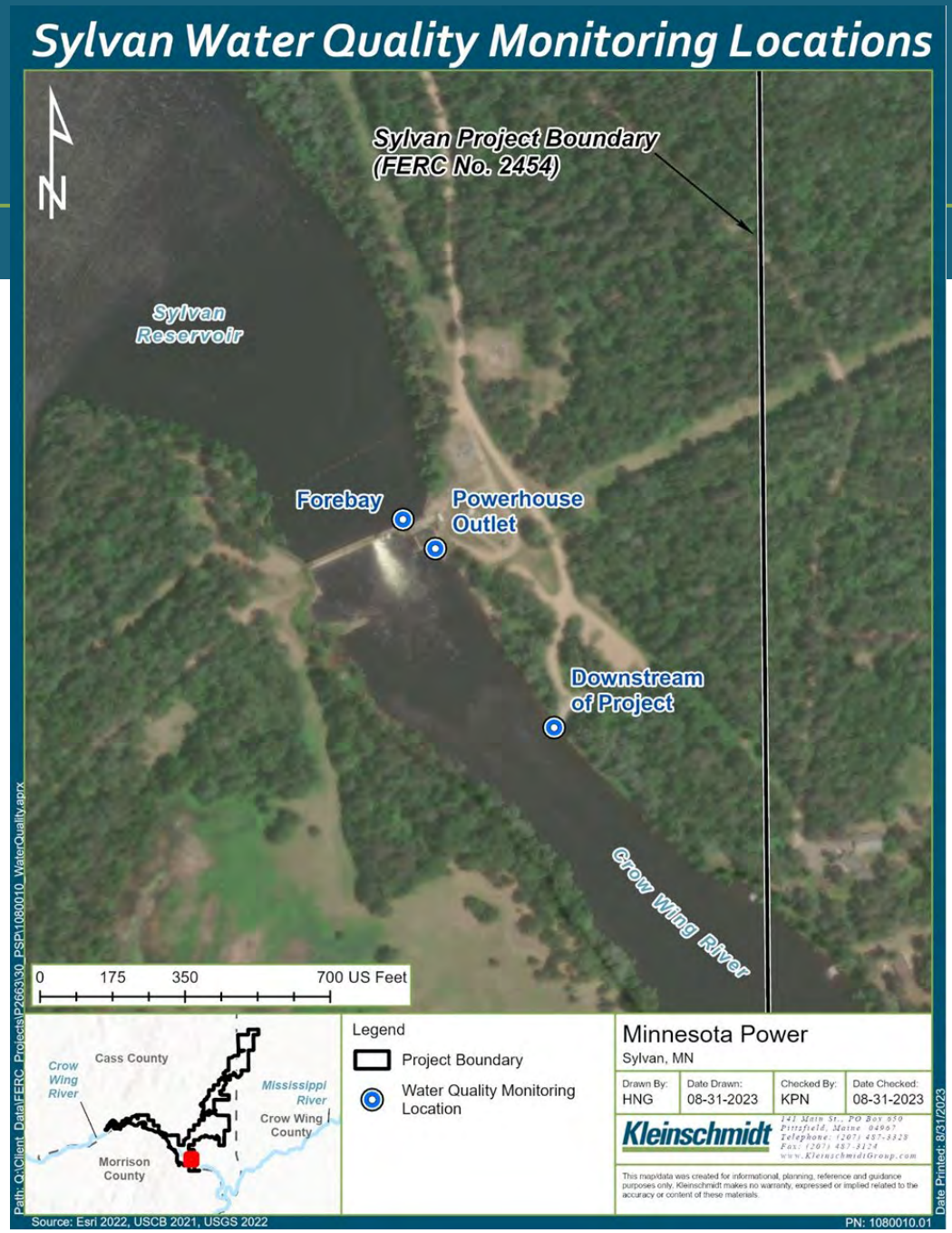
1. Forebay
   - Collected at 1-meter intervals in the water column from surface to bottom
2. Downstream of the spillway
   - Collected from the river bottom
3. Downstream of the powerhouse
   - Collected from the river bottom



Water Quality Study

Sylvan Project Monitoring Locations

1. Upstream of the turbine intake area
   - Collected at 1-meter intervals in the water column from surface to bottom
2. Immediately downstream of the powerhouse
   - Collected from the surface, middle, and bottom of the water column
3. Downstream of the Sylvan Project dam
   - Collected from the river bottom



Desktop Fish Entrainment and Impingement Study

Objectives:

- Describe the physical characteristics of the Projects (i.e., intake structures and turbines), and document factors that could affect impingement, entrainment, and survival as they relate to intake dimensions, trashrack spacing, turbine specifications, intake velocity, and flow capacity;
- Determine target fish species or family groups, and describe factors that influence their vulnerability to impingement, entrainment and turbine survival;
- Estimate entrainment rates and turbine passage survival rates for target fish species or family groups; and
- Describe potential effects to local fish communities from potential entrainment and impingement.

Desktop Fish Entrainment and Impingement Study

Methods:

- Develop an entrainment and turbine mortality database that can be applied to the Projects.
- Calculate and estimate fish entrainment rates at the Projects. Entrainment rates are defined as: number of fish/volume of water entrained.
- Characterize the species composition of potential fish entrainment.
- Apply any physical or biological filters that may influence entrainment.
- Estimate the total annual entrainment for the Projects based on normal operation.
- Estimate potential turbine mortality for fish entrainment based on turbine mortality estimates from similar project studies.
- Estimate impingement mortality for fish eliminated from entrainment estimates.

Recreation Use and Facility Inventory Study

Objectives:

- Inventory and identify the condition of the recreation facilities and associated amenities at the Commission-approved Sylvan Project and Pillager Project recreation sites (including any erosion that may exist due to recreational use);
- Identify who owns, operates, and maintains each Sylvan Project and Pillager Project recreation site and/or facility;
- Describe each Sylvan Project and Pillager Project recreation site and/or facility in relation to its associated project boundary;
- Conduct user surveys during the recreation season to determine the adequacy of the Commission-approved Sylvan Project and Pillager Project recreation sites and if modifications to the sites would be needed to meet current or future recreation needs; and
- Determine the current and projected capacity at each Commission-approved Sylvan Project and Pillager Project recreation site and/or facility.

Recreation Use and Facility Inventory Study

Methods:

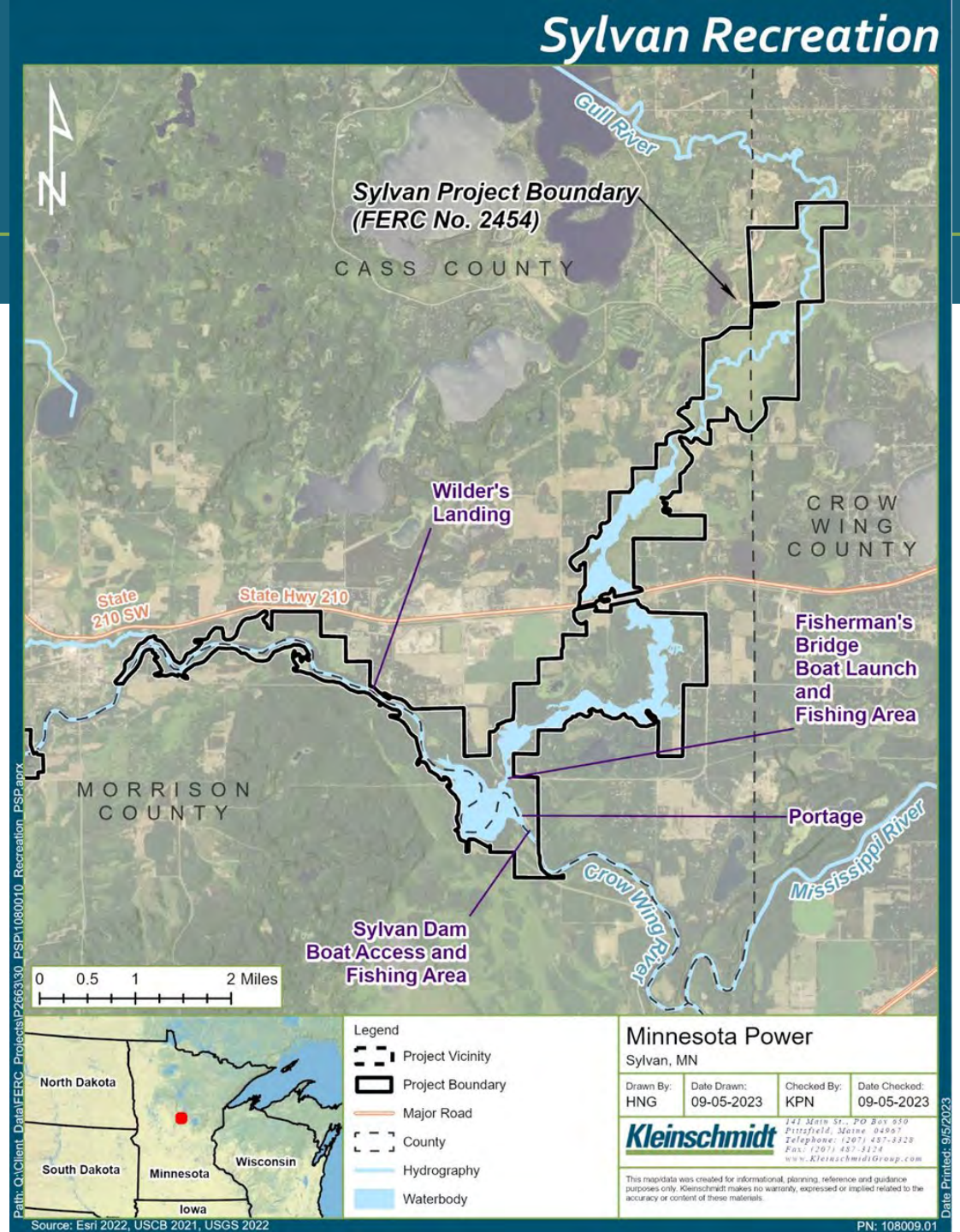
Two parts: 1) a Recreation Facility Inventory and Condition Assessment, and 2) Recreation Use Assessment at the Sylvan Project and Pillager Project.

1. **Recreation Facility Inventory and Condition Assessment**
    - Conduct a field inventory to document the existing recreation facilities and amenities at the Sylvan Project and Pillager Project recreation sites
    - Draft form available in PSP

Recreation Use and Facility Inventory Study

Sylvan Project recreation sites

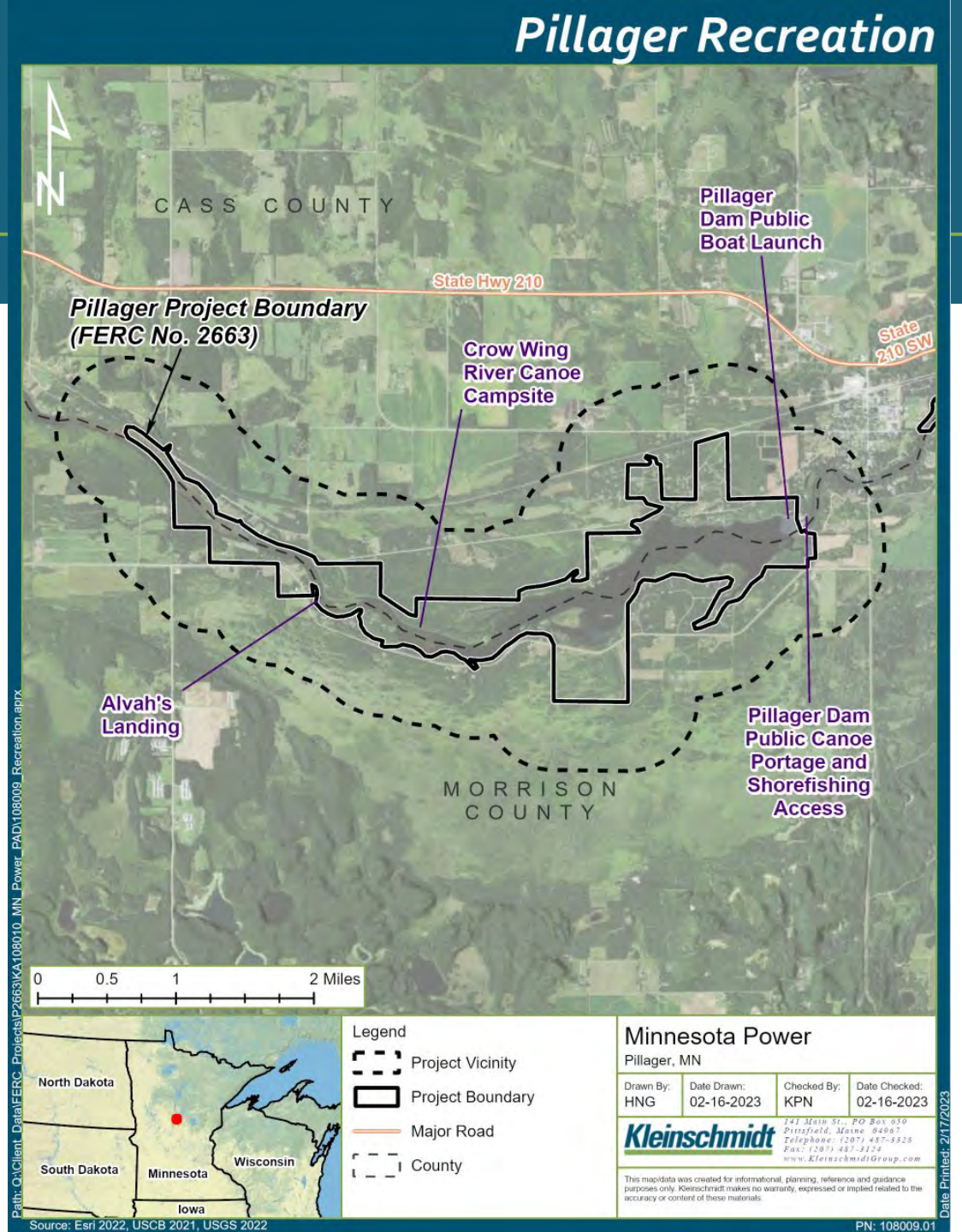
- Wilder's Landing
- Fisherman's Bridge Boat Launch and Fishing Area
- Sylvan Dam Boat Access and Fishing Area
- Canoe Portage



Recreation Use and Facility Inventory Study

Pillager Project recreation sites

- Alvah's Landing (Minnesota DNR Boat Launch)
- Pillager Dam Public Boat Launch
- Pillager Dam Public Canoe Portage and Shorefishing Access
- Crow Wing River Canoe Campsite



Recreation Use and Facility Inventory Study

2. Recreation Use Assessment

- Spot Counts
  - At the Sylvan Project and Pillager Project recreation sites, except for the Crow Wing River Canoe Campsite.
- Recreational Use Surveys
  - In-person at the Sylvan Project and Pillager Project recreation sites.
  - User-administered survey (from collection box) at the Crow Wing River Canoe Campsite.
- Draft forms available in PSP

Month	Recreation Use Assessment Days
May	• Holiday weekend day (Either on Memorial Day [5/26/2025] or during the associated Memorial Day Weekend)
June	• Two weekend days • Two weekdays
July	• Two weekend or holiday days (One day will be on the Fourth of July or during the associated Fourth of July weekend) • Two weekdays
August / September	• Two weekend days (One day will be on Labor Day [9/1/2025] or during the associated Labor Day weekend) • Two weekdays

Historic Architectural Resources Study

Objectives / Methods:

- Identify the Area of Potential Effects (APE) at the Projects
  - Proposed to be the FERC Projects Boundaries
  - Consult with SHPO and Tribes on the proposed APEs
- Perform a literature review to identify historic architectural resources 45 years or older listed or eligible for listing in the National Register of Historic Places (NRHP) within the APEs
- Perform updated survey and evaluation documentation of the NRHP-eligible historic architectural resources at the Projects' dams and associated facilities
- Evaluate potential Projects effects on historic architectural resources that are listed or eligible for listing in the NRHP within the APEs

Archaeological Resources Study

Objectives / Methods:

- Identify the APEs at the Projects
  - Proposed to be the FERC Projects Boundaries
  - Consult with SHPO and Tribes on the proposed APEs
- Perform a desktop archaeological resources survey to compile existing information and identify known archaeological resources listed or eligible for listing in the NRHP within the APEs

Archaeological Resources Study

Objectives / Methods:

- Perform a conditions assessment (field visit) to document the current condition of archaeological resources listed or eligible for listing in the NRHP within the APEs
- Conduct a reconnaissance Phase I survey of the Projects' APEs to determine if unrecorded archaeological resources are present
- Evaluate the potential effects the Projects would have on archaeological resources that are listed or eligible for listing in the NRHP within the APEs

Requested Studies Not Adopted

- Fish Passage Feasibility Study at the Little Falls Project
- Re-evaluation of the Chippewa Agency Historic District Site

Additional Information Requested

- Updated Environmental Justice information - provided
- Aquatic Resources references - provided
- Recreation user information at Little Falls - Minnesota Power to provide in the Initial Study Report

Overview of Next Steps

- **12/10/2023 – PSP Comments Due**
- 1/9/2024 – Revised Study Plan (RSP) will be filed
- 1/24/2024 – RSP Comments Due
- 2/8/2024 – FERC will issue a Study Plan Determination (SPD)

File comments on FERC's website: https://ferconline.ferc.gov/LogIn.aspx

Questions / Discussion

Greg Prom
Senior Environmental Compliance Specialist
Minnesota Power / ALLETE, Inc.
218-355-3191
gprom@allete.com

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt Associates
715-318-3729
Lesley.Brotkowski@kleinschmidtgroup.com



Little Falls Hydroelectric Project (FERC Project No. 2532)

Sylvan Hydroelectric Project (FERC Project No. 2454)

Pillager Hydroelectric Project (FERC Project No. 2663)

Relicensing Consultation Documentation

Date	10/11/2023
Person documenting conversation	Elizabeth Krchnavek
Discussion participants	Nathan Wallerstedt (651-290-5477) via voicemail
Subject of conversation	Contact update for FERC coordinator of the St. Paul District of USACE

Summary of Conversation:

Stated that Nanette Bischoff has retired. The new FERC Coordinator at the St. Paul District of United States Army Corps of Engineers (USACE) is Bob Edstrom. His email is robert.k.edstrom@usace.army.mil.

From: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>
Sent: Thursday, October 12, 2023 10:21 AM
To: Manydeeds, Mary <Mary.Manydeeds@bia.gov>; jjackson@beemac.com
Cc: Gregory Prom (MP) <gprom@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>
Subject: Little Falls, Sylvan, and Pillager Study Plan Meeting Presentation

Good morning,

Thank you for participating in the Proposed Study Plan Meeting for the Little Falls, Sylvan, and Pillager Hydroelectric Projects yesterday. A copy of the presentation slide deck is attached and a link to the presentation recording is below.

https://kleinschmidtgroup-my.sharepoint.com/:v:/p/lesley_brotkowski/EQImmO6BzN1Ko0TyaYuKJe4BU9X_VDyhfbuFGbx-c-2yAA

In order to access the presentation recording, you will need to set up an account, with a password and multifactor authentication to access it. The account will use your work email as the username but will have a different password than your work account. When you click the link above, you will be prompted to set up this unique password.

Open the link in a private browser window (on my computer, I access this by clicking the three dots in the upper right corner of my web browser, and clicking “new in private window”), this way you will be prompted to set up your password from a Kleinschmidt account, rather than your browser trying to sign you in with your work account.

Thank you,

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt
Office: 715-318-3729
www.KleinschmidtGroup.com

From: Gregory Prom (MP) <gprom@mnpower.com>
Sent: Friday, October 13, 2023 3:23 PM
To: 'Reynolds, John (MIAC)'
Cc: Cerda, Melissa (MIAC); Lesley Brotkowski
Subject: RE: [EXTERNAL MAIL] MIAC Review, Request for Information
Attachments: Review_Form_-_OSA_general_tcm36-536511_Little Falls Sylvan Pillager_09122023.docx; Project Location - Little Falls.jpg; Project Location - Pillager.jpg; Project Location - Sylvan.jpg; APE - Little Falls.jpg; APE - Pillager.jpg; APE - Sylvan.jpg

John,

I have attached the OSA review form and project location maps. Also attached is the link to the Proposed Study Plan that was filed with the Federal Energy Regulatory Commission (FERC) on September 8, 2023. The electronic files can be downloaded through FERC's website using this link: https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20230908-5158

Please let me know if you have any additional questions,

Sincerely,

Greg Prom

Senior Environmental Compliance Specialist
Minnesota Power/ALLETE
30 West Superior Street
Duluth, Minnesota 55802

Office: 218-355-3191
Cell: 218-461-6856
Email: gprom@allete.com

From: Reynolds, John (MIAC) <John.Reynolds@state.mn.us>
Sent: Friday, October 13, 2023 11:28 AM
To: Gregory Prom (MP) <gprom@mnpower.com>
Cc: Cerda, Melissa (MIAC) <melissa.cerda@state.mn.us>
Subject: [EXTERNAL MAIL] MIAC Review, Request for Information

You don't often get email from john.reynolds@state.mn.us. Learn why this is important

Hello,

MIAC has attempted to complete review of the proposed Little Falls, Sylvan, Pillager Hydroelectric Projects. Unfortunately, we were not able to access the attached documents in order to complete the review. Can you provide the OSA Review Form, and any other pertinent information? For any questions, please do not hesitate to reply.

Thanks.

DEPARTMENT OF ADMINISTRATION
STATE ARCHAEOLOGIST

PROJECT REVIEW FORM

Please complete all the fields marked with an asterisk (*).

This form is a fillable document. After completing this form, please send your request to:
OSA.Project.Reviews.adm@state.mn.us

REVIEW INFORMATION

1. **PROJECT NAME*:** Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663) Hydroelectric Projects Relicensings
2. **PROJECT ID:** Click or tap here to enter text.
3. **REASON FOR REVIEW*:** **FERC Relicensing**
4. **REVIEW TYPE*: Review Request**
5. **FUNDING*: Private**
6. **ORGANIZATION NAME:** **ALLETE, Inc., doing business as Minnesota Power**
7. **SUBMITTING ORGANIZATION TYPE: Private**

PROJECT INFORMATION

8. **PROJECT DESCRIPTION*:** Minnesota Power filed with the FERC a Proposed Study Plan (PSP) for the Little Falls Project, Sylvan Project, and Pillager Project hydropower relicensing process. The PSP includes a proposed cultural resources study.
9. **ARCHAEOLOGICAL SITE NUMBERS (if known – if not, leave blank)** (Separate counties with commas)**:** Click or tap here to enter text.
10. **COUNTY***(Add multiples by separating with a comma)**:** Morisson, Crow Wing, Cass

11. BACKGROUND RESEARCH DONE (Check the appropriate box if any research has been completed or is in progress. If no research has been done, leave blank):

☐OSA Portal Query

☐MnDOT GIS

☐MnModel

☐Legacy Historic cemeteries

12. KNOWN RESOURCES ADJACENT TO REVIEW AREA (if known – if not, leave blank):

☐Cemeteries

☐Burials

☐Archaeological Sites

13. ADDITIONAL INFORMATION: FERC has designated Allete as the non-federal representative for Section 106 consultation

LOCATION INFORMATION* (If there are additional PLSS entries, please add a continuation sheet)

14. LOCATION INFORMATION (Complete this or Project Address if PLSS is not known):

Little Falls Hydroelectric Project:

PLSS - Township:130 Range:29 Range Direction (E or W):W Section:5, 32, 33

PLSS - Township:41 Range:32 Range Direction (E or W):W Section:13, 14, 23, 26, 27, 34, 35

PLSS - Township:40 Range:32 Range Direction (E or W):W Section:8, 18

PLSS - Township:129 Range:29 Range Direction (E or W):W Section:5, 6, 7, 8, 17, 18, 19

Sylvan Hydroelectric Project:

PLSS - Township:134 Range:29 Range Direction (E or W):W Section:21, 27, 28, 33, 34

PLSS - Township: 133 Range:29 Range Direction (E or W):W Section:3, 4, 5, 8, 9, 16, 17, 18, 19, 20, 21, 30, 31, 32

PLSS - Township:133 Range:30 Range Direction (E or W):W Section:13, 14, 15, 16, 21, 15, 24, 25

Pillager Hydroelectric Project:

PLSS - Township:133 Range:31 Range Direction (E or W):W Section:16, 21,,22, 23, 24, 25, 26, 27,

PLSS - Township:133 Range:30 Range Direction (E or W):W Section:19, 20, 29, 30

PLSS - Township: Range: Range Direction (E or W): Section:

PLSS - Township: Range: Range Direction (E or W): Section:

15. ADDRESS (if PLSS is not known, please enter your project address):
Address Line 1: Click or tap here to enter text.
Address Line 2: Click or tap here to enter text.
City: Click or tap here to enter text.
State: Click or tap here to enter text.
Zip Code: Click or tap here to enter text.

16. Maps of the project locations and proposed Area of Potential Effects/FERC project boundaries are attached.

REQUESTOR INFORMATION

17. REQUESTED BY* (name): Greg Prom

18. REQUESTOR's EMAIL ADDRESS*: gprom@allete.com

19. REQUESTOR's PHONE NUMBER: 218-355-3191

20. REQUESTOR's PHYSICAL ADDRESS:
Address Line 1: 30 West Superior Street
City: Duluth
State: MN
Zip Code: 55802-2093

21. Please also copy Allete's relicensing consultant on correspondence:

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt Associates
233403 Stettin Ridge Court
Wausau, WI 54401
Lesley.brotkowski@kleinschmidtgroup.com
715-318-3729

ADDITIONAL INFORMATION AND ATTACHMENTS

Please add and attach any pertinent photos, maps, or documents that will help us complete the review.

Maps of the project locations and proposed Area of Potential Effects/FERC project boundaries are attached. A link to the Proposed Study Plan is provided in the email text.

From: Gregory Prom (MP) <gprom@mnpower.com>
Sent: Monday, November 13, 2023 11:25 AM
To: 'Reynolds, John (MIAC)' <John.Reynolds@state.mn.us>
Cc: Cerda, Melissa (MIAC) <melissa.cerda@state.mn.us>; Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>
Subject: RE: [EXTERNAL MAIL] MIAC Review, Request for Information

Thanks for your reply John,

This correspondence will be part of the records for the proposed study plan.

Have a good day,

Greg Prom

From: Reynolds, John (MIAC) <John.Reynolds@state.mn.us>
Sent: Monday, November 13, 2023 10:22 AM
To: Gregory Prom (MP) <gprom@mnpower.com>
Cc: Cerda, Melissa (MIAC) <melissa.cerda@state.mn.us>; 'Lesley Brotkowski' <Lesley.Brotkowski@kleinschmidtgroup.com>
Subject: RE: [EXTERNAL MAIL] MIAC Review, Request for Information

Hello,

Thank you again for responding to the previous request for additional project information. Following review of the provided materials and staff emails, the Minnesota Indian Affairs Council Cultural Resource personnel have decided to await completion of the final Study Plan. Formal project review and recommendation and/or from the Council will be based on the final Study Plan. For any remaining questions regarding this project, please contact our office.

Thank you.

From: Gregory Prom (MP) <gprom@mnpower.com>
Sent: Monday, October 23, 2023 9:40 AM
To: Reynolds, John (MIAC) <John.Reynolds@state.mn.us>
Cc: Cerda, Melissa (MIAC) <melissa.cerda@state.mn.us>; 'Lesley Brotkowski' <Lesley.Brotkowski@kleinschmidtgroup.com>
Subject: RE: [EXTERNAL MAIL] MIAC Review, Request for Information

John,

Minnesota Power (MP) is following the Federal Energy Regulatory Commission (FERC) integrated licensing process (ILP) for the three hydro facilities (Little Falls, Sylvan, and Pillager). As described in the power point that was sent to you, the ILP has a phased approach taking up to 5.5 years to apply for relicensing of these facilities. Here is a hyperlink to the

FERC process - https://www.ferc.gov/industries-data/hydropower/licensing/licensing-processes/integrated-licensing-process-ilp.

MP already filed a pre-application document (PAD) that describes the current facilities and a notice of intent (NOI) application that states MP intends to relicense these facilities. FERC issued two scoping documents that describes the schedule and process for these projects. They can be found on the FERC elibrary website under the FERC project numbers for each facility (Little Falls P-2532, Sylvan P-2454, and Pillager P-2663).

As part of the relicensing, the process requires consultation through the Section 106 of the National Historic Preservation Act (NHPA) as amended. MP developed draft proposed study plans (PSP) and solicited comments and discussion to develop historic architectural and archeological review in the area of potential effect (APE) for the projects. The PSP was e-filed in the FERC elibrary and can be download for review and comments. Comments are due by Dec 10, 2023, on the PSP. A revised study plan will be filed with FERC following comments that are received. A short period of time is available to provide additional comments on the revised study plan by January 24, 2024. FERC issues the final study plan determination (SPD) on February 8, 2024.

When the final SPD has been issued, MP will solicit bids from qualified archaeologist and architectural historians to perform the surveys and research. Significant surveys have already been performed for these projects, including shovel testing in certain areas. Additional shovel testing may be performed as part of the archaeological study, if deemed necessary, to identify a potential eligible site. The study seasons starts next year (2024) and has a second study season (2025) to complete if needed.

The studies will be available for review when complete, however, the archaeological studies are typically restricted from general public review to protect potentially sensitive areas.

I hope this answers your questions, if you have any additional questions please let me know.

Sincerely,

Greg Prom

From: Reynolds, John (MIAC) <John.Reynolds@state.mn.us>
Sent: Friday, October 20, 2023 2:49 PM
To: Gregory Prom (MP) <gprom@mnpower.com>
Cc: Cerda, Melissa (MIAC) <melissa.cerda@state.mn.us>
Subject: RE: [EXTERNAL MAIL] MIAC Review, Request for Information

Greg,

I am reviewing the provided information. So, can you explain precisely what is needed in a “relicensing,” and more information on the cultural resource study? Will any ground disturbance at occur during this? For the study, who is compiling it, and when will it be complete? Can our office review it?

Thanks.

From: Gregory Prom (MP) <gprom@mnpower.com>
Sent: Friday, October 13, 2023 2:23 PM
To: Reynolds, John (MIAC) <John.Reynolds@state.mn.us>
Cc: Cerda, Melissa (MIAC) <melissa.cerda@state.mn.us>; 'Lesley Brotkowski' <Lesley.Brotkowski@kleinschmidtgroup.com>
Subject: RE: [EXTERNAL MAIL] MIAC Review, Request for Information

John,

I have attached the OSA review form and project location maps. Also attached is the link to the Proposed Study Plan that was filed with the Federal Energy Regulatory Commission (FERC) on September 8, 2023. The electronic files can be downloaded through FERC's website using this link: https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20230908-5158

Please let me know if you have any additional questions,

Sincerely,

Greg Prom

Senior Environmental Compliance Specialist
Minnesota Power/ALLETE
30 West Superior Street
Duluth, Minnesota 55802

Office: 218-355-3191
Cell: 218-461-6856
Email: gprom@allete.com

From: Reynolds, John (MIAC) <John.Reynolds@state.mn.us>
Sent: Friday, October 13, 2023 11:28 AM
To: Gregory Prom (MP) <gprom@mnpower.com>
Cc: Cerda, Melissa (MIAC) <melissa.cerda@state.mn.us>
Subject: [EXTERNAL MAIL] MIAC Review, Request for Information

Hello,

MIAC has attempted to complete review of the proposed Little Falls, Sylvan, Pillager Hydroelectric Projects. Unfortunately, we were not able to access the attached documents in order to complete the review. Can you provide the OSA Review Form, and any other pertinent information? For any questions, please do not hesitate to reply.

Thanks.

From: Tworzyanski, Jennifer (ADM) <Jennifer.Tworzyanski@state.mn.us>
Sent: Wednesday, November 22, 2023 2:13 PM
To: Gregory Prom (MP) <gprom@mnpower.com>
Subject: [EXTERNAL MAIL] OSA Comments for Little Falls, Sylvan, Pillager Hydroelectric Projects

Greg,

Apologies for the lateness of this project review – our office has been inundated with project reviews. Attached is the OSA's response and recommendations for the Little Falls, Sylvan, Pillager Hydroelectric Projects. Please let me know if you have any questions or concerns.

Thanks,
-Jennifer

Jennifer Tworzyanski *(she/her/hers)*
Assistant to the State Archaeologist
Office of the State Archaeologist
328 West Kellogg Blvd
St Paul, MN 55102
651.201.2265

DEPARTMENT OF ADMINISTRATION
STATE ARCHAEOLOGIST

DEPARTMENT OF ADMINISTRATION
STATE ARCHAEOLOGIST

328 West Kellogg Blvd St Paul, MN 55102
OSA.Project.Reviews.adm@state.mn.us

Date: 11/22/2023

Greg Prom
ALLETE, Inc., doing business as Minnesota Power
218-355-3191
gprom@allete.com

Project Name: Little Falls, Sylvan, Pillager Hydroelectric Projects Relicensings

Submitter's Project ID: FERC P-2532, P-2454, & P-2663

Known or Suspected Cemeteries
☒ Platted Cemeteries - [redacted]
☒ Unplatted Cemeteries - [redacted]
☒ Burial File - [redacted]
☐ Authenticated Burial
Notes/Comments
Thank you for consulting with the Office of the State Archaeologist about this project. Review of our files indicates there are a multitude of previously recorded archaeological sites, archaeological site leads, and burials in the three project areas. Additionally, the project areas all have moderate to high potential to contain previously unrecorded archaeological sites or burials. Therefore, the OSA concurs with the necessity of a cultural resource survey of the project areas. Given the size of the project area, a comprehensive phase Ia literature review conducted by qualified archaeologists is recommended, which should include an assessment of historical and pre-contact period sites, as well as the potential for submerged sites.
Recommendations

Privileged information redacted

☐ Not Applicable

☐ No Concerns

☐ Monitoring

☐ Avoidance

☒ Phase Ia – Literature Review

☐ Phase I – Reconnaissance survey

☐ Phase II – Evaluation

☐ Phase III – Data Recovery

☒ Other - consult with MIAC and THPOs

If you require additional information or have questions, comments, or concerns please contact our office.

Sincerely,



Jennifer Tworzyanski
Assistant to the State Archaeologist
OSA
Kellogg Center 328 Kellogg Blvd W
St Paul MN 55102
651.201.2265
jennifer.tworzyanski@state.mn.us

December 18, 2023 **VIA E-MAIL**

Greg Prom
Senior Environmental Compliance Specialist
ALLETE, Inc. d.b.a. Minnesota Power
30 West Superior Street
Duluth, MN 55802-2093

RE: FERC No. 2532 Little Falls Hydroelectric Project
FERC No. 2454 Sylvan Hydroelectric Project
FERC No. 2663 Pillager Hydroelectric Project
Section 106 Consultation Regarding the Proposed Relicensing of Hydroelectric Projects
Cass, Crow Wing, and Morrison Counties, Minnesota
SHPO Number: 2023-1267 (Little Falls), 2023-3430 (Sylvan), and 2023-3431 (Pillager)

Dear Mr. Prom,

Thank you for initiating consultation with our office regarding the above undertakings. In accordance with the notice issued by the Federal Energy Regulatory Commission (FERC) on May 26, 2023 designating ALLETE/Minnesota Power (MP) as non-federal representative, information received in our office on September 8 and 20, 2023 has been reviewed pursuant to the responsibilities given the State Historic Preservation Officer Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) and its implementing federal regulations, "Protection of Historic Properties" (36 CFR Part 800).

We have completed a review of your letter dated September 20, 2023 as well as the submitted document titled *Proposed Study Plan: Little Falls Hydroelectric Project FERC P-2532 Sylvan Hydroelectric Project FERC P-2454 Pillager Hydroelectric Project FERC P-2663* (September 2023) as prepared by Kleinschmidt Associates for ALLETE, Inc.

Define Federal Undertaking and Area of Potential Effect (APE)
Based upon information provided in your September 20th letter, we understand that, due to the geographic proximity of the three (3) hydroelectric projects referenced above, MP has requested a combined FERC relicensing process for all 3 projects. Although each is considered a separate federal undertaking, the review and consultation under the Section 106 regulations will be carried out concurrently by MP.

Thank you for providing clarification on MP's definition of the Area of Potential Effect (APE) for each undertaking and also submitting map documentation and shapefiles for the APE boundaries. We continue to agree that the APEs for each project – defined as the FERC Project Boundary – are appropriate to take into account the potential direct and indirect effects of the federal undertaking, as it is currently defined.

Identification of Historic Properties
We have completed a review of Section 5.4 Cultural Resource Study. Our comments, as provided below, pertain to the proposed plan for completing historic property identification efforts within each APE as described in the PSP by section number.

Section 5.4 Cultural Resources Study
Section 5.4.1 Historic Architectural Resources Study
Section 5.4.1.1 Goals and Objectives
To clarify, the goal of the Historic Architectural Resources study is to identify historic/architectural properties within the APE for each undertaking and to assess the potential effects of the federal undertaking (license to continue project

operation and maintenance) on identified historic properties in accordance with 36 CFR 800.4 and 800.5. One of the objectives – performing a literature review – will provide MP and consulting parties with a comprehensive list of known historic properties, including those listed in the National Register of Historic Places (NRHP) and those previously evaluated and determined eligible or ineligible for listing in the NRHP. Additionally, the literature review will identify historic/architectural properties that have been subject to previous windshield or reconnaissance level survey, but which have not yet been evaluated for NRHP eligibility and properties within the APE that have been evaluated and determined ineligible for listing in the NRHP. It will be important to further clarify the objectives of the Historic Architectural Resources Study to include not only literature review and "updated survey and evaluation documentation of" NRHP-eligible historic/architectural resources, but also include any new or updated survey of properties 45 years or older within the APE, including those never before inventoried, and reevaluation of properties previously determined ineligible for listing in the NRHP if the earlier evaluation is 10 years old or older.

Section 5.4.1.5 Methodology
While paragraph 2 of this section describes the currently defined APEs as the FERC Project Boundary for each undertaking, the descriptions in Table 7 are inconsistent. We recommend that the descriptions for Sylvan and Pillager, like Little Falls, clearly reference the fact that the hydroelectric generating facilities, dams, and any embankments, as well as the reservoirs and adjacent lands are also located within the APEs.

As referenced above, along with the literature review of existing documentation (NRHP listed, NRHP eligible, NRHP ineligible, and inventoried/recorded, but unevaluated, properties) the Phase I reconnaissance survey described in this section should also include a reasonable effort to identify properties 45 years or older within the APE that have not been subject to previous inventory, survey, or evaluation. This effort will likely require field survey.

Also, this section seems to skip over relevant steps in historic property identification within each APE which will need to be carried out consistent with the Secretary of the Interior's *Standards for Identification* and *Evaluation* (36 CFR 800.4) as well as our state survey guidelines. This means that all survey within the APE will need to include consideration of the need for any new or updated historic contexts, as well as completion of property documentation at the Phase I reconnaissance level for those properties identified as not warranting additional Phase II survey and evaluation to fully support NRHP eligibility/ineligibility, and Phase II intensive level survey and evaluation documentation for all properties formally determined eligible or ineligible for listing in the NRHP.

We recommend updating this section to better reflect the requirements for historic property identification under 36 CFR 800.4 and assessment and findings of effect under 36 CFR 800.4 (no effect) and 800.5 (no adverse effect, and adverse effect) and the recommendations provided in this letter.

Section 5.4.1.7 Deliverables and Schedule
This section should also reference that any corresponding property inventory data will be prepared consistent with current state survey requirements. We have recently transitioned to the new MnSHIP GIS application for data on above-ground resources in the state. All updated survey and new survey information for properties will need to be prepared consistent with MnSHIP requirements and match any determinations made in corresponding survey reports and federal agency, or authorized federal agent, determination letters.

Section 5.2.4 Archaeological Resources Study
As with Section 5.1, the sections of the PSP involving historic, architectural, and archaeological property identification should clearly reference the fact that this work is being carried out pursuant to the federal agency and applicant's responsibilities under Section 106 and 36 CFR 800. Both the SHPO request for archaeological survey and the consulting party Friends of Old Crow Wing request for a re-evaluation of the Chippewa Agency Historic District are consistent with requirements for historic property identification under 36 CFR 800.4.

Section 5.4.2.1 Goals and Objectives and Section 5.4.2.5 Methodology
Consistent with our comments (above) regarding identification of historic/architectural properties, the goal of the archaeological resources study is to identify archaeological properties within the APE for each undertaking and to assess the potential effects of the federal undertaking on identified historic properties (historic, architectural, archaeological) in

accordance with 36 CFR 800.4 and 800.5. For archaeological properties, the identification effort will include a literature review and desktop study as a first step, followed by an archaeological field survey – which may include both reconnaissance and intensive level survey, as appropriate – of the APE in order to identify and evaluate for NRHP eligibility any previously recorded or newly identified archaeological sites. The current PSP focuses on only reconnaissance level survey, but this effort should not be limited or predetermined prior to iterative survey steps being carried out. There will likely need to be intensive level survey and evaluation of archaeological sites, including the NRHP-listed Chippewa Agency Historic District. Therefore, the PSP should include reference to both reconnaissance (Phase I) and intensive (Phase II) level archaeological surveys which may need to be carried out and documented in accordance with current state survey guidelines for these undertakings.

In addition to review of SHPO's data on archaeological sites, the literature review needs to include utilization of the Office of the State Archaeologist's data portal.

General PSP Comments

The PSP does not address previous recommendations made by our office and consulting party Friends of Old Crow Wing regarding the identification of traditional cultural places in consultation with tribes. This request is included in previous Section 106 meeting notes, and we noticed a similar comment in the letter that Friends of Old Crow Wing sent to Minnesota Power. This request is not included in the cultural resources studies described in the PSP, and is not included as a "Requested Study Not Adopted."

Our office has recommended consultation with more tribes, and we see that the list of tribes on the distribution list has been expanded. While this expanded notification list is helpful, meaningful consultation with tribes to identify any properties of religious or cultural significance to tribes within the APEs is required under the Section 106 regulations. Typically, this consultation will require intentional outreach and engagement with Tribal Historic Preservation Officers who express an interest in the APE geographic areas as historic property identification efforts are completed and documented, and assessment of effects to identified historic properties carried out.

We are aware of the fact that many other recent FERC re-licensing efforts in other states have included a Tribal Survey component, and we have seen Tribal Surveys carried out for other federal undertakings in Minnesota. This indicates that a tribal-led study to identify traditional cultural places is accepted practice, and it would also consider relevant tribal values and knowledge y engaging traditional cultural specialists in the identification of these places. Perhaps it is an oversight that this effort not included in the current PSP for these relicensing efforts, yet we recommend clarification on this matter.

We also note that the PSP distribution list did not include either the Crow Wing County Historical Society, Cass County Historical Society, or Friends of Old Crow Wing. We are aware of the interest by these entities regarding the proposed relicensing and potential effects to historic properties. We recommend adding both organizations to any distribution lists associated with Section 106 review of these proposed undertakings.

We look forward to continuing consultation with FERC and Minnesota Power/ALLETE and other consulting parties regarding the Section 106 reviews of these undertakings. Please feel free to contact me if you have any questions regarding our comment letter and/or would like to discuss next steps in the consultation process. I can be reached at (651) 201-3290 or by e-mail at sarah.beimers@state.mn.us.

Sincerely,

Sarah J. Beimers
Environmental Review Program Manager

From: Lesley Brotkowski
Sent: Tuesday, January 9, 2024 6:06 PM
To: Tammie.Poitra@bia.gov; Mary.Manydeeds@bia.gov; robert.k.edstrom@usace.army.mil; darin_simpkins@fws.gov; dave_thomson@nps.gov; durellcooper05@gmail.com; MikeW@badriver-nsn.gov; thpo@badriver-nsn.gov; deputythpo@badriver-nsn.gov; rwassana@cheyenneandarapaho-nsn.org; Anthony.Reider@fsst.org; jeffery.stiffarm@ftbelknap.org; trhodd@iowas.org; doreen@kbic-nsn.gov; ldfthpo@ldftribe.com; jim.williams@lvd-nsn.gov; alina.shively@lvd-nsn.gov; lisa.brunk@lvd-nsn.gov; robert.larsen@lowersioux.com; chairman@mitw.org; cchavers@boisforte-nsn.gov; kevindupuis@fdlrez.com; robertdeschampe@grandportage.com; diane.thompson@llojibwe.net; melanie.benjamin@millelacsband.com; Susan.Klapel@millelacsband.com; Michael.Fairbanks@whiteearth-nsn.gov; bdrost@mnchippewatribe.org; jbruce@mnchippewatribe.org; Sbartell@piic.org; nicole.boyd@redcliff-nsn.gov; dseki@redlakenation.org; alonzo.denney@ssndakota.com; annette.krebsbach@shakopeedakota.org; Chairman@swo-nsn.gov; robert.vanzile@scc-nsn.gov; lonnas@spiritlakenation.com; info@standingrock.org; Scott.herman@rst-nsn.gov; jamie.azure@tmbci.org; kevinj@uppersiouxcommunity-nsn.gov; john.jaschke@state.mn.us; Sarah.Beimers@state.mn.us; ENReviewSHPO@state.mn.us; shannon.geshick@state.mn.us; melissa.cerda@state.mn.us; Jill.Townley@state.mn.us; daniel.oshea@state.mn.us; jason.boyle@state.mn.us; eric.altena@state.mn.us; thorleif@umn.edu; mn.osa@state.mn.us; Jesse.Anderson@state.mn.us; Bonnie.finnerty@state.mn.us; william.wilde@state.mn.us; will.seuffert@state.mn.us; josh.stevenson@casscountymn.gov; CoAdmin@crowwing.us; mattl@co.morrison.mn.us; wzylka@cityoflittlefalls.com; jonr@cityoflittlefalls.com; jrklein@brainerd.net; info@sylvantwp.com; lblumke@brainerd.net; dlobaxter@charter.net; dbadeaux@ci.brainerd.mn.us; timt@mississippiheadwaters.org; staff@morrisoncountyhistory.org; history@crowwing.us; casscountymuseum@gmail.com; Rnnelson13@hotmail.com; royandjoann@hotmail.com; dwedll@hotmail.com; stephenschaitberger@charter.net
Cc: gprom@allete.com; nrosemore@mnpower.com; dmoeller@allete.com; mradzak@mnpower.com; Elizabeth Krchnavek <Elizabeth.Krchnavek@KleinschmidtGroup.com>
Subject: Revised Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Good afternoon,

On January 9, 2024, ALLETTE, Inc., doing business as Minnesota Power, filed with the Federal Energy Regulatory Commission (FERC) a Revised Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663). The electronic files can be downloaded through FERC's website using the link provided:
https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20240109-5147

If you have any questions regarding this filing, please contact me at the contact information below, or Greg Prom, ALLETE, Inc. Senior Environmental Compliance Specialist at gprom@allete.com.

Thank you,

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt
Office: 715-318-3729
www.KleinschmidtGroup.com

Kleinschmidt

We provide practical **solutions** *for complex renewable energy, water, and environmental projects.*

January 9, 2024

Little Falls Hydroelectric Project, Sylvan Hydroelectric Project, and Pillager Hydroelectric Project
Distribution List Recipient

RE: Little Falls Hydroelectric Project, FERC Number P-2532
Sylvan Hydroelectric Project, FERC Number P-2454
Pillager Hydroelectric Project, FERC Number P-2663
Revised Study Plan for Little Falls, Sylvan, and Pillager Projects

Dear Distribution List Recipient:

ALLETE, Inc., doing business as Minnesota Power (Licensee), has submitted to the Federal Energy Regulatory Commission (FERC) a Proposed Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663).

The electronic files are available at FERC's eLibrary https://elibrary.ferc.gov/eLibrary/ under the docket numbers P-2532, P-2454, and P-2663.

If you have questions concerning this filing, would like to be removed from this distribution list, or have an updated email address or alternative contact information, please contact Lesley Brotkowski at Lesley.Brotkowski@KleinschmidtGroup.com.

Sincerely,

Lesley Brotkowski

Ms. Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt Associates

From: Lesley Brotkowski
Sent: Tuesday, January 9, 2024 6:11 PM
To: Beimers, Sarah (ADM) <sarah.beimers@state.mn.us>; Harrington, Lucy (She/Her/Hers) (ADM) <lucy.harrington@state.mn.us>; MN_ADM_ENV Review SHPO <ENReviewSHPO@state.mn.us>
Cc: Gregory Prom (MP) <gprom@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@KleinschmidtGroup.com>
Subject: Revised Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Sarah and Lucy,

A link to the FERC filing of the Revised Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663) is located below. The SHPO Request for Project Review Form and associated maps are attached.

Please reach out to Greg or me with any questions or comments regarding this filing.

Thank you!
Lesley

Please mail the completed form and required material to:

ENReviewSHPO@state.mn.us

DEPARTMENT OF ADMINISTRATION

Request for Project Review by the State Historic Preservation Office (SHPO)

◉ This is a new submittal

○ This is additional information relating to SHPO Project #: 2023-1267 **DATE:** 1/9/2024

I. GENERAL PROJECT INFORMATION

Project Title: Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663) Hydroelectric Projects Revised Study Plan

Project Address (or Location): Please see attached maps and Revised Study Plan for details

City / Township (circle one): See attachment Zip: See attachment County: Morrison, Crow Wing, Cass

Legal Description: Township Attachment Range Attachment E/W (circle one) Section Attachment Quarter-section Attachment

II. PROJECT CONTACT INFORMATION

Project Contact Name: Greg Prom Title: Senior Environmental Compliance Specialist

Company/Agency: ALLETE, Inc., d.b.a Minnesota Power

Street Address: 30 West Superior Street Phone Number: 218-355-3191

City: Duluth State: MN Zip: 55802-2093 Email: gprom@allete.com

III. FEDERAL AND/OR STATE INVOLVEMENT

Federal Agency (if applicable): Federal Energy Regulatory Commission (FERC) relicensing
(Agency providing funds, licenses, or permits)
Permit or Project Reference #: P-2532, P-2454, P-2663

State Agency (if applicable): N/A
(Agency providing funds, licenses, or permits)
Permit or Project Reference #: N/A

Local Agency (if applicable): N/A

(Continued on Reverse Side)

Please refer to *Instructions for Completing the Request for Project Review* form on our website. Submit one *Request for Project Review* form for each project. For questions regarding the SHPO review process, please visit our website or contact Kelly Gragg-Johnson (651-201-3285) or Leslie Coburn (651-201-3286) or by email at ENReviewSHPO@state.mn.us.

IV. PROJECT DESCRIPTION AND BOUNDARIES

A) REQUIRED FOR ALL PROJECTS

☑ Write a detailed description of the proposed project. (See attached.)

See attached. Minnesota Power filed with the FERC a Revised Study Plan for the Little Falls Project, Sylvan Project, and Pillager Project (Projects) relicensing process. No changes to operations proposed.

☑ Attach a map of project location, with project area(s) clearly marked. Road names must be included and legible.

B) Architecture

Are there any buildings or structures within the project area? ◉ Yes ○ No

If **No**, continue to the Archaeology section below. If **Yes**, submit all of the following information:

☑ List all buildings and structures within the project area and the year they were built. (See attached.)

Please see the attached

☐ Photographs of ***each*** building and structure located within the project area, along with a photo key. Include streetscape images, if applicable. All photographs must be clear, crisp, focused, and taken at ground level. Aerial photos are insufficient.

☑ List known historic buildings or structures located within the project area (i.e., individual properties or districts which are listed in the National Register or which meet the criteria for listing in the National Register). (See attached.)

Please see the attached

C) Archaeology

Does the proposed undertaking involve ground-disturbing activity? ○ Yes ◉ No

If **No**, this form is complete. If **Yes**, submit all of the following information:

☐ Attach the relevant portion of a 1:24000-scale USGS topographic map (photocopied or computer generated) ***with the project boundary marked***.

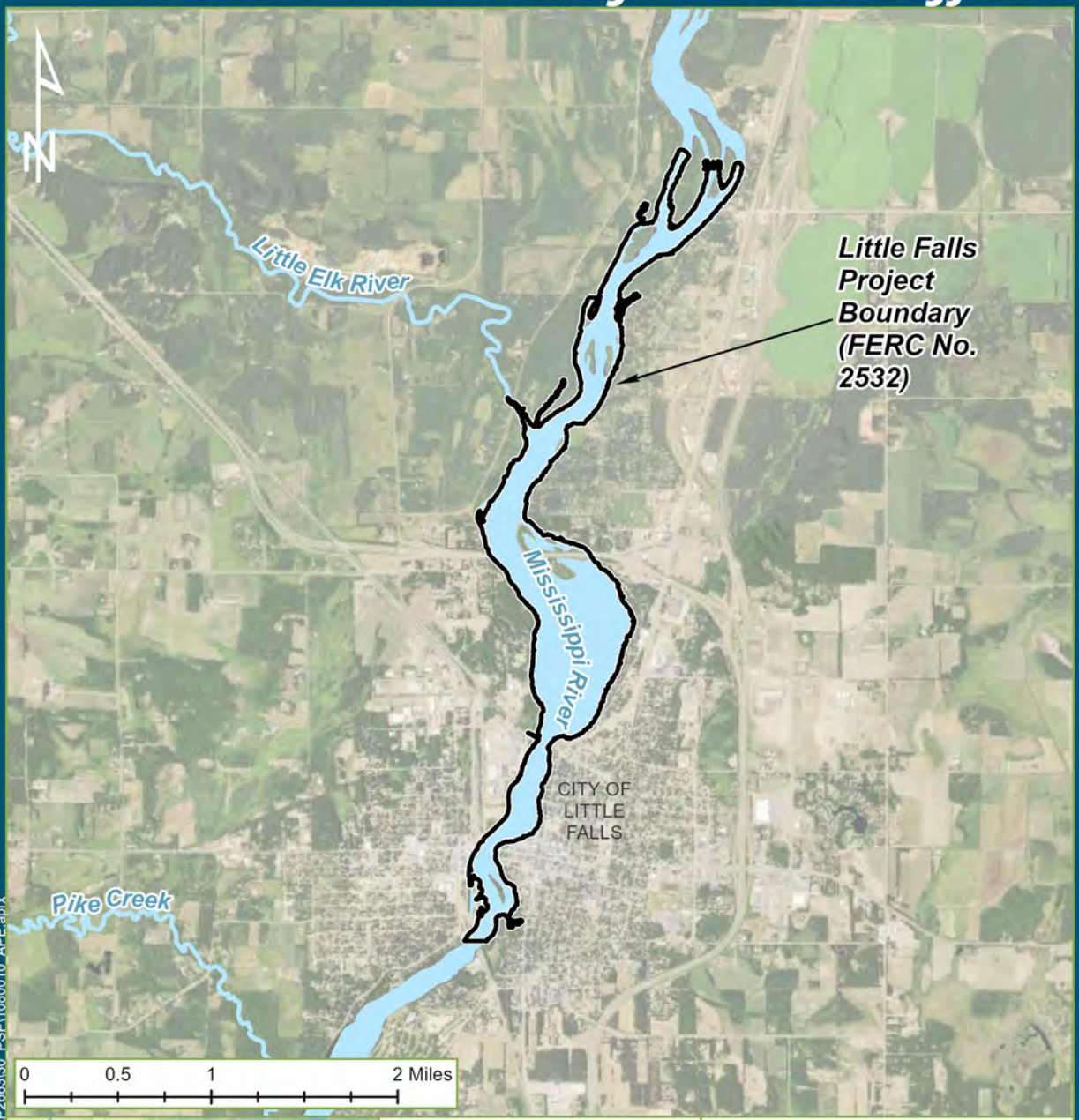
☑ Description of current and previous land use and disturbances: (See attached.)

Please see the attached Revised Study Plan.

☑ Any available information concerning known or suspected archaeological resources within the project area. (See attached.)

Please see the attached Revised Study Plan.

Little Falls Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power

Little Falls, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

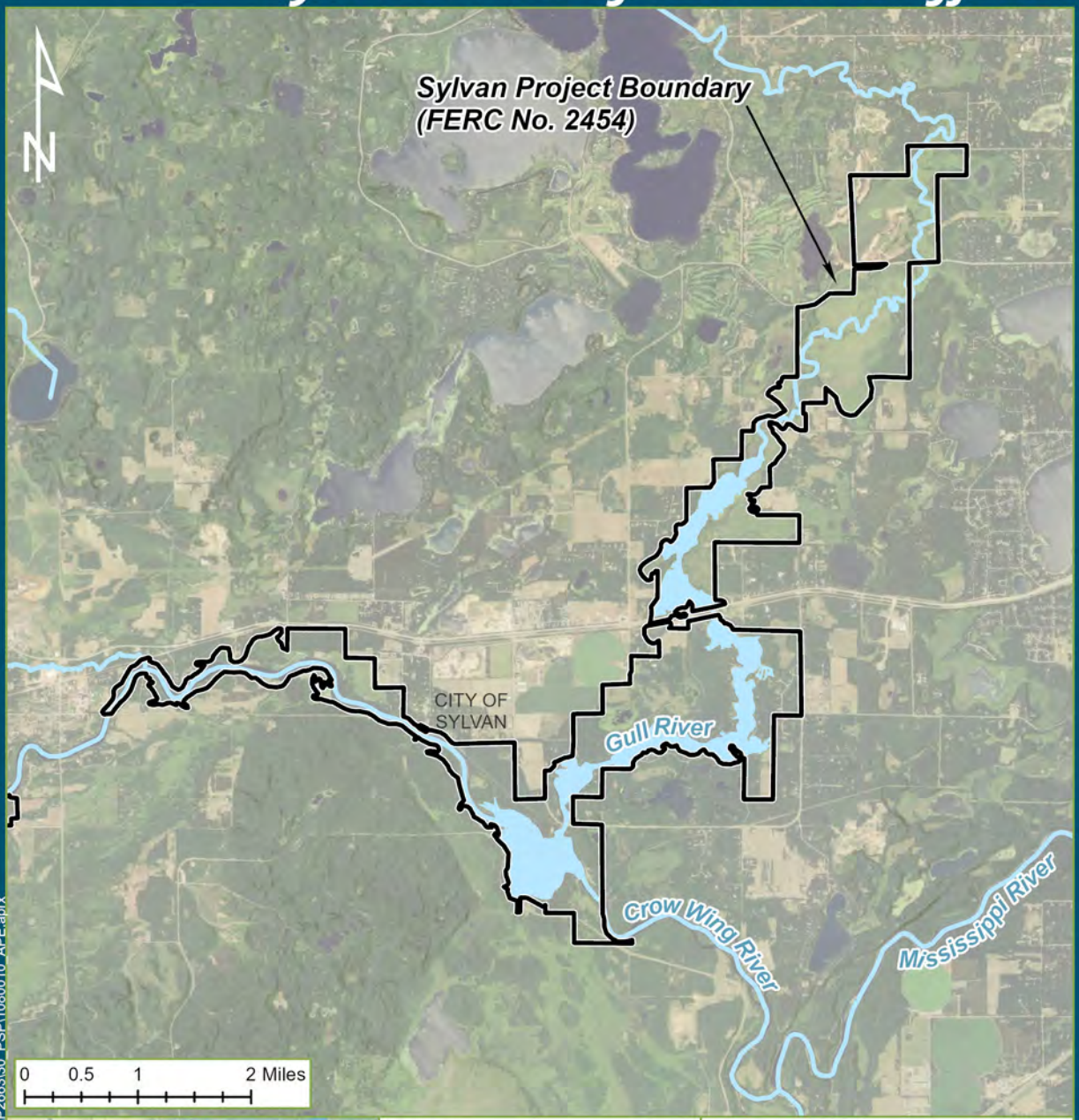
Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Sylvan Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power
Sylvan, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

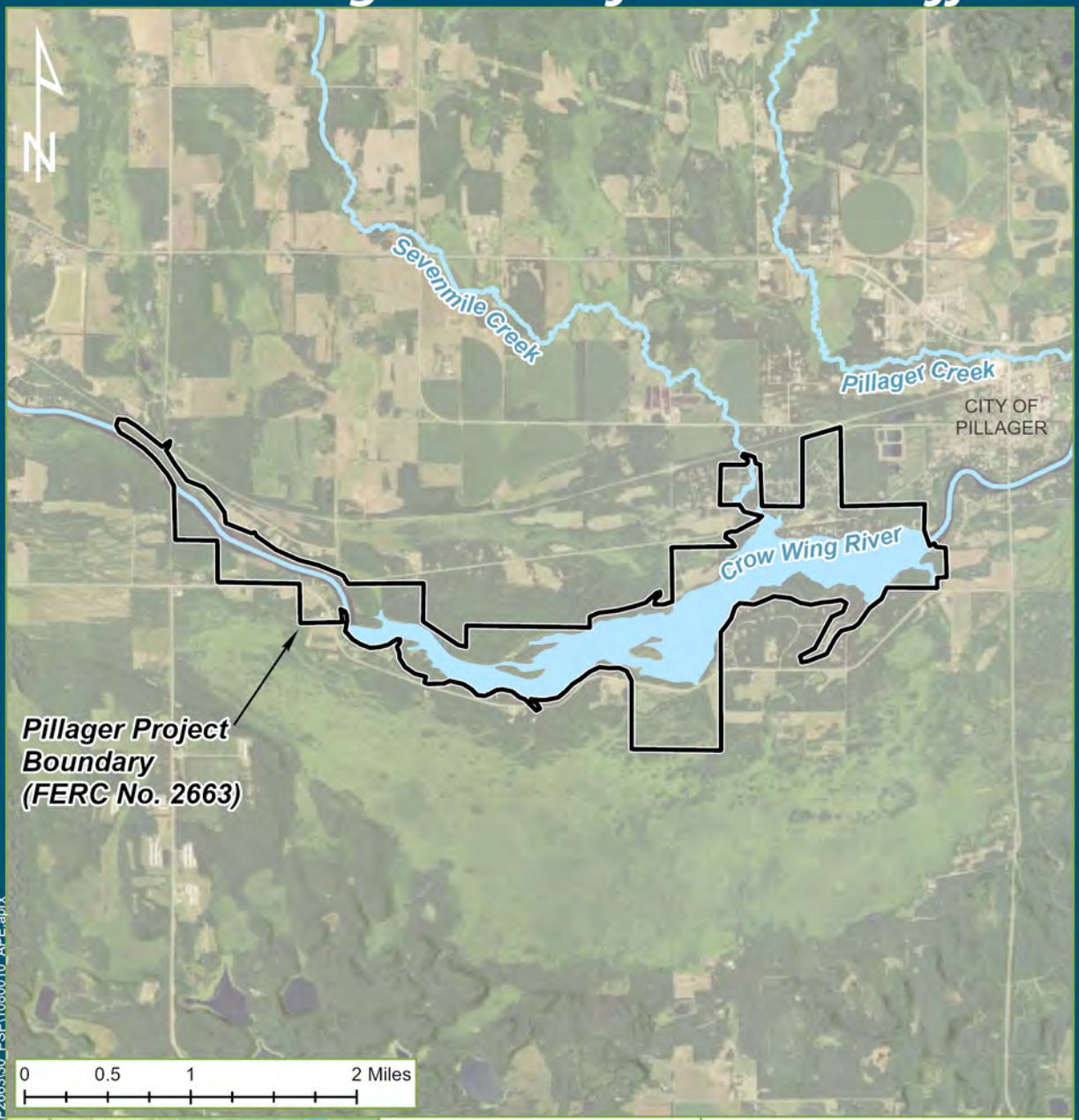
Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Pillager Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power
Pillager, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Subject: FW: Revised Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects
Attachments: OSA Form Little Falls Sylvan Pillager RSP 2024_01_09.pdf

---

From: Lesley Brotkowski
Sent: Tuesday, January 9, 2024 6:16 PM
To: mn.osa@state.mn.us; jennifer.tworzyanski@state.mn.us
Cc: Gregory Prom (MP) <gprom@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@KleinschmidtGroup.com>
Subject: Revised Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Jennifer,

A link to the FERC filing of the Revised Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663) is located below. The OSA Request for Project Review Form and associated maps are attached.

Please reach out to Greg or me with any questions or comments regarding this filing.

Thank you!
Lesley

DEPARTMENT OF ADMINISTRATION
STATE ARCHAEOLOGIST

PROJECT REVIEW FORM

Please complete all the fields marked with an asterisk (*).

This form is a fillable document. After completing this form, please send your request to:
OSA.Project.Reviews.adm@state.mn.us

REVIEW INFORMATION

1. **PROJECT NAME*:** Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663) Hydroelectric Projects Relicensings
2. **PROJECT ID:** Click or tap here to enter text.
3. **REASON FOR REVIEW*:** **FERC Relicensing**
4. **REVIEW TYPE*: Review Request**
5. **FUNDING*: Private**
6. **ORGANIZATION NAME:** **ALLETE, Inc., doing business as Minnesota Power**
7. **SUBMITTING ORGANIZATION TYPE: Private**

PROJECT INFORMATION

8. **PROJECT DESCRIPTION*:** Minnesota Power filed with the FERC a Revised Study Plan (RSP) for the Little Falls Project, Sylvan Project, and Pillager Project hydropower relicensing process. The RSP includes a proposed cultural resources study.
9. **ARCHAEOLOGICAL SITE NUMBERS (if known – if not, leave blank)** (Separate counties with commas)**:** Click or tap here to enter text.
10. **COUNTY***(Add multiples by separating with a comma)**:** Morisson, Crow Wing, Cass

11. BACKGROUND RESEARCH DONE (Check the appropriate box if any research has been completed or is in progress. If no research has been done, leave blank):

☐OSA Portal Query

☐MnDOT GIS

☐MnModel

☐Legacy Historic cemeteries

12. KNOWN RESOURCES ADJACENT TO REVIEW AREA (if known – if not, leave blank):

☐Cemeteries

☐Burials

☐Archaeological Sites

13. ADDITIONAL INFORMATION: FERC has designated Allete, INC as the non-federal representative for Section 106 consultation.

LOCATION INFORMATION* (If there are additional PLSS entries, please add a continuation sheet)

14. LOCATION INFORMATION (Complete this or Project Address if PLSS is not known):

Little Falls Hydroelectric Project:

PLSS - Township:130 Range:29 Range Direction (E or W):W Section:5, 32, 33

PLSS - Township:41 Range:32 Range Direction (E or W):W Section:13, 14, 23, 26, 27, 34, 35

PLSS - Township:40 Range:32 Range Direction (E or W):W Section:8, 18

PLSS - Township:129 Range:29 Range Direction (E or W):W Section:5, 6, 7, 8, 17, 18, 19

Sylvan Hydroelectric Project:

PLSS - Township:134 Range:29 Range Direction (E or W):W Section:21, 27, 28, 33, 34

PLSS - Township: 133 Range:29 Range Direction (E or W):W Section:3, 4, 5, 8, 9, 16, 17, 18, 19, 20, 21, 30, 31, 32

PLSS - Township:133 Range:30 Range Direction (E or W):W Section:13, 14, 15, 16, 21, 15, 24, 25

Pillager Hydroelectric Project:

PLSS - Township:133 Range:31 Range Direction (E or W):W Section:16, 21,,22, 23, 24, 25, 26, 27,

PLSS - Township:133 Range:30 Range Direction (E or W):W Section:19, 20, 29, 30

PLSS - Township: Range: Range Direction (E or W): Section:

PLSS - Township: Range: Range Direction (E or W): Section:

15. ADDRESS (if PLSS is not known, please enter your project address):
Address Line 1: Click or tap here to enter text.
Address Line 2: Click or tap here to enter text.
City: Click or tap here to enter text.
State: Click or tap here to enter text.
Zip Code: Click or tap here to enter text.

16. Maps of the project locations and proposed Area of Potential Effects/FERC project boundaries are attached.

REQUESTOR INFORMATION

17. REQUESTED BY* (name): Greg Prom

18. REQUESTOR's EMAIL ADDRESS*: gprom@allete.com

19. REQUESTOR's PHONE NUMBER: 218-355-3191

20. REQUESTOR's PHYSICAL ADDRESS:
Address Line 1: 30 West Superior Street
City: Duluth
State: MN
Zip Code: 55802-2093

21. Please also copy Allete's relicensing consultant on correspondence:

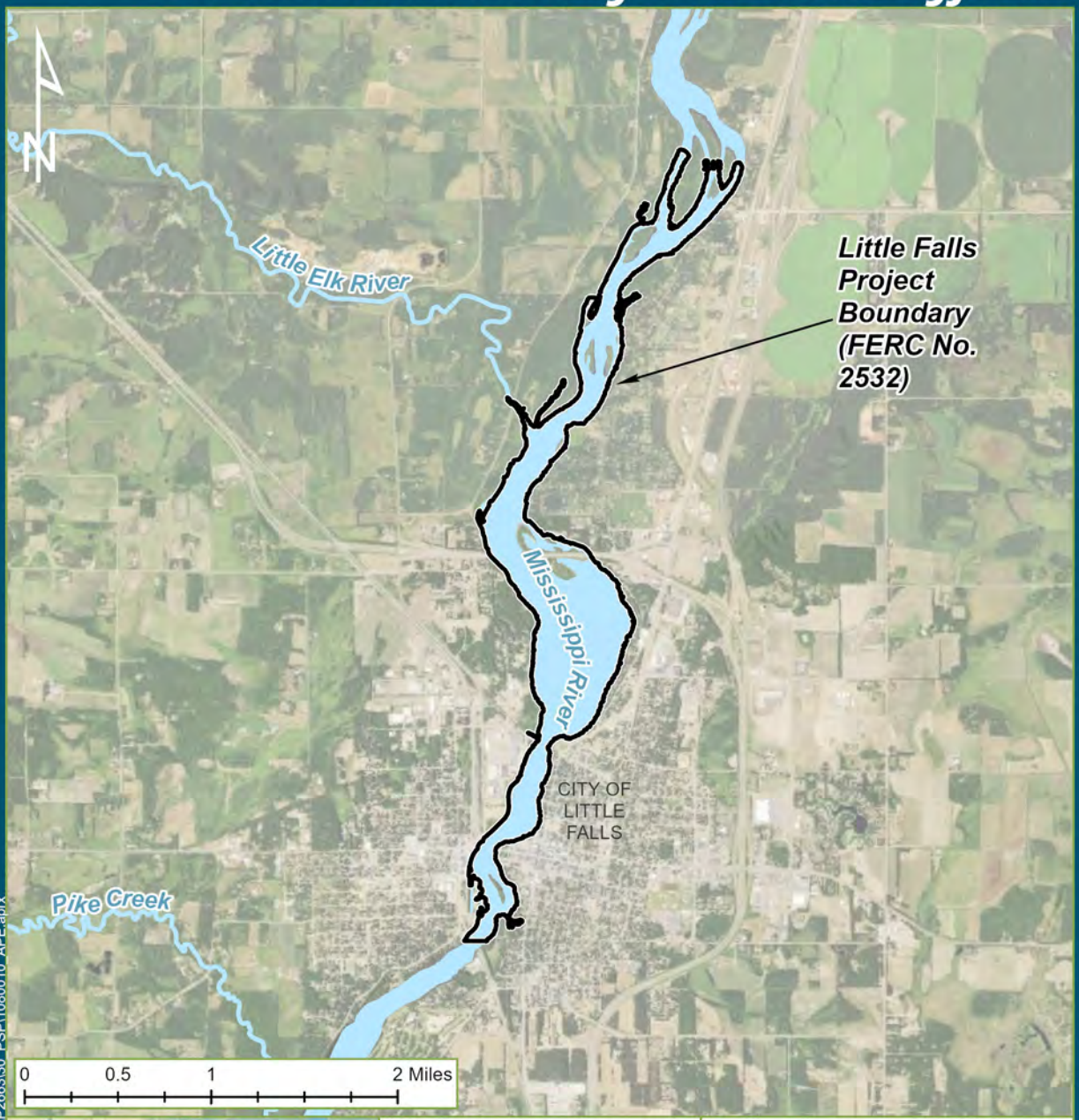
Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt Associates
233403 Stettin Ridge Court
Wausau, WI 54401
Lesley.brotkowski@kleinschmidtgroup.com
715-318-3729

ADDITIONAL INFORMATION AND ATTACHMENTS

Please add and attach any pertinent photos, maps, or documents that will help us complete the review.

Maps of the project locations and proposed Area of Potential Effects/FERC project boundaries are attached. A link to the Revised Study Plan is provided in the email text. We are requesting your review of the Revised Study Plan.

Little Falls Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power

Little Falls, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

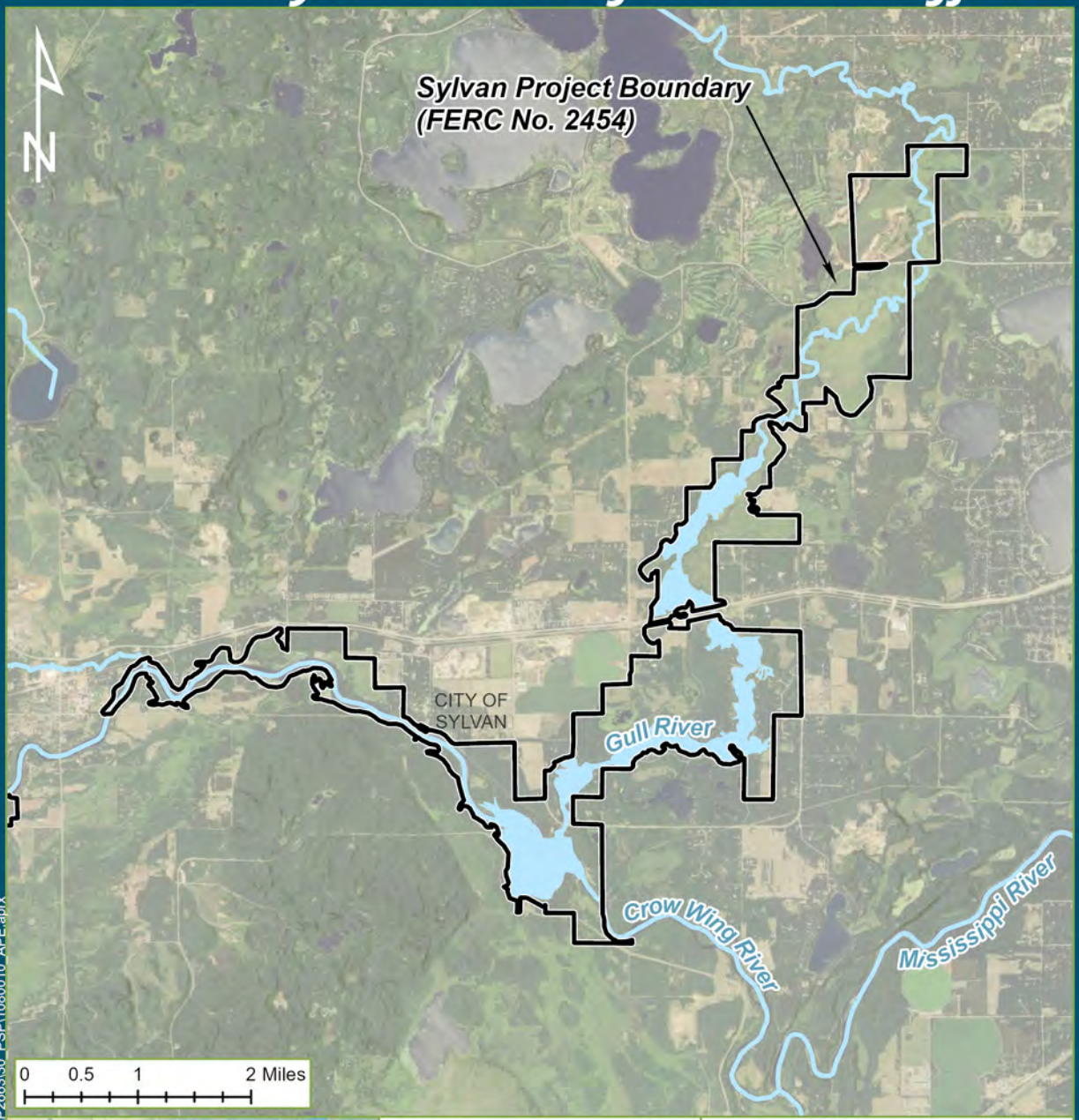
Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Sylvan Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power
Sylvan, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

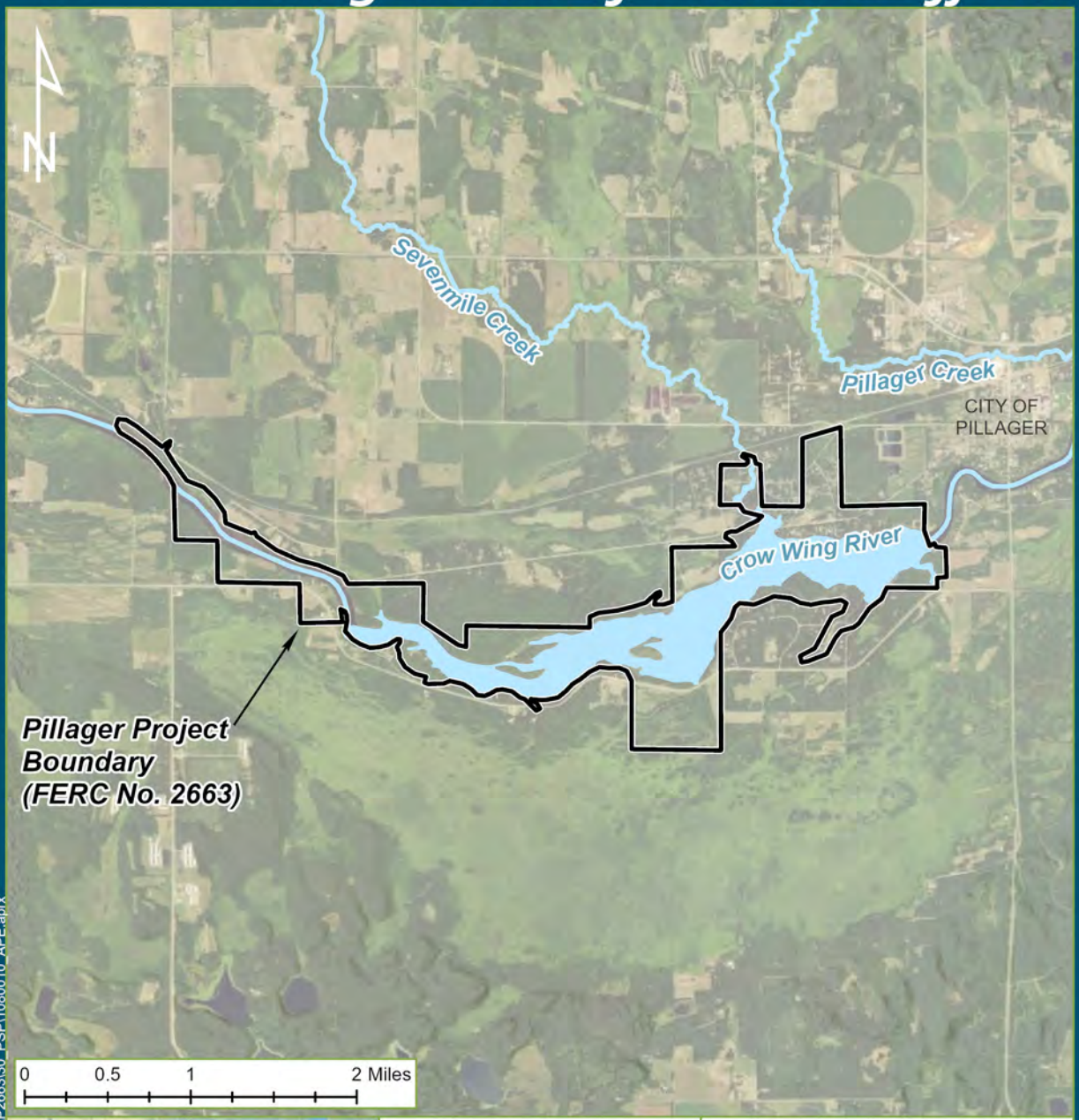
Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Pillager Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power
Pillager, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

From: Microsoft Outlook
To: rwassana@cheyenneandarapaho-nsn.org
Sent: Tuesday, January 9, 2024 6:06 PM
Subject: Undeliverable: Revised Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Delivery has failed to these recipients or groups:

rwassana@cheyenneandarapaho-nsn.org (rwassana@cheyenneandarapaho-nsn.org)
Your message couldn't be delivered. The Domain Name System (DNS) reported that the recipient's domain does not exist.

Contact the recipient by some other means (by phone, for example) and ask them to tell their email admin that it appears that their domain isn't properly registered at their domain registrar. Give them the error details shown below. It's likely that the recipient's email admin is the only one who can fix this problem.

For more information and tips to fix this issue see this article: https://go.microsoft.com/fwlink/?LinkId=389361.

Diagnostic information for administrators:

Generating server: CYXPR08MB9300.namprd08.prod.outlook.com

rwassana@cheyenneandarapaho-nsn.org
Remote server returned '550 5.4.310 DNS domain cheyenneandarapaho-nsn.org does not exist [Message=InfoDomainNonexistent] [LastAttemptedServerName=cheyenneandarapaho-nsn.org] [DM6NAM12FT061.eop-nam12.prod.protection.outlook.com 2024-01-09T23:06:04.440Z 08DC07E5674DB5F7]'

Original message headers:


```
ARC-Seal: i=1; a=rsa-sha256; s=arcselector9901; d=microsoft.com; cv=none;

b=YA5KD/TrxYPqPHSlycIseKCHilV9nlksoZFWu73zoZIk2wb+Y4CIIfl1hnT53ca7gT/wgum3hXLkIk6lREJ68NF
moKAOWDHb/0B+6GUil8G1DfghF8jJrVhI0Bh/85geNkx84Cg3+xEM3t5I284p6auAQDZBoxrUYZ10YOvS7xJ0kmwQ
ShA9nA84Jb09Gu4gIB/QXPv+eBYMymCLXnJ2QPkUkiFF4pm6afnAmCbHzBD1lGozhkmhJ35KJkLZiepQ5yC+R4Ifq
/sl59DksoHCjEj6mcT5NfgiGzaIQ1oNX2M91a1MNjysDArnyEBWiTW1TeE1T4qX3Jka2ICEesr8WQ==
ARC-Message-Signature: i=1; a=rsa-sha256; c=relaxed/relaxed; d=microsoft.com;
 s=arcselector9901;
 h=From:Date:Subject:Message-ID:Content-Type:MIME-Version:X-MS-Exchange-AntiSpam-
MessageData-ChunkCount:X-MS-Exchange-AntiSpam-MessageData-0:X-MS-Exchange-AntiSpam-
MessageData-1;
```

From: Mike Wiggins <MikeW@badriver-nsn.gov>
Sent: Tuesday, January 9, 2024 6:06 PM
To: Lesley Brotkowski
Subject: Automatic reply: Revised Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

You don't often get email from mikew@badriver-nsn.gov. Learn why this is important

Boozhoo,
Please be informed that this email address previously used is no longer in use. For any communication or inquiries regarding Chairman Robert Blanchard, kindly contact the Blackbird administration building directly, 715-682-7111, extension 1504.

If this is an urgent matter please contact Vice Chairman, Patrick Bigboy (715)292-9581, or Tribal Operations Manager, Chris McGeshick at TribalOps@badriver-nsn.gov or (715)292-8282.
Miigwech.

From: Lesley Brotkowski
Sent: Wednesday, January 10, 2024 10:11 AM
To: rwassana@cheyenneandarapaho-nsn.gov
Cc: Gregory Prom (MP)
Subject: Revised Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Good morning,

On January 9, 2024, ALLETTE, Inc., doing business as Minnesota Power, filed with the Federal Energy Regulatory Commission (FERC) a Revised Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663). The electronic files can be downloaded through FERC's website using the link provided:
https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20240109-5147

If you have any questions regarding this filing, please contact me at the contact information below, or Greg Prom, ALLETE, Inc. Senior Environmental Compliance Specialist at gprom@allete.com.

Thank you,

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt
Office: 715-318-3729
www.KleinschmidtGroup.com

From: Lesley Brotkowski
Sent: Wednesday, January 10, 2024 10:12 AM
To: R.Blanchard@badriver-nsn.gov
Cc: Gregory Prom (MP)
Subject: Revised Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Good morning,

On January 9, 2024, ALLETTE, Inc., doing business as Minnesota Power, filed with the Federal Energy Regulatory Commission (FERC) a Revised Study Plan for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663). The electronic files can be downloaded through FERC's website using the link provided:
https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20240109-5147

If you have any questions regarding this filing, please contact me at the contact information below, or Greg Prom, ALLETE, Inc. Senior Environmental Compliance Specialist at gprom@allete.com.

Thank you,

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt
Office: 715-318-3729
www.KleinschmidtGroup.com

From: Ray Nelson <rnnelson13@hotmail.com>
Sent: Wednesday, January 17, 2024 12:44 PM
To: Gregory Prom (MP) <gprom@mnpower.com>
Cc: Don Wedll <dwedll@hotmail.com>; Kathy Bernier <mnarrows@hotmail.com>
Subject: [EXTERNAL MAIL] Revised Study Plan

Greg,

Thanks and glad we (several FOCW) received the revised plan to review. It looks to be a much more complete all around evaluation and glad it is scheduled to be done by September 2024.

The Friends of Old Crow Wing anticipate the Archaeological Study in particular, does address a real concern for best protection measures for the Agency site and mounds acreage ("Chippewa Agency Historic District 73000967_R").

Is Situ Archaeological Consulting going to be the contractor doing this study? Or? In regards to this request:

The F0CW have several members quite familiar with the history and site property. As a Consulting Party resource, the FOCW are very willing to recommend or offer what expertise we possess in the process of acquiring the best information available to develop the evaluation. So please make the contractor aware of our contact information and desire to participate…**not hinder the evaluation.**

Thank you,

Ray Nelson

612-720-2644

Sent from Mail for Windows

From: Gregory Prom (MP)
Sent: Tuesday, January 23, 2024 10:23 AM
To: 'Ray Nelson' <rnnelson13@hotmail.com>
Cc: Don Wedll <dwedll@hotmail.com>; Kathy Bernier <mnarrows@hotmail.com>
Subject: RE: [EXTERNAL MAIL] Revised Study Plan

Ray,

Thanks for the response. The consulting party hasn't been determined yet and will go out to bid with qualified archaeologists. I will relay the information that you sent when a consultant is selected.

Have a great rest of the day,

Greg Prom

Senior Environmental Compliance Specialist
Minnesota Power/ALLETE
30 West Superior Street
Duluth, Minnesota 55802

Office: 218-355-3191
Cell: 218-461-6856
Email: gprom@allete.com



From: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>
Sent: Wednesday, January 31, 2024 7:04 AM
To: Beimers, Sarah (ADM) <sarah.beimers@state.mn.us>; Gregory Prom (MP) <gprom@mnpower.com>
Cc: Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>
Subject: Re: Revised Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Good morning Sarah,

The FERC comment period on the Revised Study plan ended January 24th. With the FERC Integrated Licensing Process schedule, the review period for the Revised Study Plan is much shorter than for the Proposed Study Plan.

Thank you,
Lesley

Get Outlook for iOS

From: Beimers, Sarah (ADM) <sarah.beimers@state.mn.us>
Sent: Tuesday, January 30, 2024 11:54 AM
To: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Gregory Prom (MP) <gprom@mnpower.com>
Cc: Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>
Subject: RE: Revised Study Plan for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Leslie and Greg,
Please clarify for our office whether there is currently an open comment period for SHPO review of the revised study plan. It wasn't clear in the cover letter to FERC or your email transmittal.
Thank you,
Sarah

Sarah Beimers (she/her) **| Environmental Review Program Manager**
State Historic Preservation Office
Minnesota Department of Administration

CITY OF Little Falls

February 5, 2024

Debbie-Anne Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

RE: City of Little Falls Comments on the Revised Study Plan for the Little Falls Hydroelectric Project, Morrison County, MN, P-2532

Dear Acting Secretary Reese,

The City of Little Falls has reviewed and provides the following recommendations on the Federal Energy Regulatory Commissions (FERC) Revised Study Plan (RSP) for the Little Falls Hydroelectric Project dated January 9, 2024, and owned and operated by Allete, Inc, doing business as Minnesota Power.

The City of Little Falls offers the following comments on the RSP.

The Mississippi River is a vital asset to the City of Little Falls and surrounding area. We believe a Recreation Use and Facility Inventory Study is warranted at this location. Numerous recreational opportunities for recreation at the project location include:

- Canoe
- Kayak
- Fishing
- Motor Boating
- Picnicking
- Hiking

Little Falls recognizes the importance of these recreational activities along the Mississippi River and have established numerous parks located on the shores of the Mississippi River to encourage these activities. The State of Minnesota and the City of Little Falls have established ten (10) parks along the shores of the Mississippi River consisting of almost 25% of the shoreline within City Limits.

The importance of recreation to the area is also highlighted in the 2020 Little Falls Comprehensive Plan. Following are two excepts from the Comprehensive Plan:

- The Mississippi River is the City's most important park and open space feature serving to define the City in physical and many of its economic qualities.
- Mississippi River – Preserve, protect and enhance the Mississippi River and adjacent lands for year-round recreational activities and for the scenic vistas it provides. (Uses could include picnicking, camping, fishing, boating/canoeing, landing facilities, jogging, biking, nature observation/interpreting and scenic viewing.)

The City of Little Falls established parkland, Mill Park, adjacent to the project location. The City is in the process of updating our Mill Park Master Plan. During the public input phase, we were amazed to receive 471 respondents, equal to 5% of the population of Little Falls participation rate, provided comments regarding Mill Park. Over 50% of those respondents want a fishing area adjacent to the Little Falls Hydroelectric dam. Just under 50% want a canoe/Kayak access adjacent to the Little Falls Hydroelectric dam.

In addition to the importance to the City of Little Falls, the Mississippi River is listed as a Minnesota State Water Trail that was established in 1967. The Mississippi River is the fourth longest river in the world and the largest on the continent, flowing 2,350 miles from Lake Itasca in Minnesota to the Gulf of Mexico. In Minnesota, the river flows through valleys, bluffs, prairies and woodlands in a variety of flow rates and widths. Portions of the river have been designated as a Wild and Scenic River. There are ten mapped segments of the Mississippi River in Minnesota, beginning at the source and ending on the Minnesota/Iowa border. Visitors from throughout the United States travel to Minnesota for the sole purpose of paddling the Mississippi River from the headwaters in Itasca State Park to the delta in the Gulf of Mexico.

Study Requests

Given the above information, the City of Little Falls believes a study should be completed on the recreational and inventory study. The Federal Power Act requires licensees to equally consider non-power resources including recreation. The Applicants are not currently planning recreation studies for the Little Falls Hydroelectric Project; the City of Little Falls recommends that the Applicants conduct such studies. A recreation study is needed to inform the license decision and for the development of a recreation resource management plan (RRMP) as required by FERC (18 CFR 4.51(f)(5)). The study is required because existing information about the current and projected recreation resources, use characteristics, and needs is insufficient. FERC requires studies relative to recreation resources including the development of an RRMP. The City requests to be consulted during the preparation of the plan. Existing information is not adequate to develop a comprehensive RRMP nor would it serve to inform FERC's equal consideration of the power and non-power values of the Mississippi River in its licensing decision or help identify measures needed to protect, mitigate and enhance recreational resources.

The FERC expects licensees "to develop suitable recreation facilities upon project lands and waters and make provisions for adequate public access. See 18 CFR 2.7"; the FERC also "expects licensees to consider the needs of persons with disabilities when designing and constructing project-related recreational facilities or public access routes. See 18 CFR 2.7(b)."[2] Evaluation of the accessibility of the recreational facilities and public access routes, level of difficulty of each route, and compliance with the Americans with Disabilities Act, should be considered and analyzed within the document.

Little Falls Hydroelectric Informal Access Site Recommendations

- Install and maintain a rock riffle channel through Mill Park.

Rationale: A rock riffle will allow kayak and canoe users, and fish passage, to bypass the dam without the need to portage.

Respectfully,

Greg Kimman, PE
City Engineer/Public Works Director
Ph 320-639-2555
Email: gkimman@cityoflittlefalls.com

Appendix A: Mill Park Master Plan Update-Public Survey
Appendix B: Mill Park Concept Plan

From: Lesley Brotkowski
Sent: Tuesday, April 9, 2024 4:45 PM
To: Goggleye Jr, George J (MIAC) <George.Goggleye@state.mn.us>; Tworzyanski, Jennifer (ADM) <Jennifer.Tworzyanski@state.mn.us>; gprom@allete.com
Cc: Cerda, Melissa (MIAC) <melissa.cerda@state.mn.us>; Reynolds, John (MIAC) <John.Reynolds@state.mn.us>
Subject: RE: Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663)

Thank you for your response, George. We've added you to the distribution list.

Lesley

From: Goggleye Jr, George J (MIAC) <George.Goggleye@state.mn.us>
Sent: Tuesday, April 9, 2024 2:12 PM
To: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Tworzyanski, Jennifer (ADM) <Jennifer.Tworzyanski@state.mn.us>; gprom@allete.com
Cc: Cerda, Melissa (MIAC) <melissa.cerda@state.mn.us>; Reynolds, John (MIAC) <John.Reynolds@state.mn.us>
Subject: RE: Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663)

You can me for distribution.
George

From: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>
Sent: Tuesday, April 2, 2024 12:28 PM
To: Tworzyanski, Jennifer (ADM) <Jennifer.Tworzyanski@state.mn.us>; gprom@allete.com
Cc: Cerda, Melissa (MIAC) <melissa.cerda@state.mn.us>; Reynolds, John (MIAC) <John.Reynolds@state.mn.us>; Goggleye Jr, George J (MIAC) <George.Goggleye@state.mn.us>
Subject: RE: Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663)

Jennifer, thank you for your review and comments on the revised study plan.

We'll be sure to include the MIAC in our consultation efforts. We currently have Shannon Geshick and Melissa Cerda on the distribution list for the projects. John and George, would you like to be added to the distribution list as well? Those on the list receive copies of documents generated during the FERC licensing effort.

Thank you,
Lesley

From: Tworzyanski, Jennifer (ADM) <Jennifer.Tworzyanski@state.mn.us>
Sent: Tuesday, April 2, 2024 9:53 AM
To: gprom@allete.com; Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>
Cc: Cerda, Melissa (MIAC) <melissa.cerda@state.mn.us>; Reynolds, John (MIAC) <John.Reynolds@state.mn.us>; Goggleye Jr, George J (MIAC) <George.Goggleye@state.mn.us>
Subject: Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663)

Greg and Lesley,

Apologies for the delay in reviewing the proposed revised study plan for the Little Falls (FERC P-2532), Sylvan (FERC P-2454), and Pillager (FERC P-2663)
Hydroelectric Projects Relicensings. The OSA agrees with the methods and scope of the proposed cultural resource surveys, with the additional recommendation that the Minnesota Indian Affairs Council (MIAC) (cc'd on this message for convenience) be included in any consultation efforts, particularly for any American Indian burials or cemeteries as MIAC has statutory authority per Minnesota Statute 307.08 (Private Cemeteries Act).

Thank you,
-Jennifer

Jennifer Tworzyanski *(she/her/hers)*
Assistant to the State Archaeologist
Office of the State Archaeologist
328 West Kellogg Blvd
St Paul, MN 55102
651.201.2265

DEPARTMENT OF ADMINISTRATION
STATE ARCHAEOLOGIST

From: Gregory Prom (MP) <gprom@mnpower.com>
Sent: Monday, June 17, 2024 1:00 PM
To: 'durellcooper05@gmail.com' <durellcooper05@gmail.com>; 'R.Blanchard@badriver-nsn.gov' <R.Blanchard@badriver-nsn.gov>; 'thpo@badriver-nsn.gov' <thpo@badriver-nsn.gov>; 'deputythpo@badriver-nsn.gov' <deputythpo@badriver-nsn.gov>; 'rwassana@cheyenneandarapaho-nsn.gov' <rwassana@cheyenneandarapaho-nsn.gov>; 'Anthony.Reider@fsst.org' <Anthony.Reider@fsst.org>; 'jeffery.stiffarm@ftbelknap.org' <jeffery.stiffarm@ftbelknap.org>; 'trhodd@iowas.org' <trhodd@iowas.org>; 'doreen@kbic-nsn.gov' <doreen@kbic-nsn.gov>; 'ldfthpo@ldftribe.com' <ldfthpo@ldftribe.com>; 'jim.williams@lvd-nsn.gov' <jim.williams@lvd-nsn.gov>; 'alina.shively@lvd-nsn.gov' <alina.shively@lvd-nsn.gov>; 'lisa.brunk@lvd-nsn.gov' <lisa.brunk@lvd-nsn.gov>; 'robert.larsen@lowersioux.com' <robert.larsen@lowersioux.com>; 'chairman@mitw.org' <chairman@mitw.org>; 'cchavers@boisforte-nsn.gov' <cchavers@boisforte-nsn.gov>; 'kevindupuis@fdlrez.com' <kevindupuis@fdlrez.com>; 'robertdeschampe@grandportage.com' <robertdeschampe@grandportage.com>; 'diane.thompson@llojibwe.net' <diane.thompson@llojibwe.net>; 'melanie.benjamin@millelacsband.com' <melanie.benjamin@millelacsband.com>; 'Susan.Klapel@millelacsband.com' <Susan.Klapel@millelacsband.com>; 'Michael.Fairbanks@whiteearth-nsn.gov' <Michael.Fairbanks@whiteearth-nsn.gov>; 'bdrost@mnchippewatribe.org' <bdrost@mnchippewatribe.org>; 'jbruce@mnchippewatribe.org' <jbruce@mnchippewatribe.org>; 'Sbartell@piic.org' <Sbartell@piic.org>; 'nicole.boyd@redcliff-nsn.gov' <nicole.boyd@redcliff-nsn.gov>; 'dseki@redlakenation.org' <dseki@redlakenation.org>; 'alonzo.denney@ssndakota.com' <alonzo.denney@ssndakota.com>; 'annette.krebsbach@shakopeedakota.org' <annette.krebsbach@shakopeedakota.org>; 'Chairman@swo-nsn.gov' <Chairman@swo-nsn.gov>; 'robert.vanzile@scc-nsn.gov' <robert.vanzile@scc-nsn.gov>; 'lonnas@spiritlakenation.com' <lonnas@spiritlakenation.com>; 'info@standingrock.org' <info@standingrock.org>; 'Scott.herman@rst-nsn.gov' <Scott.herman@rst-nsn.gov>; 'jamie.azure@tmbci.org' <jamie.azure@tmbci.org>; 'kevinj@uppersiouxcommunity-nsn.gov' <kevinj@uppersiouxcommunity-nsn.gov>; 'ENReviewSHPO@state.mn.us' <ENReviewSHPO@state.mn.us>; 'shannon.geshick@state.mn.us' <shannon.geshick@state.mn.us>; 'melissa.cerda@state.mn.us' <melissa.cerda@state.mn.us>; 'george.goggleye@state.mn.us' <george.goggleye@state.mn.us>; 'mn.osa@state.mn.us' <mn.osa@state.mn.us>; 'jennifer.tworzyanski@state.mn.us' <jennifer.tworzyanski@state.mn.us>
Cc: Gregory Prom (MP) <gprom@mnpower.com>; nrosemore@mnpower.com; David Moeller (ALLETE) <dmoeller@allete.com>; Matthew Radzak (MP) <mradzak@mnpower.com>; Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Josh Petersen <josh.petersen@merjent.com>; aaron.armstrong-duarte <aaron.armstrong-duarte@merjent.com>
Subject: RE: Area of Potential Effect Consultation for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Dear Sir or Madam,

ALLETE, Inc., doing business as Minnesota Power (MP or Licensee) is the Licensee of the Little Falls Hydroelectric Project (Little Falls Project) (FERC No. 2532), Sylvan Hydroelectric Project (Sylvan Project) (FERC No. 2454), and Pillager Hydroelectric Project (Pillager Project) (FERC No. 2663) (collectively

Commission) and the licenses expire on March 31, 2028. The Licensee is using FERC's Integrated Licensing Process (ILP) as established in FERC regulations, Title 18 of the US Code of Federal Regulations (CFR), Part 5. The Licensee filed a Pre-Application Document (PAD) and Notice of Intents (NOI) to seek new licenses for the Projects on March 30, 2023. On January 9, 2024, the Licensee filed the Revised Study Plan with the Commission for studies proposed to be conducted.[1] The Licensee

proposed to conduct a Cultural Resources Study that includes two parts: 1) Archaeological Resources Study, and 2) Historic Architectural Resources Study.

In this letter, the Licensee is requesting review and concurrence on the proposed Area of Potential Effects (APE) for the Little Falls Project, Sylvan Project, and Pillager Project from the Minnesota State Historic Preservation Office (SHPO) and participating tribes. The APEs will be the areas studied for the proposed Cultural Resources Study. The proposed APEs are shown in the attached Figures 1, 2, and 3.

Each of the Projects has a FERC-defined Project Boundary as approved in the Project licenses issued by the FERC. The FERC defines a Project Boundary as an administrative marker to clearly delineate those lands necessary for operation and maintenance of a project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources. The proposed APEs encompass the FERC approved Project Boundaries.

The proposed APE for the Little Falls Project encompasses the existing FERC approved Project Boundary as depicted in Figure 1. As defined in the 1996 Cultural Resources Management Plan (CRMP), this includes the Little Falls reservoir and its marginal fee or flowage lands above and below the Little Falls dam, including the hydroelectric facilities and Mill Island, a rocky escarpment that anchors the dam at mid-channel (Institute for Minnesota Archaeology [IMA] 1996a). The APE also includes the floor of the reservoir (including submerged tracts), the present shorelines of both the reservoir and discharge pools, and parcels adjoining the electrical generation facilities, including Mill Island (IMA 1996a).

The proposed APE for the Sylvan Project encompasses the existing FERC approved Project Boundary as depicted in Figure 2. As defined in the 1996 CRMP, this includes the Sylvan reservoir and its marginal fee and flowage lands, other areas subject to Sylvan Project flooding or erosion above and below the Sylvan dam, and the hydroelectric facilities (IMA 1996b). The APE also includes the floor of the reservoir (including submerged tracts), the present shorelines of both the reservoir and discharge pool, the various wetland, floodplain, and upland areas adjoining the reservoir to which MP has fee or flowage rights, and in some rare instances, areas extending beyond the limits of MP-associated lands to the Sylvan Project “flood line” (IMA 1996b).

The proposed APE for the Pillager Project encompasses the existing FERC approved Project Boundary as depicted in Figure 3. As defined in the 1999 CRMP, this includes the Pillager reservoir and its marginal fee and flowage lands and other areas subject to Pillager Project flooding or erosion above and below the Pillager dam, including the hydroelectric facilities (IMA 1999). The APE also includes the floor of the reservoir (including submerged or partly submerged tracts), the present shorelines of both the reservoir and discharge pool, and the various areas adjoining the reservoir to which MP has fee or flowage rights (IMA 1999).

MP is requesting concurrence on the proposed APEs for the Little Falls Project, Sylvan Project, and Pillager Project from Minnesota SHPO and participating tribes within 30 days, or by July 14, 2024. Please contact me by phone at (218) 355-3191 or e-mail at gprom@allete.com with any questions or comments. Thank you in advance for your review of the proposed APEs.

Sincerely,

Greg Prom

Senior Environmental Compliance Specialist
Minnesota Power/ALLETE
30 West Superior Street
Duluth, Minnesota 55802

Office: 218-355-3191
Cell: 218-461-6856
Email: gprom@allete.com



[1] FERC Accession Number: 20240109-5147

minnesota power

AN ALLETE COMPANY

June 18, 2024

VIA Email

Area of Potential Effects Distribution List

Subject: Little Falls Hydroelectric Project (FERC Project No. 2532)
Sylvan Hydroelectric Project (FERC Project No. 2454)
Pillager Hydroelectric Project (FERC Project No. 2663)
Area of Potential Effects Concurrence

Dear Sir or Madam,

ALLETE, Inc., doing business as Minnesota Power (MP or Licensee) is the Licensee of the Little Falls Hydroelectric Project (Little Falls Project) (FERC No. 2532), Sylvan Hydroelectric Project (Sylvan Project) (FERC No. 2454), and Pillager Hydroelectric Project (Pillager Project) (FERC No. 2663) (collectively referred to as Projects). The Projects are licensed by the Federal Energy Regulatory Commission (FERC or Commission) and the licenses expire on March 31, 2028. The Licensee is using FERC's Integrated Licensing Process (ILP) as established in FERC regulations, Title 18 of the US Code of Federal Regulations (CFR), Part 5. The Licensee filed a Pre-Application Document (PAD) and Notice of Intents (NOI) to seek new licenses for the Projects on March 30, 2023. On January 9, 2024, the Licensee filed the Revised Study Plan with the Commission for studies proposed to be conducted.[1] The Licensee proposed to conduct a Cultural Resources Study that includes two parts: 1) Archaeological Resources Study, and 2) Historic Architectural Resources Study.

In this letter, the Licensee is requesting review and concurrence on the proposed Area of Potential Effects (APE) for the Little Falls Project, Sylvan Project, and Pillager Project from the Minnesota State Historic Preservation Office (SHPO) and participating tribes. The APEs will be the areas studied for the proposed Cultural Resources Study. The proposed APEs are shown in Figures 1, 2, and 3.

Each of the Projects has a FERC-defined Project Boundary as approved in the Project licenses issued by the FERC. The FERC defines a Project Boundary as an administrative marker to clearly delineate those lands necessary for operation and maintenance of a project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources. The proposed APEs encompass the FERC approved Project Boundaries.

The proposed APE for the Little Falls Project encompasses the existing FERC approved Project Boundary as depicted in Figure 1. As defined in the 1996 Cultural Resources Management Plan (CRMP), this includes the Little Falls reservoir and its marginal fee or flowage lands above and below the Little Falls dam, including the hydroelectric facilities and Mill Island, a rocky escarpment that

[1] FERC Accession Number: 20240109-5147

anchors the dam at mid-channel (Institute for Minnesota Archaeology [IMA] 1996a). The APE also includes the floor of the reservoir (including submerged tracts), the present shorelines of both the reservoir and discharge pools, and parcels adjoining the electrical generation facilities, including Mill Island (IMA 1996a).

The proposed APE for the Sylvan Project encompasses the existing FERC approved Project Boundary as depicted in Figure 2. As defined in the 1996 CRMP, this includes the Sylvan reservoir and its marginal fee and flowage lands, other areas subject to Sylvan Project flooding or erosion above and below the Sylvan dam, and the hydroelectric facilities (IMA 1996b). The APE also includes the floor of the reservoir (including submerged tracts), the present shorelines of both the reservoir and discharge pool, the various wetland, floodplain, and upland areas adjoining the reservoir to which MP has fee or flowage rights, and in some rare instances, areas extending beyond the limits of MP-associated lands to the Sylvan Project "flood line" (IMA 1996b).

The proposed APE for the Pillager Project encompasses the existing FERC approved Project Boundary as depicted in Figure 3. As defined in the 1999 CRMP, this includes the Pillager reservoir and its marginal fee and flowage lands and other areas subject to Pillager Project flooding or erosion above and below the Pillager dam, including the hydroelectric facilities (IMA 1999). The APE also includes the floor of the reservoir (including submerged or partly submerged tracts), the present shorelines of both the reservoir and discharge pool, and the various areas adjoining the reservoir to which MP has fee or flowage rights (IMA 1999).

MP is requesting concurrence on the proposed APEs for the Little Falls Project, Sylvan Project, and Pillager Project from Minnesota SHPO and participating tribes within 30 days, or by July 14, 2024. Please contact me by phone at (218) 355-3191 or e-mail at gprom@allete.com with any questions or comments. Thank you in advance for your review of the proposed APEs.

Sincerely,

Greg Prom

Greg Prom
Senior Environmental Compliance Specialist
Minnesota Power/ALLETE
30 West Superior Street
Duluth, Minnesota 55802

cc: Area of Potential Effects Distribution List
Josh Petersen, Merjent

Attachments:

Figure 1 – Little Falls Project Proposed Area of Potential Effects
Figure 2 – Sylvan Project Proposed Area of Potential Effects
Figure 3 – Pillager Project Proposed Area of Potential Effects
Area of Potential Effects Distribution List

minnesota power
AN ALLETE COMPANY

Citations

Institute for Minnesota Archaeology (IMA) Consulting. 1996a. Cultural Resource Management Plan for the Little Falls Hydroelectric Project on the Mississippi River, Morrison County, Minnesota.

Institute for Minnesota Archaeology (IMA) Consulting. 1996b. Cultural Resource Management Plan for the Sylvan Hydroelectric Project on the Crow Wing River in Cass, Crow Wing, and Morrison County, Minnesota.

Institute for Minnesota Archaeology (IMA). 1999. Cultural Resources Management Plan for the Pillager Hydroelectric Project on the Crow Wing River in Cass and Morrison Counties, Minnesota.

Attachments

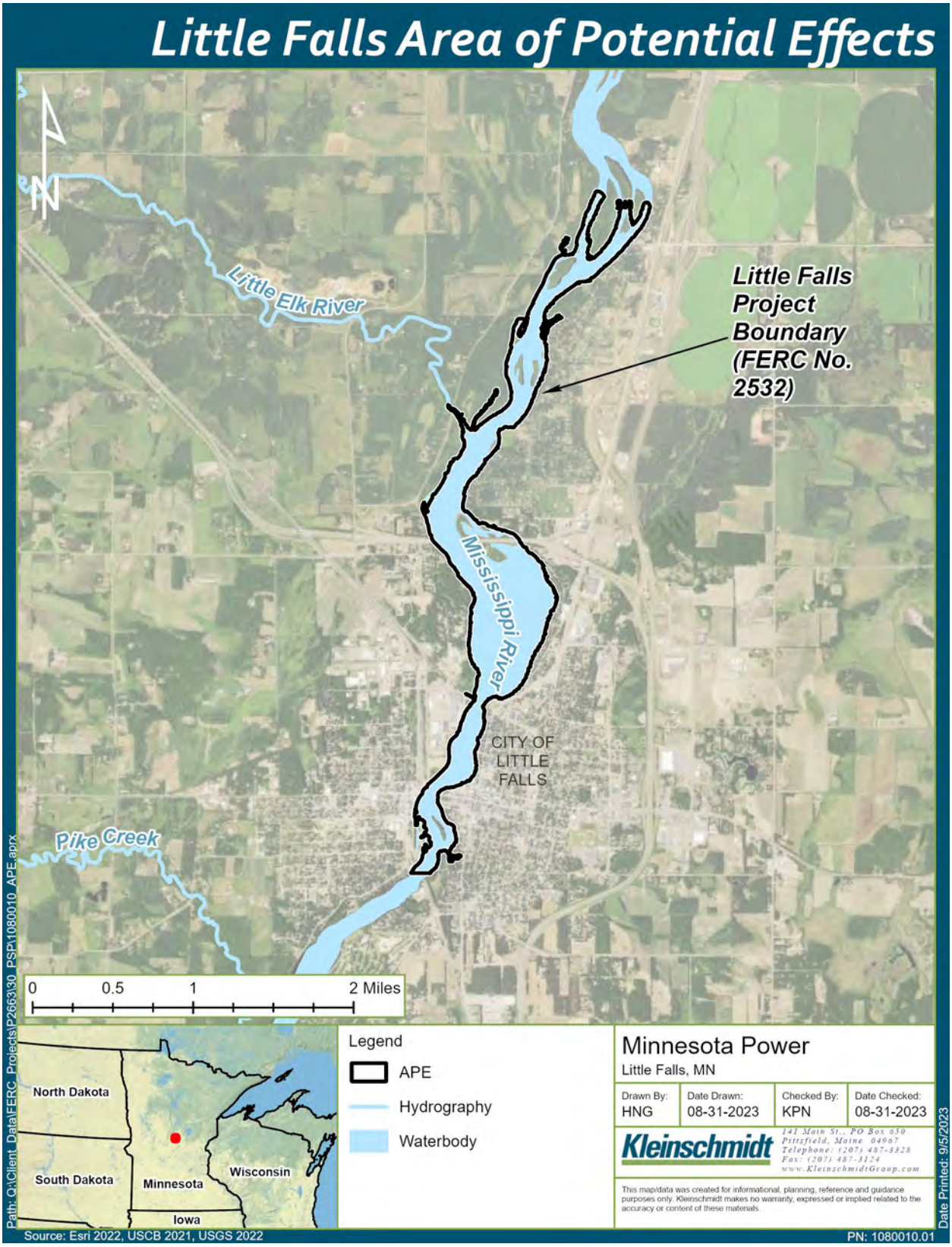


Figure 1: Little Falls Project Proposed Area of Potential Effects

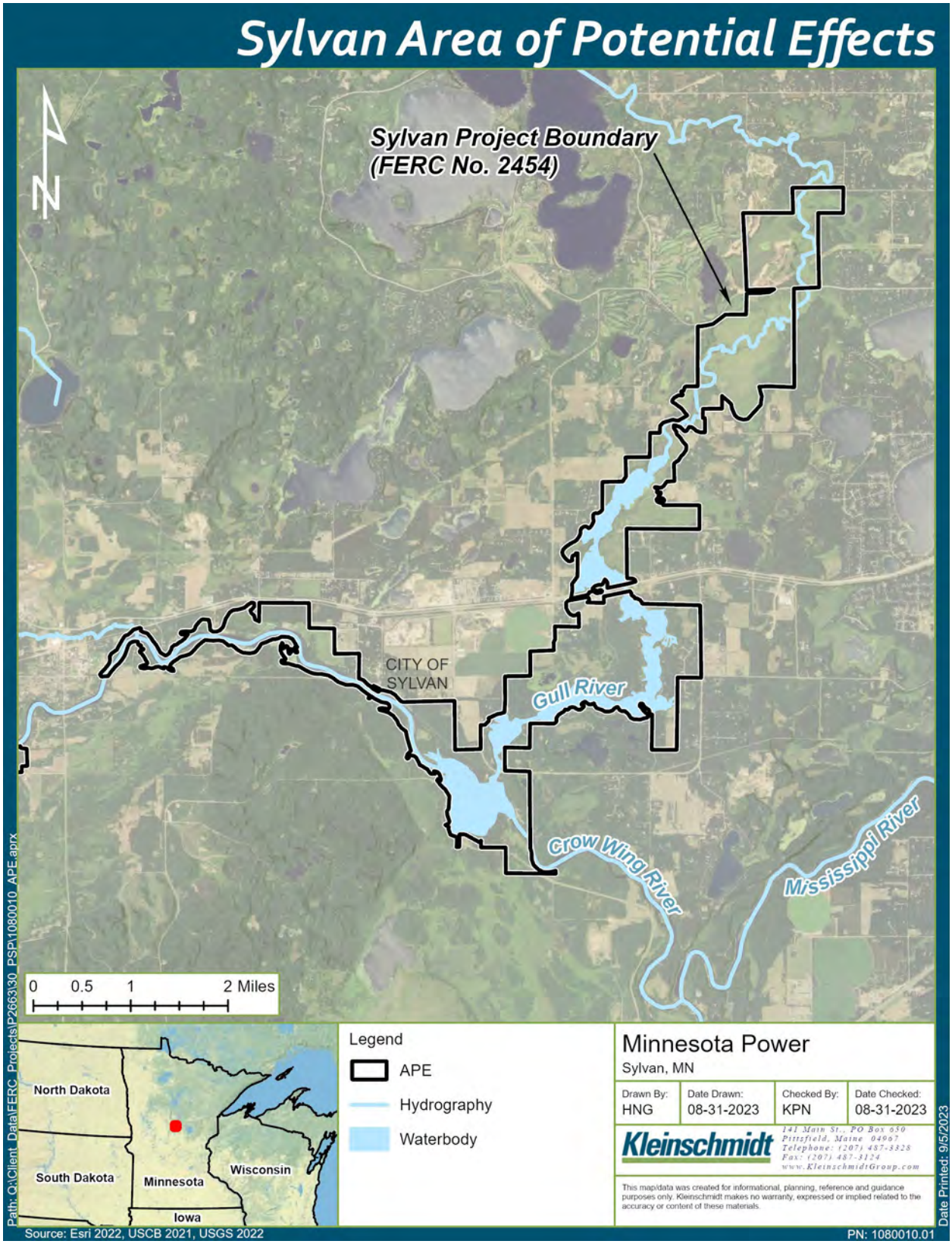


Figure 2: Sylvan Project Proposed Area of Potential Effects

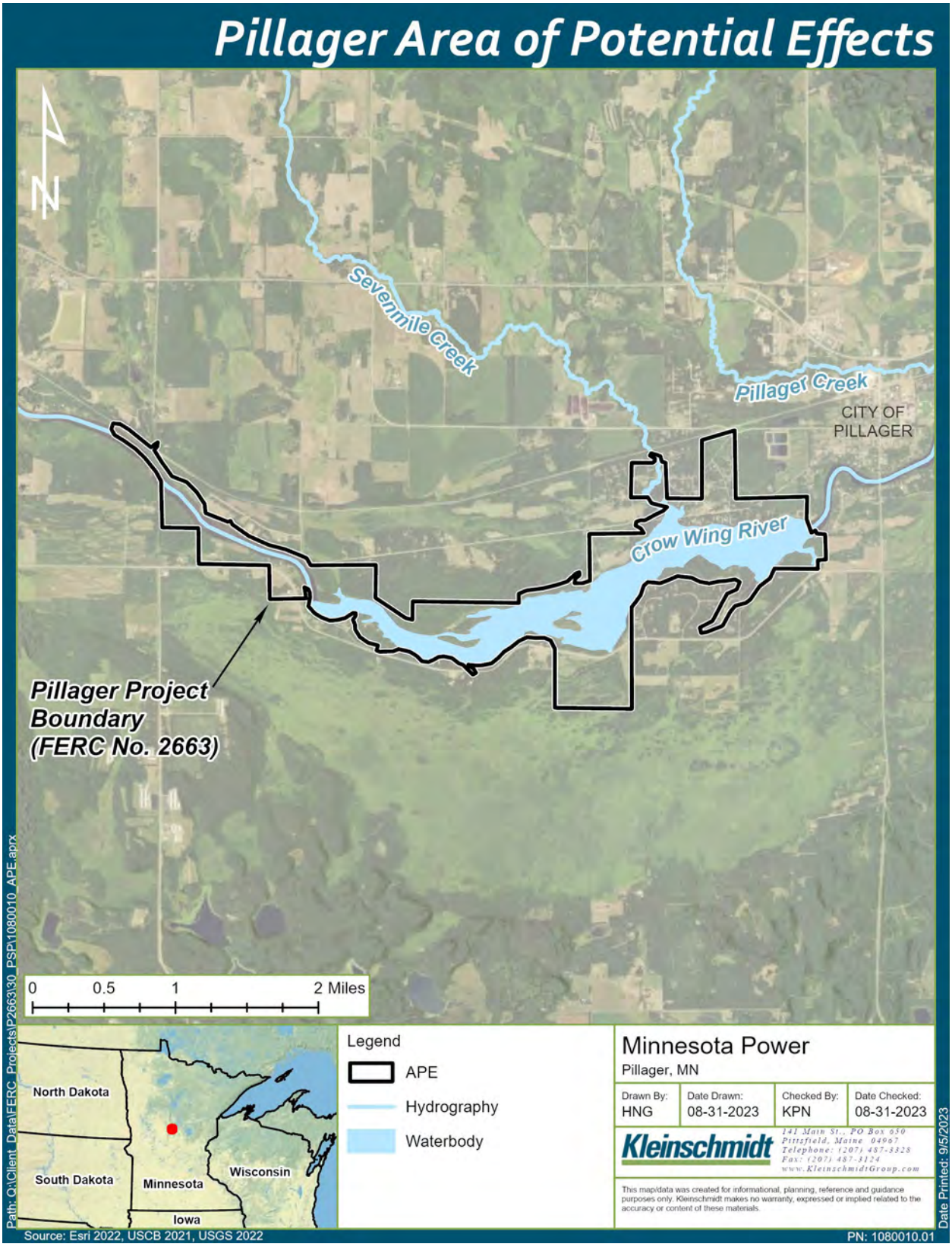


Figure 3: Pillager Project Proposed Area of Potential Effects

Little Falls (P-2532), Sylvan (P-2454), Pillager (P-2663) Hydroelectric Projects
Area of Potential Effects Distribution List

Tribes

Durell Cooper
Chairman
Apache Tribe of Oklahoma
P.O. Box 1330
Anadarko, Oklahoma 73005
durellcooper05@gmail.com

Robert Blanchard
Chairman
Bad River Band of Lake Superior Chippewa Indians of the Bad River Reservation, Wisconsin
P.O. Box 39
Odanah, Wisconsin 54861
R.Blanchard@badriver-nsn.gov

Larry "Moose" Plucinski
Tribal Historic Preservation Officer (THPO)
Bad River Band of Lake Superior Chippewa Indians of the Bad River Reservation, Wisconsin
P.O. Box 39
Odanah, Wisconsin 54861
thpo@badriver-nsn.gov

Gavin D'Acquisto
Deputy THPO
Bad River Band of Lake Superior Chippewa Indians of the Bad River Reservation, Wisconsin
P.O. Box 39
Odanah, Wisconsin 54861
deputythpo@badriver-nsn.gov

Reggie Wassana
Governor
Cheyenne and Arapaho Tribes of Oklahoma
P.O. Box 38
Concho, Oklahoma 73022
rwassana@cheyenneandarapaho-nsn.gov

Anthony Reider, President
Flandreau Santee Sioux Tribe of South Dakota
P.O. Box 283
Flandreau, South Dakota 57028
Anthony.Reider@fsst.org

Jeffery Stiffarm, President
Fort Belknap Indian Community of the Fort Belknap Reservation of Montana
RR 1, Box 66
Harlem, Montana 59526
jeffery.stiffarm@ftbelknap.org

Timothy Rhodd, Chairman
Iowa Tribe of Kansas and Nebraska
3345 Thrasher Road
White Cloud, Kansas 66439
trhodd@iowas.org

Doreen Blaker, President
Keweenaw Bay Indian Community, Michigan
16429 Beartown Road
Baraga, Michigan 49908
doreen@kbic-nsn.gov

Sarah Thompson
Tribal Historic Preservation Office
Lac du Flambeau Band of Lake Superior Chippewa Indians of the Lac du Flambeau Reservation of Wisconsin
P.O. Box 67
Lac du Flambeau, Wisconsin 54538
ldfthpo@ldftribe.com

James Williams, Chairman
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
P.O. Box 249
Watersmeet, Michigan 49969
jim.williams@lvd-nsn.gov

Alina Shively
THPO Director
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
P.O. Box 249
Watersmeet, Michigan 49969
alina.shively@lvd-nsn.gov

Lisa McGeshick
THPO Deputy
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
P.O. Box 249
Watersmeet, Michigan 49969
lisa.brunk@lvd-nsn.gov

Robert Larsen, President
Lower Sioux Indian Community in the State of Minnesota
P.O. Box 308
Morton, Minnesota 56270
robert.larsen@lowersioux.com

Ron Corn, Chairman
Menominee Indian Tribe of Wisconsin
P.O. Box 910
Keshena, Wisconsin 54135
chairman@mitw.org

Catherine Chavers, Chairman
Minnesota Chippewa Tribe - Bois Forte Band (Nett Lake)
5344 Lake Shore Drive
Nett Lake, Minnesota 55772
cchavers@boisforte-nsn.gov

Kevin DuPuis, Chairman
Minnesota Chippewa Tribe - Fond du Lac Band
1720 Big Lake Road
Cloquet, Minnesota 55720
kevindupuis@fdlrez.com

Robert Deschampe
Chairman
Minnesota Chippewa Tribe - Grand Portage Band
P.O. Box 428
Grand Portage, Minnesota 55605
robertdeschampe@grandportage.com

Diane Thompson
Minnesota Chippewa Tribe - Leech Lake Band
6530 U.S. Hwy 2 Northwest
Cass Lake, Minnesota 56633
diane.thompson@llojibwe.net

Melanie Benjamin
Chief Executive
Minnesota Chippewa Tribe - Mille Lacs Band
43408 Oodena Drive
Onamia, Minnesota 56359
melanie.benjamin@millelacsband.com

Susan Klapel
Executive Director of Natural Resources
Minnesota Chippewa Tribe - Mille Lacs Band
43408 Oodena Drive
Onamia, Minnesota 56359
Susan.Klapel@millelacsband.com

Michael Fairbanks
Chairman
Minnesota Chippewa Tribe - White Earth Band
P.O. Box 418 (Hwy 224)
White Earth, Minnesota 56591
Michael.Fairbanks@whiteearth-nsn.gov

Elizabeth K. Drost
Executive Director
The Minnesota Chippewa Tribe
P.O. Box 217
Cass Lake, Minnesota 56633
bdrost@mnchippewatribe.org

Jane Rea-Bruce
Executive Assistant
The Minnesota Chippewa Tribe
P.O. Box 217
Cass Lake, Minnesota 56633
jbruce@mnchippewatribe.org

Sarah Bartell
Office Manager
Prairie Island Indian Community in the State of Minnesota
5636 Sturgeon Lake Road
Welch, Minnesota, 55089
Sbartell@piic.org

Nicole Boyd
Chairman
Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin
88385 Pike Road Highway 13
Bayfield, Wisconsin 54814
nicole.boyd@redcliff-nsn.gov

Darrell Seki
Chairman
Red Lake Band of Chippewa Indians
P.O. Box 550
Red Lake, Minnesota 56671
dseki@redlakenation.org

Alonzo Denney
Chairman
Santee Sioux Nation, Nebraska
108 Spirit Lake Avenue West
Niobrara, Nebraska 68760-7219
alonzo.denney@ssndakota.com

Keith Anderson
Chairman
Shakopee Mdewakanton Sioux Community of Minnesota
2330 Sioux Trail, NW
Prior Lake, Minnesota 55372-9077
annette.krebsbach@shakopeedakota.org

J. Garret Renville
Tribal Chairman
Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota
P.O. Box 509
Agency Village, South Dakota 57262
Chairman@swo-nsn.gov

Robert VanZile
Chairman
Sokaogon Chippewa Community, Wisconsin
3051 Sand Lake Road
Crandon, Wisconsin 54520
robert.vanzile@scc-nsn.gov

Lonna Street
Chairperson
Spirit Lake Tribe, North Dakota
P.O. Box 359
Fort Totten, North Dakota 58335
lonnas@spiritlakenation.com

Janet Alkire
Chairperson
Standing Rock Sioux Tribe of North & South Dakota
P.O. Box D
Fort Yates, North Dakota 58538
info@standingrock.org

Scott O. Herman
President
Rosebud Sioux Tribe of the Rosebud Indian Reservation, South Dakota
P.O. Box 430
Rosebud, South Dakota 57570
Scott.herman@rst-nsn.gov

Jamie Azure, Chairman
Turtle Mountain Band of Chippewa Indians of North Dakota
P.O. Box 900
Belcourt, North Dakota 58316
jamie.azure@tmbci.org

Kevin Jensvold, Chairman
Upper Sioux Community, Minnesota
P.O. Box 147
Granite Falls, Minnesota 56241
kevinj@uppersiouxcommunity-nsn.gov

State Agencies

Lucy Harrington
State Historic Preservation Office
Minnesota Department of Administration
203 Administration Building
50 Sherburne Avenue
Saint Paul, Minnesota 55155
lucy.harrington@state.mn.us
ENReviewSHPO@state.mn.us

Shannon Geshick
Executive Director
Minnesota Indian Affairs Council
161 Saint Anthony Avenue, Suite 919
Saint Paul, Minnesota 55103
shannon.geshick@state.mn.us

Melissa Cerda
Senior Cultural Resources Specialist
Minnesota Indian Affairs Council
161 Saint Anthony Avenue, Suite 919
Saint Paul, Minnesota 55103
melissa.cerda@state.mn.us

George Googleye, Jr.
Cultural Resource Manager
Minnesota Indian Affairs Council
161 Saint Anthony Avenue, Suite 919
Saint Paul, Minnesota 55103
george.goggleye@state.mn.us

Jennifer Tworzyanski
Minnesota Office of the State Archaeologist
328 West Kellogg Boulevard
Saint Paul, Minnesota 55102
mn.osa@state.mn.us
jennifer.tworzyanski@state.mn.us

Licensee

Greg Prom
Senior Environmental Compliance Specialist
ALLETE, Inc.
30 West Superior Street
Duluth, Minnesota 55802
gprom@allete.com

Nora Rosemore
Manager – Renewable Business Operations
Hydro Operations
ALLETE, Inc.
30 West Superior Street
Duluth, Minnesota 55802
nrosemore@mnpower.com

David Moeller
Senior Regulatory Counsel
Minnesota Power/ALLETE, Inc.
30 West Superior Street
Duluth, Minnesota 55802
dmoeller@allete.com

Matthew Radzak
ALLETE, Inc.
30 West Superior Street
Duluth, Minnesota 55802
mradzak@mnpower.com

Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt Associates
233403 Stettin Ridge Court
Wausau, Wisconsin 54401
Lesley.Brotkowski@kleinschmidtgroup.com

From: MN_ADM_ENV Review SHPO <ENReviewSHPO@state.mn.us>
Sent: Monday, June 17, 2024 12:01 PM
To: Gregory Prom (MP) <gprom@mnpower.com>
Subject: [EXTERNAL MAIL] Automatic reply: Area of Potential Effect Consultation for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Thank you contacting the Minnesota State Historic Preservation Office via the Environmental Review Program mailbox.

If you've submitted a project review request, this message serves as **confirmation** that we have received your email.

Please Note: The Environmental Review Team continues to experience a high volume of project submissions, and most review times can take between 45-60 days to complete. Currently, the Team has vacant positions with staff taking on additional responsibilities, and as a result, some reviews may take longer, including our response time to questions and inquiries. As agencies submit projects for review, we ask you please plan for a longer response times from SHPO.

- Please continue to send projects for review to ENReviewSHPO@state.mn.us.
- General environmental review inquiries should be directed to MNSHPO@state.mn.us where your request will be redirected to the appropriate SHPO team member.

We value and appreciate your partnership and understand the impacts when there is uncertainty around project timelines. We have made strides recently with the launch of Minnesota's Statewide Historic Inventory Portal (MnSHIP) allowing greater online access to historic inventories, and we continue to accept electronic project submissions, a change made in 2020 due to the pandemic.

Sincerely,

Environmental Review Program Team
State Historic Preservation Office
Minnesota Department of Administration

For information on submitting projects for review, please visit the Environmental Review Program Website.

From: Altena, Eric (DNR) <eric.altena@state.mn.us>
Sent: Tuesday, June 18, 2024 8:39 AM
To: Jared Porter <Jared.Porter@KleinschmidtGroup.com>
Cc: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Gregory Prom (MP) <gprom@mnpower.com>
Subject: RE: Crow Wing and Mississippi River Fisheries Data

Jared,
Thanks for the reminder bump! Attached are the preliminary reports for your use. Not likely to change a lot, however, there will be additional texts added this winter for the final reports next March.
Please let me know if you need anything else.
Eric

Eric Altena
Area Fisheries Manager | Fish and Wildlife

Minnesota Department of Natural Resources
16543 Haven Road
Little Falls, MN 56345
Office-320-232-1069
Cell -320-293-2439
Email: eric.altena@state.mn.us
mndnr.gov





Life is truly short! Love as if it is
your last day, sleep to be ready for
the challenges of tomorrow and eat for the
energy to do so. Heck, spend the rest
of your time FISHING, BOWHUNTING
and playing HOCKEY.... For the love of the game!!

From: Jared Porter <Jared.Porter@KleinschmidtGroup.com>
Sent: Monday, June 17, 2024 4:06 PM
To: Altena, Eric (DNR) <eric.altena@state.mn.us>
Cc: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Gregory Prom (MP) <gprom@mnpower.com>
Subject: RE: Crow Wing and Mississippi River Fisheries Data

You don't often get email from jared.porter@kleinschmidtgroup.com. Learn why this is important

Hi Eric,

I hope trapnetting has gone well for you these past few weeks! I'm just checking back in on the status of any preliminary data that can be shared as surveys get completed.

Thank you,
-Jared

From: Altena, Eric (DNR) <eric.altena@state.mn.us>
Sent: Tuesday, May 21, 2024 2:06 PM
To: Jared Porter <Jared.Porter@KleinschmidtGroup.com>
Cc: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Gregory Prom (MP) <gprom@mnpower.com>
Subject: RE: Crow Wing and Mississippi River Fisheries Data

Hello Jared,
We have done a couple of early season trap net surveys and electrofishing so far. We will be doing some additional panfish surveys with trapnets within the next week or so. I can send the preliminary data as soon as we are done with that if that works for you? That should be within a couple of weeks.
We have done work on both Sylvan and Placid reservoirs this spring.

Eric
Eric Altena
Area Fisheries Manager | Fish and Wildlife

Minnesota Department of Natural Resources
16543 Haven Road
Little Falls, MN 56345
Office-320-232-1069
Cell -320-293-2439
Email: eric.altena@state.mn.us
mndnr.gov





Life is truly short! Love as if it is
your last day, sleep to be ready for
the challenges of tomorrow and eat for the
energy to do so. Heck, spend the rest
of your time FISHING, BOWHUNTING
and playing HOCKEY.... For the love of the game!!

From: Jared Porter <Jared.Porter@KleinschmidtGroup.com>
Sent: Tuesday, May 21, 2024 1:31 PM
To: Altena, Eric (DNR) <eric.altena@state.mn.us>
Cc: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Gregory Prom (MP) <gprom@mnpower.com>
Subject: Crow Wing and Mississippi River Fisheries Data

You don't often get email from jared.porter@kleinschmidtgroup.com. Learn why this is important

This message may be from an external email source.
Do not select links or open attachments unless verified. Report all suspicious emails to Minnesota IT Services Security Operations Center.

Hi Eric,

We're working on impingement/entrainment studies in support of the FERC relicensing process for the Little Falls, Sylvan, and Pillager Projects. I'm reaching out regarding existing fisheries data that would be relevant for the studies. For Sylvan Reservoir, we have the 2014 Lake Survey Report that includes abundance and length distribution data from trap netting and electrofishing efforts. The 2021 Sylvan Lake Management Plan references ice-out and panfish trap net assessments scheduled for 2024. I was wondering if any 2024 surveys have occurred, or are planned. Have any fish assemblage surveys been conducted in the Sylvan Reservoir during 2024, or during recent years? If so, would we be able to obtain any reporting or data?

We also have fish population assessment reporting (lake survey report) for Placid Lake/Pillager Reservoir from 2014, and reporting for the Mississippi River (stream survey reports) from 2021. Is there any additional fish assemblage reporting or data from the Mississippi and Crow Wing watersheds that we could include in our analyses? Species abundance and size distribution reporting from the past few years, or raw data, would be helpful in conducting the impingement/entrainment studies if available. Any additional information from 2024 or recent years would be much appreciated.

Thank you,
-Jared

Jared Porter
Project Scientist
Kleinschmidt
O: 608.455.6410 C: 864.421.3163

DEPARTMENT OF NATURAL RESOURCES

Fisheries Management

LAKE SURVEY REPORT

DRAFT VERSION

PRELIMINARY DATA (AS OF 06/18/2024)

Lake Name: Sylvan
DOW Number: 49-0036-00

Survey Type: Targeted Survey
Survey ID Date: 04/08/2024

TARGETED SURVEY
Electrofishing
Trap Netting targeting Black Crappie All Ages
Trap Netting targeting Bluegill All Ages
Trap Netting

Lake Identification

Alternate Lake Name:	N/A	DNR Sounding Map Number:	N/A
Primary Lake Class ID:	35	Alternate Lake Class ID:	N/A

Lake Location

Primary County:	Morrison	Nearest Town:	Sylvan
All Counties:	Cass, Morrison.		

Legal Descriptions

Lake Center: Township - 133N Range - 29W Section - 30
PLS Section Lake Center: 13302930

All Legal Descriptions:

Cass County:	Township - 133N	Range - 29W	Section - 19
Morrison County:	Township - 133N	Range - 29W	Section - 30
	Township - 133N	Range - 30W	Sections - 24, 25

Area Office

Area Name:	Little Falls	ORG Code:	F312
Region Name:	Central	Region Number:	3

Lake Access

(Information based on Re-Survey dated 06/09/2008)

Station ID	Ownership	Public Use	Type	Location / Comments
AC - 1	DNR	Open to Public use	Concrete	STATE OWNED ACCESS ON THE NORTH SIDE OF THE LAKE CTY ROAD 36.

Lake Characteristics

Lake Area (planimetered acres):	655.00	GIS Shoreline Length (miles):	5.55
GIS Lake Area (acres):	321.49	Maximum Fetch (miles):	1.23
DOW Lake Area (acres):	260.00	Fetch Orientation (degrees):	22
Littoral Area (acres):	190.97	USGS Quad Map Number:	M12c
Area in MN (acres):	321.49	USGS Quad 24K GIS Index:	2523
Maximum Depth (feet):	31.0		
Mean Depth (feet):	N/A		

Watershed Characteristics

Major Watershed

Name: Crow Wing River
Watershed Number: 12
Watershed size (acres): 1,268,954

Minor Watershed

Name: unknown DNR Minor Wshd
Watershed Number: 39
Watershed size (acres): 7,006

Surveys and Investigations

Initial Survey: 06/23/1958.
Re-Survey: 06/09/2008, 06/10/1996, 06/10/1985.
Population Assessment: 06/12/2014, 06/10/2002, 06/11/1990.
Special Assessment: 09/05/2000.
Targeted Survey: 04/08/2024, 06/09/2020, 06/11/1985.

Water Level History - Readings

Station ID	Date	Level	Reading (feet)	Reading Type
BM - 1	06/12/2008	Normal	6.65	Above or below Benchmark

Water Level History - Station Summary

Station ID	Minimum Level Feet	Minimum Level Date	Maximum Level Feet	Maximum Level Date	Range (feet)	Average Level (feet)	Reading Type (and number of readings)
BM - 1	6.65	06/12/2008	6.65	06/12/2008	0.00	6.65	Above or below Benchmark (1)

DRAFT

Net Catch Summary by Numbers for STN

Special sampling with trap nets

Number of Sets: 28
First Set Date: 04/08/2024
Last Lift Date: 06/07/2024
Target Species: All ages black crappie, All ages bluegill

Abbr	Species	Total Fish	Number Per Set	Quartiles for Lake Class 35[1] 25%	50%	75%
BLC	Black Crappie	90	3.21	N/A	N/A	N/A
BLG	Bluegill	454	16.21	N/A	N/A	N/A
BOF	Bowfin (Dogfish)	21	0.75	N/A	N/A	N/A
BRB	Brown Bullhead	4	0.14	N/A	N/A	N/A
CAP	Common Carp	15	0.54	N/A	N/A	N/A
GOS	Golden Shiner	1	0.04	N/A	N/A	N/A
GRR	Greater Redhorse	5	0.18	N/A	N/A	N/A
HSF	Hybrid Sunfish	8	0.29	N/A	N/A	N/A
LMB	Largemouth Bass	23	0.82	N/A	N/A	N/A
NOP	Northern Pike	50	1.79	N/A	N/A	N/A
PMK	Pumpkinseed	55	1.96	N/A	N/A	N/A
RKB	Rock Bass	56	2.00	N/A	N/A	N/A
SHR	Shorthead Redhorse	2	0.07	N/A	N/A	N/A
SLR	Silver Redhorse	2	0.07	N/A	N/A	N/A
WAE	Walleye	1	0.04	N/A	N/A	N/A
WTS	White Sucker	3	0.11	N/A	N/A	N/A
YEB	Yellow Bullhead	14	0.50	N/A	N/A	N/A
YEP	Yellow Perch	15	0.54	N/A	N/A	N/A
		Total Fish/Set:	29.25	[1] Quartiles for Number Per Set		

Net Catch Summary by Weight for STN

Special sampling with trap nets

Abbr	Species	Total Weight (Pounds)	Pounds Per Set	Mean Weight[2]	Quartiles for Lake Class 35[1] 25%	50%	75%
BLC	Black Crappie	36.37	1.30	0.40	N/A	N/A	N/A
BLG	Bluegill	109.09	3.90	0.24	N/A	N/A	N/A
BOF	Bowfin (Dogfish)	0.00	0.00	N/A	N/A	N/A	N/A
BRB	Brown Bullhead	0.00	0.00	N/A	N/A	N/A	N/A
CAP	Common Carp	133.98	4.78	8.93	N/A	N/A	N/A
GOS	Golden Shiner	0.07	0.00	0.07	N/A	N/A	N/A
GRR	Greater Redhorse	22.50	0.80	4.50	N/A	N/A	N/A
HSF	Hybrid Sunfish	2.71	0.10	0.34	N/A	N/A	N/A
LMB	Largemouth Bass	56.15	2.01	2.44	N/A	N/A	N/A
NOP	Northern Pike	89.82	3.21	1.80	N/A	N/A	N/A
PMK	Pumpkinseed	9.84	0.35	0.18	N/A	N/A	N/A
RKB	Rock Bass	17.38	0.62	0.31	N/A	N/A	N/A
SHR	Shorthead Redhorse	0.00	0.00	N/A	N/A	N/A	N/A
SLR	Silver Redhorse	0.00	0.00	N/A	N/A	N/A	N/A
WAE	Walleye	1.89	0.07	1.89	N/A	N/A	N/A
WTS	White Sucker	8.87	0.32	2.96	N/A	N/A	N/A
YEB	Yellow Bullhead	0.00	0.00	N/A	N/A	N/A	N/A
YEP	Yellow Perch	2.93	0.10	0.20	N/A	N/A	N/A
	Total Pounds Fish/Set:		17.56				

[1] Quartiles for Mean Weight

[2] Mean Weights are based on measured fish counts only.

DRAFT

Electrofishing Catch Summary for EF

Standard electrofishing

Number of Stations: 1
Total run-time for all stations: 00:55:00
Total on-time for all stations: 00:55:44
First Sampling Date: 04/19/2024
Last Sampling Date: 04/19/2024
Daylight Sampling: Yes
Target Species: N/A

		Summary By Numbers			Summary By Weight (pounds)			
		Total	Number per Hour		Total	Lbs per Hour		Mean
Abbr	Species	Number	Run-Time	On-Time	Weight	Run-Time	On-Time	Weight
NOP	Northern Pike	8	8.73	8.61	15.66	17.08	16.86	1.96
SMB	Smallmouth Bass	18	19.64	19.38	44.43	48.47	47.83	2.47
WAE	Walleye	16	17.45	17.22	38.41	41.90	41.35	2.40
YEP	Yellow Perch	3	3.27	3.23	0.75	0.82	0.80	0.25

Length Frequency Distribution for STN

Special sampling with trap nets

(Field work conducted between 04/08/2024 and 06/07/2024)

	BLC	BLG	CAP	GOS	GRR	HSF	LMB	NOP	PMK	RKB	WAE	WTS	YEP
< 3.00	-	-	-	-	-	-	-	-	-	-	-	-	-
3.00 - 3.49	-	4	-	-	-	-	-	-	-	-	-	-	-
3.50 - 3.99	1	16	-	-	-	-	-	-	1	1	-	-	-
4.00 - 4.49	1	2	-	-	-	-	-	-	4	-	-	-	-
4.50 - 4.99	-	19	-	-	-	-	-	-	8	4	-	-	1
5.00 - 5.49	3	34	-	-	-	-	-	-	10	3	-	-	2
5.50 - 5.99	-	48	-	1	-	-	-	-	12	3	-	-	1
6.00 - 6.49	2	57	-	-	-	1	-	-	5	3	-	-	1
6.50 - 6.99	5	84	-	-	-	1	-	-	7	-	-	-	3
7.00 - 7.49	8	91	-	-	-	2	1	-	6	5	-	-	2
7.50 - 7.99	4	62	-	-	-	2	-	-	1	3	-	-	1
8.00 - 8.49	9	29	-	-	-	-	-	-	1	2	-	-	-
8.50 - 8.99	13	6	-	-	-	-	-	3	-	2	-	-	2
9.00 - 9.49	9	2	-	-	-	-	-	4	-	-	-	-	-
9.50 - 9.99	15	-	-	-	-	-	-	1	-	2	-	-	-
10.00 - 10.49	10	-	-	-	-	-	-	2	-	2	-	-	2
10.50 - 10.99	4	-	-	-	-	-	-	2	-	-	-	-	-
11.00 - 11.49	6	-	-	-	-	-	-	2	-	-	-	-	-
11.50 - 11.99	-	-	-	-	-	-	1	2	-	-	-	-	-
12.00 - 12.99	-	-	-	-	-	-	-	-	-	-	-	-	-
13.00 - 13.99	-	-	-	-	-	-	1	-	-	-	-	-	-
14.00 - 14.99	-	-	-	-	-	-	2	2	-	-	-	-	-
15.00 - 15.99	-	-	-	-	-	-	4	1	-	-	-	-	-
16.00 - 16.99	-	-	-	-	-	-	6	2	-	-	-	-	-
17.00 - 17.99	-	-	-	-	-	-	4	2	-	-	1	-	-
18.00 - 18.99	-	-	-	-	-	-	1	4	-	-	-	-	-
19.00 - 19.99	-	-	-	-	-	-	3	3	-	-	-	2	-
20.00 - 20.99	-	-	-	-	3	-	-	3	-	-	-	-	-
21.00 - 21.99	-	-	-	-	1	-	-	1	-	-	-	-	-
22.00 - 22.99	-	-	-	-	-	-	-	3	-	-	-	-	-
23.00 - 23.99	-	-	1	-	1	-	-	3	-	-	-	-	-
24.00 - 24.99	-	-	2	-	-	-	-	-	-	-	-	-	-
25.00 - 25.99	-	-	3	-	-	-	-	3	-	-	-	-	-
26.00 - 26.99	-	-	4	-	-	-	-	1	-	-	-	-	-
27.00 - 27.99	-	-	3	-	-	-	-	2	-	-	-	-	-
28.00 - 28.99	-	-	-	-	-	-	-	1	-	-	-	-	-
29.00 - 29.99	-	-	1	-	-	-	-	1	-	-	-	-	-
30.00 - 30.99	-	-	-	-	-	-	-	-	-	-	-	-	-
31.00 - 31.99	-	-	-	-	-	-	-	1	-	-	-	-	-
32.00 - 32.99	-	-	-	-	-	-	-	1	-	-	-	-	-
33.00 - 33.99	-	-	1	-	-	-	-	-	-	-	-	-	-
34.00 - 34.99	-	-	-	-	-	-	-	-	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	-	-	-	-	-	-	-	-

	BLC	BLG	CAP	GOS	GRR	HSF	LMB	NOP	PMK	RKB	WAE	WTS	YEP
Total	90	454	15	1	5	6	23	50	55	30	1	2	15
Min. Length	3.82	3.27	23.86	5.67	20.79	6.30	7.17	8.58	3.54	3.82	17.80	19.09	4.88
Max. Length	11.26	9.02	33.86	5.67	23.94	7.91	19.88	32.56	8.35	10.47	17.80	19.17	10.16
Mean Length	8.77	6.59	26.76	5.67	21.50	7.22	16.05	18.14	5.75	6.79	17.80	19.13	7.18
# Measured	90	454	15	1	5	6	23	50	54	14	1	2	15
No Lengths for	0	0	0	0	0	2	0	0	1	42	0	1	0

Note: Unless all fish were measured in the catch, totals shown for some length-frequency distributions may differ from the total number of fish in the catch, due to rounding of fractions used in the estimation of length frequency from a subsample of measured fish.

DRAFT

Length Frequency Distribution for EF

Standard electrofishing

(Field work conducted on 04/19/2024)

	NOP	SMB	WAE	YEP
< 3.00	-	-	-	-
3.00 - 3.49	-	-	-	-
3.50 - 3.99	-	-	-	-
4.00 - 4.49	-	-	-	-
4.50 - 4.99	-	-	-	-
5.00 - 5.49	-	-	-	-
5.50 - 5.99	-	-	-	-
6.00 - 6.49	-	-	-	-
6.50 - 6.99	-	-	-	-
7.00 - 7.49	-	-	-	1
7.50 - 7.99	-	-	-	-
8.00 - 8.49	-	-	-	1
8.50 - 8.99	-	-	-	1
9.00 - 9.49	-	-	-	-
9.50 - 9.99	-	-	-	-
10.00 - 10.49	-	-	-	-
10.50 - 10.99	-	-	-	-
11.00 - 11.49	-	-	-	-
11.50 - 11.99	-	1	-	-
12.00 - 12.99	-	1	-	-
13.00 - 13.99	-	-	-	-
14.00 - 14.99	1	3	2	-
15.00 - 15.99	1	5	2	-
16.00 - 16.99	-	2	1	-
17.00 - 17.99	1	3	2	-
18.00 - 18.99	2	-	1	-
19.00 - 19.99	-	1	2	-
20.00 - 20.99	-	2	3	-
21.00 - 21.99	1	-	1	-
22.00 - 22.99	-	-	-	-
23.00 - 23.99	-	-	2	-
24.00 - 24.99	-	-	-	-
25.00 - 25.99	-	-	-	-
26.00 - 26.99	1	-	-	-
27.00 - 27.99	1	-	-	-
28.00 - 28.99	-	-	-	-
29.00 - 29.99	-	-	-	-
30.00 - 30.99	-	-	-	-
31.00 - 31.99	-	-	-	-
32.00 - 32.99	-	-	-	-
33.00 - 33.99	-	-	-	-
34.00 - 34.99	-	-	-	-
35.00 - 35.99	-	-	-	-
= > 36.00	-	-	-	-

	NOP	SMB	WAE	YEP
Total	8	18	16	3
Min. Length	14.29	11.93	14.17	7.24
Max. Length	27.44	20.24	23.62	8.74
Mean Length	20.09	16.15	18.75	8.10
# Measured	8	18	16	3
No Lengths for	0	0	0	0

Note: Unless all fish were measured in the catch, totals shown for some length-frequency distributions may differ from the total number of fish in the catch, due to rounding of fractions used in the estimation of length frequency from a subsample of measured fish.

Age Class Frequency Distribution

Species & SS Type (1)	Number of Fish (2)			Number of Fish in Year Class ('yy) and Age Class														
				'24	'23	'22	'21	'20	'19	'18	'17	'16	'15	'14	'13	'12	'11	'10	<'10
	Aged	Keyed	Unaged	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+
Black Crappie																			
STN	51	34	5	0	1	4	13	21	18	23	0	0	5	0	0	0	0	0	0

(1) Key to Sampling Station (SS) Type abbreviations:
STN = Special sampling with trap nets

(2) Notes:
Number of Fish Aged: Fish that were aged from bony parts.
Number of Fish Keyed: Fish assigned an age with an age-length key or by expansion of mesh or station age distributions.
Number of Fish Unaged: Fish that were not aged and were not assigned an age.

Field Notes - General Field

LC.BIce-out trap netting and early spring electrofishing were performed to provide fish population data which has been difficult to attain during routine summer gill net and trap net efforts. Eight (8) trap nets were set and lifted on two consecutive days - April 9 and 10. Water temps ranged from 46.5 to 49F.
Electrofishing was conducted April 19 upstream of the reservoir from below the Placid Dam down to the 1st bridge. Water temps were around 45F, very cold day with snow. Otoliths were collected from a subsample of Black Crappie captured in Ice-out trap nets.
Trap nets targeting BLG and BLC were set on June 5, six nets were used. New waypoints were taken as PFTNs on Lowrance. Water temp 70-71F. Air temps rising into low 70s. June 6 water temp dropped to 69-70F, moved one net (STN11). June 7 water temp 67-68F after cool nights. A few otoliths taken from BLC. Snapping turtles in many nets during the survey.

Approval Dates And Notices

Date Approved By Little Falls Area Fisheries Supervisor: _____

Date Approved By Central Region Fisheries Manager: _____

This DRAFT VERSION of the Lake Survey Report contains preliminary data (as of 06/18/2024), and is therefore subject to change at any time.

DEPARTMENT OF NATURAL RESOURCES

Minnesota Department of Natural Resources

FISHERIES DATABASE

By accepting the data in this report, the user agrees the data will be used for personal benefit and not for profit. Any other uses or publication of the data needs the consent of the Department. The Minnesota Department of Natural Resources assumes no responsibility for actual or consequential damage incurred as a result of any user's reliance on the data.

REPORT OVERVIEW - FOR OFFICE USE ONLY

(This page is not part of the Lake Survey Report and should be discarded)

Lake Name: Sylvan **Survey Type: Targeted Survey**

DOW Number: 49-0036-00 **Survey ID Date: 04/08/2024**

Electrofishing, Trap Netting targeting Black Crappie All Ages, Trap Netting targeting Bluegill All Ages, Trap Netting

Survey Status: Field Work Complete

The following 24 (of 34) report components are not included in this Lake Survey Report:

1. Current Water Level
2. Benchmark And Gauge Descriptions / Locations
3. Water Level History[1]
4. Lake Inlets
5. Additional Inlet Information
6. Lake Outlets
7. Additional Outlet Information
8. Water Control Structure (Dam)
9. Surrounding Watershed Characteristics, Shoreline Characteristics, and Riparian Landscape Observations[2]
10. Resorts And Campgrounds
11. Fish Spawning Conditions
12. Erosion And Pollution
13. Fish Diseases And Parasites
14. Aquatic Vegetation And Shoalwater Substrates
15. Dissolved Oxygen And Temperature Profile Of Lake Water
16. Field Measusrements Of Water Quality
17. Water Quality (Winter Observations) (added to revision 01/21/2010)
18. Laboratory Analysis Of Water Chemistry
19. Zooplankton Sampling (added to revision 20221130)
20. Catch Summary (Pre-1993 Format) (added to revision 20201001)
21. Length At Capture With Last Incremental Length*
22. Back-Calculated Lengths
23. Other Species (added to revision 03/24/2009)
24. Survey Attachments (added to revision 20150622)

[1] Water Level History report: This data has not yet been migrated into the Fisheries LSM database. On 01/08/2009, two additional Water Level History report components (Readings and Station Summary) were added.

[2] Effective 03/25/2014, the Surrounding Watershed Characteristics, Shoreline Characteristics, and Riparian Landscape Observations report component was modified to be included in the Lake Survey report if it did not include any Watershed and Shoreline characteristics and only consisted of Riparian Landscape Observations.

* Length At Capture With Last Incremental Length report: The following criteria must be met for a report to be generated:
1. The fish species must have an assigned body scale constant.
2. Fish must have an "official" age assigned.
3. Fish must have a digitized measurement marked for back calculation use.

Note: The data source for Length and Age Class Frequency Distribution tables is updated twice daily - once at noon and once overnight. Any changes to the data made before noon on 06/18/2024 may not be reflected in the Distribution tables until after 12:30 pm on 06/18/2024.

FOR OFFICE USE ONLY: As of revision 20150622, this page is automatically suppressed on signed versions of this repor (area supervisor, region manager, research biologist, research supervisor, program staff, or program manager signed).

OFFICE USE ONLY

DEPARTMENT OF NATURAL RESOURCES

Fisheries Management

LAKE SURVEY REPORT

DRAFT VERSION

PRELIMINARY DATA (AS OF 06/18/2024)

Lake Name: Placid

DOW Number: 49-0080-00

Survey Type: Targeted Survey

Survey ID Date: 04/10/2024

TARGETED SURVEY
Electrofishing
Trap Netting targeting Black Crappie All Ages
Trap Netting targeting Bluegill All Ages
Trap Netting

Lake Identification

Alternate Lake Name:	N/A	DNR Sounding Map Number:	C0158
Primary Lake Class ID:	34	Alternate Lake Class ID:	N/A

Lake Location

Primary County:	Morrison	Nearest Town:	Pillager
All Counties:	Cass, Morrison.		

Legal Descriptions

Lake Center:	Township - 133N	Range - 30W	Section - 30
PLS Section Lake Center:	13303030		

All Legal Descriptions:

Cass County:	Township - 133N	Range - 30W	Sections - 19, 20
Morrison County:	Township - 133N	Range - 30W	Sections - 29, 30
	Township - 133N	Range - 31W	Sections - 25, 26

Area Office

Area Name:	Little Falls	ORG Code:	F312
Region Name:	Central	Region Number:	3

Lake Access

(Information based on Initial Survey dated 07/03/1958)

Station ID	Ownership	Public Use	Type	Location / Comments
AC - 1	DNR	Open to Public use	Concrete	STATE OWNED ACCESS ON THE NORTHEAST END OF THE LAKE.

Lake Characteristics

Lake Area (planimetered acres):	459.00	GIS Shoreline Length (miles):	10.72
GIS Lake Area (acres):	537.46	Maximum Fetch (miles):	3.03
DOW Lake Area (acres):	462.00	Fetch Orientation (degrees):	67
Littoral Area (acres):	340.00	USGS Quad Map Number:	M11d
Area in MN (acres):	537.46	USGS Quad 24K GIS Index:	2522
Maximum Depth (feet):	25.0		
Mean Depth (feet):	15.0		

Watershed Characteristics

Major Watershed

Name: Crow Wing River
Watershed Number: 12
Watershed size (acres): 1,268,954

Minor Watershed

Name: Crow Wing R
Watershed Number: 41
Watershed size (acres): 20,693

Surveys and Investigations

Initial Survey: 07/03/1958.
Re-Survey: 06/16/2008, 06/17/1996, 06/17/1985.
Population Assessment: 06/17/2014, 06/17/2002, 06/19/1990.
Special Assessment: 09/05/2000.
Natural Reproduction Check: 09/08/2009.
Targeted Survey: 06/30/1985, 06/30/1958, 06/19/1958.

Water Level History - Readings

Station ID	Date	Level	Reading (feet)	Reading Type
BM - 1	06/17/2008	Normal	3.35	Above or below Benchmark

Water Level History - Station Summary

Station ID	Minimum Level Feet	Minimum Level Date	Maximum Level Feet	Maximum Level Date	Range (feet)	Average Level (feet)	Reading Type (and number of readings)
BM - 1	3.35	06/17/2008	3.35	06/17/2008	0.00	3.35	Above or below Benchmark (1)

DRAFT

Net Catch Summary by Numbers for STN

Special sampling with trap nets

Number of Sets: 32
First Set Date: 04/10/2024
Last Lift Date: 06/05/2024
Target Species: All ages black crappie, All ages bluegill

Abbr	Species	Total Fish	Number Per Set	Quartiles for Lake Class 34[1] 25%	50%	75%
BLB	Black Bullhead	149	4.66	N/A	N/A	N/A
BLC	Black Crappie	41	1.28	N/A	N/A	N/A
BLG	Bluegill	37	1.16	N/A	N/A	N/A
BOF	Bowfin (Dogfish)	12	0.38	N/A	N/A	N/A
BRB	Brown Bullhead	25	0.78	N/A	N/A	N/A
CRC	Creek Chub	1	0.03	N/A	N/A	N/A
GRR	Greater Redhorse	10	0.31	N/A	N/A	N/A
GSF	Green Sunfish	8	0.25	N/A	N/A	N/A
HSF	Hybrid Sunfish	14	0.44	N/A	N/A	N/A
LMB	Largemouth Bass	2	0.06	N/A	N/A	N/A
NOP	Northern Pike	39	1.22	N/A	N/A	N/A
PMK	Pumpkinseed	258	8.06	N/A	N/A	N/A
RKB	Rock Bass	77	2.41	N/A	N/A	N/A
SHR	Shorthead Redhorse	9	0.28	N/A	N/A	N/A
SLR	Silver Redhorse	4	0.13	N/A	N/A	N/A
TPM	Tadpole Madtom	1	0.03	N/A	N/A	N/A
WAE	Walleye	5	0.16	N/A	N/A	N/A
WTS	White Sucker	4	0.13	N/A	N/A	N/A
YEB	Yellow Bullhead	22	0.69	N/A	N/A	N/A
YEP	Yellow Perch	184	5.75	N/A	N/A	N/A
		Total Fish/Set:	28.19			

[1] Quartiles for Number Per Set

Net Catch Summary by Weight for STN

Special sampling with trap nets

Abbr	Species	Total Weight (Pounds)	Pounds Per Set	Mean Weight[2]	Quartiles for Lake Class 34[1] 25%	50%	75%
BLB	Black Bullhead	29.22	0.91	0.18	N/A	N/A	N/A
BLC	Black Crappie	24.10	0.75	0.59	N/A	N/A	N/A
BLG	Bluegill	7.98	0.25	0.22	N/A	N/A	N/A
BOF	Bowfin (Dogfish)	51.52	1.61	4.29	N/A	N/A	N/A
BRB	Brown Bullhead	0.00	0.00	N/A	N/A	N/A	N/A
CRC	Creek Chub	0.00	0.00	N/A	N/A	N/A	N/A
GRR	Greater Redhorse	37.91	1.18	3.79	N/A	N/A	N/A
GSF	Green Sunfish	0.61	0.02	0.08	N/A	N/A	N/A
HSF	Hybrid Sunfish	2.04	0.06	0.15	N/A	N/A	N/A
LMB	Largemouth Bass	6.30	0.20	3.15	N/A	N/A	N/A
NOP	Northern Pike	78.16	2.44	2.00	N/A	N/A	N/A
PMK	Pumpkinseed	35.70	1.12	0.14	N/A	N/A	N/A
RKB	Rock Bass	17.33	0.54	0.23	N/A	N/A	N/A
SHR	Shorthead Redhorse	36.32	1.14	4.04	N/A	N/A	N/A
SLR	Silver Redhorse	20.20	0.63	5.05	N/A	N/A	N/A
TPM	Tadpole Madtom	0.02	0.00	0.02	N/A	N/A	N/A
WAE	Walleye	25.97	0.81	5.19	N/A	N/A	N/A
WTS	White Sucker	10.61	0.33	2.65	N/A	N/A	N/A
YEB	Yellow Bullhead	1.96	0.06	0.09	N/A	N/A	N/A
YEP	Yellow Perch	29.78	0.93	0.16	N/A	N/A	N/A
	Total Pounds Fish/Set:		12.99		[1] Quartiles for Mean Weight		

[2] Mean Weights are based on measured fish counts only.

DRAFT

Electrofishing Catch Summary for EF

Standard electrofishing

Number of Stations: 1
Total run-time for all stations: 01:14:00
Total on-time for all stations: 01:06:00
First Sampling Date: 04/17/2024
Last Sampling Date: 04/17/2024
Daylight Sampling: Yes
Target Species: N/A

		Summary By Numbers			Summary By Weight (pounds)			
		Total	Number per Hour		Total	Lbs per Hour		Mean
Abbr	Species	Number	Run-Time	On-Time	Weight	Run-Time	On-Time	Weight
NOP	Northern Pike	7	5.68	6.36	6.99	5.67	6.35	1.00
PMK	Pumpkinseed	2	1.62	1.82	0.41	0.34	0.38	0.21
SMB	Smallmouth Bass	20	16.22	18.18	29.40	23.84	26.72	1.47

Length Frequency Distribution for STN

Special sampling with trap nets

(Field work conducted between 04/10/2024 and 06/05/2024)

	BLB	BLC	BLG	BOF	GRR	GSF	HSF	LMB	NOP	PMK	RKB	SHR	SLR	TPM	WAE
< 3.00	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
3.00 - 3.49	-	3	-	-	-	-	-	-	-	3	-	-	-	1	-
3.50 - 3.99	5	4	-	-	-	1	-	-	-	5	2	-	-	-	-
4.00 - 4.49	-	-	-	-	-	1	6	-	-	15	5	-	-	-	-
4.50 - 4.99	2	-	1	-	-	5	-	-	-	25	4	-	-	-	-
5.00 - 5.49	1	1	6	-	-	1	3	-	-	99	6	-	-	-	-
5.50 - 5.99	6	-	9	-	-	-	1	-	-	72	23	-	-	-	-
6.00 - 6.49	4	-	7	-	-	-	1	-	-	23	16	-	-	-	-
6.50 - 6.99	4	-	2	-	-	-	1	-	-	11	5	-	-	-	-
7.00 - 7.49	5	3	7	-	-	-	1	-	-	5	1	-	-	-	-
7.50 - 7.99	2	1	2	-	-	-	1	-	-	-	4	-	-	-	-
8.00 - 8.49	-	2	2	-	-	-	-	-	-	-	2	-	-	-	-
8.50 - 8.99	1	1	-	-	-	-	-	-	1	-	6	-	-	-	-
9.00 - 9.49	-	3	1	-	-	-	-	-	-	-	1	-	-	-	-
9.50 - 9.99	-	7	-	-	-	-	-	-	1	-	1	-	-	-	-
10.00 - 10.49	-	2	-	-	1	-	-	-	1	-	-	-	-	-	-
10.50 - 10.99	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
11.00 - 11.49	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-
11.50 - 11.99	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-
12.00 - 12.99	5	3	-	-	-	-	-	-	1	-	-	-	-	-	-
13.00 - 13.99	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
14.00 - 14.99	-	3	-	-	1	-	-	-	2	-	-	-	-	-	-
15.00 - 15.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.00 - 16.99	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
17.00 - 17.99	-	-	-	-	-	-	-	1	4	-	-	-	-	-	-
18.00 - 18.99	-	-	-	-	1	-	-	1	3	-	-	1	-	-	-
19.00 - 19.99	-	-	-	-	1	-	-	-	3	-	-	1	-	-	-
20.00 - 20.99	-	-	-	-	2	-	-	-	3	-	-	2	-	-	1
21.00 - 21.99	-	-	-	3	-	-	-	-	3	-	-	1	1	-	-
22.00 - 22.99	-	-	-	1	2	-	-	-	2	-	-	2	1	-	-
23.00 - 23.99	-	-	-	1	-	-	-	-	3	-	-	1	2	-	1
24.00 - 24.99	-	-	-	2	2	-	-	-	4	-	-	1	-	-	1
25.00 - 25.99	-	-	-	-	-	-	-	-	2	-	-	-	-	-	1
26.00 - 26.99	-	-	-	1	-	-	-	-	2	-	-	-	-	-	-
27.00 - 27.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
28.00 - 28.99	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
29.00 - 29.99	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
30.00 - 30.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31.00 - 31.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32.00 - 32.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33.00 - 33.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34.00 - 34.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	BLB	BLC	BLG	BOF	GRR	GSF	HSF	LMB	NOP	PMK	RKB	SHR	SLR	TPM	WAE
Total	35	41	37	8	10	8	14	2	39	258	77	9	4	1	5
Min. Length	3.78	2.01	4.84	21.02	10.16	3.74	4.17	17.64	8.70	3.31	3.58	18.82	21.77	3.07	20.51
Max. Length	12.05	14.61	9.06	26.26	24.21	5.31	7.68	18.11	29.88	7.17	11.46	24.61	23.82	3.07	27.60
Mean Length	6.56	9.01	6.40	23.13	19.63	4.66	5.35	17.87	20.05	5.40	6.27	21.56	22.81	3.07	24.27
# Measured	22	41	37	8	10	8	14	2	39	131	76	9	4	1	5
No Lengths for	127	0	0	4	0	0	0	0	0	127	1	0	0	0	0

Note: Unless all fish were measured in the catch, totals shown for some length-frequency distributions may differ from the total number of fish in the catch, due to rounding of fractions used in the estimation of length frequency from a subsample of measured fish.

DRAFT

Length Frequency Distribution for STN (*Continued*)

Special sampling with trap nets

(Field work conducted between 04/10/2024 and 06/05/2024)

	WTS	YEB	YEP
< 3.00	-	-	-
3.00 - 3.49	-	-	-
3.50 - 3.99	-	-	-
4.00 - 4.49	-	-	2
4.50 - 4.99	-	-	5
5.00 - 5.49	-	-	7
5.50 - 5.99	-	2	23
6.00 - 6.49	-	-	13
6.50 - 6.99	-	-	50
7.00 - 7.49	-	-	36
7.50 - 7.99	-	-	16
8.00 - 8.49	-	-	16
8.50 - 8.99	-	-	10
9.00 - 9.49	-	-	3
9.50 - 9.99	-	-	3
10.00 - 10.49	-	-	-
10.50 - 10.99	-	-	-
11.00 - 11.49	-	-	-
11.50 - 11.99	-	-	-
12.00 - 12.99	-	-	-
13.00 - 13.99	-	-	-
14.00 - 14.99	-	-	-
15.00 - 15.99	-	-	-
16.00 - 16.99	-	-	-
17.00 - 17.99	1	-	-
18.00 - 18.99	3	-	-
19.00 - 19.99	-	-	-
20.00 - 20.99	-	-	-
21.00 - 21.99	-	-	-
22.00 - 22.99	-	-	-
23.00 - 23.99	-	-	-
24.00 - 24.99	-	-	-
25.00 - 25.99	-	-	-
26.00 - 26.99	-	-	-
27.00 - 27.99	-	-	-
28.00 - 28.99	-	-	-
29.00 - 29.99	-	-	-
30.00 - 30.99	-	-	-
31.00 - 31.99	-	-	-
32.00 - 32.99	-	-	-
33.00 - 33.99	-	-	-
34.00 - 34.99	-	-	-
35.00 - 35.99	-	-	-
= > 36.00	-	-	-

	WTS	YEB	YEP
Total	4	2	184
Min. Length	17.72	5.51	4.49
Max. Length	18.90	5.67	9.92
Mean Length	18.46	5.59	6.92
# Measured	4	2	140
No Lengths for	0	20	44

Note: Unless all fish were measured in the catch, totals shown for some length-frequency distributions may differ from the total number of fish in the catch, due to rounding of fractions used in the estimation of length frequency from a subsample of measured fish.

Length Frequency Distribution for EF

Standard electrofishing

(Field work conducted on 04/17/2024)

	NOP	PMK	SMB
< 3.00	-	-	-
3.00 - 3.49	-	-	-
3.50 - 3.99	-	-	-
4.00 - 4.49	-	-	-
4.50 - 4.99	-	-	-
5.00 - 5.49	-	1	-
5.50 - 5.99	-	-	-
6.00 - 6.49	-	-	-
6.50 - 6.99	-	1	-
7.00 - 7.49	-	-	-
7.50 - 7.99	-	-	-
8.00 - 8.49	-	-	-
8.50 - 8.99	-	-	-
9.00 - 9.49	-	-	-
9.50 - 9.99	1	-	1
10.00 - 10.49	-	-	1
10.50 - 10.99	-	-	3
11.00 - 11.49	1	-	-
11.50 - 11.99	1	-	-
12.00 - 12.99	-	-	6
13.00 - 13.99	1	-	4
14.00 - 14.99	1	-	1
15.00 - 15.99	-	-	-
16.00 - 16.99	-	-	1
17.00 - 17.99	-	-	1
18.00 - 18.99	-	-	1
19.00 - 19.99	-	-	1
20.00 - 20.99	-	-	-
21.00 - 21.99	1	-	-
22.00 - 22.99	-	-	-
23.00 - 23.99	-	-	-
24.00 - 24.99	1	-	-
25.00 - 25.99	-	-	-
26.00 - 26.99	-	-	-
27.00 - 27.99	-	-	-
28.00 - 28.99	-	-	-
29.00 - 29.99	-	-	-
30.00 - 30.99	-	-	-
31.00 - 31.99	-	-	-
32.00 - 32.99	-	-	-
33.00 - 33.99	-	-	-
34.00 - 34.99	-	-	-
35.00 - 35.99	-	-	-
= > 36.00	-	-	-

	NOP	PMK	SMB
Total	7	2	20
Min. Length	9.96	5.47	9.72
Max. Length	24.61	6.85	19.61
Mean Length	15.19	6.16	13.41
# Measured	7	2	20
No Lengths for	0	0	0

Note: Unless all fish were measured in the catch, totals shown for some length-frequency distributions may differ from the total number of fish in the catch, due to rounding of fractions used in the estimation of length frequency from a subsample of measured fish.

DRAFT

Other Species

Gear Type (1)	Other Species (Gender) (2)	Total Num	Number Measured	Length (inches) Min - Mean - Max	Number Weighed	Weight (pounds) Min - Mean - Max
STN	Painted Turtle	90	0	N/A	0	N/A
	Snapping Turtle	10	0	N/A	0	N/A

(1) Key to sampling gear abbreviations:
STN = Special sampling with trap nets

(2) Gender: If identified and reported.

Field Notes - General Field

Ice-out trap netting and early season electrofishing was conducted to assess gamefish which have been difficult to sample with routine gill nets and trap nets. Eight (8) trap nets were set and lifted twice April 10-12. Water temps were 48-51F. Electrofishing was performed April17 at water temp of 48F. Electrofishing took place upstream of the reservoir in more riverine environments. CFS was 2240 April 17 at Sylvan Dam, historical average is 3000 CFS. No aging structures were collected.

Panfish Trap Netting June 3-5, 8 trap nets were set targeting panfish. New locations chosen, some near previous trap net sets. Water temp June 3 was 67.5F. June 4 water temp 69F. Air temps topping out in the low 80s. Otoliths were collected from BLG. June 5 water temp 70-71F. BOF and bullheads were counted but not measured. No nets were moved. BLB and BRB were difficult to differentiate, may be some hybridization, were mostly recorded as BLB.

Approval Dates And Notices

Date Approved By Little Falls Area Fisheries Supervisor: _____

Date Approved By Central Region Fisheries Manager: _____

This DRAFT VERSION of the Lake Survey Report contains preliminary data (as of 06/18/2024), and is therefore subject to change at any time.

DEPARTMENT OF NATURAL RESOURCES

Minnesota Department of Natural Resources

FISHERIES DATABASE

By accepting the data in this report, the user agrees the data will be used for personal benefit and not for profit. Any other uses or publication of the data needs the consent of the Department. The Minnesota Department of Natural Resources assumes no responsibility for actual or consequential damage incurred as a result of any user's reliance on the data.

(*This page is intentionally blank*)

(*This page is intentionally blank*)

From:	Jared Porter
To:	Altena, Eric (DNR)
Cc:	Lesley Brotkowski; Gregory Prom (MP)
Subject:	RE: Crow Wing and Mississippi River Fisheries Data
Date:	Tuesday, June 18, 2024 12:19:19 PM
Attachments:	image001.png image002.png image003.png image004.png image005.jpg

---

Hi Eric,
Thank you for sharing this data with us! This is very helpful for characterizing the fish communities.

Much appreciated,
-Jared

From: Harrington, Lucy (She/Her/Hers) (ADM) <Lucy.Harrington@state.mn.us>
Sent: Monday, July 15, 2024 6:50 PM
To: Gregory Prom (MP) <gprom@mnpower.com>; 'durellcooper05@gmail.com' <durellcooper05@gmail.com>; 'R.Blanchard@badriver-nsn.gov' <R.Blanchard@badriver-nsn.gov>; 'thpo@badriver-nsn.gov' <thpo@badriver-nsn.gov>; 'deputythpo@badriver-nsn.gov' <deputythpo@badriver-nsn.gov>; 'rwassana@cheyenneandarapaho-nsn.gov' <rwassana@cheyenneandarapaho-nsn.gov>; 'Anthony.Reider@fsst.org' <Anthony.Reider@fsst.org>; 'jeffery.stiffarm@ftbelknap.org' <jeffery.stiffarm@ftbelknap.org>; 'trhodd@iowas.org' <trhodd@iowas.org>; 'doreen@kbic-nsn.gov' <doreen@kbic-nsn.gov>; 'ldfthpo@ldftribe.com' <ldfthpo@ldftribe.com>; 'jim.williams@lvd-nsn.gov' <jim.williams@lvd-nsn.gov>; 'alina.shively@lvd-nsn.gov' <alina.shively@lvd-nsn.gov>; 'lisa.brunk@lvd-nsn.gov' <lisa.brunk@lvd-nsn.gov>; 'robert.larsen@lowersioux.com' <robert.larsen@lowersioux.com>; 'chairman@mitw.org' <chairman@mitw.org>; 'cchavers@boisforte-nsn.gov' <cchavers@boisforte-nsn.gov>; 'kevindupuis@fdlrez.com'

<diane.thompson@llojibwe.net>; 'melanie.benjamin@millelacsband.com' <melanie.benjamin@millelacsband.com>; Susan.Klapel@millelacsband.com; 'Michael.Fairbanks@whiteearth-nsn.gov' <Michael.Fairbanks@whiteearth-nsn.gov>; bdrost <bdrost@mnchippewatribe.org>; 'jbruce@mnchippewatribe.org' <jbruce@mnchippewatribe.org>; 'Sbartell@piic.org' <Sbartell@piic.org>; 'nicole.boyd@redcliff-nsn.gov' <nicole.boyd@redcliff-nsn.gov>; 'dseki@redlakenation.org' <dseki@redlakenation.org>; 'alonzo.denney@ssndakota.com' <alonzo.denney@ssndakota.com>; 'annette.krebsbach@shakopeedakota.org' <annette.krebsbach@shakopeedakota.org>; 'Chairman@swo-nsn.gov' <Chairman@swo-nsn.gov>; 'robert.vanzile@scc-nsn.gov' <robert.vanzile@scc-nsn.gov>; 'lonnas@spiritlakenation.com' <lonnas@spiritlakenation.com>; 'info@standingrock.org' <info@standingrock.org>; 'Scott.herman@rst-nsn.gov' <Scott.herman@rst-nsn.gov>; 'jamie.azure@tmbci.org' <jamie.azure@tmbci.org>; 'kevinj@uppersiouxcommunity-nsn.gov' <kevinj@uppersiouxcommunity-nsn.gov>; Geshick, Shannon (MIAC) <shannon.geshick@state.mn.us>; Cerda, Melissa (MIAC) <melissa.cerda@state.mn.us>; Goggleye Jr, George J (MIAC) <George.Goggleye@state.mn.us>; OSA, MN (ADM) <mn.osa@state.mn.us>; Tworzyanski, Jennifer (ADM) <Jennifer.Tworzyanski@state.mn.us>
Cc: nrosemore@mnpower.com; David Moeller (ALLETE) <dmoeller@allete.com>; Matthew Radzak (MP) <mradzak@mnpower.com>; Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Josh Petersen <josh.petersen@merjent.com>; aaron.armstrong-duarte <aaron.armstrong-duarte@merjent.com>
Subject: RE: Area of Potential Effect Consultation for Little Falls, Sylvan, and Pillager Hydroelectric Projects

Please find attached the Minnesota State Historic Preservation Office comment in response to the request from Minnesota Power dated June 17, 2024. We look forward to continuing consultation regarding the three undertakings.

Lucy Harrington (she/her) **| Environmental Review Archaeologist**
State Historic Preservation Office
Minnesota Department of Administration
50 Sherburne Avenue, Suite 203
Saint Paul, Minnesota 55155
(651) 201-3283 | lucy.harrington@state.mn.us

Please reference this SHPO Environmental Review Program Update regarding current project review timelines and staffing changes for the Environmental Review Program.

DEPARTMENT OF ADMINISTRATION
STATE HISTORIC PRESERVATION OFFICE

July 15, 2024 **VIA E-MAIL**

Greg Prom
Senior Environmental Compliance Specialist
ALLETE, Inc. d.b.a. Minnesota Power
30 West Superior Street
Duluth, MN 55802-2093

RE: FERC No. 2532 Little Falls Hydroelectric Project
FERC No. 2454 Sylvan Hydroelectric Project
FERC No. 2663 Pillager Hydroelectric Project
Section 106 Consultation Regarding the Proposed Relicensing of Hydroelectric Projects
Cass, Crow Wing, and Morrison Counties, Minnesota
SHPO Number: 2023-1267 (Little Falls), 2023-3430 (Sylvan), and 2023-3431 (Pillager)

Dear Mr. Prom,

Thank you for continuing consultation with our office regarding the above undertakings. In accordance with the notice issued by the Federal Energy Regulatory Commission (FERC) on May 26, 2023 designating ALLETE/Minnesota Power (MP) as non-federal representative, information received in our office on June 17, 2024 has been reviewed pursuant to the responsibilities given the State Historic Preservation Officer Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) and its implementing federal regulations, "Protection of Historic Properties" (36 CFR Part 800).

We have completed a review of your letter dated June 18, 2024 as well as the attached figures depicting the Area of Potential Effects for each project.

Define Federal Undertaking and Area of Potential Effect (APE)
Based upon information previously provided on September 20, 2023, we understand that, due to the geographic proximity of the three (3) hydroelectric projects referenced above, MP has requested a combined FERC relicensing process for all 3 projects. Although each is considered a separate federal undertaking, the review and consultation under the Section 106 regulations will be carried out concurrently by MP.

As stated in our letter dated December 18, 2023, we continue to agree that the Area of Potential Effects for each project – defined as the FERC Project Boundary – are appropriate to take into account the potential direct and indirect effects of the federal undertaking, as it is currently defined.

We look forward to continuing consultation with FERC and Minnesota Power/ALLETE and other consulting parties regarding the Section 106 reviews of these undertakings. Please feel free to reach out to Environmental Review Archaeologist Lucy Harrington at lucy.harrington@state.mn.us or (651)201-3283 if you have any questions about our comment letter.

Sincerely,

Amy Spong
Deputy State Historic Preservation Officer

From: Kimman, Greg <GregK@ci.little-falls.mn.us>
Sent: Wednesday, December 4, 2024 8:12 AM
To: Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>; Alex Smith <alexs@ci.little-falls.mn.us>
Cc: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Gregory Prom (MP) <gprom@mnpower.com>; Zylka, Wendy <WendyZ@ci.little-falls.mn.us>
Subject: RE: Request for Available Recreation User Information on Recreation Sites

Good Morning Elizabeth,
Yes, the City of Little Falls owns the recreational sites listed in the table below. I will give you a call to discuss potential data for the sites this morning.

Greg Kimman, PE
City Engineer/Public Works Director
100 7th Avenue NE
Little Falls, MN 56345

Ph: 320-616-5500

From: Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>
Sent: Tuesday, December 3, 2024 4:00 PM
To: Alex Smith <alexs@ci.little-falls.mn.us>; Kimman, Greg <GregK@ci.little-falls.mn.us>
Cc: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Gregory Prom (MP) <gprom@mnpower.com>; Zylka, Wendy <WendyZ@ci.little-falls.mn.us>
Subject: Request for Available Recreation User Information on Recreation Sites

Good Afternoon,

On behalf of Minnesota Power, I am requesting available information pertaining to recreation sites owned by the City of Little Falls adjacent to the Little Falls Hydroelectric Project (Little Falls Project) (FERC No. 2532). Minnesota Power is the Licensee of the Little Falls Project, which is currently in the Federal Energy Regulatory Commission (FERC) relicensing process. FERC has asked Minnesota Power to gather available information for the recreation sites listed below. This information will be included in a study report, which will be filed with FERC by February 7, 2025.

Could you please confirm that the City of Little Falls owns each of the recreation sites listed in Table 1 below? Do you have any available recreation user information or data of the recreation sites listed in Table 1? If so, could you please provide these available data? If helpful, I would be happy to discuss over the phone available recreation user data that you may have on these sites. Please feel free to reach out to me directly or we can schedule a call at a time convenient to you. Thank you very much for your assistance.

Table 1: Recreation Sites to Obtain Available Recreation Use Information in the Little Falls Project Vicinity

Site Name	Description
Mill Park	615 Lindbergh Drive South.
Maple Island Park	59 3rd Avenue SE.
James Green Park	38 1st Avenue SE.
Veterans Memorial Park	25 Broadway Avenue East.
Kiwanis Park	59 1st Avenue NE.
Old City Beach Parking Lot	501 1st Street NE.
Canoe Portage	Located at Front Street and Broadway East. Canoe portage around dam.
LeBourget Park	300 Paul Larson Memorial Drive.
Riverside Park	901 1st Street NE.

Thank you,

Elizabeth Krchnavek
Licensing Coordinator
Kleinschmidt
Cell: 571-230-6830
Office: 984-389-1086
www.KleinschmidtGroup.com

From: Elizabeth Krchnavek
Sent: Friday, November 15, 2024 3:16 PM
To: wendyz@ci.little-falls.mn.us
Cc: Lesley Brotkowski <Lesley.Brotkowski@KleinschmidtGroup.com>; Gregory Prom (MP) <gprom@mnpower.com>
Subject: Request for Available Recreation User Information on Recreation Sites

Good Afternoon,

On behalf of Minnesota Power, I am requesting information pertaining to recreation sites owned by the City of Little Falls adjacent to the Little Falls Hydroelectric Project (Little Falls Project) (FERC No. 2532). Minnesota Power is the Licensee of the Little Falls Project, which is currently in the Federal Energy Regulatory Commission (FERC) relicensing process. FERC has asked Minnesota Power to gather available information for the recreation sites listed below. This information will be included in a study report, which will be filed with FERC by February 7, 2025.

Could you please confirm that the City of Little Falls owns each of the recreation sites listed in Table 1 below? Do you have any available recreation user information or data of the recreation sites listed in Table 1? If so, could you please provide these available data?

Table 1: Recreation Sites to Obtain Available Recreation Use Information in the Little Falls Project Vicinity

Site Name	Description
Mill Park	615 Lindbergh Drive South.
Maple Island Park	59 3rd Avenue SE.
James Green Park	38 1st Avenue SE.
Veterans Memorial Park	25 Broadway Avenue East.
Kiwanis Park	59 1st Avenue NE.

Old City Beach Parking Lot	501 1st Street NE.
Canoe Portage	Located at Front Street and Broadway East. Canoe portage around dam.
LeBourget Park	300 Paul Larson Memorial Drive.
Riverside Park	901 1st Street NE.

I would be happy to schedule a call if it would be easier, to discuss available recreation user data that you may have on these sites. Thank you very much for your assistance.

Thank you,

Elizabeth Krchnavek
Licensing Coordinator
Kleinschmidt
Cell: 571-230-6830
Office: 984-389-1086
www.KleinschmidtGroup.com

Little Falls Hydroelectric Project (FERC Project No. 2532)

Sylvan Hydroelectric Project (FERC Project No. 2454)

Pillager Hydroelectric Project (FERC Project No. 2663)

Relicensing Consultation Documentation

Date	12/4/2024
Person documenting conversation	Elizabeth Krchnavek (Kleinschmidt Associates)
Discussion participants	Greg Kimman (City of Little Falls), Elizabeth Krchnavek
Subject of conversation	Recreation Data

Summary of Conversation:

Discussion about available recreation data for certain City of Little Falls recreation site. Elizabeth Krchnavek explained that in response to FERC's July 27, 2023 letter, and as proposed in the Minnesota Power's approved study plan, the Licensee is requesting available recreation user data at the City of Little Falls recreation sites in the Little Falls Project (FERC P-2532) Vicinity. The parks include Mill Park, Maple Island Park, James Green Park, Veterans Memorial Park, Kiwanis Park, Old City Beach Parking Lot, Canoe Portage, LeBourget Park, and Riverside Park. Greg Kimman confirmed that those sites are owned and maintained by the City of Little Falls. Greg Kimman explained that the City of Little Falls does not collect recreation data regularly, and does not have recreation user data to provide. Greg Kimman offered that he could provide estimates on annual use at the site via email.

From: Kimman, Greg <GregK@ci.little-falls.mn.us>
Sent: Monday, January 13, 2025 10:28 AM
To: Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>
Cc: Lesley Brotkowski <
Smith <alexs@ci.little-falls.mn.us>; Zylka, Wendy <WendyZ@ci.little-falls.mn.us>
Subject: RE: Request for Available Recreation User Information on Recreation Sites

Hi Elizabeth,

1) The 200 would be portages around the dam.
2) That is correct.

Greg Kimman, PE
City Engineer/Public Works Director
100 7th Avenue NE
Little Falls, MN 56345

Ph: 320-616-5500

From: Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>
Sent: Friday, January 10, 2025 10:57 AM
To: Kimman, Greg <GregK@ci.little-falls.mn.us>
Cc: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Gregory Prom (MP) <gprom@mnpower.com
Smith <alexs@ci.little-falls.mn.us>; Zylka, Wendy <WendyZ@ci.little-falls.mn.us>
Subject: RE: Request for Available Recreation User Information on Recreation Sites

Good Morning Greg,

I have a couple quick follow up questions on the recreation estimates you provided below.

1. Do you have estimate of annual number of portages around the dam? I know you have 200 canoe/kayakers listed at James Green Park, but do you have an estimate on how many are actually portaging around the dam, vs. only paddling below/above the dam?
2. Am I assuming correctly that the number you have listed for each recreation activity is the primary activity of the visitor? So, for example, at Mill Park you would estimate 4,600 visitors annually total (with 3,600 their primary purpose of visiting being fishing, and 1,000 their primary purpose being walking)?

Thank you very much,

Elizabeth Krchnavek
Licensing Coordinator
Kleinschmidt
Cell: 571-230-6830
Office: 984-389-1086
www.KleinschmidtGroup.com

From: Elizabeth Krchnavek
Sent: Monday, December 9, 2024 3:03 PM
To: Kimman, Greg <GregK@ci.little-falls.mn.us>
Cc: Lesley Brotkowski <Lesley.Brotkowski@KleinschmidtGroup.com>; Gregory Prom (MP) <gprom@mnpower.com>; Alex Smith <alexs@ci.little-falls.mn.us>; Zylka, Wendy <wendyz@ci.little-falls.mn.us>
Subject: RE: Request for Available Recreation User Information on Recreation Sites

Good Afternoon Greg,
Received. Thank you very much for providing this information. We'll review and let you know if we have any questions.
Thank you!

Elizabeth Krchnavek
Licensing Coordinator
Kleinschmidt
Cell: 571-230-6830
Office: 984-389-1086
www.KleinschmidtGroup.com

From: Kimman, Greg <GregK@ci.little-falls.mn.us>
Sent: Monday, December 9, 2024 11:20 AM
To: Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>; Alex Smith <alexs@ci.little-falls.mn.us>
Cc: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Gregory Prom (MP) <gprom@mnpower.com>; Zylka, Wendy <WendyZ@ci.little-falls.mn.us>
Subject: RE: Request for Available Recreation User Information on Recreation Sites

Hi Elizabeth,
We do not have counts of activities at the various parks, but I can give you an estimated usage and the activities at each park.

Annual Visitors

Mill Park:
- Fishing 3600
- Walking/Biking 1000

Maple Island Park
- Walking 14,500
- Fishing 1,500
- Kayak/Canoe 200
- Concerts/events 3,000

James Green
- Walking 14,500

Fishing 3,500
Kayak/Canoe 200

Veterans Memorial
Walking 3,000

Kiwanis
Walking 2,000
Fishing 2,000

City Beach Parking Lot
Fishing 750

Canoe Portage (included in Maple Island & James Green)

Lebourget
Walking 1,500
Fishing 2000
Kayak/Canoe 200
Disc Golf 1,500
Concerts 500

Riverside Park
Picnic 500

This does not include the arts & crafts fair held in early September. We usually get close to 100,000 visitors to LF during that weekend.

Greg Kimman, PE
City Engineer/Public Works Director
100 7th Avenue NE
Little Falls, MN 56345

Ph: 320-616-5500

From: Anita Cloud <anita.cloud@llojibwe.net>
Sent: Wednesday, January 29, 2025 6:10 PM
To: Gregory Prom (MP) <gprom@mnpower.com>
Cc: Gina Lemon <gina.lemon@llojibwe.net>
Subject: [EXTERNAL MAIL] thpo # 24-682

Have a good day…

Respectfully,

Anita M Cloud
Leech Lake Band of Ojibwe
Tribal Historic Preservation Assistant
190 Sailstar Drive NE
Cass Lake, MN 56633
anita.cloud@llojibwe.net

Anita Cloud
Tribal Historic Preservation Assistant

anita.cloud@llojibwe.net
http://www.llojibwe.org/
190 Sailstar Drive NW, Cass Lake, MN 56633

This email, including attachments, is confidential and/or legally privileged. It is intended for use only by the person to whom it is directed. If you are not the intended recipient and/or received it in error, you should reply by email to the sender; delete this email, including deletion of all associated text files from storage locations including individual and network storage devices; and refrain from disseminating or copying this information.

LEECH LAKE BAND OF OJIBWE

Tribal Historic Preservation Office

Gina M Lemon, Tribal Historic Preservation Officer
Anita M Cloud, Tribal Historic Preservation Assistant

January 28, 2025 Via Internet

Minnesota Power / ALLETE, Inc.
Attn: Greg Prom, Senior Environmental Compliance Specialist
30 West Superior Street
Duluth, MN 55802

RE: Request for Tribal Cultural Properties Review at Little Falls, Sylvan and Pillager Hydro Electric Projects.
ALLETE, Inc., d/b/a Minnesota Power (MP) is in the process of relicensing the hydroelectric facilities in Little Falls, Sylvan and Pillager, MN. MP is proposing to conduct a Cultural Resources Study that includes an archaeological resources survey to identify archaeological resources and Traditional Cultural Properties (TCPs) within the Area of Potential Effects (APE) of the Little Falls, Sylvan and Pillager Projects.

Little Falls, MN; Morrison County, MN
Sec 7, 8, T.40N, R.32W. 5th P.M
Sec 5, 7, 8, 17-19, T.129N, R.29W. 5th P.M
Sec 14, 23, 26, 27, 34, 35, T.41N, R.32W. 5th P.M

Sylvan, MN; Cass County, MN
Sec 3-5, 8, 9, 16-21, 29-32, T.133N, R.29W. 5th P.M
Sec 27, 28, 33, 34, T.134N, R.29W. 5th P.M
Sec 13-16, 21-25, T.133N, R.30W. 5th P.M

Pillager, MN; Cass Co, MN
Sec 19, 20, 29, 30, T.133N, R.30W. 5th P.M
Sec 21-27, T.133N, R.31W. 5th P.M

LL THPO No. 24-682-NCRI

Dear Greg Prom,

Thank you for the opportunity to comment on the above referenced project. This has been reviewed pursuant to the responsibilities given to the Tribal Historic Preservation Officer (THPO) by the National Historic Preservation Act of 1966, as amended in 1992, and the Procedures of the Advisory Council on Historic Preservation (38CFR800).

I have reviewed the documentation. After careful consideration of our records, I have determined that the Leech Lake Band of Ojibwe does not have any recorded historic properties, within this area. ** This does not mean there are not any cultural resources present, at this time. **

Should any human remains or suspected human remains be encountered, all work shall cease and the following personnel should be notified immediately: County Sheriff's Office, Office of the State Archaeologist, and the Leech Lake Band of Ojibwe along with other interested parties.

Please note the above determination does not "exempt" future projects from Section 106 review. In the event of any other tribe notifying you of an issue or us (LLBO) of concerns for this specific project, we may reenter into the consultation process.

You may contact me at **(218) 335-2940** if you have questions regarding our review of this project. Please refer to the **LL-THPO Number** as stated above in all correspondence with this project.

Respectfully submitted,

Gina M Lemon
Tribal Historic Preservation Officer

From: Lesley Brotkowski
Sent: Friday, February 7, 2025 2:12 PM
To: Tammie.Poitra@bia.gov; Mary.Manydeeds@bia.gov; robert.k.edstrom@usace.army.mil; darin_simpkins@fws.gov; dave_thomson@nps.gov; durell.cooper@apachetribe.org; R.Blanchard@badriver-nsn.gov; thpo@badriver-nsn.gov; deputythpo@badriver-nsn.gov; rwassana@cheyenneandarapaho-nsn.gov; Anthony.Reider@fsst.org; jeffery.stiffarm@ftbelknap.org; trhodd@iowas.org; chairman@kbic-nsn.gov; ldfthpo@ldftribe.com; jim.williams@lvd-nsn.gov; alina.shively@lvd-nsn.gov; lisa.brunk@lvd-nsn.gov; robert.larsen@lowersioux.com; chairman@mitw.org; cchavers@boisforte-nsn.gov; brucesavage@fdlband.org; robertdeschampe@grandportage.com; Faron.Jackson@llojibwe.net; virgil.wind@millelacsband.com; Susan.Klapel@millelacsband.com; Michael.Fairbanks@whiteearth-nsn.gov; Mike.LaRoque@whiteearth-nsn.gov; Sbartell@piic.org; nicole.boyd@redcliff-nsn.gov; dseki@redlakenation.org; alonzo.denney@ssndakota.com; Businesscouncil@shakopeedakota.org; Chairman@swo-nsn.gov; robert.vanzile@scc-nsn.gov; LStreet@spiritlakenation.com; info@standingrock.org; kathleen.woodenknife@rst-nsn.gov; jamie.azure@tmbci.org; kevinj@uppersiouxcommunity-nsn.gov; john.jaschke@state.mn.us; jbruce@mnchippewatribe.org; lucy.harrington@state.mn.us; ENReviewSHPO@state.mn.us; shannon.geshick@state.mn.us; george.goggleye@state.mn.us; Jill.Townley@state.mn.us; daniel.oshea@state.mn.us; jason.boyle@state.mn.us; eric.altena@state.mn.us; thorleif@umn.edu; mn.osa@state.mn.us; jennifer.tworzyanski@state.mn.us; Jesse.Anderson@state.mn.us; MIAC.culturalresources@state.mn.us; Bonnie.finnerty@state.mn.us; william.wilde@state.mn.us; will.seuffert@state.mn.us; josh.stevenson@casscountymn.gov; CoAdmin@crowwing.us; mattl@co.morrison.mn.us; wzylka@cityoflittlefalls.com; alexs@ci.little-falls.mn.us; GregK@ci.little-falls.mn.us; rosingtownshipmn@yahoo.com; clerk@sylvantwp.com; loriblumke@cityofpillager.com; dlobaxter@charter.net; dbadeaux@ci.brainerd.mn.us; timt@mississippiheadwaters.org staff@morrisoncountyhistory.org; history@crowwing.us; casscountymuseum@gmail.com; Rnnelson13@hotmail.com; royandjoann@hotmail.com; dwedll@hotmail.com; stephenschaitberger@charter.net
Cc: Gregory Prom (MP) <gprom@mnpower.com>; David Moeller (ALLETE) <dmoeller@allete.com>; Matthew Radzak (MP) <mradzak@mnpower.com>; nrosemore@mnpower.com; Elizabeth Krchnavek <Elizabeth.Krchnavek@KleinschmidtGroup.com>
Subject: Initial Study Report for Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects

Good afternoon,

On February 7, 2025, ALLETTE, Inc., doing business as Minnesota Power, filed with the Federal Energy Regulatory Commission (FERC) the Initial Study Report (ISR) for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663). The electronic files can be downloaded through FERC's website using the link provided:
https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20250207-5138

If you have any questions regarding this filing, please contact me at the contact information below, or Greg Prom, ALLETE, Inc. Senior Environmental Compliance Specialist at gprom@allete.com.

Thank you,

Lesley Brotkowski
Senior Regulatory Advisor
Kleinschmidt
Office: 715-318-3729
www.KleinschmidtGroup.com

Subject: FW: SHPO Review Form - Initial Study Report for Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects
Attachments: SHPO Rev Form Little Falls Sylvan Pillager ISR 2025_02_07.pdf

---

From: Lesley Brotkowski
Sent: Friday, February 7, 2025 3:24 PM
To: lucy.harrington@state.mn.us; ENReviewSHPO@state.mn.us
Cc: Gregory Prom (MP) <gprom@mnpower.com>; Matthew Radzak (MP) <mradzak@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@KleinschmidtGroup.com>
Subject: SHPO Review Form - Initial Study Report for Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects

Hello Lucy,

The SHPO review form for the Initial Study Report is attached. The public version of the Initial Study Report is available through the link below. The privileged version will be transmitted to you through a OneDrive link, which will be sent this afternoon in a separate email.

Thank you,
Lesley

Please mail the completed form and required material to:

ENReviewSHPO@state.mn.us

DEPARTMENT OF ADMINISTRATION

Request for Project Review by the State Historic Preservation Office (SHPO)

◯ This is a new submittal

◉ This is additional information relating to SHPO Project #: 2023-1267 **DATE:** 2/7/2025

I. GENERAL PROJECT INFORMATION

Project Title: Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663) Hydroelectric Projects Initial Study Report

Project Address (or Location): Please see attached maps and Initial Study Report for details.

City / Township (circle one): See attachment Zip: See attachment County: Morrison, Crow Wing, Cass

Legal Description: Township Attachment Range Attachment E/W (circle one) Section Attachment Quarter-section Attachment

II. PROJECT CONTACT INFORMATION

Project Contact Name: Greg Prom Title: Senior Environmental Compliance Specialist

Company/Agency: ALLETE, Inc., d.b.a. Minnesota Power

Street Address: 30 West Superior Street Phone Number: 218-355-3191

City: Duluth State: MN Zip: 55802-2093 Email: gprom@allete.com

III. FEDERAL AND/OR STATE INVOLVEMENT

Federal Agency (if applicable): Federal Energy Regulatory Commission (FERC) relicensing
(Agency providing funds, licenses, or permits)
Permit or Project Reference #: P-2532, P-2454, P-2663

State Agency (if applicable): N/A
(Agency providing funds, licenses, or permits)
Permit or Project Reference #: N/A

Local Agency (if applicable): N/A

(Continued on Reverse Side)

Please refer to *Instructions for Completing the Request for Project Review* form on our website. Submit one *Request for Project Review* form for each project. For questions regarding the SHPO review process, please visit our website or contact Kelly Gragg-Johnson (651-201-3285) or Leslie Coburn (651-201-3286) or by email at ENReviewSHPO@state.mn.us.

IV. PROJECT DESCRIPTION AND BOUNDARIES

A) REQUIRED FOR ALL PROJECTS

☑ Write a detailed description of the proposed project. (See attached.)

Please see attached. The Initial Study Report was filed with FERC for the Little Falls Project, Sylvan Project, and Pillager Project (Projects) relicensing process.

☑ Attach a map of project location, with project area(s) clearly marked. Road names must be included and legible.

B) Architecture

Are there any buildings or structures within the project area? ◉ Yes ○ No

If **No**, continue to the Archaeology section below. If **Yes**, submit all of the following information:

☑ List all buildings and structures within the project area and the year they were built. (See attached.)

Please see the attached Phase I architectural history survey and evaluation reports.

☐ Photographs of ***each*** building and structure located within the project area, along with a photo key. Include streetscape images, if applicable. All photographs must be clear, crisp, focused, and taken at ground level. Aerial photos are insufficient.

☑ List known historic buildings or structures located within the project area (i.e., individual properties or districts which are listed in the National Register or which meet the criteria for listing in the National Register). (See attached.)

Please see the attached Phase I archaeological survey reports.

C) Archaeology

Does the proposed undertaking involve ground-disturbing activity? ○ Yes ◉ No

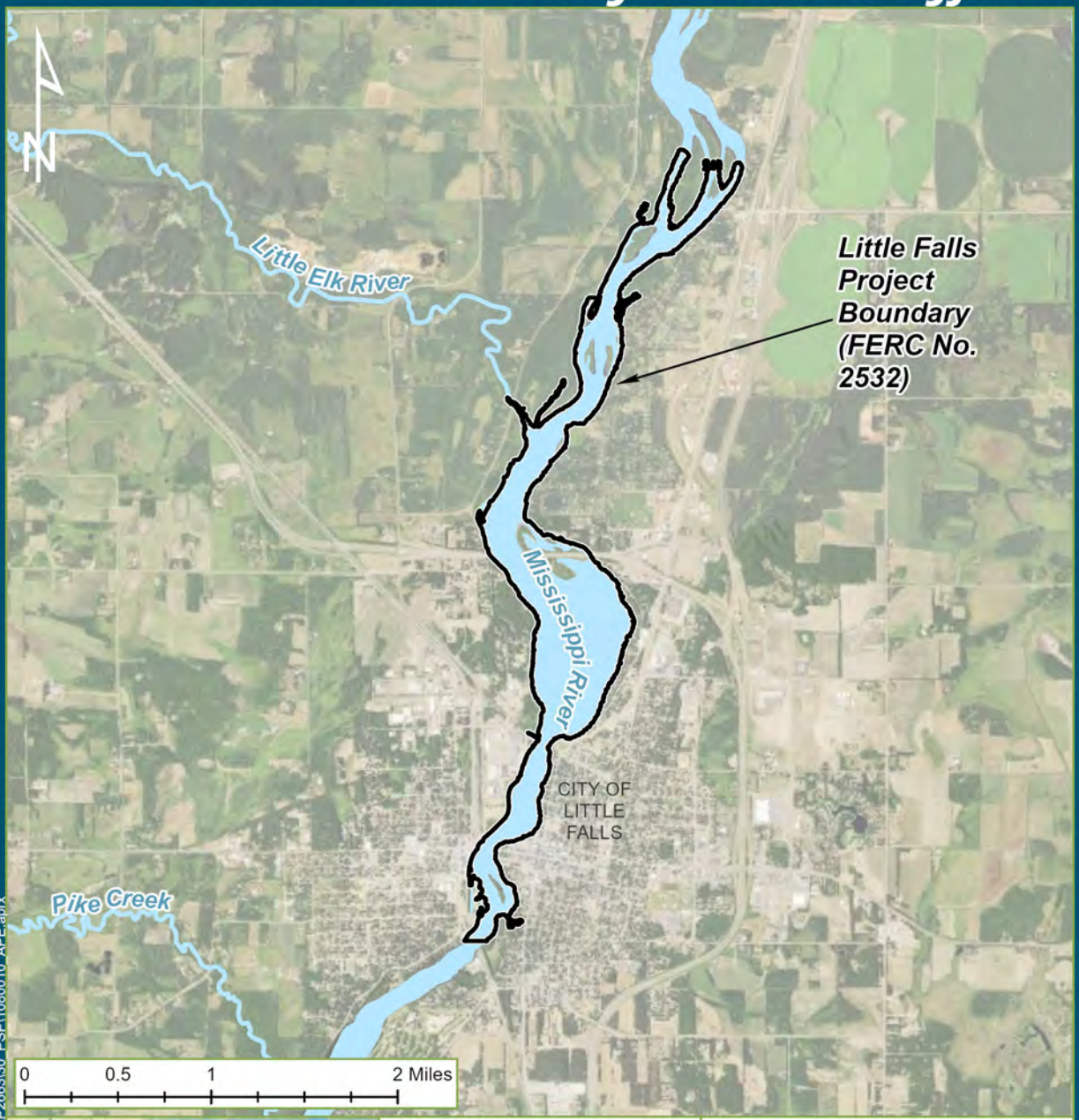
If **No**, this form is complete. If **Yes**, submit all of the following information:

☐ Attach the relevant portion of a 1:24000-scale USGS topographic map (photocopied or computer generated) ***with the project boundary marked***.

☐ Description of current and previous land use and disturbances: (See attached.)

☐ Any available information concerning known or suspected archaeological resources within the project area. (See attached.)

Little Falls Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power

Little Falls, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

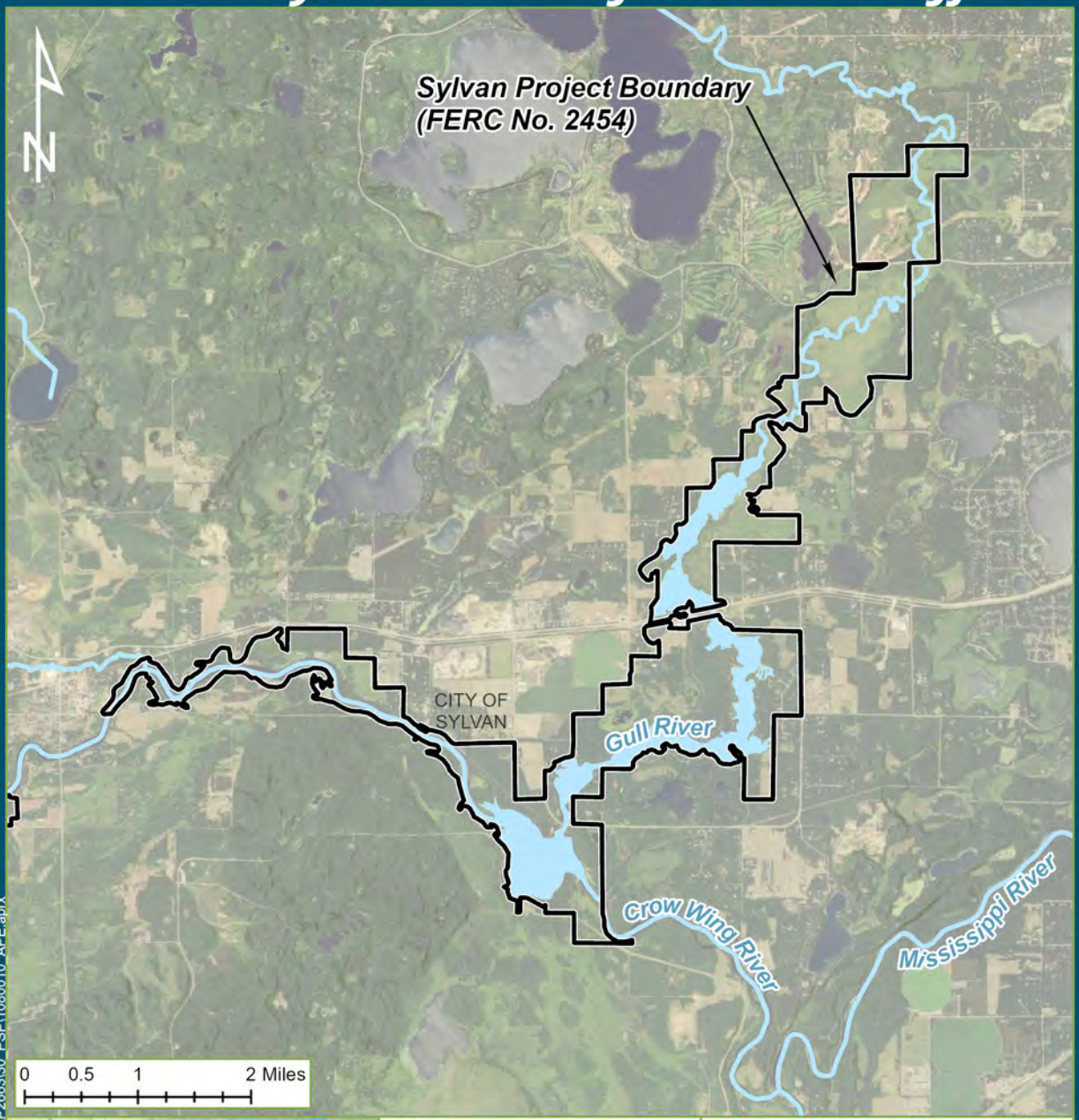
Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Sylvan Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power
Sylvan, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

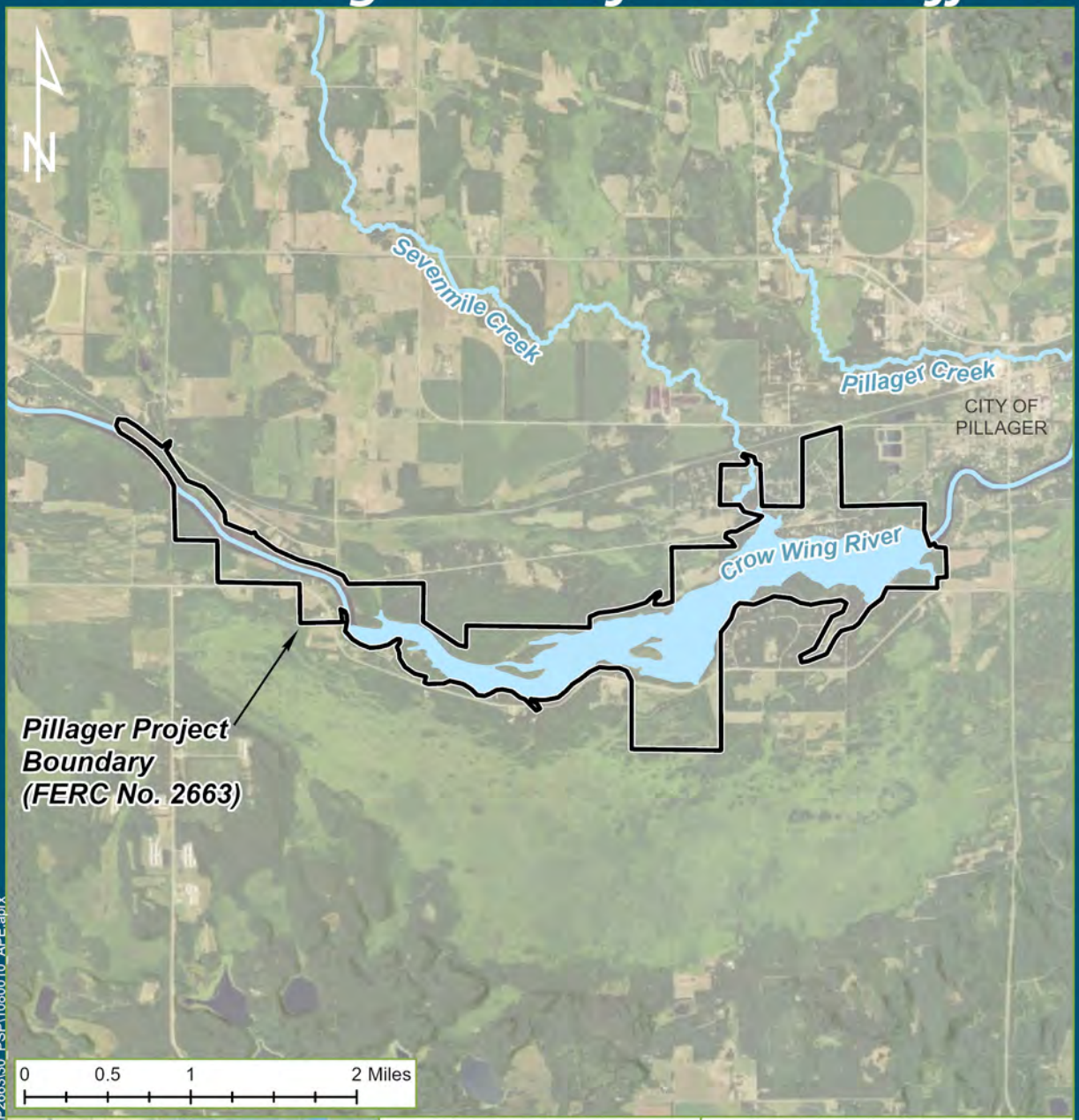
Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Pillager Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power
Pillager, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Subject: FW: OSA Review Form: Initial Study Report for Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects
Attachments: OSA Form Little Falls Sylvan Pillager ISR 2025_02_07.pdf

---

From: Lesley Brotkowski
Sent: Friday, February 7, 2025 3:26 PM
To: jennifer.tworzyanski@state.mn.us; mn.osa@state.mn.us
Cc: Gregory Prom (MP) <gprom@mnpower.com>; Matthew Radzak (MP) <mradzak@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@KleinschmidtGroup.com>
Subject: OSA Review Form: Initial Study Report for Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects

Jennifer,

The OSA review form for the Initial Study Report is attached. The public version of the Initial Study Report is available through the link below. The privileged version will be transmitted to you through a OneDrive link, which will be sent this afternoon in a separate email.

Thank you,
Lesley

DEPARTMENT OF ADMINISTRATION
STATE ARCHAEOLOGIST

PROJECT REVIEW FORM

Please complete all the fields marked with an asterisk (*).

This form is a fillable document. After completing this form, please send your request to:
OSA.Project.Reviews.adm@state.mn.us

REVIEW INFORMATION

1. **PROJECT NAME*:** Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663) Hydroelectric Projects Relicensings – Initial Study Report submittal
2. **PROJECT ID:** Click or tap here to enter text.
3. **REASON FOR REVIEW*:** FERC Relicensing – Initial Study Report submittal
4. **REVIEW TYPE*:** Review Request
5. **FUNDING*:** Other
6. **ORGANIZATION NAME:** ALLETE, Inc., doing business as Minnesota Power
7. **SUBMITTING ORGANIZATION TYPE:** Private

PROJECT INFORMATION

8. **PROJECT DESCRIPTION*:** The Initial Study Report (ISR) was filed with FERC for the Little Falls Project, Sylvan Project, and Pillager Project (Projects) relicensing process. The ISR includes historic architectural and archaeological study reports.
9. **ARCHAEOLOGICAL SITE NUMBERS (if known – if not, leave blank)** (Separate counties with commas)**:** Please see attached Phase I archaeological survey reports.
10. **COUNTY*** (Add multiples by separating with a comma)**:** Morisson, Crow Wing, Cass

11. BACKGROUND RESEARCH DONE (Check the appropriate box if any research has been completed or is in progress. If no research has been done, leave blank):

☐OSA Portal Query

☐MnDOT GIS

☐MnModel

☐Legacy Historic cemeteries

12. KNOWN RESOURCES ADJACENT TO REVIEW AREA (if known – if not, leave blank):

☒Cemeteries

☒Burials

☒Archaeological Sites

13. ADDITIONAL INFORMATION: FERC has designated ALLETE, Inc. as the non-federal representative for Section 106 consultation.

LOCATION INFORMATION* (If there are additional PLSS entries, please add a continuation sheet)

14. LOCATION INFORMATION (Complete this or Project Address if PLSS is not known):

Little Falls Hydroelectric Project:

PLSS - Township:130 Range:29 Range Direction (E or W):W Section:5, 32, 33

PLSS - Township:41 Range:32 Range Direction (E or W):W Section:13, 14, 23, 26, 27, 34, 35

PLSS - Township:40 Range:32 Range Direction (E or W):W Section:8, 18

PLSS - Township:129 Range:29 Range Direction (E or W):W Section:5, 6, 7, 8, 17, 18, 19

Sylvan Hydroelectric Project:

PLSS - Township:134 Range:29 Range Direction (E or W):W Section:21, 27, 28, 33, 34

PLSS - Township: 133 Range:29 Range Direction (E or W):W Section:3, 4, 5, 8, 9, 16, 17, 18, 19, 20, 21, 30, 31, 32

PLSS - Township:133 Range:30 Range Direction (E or W):W Section:13, 14, 15, 16, 21, 15, 24, 25

Pillager Hydroelectric Project:

PLSS - Township:133 Range:31 Range Direction (E or W):W Section:16, 21,,22, 23, 24, 25, 26, 27,

PLSS - Township:133 Range:30 Range Direction (E or W):W Section:19, 20, 29, 30

PLSS - Township: Range: Range Direction (E or W): Section:

PLSS - Township: Range: Range Direction (E or W): Section:

15. ADDRESS (if PLSS is not known, please enter your project address):

Address Line 1: Click or tap here to enter text.

Address Line 2: Click or tap here to enter text.

City: Click or tap here to enter text.

State: Click or tap here to enter text.

Zip Code: Click or tap here to enter text.

16. Maps of the project locations and Area of Potential Effects/FERC project boundaries are attached.

REQUESTOR INFORMATION

17. REQUESTED BY* (name): Greg Prom

18. REQUESTOR's EMAIL ADDRESS*: gprom@allete.com

19. REQUESTOR's PHONE NUMBER: 218-355-3191

20. REQUESTOR's PHYSICAL ADDRESS:

Address Line 1: 30 West Superior Street

City: Duluth

State: MN

Zip Code: 55802-2093

21. Please also copy Allete's relicensing consultant on correspondence:

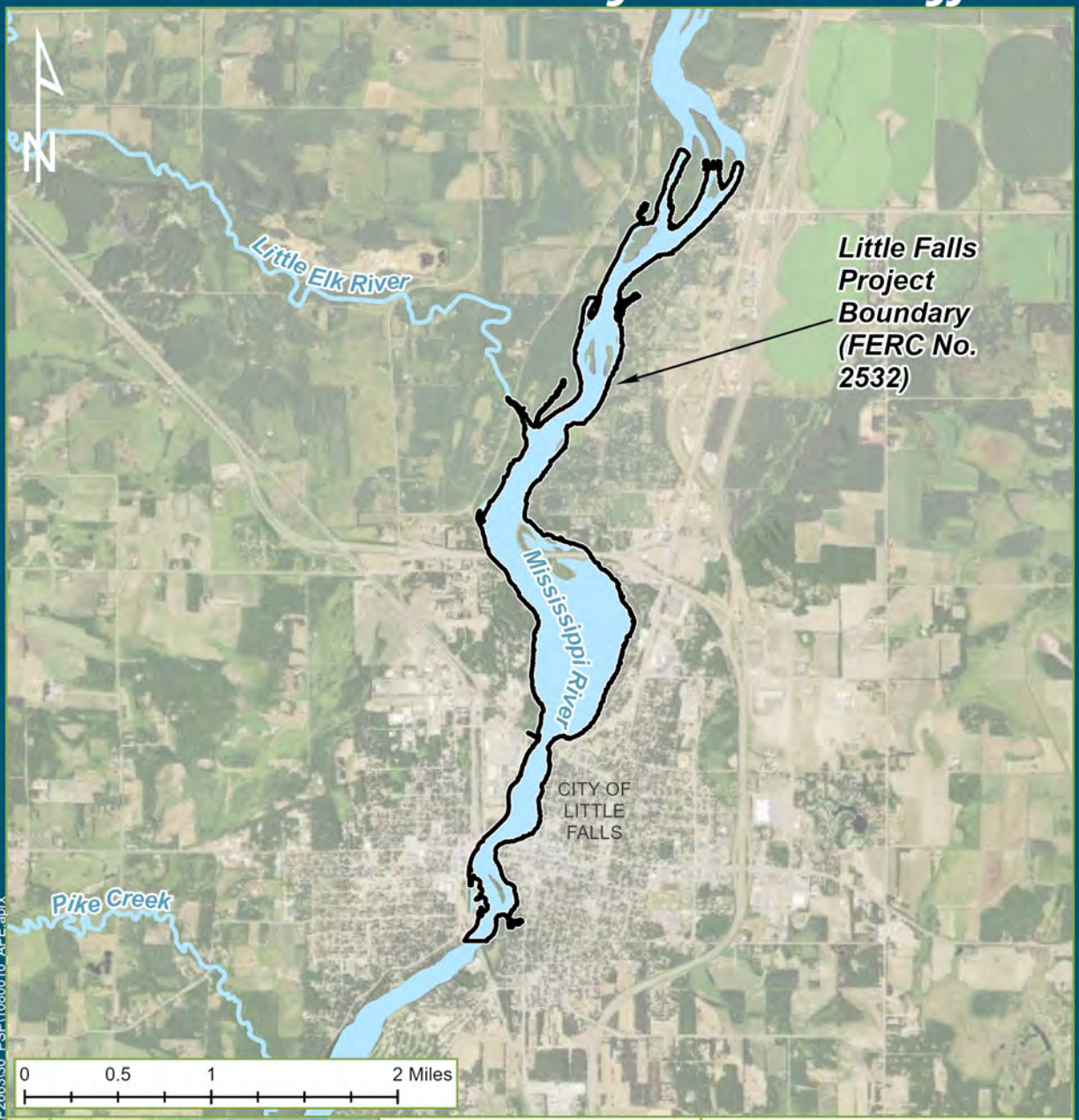
Lesley Brotkowski
Senior Licensing Coordinator
Kleinschmidt Associates
233403 Stettin Ridge Court
Wausau, WI 54401
Lesley.brotkowski@kleinschmidtgroup.com
715-318-3729

ADDITIONAL INFORMATION AND ATTACHMENTS

Please add and attach any pertinent photos, maps, or documents that will help us complete the review.

Maps of the project locations and Area of Potential Effects/FERC project boundaries are attached. A link to the Initial Study Report is provided in the email text. We are requesting your review of the Initial Study Report.

Little Falls Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power

Little Falls, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

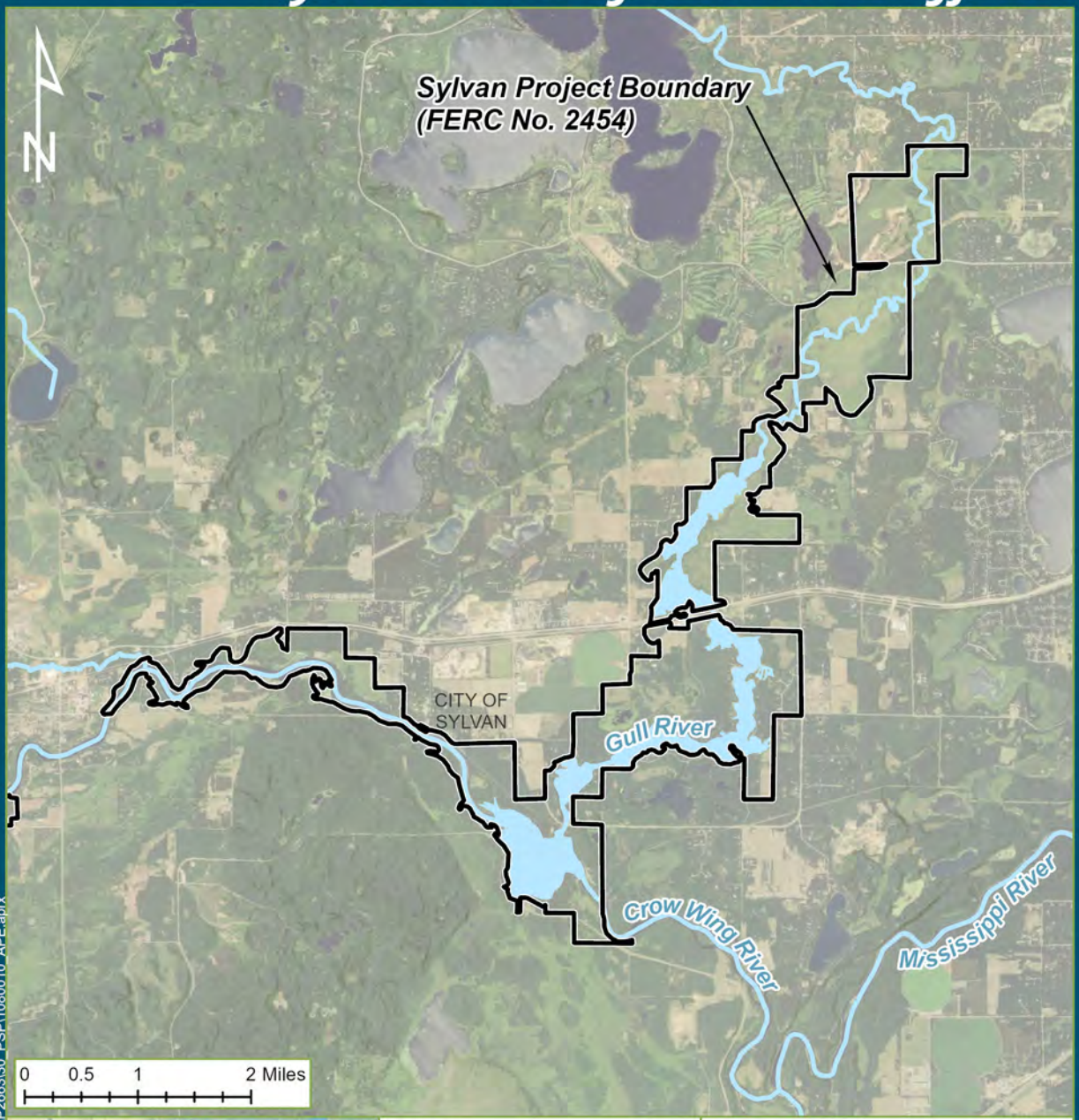
Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Sylvan Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power
Sylvan, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

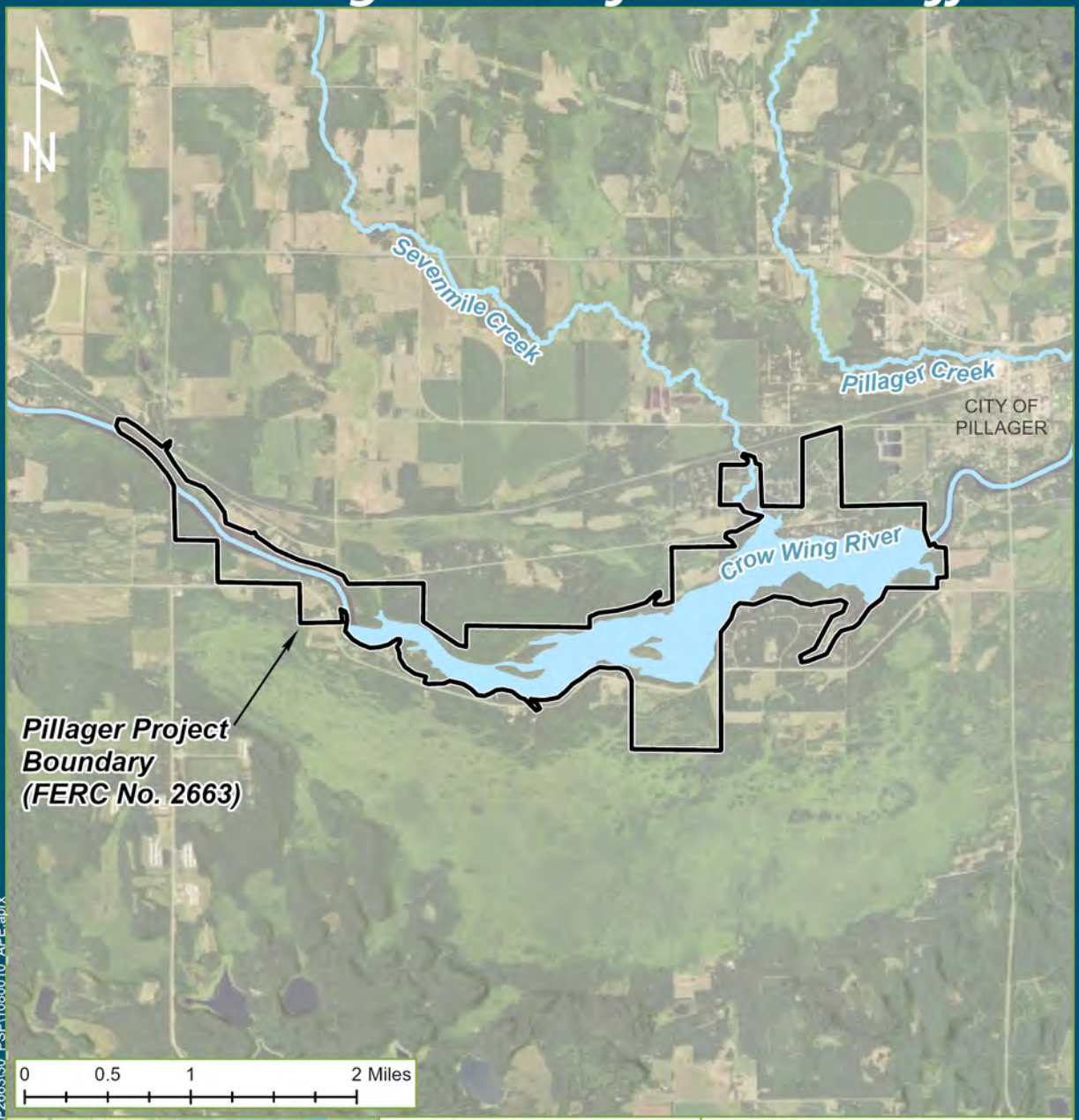
Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Pillager Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power
Pillager, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Subject: FW: MIAC Review Form: Initial Study Report for Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects
Attachments: MIAC Form Little Falls Sylvan Pillager ISR 2025_02_07.pdf

---

From: Lesley Brotkowski
Sent: Friday, February 7, 2025 3:33 PM
To: shannon.geshick@state.mn.us; george.goggleye@state.mn.us; MIAC.culturalresources@state.mn.us
Cc: Gregory Prom (MP) <gprom@mnpower.com>; Matthew Radzak (MP) <mradzak@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@KleinschmidtGroup.com>
Subject: MIAC Review Form: Initial Study Report for Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects

Shannon and George,

The MIAC review form for the Initial Study Report is attached. The public version of the Initial Study Report is available through the link below. The privileged version will be transmitted to you through a OneDrive link, which will be sent this afternoon in a separate email.

Thank you,
Lesley

MINNESOTA INDIAN AFFAIRS COUNCIL

PROJECT REVIEW FORM

Instructions to complete the form –

Please ensure that all the fields listed with an asterisk (*) are completed before you submit your request as they are mandatory and comprise the minimum information needed for us to fulfill your request.

This is a fillable document. After completing this form, you can either save it and send it to us electronically, or you can print it, and then scan the completed form and send it to us electronically.
When you are about to send us the completed form, please feel free to add additional attachments like photos, documents etc. that are complimentary to this request.
After completing this form please send your request to: **MIAC.culturalresources@state.mn.us**

Data Dictionary of the form fields

Project Name – The user can add a project name for the requested review. Example: Mounds Review, Historic Property Review etc.
Project ID – The user can create a unique identifier by which MIAC &/or OSA can communicate back to the user regarding their submitted request. Example: Mounds123, HPP789 etc.
Reason for Review – The user can add the reason they are submitting the review request.
Review Type – What is the type of review you are requesting.
Funding – If there is any funding attached to your request, please mark the appropriate selection.
Organization Name – If you are associated with an organization on whose behalf you are sending this request.
Submitting Organization Type – Please select the organization type you are associated with.
Project Description – Please write a detailed description of the project you would like reviewed.
Site Numbers – If you consulted the State Archaeologist portal and your proposed project intersected any sites add the site numbers as part of your request.
County – Please add the County(s) where the project is located.
Background Research Done – If you consulted any of the systems before sending this request.
Known Resources Adjacent to Review Area – If you are aware of any known cultural resources adjacent to your project area, please mark the selection(s) appropriately.
Additional Information – If there is any other additional information, you want us to know for us to work on your request.
Location Information (PLSS) – Please add the Township, Range, Range Direction, Section for the project you are wanting us to review [Complete this or Location Information (Project Address) if PLSS is not known].
Location Information (Project Address) – If PLSS is not known for your project, enter the project's address here.
Requested By – Name of the person submitting this request [this will be used for communication purposes only].
Requestor's Email Address – Valid email of the person submitting the request [this will be used for communication purposes only].
Requestor's Phone Number – Phone number of the person submitting the request [this will be used for communication purposes only].
Requestor's Physical Address – Physical address of the person submitting the request [this will be used for communication purposes only].
Attachments - Please add any pertinent photos, maps, documents etc. to accompany your request.

REVIEW INFORMATION

1. **PROJECT NAME*:** Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663) Hydroelectric Projects Relicensings – Initial Study Report submittal
2. **PROJECT ID:** Click or tap here to enter text.
3. **REASON FOR REVIEW*:** FERC Relicensing – Initial Study Report submittal
4. **REVIEW TYPE*:** Review Request
5. **FUNDING*:** Other
6. **ORGANIZATION NAME:** ALLETE, Inc., doing business as Minnesota Power
7. **SUBMITTING ORGANIZATION TYPE:** **Private**

PROJECT INFORMATION

8. **PROJECT DESCRIPTION*:** The Initial Study Report (ISR) was filed with FERC for the Little Falls Project, Sylvan Project, and Pillager Project (Projects) relicensing process. The ISR includes historic architectural and archaeological study reports.
9. **SITE NUMBERS** (Can add multiples by separating numbers out with a comma)**:** Please see attached Phase I archaeological survey reports.
10. **COUNTY***(Add multiples by separating names out with a comma)**:** Morisson, Crow Wing, Cass
11. **BACKGROUND RESEARCH DONE:**
    - ☐OSA Portal Query
    - ☐MnDOT GIS
    - ☐MnModel
    - ☐Legacy Historic cemeteries
12. **KNOWN RESOURCES ADJACENT TO REVIEW AREA:**
    - ☒Cemeteries
    - ☒Burials

☒Archaeological Sites

13. ADDITIONAL INFORMATION: FERC has designated ALLETE, Inc. as the non-federal representative for Section 106 consultation.

LOCATION INFORMATION* (If there are additional PLSS entries, please add a continuation sheet)

14. LOCATION INFORMATION (Complete this or Project Address if PLSS is not known):

Little Falls Hydroelectric Project:

PLSS - Township:130 Range:29 Range Direction (E or W):W Section:5, 32, 33
PLSS - Township:41 Range:32 Range Direction (E or W):W Section:13, 14, 23, 26, 27, 34, 35
PLSS - Township:40 Range:32 Range Direction (E or W):W Section:8, 18
PLSS - Township:129 Range:29 Range Direction (E or W):W Section:5, 6, 7, 8, 17, 18, 19

Sylvan Hydroelectric Project:

PLSS - Township:134 Range:29 Range Direction (E or W):W Section:21, 27, 28, 33, 34
PLSS - Township: 133 Range:29 Range Direction (E or W):W Section:3, 4, 5, 8, 9, 16, 17, 18, 19, 20, 21, 30, 31, 32
PLSS - Township:133 Range:30 Range Direction (E or W):W Section:13, 14, 15, 16, 21, 15, 24, 25

Pillager Hydroelectric Project:

PLSS - Township:133 Range:31 Range Direction (E or W):W Section:16, 21,,22, 23, 24, 25, 26, 27,
PLSS - Township:133 Range:30 Range Direction (E or W):W Section:19, 20, 29, 30

15. ADDRESS (if PLSS is not known, please enter your project address):

Address Line 1: Click or tap here to enter text.
Address Line 2: Click or tap here to enter text.
City: Click or tap here to enter text.
State: Click or tap here to enter text.
Zip Code: Click or tap here to enter text.

REQUESTOR INFORMATION

16. REQUESTED BY*: Greg Prom

17. REQUESTOR's EMAIL ADDRESS*: gprom@allete.com

18. REQUESTOR's PHONE NUMBER: 218-355-3191

19. REQUESTOR's PHYSICAL ADDRESS:

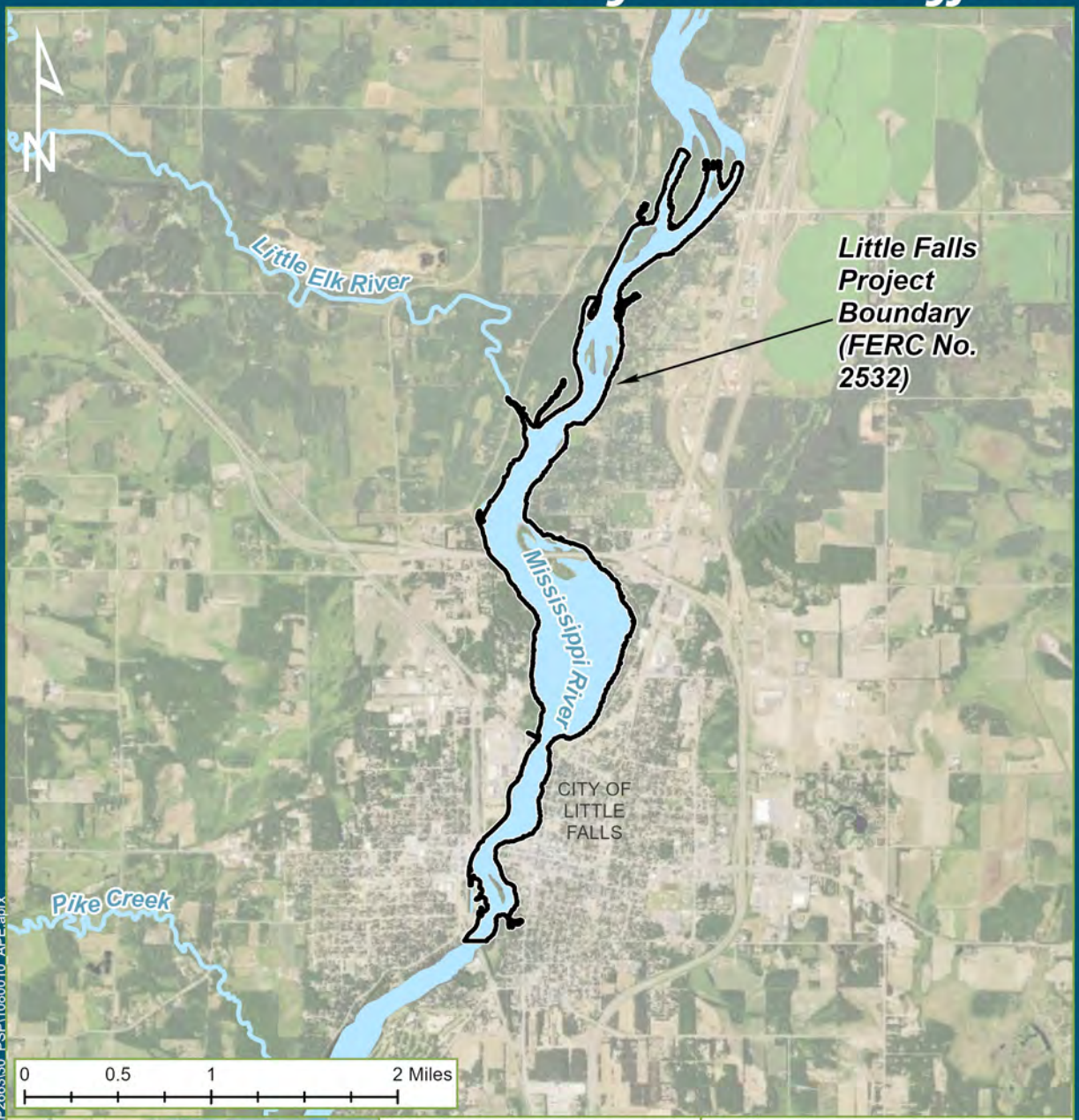
Address Line 1: 30 West Superior Street
Address Line 2: Click or tap here to enter text.
City: Duluth
State: MN
Zip Code: 55802-2093

ATTACHMENTS

Please add any pertinent photos, maps, or documents that are complimentary to the request which would assist us in fulfilling your request.

You can add attachments when you send this request electronically.

Little Falls Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power

Little Falls, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

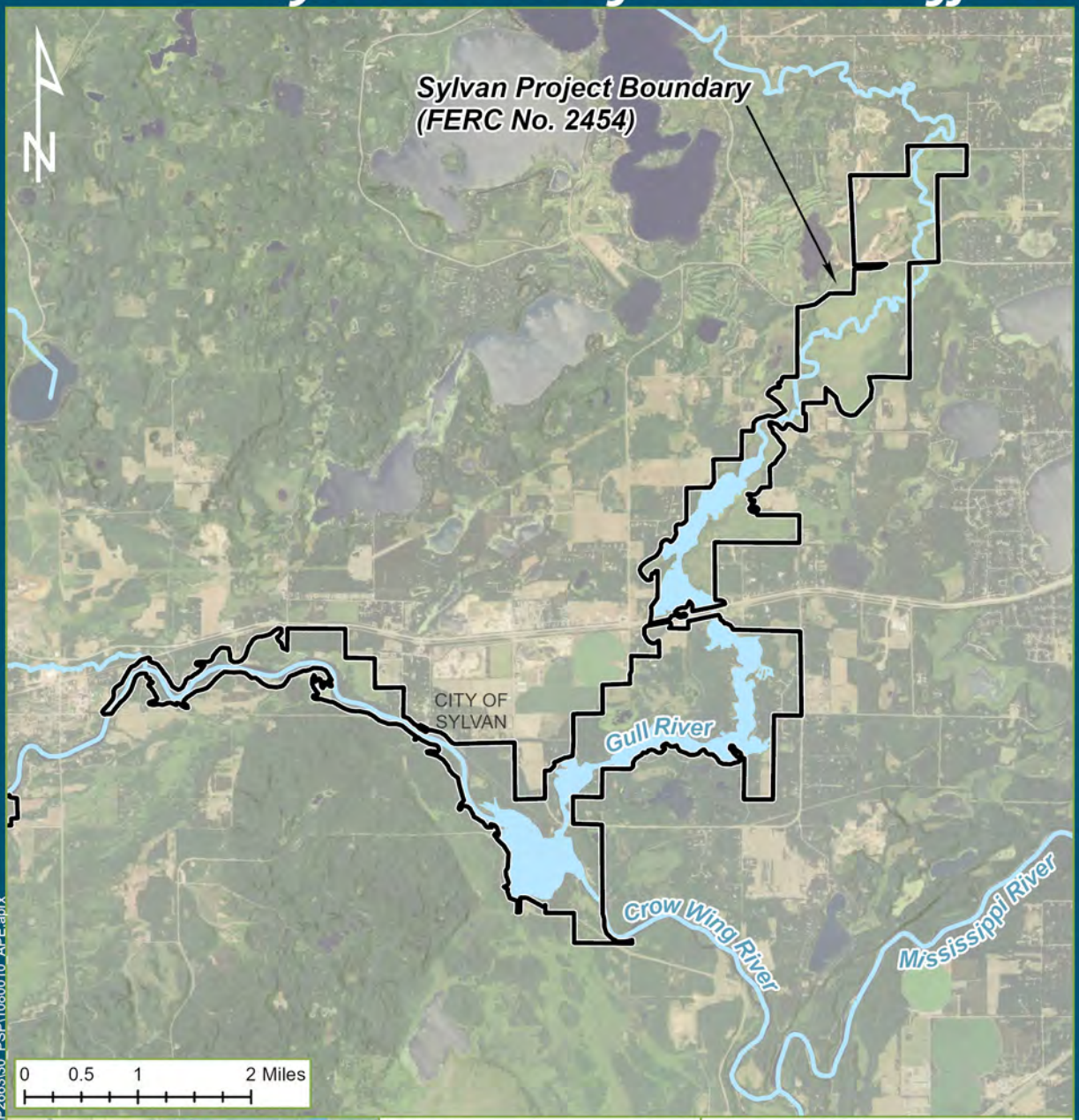
Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Sylvan Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power
Sylvan, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

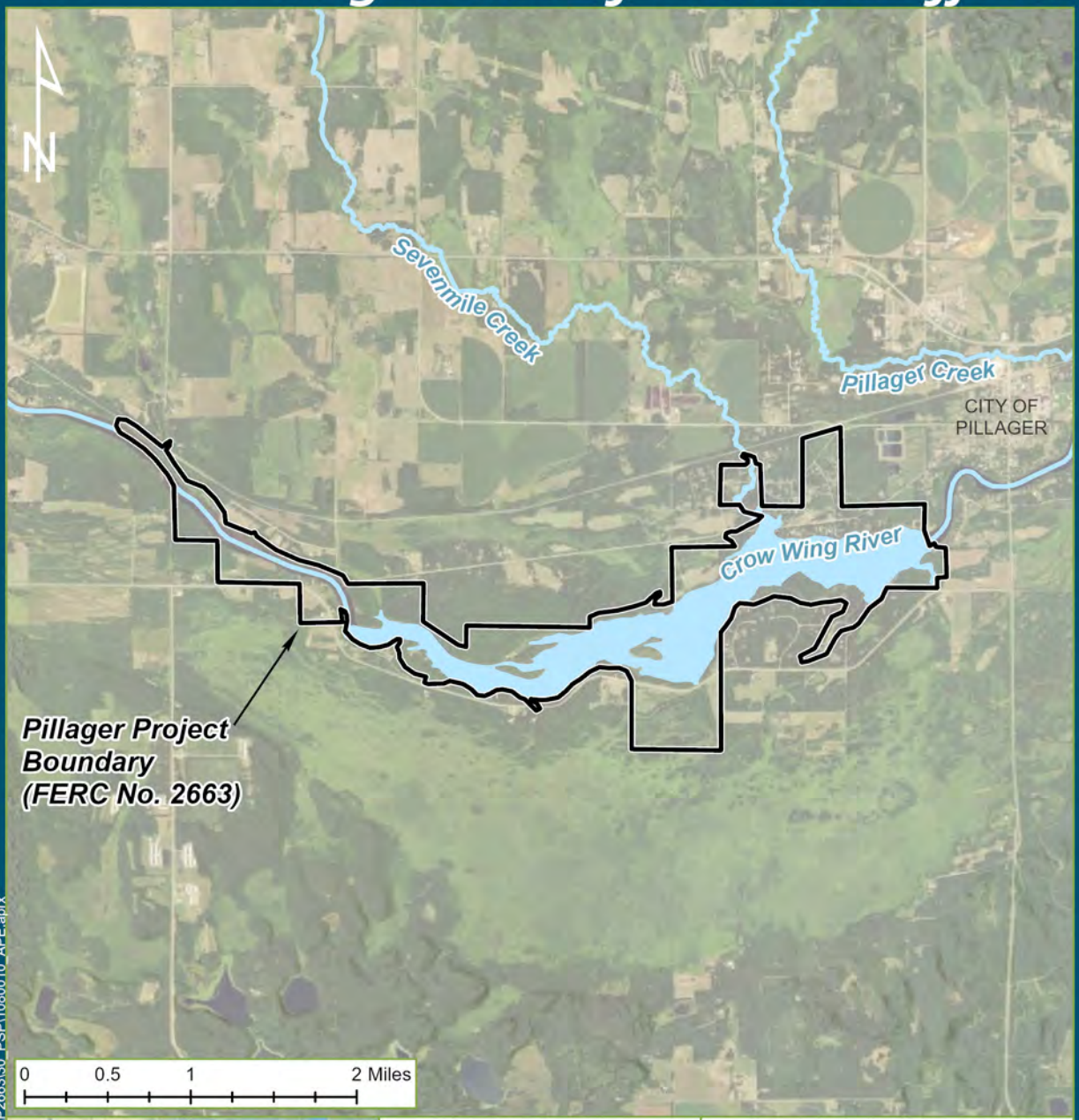
Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Pillager Area of Potential Effects





Legend

- APE
- Hydrography
- Waterbody

Minnesota Power
Pillager, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	08-31-2023	KPN	08-31-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

Path: O:\Client Data\FERC_Projects\P2663\30_PSP\1080010_APE.aprx

Date Printed: 9/5/2023

Source: Esri 2022, USCB 2021, USGS 2022

PN: 1080010.01

Subject: FW: PRIVILEGED Appendices: Initial Study Report for Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects

---

From: Lesley Brotkowski
Sent: Friday, February 7, 2025 4:10 PM
To: 'durell.cooper@apachetribe.org' <durell.cooper@apachetribe.org>; 'R.Blanchard@badriver-nsn.gov' <R.Blanchard@badriver-nsn.gov>; 'thpo@badriver-nsn.gov' <thpo@badriver-nsn.gov>; 'deputythpo@badriver-nsn.gov' <deputythpo@badriver-nsn.gov>; 'rwassana@cheyenneandarapaho-nsn.gov' <rwassana@cheyenneandarapaho-nsn.gov>; 'Anthony.Reider@fsst.org' <Anthony.Reider@fsst.org>; 'jeffery.stiffarm@ftbelknap.org' <jeffery.stiffarm@ftbelknap.org>; 'trhodd@iowas.org' <trhodd@iowas.org>; 'chairman@kbic-nsn.gov' <chairman@kbic-nsn.gov>; 'ldfthpo@ldftribe.com' <ldfthpo@ldftribe.com>; 'jim.williams@lvd-nsn.gov' <jim.williams@lvd-nsn.gov>; 'alina.shively@lvd-nsn.gov' <alina.shively@lvd-nsn.gov>; 'lisa.brunk@lvd-nsn.gov' <lisa.brunk@lvd-nsn.gov>; 'robert.larsen@lowersioux.com' <robert.larsen@lowersioux.com>; 'chairman@mitw.org' <chairman@mitw.org>; 'cchavers@boisforte-nsn.gov' <cchavers@boisforte-nsn.gov>; 'brucesavage@fdlband.org' <brucesavage@fdlband.org>; 'robertdeschampe@grandportage.com' <robertdeschampe@grandportage.com>; 'Faron.Jackson@llojibwe.net' <Faron.Jackson@llojibwe.net>; 'virgil.wind@millelacsband.com' <virgil.wind@millelacsband.com>; 'Susan.Klapel@millelacsband.com' <Susan.Klapel@millelacsband.com>; 'Michael.Fairbanks@whiteearth-nsn.gov' <Michael.Fairbanks@whiteearth-nsn.gov>; 'Mike.LaRoque@whiteearth-nsn.gov' <Mike.LaRoque@whiteearth-nsn.gov>; 'jbruce@mnchippewatribe.org' <jbruce@mnchippewatribe.org>; 'Sbartell@piic.org' <Sbartell@piic.org>; 'nicole.boyd@redcliff-nsn.gov' <nicole.boyd@redcliff-nsn.gov>; 'dseki@redlakenation.org' <dseki@redlakenation.org>; 'alonzo.denney@ssndakota.com' <alonzo.denney@ssndakota.com>; 'Businesscouncil@shakopeedakota.org' <Businesscouncil@shakopeedakota.org>; 'Chairman@swo-nsn.gov' <Chairman@swo-nsn.gov>; 'robert.vanzile@scc-nsn.gov' <robert.vanzile@scc-nsn.gov>; 'LStreet@spiritlakenation.com' <LStreet@spiritlakenation.com>; 'info@standingrock.org' <info@standingrock.org>; 'kathleen.woodenknife@rst-nsn.gov' <kathleen.woodenknife@rst-nsn.gov>; 'jamie.azure@tmbci.org' <jamie.azure@tmbci.org>; 'kevinj@uppersiouxcommunity-nsn.gov' <kevinj@uppersiouxcommunity-nsn.gov>; 'lucy.harrington@state.mn.us' <lucy.harrington@state.mn.us>; 'ENReviewSHPO@state.mn.us' <ENReviewSHPO@state.mn.us>; 'shannon.geshick@state.mn.us' <shannon.geshick@state.mn.us>; 'MIAC.culturalresources@state.mn.us' <MIAC.culturalresources@state.mn.us>; george.goggleye@state.mn.us; 'jennifer.tworzyanski@state.mn.us' <jennifer.tworzyanski@state.mn.us>; 'mn.osa@state.mn.us' <mn.osa@state.mn.us>
Cc: Gregory Prom (MP) <gprom@mnpower.com>; Matthew Radzak (MP) <mradzak@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@KleinschmidtGroup.com>
Subject: PRIVILEGED Appendices: Initial Study Report for Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects

Good afternoon,

On February 7, 2025, ALLETTE, Inc., doing business as Minnesota Power, filed with the Federal Energy Regulatory Commission (FERC) the Initial Study Report (ISR) for the Little Falls Hydroelectric Project (P-2532), Sylvan Hydroelectric Project (P-2454), and the Pillager Hydroelectric Project (P-2663) (link below). The cultural resource studies were filed with FERC as privileged documents. We are submitting to you the following PRIVILEGED reports.

- Phase I Architectural History Survey and Evaluation for the Little Falls Hydroelectric Relicensing Project (Privileged)
- Phase I Archaeological Investigation and Conditions Assessment of Archaeological Sites for the Little Falls Hydroelectric Relicensing Project (Privileged)

- Phase I Architectural History Reconnaissance Survey for the Sylvan Hydroelectric Relicensing Project (Privileged)
- Phase I Archaeological Investigation and Conditions Assessment of Archaeological Sites for the Sylvan Hydroelectric Relicensing Project (Privileged)
- Phase I Architectural History Reconnaissance Survey for the Pillager Hydroelectric Relicensing Project (Privileged)
- Phase I Archaeological Investigation and Conditions Assessment of Archaeological Sites for the Pillager Hydroelectric Relicensing Project (Privileged)

These reports are available through a OneDrive link: Little Falls Sylvan Pillager ISR PRIVILEGED Appendices

We request that these documents be treated as privileged material. If you have any questions regarding this filing, please contact me at the contact information below, or Greg Prom, ALLETE, Inc. Senior Environmental Compliance Specialist at gprom@allete.com.

Thank you,
Lesley Brotkowski
Senior Regulatory Advisor
Kleinschmidt
Office: 715-318-3729

From: MN_ADM_ENV Review SHPO <ENReviewSHPO@state.mn.us>
Sent: Friday, February 7, 2025 3:16 PM
To: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>
Subject: Automatic reply: Initial Study Report for Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects

Thank you contacting the Minnesota State Historic Preservation Office via the Environmental Review Program mailbox.

If you've submitted a project review request, this message serves as **confirmation** that we have received your email.

Please Note: The Environmental Review Team continues to experience a high volume of project submissions, and most review times can take between 45-60 days to complete. Currently, the Team has vacant positions with staff taking on additional responsibilities, and as a result, some reviews may take longer, including our response time to questions and inquiries. As agencies submit projects for review, we ask you please plan for a longer response times from SHPO.

- Please continue to send projects for review to ENReviewSHPO@state.mn.us.
- General environmental review inquiries should be directed to MNSHPO@state.mn.us where your request will be redirected to the appropriate SHPO team member.

We value and appreciate your partnership and understand the impacts when there is uncertainty around project timelines. We have made strides recently with the launch of Minnesota's Statewide Historic Inventory Portal (MnSHIP) allowing greater online access to historic inventories, and we continue to accept electronic project submissions, a change made in 2020 due to the pandemic.

Sincerely,

Environmental Review Program Team
State Historic Preservation Office
Minnesota Department of Administration

For information on submitting projects for review, please visit the Environmental Review Program Website.

From: Goggleye Jr, George J (MIAC) <George.Goggleye@state.mn.us>
Sent: Monday, February 10, 2025 7:52 AM
To: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>; Geshick, Shannon (MIAC) <shannon.geshick@state.mn.us>; MIAC Cultural Resources <MIAC.culturalresources@state.mn.us>
Cc: Gregory Prom (MP) <gprom@mnpower.com>; Matthew Radzak (MP) <mradzak@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>
Subject: RE: MIAC Review Form: Initial Study Report for Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects

Good morning,

I will perform the initial data entry regarding this review and upload the information if this already hasn't been done.

Thank you

George Goggleye Jr
Cultural Resource Manager
Minnesota Indian Affairs Council (MIAC)
616 Beltrami Ave Suite 170
Bemidji, MN 56601
Cell: 612-456-8028

To protect the sovereignty of the tribal nations who share geography with the state of Mni Sota and ensure the well being of all American Indian citizens throughout the state.

mn.gov/indianaffairs

MINNESOTA
INDIAN AFFAIRS COUNCIL

From: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>
Sent: Friday, February 7, 2025 2:33 PM
To: Geshick, Shannon (MIAC) <shannon.geshick@state.mn.us>; Goggleye Jr, George J (MIAC) <George.Goggleye@state.mn.us>; MIAC Cultural Resources <MIAC.culturalresources@state.mn.us>
Cc: Gregory Prom (MP) <gprom@mnpower.com>; Matthew Radzak (MP) <mradzak@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>
Subject: MIAC Review Form: Initial Study Report for Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects

Shannon and George,

The MIAC review form for the Initial Study Report is attached. The public version of the Initial Study Report is available through the link below. The privileged version will be transmitted to you through a OneDrive link, which will be sent this afternoon in a separate email.

Thank you,
Lesley

From:	Lesley Brotkowski
To:	Wilde, William (MPCA)
Cc:	Gregory Prom (MP); Elizabeth Krchnavek
Subject:	ISR Meeting Presentation and Schedule - Little Falls, Sylvan, Pillager Hydro Projects
Date:	Wednesday, February 19, 2025 2:11:00 PM
Attachments:	Little Falls Sylvan Pillager ISR Meeting 2025_02_19.pdf image001.gif

---

Hi Bill,

Thank you for attending the Initial Study Report (ISR) meeting today for the Little Falls, Sylvan, and Pillager Hydroelectric Projects. A copy of today's presentation is attached. The FERC process overview and schedule is included in the presentation.

The ISR filed with FERC includes the reports for studies presented today:
https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20250207-5138

Thank you,

Lesley Brotkowski
Senior Regulatory Advisor

Office: 715-318-3729
www.KleinschmidtGroup.com

From: Lesley Brotkowski
Sent: Wednesday, February 19, 2025 4:24 PM
To: Clerk <clerk@sylvantwp.com>
Cc: Gregory Prom (MP) <gprom@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@KleinschmidtGroup.com>
Subject: RE: Question

Hi Jenna,

Thank you for attending the Initial Study Report Meeting for the Little Falls, Sylvan, and Pillager Hydroelectric Projects today. A copy of the presentation is attached.

Lesley

From: Clerk <clerk@sylvantwp.com>
Sent: Wednesday, February 19, 2025 10:10 AM
To: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>
Subject: Question

Hi Lesley, is it possible to get a copy of the slides from today's meeting that I could provide for my Township Board to review?

Thanks,

Jenna Ruggles
Clerk/Treasurer, Sylvan Township
clerk@sylvantwp.com
218.746.3652

From:	Lesley Brotkowski
To:	Harrington, Lucy (She/Her/Hers) (ADM); MN_ADM_ENV Review SHPO
Cc:	Gregory Prom (MP); Matthew Radzak (MP); Elizabeth Krchnavek
Subject:	SHPO Review Form - Little Falls, Sylvan, Pillager Hydroelectric Projects - Initial Study Report Meeting Summary
Date:	Thursday, February 27, 2025 5:33:42 PM
Attachments:	SHPO Rev Form Little Falls Sylvan Pillager ISR Meeting Summary 2025_02_27.pdf

---

Hi Lucy,

The SHPO review form for the Initial Study Report Meeting Summary provided below is attached.

Thank you,
Lesley

Please mail the completed form and required material to:

ENReviewSHPO@state.mn.us

DEPARTMENT OF ADMINISTRATION

Request for Project Review by the State Historic Preservation Office (SHPO)

○ This is a new submittal

◉ This is additional information relating to SHPO Project #: 2023-1267 **DATE:** 2/27/2025

I. GENERAL PROJECT INFORMATION

Project Title: Little Falls (FERC P-2532), Sylvan (FERC P-2454), Pillager (FERC P-2663 Hydro Projects ISR Meeting Summary

Project Address (or Location): Please see attached maps

City / Township (circle one): See attachment Zip: See attachment County: Morrison, Crow Wing, Cass

Legal Description: Township Attachment Range Attachment E/W (circle one) Section Attachment Quarter-section Attachment

II. PROJECT CONTACT INFORMATION

Project Contact Name: Greg Prom Title: Senior Environmental Compliance Specialist

Company/Agency: ALLETE, Inc., d.b.a. Minnesota Power

Street Address: 30 West Superior Street Phone Number: 218-355-3191

City: Duluth State: MN Zip: 55802-2093 Email: gprom@allete.com

III. FEDERAL AND/OR STATE INVOLVEMENT

Federal Agency (if applicable): Federal Energy Regulatory Commission (FERC) relicensing
(Agency providing funds, licenses, or permits)
Permit or Project Reference #: P-2532, P-2454, P-2663

State Agency (if applicable): N/A
(Agency providing funds, licenses, or permits)
Permit or Project Reference #: N/A

Local Agency (if applicable): N/A

(Continued on Reverse Side)

Please refer to *Instructions for Completing the Request for Project Review* form on our website. Submit one *Request for Project Review* form for each project. For questions regarding the SHPO review process, please visit our website or contact Kelly Gragg-Johnson (651-201-3285) or Leslie Coburn (651-201-3286) or by email at ENReviewSHPO@state.mn.us.

IV. PROJECT DESCRIPTION AND BOUNDARIES

A) REQUIRED FOR ALL PROJECTS

☑ Write a detailed description of the proposed project. (See attached.)

Please see attached. The Initial Study Report (ISR) meeting summary was filed with FERC for the Little Falls Project, Sylvan Project, and Pillager Project (Projects) relicensing process.

☑ Attach a map of project location, with project area(s) clearly marked. Road names must be included and legible.

B) Architecture

Are there any buildings or structures within the project area? ◉ Yes ○ No

If **No**, continue to the Archaeology section below. If **Yes**, submit all of the following information:

☑ List all buildings and structures within the project area and the year they were built. (See attached.)

Please see previous submittals. This is a supplemental filing.

☐ Photographs of ***each*** building and structure located within the project area, along with a photo key. Include streetscape images, if applicable. All photographs must be clear, crisp, focused, and taken at ground level. Aerial photos are insufficient.

☑ List known historic buildings or structures located within the project area (i.e., individual properties or districts which are listed in the National Register or which meet the criteria for listing in the National Register). (See attached.)

Please see previous submittals. This is a supplemental filing.

C) Archaeology

Does the proposed undertaking involve ground-disturbing activity? ○ Yes ◉ No

If **No**, this form is complete. If **Yes**, submit all of the following information:

☐ Attach the relevant portion of a 1:24000-scale USGS topographic map (photocopied or computer generated) ***with the project boundary marked***.

☐ Description of current and previous land use and disturbances: (See attached.)

☐ Any available information concerning known or suspected archaeological resources within the project area. (See attached.)

From: Harrington, Lucy (She/Her/Hers) (ADM) <Lucy.Harrington@state.mn.us>
Sent: Friday, May 16, 2025 7:07 PM
To: Lesley Brotkowski <Lesley.Brotkowski@kleinschmidtgroup.com>
Cc: Gregory Prom (MP) <gprom@mnpower.com>; Matthew Radzak (MP) <mradzak@mnpower.com>; Elizabeth Krchnavek <Elizabeth.Krchnavek@kleinschmidtgroup.com>
Subject: RE: SHPO Review Form - Initial Study Report for Little Falls (P-2532), Sylvan (P-2454), and Pillager (P-2663) Hydroelectric Projects

Good evening,

Please find attached MN SHPO's comments on the Initial Study Report. I apologize for the extreme delay with which we are sending these comments. We are requesting revisions on all 6 reports.

Thank you,
Lucy

Lucy Harrington (she/her) **| Environmental Review Archaeologist**
State Historic Preservation Office
Minnesota Department of Administration
50 Sherburne Avenue, Suite 203
Saint Paul, Minnesota 55155
(651) 201-3283 | lucy.harrington@state.mn.us

May 16, 2025 **VIA E-MAIL**

Greg Prom
Senior Environmental Compliance Specialist
ALLETE, Inc. d.b.a. Minnesota Power
30 West Superior Street
Duluth, MN 55802-2093

RE: FERC No. 2532 Little Falls Hydroelectric Project
FERC No. 2454 Sylvan Hydroelectric Project
FERC No. 2663 Pillager Hydroelectric Project
Section 106 Consultation Regarding the Proposed Relicensing of Hydroelectric Projects
Cass, Crow Wing, and Morrison Counties, Minnesota
SHPO Number: 2023-1267 (Little Falls), 2023-3430 (Sylvan), and 2023-3431 (Pillager)

Dear Mr. Prom,

Thank you for continuing consultation with our office regarding the above undertakings. In accordance with the notice issued by the Federal Energy Regulatory Commission (FERC) on May 26, 2023 designating ALLETE/Minnesota Power (MP) as non-federal representative, we are continuing consultation on the above referenced undertakings pursuant to the responsibilities given the State Historic Preservation Officer Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) and its implementing federal regulations, "Protection of Historic Properties" (36 CFR Part 800).

We have completed a review of your submittal dated February 7, 2025 which included six (6) reports listed below as part of the Initial Study Report. We apologize for the extreme delay with which we are sending out comments. The size of this submittal was very large.

- *Phase I Architectural History Reconnaissance Survey for the Little Falls Hydroelectric Relicensing Project (FERC License No. P-2532), Morrison County, Minnesota* (Merjent, Inc., February 2025)
- *Phase I Architectural History Reconnaissance Survey for the Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454), Cass, Crow Wing, Morrison Counties, Minnesota* (Merjent, Inc., February 2025)
- *Phase I Architectural History Reconnaissance Survey for the Pillager Hydroelectric Relicensing Project (FERC License No. P-2663), Cass and Morrison Counties, Minnesota* (Merjent, Inc., January 2025)
- *Phase I Archaeological Investigation and Conditions Assessment of Archaeological Sites for the Little Falls Hydroelectric Relicensing Project (FERC License No. P-2532) Morrison County, Minnesota* (Merjent, Inc., February 2025)
- *Phase I Archaeological Investigation and Conditions Assessment of Archaeological Sites for the Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454) Cass, Crow Wing, and Morrison Counties, Minnesota* (Merjent, Inc., February 2025)
- *Phase I Archaeological Investigation and Conditions Assessment of Archaeological Sites for the Pillager Hydroelectric Relicensing Project (FERC License No. P-2663) Cass and Morrison Counties, Minnesota* (Merjent, Inc., February 2025)

We provide the following comments on the above listed reports grouped by subject.

Architecture History Reports Comments

All three reports have errors and incomplete information. **Please revise and resubmit the reports after addressing the comments about specific properties outlined below.** Be sure to follow the "Survey Report Requirements" on page 13 of the Historic and Architectural Survey Manual before revising, finalizing, and resubmitting the reports.

The inventory forms submitted to the Minnesota Statewide Historic Inventory Portal (MnSHIP) are incomplete. Although limited information on select properties is available within the reports, the MnSHIP record must have complete information for the documentation to meet the Secretary of the Interior's Standards for Identification. In MnSHIP, the "Attachments" section is for uploading narrative descriptions, a statement of significance, bibliography, maps, images, and other information needed to document the property in a manner that meets the Secretary of the Interior's Standards. See the Historic and Architectural Survey Manual for guidance on attachment pages and other supplementary information. Although there is no standard attachment, a template can be found in Appendix C of the MnSHIP User Guide. **Please resubmit inventory forms with complete information so that we may review and comment on the following properties:**

Little Falls Hydroelectric Relicensing Project (FERC License No. P-2532; SHPO #2023-1267)

- MO-LFC-00837: BNSF Railroad Bridge
- MO-LFC-00838: Little Falls Hydroelectric Station

Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454; SHPO #2023-3430)

- CA-SLV-00012: [redacted], Pillager, MN
- CA-SLV-00013: [redacted], Brainerd, MN
- CA-SLV-00014: [redacted], Pillager, MN
- CA-SLV-00015: [redacted], Pillager, MN
- CA-SLV-00016: [redacted], Pillager, MN
- CA-SLV-00017: [redacted], Pillager, MN
- CA-SLV-00018: [redacted], Pillager, MN

Pillager Hydroelectric Relicensing Project (FERC License No. P-2663, SHPO #2023-3431)

- CA-SLV-00019: [redacted], Pillager, MN
- CA-SLV-00020: [redacted], Pillager, MN
- CA-SLV-00021: [redacted], Pillager, MN
- CA-SLV-00022: [redacted], Pillager, MN
- MO-MOT-00004: [redacted], Motley, MN
- MO-MOT-00005: [redacted], Motley, MN
- MO-MOT-00006: [redacted], Motley, MN
- MO-ROS-00003: [redacted], Pillager, MN
- MO-ROS-00004: [redacted], Pillager, MN
- MO-ROS-00005: [redacted], Pillager, MN
- MO-ROS-00006: [redacted], Pillager, MN
- MO-ROS-00007: [redacted], Pillager, MN

The survey reports appear to be adopting evaluations made as part of earlier surveys. The Minnesota State Historic Preservation Office considers any eligibility determinations made ten or more years before the date of the current survey to be out of date. The properties must be resurveyed (see page 9 of the Historic and Architectural Survey Manual) and updated in MnSHIP (see page 33 of the MnSHIP User Guide). **Please provide updated inventory forms for the following properties, all of which were last surveyed more than 10 years ago:**

Privileged information redacted

Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454; SHPO #2023-3430)

- CA-SLV-00003: Sylvan Hydroelectric Powerplant Facilities. Merjent did not submit an updated inventory form for the property despite the report noting the property was surveyed. The property was last surveyed in 1991.
- CA-SLV-00005: Bridge 11508. Merjent did not submit an updated inventory form for the property. The property was last surveyed in 2010. *Note: the report calls this County Road 36, which is incorrect.*

Pillager Hydroelectric Relicensing Project (FERC License No. P-2663, SHPO #2023-3431)

- CA-MAY-00003: Road Fragment. Merjent did not submit an updated inventory form for the property. This property is likely part of the Fort Ripley Military Road and was last surveyed in 1991.
- CA-PLC-00002: Pillager Hydroelectric Facility. Merjent did not submit an updated inventory form for the property despite the report noting the property was surveyed. The property was last surveyed in 1992.
- CA-SLV-00002: Fort Ripley Military Road: Sylvan Twp. Merjent did not submit an updated inventory form for the property. This property was last surveyed in 1991.

The survey reports also appear to be adopting previous evaluations completed within the last 10 years for the following properties; **we agree these properties are not eligible for inclusion in the National of Historic Places (NRHP)** :

Little Falls Hydroelectric Relicensing Project (FERC License No. P-2532; SHPO #2023-1267)

- MO-GRE-00191: Bridge 49010 (Not Eligible, March 2023) *Note: this is <u>not</u> a duplicate for XX-ROD-00040 as suggested by the report; these are two separate resources.*
- MO-GRE-00196: Bridge 49529 (Not Eligible, March 2023)
- MO-LFC-00161: Bridge No. 5907 (Not Eligible, March 2023) *Note: this is <u>not</u> a duplicate for XX-ROD-00180 as suggested by the report; these are two separate resources.*
- XX-ROD-00040: Trunk Highway 10 (Not Eligible, November 2020) *Note: this is <u>not</u> a duplicate for MO-GRE-00191 as suggested by the report; these are two separate resources.*
- XX-ROD-00180: TH 27 (Not Eligible, December 2021) *Note: this is <u>not</u> a duplicate for MO-LFC-00161 as suggested by the report; these are two separate resources.*
- XX-RRD-NPR022: St. Paul and Northern Pacific Railway (Not Eligible, December 2022) *Note: this inventory record incorporates and supersedes TO-RRD-00001, an inventory number that has been retired as noted in MnSHIP.*

Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454; SHPO #2023-3430)

- CW-UOG-00001: Bridge 18508 (Not Eligible, March 2023) *Note: the report calls this Bridge 11508, which is incorrect.*

The survey reports do not provide sufficient information to justify the lack of survey or evaluation for several properties within the APE. Although the reports note that survey or evaluation was not completed due to lack of access and lack of visibility from public roads, the reports also indicate it is unlikely the project would affect the properties. The photographs provided illustrate the lack of visibility from the public way. However, a lack of access or visibility cannot be reasoning for a conclusion that the project would not affect the properties. **Please provide aerial photographs with the APE delineated, annotate the images with the inventory numbers, and describe the basis for concluding the project will not affect the following properties:**

Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454; SHPO #2023-3430)

- CA-SLV-00012: [redacted], Pillager, MN
- CA-SLV-00013: [redacted], Brainerd, MN
- CA-SLV-00014: [redacted], Pillager, MN
- CA-SLV-00015: [redacted], Pillager, MN
- CA-SLV-00016: [redacted], Pillager, MN

- CA-SLV-00017: [redacted], Pillager, MN
- CA-SLV-00018: [redacted], Pillager, MN

Pillager Hydroelectric Relicensing Project (FERC License No. P-2663, SHPO #2023-3431)

- CA-MAY-00003: Road Fragment
- CA-SLV-00002: [redacted] Sylvan Twp.
- CA-SLV-00019: [redacted], Pillager, MN
- CA-SLV-00020: [redacted], Pillager, MN
- CA-SLV-00021: [redacted], Pillager, MN
- CA-SLV-00022: [redacted], Pillager, MN
- MO-MOT-00006: [redacted], Motley, MN
- MO-ROS-00003: [redacted], Pillager, MN
- MO-ROS-00004: [redacted], Pillager, MN
- MO-ROS-00005: [redacted], Pillager, MN
- MO-ROS-00006: [redacted], Pillager, MN
- MO-ROS-00007: [redacted], Pillager, MN

The survey reports provide assessments of effect for four historic properties. However, none of the assessments meet the requirements found in 36 CFR 800.5(a) and 800.11. **Please provide assessments of effect for each of the following properties that apply the criteria of adverse effect and describe the basis for the determination:**

- XX-RRD-NPR007: Main Line/Northern Pacific Railway Corridor Historic District (Eligible, May 2022). Both the Sylvan and Pillager reports note that the Northern Pacific Railway Corridor Historic District "was inaccessible for surveying and evaluating effects" and that "it is believed that the proposed project will have no effect on" the property. Merjent provided no assessment of effects or supporting documentation.
- MO-LFC-00838: Little Falls Hydroelectric Powerplant Facilities. The report notes that the "proposed project and relicensing of the facility will not adversely effect (*sic*) the station and its ability to portray significance." Merjent provided incomplete inventory information and no assessment of effects or supporting documentation.
- CA-SLV-00003: Sylvan Hydroelectric Powerplant Facilities. The report notes that the "proposed project and relicensing of the facility will not adversely effect (*sic*) the station and its ability to portray significance." Merjent provided no updated inventory information, assessment of effects, or supporting documentation.
- CA-PLC-00002: Pillager Hydroelectric Powerplant Facilities (eligible 1992): The report notes that the "proposed project and relicensing of the facility will not adversely effect (*sic*) the station and its ability to portray significance." Merjent provided no updated inventory information, assessment of effects, or supporting documentation.

Archaeology Report Comments

We request the following general revisions on all three archaeology reports.

Please revise the reports to include definitions of non-project human impacts, project activities, and historical urban development. Based on the context, it appears that non-project human impacts refer to all man-made paths and other activities in the terrestrial portion of the APE regardless of the land-ownership status. Historical urban development / historical impacts seems to have been defined in some of the reports, but not all, to be those man-made developments that are 45 years of age or older. It is unclear what is defined as "project activities" or "project impacts" except shoreline erosion. One would assume that a boat launch developed on Minnesota Power owned land within the Sylvan Hydroelectric Project Boundary is a "project activity," however, this has not been documented as such. Lacking a clear understanding of

what is considered a project effect or how these were determined, we do not agree with any of the archaeologist's assessment of the project's effects on archaeological sites. Please revise the reports as requested and provide the definitions requested above so that we can have a clearer understand of the projects effects on historic properties that are archaeological sites.

Considering the lack of consistent research design, methodology, and actual field investigations regarding the annual shoreline monitoring, we do not have enough information to concur with the archaeologist's determination that the sites within the APE of these three projects have not endured major adverse effects due to erosion, non-project human impacts, or project-related activities. Project-related activities that might affect archaeological sites do not appear to have been defined or clearly documented. Further, the archaeologists do not seem to have access to all of the annual monitoring reports from the beginning of the current license, which cover topics associated with annual erosion and human impacts as well.

Throughout the reports, the author refers to "SHPO eligibility determinations" or "SHPO has determined sites eligible…" Pursuant to the implementing regulations for Section 106 of the National Historic Preservation Act, 36 CFR 800, SHPO does not make eligibility determinations. SHPO concurs with eligibility determinations made by federal agencies or their designated entity or with eligibility recommendations made by qualified consultants. Please revise the reports to reflect this accurately. This language is pervasive throughout all three reports.

As FERC's designated authority, Minnesota Power and their qualified consultant, Merjent, do have the responsibility under 36 CFR 800 to **determine** sites eligible for listing in the NRHP or not. Lacking a cover letter explaining Minnesota Power's determination of eligibility, we assume that they have authorized Merjent to make those determinations. Please revise the report so that the "eligibility recommendations" are presented as determinations instead or please submit a cover letter with the report documenting any new eligibility **determinations**.

The use of tables to report survey results, condition assessments, and the shoreline survey is an interesting choice. The photographs in the tables are too small and, considering they lack appropriate captions, are not useful to communicating their intent. Please revise the reports so that, minimally, the photographs are of a size that it is easy to see what they are trying to depict and also so that each photograph has a caption explaining what it is depicting and the direction the photograph was taken. Further, based on the text of the reports and a review of the maps in the report appendices, we understand that a large number of shovel tests were excavated as part of the surveys. It would be useful to include a description of the shovel test excavation strategy (i.e. why they were excavated in certain areas and not others), a description of the shovel test results (i.e. what was found in each shovel test), a representative sample of the shovel test profiles, and representative photos of the shovel tests in the reports. While the maps in the appendices show where all of the negative shovel tests were excavated, it is standard best practice to describe the survey results in the body of the report.

Based on our office's communication with FERC for an unrelated project, we understand that "periodic monitoring" is not required as a condition of the FERC license. Instead, a programmatic agreement is required as a condition of the license if the project is found to have adverse effects on historic properties. The programmatic agreement then stipulates that the license applicant must develop a Historic Properties Management Plan to take into consideration effects to historic properties over the life of the license. Based on the reports, the archaeological consultant appears to have determined that the projects are not having an effect on historic properties that are archaeological sites, therefore, we do not understand why they have recommended periodic monitoring for almost every single site across all three projects. However, considering our questions regarding the assessment of project effects, we agree it may still be necessary to conduct periodic monitoring of some of the archaeological sites within the projects' boundaries.

Little Falls Hydroelectric Relicensing Project (FERC License No. P-2532; SHPO #2023-1267)

The survey results section includes photos of shovel tests that do not appear to meet the standards outlined in the *SHPO Manual for Archaeological Projects in Minnesota* (Anfinson 2005) of being 30-40 centimeters in diameter with vertical sidewalls to full depth. In our experience, shovel tests that do not meet these standards, do not represent an adequate

level of effort for the identification of historic properties that are archaeological sites because they do not adequately sample the subsurface.

How did the archaeological consultant determine that the portion of archaeological sites **21MO0006, 21MO0007, 21MO0033, 21MO0034, 21MO0035, 21MO0037, 21MO0038, 21MO0102, 21MO0108, 21MOad, 21MOaf, 21MOag, 21MOah, 21Moo, 21Mop, 21MOq**, and **21MOr** that are within the APE of the proposed undertaking are **non-contributing to the overall eligibility** of those sites without conducting an evaluation of those sites? We **do not concur** that the portions of the sites listed above that are within the APE are non-contributing to the overall eligibility lacking additional investigation and/or explanation for how this determination was achieved.

Archaeological site **21MO0102** is on land owned by Minnesota Power and the site was observed as having moderate modern impacts from pedestrian traffic and recreational use at the shoreline as well impacts from "historical" urban and park development. Boulders have been placed to stabilize the shoreline and the archaeologists observed no impacts form the Project. However, considering the project has developed recreational facilities in this area and the condition assessment noted moderate impacts from pedestrian traffic and recreational use of the shoreline, it would appear to our office that the project is having an effect on this site. **Please clarify.**

Archaeological site **21MOq** is on land owned by Minnesota Power and the site was observed as having moderate impacts from pedestrian traffic and recreational use at the shoreline as well as "historical" urban development. The report claims that the project is not impacting the site, however, there are impacts from pedestrian traffic and recreational use and Minnesota Power owns the land where the project is located, which is in the project boundary. **Please clarify.**

Archaeological site **21MO0103** is on land owned by Minnesota Power and was determined **not eligible** by Merjent based on a lack of integrity (presumably, this was not clearly stated). We understand that this site was originally recorded by early explorers and no evidence of it has been found in surveys since. Merjent has agreed with a previous archaeological survey that the site is not present anymore due to the original construction of the Little Falls Hydroelectric Dam. Based on repeated surveys failing to identify this site, our office concurs that it is **not eligible.**

Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454; SHPO #2023-3430)

The report shows an incorrect boundary for the National Register of Historic Places listed Chippewa Agency Historic District (CA-SLV-00006). The boundary is clearly depicted in the NRHP nomination for the property, which is available in the OSA Portal as an attachment to the record for archaeological site 21CA0055. Therefore, the assessment of project effects to this property is incomplete. We recommend revising the report to accurately reflect the district boundary and assess effects to the entire property.

Based on the current description of the effects to this property, we understand that there have been severe impacts to the Chippewa Agency Historic District (21CA0055 / CA-SLV-00006), which is located on land owned by Minnesota Power. These impacts seem to have occurred since the issuance of the most recent license by FERC to Minnesota Power and include: unauthorized foot trails, unauthorized ATV trails, erosion of the riverbank, and possibly unauthorized excavation of cultural materials within the district boundary. The report also seems to suggest that one of the circular burials mounds within the district originally identified in the 1890s has been subject to so much erosion or possibly looting that it is no longer extant. We also note that the report references a boat launch within the district boundary. A review of modern aerial imagery shows the boat launch and a nearby area that appears to be a pull-out location along 136th Street SW. Considering these facilities are located on land owned by Minnesota Power within the boundaries of the NRHP listed district and the FERC project boundary, please provide additional information on how they are maintained and used in relation to their potential effects on the historic property. Please also provide additional information about how this NRHP listed property is treated within the FERC project boundary and whether there are adverse effects occurring to the property.

We understand from the archaeology report that Minnesota Power installed physical barriers and signage in 2013 to minimize effects to the historic property. We have no evidence that our office or any other consulting party was consulted about these measures even though the current Cultural Resources Management Plan for the project directs Minnesota

Power to do so. Please provide additional information about how these measures were installed. Additionally, we understand that Merjent does not believe that the access road under the transmission line within the district is actively used. A review of modern aerial imagery available from Google Earth appears to contradict this as the access road under the transmission line appears actively driven over and maintained since at least 1991. Modern aerial imagery also shows a use-trail along the western edge of the district near the river in the vicinity of the Agency component of the district that similarly appears to be actively used and maintained. Was this investigated as part of the condition assessment?

Archaeological site **21CA0230** was determined **not eligible** by Merjent based on a loss of integrity (presumably, this was not clearly stated). The loss of integrity is attributed to the construction of a cul-de-sac and culvert within the site, which is located on land owned by Minnesota Power within the project boundary. Based on the lack of cultural materials within the site, our office concurs that the site is **not eligible**.

Archaeological site **21CA0231** was determined **not eligible** by Merjent based on a lack of significance and possible integrity (presumably, this was not clearly stated). The site is on land owned by Minnesota Power within the project boundary and has been impacted by periodic inundation which the archaeologists have stated is causing the site to be deflated. Based on the lack of cultural material identified in the recent survey and the sparse nature of material originally documented within the site, our office concurs that the site it **not eligible.**

Archaeological site **21CA0507** was determined **not eligible** by Merjent based on a lack of significance and loss of integrity (presumably, this was not clearly stated). The land is partially on land owned by Minnesota Power within the project boundary. Impacts to the site include residential development and construction. We recommend that Merjent conduct a Phase II evaluation of the site following the guidelines outlined in the *SHPO Manual for Archaeological Projects in Minnesota* (Anfinson 2005), which involves the excavation of formal test units. Lacking a formal evaluation of the site following the Secretary of the Interior's guidelines, applicable National Register Bulletins, and the Minnesota state guidelines, we consider this site **unevaluated**.

Archaeological alpha site **21CAdz** was determined **not eligible** by Merjent based on a loss of integrity (presumably, this was not clearly stated). The site is on land owned by Minnesota Power within the project boundary. Based on the report, the site was not relocated during the 2024 surveys despite being field confirmed in a previous survey effort (Mulholland and Mulholland 2015). Merjent attributes this to periodic inundation of the site and overbank deposition infilling the site features and burying any surface deposited artifacts. We recommend that Merjent conduct a Phase II evaluation of the site following the guidelines outlined in the *SHPO Manual for Archaeological Projects in Minnesota* (Anfinson 2005), which involves the excavation of formal test units. Lacking a formal evaluation of the site following the Secretary of the Interior's guidelines, applicable National Register Bulletins, and the Minnesota state guidelines, we consider this site **unevaluated**.

Archaeological site **21CA0504** was determined **potentially eligible** by Merjent under Criterion D; however, they recommended a Phase II evaluation of the site. The site is on land owned by Minnesota Power within the project boundary. We agree that this site should be formally evaluated with a Phase II evaluation following the guidelines outlined in the *SHPO Manual for Archaeological Projects in Minnesota* (Anfinson 2005), which involves the excavation of formal test units. Lacking a formal evaluation of the site following the Secretary of the Interior's guidelines, applicable National Register Bulletins, and the Minnesota state guidelines, we consider this site **listed in the National Register of Historic Places within the boundaries of the Chippewa Agency Historic District (CA-SLV-00006).**

We understand that archaeological alpha site **21CAg** has been misplotted and is located on land owned by the Department of Defense within the boundaries of the Camp Ripley Military Reservation. We recommend that Merjent prepare a site form update that includes updating the site location and submit that to the Office of the State Archaeologist. We consider the site **unevaluated** for listing in the National Register of Historic Places.

Pillager Hydroelectric Relicensing Project (FERC License No. P-2663, SHPO #2023-3431)

How did the archaeological consultant determine that the portion of archaeological sites **21CA0242, 21CA0244, 21Cady, 21CA0240,** and **21MO0134** that are within the APE of the proposed undertaking are **non-contributing to the overall**

eligibility of those sites without conducting an evaluation of those sites? We **do not concur** that the portions of the sites listed above that are within the APE are non-contributing to the overall eligibility lacking additional investigation and/or explanation for how this determination was achieved. Further, we understand that shovel tests were excavated within some portion of some of these sites, but considering our comments below, we suspect that all the shovel tests reported in this report were not excavated to standards.

We have reviewed this report and have concluded that, based on the negative results of the survey within seven (7) previously documented archaeological sites (**21CA0237, 21CA0239, 21CA0243, 21CA0245, 21MO0123, 21MO0124,** and **21MO0125**), either the shovel tests were not excavated to standard (i.e. they were not 30 – 40 centimeters in diameter, they did not have straight sidewalls, and/or the sediment was not screened), or the archaeologists (past or present) misplotted the archaeological site locations. We find it more than "lucky" or "unlucky" that no cultural material was found in seven previously documented archaeological sites and 226 shovel tests within those sites. Considering the shovel tests photographed in the archaeological report for the Little Falls project did not meet standards, we believe this is likely the case for this report as well. We recommend that these seven sites should be formally evaluated with a Phase II evaluation following the guidelines outlined in the *SHPO Manual for Archaeological Projects in Minnesota* (Anfinson 2005), which involves the excavation of formal test units. Lacking a formal evaluation of the sites following the Secretary of the Interior's guidelines, applicable National Register Bulletins, and the Minnesota state guidelines, we consider them **unevaluated**.

We agree with the archaeologist's recommendation that sites **21CA0238, 21CA0241, 21MO0121,** and **21MO0435** be formally evaluated with a Phase II evaluation following the guidelines outlined in the *SHPO Manual for Archaeological Projects in Minnesota* (Anfinson 2005), which involves the excavation of formal test units. Lacking a formal evaluation of the sites following the Secretary of the Interior's guidelines, applicable National Register Bulletins, and the Minnesota state guidelines. Based on the results in the current report, we consider these sites to be **unevaluated**.

We look forward to continuing consultation with FERC and Minnesota Power/ALLETE and other consulting parties regarding the Section 106 reviews of these undertakings. Please feel free to reach out to Environmental Review Archaeologist Lucy Harrington at lucy.harrington@state.mn.us or (651)201-3283 if you have any questions about our comment letter.

Sincerely,



Amy Spong
Deputy State Historic Preservation Officer

CC: Lesley Brotkowski, Kleinschmidt
Matthew Radzak, Minnesota Power
Elizabeth Krchnavek, Kleinschmidt

June 2, 2025

VIA E-FILING

Debbie-Anne Reese, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Subject: Little Falls Hydroelectric Project (FERC Project No. 2532)
Sylvan Hydroelectric Project (FERC Project No. 2454)
Pillager Hydroelectric Project (FERC Project No. 2663)
Minnesota State Historic Preservation Office Comments on Phase I Architectural History Reconnaissance Surveys and Phase I Archaeological Investigation and Conditions Assessment Surveys

Dear Secretary Reese:

ALLETE, Inc., doing business as Minnesota Power, is the Licensee of the Little Falls Hydroelectric Project (Little Falls Project) (FERC No. 2532), Sylvan Hydroelectric Project (Sylvan Project) (FERC No. 2454), and Pillager Hydroelectric Project (Pillager Project) (FERC No. 2663), herein collectively referred to as the "Projects." In accordance with the Federal Energy Regulatory Commission (FERC or Commission) Process Plan and Schedule, Minnesota Power filed an Initial Study Report (ISR) on February 7, 2025, and held an ISR Meeting on February 19, 2025, to review study results. The Commission filed comments on the ISR on April 4, 2025; no other comments or requests to amend the study plan were received by the April 8, 2025, deadline.

On May 16, 2025, Minnesota Power received a comment letter from the Minnesota State Historic Preservation Office (SHPO) regarding the Phase I Architectural History Reconnaissance Surveys and Phase I Archaeological Investigations and Conditions Assessment for Archaeological Sites for the Projects included in the ISR. Minnesota Power is filing a copy of this letter with the Commission as a Privileged document as it contains sensitive information.

Minnesota SHPO provided comments and requested revision to the architectural history and archaeological reports for the Projects. Minnesota Power and its Cultural Resources Consultant, Merjent,[1] will review the Minnesota SHPO comments and revise the reports in accordance with

[1] Merjent's Cultural Resources Staff (Nick Powell, Architectural Historian; and Dr. Aaron Armstrong-Duarte, Archaeologist) meet the Secretary of the Interior Professional Qualification Standards under 36 CFR Part 61. In addition, Dr. Armstrong-Duarte is a member in good standing with the Register of Professional Archaeologists and the Society for American Archaeology.

the FERC-approved Study Plan, the Minnesota Historical Society's Historic and Architectural Survey Manual[2], and the Minnesota SHPO Manual for Archaeological Projects in Minnesota[3]. The revised reports will be included with the Draft License Application to be filed with the Commission by November 1, 2025.

Minnesota SHPO noted that the Phase I Archaeological Investigation and Conditions Assessment of Archaeological Sites for the Sylvan Hydroelectric Relicensing Project depicted an incorrect boundary for the Chippewa Agency Historic District. The archaeology report prepared by Merjent utilized the Office of the State Archaeologist (OSA) boundary of the Chippewa Agency Site (21CA0055); Minnesota SHPO states that this report should be revised to evaluate the boundary as defined in the 1973 National Register of Historic Places (NRHP) nomination documentation for the Chippewa Agency Historic District (CA-SLV-00006). Merjent will conduct a conditions assessment within the larger NRHP nomination boundary of the Chippewa Agency site in 2025 and include results of this assessment in the revised report.

For select archaeological sites associated with the Pillager and Sylvan Projects, the Minnesota SHPO recommended Phase II archaeological evaluations be conducted to determine if the sites are potentially eligible or not eligible for listing in the NRHP. Merjent conducted a Phase I survey and literature review of all inventoried archaeological sites within the boundaries of the Projects and made eligibility recommendations for each site based on site observations, shovel testing, and professional determinations. No adverse effects related to Projects' operations were observed concerning the archaeological sites during the Phase I survey and no ground disturbance or change in operations is proposed for the relicensing of these Projects. As such, the action of relicensing these Projects will not have an adverse effect on archaeological sites, regardless of NRHP eligibility status. Further, the anticipated FERC requirement for Minnesota Power to develop a Historic Properties Management Plan as part of the new licenses for the Projects will include measures for managing existing NRHP-eligible sites as well as processes for addressing future evaluations, if applicable. Minnesota Power maintains that Phase II testing of these sites is not necessary for the relicensing of the Projects.

If there are any questions about this filing, please contact me by phone at (218) 355-3191 or e-mail at gprom@allete.com.

Best Regards,

Greg Prom
Senior Environmental Compliance Specialist
ALLETE, Inc., d.b.a Minnesota Power
30 West Superior Street
Duluth, Minnesota 55802-2093

[2] Minnesota Historical Society, "Historic and Architectural Survey Manual," Revised 08/2017, https://mn.gov/admin/assets/surveymanual082017_tcm36-327675.pdf

[3] Minnesota State Historic Preservation Office, "SHPO Manual For Archaeological Projects In Minnesota," 07/2005, https://mn.gov/admin/assets/archsurvey_tcm36-327672.pdf

Attachment: May 16, 2025, Minnesota State Historic Preservation Office Comments on Phase I Architectural History Reconnaissance Surveys and Phase I Archaeological Investigation and Conditions Assessment Surveys (Privileged)

May 16, 2025 **VIA E-MAIL**

Greg Prom
Senior Environmental Compliance Specialist
ALLETE, Inc. d.b.a. Minnesota Power
30 West Superior Street
Duluth, MN 55802-2093

RE: FERC No. 2532 Little Falls Hydroelectric Project
FERC No. 2454 Sylvan Hydroelectric Project
FERC No. 2663 Pillager Hydroelectric Project
Section 106 Consultation Regarding the Proposed Relicensing of Hydroelectric Projects
Cass, Crow Wing, and Morrison Counties, Minnesota
SHPO Number: 2023-1267 (Little Falls), 2023-3430 (Sylvan), and 2023-3431 (Pillager)

Dear Mr. Prom,

Thank you for continuing consultation with our office regarding the above undertakings. In accordance with the notice issued by the Federal Energy Regulatory Commission (FERC) on May 26, 2023 designating ALLETE/Minnesota Power (MP) as non-federal representative, we are continuing consultation on the above referenced undertakings pursuant to the responsibilities given the State Historic Preservation Officer Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) and its implementing federal regulations, "Protection of Historic Properties" (36 CFR Part 800).

We have completed a review of your submittal dated February 7, 2025 which included six (6) reports listed below as part of the Initial Study Report. We apologize for the extreme delay with which we are sending out comments. The size of this submittal was very large.

- *Phase I Architectural History Reconnaissance Survey for the Little Falls Hydroelectric Relicensing Project (FERC License No. P-2532), Morrison County, Minnesota* (Merjent, Inc., February 2025)
- *Phase I Architectural History Reconnaissance Survey for the Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454), Cass, Crow Wing, Morrison Counties, Minnesota* (Merjent, Inc., February 2025)
- *Phase I Architectural History Reconnaissance Survey for the Pillager Hydroelectric Relicensing Project (FERC License No. P-2663), Cass and Morrison Counties, Minnesota* (Merjent, Inc., January 2025)
- *Phase I Archaeological Investigation and Conditions Assessment of Archaeological Sites for the Little Falls Hydroelectric Relicensing Project (FERC License No. P-2532) Morrison County, Minnesota* (Merjent, Inc., February 2025)
- *Phase I Archaeological Investigation and Conditions Assessment of Archaeological Sites for the Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454) Cass, Crow Wing, and Morrison Counties, Minnesota* (Merjent, Inc., February 2025)
- *Phase I Archaeological Investigation and Conditions Assessment of Archaeological Sites for the Pillager Hydroelectric Relicensing Project (FERC License No. P-2663) Cass and Morrison Counties, Minnesota* (Merjent, Inc., February 2025)

We provide the following comments on the above listed reports grouped by subject.

Architecture History Reports Comments

All three reports have errors and incomplete information. **Please revise and resubmit the reports after addressing the comments about specific properties outlined below.** Be sure to follow the "Survey Report Requirements" on page 13 of the Historic and Architectural Survey Manual before revising, finalizing, and resubmitting the reports.

The inventory forms submitted to the Minnesota Statewide Historic Inventory Portal (MnSHIP) are incomplete. Although limited information on select properties is available within the reports, the MnSHIP record must have complete information for the documentation to meet the Secretary of the Interior's Standards for Identification. In MnSHIP, the "Attachments" section is for uploading narrative descriptions, a statement of significance, bibliography, maps, images, and other information needed to document the property in a manner that meets the Secretary of the Interior's Standards. See the Historic and Architectural Survey Manual for guidance on attachment pages and other supplementary information. Although there is no standard attachment, a template can be found in Appendix C of the MnSHIP User Guide. **Please resubmit inventory forms with complete information so that we may review and comment on the following properties:**

Little Falls Hydroelectric Relicensing Project (FERC License No. P-2532; SHPO #2023-1267)

- MO-LFC-00837: BNSF Railroad Bridge
- MO-LFC-00838: Little Falls Hydroelectric Station

Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454; SHPO #2023-3430)

- CA-SLV-00012: [redacted], Pillager, MN
- CA-SLV-00013: [redacted], Brainerd, MN
- CA-SLV-00014: [redacted], Pillager, MN
- CA-SLV-00015: [redacted], Pillager, MN
- CA-SLV-00016: [redacted], Pillager, MN
- CA-SLV-00017: [redacted], Pillager, MN
- CA-SLV-00018: [redacted], Pillager, MN

Pillager Hydroelectric Relicensing Project (FERC License No. P-2663, SHPO #2023-3431)

- CA-SLV-00019: [redacted], Pillager, MN
- CA-SLV-00020: [redacted], Pillager, MN
- CA-SLV-00021: [redacted], Pillager, MN
- CA-SLV-00022: [redacted], Pillager, MN
- MO-MOT-00004: [redacted], Motley, MN
- MO-MOT-00005: [redacted], Motley, MN
- MO-MOT-00006: [redacted], Motley, MN
- MO-ROS-00003: [redacted], Pillager, MN
- MO-ROS-00004: [redacted], Pillager, MN
- MO-ROS-00005: [redacted], Pillager, MN
- MO-ROS-00006: [redacted], Pillager, MN
- MO-ROS-00007: [redacted], Pillager, MN

The survey reports appear to be adopting evaluations made as part of earlier surveys. The Minnesota State Historic Preservation Office considers any eligibility determinations made ten or more years before the date of the current survey to be out of date. The properties must be resurveyed (see page 9 of the Historic and Architectural Survey Manual) and updated in MnSHIP (see page 33 of the MnSHIP User Guide). **Please provide updated inventory forms for the following properties, all of which were last surveyed more than 10 years ago:**

Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454; SHPO #2023-3430)

- CA-SLV-00003: Sylvan Hydroelectric Powerplant Facilities. Merjent did not submit an updated inventory form for the property despite the report noting the property was surveyed. The property was last surveyed in 1991.
- CA-SLV-00005: Bridge 11508. Merjent did not submit an updated inventory form for the property. The property was last surveyed in 2010. *Note: the report calls this County Road 36, which is incorrect.*

Pillager Hydroelectric Relicensing Project (FERC License No. P-2663, SHPO #2023-3431)

- CA-MAY-00003: Road Fragment. Merjent did not submit an updated inventory form for the property. This property is likely part of the Fort Ripley Military Road and was last surveyed in 1991.
- CA-PLC-00002: Pillager Hydroelectric Facility. Merjent did not submit an updated inventory form for the property despite the report noting the property was surveyed. The property was last surveyed in 1992.
- CA-SLV-00002: Fort Ripley Military Road: Sylvan Twp. Merjent did not submit an updated inventory form for the property. This property was last surveyed in 1991.

The survey reports also appear to be adopting previous evaluations completed within the last 10 years for the following properties; **we agree these properties are not eligible for inclusion in the National of Historic Places (NRHP)** :

Little Falls Hydroelectric Relicensing Project (FERC License No. P-2532; SHPO #2023-1267)

- MO-GRE-00191: Bridge 49010 (Not Eligible, March 2023) *Note: this is <u>not</u> a duplicate for XX-ROD-00040 as suggested by the report; these are two separate resources.*
- MO-GRE-00196: Bridge 49529 (Not Eligible, March 2023)
- MO-LFC-00161: Bridge No. 5907 (Not Eligible, March 2023) *Note: this is <u>not</u> a duplicate for XX-ROD-00180 as suggested by the report; these are two separate resources.*
- XX-ROD-00040: Trunk Highway 10 (Not Eligible, November 2020) *Note: this is <u>not</u> a duplicate for MO-GRE-00191 as suggested by the report; these are two separate resources.*
- XX-ROD-00180: TH 27 (Not Eligible, December 2021) *Note: this is <u>not</u> a duplicate for MO-LFC-00161 as suggested by the report; these are two separate resources.*
- XX-RRD-NPR022: St. Paul and Northern Pacific Railway (Not Eligible, December 2022) *Note: this inventory record incorporates and supersedes TO-RRD-00001, an inventory number that has been retired as noted in MnSHIP.*

Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454; SHPO #2023-3430)

- CW-UOG-00001: Bridge 18508 (Not Eligible, March 2023) *Note: the report calls this Bridge 11508, which is incorrect.*

The survey reports do not provide sufficient information to justify the lack of survey or evaluation for several properties within the APE. Although the reports note that survey or evaluation was not completed due to lack of access and lack of visibility from public roads, the reports also indicate it is unlikely the project would affect the properties. The photographs provided illustrate the lack of visibility from the public way. However, a lack of access or visibility cannot be reasoning for a conclusion that the project would not affect the properties. **Please provide aerial photographs with the APE delineated, annotate the images with the inventory numbers, and describe the basis for concluding the project will not affect the following properties:**

Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454; SHPO #2023-3430)

- CA-SLV-00012: [redacted], Pillager, MN
- CA-SLV-00013: [redacted], Brainerd, MN
- CA-SLV-00014: [redacted], Pillager, MN
- CA-SLV-00015: [redacted], Pillager, MN
- CA-SLV-00016: [redacted], Pillager, MN

- CA-SLV-00017: [redacted], Pillager, MN
- CA-SLV-00018: [redacted], Pillager, MN

Pillager Hydroelectric Relicensing Project (FERC License No. P-2663, SHPO #2023-3431)

- CA-MAY-00003: Road Fragment
- CA-SLV-00002: [redacted] Sylvan Twp.
- CA-SLV-00019: [redacted], Pillager, MN
- CA-SLV-00020: [redacted], Pillager, MN
- CA-SLV-00021: [redacted], Pillager, MN
- CA-SLV-00022: [redacted], Pillager, MN
- MO-MOT-00006: [redacted], Motley, MN
- MO-ROS-00003: [redacted], Pillager, MN
- MO-ROS-00004: [redacted], Pillager, MN
- MO-ROS-00005: [redacted], Pillager, MN
- MO-ROS-00006: [redacted], Pillager, MN
- MO-ROS-00007: [redacted], Pillager, MN

The survey reports provide assessments of effect for four historic properties. However, none of the assessments meet the requirements found in 36 CFR 800.5(a) and 800.11. **Please provide assessments of effect for each of the following properties that apply the criteria of adverse effect and describe the basis for the determination:**

- XX-RRD-NPR007: Main Line/Northern Pacific Railway Corridor Historic District (Eligible, May 2022). Both the Sylvan and Pillager reports note that the Northern Pacific Railway Corridor Historic District "was inaccessible for surveying and evaluating effects" and that "it is believed that the proposed project will have no effect on" the property. Merjent provided no assessment of effects or supporting documentation.
- MO-LFC-00838: Little Falls Hydroelectric Powerplant Facilities. The report notes that the "proposed project and relicensing of the facility will not adversely effect (*sic*) the station and its ability to portray significance." Merjent provided incomplete inventory information and no assessment of effects or supporting documentation.
- CA-SLV-00003: Sylvan Hydroelectric Powerplant Facilities. The report notes that the "proposed project and relicensing of the facility will not adversely effect (*sic*) the station and its ability to portray significance." Merjent provided no updated inventory information, assessment of effects, or supporting documentation.
- CA-PLC-00002: Pillager Hydroelectric Powerplant Facilities (eligible 1992): The report notes that the "proposed project and relicensing of the facility will not adversely effect (*sic*) the station and its ability to portray significance." Merjent provided no updated inventory information, assessment of effects, or supporting documentation.

Archaeology Report Comments

We request the following general revisions on all three archaeology reports.

Please revise the reports to include definitions of non-project human impacts, project activities, and historical urban development. Based on the context, it appears that non-project human impacts refer to all man-made paths and other activities in the terrestrial portion of the APE regardless of the land-ownership status. Historical urban development / historical impacts seems to have been defined in some of the reports, but not all, to be those man-made developments that are 45 years of age or older. It is unclear what is defined as "project activities" or "project impacts" except shoreline erosion. One would assume that a boat launch developed on Minnesota Power owned land within the Sylvan Hydroelectric Project Boundary is a "project activity," however, this has not been documented as such. Lacking a clear understanding of

what is considered a project effect or how these were determined, we do not agree with any of the archaeologist's assessment of the project's effects on archaeological sites. Please revise the reports as requested and provide the definitions requested above so that we can have a clearer understand of the projects effects on historic properties that are archaeological sites.

Considering the lack of consistent research design, methodology, and actual field investigations regarding the annual shoreline monitoring, we do not have enough information to concur with the archaeologist's determination that the sites within the APE of these three projects have not endured major adverse effects due to erosion, non-project human impacts, or project-related activities. Project-related activities that might affect archaeological sites do not appear to have been defined or clearly documented. Further, the archaeologists do not seem to have access to all of the annual monitoring reports from the beginning of the current license, which cover topics associated with annual erosion and human impacts as well.

Throughout the reports, the author refers to "SHPO eligibility determinations" or "SHPO has determined sites eligible…" Pursuant to the implementing regulations for Section 106 of the National Historic Preservation Act, 36 CFR 800, SHPO does not make eligibility determinations. SHPO concurs with eligibility determinations made by federal agencies or their designated entity or with eligibility recommendations made by qualified consultants. Please revise the reports to reflect this accurately. This language is pervasive throughout all three reports.

As FERC's designated authority, Minnesota Power and their qualified consultant, Merjent, do have the responsibility under 36 CFR 800 to **determine** sites eligible for listing in the NRHP or not. Lacking a cover letter explaining Minnesota Power's determination of eligibility, we assume that they have authorized Merjent to make those determinations. Please revise the report so that the "eligibility recommendations" are presented as determinations instead or please submit a cover letter with the report documenting any new eligibility **determinations**.

The use of tables to report survey results, condition assessments, and the shoreline survey is an interesting choice. The photographs in the tables are too small and, considering they lack appropriate captions, are not useful to communicating their intent. Please revise the reports so that, minimally, the photographs are of a size that it is easy to see what they are trying to depict and also so that each photograph has a caption explaining what it is depicting and the direction the photograph was taken. Further, based on the text of the reports and a review of the maps in the report appendices, we understand that a large number of shovel tests were excavated as part of the surveys. It would be useful to include a description of the shovel test excavation strategy (i.e. why they were excavated in certain areas and not others), a description of the shovel test results (i.e. what was found in each shovel test), a representative sample of the shovel test profiles, and representative photos of the shovel tests in the reports. While the maps in the appendices show where all of the negative shovel tests were excavated, it is standard best practice to describe the survey results in the body of the report.

Based on our office's communication with FERC for an unrelated project, we understand that "periodic monitoring" is not required as a condition of the FERC license. Instead, a programmatic agreement is required as a condition of the license if the project is found to have adverse effects on historic properties. The programmatic agreement then stipulates that the license applicant must develop a Historic Properties Management Plan to take into consideration effects to historic properties over the life of the license. Based on the reports, the archaeological consultant appears to have determined that the projects are not having an effect on historic properties that are archaeological sites, therefore, we do not understand why they have recommended periodic monitoring for almost every single site across all three projects. However, considering our questions regarding the assessment of project effects, we agree it may still be necessary to conduct periodic monitoring of some of the archaeological sites within the projects' boundaries.

Little Falls Hydroelectric Relicensing Project (FERC License No. P-2532; SHPO #2023-1267)

The survey results section includes photos of shovel tests that do not appear to meet the standards outlined in the *SHPO Manual for Archaeological Projects in Minnesota* (Anfinson 2005) of being 30-40 centimeters in diameter with vertical sidewalls to full depth. In our experience, shovel tests that do not meet these standards, do not represent an adequate

level of effort for the identification of historic properties that are archaeological sites because they do not adequately sample the subsurface.

How did the archaeological consultant determine that the portion of archaeological sites **21MO0006, 21MO0007, 21MO0033, 21MO0034, 21MO0035, 21MO0037, 21MO0038, 21MO0102, 21MO0108, 21MOad, 21MOaf, 21MOag, 21MOah, 21Moo, 21Mop, 21MOq**, and **21MOr** that are within the APE of the proposed undertaking are **non-contributing to the overall eligibility** of those sites without conducting an evaluation of those sites? We **do not concur** that the portions of the sites listed above that are within the APE are non-contributing to the overall eligibility lacking additional investigation and/or explanation for how this determination was achieved.

Archaeological site **21MO0102** is on land owned by Minnesota Power and the site was observed as having moderate modern impacts from pedestrian traffic and recreational use at the shoreline as well impacts from "historical" urban and park development. Boulders have been placed to stabilize the shoreline and the archaeologists observed no impacts form the Project. However, considering the project has developed recreational facilities in this area and the condition assessment noted moderate impacts from pedestrian traffic and recreational use of the shoreline, it would appear to our office that the project is having an effect on this site. **Please clarify.**

Archaeological site **21MOq** is on land owned by Minnesota Power and the site was observed as having moderate impacts from pedestrian traffic and recreational use at the shoreline as well as "historical" urban development. The report claims that the project is not impacting the site, however, there are impacts from pedestrian traffic and recreational use and Minnesota Power owns the land where the project is located, which is in the project boundary. **Please clarify.**

Archaeological site **21MO0103** is on land owned by Minnesota Power and was determined **not eligible** by Merjent based on a lack of integrity (presumably, this was not clearly stated). We understand that this site was originally recorded by early explorers and no evidence of it has been found in surveys since. Merjent has agreed with a previous archaeological survey that the site is not present anymore due to the original construction of the Little Falls Hydroelectric Dam. Based on repeated surveys failing to identify this site, our office concurs that it is **not eligible.**

Sylvan Hydroelectric Relicensing Project (FERC License No. P-2454; SHPO #2023-3430)

The report shows an incorrect boundary for the National Register of Historic Places listed Chippewa Agency Historic District (CA-SLV-00006). The boundary is clearly depicted in the NRHP nomination for the property, which is available in the OSA Portal as an attachment to the record for archaeological site 21CA0055. Therefore, the assessment of project effects to this property is incomplete. We recommend revising the report to accurately reflect the district boundary and assess effects to the entire property.

Based on the current description of the effects to this property, we understand that there have been severe impacts to the Chippewa Agency Historic District (21CA0055 / CA-SLV-00006), which is located on land owned by Minnesota Power. These impacts seem to have occurred since the issuance of the most recent license by FERC to Minnesota Power and include: unauthorized foot trails, unauthorized ATV trails, erosion of the riverbank, and possibly unauthorized excavation of cultural materials within the district boundary. The report also seems to suggest that one of the circular burials mounds within the district originally identified in the 1890s has been subject to so much erosion or possibly looting that it is no longer extant. We also note that the report references a boat launch within the district boundary. A review of modern aerial imagery shows the boat launch and a nearby area that appears to be a pull-out location along 136th Street SW. Considering these facilities are located on land owned by Minnesota Power within the boundaries of the NRHP listed district and the FERC project boundary, please provide additional information on how they are maintained and used in relation to their potential effects on the historic property. Please also provide additional information about how this NRHP listed property is treated within the FERC project boundary and whether there are adverse effects occurring to the property.

We understand from the archaeology report that Minnesota Power installed physical barriers and signage in 2013 to minimize effects to the historic property. We have no evidence that our office or any other consulting party was consulted about these measures even though the current Cultural Resources Management Plan for the project directs Minnesota

Power to do so. Please provide additional information about how these measures were installed. Additionally, we understand that Merjent does not believe that the access road under the transmission line within the district is actively used. A review of modern aerial imagery available from Google Earth appears to contradict this as the access road under the transmission line appears actively driven over and maintained since at least 1991. Modern aerial imagery also shows a use-trail along the western edge of the district near the river in the vicinity of the Agency component of the district that similarly appears to be actively used and maintained. Was this investigated as part of the condition assessment?

Archaeological site **21CA0230** was determined **not eligible** by Merjent based on a loss of integrity (presumably, this was not clearly stated). The loss of integrity is attributed to the construction of a cul-de-sac and culvert within the site, which is located on land owned by Minnesota Power within the project boundary. Based on the lack of cultural materials within the site, our office concurs that the site is **not eligible**.

Archaeological site **21CA0231** was determined **not eligible** by Merjent based on a lack of significance and possible integrity (presumably, this was not clearly stated). The site is on land owned by Minnesota Power within the project boundary and has been impacted by periodic inundation which the archaeologists have stated is causing the site to be deflated. Based on the lack of cultural material identified in the recent survey and the sparse nature of material originally documented within the site, our office concurs that the site it **not eligible.**

Archaeological site **21CA0507** was determined **not eligible** by Merjent based on a lack of significance and loss of integrity (presumably, this was not clearly stated). The land is partially on land owned by Minnesota Power within the project boundary. Impacts to the site include residential development and construction. We recommend that Merjent conduct a Phase II evaluation of the site following the guidelines outlined in the *SHPO Manual for Archaeological Projects in Minnesota* (Anfinson 2005), which involves the excavation of formal test units. Lacking a formal evaluation of the site following the Secretary of the Interior's guidelines, applicable National Register Bulletins, and the Minnesota state guidelines, we consider this site **unevaluated**.

Archaeological alpha site **21CAdz** was determined **not eligible** by Merjent based on a loss of integrity (presumably, this was not clearly stated). The site is on land owned by Minnesota Power within the project boundary. Based on the report, the site was not relocated during the 2024 surveys despite being field confirmed in a previous survey effort (Mulholland and Mulholland 2015). Merjent attributes this to periodic inundation of the site and overbank deposition infilling the site features and burying any surface deposited artifacts. We recommend that Merjent conduct a Phase II evaluation of the site following the guidelines outlined in the *SHPO Manual for Archaeological Projects in Minnesota* (Anfinson 2005), which involves the excavation of formal test units. Lacking a formal evaluation of the site following the Secretary of the Interior's guidelines, applicable National Register Bulletins, and the Minnesota state guidelines, we consider this site **unevaluated**.

Archaeological site **21CA0504** was determined **potentially eligible** by Merjent under Criterion D; however, they recommended a Phase II evaluation of the site. The site is on land owned by Minnesota Power within the project boundary. We agree that this site should be formally evaluated with a Phase II evaluation following the guidelines outlined in the *SHPO Manual for Archaeological Projects in Minnesota* (Anfinson 2005), which involves the excavation of formal test units. Lacking a formal evaluation of the site following the Secretary of the Interior's guidelines, applicable National Register Bulletins, and the Minnesota state guidelines, we consider this site **listed in the National Register of Historic Places within the boundaries of the Chippewa Agency Historic District (CA-SLV-00006).**

We understand that archaeological alpha site **21CAg** has been misplotted and is located on land owned by the Department of Defense within the boundaries of the Camp Ripley Military Reservation. We recommend that Merjent prepare a site form update that includes updating the site location and submit that to the Office of the State Archaeologist. We consider the site **unevaluated** for listing in the National Register of Historic Places.

Pillager Hydroelectric Relicensing Project (FERC License No. P-2663, SHPO #2023-3431)

How did the archaeological consultant determine that the portion of archaeological sites **21CA0242, 21CA0244, 21Cady, 21CA0240,** and **21MO0134** that are within the APE of the proposed undertaking are **non-contributing to the overall**

eligibility of those sites without conducting an evaluation of those sites? We **do not concur** that the portions of the sites listed above that are within the APE are non-contributing to the overall eligibility lacking additional investigation and/or explanation for how this determination was achieved. Further, we understand that shovel tests were excavated within some portion of some of these sites, but considering our comments below, we suspect that all the shovel tests reported in this report were not excavated to standards.

We have reviewed this report and have concluded that, based on the negative results of the survey within seven (7) previously documented archaeological sites (**21CA0237, 21CA0239, 21CA0243, 21CA0245, 21MO0123, 21MO0124,** and **21MO0125**), either the shovel tests were not excavated to standard (i.e. they were not 30 – 40 centimeters in diameter, they did not have straight sidewalls, and/or the sediment was not screened), or the archaeologists (past or present) misplotted the archaeological site locations. We find it more than "lucky" or "unlucky" that no cultural material was found in seven previously documented archaeological sites and 226 shovel tests within those sites. Considering the shovel tests photographed in the archaeological report for the Little Falls project did not meet standards, we believe this is likely the case for this report as well. We recommend that these seven sites should be formally evaluated with a Phase II evaluation following the guidelines outlined in the *SHPO Manual for Archaeological Projects in Minnesota* (Anfinson 2005), which involves the excavation of formal test units. Lacking a formal evaluation of the sites following the Secretary of the Interior's guidelines, applicable National Register Bulletins, and the Minnesota state guidelines, we consider them **unevaluated**.

We agree with the archaeologist's recommendation that sites **21CA0238, 21CA0241, 21MO0121,** and **21MO0435** be formally evaluated with a Phase II evaluation following the guidelines outlined in the *SHPO Manual for Archaeological Projects in Minnesota* (Anfinson 2005), which involves the excavation of formal test units. Lacking a formal evaluation of the sites following the Secretary of the Interior's guidelines, applicable National Register Bulletins, and the Minnesota state guidelines. Based on the results in the current report, we consider these sites to be **unevaluated**.

We look forward to continuing consultation with FERC and Minnesota Power/ALLETE and other consulting parties regarding the Section 106 reviews of these undertakings. Please feel free to reach out to Environmental Review Archaeologist Lucy Harrington at lucy.harrington@state.mn.us or (651)201-3283 if you have any questions about our comment letter.

Sincerely,



Amy Spong
Deputy State Historic Preservation Officer

CC: Lesley Brotkowski, Kleinschmidt
Matthew Radzak, Minnesota Power
Elizabeth Krchnavek, Kleinschmidt

CROW WING COUNTY
HISTORICAL SOCIETY
MUSEUM & LIBRARY - EST. 1927

Email:
history@crowwing.gov

Website:
www.crowwinghistory.org

Street Address:
320 Laurel Street
Brainerd, MN 56401

Phone:
(218) 829-3268

June 17, 2025

Debbie-Anne Reese, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Subject: Little Falls Hydroelectric Project (FERC Project No. 2532) Sylvan Hydroelectric Project (FERC Project No. 2454), Pillager Hydroelectric Project (FERC Project No. 2663), Minnesota State Historic Preservation Office Comments on Phase I Architectural, History Reconnaissance Surveys and Phase I Archaeological Investigation and Conditions Assessment Surveys

Dear Secretary Reese:

The Crow Wing County Historical Society in coordination with the Friends of Old Crow Wing (501(c)3) would like to have the request by the Minnesota Historical Society implemented. Since the beginning, Friends of Old Crow Wing have participated in and commented on the relicensing process, including the request to be a consulting party in July 2023 (see enclosure). We have repeatedly emphasized the necessity of an onsite review of the archaeological site listed on the National Register of Historic Places as "Chippewa Agency Historic District 73000967_R". We have very similar concerns to the Minnesota Historical Society in relation to the existing study, the lack of adequate review, and no protection of the site.

We would like you to review the existing comments provided on May 16, 2025 by the Minnesota State Historic Preservation Office related to Document Accession #20250602 and request that the supplemental information requested by the Minnesota State Historic Preservation Office be developed. Should you have any questions, please contact the Crow Wing County Historical Society's Friends of Old Crow Wing at 320 Laurel Street, Brainerd, MN 56401.

Sincerely,

Dr. Nicholas P. Bernier
Chairman

Cc: Minnesota State Historical Preservation Office
Greg Prom, Minnesota Power
Jay Summer, Federal Energy Resource Commission

Enclosure: Section 106 consultation

Listed on the National Register of Historic Places

Jay Summers <Jay.Summers@ferc.gov>
Tue, Aug 8, 2023, 1:28 PM
to Michael, me

Good afternoon Don,
Section 106 consultation occurs after the applicant has filed their license application, and any relevant studies have been conducted. However, we will remember to include the Friends of the Crow Wing as consulting parties when we get to that point in the licensing process. You may also electronically file your request to consult on section 106 resources under the Little Falls, Sylvan, or Pillager dockets (P-2532, P2454, or P-2663).

From:	Gregory Prom (MP)
To:	"Amber.Westerbur@state.mn.us"
Cc:	Lesley Brotkowski; Elizabeth Krchnavek; Matthew Radzak (MP)
Subject:	RE: Request for Determination of CZMA Compliance for Little Falls (P-2532), Sylvan (P-2454), Pillager (P-2663) Hydroelectric Projects
Date:	Tuesday, August 5, 2025 3:32:40 PM
Attachments:	image001.png Little Falls Sylvan Pillager CZMA Request Letter 2025_08_05.docx

Dear Ms. Westerbur,

Attached please find a formal request for a Coastal Zone Management Act (CZMA) consistency determination regarding the Federal Energy Regulatory Commission (FERC) relicensing of the Little Falls, Sylvan, and Pillager Hydroelectric Projects (FERC Nos. 2532, 2454, and 2663, respectively).

As outlined in the letter, ALLETE, Inc., doing business as Minnesota Power, is seeking confirmation that the proposed relicensing of these Projects complies with the policies of Minnesota's Coastal Zone Management Program. The Projects are located outside of Minnesota's designated coastal zone and are not anticipated to have reasonably foreseeable effects on the coastal zone.

We would appreciate your review and written determination within 60 days. Please note that, per FERC regulations, concurrence with CZMA compliance is presumed if no response is received within 180 days.

Thank you,

Greg Prom

Senior Environmental Compliance Specialist
Minnesota Power/ALLETE
30 West Superior Street
Duluth, Minnesota 55802

Office: 218-355-3191
Cell: 218-461-6856
Email: gprom@allete.com

minnesota power
AN ALLETE COMPANY

August 6, 2025

Via E-Mail

Amber Westerbur
Coastal Program Manager
Minnesota Department of Natural Resources
Minnesota Lake Superior Coastal Program
1568 Highway 2
Two Harbors, Minnesota 55616

Subject: Little Falls Hydroelectric Project (FERC Project No. 2532)
Sylvan Hydroelectric Project (FERC Project No. 2454)
Pillager Hydroelectric Project (FERC Project No. 2663)
Request for Coastal Zone Management Act Determination of Compliance

Dear Ms. Westerbur:

ALLETE, Inc., doing business as Minnesota Power (MP or Licensee), is the duly authorized manager, operator, and administrator of the Little Falls Hydroelectric Project (FERC No. 2532), Sylvan Hydroelectric Project (FERC No. 2454), and Pillager Hydroelectric Project (FERC No. 2663), herein collectively referred to as the "Projects." These Projects are licensed by the Federal Energy Regulatory Commission (FERC). The Little Falls Project includes a dam located on the Mississippi River in Morrison County, Minnesota. The Sylvan and Pillager Projects are located on the Crow Wing River in Cass, Crow Wing, and Morrison counties, Minnesota. Maps of the locations are attached.

The FERC licenses for the Projects expire on March 31, 2028. The Licensee is using the Commission's Integrated Licensing Process (ILP) to relicense the Projects concurrently. As part of the relicensing process, an applicant must provide to the FERC documentation that a determination has been made that the proposed relicensings complies with the policies of Minnesota's Coastal Zone Management Program, and that any activities associated with the licensing will be conducted in a manner that is consistent with such policies. This letter constitutes a formal request for a written determination of consistency with Minnesota's Coastal Zone Management Program.

The Projects are not located in Minnesota's designated coastal zone nor are the proposed actions of relicensings of the Projects anticipated to have reasonably foreseeable effects on Minnesota's designated coastal zone. ALLETE, Inc. is requesting your confirmation that the proposed

relicensing of the Projects complies with the policies of Minnesota's Coastal Zone Management Program.

We would appreciate your review and written determination within 60 days. Concurrence with CZMA compliance is presumed by FERC if no response is received within 180 days. Thank you for your time and attention to this matter.

Please feel free to contact me with any questions or comments regarding this request by phone at (218) 355-3191 or e-mail at gprom@allete.com.

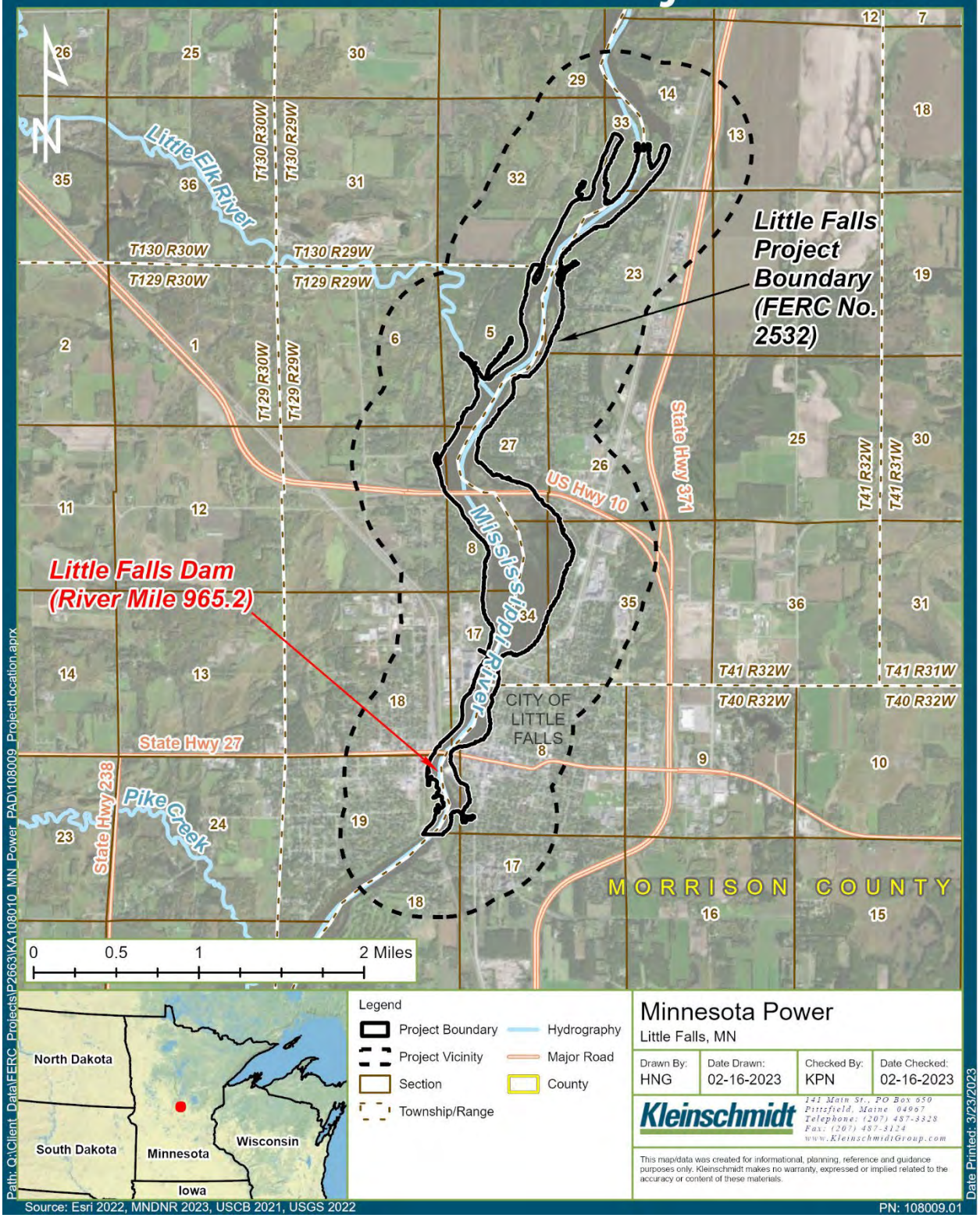
Best Regards,



Greg Prom
Senior Environmental Compliance Specialist
ALLETE, Inc., d.b.a Minnesota Power
30 West Superior Street
Duluth, Minnesota 55802-2093

Attachment: Maps of Locations of the Little Falls Hydroelectric Project (FERC No. 2532), Sylvan Hydroelectric Project (FERC No. 2454), and Pillager Hydroelectric Project (FERC No. 2663)

Little Falls Project Location



Minnesota Power
Little Falls, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	02-16-2023	KPN	02-16-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

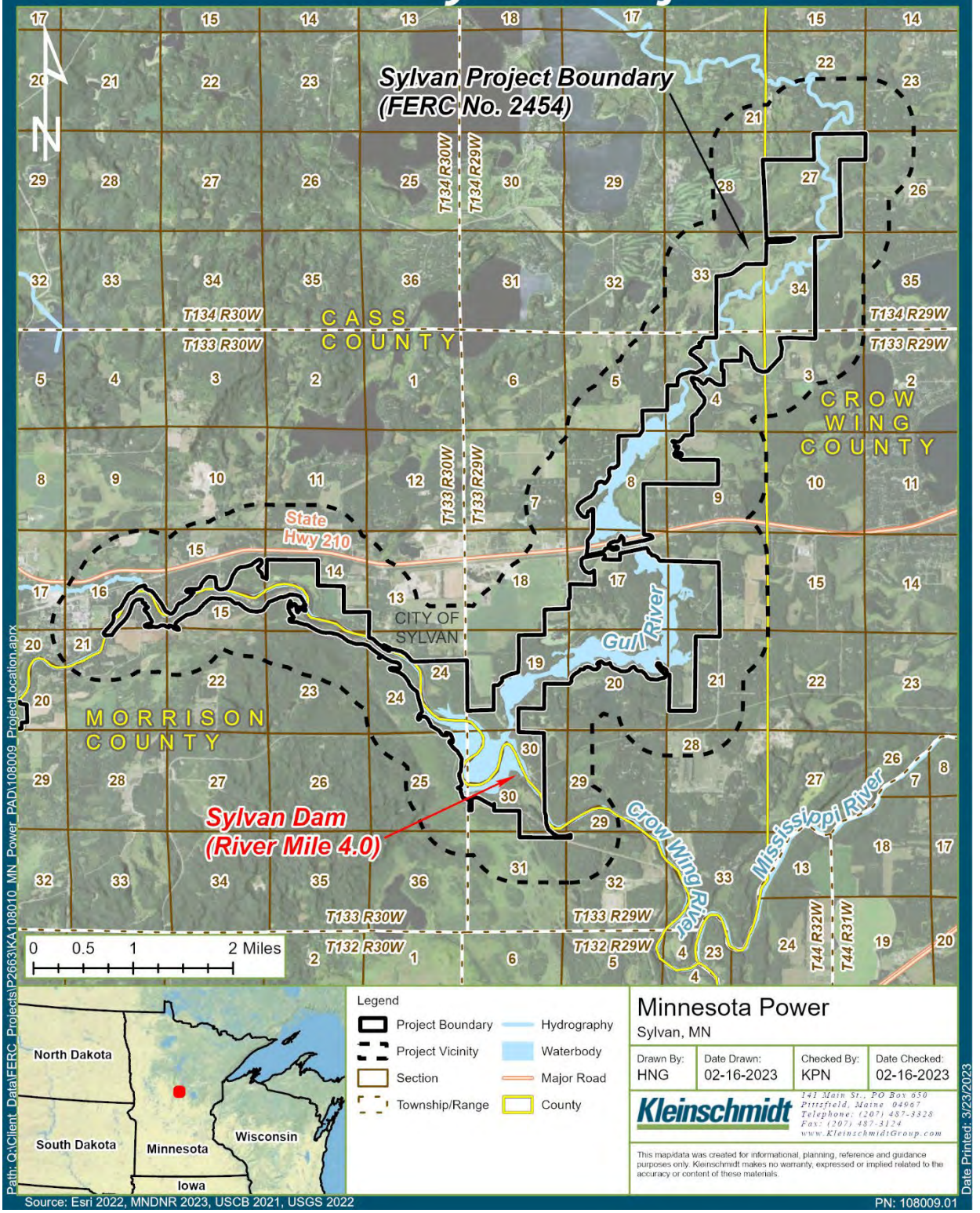
Path: Q:\Client_Data\FERC_Projects\P2663\KA108010_MN_Power_PAD\108009_ProjectLocation.aprx

Date Printed: 3/23/2023

Source: Esri 2022, MNDNR 2023, USCB 2021, USGS 2022

PN: 108009.01

Sylvan Project Location



Legend

- Project Boundary
- Project Vicinity
- Section
- Township/Range
- Hydrography
- Waterbody
- Major Road
- County

Minnesota Power
Sylvan, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	02-16-2023	KPN	02-16-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

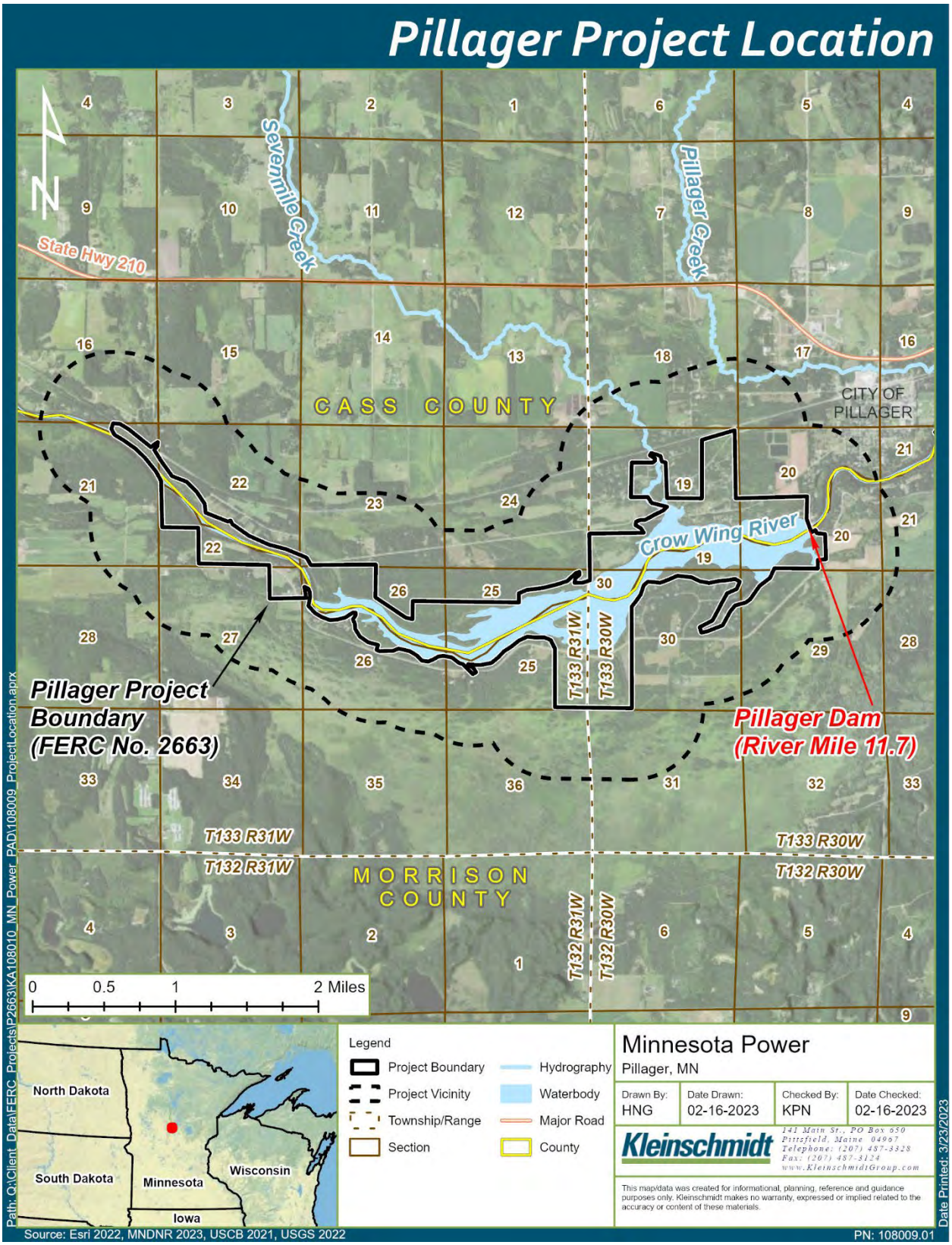
Path: Q:\Client Data\FERC Projects\P2663\KA108010_MN Power_PAD\108009_ProjectLocation.aprx

Date Printed: 3/23/2023

Source: Esri 2022, MNDNR 2023, USCB 2021, USGS 2022

PN: 108009.01

Pillager Project Location



Minnesota Power
Pillager, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	02-16-2023	KPN	02-16-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

Path: Q:\Client_Data\FERC_Projects\P2663\KA108010_MN_Power_PAD\108009_ProjectLocation.aprx

Date Printed: 3/23/2023

Source: Esri 2022, MNDNR 2023, USCB 2021, USGS 2022

PN: 108009.01

APPENDIX E-2

COASTAL ZONE MANAGEMENT ACT COMPLIANCE DOCUMENTATION

From:	Gregory Prom (MP)
To:	"Amber.Westerbur@state.mn.us"
Cc:	Lesley Brotkowski; Elizabeth Krchnavek; Matthew Radzak (MP)
Subject:	RE: Request for Determination of CZMA Compliance for Little Falls (P-2532), Sylvan (P-2454), Pillager (P-2663) Hydroelectric Projects
Date:	Tuesday, August 5, 2025 3:32:40 PM
Attachments:	image001.png Little Falls Sylvan Pillager CZMA Request Letter 2025_08_05.docx

Dear Ms. Westerbur,

Attached please find a formal request for a Coastal Zone Management Act (CZMA) consistency determination regarding the Federal Energy Regulatory Commission (FERC) relicensing of the Little Falls, Sylvan, and Pillager Hydroelectric Projects (FERC Nos. 2532, 2454, and 2663, respectively).

As outlined in the letter, ALLETE, Inc., doing business as Minnesota Power, is seeking confirmation that the proposed relicensing of these Projects complies with the policies of Minnesota's Coastal Zone Management Program. The Projects are located outside of Minnesota's designated coastal zone and are not anticipated to have reasonably foreseeable effects on the coastal zone.

We would appreciate your review and written determination within 60 days. Please note that, per FERC regulations, concurrence with CZMA compliance is presumed if no response is received within 180 days.

Thank you,

Greg Prom

Senior Environmental Compliance Specialist
Minnesota Power/ALLETE
30 West Superior Street
Duluth, Minnesota 55802

Office: 218-355-3191
Cell: 218-461-6856
Email: gprom@allete.com

minnesota power
AN ALLETE COMPANY

August 6, 2025

Via E-Mail

Amber Westerbur
Coastal Program Manager
Minnesota Department of Natural Resources
Minnesota Lake Superior Coastal Program
1568 Highway 2
Two Harbors, Minnesota 55616

Subject: Little Falls Hydroelectric Project (FERC Project No. 2532)
Sylvan Hydroelectric Project (FERC Project No. 2454)
Pillager Hydroelectric Project (FERC Project No. 2663)
Request for Coastal Zone Management Act Determination of Compliance

Dear Ms. Westerbur:

ALLETE, Inc., doing business as Minnesota Power (MP or Licensee), is the duly authorized manager, operator, and administrator of the Little Falls Hydroelectric Project (FERC No. 2532), Sylvan Hydroelectric Project (FERC No. 2454), and Pillager Hydroelectric Project (FERC No. 2663), herein collectively referred to as the "Projects." These Projects are licensed by the Federal Energy Regulatory Commission (FERC). The Little Falls Project includes a dam located on the Mississippi River in Morrison County, Minnesota. The Sylvan and Pillager Projects are located on the Crow Wing River in Cass, Crow Wing, and Morrison counties, Minnesota. Maps of the locations are attached.

The FERC licenses for the Projects expire on March 31, 2028. The Licensee is using the Commission's Integrated Licensing Process (ILP) to relicense the Projects concurrently. As part of the relicensing process, an applicant must provide to the FERC documentation that a determination has been made that the proposed relicensings complies with the policies of Minnesota's Coastal Zone Management Program, and that any activities associated with the licensing will be conducted in a manner that is consistent with such policies. This letter constitutes a formal request for a written determination of consistency with Minnesota's Coastal Zone Management Program.

The Projects are not located in Minnesota's designated coastal zone nor are the proposed actions of relicensings of the Projects anticipated to have reasonably foreseeable effects on Minnesota's designated coastal zone. ALLETE, Inc. is requesting your confirmation that the proposed

relicensing of the Projects complies with the policies of Minnesota's Coastal Zone Management Program.

We would appreciate your review and written determination within 60 days. Concurrence with CZMA compliance is presumed by FERC if no response is received within 180 days. Thank you for your time and attention to this matter.

Please feel free to contact me with any questions or comments regarding this request by phone at (218) 355-3191 or e-mail at gprom@allete.com.

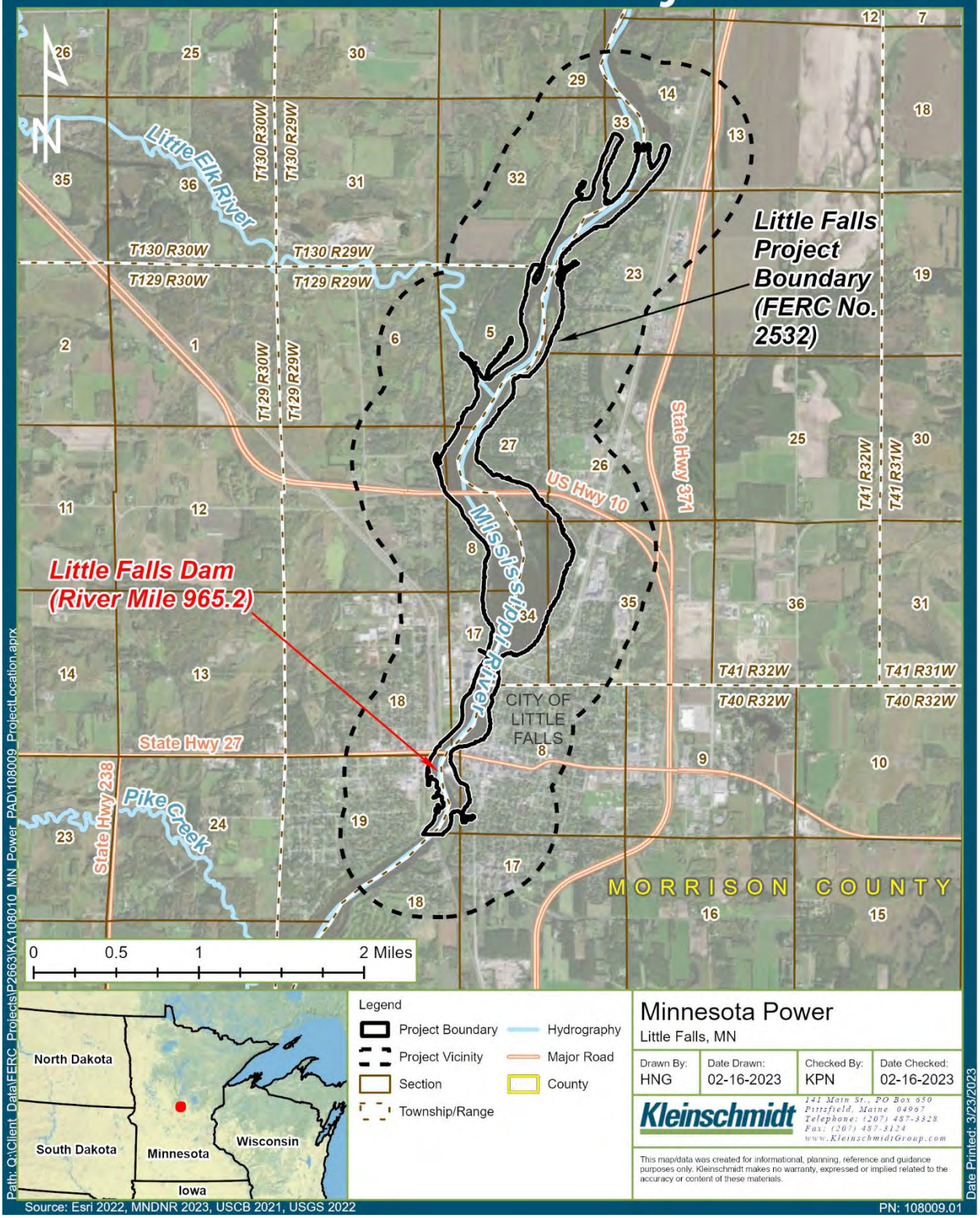
Best Regards,



Greg Prom
Senior Environmental Compliance Specialist
ALLETE, Inc., d.b.a Minnesota Power
30 West Superior Street
Duluth, Minnesota 55802-2093

Attachment: Maps of Locations of the Little Falls Hydroelectric Project (FERC No. 2532), Sylvan Hydroelectric Project (FERC No. 2454), and Pillager Hydroelectric Project (FERC No. 2663)

Little Falls Project Location



Minnesota Power
Little Falls, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	02-16-2023	KPN	02-16-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

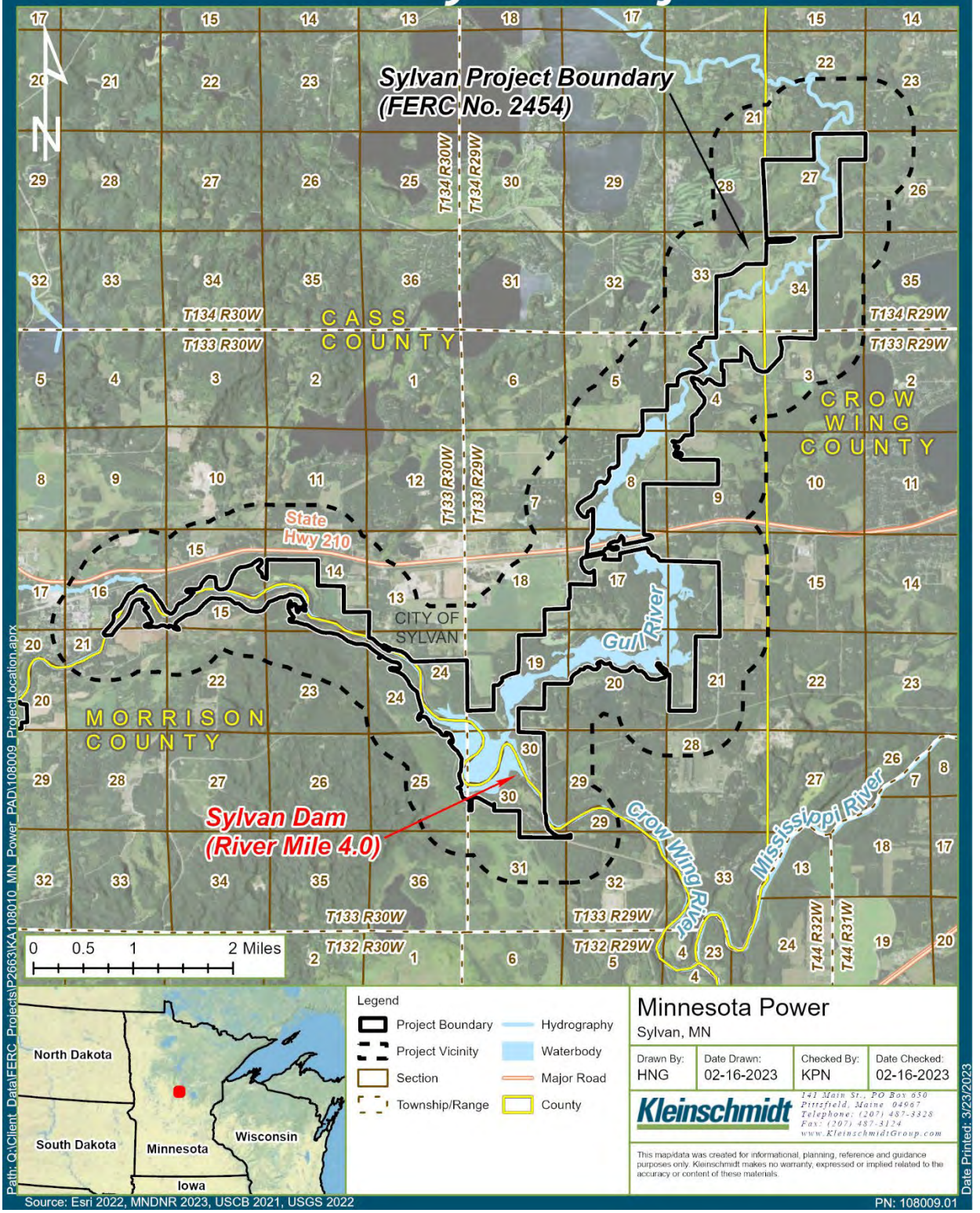
Path: Q:\Client_Data\FERC_Projects\P2663\KA108010_MN_Power_PAD\108009_ProjectLocation.aprx

Date Printed: 3/23/2023

Source: Esri 2022, MNDNR 2023, USCB 2021, USGS 2022

PN: 108009.01

Sylvan Project Location



Legend

- Project Boundary
- Project Vicinity
- Section
- Township/Range
- Hydrography
- Waterbody
- Major Road
- County

Minnesota Power
Sylvan, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	02-16-2023	KPN	02-16-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

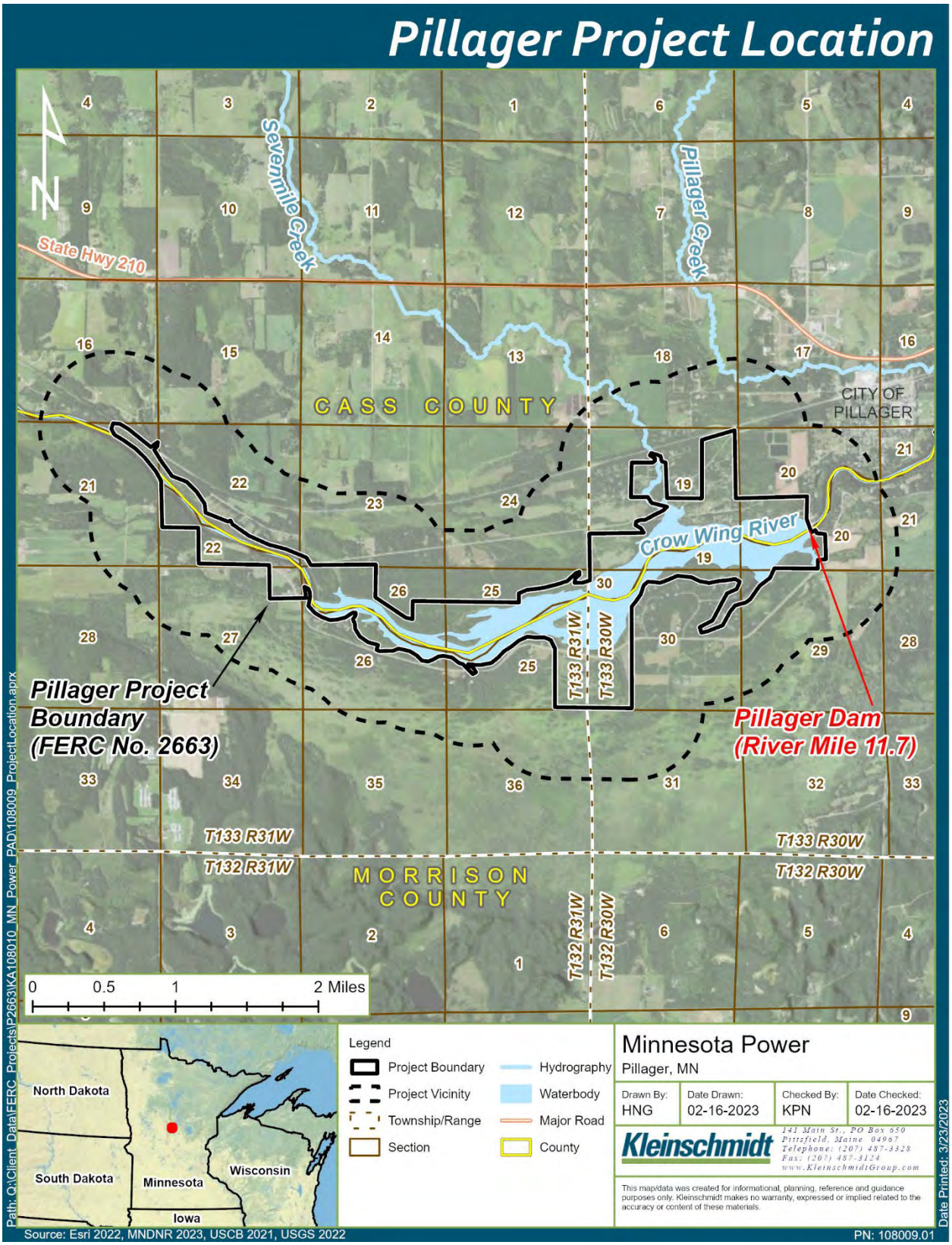
Path: Q:\Client Data\FERC Projects\P2663\KA108010_MN Power_PAD\108009_ProjectLocation.aprx

Date Printed: 3/23/2023

Source: Esri 2022, MNDNR 2023, USCB 2021, USGS 2022

PN: 108009.01

Pillager Project Location



Minnesota Power
Pillager, MN

Drawn By:	Date Drawn:	Checked By:	Date Checked:
HNG	02-16-2023	KPN	02-16-2023

Kleinschmidt
141 Main St., PO Box 650
Pittsfield, Maine 04967
Telephone: (207) 487-3328
Fax: (207) 487-3124
www.KleinschmidtGroup.com

This map/data was created for informational, planning, reference and guidance purposes only. Kleinschmidt makes no warranty, expressed or implied related to the accuracy or content of these materials.

Path: Q:\Client_Data\FERC_Projects\P2663\KA108010_MN_Power_PAD\108009_ProjectLocation.aprx

Date Printed: 3/23/2023

Source: Esri 2022, MNDNR 2023, USCB 2021, USGS 2022

PN: 108009.01

APPENDIX E-3

SYLVAN PROJECT AND PILLAGER PROJECT 2025 RECREATION USE SURVEY REPORT

Minnesota Power Sylvan Hydroelectric Project FERC Project No. P-2454 Cass and Morrison Counties, MN

2025 Recreation Use Assessment

PREPARED BY

Minnesota Power
30 W. Superior St.
Duluth, MN 55802

October 20, 2025

minnesota power

AN ALLETE COMPANY

TABLE OF CONTENTS

1 INTRODUCTION 1

1.1 PROJECT DESCRIPTION 1

1.2 OBJECTIVE 2

2 METHODOLOGY 3

2.1 RECREATION USE ASSESSMENT 3

3 SURVEY RESULTS 4

3.1 SYLVAN DAM BOAT ACCESS AND FISHING AREA 4

3.1.1 Recreation Use Assessment Results 4

3.2 SYLVAN CANOE PORTAGE 5

3.2.1 Recreation Use Assessment Results 5

3.3 WILDER'S LANDING 5

3.3.1 Recreation Use Assessment Results 6

3.4 FISHERMAN'S BRIDGE BOAT LAUNCH AND FISHING AREA 6

3.4.1 Recreation Use Assessment Results 6

4 CAPACITY ANALYSIS OF USER SURVEYS 8

5 CONCLUSIONS 10

5.1 RECREATION USE ASSESSMENT CONCLUSIONS 10

6 REFERENCES 11

LIST OF TABLES

Table 1-1 Recreation Site Descriptions 2
Table 2-1 2025 Recreation Use Survey Schedule 3
Table 3-1 Sylvan Dam Boat Access and Fishing Area Recreation Use Survey and Spot Count Summary 4
Table 3-2 Sylvan Canoe Portage Recreation Use Survey and Spot Count Summary 5
Table 3-3 Wilder's Landing Recreation Use Survey and Spot Count Summary 6
Table 3-4 Fisherman's Bridge Boat Launch and Fishing Area Recreation Use Survey and Spot Count Summary 7
Table 4-1 2025 User Survey Existing Capacity Analysis 8
Table 4-2 2024-2025 User Survey Existing Capacity Analysis 9
Table 4-3 User Survey Projected 40-Year Capacity Analysis 9

LIST OF APPENDICES

Appendix A - Site Locations and Aerial Overviews

Appendix B – Survey Data Forms and Spot Counts

1 INTRODUCTION

The Sylvan Hydroelectric Project (Project) is owned and operated by Minnesota Power (MP), an ALLETE Company, and is licensed by the Federal Energy Regulatory Commission (FERC). The Project's FERC License (P-2663) was issued on October 29, 1993, and the current operating license will expire on March 31, 2028. In accordance with FERC's regulations at 18 Code of Federal Regulations (CFR) §16.9(b), MP will file an application for a new license with FERC no later than March 31, 2026.

As part of the relicensing process, a recreation use and facility inventory study was conducted in 2024. The study findings were submitted to FERC; however, on April 4, 2025, FERC issued comments indicating that the recreation use survey was not fully consistent with the approved study plan and requested additional survey dates. In response, MP filed a letter with FERC on May 1, 2025, committing to conduct additional recreational use observations and surveys on six separate days in 2025, with two hours of observation per site per survey day. The surveys were conducted on one weekday and one weekend day in June, July, and August 2025. The results of the 2025 Recreation Use Assessment are included herein.

1.1 PROJECT DESCRIPTION

The Sylvan Hydroelectric Project is a 1.80 Megawatt (MW), run-of-river hydroelectric generation facility located on the Crow Wing River in Cass, Crow Wing, and Morrison Counties, Minnesota. There are four Commission-approved Project recreation sites: Sylvan Dam Boat Access and Fishing Area, Sylvan Canoe Portage, Wilder's Landing, and Fisherman's Bridge Boat Launch and Fishing Area. Each of the sites can be accessed any time of day and have no specific hours of operation. Except for the Sylvan Dam Boat Access and the Fisherman's Bridge Boat Launch and Fishing area sites, in which maintenance responsibilities are shared between MP and the Minnesota Department of Natural Resources (MnDNR), the owner / operator of each site performs all maintenance activities. At each site except for Wilder's Landing, MP inspects signs, mows, and collects garbage three times each summer. At all sites the MnDNR is typically responsible for road and boat launch repairs.

Site locations and plan views of each recreation site, including the Project's FERC boundary, are included in Appendix A. An overview of the recreation sites, their owners, and locations with respect to the dam are included in Table 1-1 below. Further details are provided in each site's representative subsection of Section 3.

Table 1-1
Recreation Site Descriptions

Recreation Site Area	Owner/Operator	Description
Sylvan Dam Boat Access and Fishing Area	MP & MnDNR [1]	Located directly downstream of the Sylvan Dam on the Crow Wing River. Parking for approximately 20 vehicles (10 for anglers, 10 for boaters), a shorefishing area, and a concrete boat ramp.
Sylvan Canoe Portage	MP	Located on the east side of the Sylvan Dam with an approximately 200-yard-long canoe portage trail around the dam. Unimproved launch upstream of the dam and utilizing the concrete boat ramp downstream of the dam.
Wilder's Landing	MnDNR	Located approximately 2 miles upstream of the Sylvan Dam, at the northwest end of the Crow Wing River. Parking for approximately 15 vehicles and a concrete boat ramp.
Fisherman's Bridge Boat Launch and Fishing Area	MP & MnDNR [1]	Located approximately 0.5 miles upstream of the Sylvan Dam, at the north end of Sylvan Reservoir. Designated shorefishing area with parking for approximately five vehicles on the east side of river. Two lane concrete boat launch and dock with parking for approximately 15 vehicles on the west side of river.

Notes: [1] MP owns the land and leases the site to MnDNR, who operates it.

1.2 OBJECTIVE

An inventory was conducted during the 2024 study to evaluate recreation facilities and use to inform the FERC relicensing process for the Project. The updated recreation study was conducted in accordance with the Revised Study Plan and response to FERC's April 4, 2025, comments from the 2024 study review. The following tasks were performed for the updated 2025 recreation study:

- Conduct recreation user surveys and recreation observations during the recreation season (June, July and August). The surveys were conducted on one weekday and one weekend for 2 hours per recreation site, per survey day. The surveys were performed according to the FERC approved Revised Study Plan to determine the adequacy of the sites and whether modifications to the sites would be needed to meet current or future recreation needs.

- Determine the current and projected capacity at each recreation site and facility for the hydroelectric facility.

This report updates the 2024 survey to present findings from recreation surveys conducted by MP staff during the 2025 season, and presents conclusions based on combined data from both the 2024 and 2025 recreation use surveys.

2 METHODOLOGY

In response to FERC's April 4, 2025 issuance, additional Recreation Use Assessment data were collected by MP staff between June and August 2025. These data included recreation user surveys and observation surveys conducted during site visits to each recreation location. Survey dates and times were randomly selected, and the order of site visits was varied for each survey day. Site visits were performed on the dates listed in Table 2-1.

Table 2-1
2025 Recreation Use Survey Schedule

Dates	Required Occasion
June 13, 2025 (Fri)	June weekday
June 14, 2025 (Sat)	June weekend day
July 18, 2025 (Fri)	July weekday
July 19, 2025 (Sat)	July weekend day
August 15, 2025 (Fri)	August weekday
August 16, 2025 (Sat)	August weekend day

2.1 RECREATION USE ASSESSMENT

The Recreation Use Assessment consisted of documenting observed usage of the sites, performing a spot count of the number of visitors, and conducting user surveys of visitors at the sites. Recreation usage observations and spot counts were completed over a 2-hour period at each non-canoe access site (Sylvan Dam Boat Access and Fishing Area, Sylvan Canoe Portage, Wilder's Landing, and Fisherman's Bridge Boat Launch and Fishing Area). Observation times were randomized for each of the site visit dates specified in the above schedule in Table 2-1, in order to account for time-of-day use patterns. Usage observations consisted of documenting the weather condition, number of people observed, visitor activities, and other pertinent usage notes. For the spot count, field staff recorded the total number of vehicles and visitors observed over a 2-hour period at each site. Field staff also recorded the total number of vehicles and visitors observed at a single point in time. This typically occurred when the field staff began the 2-hour session at each site. During the 2-hour period, MP field staff also administered user surveys to visitors who were willing to participate. User surveys included collecting visitors' opinions on the existing conditions and recreation opportunities.

The Recreation Use Assessment was recorded using paper forms. The survey forms specific to the usage observations, spot count, and user surveys were developed based on the forms provided by MP and included in the relicensing Revised Study Plan (see Appendix B for sample forms). The user surveys were administered by MP field staff directly to visitors. Hard-copy versions of the user forms were available to use. The surveys were either filled out by the visitor or the surveyor, based on visitor preference. Instances in which a visitor declined to complete a survey were not specifically recorded but were occasionally noted on the form.

3 SURVEY RESULTS

The following sections summarize the results of the Recreation Use Assessments at each Pillager recreation site. The forms completed in the field, including the user surveys, are included in Appendix C.

3.1 SYLVAN DAM BOAT ACCESS AND FISHING AREA

The Sylvan Dam Boat Access and Fishing Area recreation site is located directly downstream of the Sylvan Dam on the Crow Wing River. Site amenities include parking for approximately 20 vehicles (10 spots for anglers and 10 spots for other boaters), a shorefishing area, and a concrete boat ramp. The site is owned by MP, who leases the land to MnDNR for operation and maintenance of the site. There are no set hours or seasons of operation for this site.

3.1.1 Recreation Use Assessment Results

Seven recreation use surveys were completed by visitors for this site during the 2025 survey. Key findings from the visitor use surveys and spot counts in 2025 are as follows and included in Table 3-1:

- In general, Sylvan Dam Boat Access and Fishing Area was moderately visited during the recreation survey period. The number of people observed varied from 3 to 8 people per site visit, based on the spot counts.
- The visitors indicated moderate recreation opportunities were offered at the site.
- No concerns about safety were indicated.
- One visitor noted that the rocks could be cleaned up/filled to prevent further erosion.
- One visitor noted that the road could be fixed/potholes filled.

Table 3-1
Sylvan Dam Boat Access and Fishing Area 2025 Recreation Use Survey and Spot Count Summary

Date	No. of Visitors	No. of Cars	Activities Observed	No. of User Surveys	Average Site Utilization Score[1]	Max / Min Utilization Score	Average Site Condition Score[2]	Max / Min Site Condition Score
6/13/2025	7	5	Fishing from shore	2	3	3 / 3	3.5	5 / 2
6/14/2025	6	6	Fishing from shore, Motorized boating, Canoe/Kayking	3	3.7	4 / 3	4	4 / 4
7/18/2025	8	3	Fishing from shore, Skipping rocks [3]	1	4	4 / 4	4	4 / 4
7/19/2025	3	2	Fishing from shore	0	N/A	N/A	N/A	N/A
8/15/2025	4	3	Fishing from boat, Motorized boating	1	3	3 / 3	4	4 / 4
8/16/2025	4	4	Motorized boating,[4] Canoe/Kayaking	0	N/A	N/A	N/A	N/A

Notes: [1] Utilization rated from 1 to 5, where 1 = “underutilized”, 3 = “moderate”, and 5 = “overcrowded”.
[2] Site condition rated from 1 to 5, where 1 = “poor”, 3 = “satisfactory”, and 5 = “excellent”.
[3] Family of five stopped to talk, but were not interested in filling out a survey.

(4) Vehicles turned around in parking lot and left.

3.2 SYLVAN CANOE PORTAGE

The Sylvan Canoe Portage recreation site is located on the east side of the Sylvan Dam and includes an approximately 200-foot-long canoe portage trail around the dam. Site amenities also include an unimproved launch upstream of the dam. The portage uses the concrete boat ramp (part of the Sylvan Dam Boat Access and Fishing Area site) for the downstream launch. The boat launch is operated by the MnDNR, while the remainder of the site is owned, operated, and maintained by MP. There are no set hours or seasons of operation for this site.

Note that the Sylvan Canoe Portage is directly connected to the Sylvan Dam Boat Access and Fishing Area, in that the portage uses the other site's boat launch for the downstream canoe launch spot. Therefore, some of the survey results noted vehicles and visitors that were passing through the portage on the gravel road.

3.2.1 Recreation Use Assessment Results

No recreation use surveys were completed by visitors to this site during the 2025 survey. This site was underutilized during the 2025 survey period. No actual portages were observed. No surveys were administered, as the only visitors observed did not stay at the site long enough to administer the survey. A summary of vehicle and visitor spot counts in 2025 are included in Table 3-2:

Table 3-2
Sylvan Canoe Portage 2025 Recreation Use Survey and Spot Count Summary

Date	No. of Visitors	No. of Cars	Activities Observed	No. of User Surveys	Average Site Utilization Score(1)	Max / Min Utilization Score	Average Site Condition Score(2)	Max / Min Site Condition Score
6/13/2025	0	8	See note (3)	0	N/A	N/A	N/A	N/A
6/14/2025	0	9	See note (3)	0	N/A	N/A	N/A	N/A
7/18/2025	4	4	See note (3)	0	N/A	N/A	N/A	N/A
7/19/2025	0	2	See note (3)	0	N/A	N/A	N/A	N/A
8/15/2025	0	0	N/A(4)	0	N/A	N/A	N/A	N/A
8/16/2025	0	0	N/A (4)	0	N/A	N/A	N/A	N/A

Notes: (1) Utilization rated from 1 to 5, where 1 = "underutilized", 3 = "moderate", and 5 = "overcrowded".
(2) Site condition rated from 1 to 5, where 1 = "poor", 3 = "satisfactory", and 5 = "excellent".
(3) Vehicles were passing through to other sites.
(4) No visitors were observed.

3.3 WILDER'S LANDING

The Wilder's Landing recreation site is located approximately 2 miles upstream of the Sylvan Dam, at the northwest end of the Crow Wing River. Site amenities include parking for approximately 15 vehicles and a concrete boat ramp. The site is owned, operated, and maintained by the MnDNR. There are no set hours or seasons of operation for this site.

3.3.1 Recreation Use Assessment Results

One recreation use survey was completed by a visitor for this site during the 2025 survey. Key findings from the visitor use survey and spot counts in 2025 are as follows and included in Table 3-4:

- In general, Wilders Landing was underutilized to moderately visited during the recreation survey period. The number of people observed varied from 0 to 7 people per site visit, based on the spot counts.
- The visitor indicated sufficient recreation opportunities were offered at the site.
- The visitor had no concerns for safety at this site.
- The visitor noted that they took the survey last year, and there was good fish health at this site.

Table 3-3
Wilder's Landing 2025 Recreation Use Survey and Spot Count Summary

Date	No. of Visitors	No. of Cars	Activities Observed	No. of User Surveys	Average Site Utilization Score(1)	Max / Min Utilization Score	Average Site Condition Score(2)	Max / Min Site Condition Score
6/13/2025	0	0	N/A(3)	0	N/A	N/A	N/A	N/A
6/14/2025	7	3	Fishing from shore, Motorized boating	0	N/A	N/A	N/A	N/A
7/18/2025	0	0	N/A(3)	0	N/A	N/A	N/A	N/A
7/19/2025	1	6	Motorized boating	0	N/A	N/A	N/A	N/A
8/15/2025	4	3	Fishing from boat, Hiking/Walking	1	3.7	3.7 / 3.7	4.7	4.7 / 4.7
8/16/2025	0	0	N/A(3)	0	N/A	N/A	N/A	N/A

Notes: (1) Utilization rated from 1 to 5, where 1 = "underutilized", 3 = "moderate", and 5 = "overcrowded".
(2) Site condition rated from 1 to 5, where 1 = "poor", 3 = "satisfactory", and 5 = "excellent".
(3) No visitors were observed; therefore, no activities were noted.

3.4 FISHERMAN'S BRIDGE BOAT LAUNCH AND FISHING AREA

The Fisherman's Bridge Boat Launch and Fishing Area recreation site is located approximately 0.5 miles upstream of the Sylvan Dam, and the north end of the Sylvan reservoir. Site amenities include a designated shorefishing area with parking for approximately 5 vehicles on the east side of the bridge/river, and a two-lane concrete boat launch and dock with parking for approximately 15 vehicles on the west side of the bridge/river. The site is owned by MP, who leases the land to MnDNR for operation of the site. Maintenance is shared by MP and the MnDNR. There are no set hours or seasons of operation for this site.

3.4.1 Recreation Use Assessment Results

Five recreation use surveys were completed by visitors for this site during the 2025 survey. Key

findings from the visitor use surveys and spot counts in 2025 are as follows and included in Table 3-4:

- In general, the Fisherman's Bridge Boat Launch was moderately visited during the recreation survey period. The number of people observed varied from 4 to 14 people per site visit, based on the spot counts.
- The visitors generally indicated sufficient recreation opportunities were offered at the site.
- Two visitors expressed concerns about the safety of people jumping or climbing up the fence along the bridge.
- Two visitors noted that having a bathroom on the site would be beneficial.
- One visitor expressed concerns about poison ivy presence at the site.

Table 3-4
Fisherman's Bridge Boat Launch and Fishing Area 2025 Recreation Use Survey and Spot Count Summary

Date	No. of Visitors	No. of Cars	Activities Observed	No. of User Surveys	Average Site Utilization Score[1]	Max / Min Utilization Score	Average Site Condition Score[2]	Max / Min Site Condition Score
6/13/2025	8	1	Hiking/Walking, Fishing from shore, Viewing wildlife	1	3	3 / 3	5	5 / 5
6/14/2025	14	7	Fishing from shore/ bridge[3], Motorized boating, Hiking/Walking	2	3	3 / 3	2	2 / 2
7/18/2025	4	3	Fishing from shore	0	N/A	N/A	N/A	N/A
7/19/2025	5	1	Fishing from shore/ bridge[4]	0	N/A	N/A	N/A	N/A
8/15/2025	6	4	Fishing from shore/ bridge/boat	2	4	4 / 4	4	4 / 4
8/16/2025	4	4	Fishing from boat[5]	0	N/A	N/A	N/A	N/A

Notes: [1] Utilization rated from 1 to 5, where 1 = "underutilized", 3 = "moderate", and 5 = "overcrowded".
[2] Site condition rated from 1 to 5, where 1 = "poor", 3 = "satisfactory", and 5 = "excellent".[3] Car left because there were no parking spots.[4] Other visitors fishing from bridge parked in other spots and walked over.[5] Vehicles drove in and immediately left without stopping to complete a survey.

4 CAPACITY ANALYSIS OF USER SURVEYS

The user survey data was further analyzed to evaluate the current and predicted capacity at each recreation site. Assessment of existing capacity included computing the average number of visitors over the 2-hour survey period and one recreation day, as well as the average reported site utilization scores. Given typical daylight hours and that there are no set hours of operation for any of the recreation sites, one recreation day was assumed to be 10 hours long. Visitors per recreation day was computed by projecting the 2-hour visitor count over 10 hours. The assessment also included comparing the number of observed vehicles versus available parking spaces. Existing capacity was evaluated as follows:

- "Sufficient" – Average site utilization score of 4 or lower and average number of vehicles was less than 90% of available parking spaces
- "Insufficient" – Average site utilization score greater than 4 and average number of vehicles regularly exceeded available number of spots

Table 4-1 presents the results of the existing capacity evaluation based on data collected during the 2025 Recreation Use Assessment. Table 4-2 summarizes the existing capacity evaluation using all Recreation Use Assessment data collected in 2024 and 2025.

Table 4-1
2025 User Survey Existing Capacity Analysis

Site	Avg. No. of Visitors (2-hr)	Visitors Per Recreation Day [1]	Avg. No. of Vehicles (2-hr)	No. of Parking Spots	Avg. Site Utilization Score [2]	Existing Capacity
Sylvan Dam Boat Access and Fishing Area	5.3	26.5	3.8	20	3.4	Sufficient
Sylvan Canoe Portage	0.7	3.5	3.8	2	N/A[3]	Sufficient
Wilder's Landing	2	10	2	15	3.7	Sufficient
Fisherman's Bridge Boat Launch and Fishing Area	6.8	34	3.3	20	3.4	Sufficient

Notes: [1] A "recreation day" assumed to be one 10-hour day.
[2] Site utilization scores ranged from 1 to 5, with 1 being underutilized and 5 being overcrowded.
[3] No surveys were completed for this site.

Table 4-2
2024-2025 User Survey Existing Capacity Analysis

Site	Avg. No. of Visitors (2-hr)	Visitors Per Recreation Day [1]	Avg. No. of Vehicles (2-hr)	No. of Parking Spots	Avg. Site Utilization Score [2]	Existing Capacity
Sylvan Dam Boat Access and Fishing Area	6.8	34	4.3	20	3	Sufficient
Sylvan Canoe Portage	0.3	1.5	1.8	2	N/A[3]	Sufficient
Wilder's Landing	3.8	7.6	2.3	15	3.1	Sufficient
Fisherman's Bridge Boat Launch and Fishing Area	7.3	36.5	3.5	20	3.2	Sufficient

Notes: [1] A "recreation day" assumed to be one 10-hour day.
[2] Site utilization scores ranged from 1 to 5, with 1 being underutilized and 5 being overcrowded.
[3] No surveys were completed for this site.

Predicted capacity was evaluated at the end of the Project's assumed 40-year license period. The projected number of visitors was estimated using county and state census population data from the U.S. Census Bureau (U.S. Census Bureau, 2022a and 2022b). The population change from 2010 to 2020 for Morrison County, Cass County, and the state of Minnesota was a 2.4%, 5.2%, and 7.6% increase, respectively. This equates to an average 5.1% increase in population in 10 years, or an approximate 22% increase over 40 years. The growth rate was applied to the current visitor counts to estimate the projected number of visitors. This increase was also applied to the site utilization scores, given the increased number of visitors. The number of projected vehicles was computed based on the current ratio of vehicles per visitor in the 2-hour survey period and compared to the available parking spaces. No increase in number of parking spaces was assumed. Predicted capacity was evaluated using the same "Sufficient" and "Insufficient" designation as described above. Results of the existing capacity evaluation are presented in the following Table 4-3.

Table 4-3
User Survey Projected 40-Year Capacity Analysis

Site	Avg. No. of Visitors (2-hr)	Visitors Per Recreation Day [1]	% Increase in Visitors	Avg. No of Vehicles (2-hr)	No. of Parking Spots	Projected Capacity
Sylvan Dam Boat Access and Fishing Area	8.3	41.5	22%	5.2	20	Sufficient
Sylvan Canoe Portage	0.4	1.8	22%	2.2	2	Sufficient
Wilder's Landing	4.6	9.3	22%	2.8	15	Sufficient
Fisherman's Bridge Boat Launch and Fishing Area	8.9	44.5	22%	4.3	20	Sufficient

Notes: [1] A "recreation day" assumed to be one 10-hour day.

5 CONCLUSIONS

Key findings and conclusions from the 2025 Recreation Use Assessment surveys are summarized below.

5.1 RECREATION USE ASSESSMENT CONCLUSIONS

Results of the 2024 and 2025 recreation usage observations, spot counts, and visitor surveys indicate that there is moderate usage of the Sylvan Dam Boat Access and Fishing Area which primarily consisted of fishing and boating activities. Recreation usage at the Sylvan Canoe Portage was underutilized, with no usage for canoe portaging observed during the 2025 survey. The Wilder's Landing varied during the survey period from underutilized to moderate usage. The observed activities consisted of fishing, boating and hiking at this location. The most usage was observed at the Fisherman's Bridge Boat Launch and Fishing Area, with up to 14 visitors reported during one site visit. Activities at this site include boating, fishing, hiking, and wildlife watching.

Of the user surveys completed, they all indicated sufficient recreation opportunities were offered. The sites were typically categorized as slightly under to moderately utilized. Overcrowding does not appear to be a concern at the recreation sites. The analysis of the user survey data indicates sufficient capacity at all recreation sites for both current and projected usage at the end of the license period. There is adequate capacity to accommodate potential increases in recreation demand.

6 REFERENCES

Kleinschmidt Associates. 2024. Revised Study Plan, Little Falls Hydroelectric Project FERC P-2532, Sylvan Hydroelectric Project FERC P-2454, Pillager Hydroelectric Project FERC P-2663, e-filed: January 9, 2024.

U.S. Census Bureau. 2022a. QuickFacts: Little Falls city, Minnesota; Baxter city, Minnesota; Morisson County, Minnesota; Crow Wing County, Minnesota; Cass County, Minnesota; Minnesota. Available online at: https://www.census.gov/quickfacts/fact/table/littlefallscityminnesota,baxtercityminnesota, morrisoncountyminnesota,crowwingcountyminnesota,casscountyminnesota,MN/PST045222. Accessed January 2025.

U.S. Census Bureau. 2022b. American Community survey 5-year data (2009-2021). Census.gov. Available online at: https://www.census.gov/data/developers/data-sets/acs-5year.html. Accessed January 2025.

Appendix A –

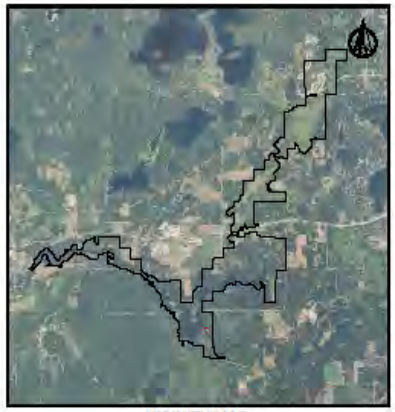
Site Locations and Aerial Overviews

SYLVAN HYDROELECTRIC PROJECT RECREATION USE AND FACILITY INVENTORY STUDY

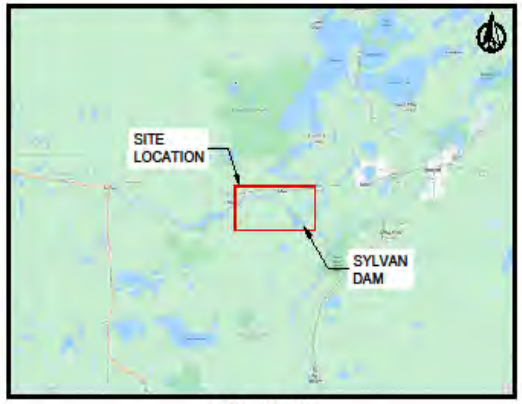
FOR

MINNESOTA POWER

CASS, CROW WING, AND MORRISON COUNTIES, MINNEOSTA



VICINITY MAP
SCALE 1" = 7500'



LOCATION MAP
NOT TO SCALE



STATE MAP
NOT TO SCALE

INDEX	NO.
TITLE SHEET	1
OVERVIEW	2
SYLVAN DAM BOAT ACCESS AND FISHING AREA	3
SYLVAN CANOE PORTAGE	4
WILDER'S LANDING	5
FISHERMAN'S BRIDGE BOAT LAUNCH AND FISHING AREA	6

merjent.

Corporate Office
1 Main Street SE, Suite 300
Minneapolis, Minnesota 55414
(612) 746-3660

Wisconsin Office
126 N Spaeth Lane, Bldg. 6
Kaukauna, WI 54130
(920) 360-4166

PLOTTED SIZE: ANSI full bleed D (11.00 x 17.00 Inches)

REVISION RECORD

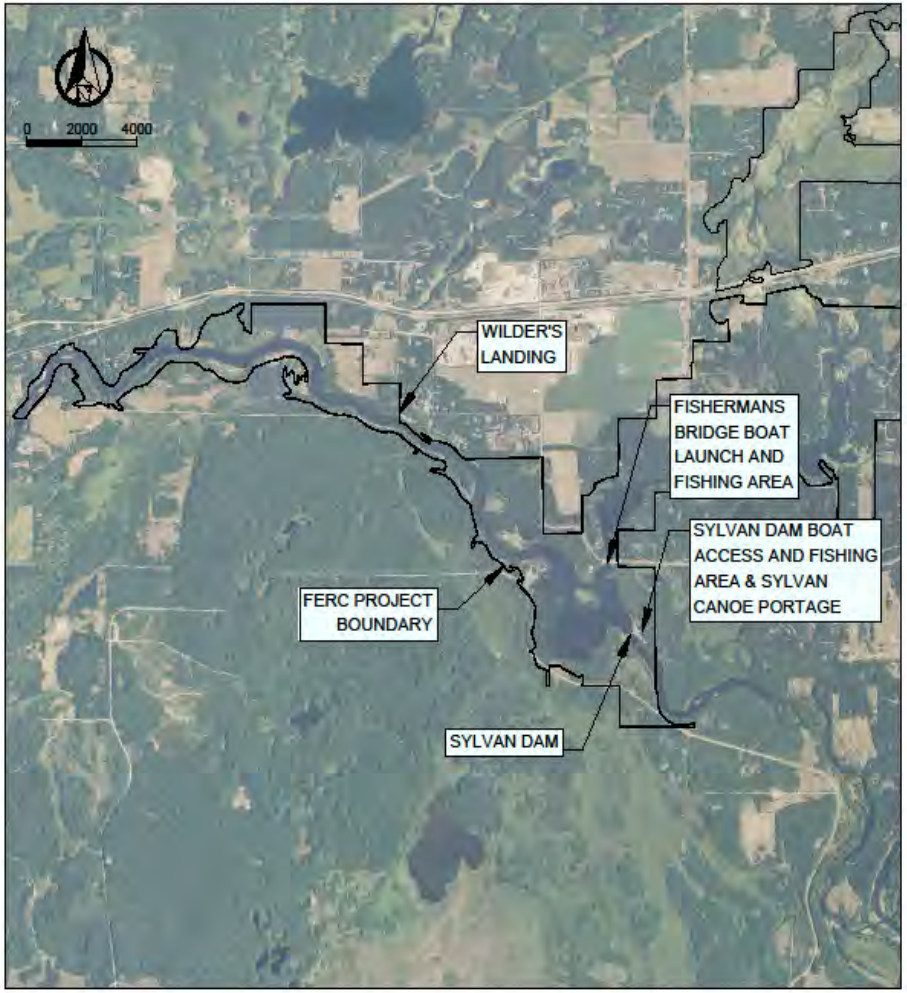
NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
0	OCT. 2024	EXHIBITS FOR RECREATION STUDY	AJ	EFB	
1	DEC. 2024	EXHIBITS FOR RECREATION STUDY REVISIONS	AJ	EFB	

MINNESOTA POWER
SYLVAN HYDROELECTRIC PROJECT RECREATION USE AND FACILITY INVENTORY STUDY
CASS, CROW WING, AND MORRISON COUNTIES, MINNESOTA

TITLE SHEET

DRAWING NO.
C100

SHEET 1 OF 8



SYLVAN RECREATION SITES

SYLVAN DAM BOAT ACCESS AND FISHING AREA:

LOCATION: CONCRETE BOAT LAUNCH PROVIDING ACCESS TO THE CROW WING RIVER BELOW THE DAM. OFF SYLVAN DAM RD SW.
COORDINATES:
LATITUDE: 46°18'13.65"N
LONGITUDE: 94°22'34.82"W
DESCRIPTION: PARKING FOR APPROXIMATELY 20 VEHICLES (10 FOR ANGLERS, 10 FOR BOATERS) AND A CONCRETE BOAT RAMP.
OWNER/OPERATOR: MINNESOTA DNR; MP LEASES THE SITE TO DNR

SYLVAN CANOE PORTAGE:

LOCATION: PORTAGE AROUND THE DAM. LOCATED ON THE EAST SIDE OF THE DAM OFF SYLVAN DAM RD SW.
COORDINATES:
LATITUDE: 46°18'21.34"N
LONGITUDE: 94°22'39.02"W
DESCRIPTION: APPROXIMATELY 200-YARD LONG CANOE PORTAGE AROUND THE DAM. PARKING FOR APPROXIMATELY TWO VEHICLES WITH AN UNIMPROVED LAUNCH UPSTREAM OF THE DAM AND UTILIZING THE CONCRETE BOAT RAMP DOWNSTREAM OF THE DAM.
OWNER/OPERATOR: MP

WILDER'S LANDING:

LOCATION: BOAT LAUNCH AT THE NORTHWEST END OF THE CROW WING RIVER. OFF 25TH AVE SW.
COORDINATES:
LATITUDE: 46°19'31.14"N
LONGITUDE: 94°24'37.49"W
DESCRIPTION: PARKING FOR APPROXIMATELY 15 VEHICLES AND A CONCRETE BOAT RAMP.
OWNER/OPERATOR: MINNESOTA DNR

FISHERMAN'S BRIDGE BOAT LAUNCH AND FISHING AREA:

LOCATION: LOCATED ON THE NORTH END OF SYLVAN RESERVOIR. OFF 136TH ST SW.
COORDINATES:
LATITUDE: 46°18'41.81"N
LONGITUDE: 94°22'51.10"W
DESCRIPTION: DESIGNATED SHOREFISHING AREA WITH PARKING FOR APPROXIMATELY FIVE VEHICLES ON THE EAST SIDE OF RIVER. TWO LANE CONCRETE BOAT LAUNCH AND DOCK WITH PARKING FOR APPROXIMATELY 15 VEHICLES ON THE WEST SIDE OF RIVER.
OWNER/OPERATOR: MINNESOTA DNR; MP LEASES THE SITE TO DNR.

merjent.

Corporate Office
1 Main Street SE, Suite 300
Minneapolis, Minnesota 55414
(612) 746-3660

Wisconsin Office
136 N Speedway Lane, Bldg. E
Kaukauna, WI 54130
(920) 360-9160

REVISION RECORD

NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
0	OCT. 2024	EXHIBITS FOR RECREATION STUDY	AJ	EFB	
1	DEC. 2024	EXHIBITS FOR RECREATION STUDY REVISIONS	AJ	EFB	

MINNESOTA POWER
SYLVAN HYDROELECTRIC PROJECT RECREATION USE AND FACILITY INVENTORY STUDY
CASS, CROW WING, AND MORRISON COUNTIES, MINNESOTA

DRAWING NO.
C101

OVERVIEW

SHEET 2 OF 8

PLOTTED SIZE: ANSI full bleed D (11.00 x 17.00 inches)



SITE OVERVIEW
SYLVAN DAM BOAT ACCESS AND FISHING AREA

merjent.

Corporate Office
1 Main Street SE, Suite 300
Minneapolis, Minnesota 55414
(612) 746-3660

Wisconsin Office
720 N Speedway Lane, Bldg. E
Kaukauna, WI 54130
(920) 560-4146

PLOTTED SIZE: ANSI full bleed D (11.00 x 17.00 inches)

REVISION RECORD

NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
0	OCT. 2024	EXHIBITS FOR RECREATION STUDY	AJ	EFB	
1	DEC. 2024	EXHIBITS FOR RECREATION STUDY REVISIONS	AJ	EFB	

MINNESOTA POWER
SYLVAN HYDROELECTRIC PROJECT RECREATION USE AND FACILITY INVENTORY STUDY
CASS, CROW WING, AND MORRISON COUNTIES, MINNESOTA

DRAWING NO.
C102

SYLVAN DAM BOAT ACCESS AND FISHING AREA

SHEET 3 OF 6



SITE OVERVIEW
SYLVAN CANOE PORTAGE

merjent.

Corporate Office
1 Main Street SE, Suite 300
Minneapolis, Minnesota 55414
(612) 746-3660

Wisconsin Office
135 N Speedway Lane, Bldg. E
Kaukauna, WI 54130
(920) 360-9146

REVISION RECORD

NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
0	OCT. 2024	EXHIBITS FOR RECREATION STUDY	AJ	EFS	
1	DEC. 2024	EXHIBITS FOR RECREATION STUDY REVISIONS	AJ	EFS	

PLOTTED SIZE: ANSI full bleed B (11.00 x 17.00 inches)

MINNESOTA POWER
SYLVAN HYDROELECTRIC PROJECT RECREATION USE AND FACILITY INVENTORY STUDY
CASS, CROW WING, AND MORRISON COUNTIES, MINNESOTA

DRAWING NO.
C103

SYLVAN CANOE PORTAGE

SHEET 4 OF 8



SITE OVERVIEW
WILDER'S LANDING

merjent.

Corporate Office
1 Main Street SE, Suite 300
Minneapolis, Minnesota 55414
(612) 746-3660

Wisconsin Office
720 N Speedway Lane, Bldg. E
Kaukauna, WI 54130
(920) 360-9146

REVISION RECORD

NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
0	OCT. 2024	EXHIBITS FOR RECREATION STUDY	AJ	EFB	
1	DEC. 2024	EXHIBITS FOR RECREATION STUDY REVISIONS	AJ	EFB	

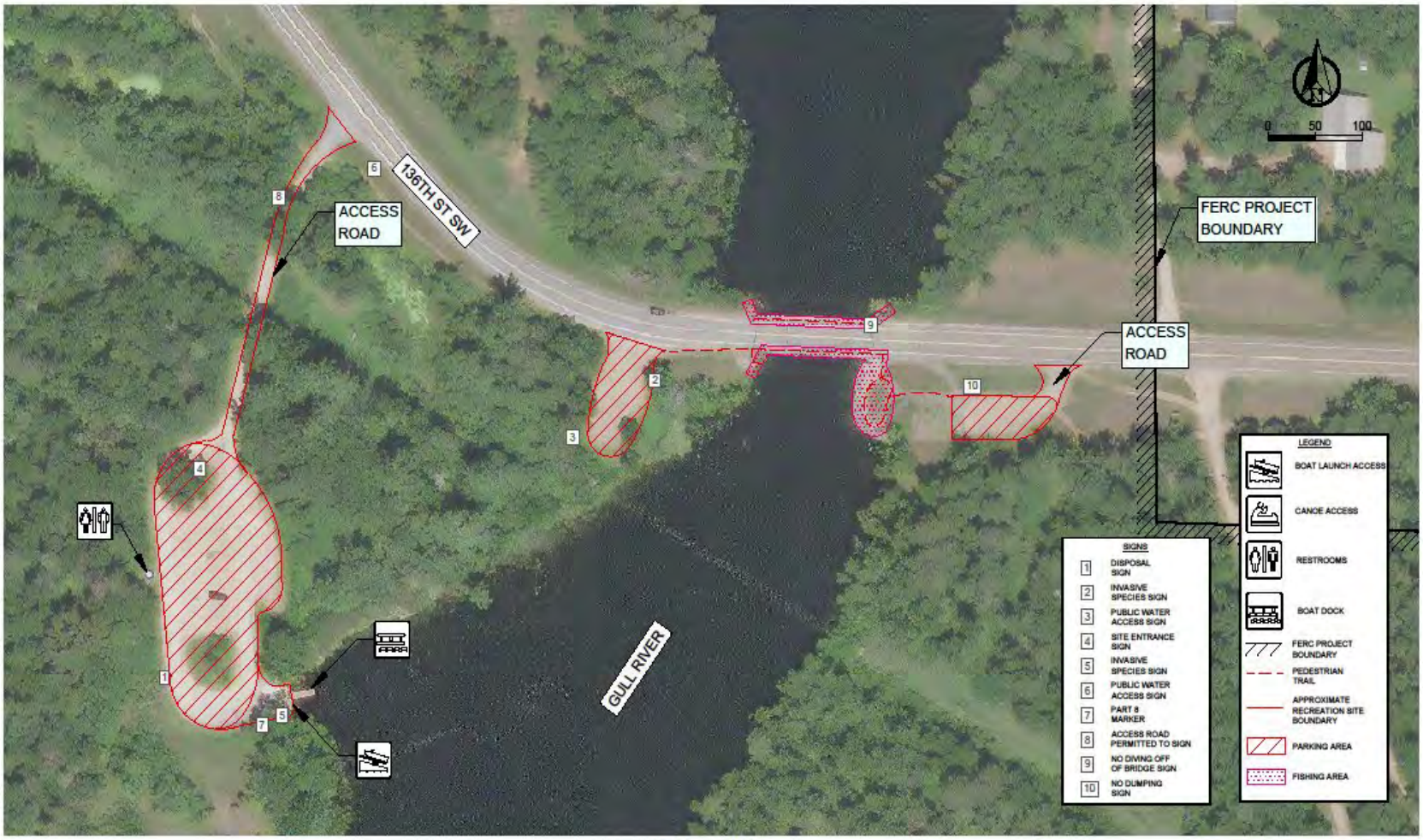
PLOTTED SIZE: ANSI full bleed D (11.00 x 17.00 inches)

MINNESOTA POWER
SYLVAN HYDROELECTRIC PROJECT RECREATION USE AND FACILITY INVENTORY STUDY
CASS, CROW WING, AND MORRISON COUNTIES, MINNESOTA

DRAWING NO.
C104

WILDER'S LANDING

SHEET 5 OF 8



SITE OVERVIEW
FISHERMAN'S BRIDGE BOAT LAUNCH &
FISHING AREA

merjent.

Corporate Office
1 Main Street SE, Suite 300
Minneapolis, Minnesota 55414
(612) 746-3660

Wisconsin Office
726 N Speedway Lane, Bldg. E
Kaukauna, WI 54130
(920) 560-4146

REVISION RECORD

NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
0	OCT. 2024	EXHIBITS FOR RECREATION STUDY	AJ	EFB	
1	DEC. 2024	EXHIBITS FOR RECREATION STUDY REVISIONS	AJ	EFB	

MINNESOTA POWER
SYLVAN HYDROELECTRIC PROJECT RECREATION USE AND FACILITY INVENTORY STUDY
CASS, CROW WING, AND MORRISON COUNTIES, MINNESOTA

DRAWING NO.
C105

FISHERMAN'S BRIDGE BOAT LAUNCH AND FISHING AREA

SHEET 6 OF 6

PLOTTED SIZE: ANSI full bleed D (11.00 x 17.00 inches)

Appendix B –

Survey Data Forms and Spot Counts

Sylvan Dam Boat Access and Fishing Area

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson

Date: 06/13/2025

Start time: 9:00 am **End time:** 11:00 am

Weather: ☐ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☐ Light Rain; ☒ Heavy Rain

Approximate Temperature (°F): 54°

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☒ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 1 (Time of spot count: 9:15a)

5. **Number of Vehicles Observed:** 3 (Time of spot count: 9:15a)

6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:** Total Spot Count:
   Vehicles – 5
   People – 7

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Clare Schwalke

Date: 6/14/2025

Start time: 2:00p **End time:** 4:00p

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 61°F

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☒ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 2:00p)

5. **Number of Vehicles Observed:** 2 (Time of spot count: 2:00p)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☒ Fishing from a boat
   - ☒ Motorized boating
   - ☒ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

Totals

People	Vehicles
𝍸 |	𝍸 |

7. **Notes:**

_____

_____

_____

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Sidney Mattson

B. **Date:** 06/13/2025

C. **Time:** 10:10 am

D. **Project:** ☒ Sylvan ☐ Pillager

E. **Sylvan Recreation Site:**

- ☐ Wilder's Landing
- ☐ Fisherman's Bridge Boat Launch and Fishing Area
- ☒ Sylvan Dam Boat Access and Fishing Area
- ☐ Sylvan Canoe Portage

Pillager Recreation Site:

- ☐ Alvah's Landing (Minnesota DNR Boat Launch)
- ☐ Pillager Dam Public Boat Launch
- ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

   ☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 2

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

NA

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Sidney Mattson

B. **Date:** 06/13/2025

C. **Time:** 10:03 am

D. **Project:** ☒ Sylvan ☐ Pillager

E. **Sylvan Recreation Site:**

- ☐ Wilder's Landing
- ☐ Fisherman's Bridge Boat Launch and Fishing Area
- ☒ Sylvan Dam Boat Access and Fishing Area
- ☐ Sylvan Canoe Portage

Pillager Recreation Site:

- ☐ Alvah's Landing (Minnesota DNR Boat Launch)
- ☐ Pillager Dam Public Boat Launch
- ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

   ☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 1

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☐ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:
Rocks could be cleaned up/filled

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☐ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

NA

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Clark Schwalke

B. **Date:** 6/14/2025

C. **Time:** 3:50p

D. **Project:** ☒ Sylvan ☐ Pillager

E. **Sylvan Recreation Site:**

- ☐ Wilder's Landing
- ☐ Fisherman's Bridge Boat Launch and Fishing Area
- ☒ Sylvan Dam Boat Access and Fishing Area
- ☐ Sylvan Canoe Portage

Pillager Recreation Site:

- ☐ Alvah's Landing (Minnesota DNR Boat Launch)
- ☐ Pillager Dam Public Boat Launch
- ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

   ☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 1

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

_____

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

_____

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

_____

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

_____
_____
_____
_____
_____
_____
_____

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Clare Schuelke

B. **Date:** 6/14/2025

C. **Time:** 2:40p

D. **Project:** ☒ Sylvan ☐ Pillager

E. **Sylvan Recreation Site:**

- ☐ Wilder's Landing
- ☐ Fisherman's Bridge Boat Launch and Fishing Area
- ☒ Sylvan Dam Boat Access and Fishing Area
- ☐ Sylvan Canoe Portage

Pillager Recreation Site:

- ☐ Alvah's Landing (Minnesota DNR Boat Launch)
- ☐ Pillager Dam Public Boat Launch
- ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

   ☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 1

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

Nah

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Clare Schwalke

B. **Date:** 6/14/2025

C. **Time:** 3:20 p

D. **Project:** ☒ Sylvan ☐ Pillager

E. **Sylvan Recreation Site:**

- ☐ Wilder's Landing
- ☐ Fisherman's Bridge Boat Launch and Fishing Area
- ☒ Sylvan Dam Boat Access and Fishing Area
- ☐ Sylvan Canoe Portage

Pillager Recreation Site:

- ☐ Alvah's Landing (Minnesota DNR Boat Launch)
- ☐ Pillager Dam Public Boat Launch
- ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 2

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

- ☒ Fishing from the shore
- ☐ Fishing from a boat
- ☐ Motorized boating
- ☐ Canoe / Kayaking / Stand-up Paddle Boarding
- ☐ Waterskiing / Wakeboarding / Tubing
- ☐ Swimming
- ☐ Hiking / Walking / Jogging
- ☐ Bicycling
- ☐ Picnicking
- ☐ Camping
- ☐ Viewing Wildlife / Birdwatching
- ☐ Photography
- ☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

_____

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

_____

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

_____

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

_____
_____
_____
_____
_____
_____
_____

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson

Date: 7/18/2025

Start time: 2:00 pm **End time:** 4:00 pm

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 71°

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☒ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 2:10p)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 2:10p)

6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☒ Other: Skipping rocks

7. **Notes:**
   Total Spot Count: People - 8
   Vehicles - 3

   * group (family) of 5, stopped to talk but weren't interested in filling out a survey

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Clare Schwalke

Date: 7/19/25

Start time: 8:15a **End time:** 10:15a

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 60°F

Totals

People: III

Vehicles: II

Dogs: II

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☒ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 1 (Time of spot count: 8:30a)

5. **Number of Vehicles Observed:** 1 (Time of spot count: 8:30a)

6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:** Two very large tree branches blocking launch parking lot/turnaround, not able to move by hand

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Sidney Mattson

B. **Date:** 7/18/2025

C. **Time:** 3:49

D. **Project:** ☒ Sylvan ☐ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☒ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 1

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☒ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	(4)	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

   (X) Yes; ☐ No; ☐ N/A

   If no, please explain:

   _____

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	(4)	5
Poor	Fair	Satisfactory	Good	Excellent

   If your rating is 1-2, please explain:

   _____

7. **Do you have any concerns of safety at this site?**

   ☐ Yes; (X) No; ☐ N/A

   If yes, please explain:

   _____

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

   Fix Road, smoked head on Roof of truck bouncing on the Ruts

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Chris Schwanke

B. **Date:** 7/19/25

C. **Time:** 8:35a

D. **Project:** ☒ Sylvan ☐ Pillager

E. **Sylvan Recreation Site:**

- ☐ Wilder's Landing
- ☐ Fisherman's Bridge Boat Launch and Fishing Area
- ☒ Sylvan Dam Boat Access and Fishing Area
- ☐ Sylvan Canoe Portage

Pillager Recreation Site:

- ☐ Alvah's Landing (Minnesota DNR Boat Launch)
- ☐ Pillager Dam Public Boat Launch
- ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

   ☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** _____

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☐ Yes; ☐ No; ☐ N/A

If no, please explain:

_____

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

_____

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☐ No; ☐ N/A

If yes, please explain:

_____

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

_____
_____
_____
_____
_____
_____
_____

Thank you for participating in this survey!

Not a formal survey, he came to fish but decided to leave due to litter by the river shore. Said he wishes there were more staffing around or someone he could talk to about it.

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Brady McGinn

Date: 8/15/25

Start time: 10:15 **End time:** 12:15

Weather: ☐ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☒ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 73°F

Totals

People	Vehicles
IIII	III

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☒ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 1 (Time of spot count: 10:15)

5. **Number of Vehicles Observed:** 1 (Time of spot count: 10:15)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☑ Fishing from a boat
   - ☑ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☒ Other: Turning around in parking lot

7. **Notes:** A car left as I pulled in. One boat Launched. fallen tree branches around parking lot.

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Brayden Carlson

Date: 8/16/25

Start time: 9:30 **End time:** 11:30

Weather: ☐ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☑ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 67

1. **Project:** ☑ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☑ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

Totals
People 1111
Vehicles 1111

4. **Number of People Observed:** 2 (Time of spot count: 9:30)

5. **Number of Vehicles Observed:** 2 (Time of spot count: 9:30)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☑ Motorized boating
   - ☑ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:**
   Couple cars drove in and out without stopping

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Brady McGinn

B. **Date:** 8/15/25

C. **Time:** 10:45

D. **Project:** ☒ Sylvan ☐ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☒ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 2

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☐ Fishing from the shore
☒ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

N/A

Thank you for participating in this survey!

Sylvan Canoe Portage

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Clare Schwalbe

Date: 6/13/2025

Start time: 9:00a **End time:** 11:00a

Weather: ☐ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☒ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 54°F

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☒ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

Spot Counts

4. **Number of People Observed:** 0 (Time of spot count: 8:50a)
5. **Number of Vehicles Observed:** 3 (Time of spot count: 8:50a)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

Totals

People

Vehicles ||||| |||

Pets

7. **Notes:**
   Vehicles I saw are passing by on their way to the Canoe launch

   MP vehicle count (included in total vehicle tally)
   ||

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson

Date: 06/14/2025

Start time: 2:00 pm **End time:** 4:00 pm

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 61°

1. **Project:** ☒ Sylvan ☐ Pillager
2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☒ Sylvan Canoe Portage
3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access
4. **Number of People Observed:** 0 (Time of spot count: 2:10p)
5. **Number of Vehicles Observed:** 0 (Time of spot count: 2:10p)
6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____
7. **Notes:** Total Count:
   Passing By Vehicles - 9
   People - 0
   *no one observed using the portage site

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Clare Schwalke

Date: 7/16/25

Start time: 2:00p **End time:** 4:00p

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 72°F

Totals

People: 1111

Vehicles: 1111

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☒ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 2:00p)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 2:00p)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:**

_____

_____

_____

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson

Date: 7/19/2025

Start time: 8:15 am **End time:** 10:15 am

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 60°

1. **Project:** ☒ Sylvan ☐ Pillager
2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☒ Sylvan Canoe Portage
3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access
4. **Number of People Observed:** 0 (Time of spot count: 8:30a)
5. **Number of Vehicles Observed:** 0 (Time of spot count: 8:30a)
6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☒ Other: Driving by to other accesses
7. **Notes:**
   Total Spot Count: People - 0
   vehicles - 2 passing by

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Brady McGinn

Date: 8/15/25

Start time: 12:30 **End time:** 2:30

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 73°F

Totals
People | Vehicles

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☒ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 12:30)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 12:30)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:** Was fallen tree across portage so I moved it.

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Brayden Carlson

Date: 8/16/25

Start time: 7:30 **End time:** 9:30

Weather: ☐ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☐ Light Rain; ☑ Heavy Rain

Approximate Temperature (°F): 66

1. **Project:** ☑ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☑ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

Totals

People	Vehicles
0	0

4. **Number of People Observed:** 0 (Time of spot count: 7:30)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 7:30)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:**

_____

_____

_____

Fisherman's Bridge Boat Launch and Fishing Area

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Clare Schwake

Date: 6/13/2025

Start time: 11:30a **End time:** 1:30p

Weather: ☐ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☒ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 55°F

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☒ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

Spot Counts

4. **Number of People Observed:** 0 (Time of spot count: 11:30a)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 11:30a)

Totals
Vehicles: 1
People: ||||| ||

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☒ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☒ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:**

_____

_____

_____

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson

Date: 06/14/2025

Start time: 11:20 **End time:** 1:20

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 55°

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☒ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 1 (Time of spot count: 11:25a)

5. **Number of Vehicles Observed:** 1 (Time of spot count: 11:25a)

6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☒ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☒ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☒ Other: Fishing from bridge

7. **Notes:**

Total Count:
Vehicles - 7
People - 14 (4/14 were kids)

*someone asked about if we survey how often people are catching fish/if it's a good fishing site

*car left after not finding an open parking spot

Boats passing: 7

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Clare Schwake

B. **Date:** 6/13/2025

C. **Time:** 12:08

D. **Project:** ☒ Sylvan ☐ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☒ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☑ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 8

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☑ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☑ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☑ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

N/A

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Sidney Mattson

B. **Date:** 06/14/2025

C. **Time:** 12:30 pm

D. **Project:** ☒ Sylvan ☐ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☒ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 3

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☒ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☒ Other: Fishing from bridge

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

walkway

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

Porta potty

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Sidney Mattson

B. **Date:** 06/14/2025

C. **Time:** 12:35 pm

D. **Project:** X Sylvan ## Pillager

E. **Sylvan Recreation Site:**

- ☐ Wilder's Landing
- X Fisherman's Bridge Boat Launch and Fishing Area
- ☐ Sylvan Dam Boat Access and Fishing Area
- ☐ Sylvan Canoe Portage

Pillager Recreation Site:

- ☐ Alvah's Landing (Minnesota DNR Boat Launch)
- ☐ Pillager Dam Public Boat Launch
- ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

   X Yes ☐ No

2. **Including yourself, how many people are in your party today?** 1

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

   - X Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - X Other: fish from bridge

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

X Yes; ☐ No; ☐ N/A

If no, please explain: out house

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain: Shoulder on bridge, pedestrians sign, cars driving ~~too~~ fast

7. **Do you have any concerns of safety at this site?**

☐ Yes; X No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

poison ivy - signs or clearing

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Clare Schwahn

Date: 7/18/25

Start time: 11:30a **End time:** 1:30p

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 68°F

Totals

People: 1111

Vehicles: 111

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☒ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 1 (Time of spot count: 11:30a)

5. **Number of Vehicles Observed:** 1 (Time of spot count: 11:30a)

6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:**

_____

_____

_____

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson

Date: 7/19/2025

Start time: 10:30 am **End time:** 12:30 pm

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 62°

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☒ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 10:30a)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 10:30a)

6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☒ Other: fishing from bridge

7. **Notes:**
   Total Spot Counts: People - 5 (3 Kids)
   Vehicles - 1
   People on bridge - 7
   ↳ parked somewhere else

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Declan Sullivan

Date: 8/15/25

Start time: 10:30 **End time:** 12:30

Weather: ☐ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☒ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 76°

People	Vehicls
~~HHT~~ |	||||

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☒ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 5 (Time of spot count: 10:30)

5. **Number of Vehicles Observed:** 4 (Time of spot count: 10:30)

6. **Observed Activities:**
   - ☒ Fishing from the shore / Bridge
   - ☒ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:**
   Lots of people on Bridge
   12:30 pm Spot Cant 1 car 1 person

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Deeda Sullivan

Date: 8/16/25

Start time: 7:40 **End time:** 9:40

Weather: ☐ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☒ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 67°

Runny

People	Vehicles
1111	1111

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☒ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 1 (Time of spot count: 7:47)

5. **Number of Vehicles Observed:** 1 (Time of spot count: 7:47)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☒ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☒ Other: Driving in and out x2 3

7. **Notes:** 9:40 spot count 0 people 0 vehicles

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Dedn Sullivan

B. **Date:** 9/15/25

C. **Time:** 10:45

D. **Project:** ☒ Sylvan ☐ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☒ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 2

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☒ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	(4)	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	(4)	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☒ Yes; ☐ No; ☐ N/A

If yes, please explain: Climbing up fence

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Dedra Sullivan

B. **Date:** 8/15/25

C. **Time:** 10:45

D. **Project:** ☒ Sylvan ☐ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☒ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 2

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☒ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	(4)	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

_____

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	(4)	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

_____

7. **Do you have any concerns of safety at this site?**

☒ Yes; ☐ No; ☐ N/A

If ~~yes,~~ please explain:

Jumping

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

_____

_____

_____

_____

_____

_____

_____

Thank you for participating in this survey!

Wilder's Landing

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson

Date: 06/13/2025

Start time: 11:30am **End time:** 1:30pm

Weather: ☐ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☐ Light Rain; ☒ Heavy Rain

Approximate Temperature (°F): 55°

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☒ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 11:40a)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 11:40a)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:** Total Count:
   Vehicles – 0
   People – 0

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson + Clare Schwake

Date: 06/14/2025

Start time: 4:15 pm **End time:** 6:15 pm

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 64°

1. **Project:** ☒ Sylvan ☐ Pillager
2. **Sylvan Recreation Site:**
   - ☒ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage
3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access
4. **Number of People Observed:** 0 (Time of spot count: 4:20p)
5. **Number of Vehicles Observed:** 0 (Time of spot count: 4:20p)
6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☒ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____
7. **Notes:** Total count: Vehicles - 3, People - 7, Boats - 2

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson + Clare Schwake

Date: 7/18/2025

Start time: 4:15pm **End time:** 6:15pm

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 74°

1. **Project:** ☒ Sylvan ☐ Pillager
2. **Sylvan Recreation Site:**
   - ☒ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage
3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access
4. **Number of People Observed:** 0 (Time of spot count: 4:20p)
5. **Number of Vehicles Observed:** 0 (Time of spot count: 4:20p)
6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____
7. **Notes:** Total Spot Count: People – 0, Vehicles – 0

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Clare Schuette

Date: 7/9/25

Start time: 10:30a **End time:** 12:30p

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 63°F

Totals

People: 1

Vehicles: 𝍸 |

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☒ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 10:40a)

5. **Number of Vehicles Observed:** 5 (Time of spot count: 10:40a)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☒ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:**

_____

_____

_____

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Brayden Carlson

Date: 8/15/25

Start time: 10:30 **End time:** 12:30

Weather: ☐ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☑ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 78°

1. **Project:** ☑ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☑ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

Totals

People	Vehicles
1111	111

4. **Number of People Observed:** 1 (Time of spot count: 10:30)

5. **Number of Vehicles Observed:** 1 (Time of spot count: 10:30)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☑ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☑ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:**

_____

_____

_____

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Brady McGinn

Date: 8/16/25

Start time: 7:45 **End time:** 9:45

Weather: ☐ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☒ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 64°F

Totals

People	Vehicles

1. **Project:** ☒ Sylvan ☐ Pillager

2. **Sylvan Recreation Site:**
   - ☒ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 7:45)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 7:45)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:**

_____

_____

_____

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Brayden Carlson

B. **Date:** 8/15/25

C. **Time:** 11:55

D. **Project:** ☑ Sylvan ☐ Pillager

E. **Sylvan Recreation Site:**

☑ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☑ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 2

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☐ Fishing from the shore
☑ Fishing from a boat
☑ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

3.7

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☑ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

4.7

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☑ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

Took survey last year, fishing has been good lately and good fish health

Thank you for participating in this survey!

Minnesota Power Pillager Hydroelectric Project FERC Project No. P-2454 Cass and Morrison Counties, MN

2025 Recreation Use Assessment

PREPARED BY

Minnesota Power
30 W. Superior St.
Duluth, MN 55802

October 20, 2025

Table of Contents

1. INTRODUCTION 1

1.1. PROJECT DESCRIPTION 1

1.2. OBJECTIVE 2

2. METHODOLOGY 3

2.1. RECREATION USE ASSESSMENT 3

3. SURVEY RESULTS 4

3.1. ALVAH'S LANDING 4

3.1.1 Recreation Use Assessment Results 4

3.2. PILLAGER DAM PUBLIC BOAT LAUNCH 5

3.2.1 Recreation Use Assessment Results 5

3.3. PILLAGER DAM PUBLIC CANOE PORTAGE AND SHOREFISHING ACCESS 6

3.3.1 Recreation Use Assessment Results 6

4. CAPACITY ANALYSIS OF USER SURVEYS 7

5. CONCLUSIONS 9

5.1. RECREATION USE ASSESSMENT CONCLUSIONS 9

6. REFERENCES 9

LIST OF TABLES

Table 1-1 Recreation Site Descriptions 2
Table 2-1 2025 Recreation Use Survey Schedule 3
Table 3-1 Alvah's Landing Recreation Use Survey and Spot Count 4
Table 3-2 Pillager Dam Public Boat Launch Recreation Use Survey and Spot Count Summary 5
Table 3-3 Pillager Dam Public Canoe Portage and Shorefishing Access Recreation Use Survey and Spot Count 6
Table 4-1 2025 User Survey Existing Capacity Analysis 7
Table 4-2 2024-2025 User Survey Existing Capacity Analysis 8
Table 4-3 User Survey Projected 40-Year Capacity Analysis 8

LIST OF APPENDICES

Appendix A - Site Locations and Aerial Overviews

Appendix B – Survey Data Forms and Spot Counts

1. INTRODUCTION

The Pillager Hydroelectric Project (Project) is owned and operated by Minnesota Power (MP), a subsidiary of ALLETE, Inc., and is licensed by the Federal Energy Regulatory Commission (FERC). The Project's FERC License (P-2454) was issued on April 27, 1998, and is set to expire on March 31, 2028. In accordance with FERC's regulations at 18 Code of Federal Regulations (CFR) §16.9(b), MP will file an application for a new license with FERC no later than March 31, 2026.

As part of the relicensing process, a recreation use and facility inventory study was conducted in 2024. The study findings were submitted to FERC; however, on April 4, 2025, FERC issued comments indicating that the recreation use survey was not fully consistent with the approved study plan and requested additional survey dates. In response, MP filed a letter with FERC on May 1, 2025, committing to conduct additional recreational use observations and surveys on six separate days in 2025, with two hours of observation per site per survey day. The surveys were conducted on one weekday and one weekend day in June, July, and August 2025. The results of the 2025 Recreation Use Assessment are included herein.

1.1. PROJECT DESCRIPTION

The Pillager Hydroelectric Project is a 1.52 Megawatt (MW), run-of-river hydroelectric generation facility located on the Crow Wing River in Cass and Morrison Counties, Minnesota. There are four Commission-approved Project recreation sites: Alvah's Landing, Pillager Dam Public Boat Launch, Pillager Dam Public Canoe Portage and Shorefishing Access, and the Crow Wing River Canoe Campsite. Each of the sites can be accessed any time of day and have no specific hours of operation. With the exception of the Pillager Dam Public Boat Launch, in which maintenance responsibilities are shared between MP and the Minnesota Department of Natural Resources (MnDNR), the owner / operator of each site performs all maintenance activities. MP's maintenance includes inspecting signs, mowing, and collecting garbage three times each summer. The MnDNR performs similar activities at the Alvah's Landing site and is typically responsible for road and boat launch repairs at the Pillager Dam Public Boat Launch site.

Site locations and plan views of each recreation site, including the Project's FERC boundary, are included in Appendix A. An overview of the recreation sites, their owners, and locations with respect to the dam are included in Table 1-1 below. Further details are provided in each site's representative subsection of Section 3.

Table 1-1
Recreation Site Descriptions

Recreation Site Name	Owner/Operator	Description
Alvah's Landing (MnDNR Boat Launch)	MnDNR	Boat launch located approximately 3 miles upstream of the Pillager Dam, on the south shore of the Crow Wing River. Parking for approximately 10 vehicles and a concrete boat ramp.
Pillager Dam Public Boat Launch	MP & MnDNR (1)	Boat launch located on the north shore of the Pillager reservoir, adjacent to dam structure. Parking for approximately 15 vehicles and a concrete boat ramp.
Pillager Dam Public Canoe Portage and Shorefishing Access	MP	Located on the south shore of the Pillager Dam. Canoe portage trail around the south end of Pillager dam, approximately 300 feet in length. Fishing area south of the dam.
Crow Wing River Canoe Campsite	MP	Two canoe-up primitive campsites located approximately 2.5 miles upstream of the Pillager Dam, just downstream and across the river from Alvah's landing.

Notes: (1) MP owns the land for Pillager Dam Public Boat Launch and leases the land to MnDNR.

1.2. OBJECTIVE

An inventory was conducted during the 2024 study to evaluate recreation facilities and use to inform the FERC relicensing process for the Project. The updated recreation study was conducted in accordance with the Revised Study Plan and response to FERC's April 4, 2025, comments from the 2024 study review. The following tasks were performed for the updated 2025 recreation study:

- Conduct recreation user surveys and recreation observations during the recreation season (June, July and August). The surveys were conducted on one weekday and one weekend for 2 hours per recreation site, per survey day. The surveys were performed according to the FERC approved Revised Study Plan to determine the adequacy of the sites and whether modifications to the sites would be needed to meet current or future recreation needs.
- Determine the current and projected capacity at each recreation site and facility for the hydroelectric facility.

This report updates the 2024 survey to present findings from recreation surveys conducted by MP staff during the 2025 season, and presents conclusions based on combined data from both the 2024 and 2025 recreation use surveys.

2. METHODOLOGY

In response to FERC's April 4, 2025 issuance, additional Recreation Use Assessment data were collected by MP staff between June and August 2025. These data included recreation user surveys and observation surveys conducted during site visits to each recreation location. Survey dates and times were randomly selected, and the order of site visits was varied for each survey day. Site visits were performed on the dates listed in Table 2-1.

Table 2-1
2025 Recreation Use Survey Schedule

Dates	Required Occasion
June 13, 2025 (Fri)	June weekday
June 14, 2025 (Sat)	June weekend day
July 18, 2025 (Fri)	July weekday
July 19, 2025 (Sat)	July weekend day
August 15, 2025 (Fri)	August weekday
August 16, 2025 (Sat)	August weekend day

2.1. RECREATION USE ASSESSMENT

The Recreation Use Assessment consisted of documenting observed usage of the sites, performing a spot count of the number of visitors, and conducting user surveys of visitors at the sites. Recreation usage observations and spot counts were completed over a 2-hour period at each non-canoe access site (Alvah's Landing, Pillager Dam, Public Canoe Portage and Shorefishing Access, and Pillager Dam Public Boat Launch). Observation times were randomized for each of the site visit dates specified in the above schedule in Table 2-1, in order to account for time-of-day use patterns. Usage observations consisted of documenting the weather condition, number of people observed, visitor activities, and other pertinent usage notes. For the spot count, field staff recorded the total number of vehicles and visitors observed over a 2-hour period at each site. Field staff also recorded the total number of vehicles and visitors observed at a single point in time. This typically occurred when the field staff began the 2-hour session at each site. During the 2-hour period, MP field staff also administered user surveys to visitors who were willing to participate. User surveys included collecting visitors' opinions on the existing conditions and recreation opportunities.

The Recreation Use Assessment was recorded using paper forms. The survey forms specific to the usage observations, spot count, and user surveys were developed based on the forms provided by MP and included in the relicensing Revised Study Plan (see Appendix B for sample forms). At the non-canoe access sites, the user surveys were administered by MP field staff directly to visitors. Hard-copy versions of the user forms were available to use. The surveys were either filled out by the visitor or the surveyor, based on visitor preference. Instances in which a visitor declined to complete a survey were not specifically recorded but were occasionally noted on the form.

3. SURVEY RESULTS

The following sections summarize the results of the Recreation Use Assessments at each Pillager recreation site. The forms completed in the field, including the user surveys, are included in Appendix C.

3.1. ALVAH'S LANDING

The Alvah's Landing recreation site is a boat launch located approximately 3 miles upstream of the Pillager Dam, on the south shore of the Crow Wing River. Site amenities include parking for approximately 10 vehicles and a concrete boat ramp. The site is owned, operated, and maintained by the MnDNR.

3.1.1 Recreation Use Assessment Results

Two recreation use surveys were completed by visitors for this site during the 2025 survey. Key findings from the visitor use surveys and spot counts in 2025 are as follows and included in Table 3-1:

- In general, Alvah's Landing was sparsely visited during the recreation survey period. The number of people observed varied from 0 to 1 person per site visit, based on the spot counts.
- The visitors indicated moderate recreation opportunities were offered at the site.
- No concerns about safety were indicated.
- Visitors noted that the boat launch was slightly inaccessible, especially for large boats – overgrown vegetation decreases access.

Table 3-1
Alvah's Landing 2025 Recreation Use Survey and Spot Count

Date	No. of Visitors	No. of Cars	Activities Observed	No. of User Surveys	Average Site Utilization Score[1]	Max / Min Utilization Score	Average Site Condition Score	Max / Min Site Condition Score
6/13/2025	0	0	N/A [2]	0	N/A	N/A	N/A	N/A
6/14/2025	1	1	See note [3]	1	2	2 / 2	2	2 / 2
7/18/2025	1	1	See note [4]	0	N/A	N/A	N/A	N/A
7/19/2025	0	0	N/A [2]	0	N/A	N/A	N/A	N/A
8/15/2025	1	1	Walking dogs	1	4	4 / 4	3	3 / 3
8/16/2025	0	0	N/A [2]	0	N/A	N/A	N/A	N/A

Notes: [1] Utilization rated from 1 to 5, where 1 = "underutilized", 3 = "moderate", and 5 = "overcrowded".
[2] No visitors were observed; therefore, no activities were noted.
[3] Only visitor came to "check the access". Did not say who they were with.
[4] Vehicle drove in and immediately left without stopping to complete a survey.

3.2. PILLAGER DAM PUBLIC BOAT LAUNCH

The Pillager Dam Public Boat Launch recreation site is a boat launch located on the north shore of the Pillager reservoir, adjacent to the dam structure. Site amenities include parking for approximately 15 vehicles (5 regular vehicle spaces and 10 vehicles with trailer spaces) and a concrete boat ramp. The site is owned by MP, who leases the land to MnDNR for operation of the site. Maintenance responsibilities at the site are shared between MP and the MnDNR.

3.2.1 Recreation Use Assessment Results

Five recreation use surveys were completed by visitors to this site during the 2025 survey. Key findings from the visitor use surveys and spot counts in 2025 are as follows and included in Table 3-2:

- The visitors indicated sufficient recreation opportunities were offered at the site.
- No concerns about safety were indicated.
- Three visitors expressed concerns over parking lot and shoreline maintenance.
- One visitor expressed interest in adding picnic tables and two visitors expressed adding a restroom to the site.

Table 3-2
Pillager Dam Public Boat Launch 2025 Recreation Use Survey and Spot Count Summary

Date	No. of Visitors	No. of Cars	Activities Observed	No. of User Surveys	Average Site Utilization Score[1]	Max / Min Utilization Score	Average Site Condition Score	Max / Min Site Condition Score
6/13/2025	3	2	Motorized boating	0	N/A	N/A	N/A	N/A
6/14/2025	5	5	Selling boat, Fixing car, Fishing from shore	2	1	1 / 1	2.5	3 / 2
7/18/2025	2	2	N/A [2]	0	N/A	N/A	N/A	N/A
7/19/2025	4	9	See note [3]	0	N/A	N/A	N/A	N/A
8/15/2025	4	6	Fishing from boat, Motorized boating	2	2.5	3 / 2	3.5	4 / 3
8/16/2025	1	0	Hiking/Walking	1	3	3 / 3	3	3 / 3

Notes: [1] Utilization rated from 1 to 5, where 1 = “underutilized”, 3 = “moderate”, and 5 = “overcrowded”.
[2] Vehicle drove in and left without stopping to complete a survey.
[3] Vehicles parked after launching boats. No one stopped to complete a survey.

3.3. PILLAGER DAM PUBLIC CANOE PORTAGE AND SHOREFISHING ACCESS

The Pillager Dam Public Canoe Portage and Shorefishing Access recreation site is located on the south shore of the Pillager Dam. Site amenities include a canoe portage trail around the south end of Pillager Dam, approximately 300 feet in length, and a fishing area south of the dam. Available parking space for one or two vehicles was identified at the site entrance. The site is operated and maintained by MP.

3.3.1 Recreation Use Assessment Results

Four recreation use surveys were completed by visitors for this site during the 2025 survey. Key findings from the visitor use surveys and spot counts in 2025 are as follows and included in Table 3-3:

- The visitors generally indicated sufficient recreation opportunities were offered at the site. However, one survey party noted insufficient opportunities due to the quality of docks.
- No concerns about safety were indicated.
- Three visitors noted that better upkeep of site would make it more usable (adding stairs down to sandbar, eliminating erosion, and filling potholes).
- Visitors generally commented that they enjoyed the site for fishing.

Table 3-3
Pillager Dam Public Canoe Portage and Shorefishing Access 2025 Recreation Use Survey and Spot Count

Date	No. of Visitors	No. of Cars	Activities Observed	No. of User Surveys	Average Site Utilization Score[1]	Max / Min Utilization Score	Average Site Condition Score	Max / Min Site Condition Score
6/13/2025	3	2	Fishing from shore, Bicycling	0	N/A	N/A	N/A	N/A
6/14/2025	9	5	Fishing from shore, Hiking/Walking	1	1	1 / 1	4	4 / 4
7/18/2025	3	2	Fishing from shore	1	3.5	3.5 / 3.5	3	3 / 3
7/19/2025	3	2	Fishing from shore	1	3	3 / 3	4	4 / 4
8/15/2025	4	3	Fishing from shore, Driving through	2	3	3 / 3	3.5	4 / 3
8/16/2025	5	2	Viewing wildlife, Fishing from shore	2	3.5	4 / 3	3.5	4 / 3

Notes: [1] Utilization rated from 1 to 5, where 1 = “underutilized”, 3 = “moderate”, and 5 = “overcrowded”.

4. CAPACITY ANALYSIS OF USER SURVEYS

The user survey data was further analyzed to evaluate the current and predicted capacity at each recreation site. Assessment of existing capacity included computing the average number of visitors over the 2-hour survey period and one recreation day, as well as the average reported site utilization scores. Given typical daylight hours and that there are no set hours of operation for any of the recreation sites, one recreation day was assumed to be 10 hours long. Visitors per recreation day was computed by projecting the 2-hour visitor count over 10 hours. The assessment also included comparing the number of observed vehicles versus available parking spaces. Existing capacity was evaluated as follows:

- "Sufficient" – Average site utilization score of 4 or lower and average number of vehicles was less than 90% of available parking spaces
- "Insufficient" – Average site utilization score greater than 4 and average number of vehicles regularly exceeded available number of spots

Table 4-1 presents the results of the existing capacity evaluation based on data collected during the 2025 Recreation Use Assessment. Table 4-2 summarizes the existing capacity evaluation using all Recreation Use Assessment data collected in 2024 and 2025.

Table 4-1
2025 User Survey Existing Capacity Analysis

Site	Avg. No. of Visitors (2-hr)	Visitors Per Recreation Day [1]	Avg. No. of Vehicles (2-hr)	No. of Parking Spots	Avg. Site Utilization Score [2]	Existing Capacity
Alvah's Landing	0.5	2.5	0.5	10	3	Sufficient
Pillager Dam Public Boat Launch	3.2	16	4	15	2	Sufficient
Pillager Dam Public Canoe Portage and Shorefishing Access	4.5	22.5	2.7	1[3]	2.9	Sufficient
Crow Wing River Canoe Campsite[4]	0	0	0	0	N/A	Sufficient

Notes: [1] A "recreation day" assumed to be one 10-hour day.
[2] Site utilization scores ranged from 1 to 5, with 1 being underutilized and 5 being overcrowded.
[3] Informal parking space for 1 or 2 vehicles at the site entrance (conservatively assume 1 available spot).
[4] No surveys were required for this location in 2025.

Table 4-2
2024-2025 User Survey Existing Capacity Analysis

Site	Avg. No. of Visitors (2-hr)	Visitors Per Recreation Day [1]	Avg. No. of Vehicles (2-hr)	No. of Parking Spots	Avg. Site Utilization Score [2]	Existing Capacity
Alvah's Landing	0.6	3	0.5	10	2.3	Sufficient
Pillager Dam Public Boat Launch	5.2	26	3.9	15	2.5	Sufficient
Pillager Dam Public Canoe Portage and Shorefishing Access	2.8	14	1.5	1[3]	2.9	Sufficient
Crow Wing River Canoe Campsite	0	0	0	0	N/A[4]	Sufficient

Notes: [1] A "recreation day" assumed to be one 10-hour day.
[2] Site utilization scores ranged from 1 to 5, with 1 being underutilized and 5 being overcrowded.
[3] Informal parking space for 1 or 2 vehicles at the site entrance (conservatively assume 1 available spot).
[4] No visitors were observed, and no user surveys were completed for this site.

Predicted capacity was evaluated at the end of the Project's assumed 40-year license period. The projected number of visitors was estimated using county and state census population data from the U.S. Census Bureau (U.S. Census Bureau, 2022a and 2022b). The population change from 2010 to 2020 for Morrison County, Cass County, and the state of Minnesota was a 2.4%, 5.2%, and 7.6% increase, respectively. This equates to an average 5.1% increase in population in 10 years, or 22% increase over 40 years. The growth rate was applied to the current visitor counts to estimate the projected number of visitors. This increase was also applied to the site utilization scores, given the increased number of visitors. The number of projected vehicles was computed based on the current ratio of vehicles per visitor in the 2-hour survey period and compared to the available parking spaces. No increase in number of parking spaces was assumed. Predicted capacity was evaluated using the same "Sufficient" and "Insufficient" designation as described above. Results of the existing capacity evaluation are presented in the following Table 4-3.

Table 4-3
User Survey Projected 40-Year Capacity Analysis

Site	Avg. No. of Visitors (2-hr)	Visitors Per Recreation Day [1]	% Increase in Visitors	Avg. No of Vehicles (2-hr)	No. of Parking Spots	Projected Capacity
Alvah's Landing	0.7	3.7	22%	0.6	10	Sufficient
Pillager Dam Public Public Boat Launch	6.3	31.7	22%	4.8	15	Sufficient
Pillager Dam Public Canoe Portage and Shorefishing Access	3.4	17.1	22%	1.8	1[2]	Sufficient
Crow Wing River Canoe Campsite[3]	0[3]	0	0	0	0	Sufficient

Notes: [1] A "recreation day" assumed to be one 10-hour day.

(2) Informal parking space for 1 or 2 vehicles at the site entrance (conservatively assume 1 available spot).
(3) No visitors were observed, and no user surveys were completed for this site; therefore, minimal to no projected usage was assumed.

5. CONCLUSIONS

Key findings and conclusions from the 2025 Recreation Use Assessment surveys are summarized below.

5.1. RECREATION USE ASSESSMENT CONCLUSIONS

Results of the 2024 and 2025 recreation usage observations, spot counts, and visitor surveys indicate that there is minimal usage of the Alvah's Landing and Crow Wing River Canoe Campsite. No users were observed or completed a survey at the canoe campsite. Recreation usage at the Pillager Dam Public Canoe Portage & Shorefishing Access was moderate, with all visitors observed to be fishing at the site. The most usage was observed at the Pillager Dam Public Boat Launch, with up to 16 visitors reported during one site visit. Activities at this site included boating, fishing, and picnicking.

The user surveys completed indicated sufficient recreation opportunities were offered. The sites were typically categorized as slightly under to moderately utilized, and minimal to no concerns for safety were identified. Overcrowding does not appear to be a concern at the recreation sites at the Pillager Project. The analysis of the user survey data indicates sufficient capacity at all recreation sites for both current and projected usage at the end of the license period. There appears to be adequate capacity for potential increases in recreation use at these sites.

6. REFERENCES

Kleinschmidt Associates. 2024. Revised Study Plan, Little Falls Hydroelectric Project FERC P-2532, Sylvan Hydroelectric Project FERC P-2454, Pillager Hydroelectric Project FERC P-2663, e-filed: January 9, 2024.

U.S. Census Bureau. 2022a. QuickFacts: Little Falls city, Minnesota; Baxter city, Minnesota; Morisson County, Minnesota; Crow Wing County, Minnesota; Cass County, Minnesota; Minnesota. Available online at: https://www.census.gov/quickfacts/fact/table/littlefallscityminnesota,baxtercityminnesota,morrisoncountyminnesota,crowwingcountyminnesota,casscountyminnesota,MN/PST045222. Accessed January 2025.

U.S. Census Bureau. 2022b. American Community survey 5-year data (2009-2021). Census.gov. Available online at: https://www.census.gov/data/developers/data-sets/acs-5year.html. Accessed January 2025.

Appendix A –

Site Locations and Aerial Overviews

PILLAGER HYDROELECTRIC PROJECT RECREATION USE & FACILITY INVENTORY STUDY

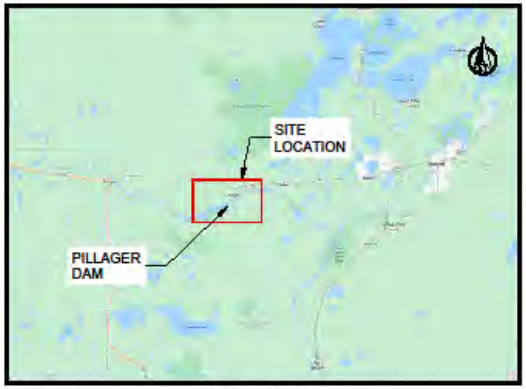
FOR

MINNESOTA POWER

CASS AND MORRISON COUNTIES, MINNESOTA



VICINITY MAP
SCALE 1" = 7000'



LOCATION MAP
NOT TO SCALE



STATE MAP
NOT TO SCALE

INDEX	NO.
TITLE SHEET	1
OVERVIEW	2
ALVAH'S LANDING	3
PILLAGER DAM PUBLIC BOAT LAUNCH	4
PILLAGER DAM CANOE PORTAGE AND SHOREFISHING ACCESS	5
CROW WING RIVER CAMPSITE	6

merjent.

Corporate Office
1 Main Street SE, Suite 300
Minneapolis, Minnesota 55414
(612) 746-3660

Wisconsin Office
120 N Speedway Lane, Bldg E
Kaukauna, WI 54130
(920) 360-9188

PLOTTED SIZE: ANSI full bleed B (11.00 x 17.00 inches)

REVISION RECORD

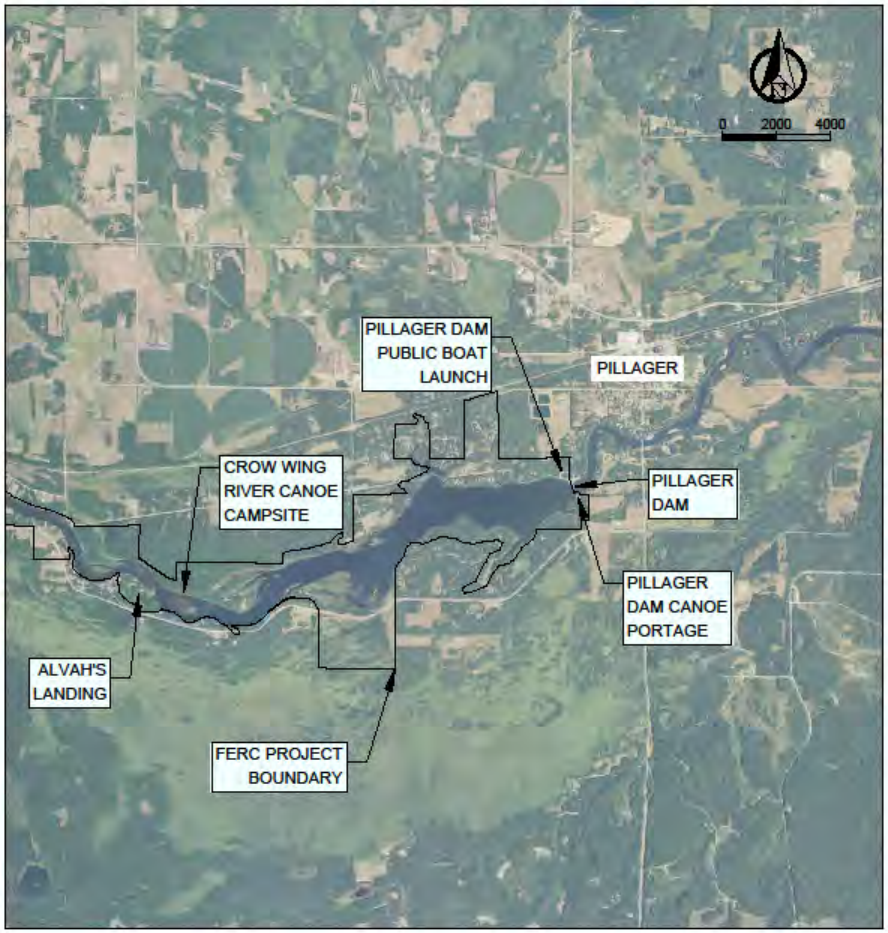
NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
0	OCT. 2024	EXHIBITS FOR RECREATION STUDY	AJ	EFB	
1	DEC. 2024	EXHIBITS FOR RECREATION STUDY REVISIONS	AJ	EFB	

MINNESOTA POWER
PILLAGER HYDROELECTRIC PROJECT RECREATION USE & FACILITY INVENTORY STUDY
CASS AND MORRISON COUNTIES, MINNESOTA

TITLE SHEET

DRAWING NO.
C100

SHEET 1 OF 8



PILLAGER RECREATION SITES

ALVAH'S LANDING:

LOCATION: OFF AZALEA ROAD 3 MILES UPSTREAM OF PILLAGER DAM.
COORDINATES:
LATITUDE: 46°18'18.10"N
LONGITUDE: 94°32'51.78"W
DESCRIPTION: PARKING FOR APPROXIMATELY 10 VEHICLES AND A CONCRETE BOAT RAMP.
OWNER/OPERATOR: MINNESOTA DNR

PILLAGER DAM PUBLIC BOAT LAUNCH:

LOCATION: BOAT LAUNCH LOCATED ON THE NORTH SHORE OF PILLAGER RESERVOIR. OFF PILLAGER DAM RD.
COORDINATES:
LATITUDE: 46°19'0.94"N
LONGITUDE: 94°29'11.67"W
DESCRIPTION: PARKING FOR APPROXIMATELY 15 VEHICLES AND A CONCRETE BOAT RAMP.
OWNER/OPERATOR: MINNESOTA DNR AND MP

PILLAGER DAM PUBLIC CANOE PORTAGE AND SHOREFISHING ACCESS:

LOCATION: PORTAGE AROUND THE SOUTH END OF PILLAGER DAM. OFF AZALEA RD.
COORDINATES:
LATITUDE: 46°18'52.72"N
LONGITUDE: 94°29'4.36"W
DESCRIPTION: CANOE PORTAGE TRAIL AROUND THE SOUTH END OF PILLAGER DAM, APPROXIMATELY 300 FEET IN LENGTH. FISHING AREA SOUTH OF THE DAM.
OWNER/OPERATOR: MP

CROW WING RIVER CANOE CAMPSITE:

LOCATION: ACROSS THE RIVER OF ALVAH'S LANDING AND APPROXIMATELY 0.5 MILES DOWNSTREAM
COORDINATES:
LATITUDE: 46°18'25.85"N
LONGITUDE: 94°31'60.00"W
DESCRIPTION: TWO CANOE-UP PRIMITIVE CAMPSITES LOCATED APPROXIMATELY 2.5 MILES UPSTREAM OF THE PILLAGER DAM, JUST DOWNSTREAM AND ACROSS THE RIVER FROM ALVAH'S LANDING.
OWNER/OPERATOR: MP

merjent.

Corporate Office
1 Main Street SE, Suite 300
Minneapolis, Minnesota 55414
(612) 746-3660

Milwaukee Office
126 N Speedway Lane, Bldg. F
Kaukauna, WI 54130
(920) 380-9186

REVISION RECORD

NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
0	OCT. 2024	EXHIBITS FOR RECREATION STUDY	AJ	EFB	
1	DEC. 2024	EXHIBITS FOR RECREATION STUDY REVISIONS	AJ	EFB	

PLOTTED SIZE: ANSI full bleed B (11.00 x 17.00 Inches)

MINNESOTA POWER
PILLAGER HYDROELECTRIC PROJECT RECREATION USE & FACILITY INVENTORY STUDY
CASS AND MORRISON COUNTIES, MINNESOTA

OVERVIEW

DRAWING NO.
C101

SHEET 2 OF 8



SITE OVERVIEW
ALVAH'S LANDING

merjent.

Corporate Office
1 Main Street SE, Suite 300
Minneapolis, Minnesota 55414
(612) 746-3660

Wisconsin Office
135 N Spaceway Lane, Bldg. E
Kaukauna, WI 54130
(920) 360-4140

REVISION RECORD

NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
0	OCT. 2024	EXHIBITS FOR RECREATION STUDY	AJ	EFB	
1	DEC. 2024	EXHIBITS FOR RECREATION STUDY REVISIONS	AJ	EFB	

MINNESOTA POWER
PILLAGER HYDROELECTRIC PROJECT RECREATION USE & FACILITY INVENTORY STUDY
CASS AND MORRISON COUNTIES, MINNESOTA

DRAWING NO.
C102

ALVAH'S LANDING

SHEET 3 OF 8

PLOTTED SIZE: ANSI full bleed B (11.00 x 17.00 inches)



SITE OVERVIEW
PILLAGER DAM PUBLIC BOAT LAUNCH

merjent.

Corporate Office: 1 Main Street SE, Suite 300 Minneapolis, Minnesota 55414 (612) 746-3660
Wisconsin Office: 135 N Spaeth Lane, Bldg. 5 Kaukauna, WI 54130 (920) 360-9146

REVISION RECORD

NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
0	OCT. 2024	EXHIBITS FOR RECREATION STUDY	AJ	EFB	
1	DEC. 2024	EXHIBITS FOR RECREATION STUDY REVISIONS	AJ	EFB	

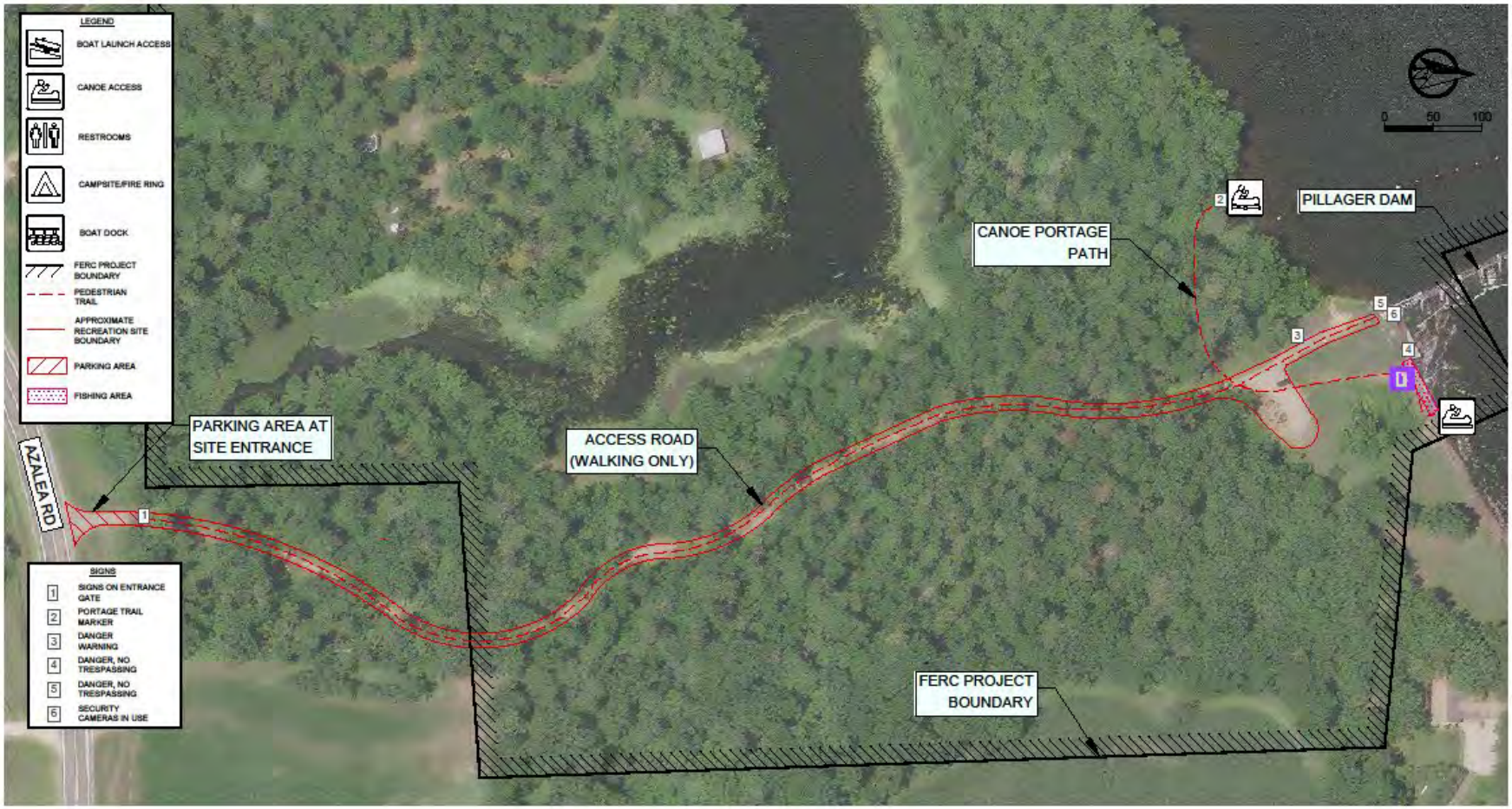
PLOTTED SIZE: ANSI full bleed B (11.00 x 17.00 inches)

MINNESOTA POWER
PILLAGER HYDROELECTRIC PROJECT RECREATION USE & FACILITY INVENTORY STUDY
CASS AND MORRISON COUNTIES, MINNESOTA

DRAWING NO. **C103**

PILLAGER DAM PUBLIC BOAT LAUNCH

SHEET 4 OF 8



SITE OVERVIEW
PILLAGER DAM PUBLIC CANOE PORTAGE &
SHOREFISHING ACCESS

merjent.

Corporate Office
1 Main Street SE, Suite 300
Minneapolis, Minnesota 55414
(612) 746-3660

Wisconsin Office
135 N Speedway Lane, Bldg. B
Kaukauna, WI 54130
(920) 360-9146

REVISION RECORD

NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
0	OCT. 2024	EXHIBITS FOR RECREATION STUDY	AJ	EFB	
1	DEC. 2024	EXHIBITS FOR RECREATION STUDY REVISIONS	AJ	EFB	

MINNESOTA POWER
PILLAGER HYDROELECTRIC PROJECT RECREATION USE & FACILITY INVENTORY STUDY
CASS AND MORRISON COUNTIES, MINNESOTA

PILLAGER DAM PUBLIC CANOE PORTAGE AND SHOREFISHING ACCESS

DRAWING NO. **C104**

SHEET 5 OF 8

PLOTTED SIZE: ANSI full bleed B (11.00 x 17.00 inches)



SITE OVERVIEW
CROW WING RIVER CANOE CAMPSITE

merjent.

Corporate Office
7 Main Street SE, Suite 300
Minneapolis, Minnesota 55414
(612) 746-3660

Wisconsin Office
135 N Spaeberry Lane, Bldg. 6
Kaukauna, WI 54130
(920) 360-4146

REVISION RECORD

NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
0	OCT. 2024	EXHIBITS FOR RECREATION STUDY	AJ	EFB	
1	DEC. 2024	EXHIBITS FOR RECREATION STUDY REVISIONS	AJ	EFB	

MINNESOTA POWER
PILLAGER HYDROELECTRIC PROJECT RECREATION USE & FACILITY INVENTORY STUDY
CASS AND MORRISON COUNTIES, MINNESOTA

DRAWING NO.
C105

CROW WING RIVER CANOE CAMPSITE

SHEET 8 OF 6

PLOTTED SIZE: ANSI full bleed B (11.00 x 17.00 inches)

Appendix B –

Survey Data Forms and Spot Counts

Alvah's Landing

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson & Clare Schwake

Date: 06/13/2025

Start time: 4:30 pm **End time:** 6:30

Weather: ☐ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☒ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 56°

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☒ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 4:40p)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 4:40p)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:**
   Total Count:
   Vehicles – 0
   People – 0
   * deer carcass in parking area

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Clare Schwake

Date: 6/14/2025

Start time: 8:45a **End time:** 10:45a

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 52

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☒ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 8:45a)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 8:45a)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☒ Other: "Access checking"

Totals

People	Vehicles
1	1

7. **Notes:**
Only vehicle / visitor came to "check the access." Didn't say who he was with.

Strong wild rice growth by the access. Big patch of vegetation by the water blocks larger vehicles from access.

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

Filled on behalf of Visitor

A. **Observer:** Clare Schmaltz

B. **Date:** 6/14/2023

C. **Time:** 10:35 a

D. **Project:** ☐ Sylvan ☒ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☒ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 1

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☐ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: Checking access

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:
Signage is damaged, access is launchable but there is a new floating growth patch blocking larger boats + trailers' ability to launch. "Not necessarily a bad thing"

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson

Date: 7/18/2025

Start time: 9:00 am **End time:** 11:00 am

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 60°

1. **Project:** ☐ Sylvan ☒ Pillager
2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage
3. **Pillager Recreation Site:**
   - ☒ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access
4. **Number of People Observed:** 0 (Time of spot count: 9:00a)
5. **Number of Vehicles Observed:** 0 (Time of spot count: 9:00a)
6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☒ Other: drove through and left
7. **Notes:** Total Spot Count: People – 1
   Vehicles – 1

   * very dense vegetation at boat launch, not likely accessible for any boat with motor

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson + Clare Schwake

Date: 7/19/2025

Start time: 3:15pm **End time:** 5:15 pm

Weather: ☒ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 73°

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☒ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 3:15p)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 3:15p)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:** Total Spot Count: People - 0
   Vehicles - 0

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Brayden Carlson

Date: 8/15/25

Start time: 12:45 **End time:** 2:45

Weather: ☐ Sunny; ☐ Partly Cloudy; ☑ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 76°

1. **Project:** ☐ Sylvan ☑ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☑ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

Totals

People	Vehicles
1	1

4. **Number of People Observed:** 1 (Time of spot count: 12:45)

5. **Number of Vehicles Observed:** 1 (Time of spot count: 12:45)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☑ Other: walking / letting dogs run around

7. **Notes:**

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Cooper Kuzel

Date: 8/16/25

Start time: 7:50 am **End time:** 9:50am

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☒ Light Rain; ☒ Heavy Rain

Approximate Temperature (°F): 64°

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☒ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 7:50)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 7:50)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

total vehicles
0

total people
0

7. **Notes:**
launch is very overgrown

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Brayden Carlson

B. **Date:** 8/15/25

C. **Time:** 12:45

D. **Project:** ☐ Sylvan ☑ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☑ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☑ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 1

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☐ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☑ Other: walking/letting dogs run around

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	(4)	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☐ Yes; ☑ No; ☐ N/A

If no, please explain:
Boat launch is unuseable

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	(3)	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:
All good other than boat launch

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☑ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**
Likes coming to walk his dogs, would like something to be done about boat launch

Thank you for participating in this survey!

Pillager Dam Public Boat Launch

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Clare Schwahn

Date: 6/13/2025

Start time: 2:15 p **End time:** 4:15p

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☒ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 56°F

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☒ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

Spot Counts

4. **Number of People Observed:** 0 (Time of spot count: 2:15p)

5. **Number of Vehicles Observed:** 1 (Time of spot count: 2:15p)
   Truck w/ empty boat trailer

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☒ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

Totals

People	Vehicles
III	II

7. **Notes:**

_____

_____

_____

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson

Date: 06/14/2025

Start time: 8:30 am **End time:** 10:30 am

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 50°

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☒ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 1 (Time of spot count: 8:35a)

5. **Number of Vehicles Observed:** 1 (Time of spot count: 8:35a)

6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☒ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☒ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☒ Other: Selling boat, fixing car

7. **Notes:**
   Total Count:
   Vehicles - 5
   People - 5
   Boat - 1

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Sidney Mattson

B. **Date:** 06/14/2025

C. **Time:** 9:46 am

D. **Project:** ☐ Sylvan ☒ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☒ Pillager Dam Public Boat Launch
☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 2

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☐ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☒ Other: selling boat

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

X Yes; ☐ No; ☐ N/A

If no, please explain: nicer shoreline / upkeep area

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain: Shoreline maintenance

7. **Do you have any concerns of safety at this site?**

X Yes; ☐ No; ☐ N/A

If yes, please explain: site by dam last year boat got sucked in

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

NA

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Sidney Mattson

B. **Date:** 06/14/2025

C. **Time:** 10:15 am

D. **Project:** ☐ Sylvan ☒ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☒ Pillager Dam Public Boat Launch
☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 1

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☐ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☒ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

_____

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:
Parking lot maintenance, landing maintenance

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

_____

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

NA

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Clare Schwalbe

Date: 7/18/25

Start time: 8:50a **End time:** 11:00a

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 57°F

Totals

People: 11

Vehicles: 11

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☒ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 9:00a)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 9:00a)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:**

_____

_____

_____

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson

Date: 7/19/2025

Start time: 1:00 pm **End time:** 3:00 pm

Weather: ☐ Sunny; ☒ Partly Cloudy; ☐ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 69°

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☒ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 1:05p)

5. **Number of Vehicles Observed:** 6 (Time of spot count: 1:05p)

6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☒ Fishing from a boat
   - ☒ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:** Total Spot Count: People - 4
   Vehicles - 9
   Boats - 8 (trailers)
   * all were parked after launching boat

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: cooper kuzel

Date: 8/15/25

Start time: 10:45am **End time:** 12:45pm

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☒ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 74°

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☒ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 10:45) 0@12:45

5. **Number of Vehicles Observed:** 1 (Time of spot count: 10:45) 4@12:45

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☒ Fishing from a boat
   - ☒ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

total vehicles	total people
1111	~~THL~~ 11

7. **Notes:**
   all vehicles and people at the site had boats, there were no other activities going on.

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Brady McGinn

Date: 8/16/25

Start time: 10:00 **End time:** 12:00

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 65°F

Totals

people	vehicles
1	

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☒ Pillager Dam Public Boat Launch
   - ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 10:00)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 10:00)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☒ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:**

_____

_____

_____

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Cooper Kuzel

B. **Date:** 8/15/25

C. **Time:** 10:55am

D. **Project:** ☐ Sylvan ☒ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☒ Pillager Dam Public Boat Launch
☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 4

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☐ Fishing from the shore
☒ Fishing from a boat
☒ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	(2)	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	(3)	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

adding bathrooms near site was a comment made by everyone in their party. also mentioned the ruts in the road from atvs, said they don't like driving over them.

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Cooper Kuzel

B. **Date:** 8/15/25

C. **Time:** 12:30

D. **Project:** ☐ Sylvan ☒ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☒ Pillager Dam Public Boat Launch
☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 1

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☐ Fishing from the shore
☒ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	(3)	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	(4)	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Brady McGinn

B. **Date:** 8/16/25

C. **Time:** 11:00

D. **Project:** ☐ Sylvan ☒ Pillager

E. **Sylvan Recreation Site:**

- ☐ Wilder's Landing
- ☐ Fisherman's Bridge Boat Launch and Fishing Area
- ☐ Sylvan Dam Boat Access and Fishing Area
- ☐ Sylvan Canoe Portage

Pillager Recreation Site:

- ☐ Alvah's Landing (Minnesota DNR Boat Launch)
- ☒ Pillager Dam Public Boat Launch
- ☐ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

   ☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 1

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

- ☐ Fishing from the shore
- ☐ Fishing from a boat
- ☐ Motorized boating
- ☐ Canoe / Kayaking / Stand-up Paddle Boarding
- ☐ Waterskiing / Wakeboarding / Tubing
- ☐ Swimming
- ☒ Hiking / Walking / Jogging
- ☐ Bicycling
- ☐ Picnicking
- ☐ Camping
- ☐ Viewing Wildlife / Birdwatching
- ☐ Photography
- ☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

adding a few picnic Tables and a place to use The restroom would be Nice. also The parking lot could Be graded.

Thank you for participating in this survey!

Pillager Dam Public Canoe Portage and Shorefishing Access

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson

Date: 06/13/2025

Start time: 2:15 **End time:** 4:15

Weather: ☐ Sunny; ☐ Partly Cloudy; ☐ Cloudy; ☒ Light Rain; ☐ Heavy Rain Wind

Approximate Temperature (°F): 56°

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☒ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 2:20 p)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 2:20 p)

6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☒ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:** Total Count:
   Vehicle – 2 *two kids
   People – 3
   Bike – 2

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Clare Schwalke

Date: 6/14/2025

Start time: 11:00a **End time:** ~~12:00~~ 1:30p

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 54°F

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☒ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 1 (Time of spot count: 11:00a)

5. **Number of Vehicles Observed:** 2 (Time of spot count: 11:00a)

6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☒ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

Totals

People: ~~HH~~ IIII

Vehicles: IIII

Dogs: 1

7. **Notes:**

_____

_____

_____

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** [redacted] & Clare Schwake

B. **Date:** 6-14-25

C. **Time:** 11:45

D. **Project:** ☐ Sylvan ☒ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☒ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☑ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 4

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☑ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☐ Yes; ☑ No; ☐ N/A

If no, please explain: Better docks

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☑ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

More Docks

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Sidney Mattson

Date: 7/18/2025

Start time: 11:15 am **End time:** 1:15 am

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 66°

1. **Project:** ☐ Sylvan ☒ Pillager
2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage
3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☒ Pillager Dam Public Canoe Portage and Shorefishing Access
4. **Number of People Observed:** 1 (Time of spot count: 11:20a)
5. **Number of Vehicles Observed:** 1 (Time of spot count: 11:20a)
6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____
7. **Notes:** Total Spot Count: People - 3
   Vehicles - 2
   4Wheeler - 1

* 2 people just drove through without stopping

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Clare Schwalbe

Date: 7/19/25

Start time: 1:00p **End time:** 3:00p

Weather: ☐ Sunny; ☒ Partly Cloudy; ☐ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 70°F

Totals

People: 111

Vehicles: 11

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☒ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 1:15p)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 1:15p)

6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

7. **Notes:**

_____

_____

_____

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Sidney Mattson

B. **Date:** 7/18/2025

C. **Time:** 11:40 am

D. **Project:** ☐ Sylvan ☒ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☒ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 1

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☒ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

3.5

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:
Weeds/grooming; poison ivy! thissles
litter → volunteers (Lions Club)

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:
erosion, NW side of bank

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**
Opening dam gate w/ signage

Question – Have you taken this survey before?
for survey

Thank you for participating in this survey!

* said they took a similar survey a year or so ago

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Clare Schwalbe

B. **Date:** 7/19/25

C. **Time:** 1:52 p

D. **Project:** ☐ Sylvan ☒ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☒ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 2

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☑ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☑ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☑ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

NC

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Cooper Kuzel

Date: 8/15/25

Start time: 12:50pm **End time:** 2:50pm

Weather: ☐ Sunny; ☒ Partly Cloudy; ☐ Cloudy; ☐ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 75°

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☒ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 1 (Time of spot count: 1:50pm)

5. **Number of Vehicles Observed:** 1 (Time of spot count: 1:50pm)

6. **Observed Activities:**
   - ☒ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☒ Other: driving

total people	total cars
1111	111

7. **Notes:**
   lots of people driving through, not stopping or getting out to use site.

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Observations / Spot Counts

Observer: Cooper Kuzel

Date: 8/16/25

Start time: 10:00am **End time:** 12:00pm

Weather: ☐ Sunny; ☐ Partly Cloudy; ☒ Cloudy; ☒ Light Rain; ☐ Heavy Rain

Approximate Temperature (°F): 66°

1. **Project:** ☐ Sylvan ☒ Pillager

2. **Sylvan Recreation Site:**
   - ☐ Wilder's Landing
   - ☐ Fisherman's Bridge Boat Launch and Fishing Area
   - ☐ Sylvan Dam Boat Access and Fishing Area
   - ☐ Sylvan Canoe Portage

3. **Pillager Recreation Site:**
   - ☐ Alvah's Landing (Minnesota DNR Boat Launch)
   - ☐ Pillager Dam Public Boat Launch
   - ☒ Pillager Dam Public Canoe Portage and Shorefishing Access

4. **Number of People Observed:** 0 (Time of spot count: 11:00)

5. **Number of Vehicles Observed:** 0 (Time of spot count: 11:00)

6. **Observed Activities:**
   - ☐ Fishing from the shore
   - ☐ Fishing from a boat
   - ☐ Motorized boating
   - ☐ Canoe / Kayaking / Stand-up Paddle Boarding
   - ☐ Waterskiing / Wakeboarding / Tubing
   - ☐ Swimming
   - ☐ Hiking / Walking / Jogging
   - ☐ Bicycling
   - ☐ Picnicking
   - ☐ Camping
   - ☐ Viewing Wildlife / Birdwatching
   - ☐ Photography
   - ☐ Other: _____

   total people: 0 TTN

   total vehicles: 0 11

7. **Notes:**

_____

_____

_____

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Cooper Kurel

B. **Date:** 8/15/25

C. **Time:** 2:10

D. **Project:** ☐ Sylvan ☒ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☒ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 1

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☒ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	(3)	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	(3)	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

commented on the sand bank going down to the shore, said stairs would be nice for getting down there

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Cooper Kucel

B. **Date:** 8/15/25

C. **Time:** 1:30

D. **Project:** ☐ Sylvan ☒ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☒ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 1

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☐ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☐ Viewing Wildlife / Birdwatching
☐ Photography
☒ Other: driving through

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	(3)	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	(4)	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

bathrooms would be nice, also tossing in picnic tables around the shorefishing parking lot. mentioned the condition of the dirt path going into the woods, said there were huge holes and bumps on it.

Thank you for participating in this survey!

Sylvan Project (P-2454), Pillager Project (P-2663)

Recreational Use Survey Form

A. **Observer:** Dedra Sullivan

B. **Date:** 8/16/25

C. **Time:** ~~[illegible]~~ 11:40

D. **Project:** ☐ Sylvan ☒ Pillager

E. **Sylvan Recreation Site:**

☐ Wilder's Landing
☐ Fisherman's Bridge Boat Launch and Fishing Area
☐ Sylvan Dam Boat Access and Fishing Area
☐ Sylvan Canoe Portage

Pillager Recreation Site:

☐ Alvah's Landing (Minnesota DNR Boat Launch)
☐ Pillager Dam Public Boat Launch
☒ Pillager Dam Public Canoe Portage and Shorefishing Access

1. **The purpose of the survey is to obtain information about recreation user experience at the site and to determine adequacy of the site. This recreational use survey is in association with the relicensing process for the Sylvan and Pillager Hydroelectric Projects. The survey will take approximately 5 minutes and is completely anonymous. No personal information will be collected. Would you be willing to participate in the survey?**

☒ Yes ☐ No

2. **Including yourself, how many people are in your party today?** 2

3. **Of the activities listed above, please indicate which is the primary activity of this trip?** *(Choose only one)*

☐ Fishing from the shore
☐ Fishing from a boat
☐ Motorized boating
☐ Canoe / Kayaking / Stand-up Paddle Boarding
☐ Waterskiing / Wakeboarding / Tubing
☐ Swimming
☐ Hiking / Walking / Jogging
☐ Bicycling
☐ Picnicking
☐ Camping
☒ Viewing Wildlife / Birdwatching
☐ Photography
☐ Other: _____

4. **On a scale from 1 to 5, with 1 being underutilized and 5 overcrowded, how much do you perceive this site is used for recreation?** *(Circle one number)*

1	2	3	4	5
Underutilized		Moderate		Overcrowded

5. **In your opinion, are the amount and types of recreation opportunities offered at this site sufficient?**

☒ Yes; ☐ No; ☐ N/A

If no, please explain:

6. **On a scale from 1 to 5, with 1 being poor and 5 excellent, how would you rate the overall condition of this site?** *(Circle one number)*

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

If your rating is 1-2, please explain:

7. **Do you have any concerns of safety at this site?**

☐ Yes; ☒ No; ☐ N/A

If yes, please explain:

8. **Do you have any additional comments about public recreation opportunities and facilities at this recreation site? (Please be as specific as possible):**

Thank you for participating in this survey!

APPENDIX E-4

RARE SPECIES INFORMATION

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793

In Reply Refer To: 09/15/2025 20:19:28 UTC
Project Code: 2025-0149726
Project Name: Little Falls Hydroelectric Project (P-2532)

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

Threatened and Endangered Species
The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance
Please refer to refer to our Section 7 website for guidance and technical assistance, including step-by-step instructions for making effects determinations for each species that might be present and for specific guidance on the following types of projects: projects in developed areas, HUD, CDBG, EDA, USDA Rural Development projects, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

We recommend running the project (if it qualifies) through our **Minnesota-Wisconsin Federal Endangered Species Determination Key (Minnesota-Wisconsin ("D-key"))**. A demonstration video showing how-to access and use the determination key is available. Please note that the Minnesota-Wisconsin D-key is the third option of 3 available d-keys. D-keys are tools to help Federal agencies and other project proponents determine if their proposed action has the potential to adversely affect federally listed species and designated critical habitat. The Minnesota-Wisconsin D-key includes a structured set of questions that assists a project proponent in determining whether a proposed project qualifies for a certain predetermined consultation outcome for all federally listed species found in Minnesota and Wisconsin (except for the northern long-eared bat- see below), which includes determinations of “no effect” or “may affect, not likely to adversely affect." In each case, the Service has compiled and analyzed the best available information on the species’ biology and the impacts of certain activities to support these determinations.

If your completed d-key output letter shows a "No Effect" (NE) determination for all listed species, print your IPaC output letter for your files to document your compliance with the Endangered Species Act.

For Federal projects with a “Not Likely to Adversely Affect” (NLAA) determination, our concurrence becomes valid if you do not hear otherwise from us after a 30-day review period, as indicated in your letter.

If your d-key output letter indicates additional coordination with the Minnesota-Wisconsin Ecological Services Field Office is necessary (i.e., you get a “May Affect” determination), you will be provided additional guidance on contacting the Service to continue ESA coordination outside of the key; ESA compliance cannot be concluded using the key for “May Affect” determinations unless otherwise indicated in your output letter.

Note: Once you obtain your official species list, you are not required to continue in IPaC with d-keys, although in most cases these tools should expedite your review. If you choose to make an effects determination on your own, you may do so. If the project is a Federal Action, you may want to review our section 7 step-by-step instructions before making your determinations.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **no effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see below) – then project proponents must determine if proposed activities will have **no effect** on or **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain Life History Information for Listed and Candidate Species on our office website. If no impacts will occur to a species on the IPaC species list (e.g., there is no habitat present in the project area), the appropriate determination is **no effect**. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

3. Should you determine that project activities **may affect** any federally listed, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

Northern Long-Eared Bats
Northern long-eared bats occur throughout Minnesota and Wisconsin and the information below may help in determining if your project may affect these species.

Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches dbh for northern long-eared bat that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, northern long-eared bats could be affected. For bat activity dates, please review Appendix L in the Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines.

Examples of unsuitable habitat include:
- Individual trees that are greater than 1,000 feet from forested or wooded areas,
- Trees found in highly developed urban areas (e.g., street trees, downtown areas),
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees, and
- A monoculture stand of shrubby vegetation with no potential roost trees.

If IPaC returns a result that northern long-eared bats are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** this species **IF** one or more of the following activities are proposed:
- Clearing or disturbing suitable roosting habitat, as defined above, at any time of year,
- Any activity in or near the entrance to a cave or mine,
- Mining, deep excavation, or underground work within 0.25 miles of a cave or mine,
- Construction of one or more wind turbines, or
- Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on the northern long-eared bat. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC

species list report for your records.

If any of the above activities are proposed, and the northern long-eared bat appears on the user's species list, the federal project user will be directed to either the northern long-eared bat and tricolored bat range-wide D-key or the Federal Highways Administration, Federal Railways Administration, and Federal Transit Administration Indiana bat/Northern long-eared bat D-key, depending on the type of project and federal agency involvement. Similar to the Minnesota-Wisconsin D-key, these d-keys helps to determine if prohibited take might occur and, if not, will generate an automated verification letter. Additional information about available tools can be found on the Service's northern long-eared bat website.

Whooping Crane
Whooping crane is designated as a non-essential experimental population in Wisconsin and consultation under Section 7(a)(2) of the Endangered Species Act is only required if project activities will occur within a National Wildlife Refuge or National Park. If project activities are proposed on lands outside of a National Wildlife Refuge or National Park, then you are not required to consult. For additional information on this designation and consultation requirements, please review "Establishment of a Nonessential Experimental Population of Whooping Cranes in the Eastern United States."

Other Trust Resources and Activities
Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. It is the responsibility of the project proponent to survey the area for any migratory bird nests. If there is an eagle nest on-site while work is on-going, eagles may be disturbed. We recommend avoiding and minimizing disturbance to eagles whenever practicable. If you cannot avoid eagle disturbance, you may seek a permit. A nest take permit is always required for removal, relocation, or obstruction of an eagle nest. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed voluntary guidelines for minimizing impacts.

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to guidelines developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's Wind Energy Guidelines. In addition, please refer to the Service's Eagle Conservation Plan Guidance, which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

State Department of Natural Resources Coordination
While it is not required for your Federal section 7 consultation, please note that additional state endangered or threatened species may also have the potential to be impacted. **Please contact the Minnesota or Wisconsin Department of Natural Resources for information on state listed species that may be present in your proposed project area.**

Minnesota
Minnesota Department of Natural Resources - Endangered Resources Review Homepage
Email: Review.NHIS@state.mn.us

Wisconsin
Wisconsin Department of Natural Resources - Endangered Resources Review Homepage
Email: DNRERReview@wi.gov

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- Bald & Golden Eagles
- Migratory Birds

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
(952) 858-0793

PROJECT SUMMARY

Project Code: 2025-0149726
Project Name: Little Falls Hydroelectric Project (P-2532)
Project Type: Power Gen - Hydropower - FERC
Project Description: Relicensing of the Little Falls Hydroelectric Project (P-2532)
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@45.990272950000005,-94.35431698275862,14z



Counties: Morrison County, Minnesota

ENDANGERED SPECIES ACT SPECIES

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Gray Wolf *Canis lupus* Population: MN There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4488	Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened
Suckley's Cuckoo Bumble Bee *Bombus suckleyi* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10885	Proposed Endangered
Western Regal Fritillary *Argynnis idalia occidentalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/12017	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts
For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/ activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

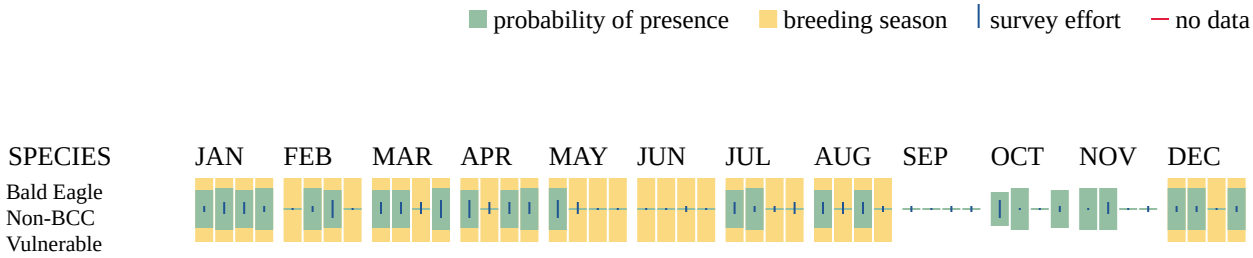
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (▪)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black Tern *Chlidonias niger surinamenisis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3093	Breeds May 15 to Aug 20
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9454	Breeds May 20 to Jul 31
Canada Warbler *Cardellina canadensis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9643	Breeds May 20 to Aug 10
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Golden-winged Warbler *Vermivora chrysoptera* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Grasshopper Sparrow *Ammodramus savannarum perpallidus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9431	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

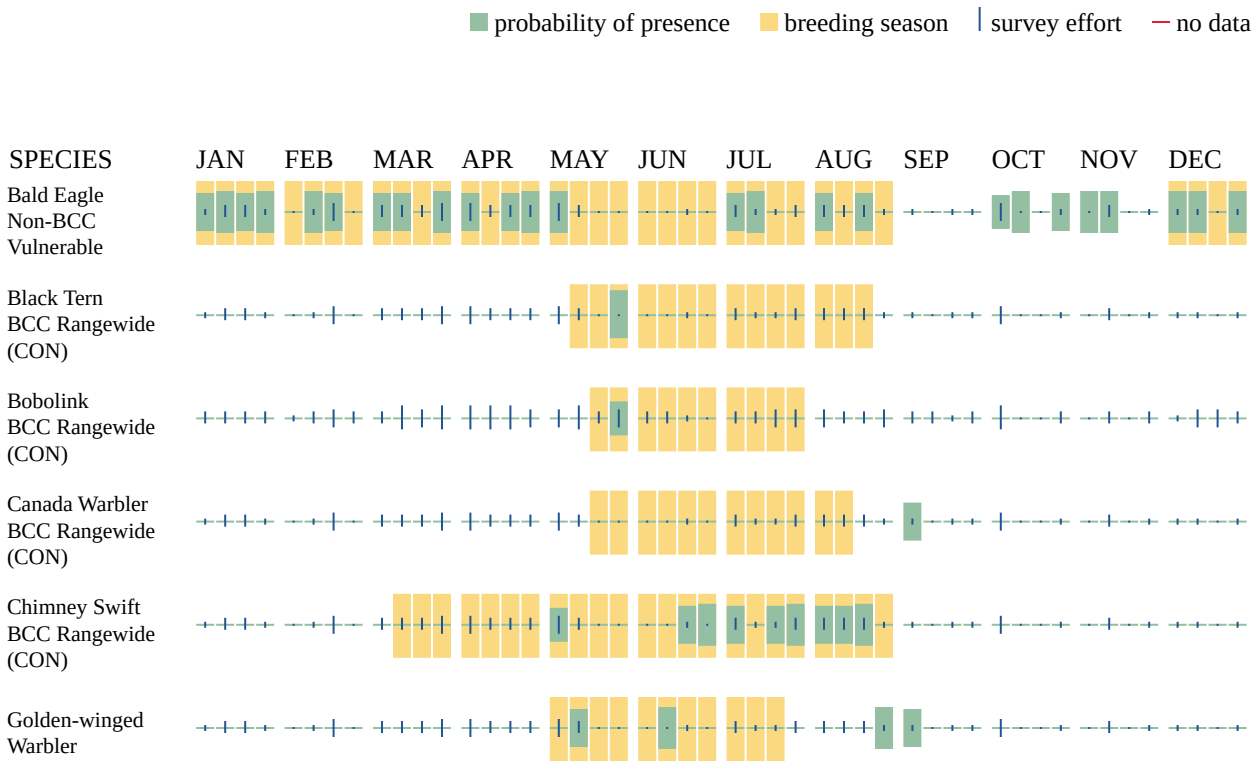
Probability of Presence (■)

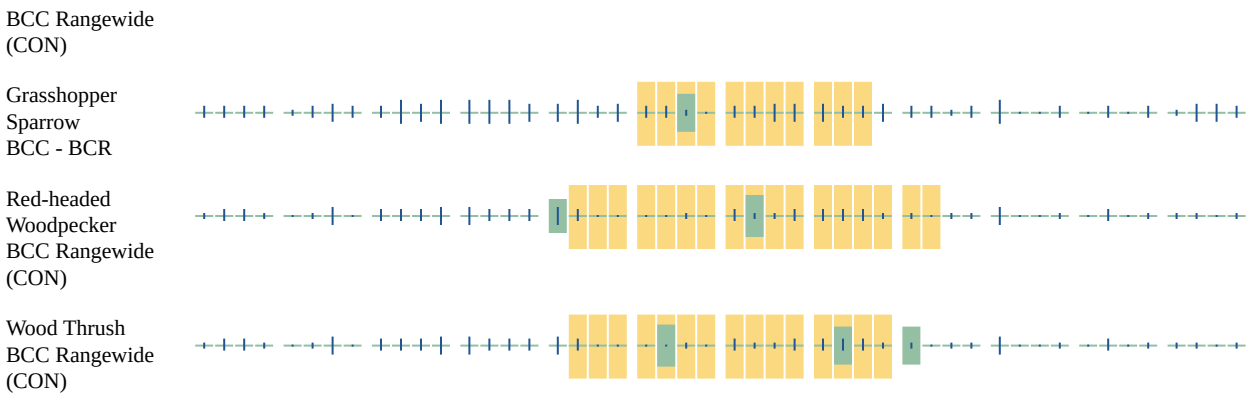
Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.





Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Elizabeth Krchnavek
Address: 204 Caughman Farm Ln Ste 301
City: Lexington
State: SC
Zip: 29072
Email elizabeth.krchnavek@kleinschmidtgroup.com
Phone: 5712306830

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793

In Reply Refer To: 09/15/2025 20:17:57 UTC
Project Code: 2025-0149721
Project Name: Pillager Hydroelectric Project (P-2663)

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

Threatened and Endangered Species
The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance
Please refer to refer to our Section 7 website for guidance and technical assistance, including step-by-step instructions for making effects determinations for each species that might be present and for specific guidance on the following types of projects: projects in developed areas, HUD, CDBG, EDA, USDA Rural Development projects, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

We recommend running the project (if it qualifies) through our **Minnesota-Wisconsin Federal Endangered Species Determination Key (Minnesota-Wisconsin ("D-key"))**. A demonstration video showing how-to access and use the determination key is available. Please note that the Minnesota-Wisconsin D-key is the third option of 3 available d-keys. D-keys are tools to help Federal agencies and other project proponents determine if their proposed action has the potential to adversely affect federally listed species and designated critical habitat. The Minnesota-Wisconsin D-key includes a structured set of questions that assists a project proponent in determining whether a proposed project qualifies for a certain predetermined consultation outcome for all federally listed species found in Minnesota and Wisconsin (except for the northern long-eared bat- see below), which includes determinations of “no effect” or “may affect, not likely to adversely affect." In each case, the Service has compiled and analyzed the best available information on the species’ biology and the impacts of certain activities to support these determinations.

If your completed d-key output letter shows a "No Effect" (NE) determination for all listed species, print your IPaC output letter for your files to document your compliance with the Endangered Species Act.

For Federal projects with a “Not Likely to Adversely Affect” (NLAA) determination, our concurrence becomes valid if you do not hear otherwise from us after a 30-day review period, as indicated in your letter.

If your d-key output letter indicates additional coordination with the Minnesota-Wisconsin Ecological Services Field Office is necessary (i.e., you get a “May Affect” determination), you will be provided additional guidance on contacting the Service to continue ESA coordination outside of the key; ESA compliance cannot be concluded using the key for “May Affect” determinations unless otherwise indicated in your output letter.

Note: Once you obtain your official species list, you are not required to continue in IPaC with d-keys, although in most cases these tools should expedite your review. If you choose to make an effects determination on your own, you may do so. If the project is a Federal Action, you may want to review our section 7 step-by-step instructions before making your determinations.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **no effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see below) – then project proponents must determine if proposed activities will have **no effect** on or **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain Life History Information for Listed and Candidate Species on our office website. If no impacts will occur to a species on the IPaC species list (e.g., there is no habitat present in the project area), the appropriate determination is **no effect**. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

3. Should you determine that project activities **may affect** any federally listed, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

Northern Long-Eared Bats
Northern long-eared bats occur throughout Minnesota and Wisconsin and the information below may help in determining if your project may affect these species.

Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches dbh for northern long-eared bat that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, northern long-eared bats could be affected. For bat activity dates, please review Appendix L in the Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines.

Examples of unsuitable habitat include:
- Individual trees that are greater than 1,000 feet from forested or wooded areas,
- Trees found in highly developed urban areas (e.g., street trees, downtown areas),
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees, and
- A monoculture stand of shrubby vegetation with no potential roost trees.

If IPaC returns a result that northern long-eared bats are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** this species **IF** one or more of the following activities are proposed:
- Clearing or disturbing suitable roosting habitat, as defined above, at any time of year,
- Any activity in or near the entrance to a cave or mine,
- Mining, deep excavation, or underground work within 0.25 miles of a cave or mine,
- Construction of one or more wind turbines, or
- Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on the northern long-eared bat. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC

species list report for your records.

If any of the above activities are proposed, and the northern long-eared bat appears on the user's species list, the federal project user will be directed to either the northern long-eared bat and tricolored bat range-wide D-key or the Federal Highways Administration, Federal Railways Administration, and Federal Transit Administration Indiana bat/Northern long-eared bat D-key, depending on the type of project and federal agency involvement. Similar to the Minnesota-Wisconsin D-key, these d-keys helps to determine if prohibited take might occur and, if not, will generate an automated verification letter. Additional information about available tools can be found on the Service's northern long-eared bat website.

Whooping Crane
Whooping crane is designated as a non-essential experimental population in Wisconsin and consultation under Section 7(a)(2) of the Endangered Species Act is only required if project activities will occur within a National Wildlife Refuge or National Park. If project activities are proposed on lands outside of a National Wildlife Refuge or National Park, then you are not required to consult. For additional information on this designation and consultation requirements, please review "Establishment of a Nonessential Experimental Population of Whooping Cranes in the Eastern United States."

Other Trust Resources and Activities
Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. It is the responsibility of the project proponent to survey the area for any migratory bird nests. If there is an eagle nest on-site while work is on-going, eagles may be disturbed. We recommend avoiding and minimizing disturbance to eagles whenever practicable. If you cannot avoid eagle disturbance, you may seek a permit. A nest take permit is always required for removal, relocation, or obstruction of an eagle nest. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed voluntary guidelines for minimizing impacts.

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to guidelines developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's Wind Energy Guidelines. In addition, please refer to the Service's Eagle Conservation Plan Guidance, which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

State Department of Natural Resources Coordination
While it is not required for your Federal section 7 consultation, please note that additional state endangered or threatened species may also have the potential to be impacted. **Please contact the Minnesota or Wisconsin Department of Natural Resources for information on state listed species that may be present in your proposed project area.**

Minnesota
Minnesota Department of Natural Resources - Endangered Resources Review Homepage
Email: Review.NHIS@state.mn.us

Wisconsin
Wisconsin Department of Natural Resources - Endangered Resources Review Homepage
Email: DNRERReview@wi.gov

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- Bald & Golden Eagles
- Migratory Birds

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
(952) 858-0793

PROJECT SUMMARY

Project Code: 2025-0149721
Project Name: Pillager Hydroelectric Project (P-2663)
Project Type: Power Gen - Hydropower - FERC
Project Description: Relicensing of the Pillager Hydroelectric Project (P-2663).
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@46.311351650000006,-94.50016527544884,14z



Counties: Cass and Morrison counties, Minnesota

ENDANGERED SPECIES ACT SPECIES

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Gray Wolf *Canis lupus* Population: MN There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4488	Threatened
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened
Suckley's Cuckoo Bumble Bee *Bombus suckleyi* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10885	Proposed Endangered

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts
For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/ activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

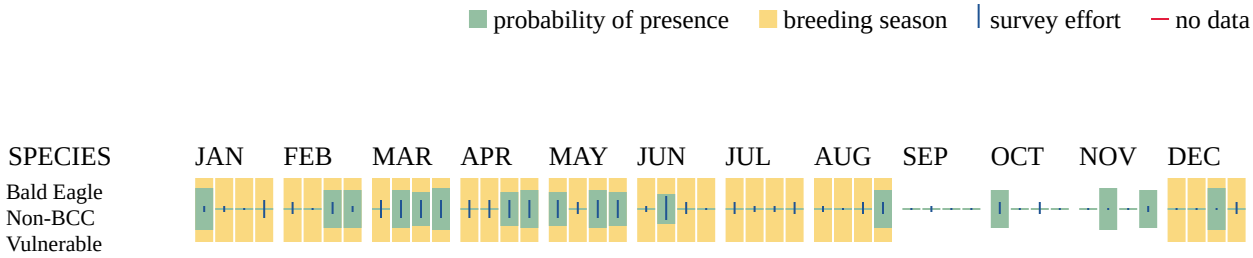
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (▪)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black Tern *Chlidonias niger surinamenisis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3093	Breeds May 15 to Aug 20
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9454	Breeds May 20 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Common Tern *Sterna hirundo* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/4963	Breeds May 1 to Aug 31
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10678	Breeds May 1 to Aug 20
Golden-winged Warbler *Vermivora chrysoptera* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere

NAME	BREEDING SEASON
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Pectoral Sandpiper *Calidris melanotos* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere
Veery *Catharus fuscescens fuscescens* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11987	Breeds May 15 to Jul 15

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds

- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Elizabeth Krchnavek
Address: 204 Caughman Farm Ln Ste 301
City: Lexington
State: SC
Zip: 29072
Email elizabeth.krchnavek@kleinschmidtgroup.com
Phone: 5712306830

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Energy Regulatory Commission

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793

In Reply Refer To: 09/26/2025 00:53:01 UTC
Project Code: 2025-0155062
Project Name: Sylvan Hydroelectric Project (P-2454)

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

Threatened and Endangered Species
The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance
Please refer to refer to our Section 7 website for guidance and technical assistance, including step-by-step instructions for making effects determinations for each species that might be present and for specific guidance on the following types of projects: projects in developed areas, HUD, CDBG, EDA, USDA Rural Development projects, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

We recommend running the project (if it qualifies) through our **Minnesota-Wisconsin Federal Endangered Species Determination Key (Minnesota-Wisconsin ("D-key"))**. A demonstration video showing how-to access and use the determination key is available. Please note that the Minnesota-Wisconsin D-key is the third option of 3 available d-keys. D-keys are tools to help Federal agencies and other project proponents determine if their proposed action has the potential to adversely affect federally listed species and designated critical habitat. The Minnesota-Wisconsin D-key includes a structured set of questions that assists a project proponent in determining whether a proposed project qualifies for a certain predetermined consultation outcome for all federally listed species found in Minnesota and Wisconsin (except for the northern long-eared bat- see below), which includes determinations of “no effect” or “may affect, not likely to adversely affect." In each case, the Service has compiled and analyzed the best available information on the species’ biology and the impacts of certain activities to support these determinations.

If your completed d-key output letter shows a "No Effect" (NE) determination for all listed species, print your IPaC output letter for your files to document your compliance with the Endangered Species Act.

For Federal projects with a “Not Likely to Adversely Affect” (NLAA) determination, our concurrence becomes valid if you do not hear otherwise from us after a 30-day review period, as indicated in your letter.

If your d-key output letter indicates additional coordination with the Minnesota-Wisconsin Ecological Services Field Office is necessary (i.e., you get a “May Affect” determination), you will be provided additional guidance on contacting the Service to continue ESA coordination outside of the key; ESA compliance cannot be concluded using the key for “May Affect” determinations unless otherwise indicated in your output letter.

Note: Once you obtain your official species list, you are not required to continue in IPaC with d-keys, although in most cases these tools should expedite your review. If you choose to make an effects determination on your own, you may do so. If the project is a Federal Action, you may want to review our section 7 step-by-step instructions before making your determinations.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **no effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see below) – then project proponents must determine if proposed activities will have **no effect** on or **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain Life History Information for Listed and Candidate Species on our office website. If no impacts will occur to a species on the IPaC species list (e.g., there is no habitat present in the project area), the appropriate determination is **no effect**. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

3. Should you determine that project activities **may affect** any federally listed, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

Northern Long-Eared Bats
Northern long-eared bats occur throughout Minnesota and Wisconsin and the information below may help in determining if your project may affect these species.

Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches dbh for northern long-eared bat that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, northern long-eared bats could be affected. For bat activity dates, please review Appendix L in the Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines.

Examples of unsuitable habitat include:
- Individual trees that are greater than 1,000 feet from forested or wooded areas,
- Trees found in highly developed urban areas (e.g., street trees, downtown areas),
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees, and
- A monoculture stand of shrubby vegetation with no potential roost trees.

If IPaC returns a result that northern long-eared bats are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** this species **IF** one or more of the following activities are proposed:
- Clearing or disturbing suitable roosting habitat, as defined above, at any time of year,
- Any activity in or near the entrance to a cave or mine,
- Mining, deep excavation, or underground work within 0.25 miles of a cave or mine,
- Construction of one or more wind turbines, or
- Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on the northern long-eared bat. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC

species list report for your records.

If any of the above activities are proposed, and the northern long-eared bat appears on the user's species list, the federal project user will be directed to either the northern long-eared bat and tricolored bat range-wide D-key or the Federal Highways Administration, Federal Railways Administration, and Federal Transit Administration Indiana bat/Northern long-eared bat D-key, depending on the type of project and federal agency involvement. Similar to the Minnesota-Wisconsin D-key, these d-keys helps to determine if prohibited take might occur and, if not, will generate an automated verification letter. Additional information about available tools can be found on the Service's northern long-eared bat website.

Whooping Crane
Whooping crane is designated as a non-essential experimental population in Wisconsin and consultation under Section 7(a)(2) of the Endangered Species Act is only required if project activities will occur within a National Wildlife Refuge or National Park. If project activities are proposed on lands outside of a National Wildlife Refuge or National Park, then you are not required to consult. For additional information on this designation and consultation requirements, please review "Establishment of a Nonessential Experimental Population of Whooping Cranes in the Eastern United States."

Other Trust Resources and Activities
Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. It is the responsibility of the project proponent to survey the area for any migratory bird nests. If there is an eagle nest on-site while work is on-going, eagles may be disturbed. We recommend avoiding and minimizing disturbance to eagles whenever practicable. If you cannot avoid eagle disturbance, you may seek a permit. A nest take permit is always required for removal, relocation, or obstruction of an eagle nest. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed voluntary guidelines for minimizing impacts.

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to guidelines developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's Wind Energy Guidelines. In addition, please refer to the Service's Eagle Conservation Plan Guidance, which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

State Department of Natural Resources Coordination
While it is not required for your Federal section 7 consultation, please note that additional state endangered or threatened species may also have the potential to be impacted. **Please contact the Minnesota or Wisconsin Department of Natural Resources for information on state listed species that may be present in your proposed project area.**

Minnesota
Minnesota Department of Natural Resources - Endangered Resources Review Homepage
Email: Review.NHIS@state.mn.us

Wisconsin
Wisconsin Department of Natural Resources - Endangered Resources Review Homepage
Email: DNRERReview@wi.gov

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- Bald & Golden Eagles
- Migratory Birds

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
(952) 858-0793

PROJECT SUMMARY

Project Code: 2025-0155062
Project Name: Sylvan Hydroelectric Project (P-2454)
Project Type: Power Gen - Hydropower - FERC
Project Description: Relicensing of the Sylvan Hydroelectric Project (P-2454).
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@46.3342151,-94.34734984578432,14z



Counties: Cass and Morrison counties, Minnesota

ENDANGERED SPECIES ACT SPECIES

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Gray Wolf *Canis lupus* Population: MN There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4488	Threatened
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened
Suckley's Cuckoo Bumble Bee *Bombus suckleyi* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10885	Proposed Endangered

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts
For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/ activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

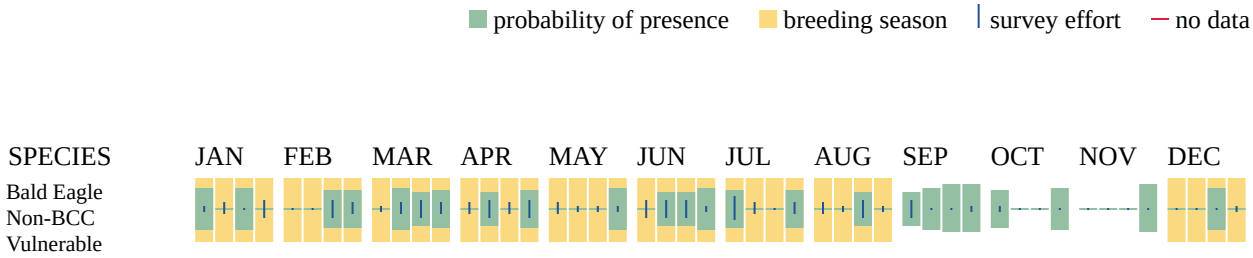
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (▪)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9454	Breeds May 20 to Jul 31
Canada Warbler *Cardellina canadensis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9643	Breeds May 20 to Aug 10
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Common Tern *Sterna hirundo* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/4963	Breeds May 1 to Aug 31
Connecticut Warbler *Oporornis agilis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9442	Breeds Jun 15 to Aug 10
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10678	Breeds May 1 to Aug 20
Golden-winged Warbler *Vermivora chrysoptera* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20

NAME	BREEDING SEASON
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Pectoral Sandpiper *Calidris melanotos* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere
Veery *Catharus fuscescens fuscescens* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11987	Breeds May 15 to Jul 15

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds

- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Elizabeth Krchnavek
Address: 204 Caughman Farm Ln Ste 301
City: Lexington
State: SC
Zip: 29072
Email elizabeth.krchnavek@kleinschmidtgroup.com
Phone: 5712306830

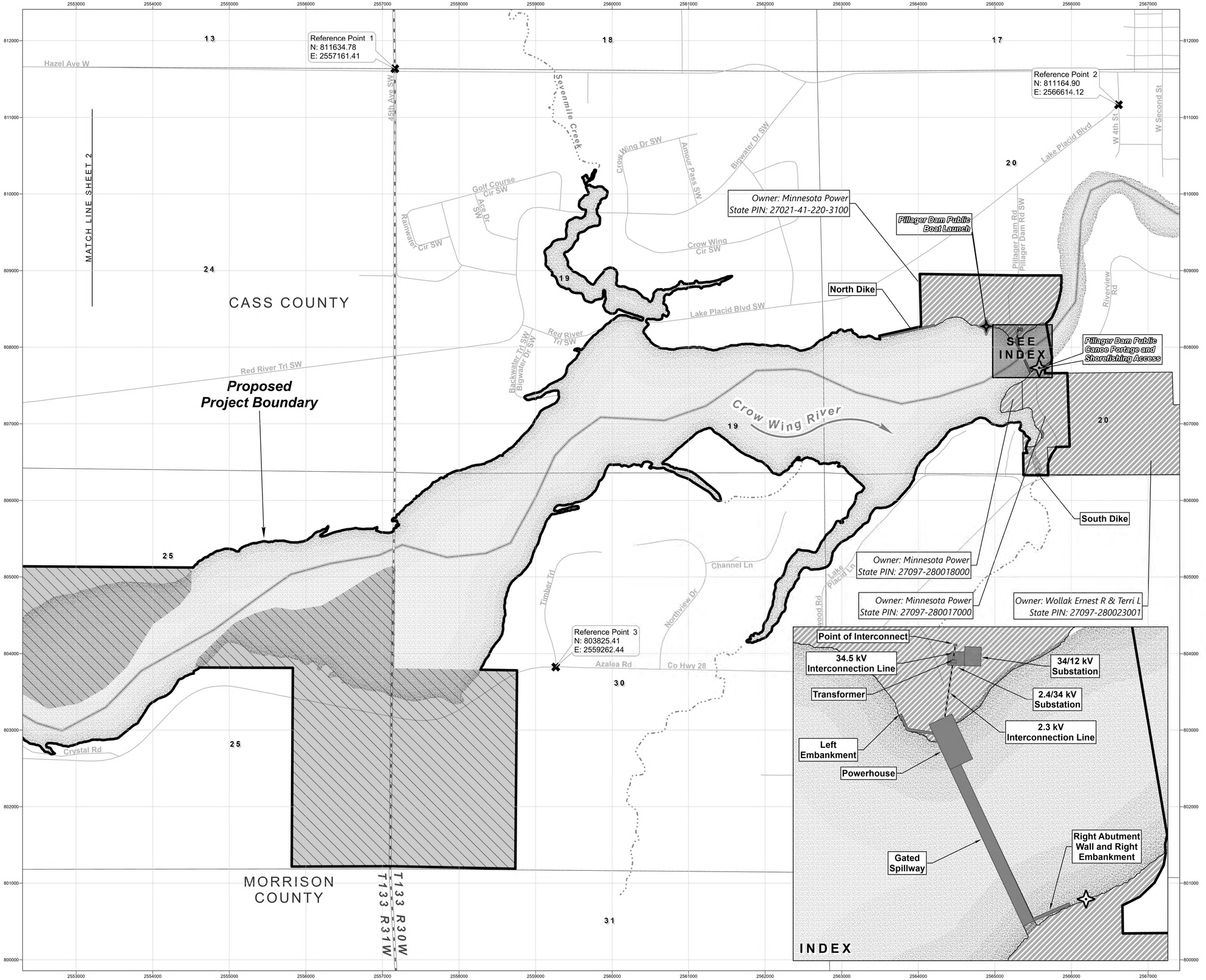
APPENDIX E-5

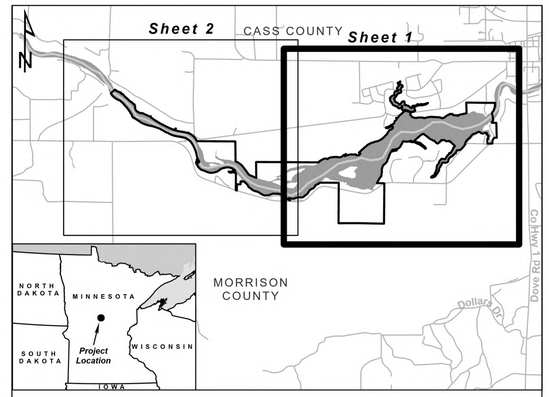
CULTURAL RESOURCES INFORMATION

(PRIVILEGED)

PILLAGER HYDROELECTRIC PROJECT
FERC NO. 2663

DRAFT EXHIBIT G
PROJECT BOUNDARY MAP





TN
0.79°E
10/3/2025
MN

- Proposed Project Boundary
- Reference Point
- Interconnection Line
- Project Recreation Site
- Operator
- MN Power
- MN Power & MN DNR
- Road
- Perennial Hydrography
- Match Line
- Project Feature
- PLSS Section
- PLSS Township/Range
- Parcel
- Natural Character Area
- County

Map notes:
1. The Pillager Project is located in the State of Minnesota in Cass and Morrison Counties.
2. Reference Point coordinates are shown in NAD 1983 StatePlane Minnesota Central FIPS 2202 Ft US.
3. Elevations shown are referenced to NGVD 29. NAVD 88 = NGVD 29 + 0.204 ft. Conversion Factor was determined from an elevation point on Pillager Dam (https://www.ngs.noaa.gov/NCAT/).
4. Parcel data were sourced from Minnesota Geospatial Information Office.
5. Licensee has acquired all flowage rights and title in fee or the right to use in perpetuity all lands necessary or appropriate for the construction, maintenance, and operation of the Project. All property records are kept on file with the licensee.
6. There are no federal lands within the Project boundary.
7. The Project boundary description, as required by 18 CFR 4.41, is represented here by a grid of Northings and Eastings around, and graticules within, the map frame. Any position in Northings and Eastings along the Project boundary can be determined using these references.
8. The Project boundary, in part, was digitized from contour elevations derived from MDNR ME LiDAR data (Minnesota Department of Natural Resources and Woolpert, Inc. (2013). Lidar Elevation, Central Lakes Region, Minnesota, 2012 [LAS point clouds; 1 m DEM; contours; building outlines]. Minnesota Geospatial Information Office and Minnesota Department of Natural Resources. Acquired April 5–28, 2012 for Aitkin, Cass, Hubbard, Itasca, Todd, Wadena, and part of Koochiching Counties.) and NAIP 2023 aerial imagery, which consists of 30 cm resolution, 4-band (red, green, blue, near-infrared) orthophotos acquired during summer 2023, with 8-bit radiometric resolution (United States Department of Agriculture, Farm Production and Conservation – Business Center – Geospatial Enterprise Operations (USDA FPAC-BC-GEO). (2023). National Agriculture Imagery Program (NAIP) 2023 Aerial Imagery for Minnesota [30 cm, 4-band orthophotos, 8-bit radiometric resolution]. Distributed by Minnesota Geospatial Information Office (MnGeo). Available at: https://resources.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_mngeo/base_naip_2023_airphotos/metadata/metadata.html)
9. The proposed Project Boundary around the reservoir is based on elevation 1200 feet NGVD 29, which encompasses the operating band of 1199.25 +/- 0.5 feet NGVD 29.

MINNESOTA POWER

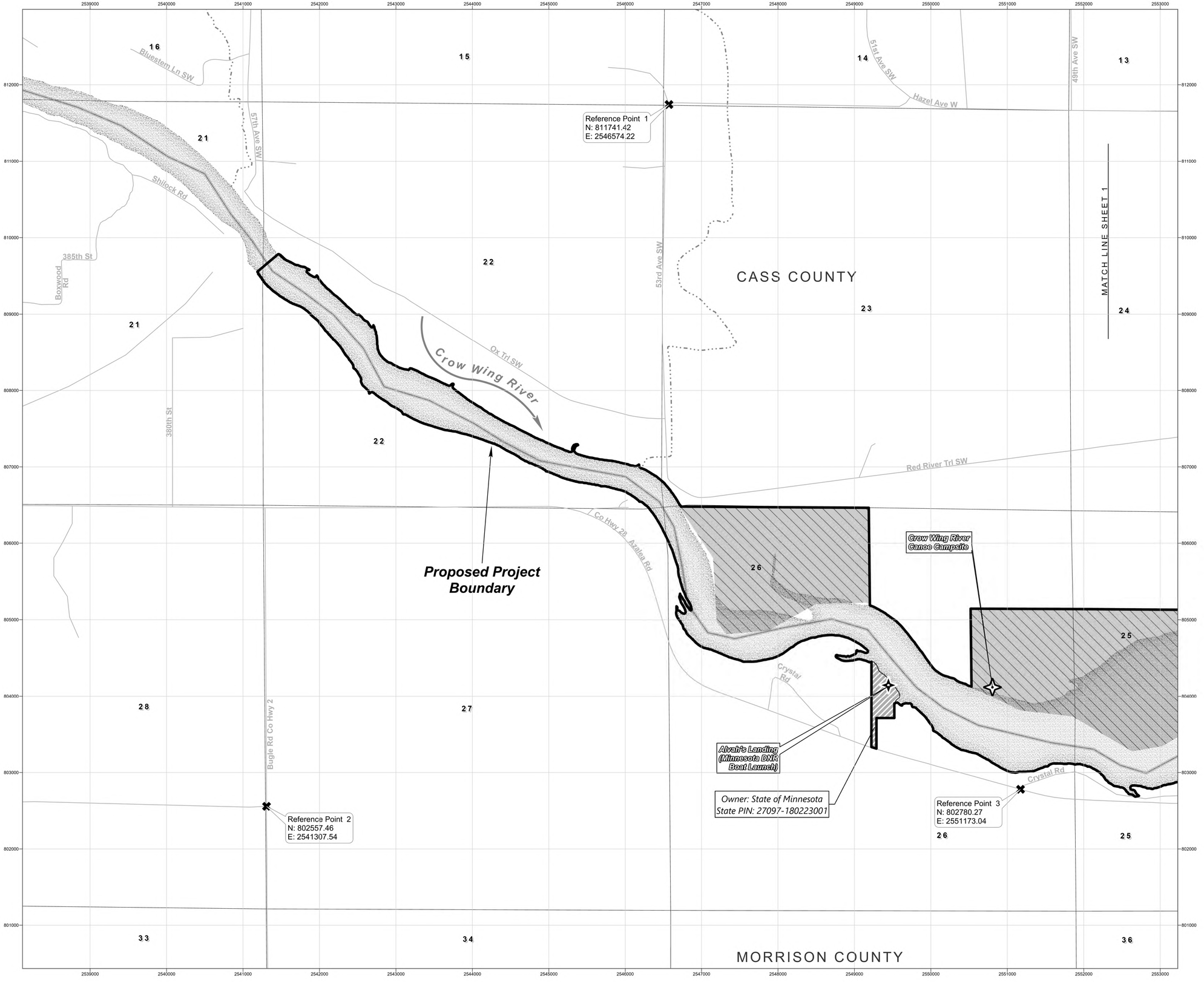
PILLAGER HYDROELECTRIC PROJECT
FERC NO. 2663

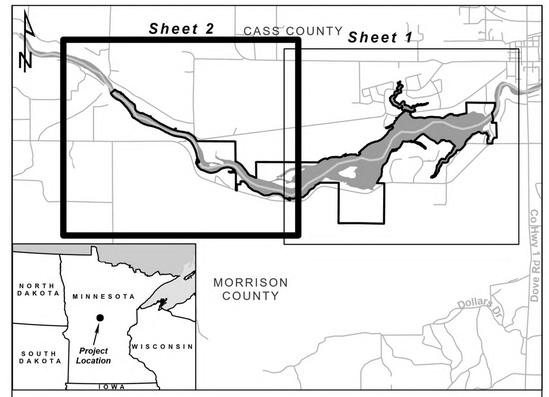
PROJECT BOUNDARY MAP

EXHIBIT G | SCALE: 1" = 600' | SHEET NO. 1 OF 2

0 450 900 1,800 2,700 3,600 Feet

DATE: OCTOBER 2025 | FERC DWG. NO. 2663-





TN
MN
0.83°E
10/3/2025

- Proposed Project Boundary
- Reference Point
- Interconnection Line
- Project Recreation Site
- Operator
- MN DNR
- MN Power
- Road
- Perennial Hydrography
- Match Line
- PLSS Section
- PLSS Township/Range
- Parcel
- Natural Character Area
- County

Map notes:

1. The Pillager Project is located in the State of Minnesota in Cass and Morrison Counties.
2. Reference Point coordinates are shown in NAD 1983 StatePlane Minnesota Central FIPS 2202 Ft US.
3. Elevations shown are referenced to NGVD 29. NAVD 88 = NGVD 29 + 0.204 ft. Conversion Factor was determined from an elevation point on Pillager Dam (https://www.ngs.noaa.gov/NCAT/).
4. Parcel data were sourced from Minnesota Geospatial Information Office.
5. Licensee has acquired all flowage rights and title in fee or the right to use in perpetuity all lands necessary or appropriate for the construction, maintenance, and operation of the Project. All property records are kept on file with the licensee.
6. There are no federal lands within the Project boundary.
7. The Project boundary description, as required by 18 CFR 4.41, is represented here by a grid of Northings and Eastings around, and graticules within, the map frame. Any position in Northings and Eastings along the Project boundary can be determined using these references.
8. The Project boundary, in part, was digitized from contour elevations derived from MDNR ME LiDAR data (Minnesota Department of Natural Resources and Woolpert, Inc. (2013). Lidar Elevation, Central Lakes Region, Minnesota, 2012 [LAS point clouds; 1 m DEM; contours; building outlines]. Minnesota Geospatial Information Office and Minnesota Department of Natural Resources. Acquired April 5–28, 2012 for Aitkin, Cass, Hubbard, Itasca, Todd, Wadena, and part of Koochiching Counties.) and NAIP 2023 aerial imagery, which consists of 30 cm resolution, 4-band (red, green, blue, near-infrared) orthophotos acquired during summer 2023, with 8-bit radiometric resolution (United States Department of Agriculture, Farm Production and Conservation – Business Center – Geospatial Enterprise Operations (USDA FPAC-BC-GEO). (2023). National Agriculture Imagery Program (NAIP) 2023 Aerial Imagery for Minnesota [30 cm, 4-band orthophotos, 8-bit radiometric resolution]. Distributed by Minnesota Geospatial Information Office (MnGeo). Available at: https://resources.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_mngeo/base_naip_2023_airphotos/metadata/metadata.html)
9. The proposed Project Boundary around the reservoir is based on elevation 1200 feet NGVD 29, which encompasses the operating band of 1199.25 +/- 0.5 feet NGVD 29.

MINNESOTA POWER

PILLAGER HYDROELECTRIC PROJECT
FERC NO. 2663

PROJECT BOUNDARY MAP

EXHIBIT G | SCALE: 1" = 600' | SHEET NO. 2 OF 2

0 450 900 1,800 2,700 3,600 Feet

DATE: OCTOBER 2025 FERC DWG. NO. 2663-

Pillager Hydroelectric Project
FERC No. 2663

Draft Exhibit H
Description of Project Management and Need for Project Power

TABLE OF CONTENTS

A. INFORMATION TO BE SUPPLIED BY ALL LICENSEES (18 CFR § 16.10[A]) H-1
1. Efficient and Reliable Electric Service H-1
i. Increase in Capacity or Generation H-1
ii. Coordination with any Upstream or Downstream Water Resource Projects H-1
iii. Coordination of Operations with Electrical Systems H-2
2. Need for Project Electricity H-2
i. Cost and Availability of Alternative Sources of Power H-2
ii. Increase in Costs if the Licensee is not Granted a License H-2
iii. Effects of Alternative Sources of Power H-3
3. Need for Project Power, Reasonable Cost, and Availability of Alternative Sources of Power H-3
i. Average Annual Cost of Power H-3
ii. Projected Resources Required to Meet Capacity and Energy Requirements H-4
iii. Alternative Sources of Power H-5
iv. Effect on the Direct Providers of Alternate Sources of Power H-5
4. Use of Power for Licensee-Owned Industrial Facility H-5
5. Need for Power if Licensee is an Indian Tribe H-5
6. Effect on Operations and Planning of the Licensee's Transmission System of Receiving or not Receiving the License H-6
7. Plans to Modify Existing Project Facilities H-6
8. Conformance with a Comprehensive Plan for the Waterway H-6
9. Financial and Personnel Resources H-8
10. Project Expansion Notification H-8
11. Electricity Consumption Efficiency Improvement Program H-9
i. Customer Energy Efficiency Program H-9
ii. Compliance of Energy Conservation Programs with Regulatory Requirements H-9
12. Indian Tribe Names and Mailing Addresses H-9

B. INFORMATION TO BE SUPPLIED BY LICENSEES THAT ARE EXISTING LICENSEES (18 CFR § 16.10[B]) H-13
1. The Information Specified in Paragraph (a) H-13
2. Measures Planned to Ensure Safe Management, Operation, and Maintenance of the Project H-13

i. Existing and Planned Operation of the Project during Flood Conditions H-13
ii. Downstream Warning Devices H-14
iii. Operational Changes that Might Affect the Emergency Action Plan H-14
iv. Existing and Planned Monitoring Devices H-14
v. Employee Safety and Public Safety Record H-14
3. Current Operations H-15
4. Project History H-16
5. Generation Losses over Previous Five Years H-16
6. Compliance with Terms and Conditions of Existing License H-18
7. Actions Taken by Licensee Related to the Project That Affect the Public H-18
8. Ownership and Operating Expense Reductions if the Project License was Transferred H-18
9. Annual Fees for Federal or Indian Lands H-18

REFERENCES H-19

LIST OF TABLES

Table 1: Annual Operations and Maintenance Expenses and Capital Costs H-4

Table 2: List of Potentially Relevant Qualifying Comprehensive Plans to the Pillager Project H-7

Table 3: Unscheduled Outages at the Pillager Project (8/31/2020 – 8/31/2024) H-16

APPENDIX

Appendix H-1: Minnesota Power's 2025-2039 Integrated Resource Plan

DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

Applicant	ALLETE, Inc.
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulations
cfs	cubic feet per second
CIP	Conservation Improvement Program
Commission	Federal Energy Regulatory Commission
EAP	Emergency Action Plan
ECO	Energy Conservation and Optimization
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
IRP	Integrated Resource Plan
Licensee	ALLETE, Inc.
MISO	Midcontinent Independent System Operator
Minnesota PUC	Minnesota Public Utilities Commission
MRO	Midwest Reliability Organization
MW	megawatt
MWh	megawatt-hour
NGVD 29	National Geodetic Vertical Datum of 1929
OSHA	Occupational Safety and Health Administration
Pillager Project	Pillager Hydroelectric Project, FERC P-2663
PSP	Public Safety Plan

A. INFORMATION TO BE SUPPLIED BY ALL LICENSEES (18 CFR § 16.10[A])

Pursuant to 18 Code of Federal Regulations (CFR) §16.10, as well as the application requirements as listed in 18 CFR §5.18(c), Exhibit H is to provide the information required under the Federal Power Act (FPA) for applicants seeking a new license, including details about the licensee's performance as the current holder of the project license.

Section A of this Exhibit H addresses the requirements of 18 CFR § 16.10(a), which apply to all applicants. This section discusses the need for project power and consideration of alternative sources, proposed modifications to the project, the licensee's capability to operate and maintain the project, and any electrical efficiency programs.

Section B of this Exhibit H fulfills the requirements of 18 CFR § 16.10(b) for existing licensees. It includes information on the safe management, operation, and maintenance of the project, operational history and improvement efforts, compliance with the current license, and any actions taken that affect the public.

1. Efficient and Reliable Electric Service

i. Increase in Capacity or Generation

Minnesota Power, a subsidiary of ALLETE, Inc. (Licensee or Applicant), is not proposing a change to capacity or generation output of the Pillager Hydroelectric Project (Federal Energy Regulatory Commission [FERC or Commission] Project No. 2663) (Pillager Project). The Licensee intends to continue operating the facility using its existing process and control systems, which are designed to efficiently manage water resources, optimize generation, and ensure reliable and responsible operation.

ii. Coordination with any Upstream or Downstream Water Resource Projects

The Pillager Project is a hydroelectric facility located on the Crow Wing River that operates in a run-of-river mode with independent operational protocols and dam safety procedures. Although the facility is operated autonomously, Minnesota Power coordinates operations across its regional hydroelectric projects. Downstream from the Pillager Project on the Crow Wing River, the Minnesota Power-owned Sylvan Hydroelectric Project (FERC No. 2454) is located about

7 miles away and similarly operates in a run-of-river mode. Minnesota Power's Little Falls Hydroelectric Project (FERC No. 2532) and Blanchard Hydroelectric Project (FERC No. 346) are located downstream on the Mississippi River 25 and 32 miles below the mouth of the Crow Wing River, respectively. No dams are located upstream of the Pillager Project.

iii. Coordination of Operations with Electrical Systems

The Pillager Project is operated in coordination with the Licensee's broader generation portfolio to help minimize overall production costs. Hydroelectric generation is operated to maximize the use of available river flows. The cost savings achieved through the Licensee's effective use of its hydroelectric resources are ultimately passed on to customers through reduced energy costs.

2. Need for Project Electricity

i. Cost and Availability of Alternative Sources of Power

The Pillager Project is a 1.520-megawatt (MW) facility that generates an average of 8,110 megawatt-hours (MWh) annually, as detailed in Exhibit A. If the Licensee were not granted a license for the Pillager Project, it would likely purchase the replacement energy from neighboring utilities that are members of the Midcontinent Independent System Operator (MISO), non-MISO utilities, independent power producers, merchant plant owners, or power marketers. To offset the capacity and energy provided by the Pillager Project, alternative sources may include fossil-fuel-powered generating units, which can have higher fuel and variable operating costs. Based on the 2024 State of the Market Report for the MISO Electricity Markets, the average real-time energy price across MISO in 2024 was approximately $31 per MWh (MISO 2025). The estimated annual replacement cost for energy from the Pillager Project would be approximately $251,410, assuming market purchases at the average MISO real-time price.

ii. Increase in Costs if the Licensee is not Granted a License

If the Licensee is not granted a license, the Pillager Project would cease to provide affordable, clean electricity, and the loss of the Pillager Project would result in increased demand and energy costs for Minnesota Power ratepayers. The resources required to replace the Pillager Project capacity and energy are

outlined above in Section 2 (i). An unquantified increase in costs may occur to the electric customer in the region if a license for continued operation of the Pillager Project was not granted.

iii. Effects of Alternative Sources of Power

A. Effects on Customers

If the Licensee is not granted a license for the Pillager Project, power for consumers would be supplied either from other resources within Minnesota Power's portfolio or through purchases from other suppliers within the MISO. Decommissioning the generating facilities at the Pillager Project could result in additional costs.

B. Effects on the Licensee's Operating and Load Characteristics

The impacts on Minnesota Power's load characteristics would be minimal because the capacity purchase that would be made would generally have the same characteristics in terms of capacity factors.

C. Effects on Communities Served

The loss of the Pillager Project, whether through decommissioning or federal acquisition, would eliminate the property tax revenues currently generated by the facility, which support local communities. If a government entity were to assume the license, these revenues would not be replaced, as public ownership typically exempts facilities from property taxation. As a result, local governments that rely on these funds could experience adverse financial effects.

3. Need for Project Power, Reasonable Cost, and Availability of Alternative Sources of Power

i. Average Annual Cost of Power

The average annual cost of power is $195,995, based on a 5-year average from 2020 to 2024. This includes expenses for operations and maintenance, general administrative costs (such as insurance and overhead), depreciation, and taxes (see Table 1).

Table 1: Annual Operations and Maintenance Expenses and Capital Costs

Annual Operations and Maintenance Expenses	2020	2021	2022	2023	2024	5-year Average
Operation and Maintenance Expense	$135,356	$193,507	$164,678	$116,186	$161,592	$154,264
Depreciation Expense	$31,142	$32,132	$37,350	$39,614	$39,566	$35,961
Taxes	$5,584	$8,612	$6,122	$4,281	$4,225	$5,771
Total Expenses	**$172,082**	**$234,251**	**$208,150**	**$160,081**	**$205,413**	**$195,995**

ii. Projected Resources Required to Meet Capacity and Energy Requirements

Minnesota Power is a regulated public utility subject to oversight by the Minnesota Public Utilities Commission (PUC) and operates within the broader framework of regional reliability and market coordination provided by the MISO and the Midwest Reliability Organization (MRO). On March 3, 2025,[1] Minnesota Power filed its 2025–2039 Integrated Resource Plan (IRP) with the Minnesota PUC, included in Appendix H-1. The IRP is a comprehensive, long-term planning document that regulated utilities are required to submit to the Minnesota PUC to demonstrate how the utility will reliably and cost-effectively meet projected customer energy needs over a 15-year horizon, while complying with state energy policies and environmental goals. Minnesota Power's 2025–2039 IRP (Appendix H-1) details its current generation resources and power supply portfolio and presents its strategy for addressing future load growth and evolving energy policy objectives.

[1] The Minnesota PUC is currently reviewing Minnesota Power's 2025–2039 IRP, filed on March 3, 2025, under Docket No. 25-127. The approval timeline includes a public comment period that runs through November 15, 2025, after which the Commission will evaluate stakeholder input and determine whether to approve, modify, or reject the plan.

iii. Alternative Sources of Power

The total annual cost of alternative purchased power and the basis for the determination of projected annual cost is discussed in Section 2 (i). In considering the relative merits of these alternatives, purchased power offers flexibility and immediate availability but is subject to market volatility, transmission constraints, and limited control over reliability and cost. Its dependability may vary depending on regional supply conditions and contract terms. Fossil-fuel-based generation, such as natural gas peaking units, provides high dispatchability and reliability, with an average operational life of 30 to 40 years and equivalent availability often exceeding 90 percent. However, these units are exposed to fuel price fluctuations and environmental regulatory risks. Renewable energy sources like wind and solar may offer longer term sustainability and emissions benefits, but their intermittent nature results in lower equivalent availability and requires supplemental resources to maintain system reliability. Energy storage systems can enhance grid flexibility and support renewable integration, though they are currently limited by cost and duration capabilities. Each alternative presents trade-offs in terms of availability, lifespan, operational characteristics, and impact on the Licensee's overall system reliability, with the Pillager Project offering a stable, low-cost, and renewable source of energy.

iv. Effect on the Direct Providers of Alternate Sources of Power

Minnesota Power's replacement capacity would utilize baseload capacity purchases from MISO members.

4. Use of Power for Licensee-Owned Industrial Facility

This information is not applicable because the Licensee does not directly use power generated by the Pillager Project to operate industrial facilities.

5. Need for Power if Licensee is an Indian Tribe

This information is not applicable because the Licensee is not an Indian Tribe applying for a project on a Tribal reservation.

6. Effect on Operations and Planning of the Licensee's Transmission System of Receiving or not Receiving the License

Should the Licensee not receive a new license, there would be minor redistribution of power flows due to the need for replacement power from other facilities. The Pillager Project is integrated with the surrounding Minnesota Power transmission and distribution systems that serve area loads. Because the Pillager Project is vital to serving the local area loads, continuing joint operation of the integrated facilities must be maintained. The division of ownership of the generation and transmission / distribution facilities would require further consideration prior to the apportionment of the equipment. The costs associated with this are difficult to determine without knowledge of proposed ownership boundaries or specific plans.

The detailed single-line diagram for the Pillager Project is filed as Critical Energy Infrastructure Information (CEII) under Exhibit A of this License Application.

7. Plans to Modify Existing Project Facilities

The Licensee is proposing no modifications to the Pillager Project facilities or changes to the operations of the Pillager Project.

8. Conformance with a Comprehensive Plan for the Waterway

Section 10(a)(2)(A) of the FPA, 16 U.S.C § 803(a)(2)(A), requires FERC) to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways potentially affected by the proposed project. In accordance with Section 10(a)(1) of the FPA, the list of FERC-approved federal and state comprehensive plans was reviewed to determine applicability to the Pillager Project. The federal resource agencies, as well as the State of Minnesota, have prepared several comprehensive plans, which provide a general assessment of a variety of environmental conditions in Minnesota. These plans address wildlife resources and their habitats, fisheries management, recreational access, and scenic river management issues. The Pillager Project's consistency with pertinent state and federal comprehensive plans is discussed below. FERC currently lists 32 comprehensive plans for the State of Minnesota (FERC 2023), and 11 are potentially relevant to the Pillager Project, as listed on Table 2.

The Pillager Project will be operated under the terms and conditions of a license issued by FERC, which will be based on FERC's determination of the license terms and conditions that are best suited to comprehensive development of the waterway. The environmental impacts of the Pillager Project in the context of the Mississippi River are addressed in Exhibit E of the Final License Application. This includes discussion of the Pillager Project's conformance with comprehensive plans for the waterway, as discussed in Section 6.0 of Exhibit E of the License Application.

Table 2: List of Potentially Relevant Qualifying Comprehensive Plans to the Pillager Project

Resource	Comprehensive Plan
Water Resources	Minnesota Department of Natural Resources. 1977. A management plan for the Crow Wing River. St. Paul, Minnesota. February 1977.
Water Resources	Minnesota Department of Natural Resources. 1983. Statewide outstanding rivers inventory. St. Paul, Minnesota. March 1983.
Recreation and Land Use	Minnesota Department of Natural Resources. 2015. Minnesota State Parks and Trails System Plan. St. Paul, Minnesota.
Terrestrial Wildlife and Botanical Resources	Minnesota Department of Natural Resources. 2016. Minnesota's Wildlife Action Plan, 2015-2025. St. Paul, Minnesota.
Recreation and Land Use	Minnesota Department of Natural Resources. n.d. Canoe and boating route program. St. Paul, Minnesota. 39 pamphlets.
Recreation and Land Use	Minnesota Department of Natural Resources. n.d. Minnesota's Statewide Comprehensive Outdoor Recreation Plan (SCORP): 2014-2018. St. Paul, Minnesota.
Water Resources, Fish and Aquatic Resources, Terrestrial and Botanical Resources	Minnesota Department of Natural Resources. n.d. Strategic Conservation Agenda: The DNR's 10-year Strategic Plan, 2015-2025. St. Paul, Minnesota.
Water Resources	National Park Service. 1993. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C.
Terrestrial Wildlife and Botanical Resources	U.S. Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American waterfowl management plan. Department of the Interior. Environment Canada. May 1986.

Resource	Comprehensive Plan
Terrestrial Wildlife and Botanical Resources	U.S. Fish and Wildlife Service. 1993. Upper Mississippi River & Great Lakes Region joint venture implementation plan: A component of the North American waterfowl management plan. March 1993.
Fish and Aquatic Resources	U.S. Fish and Wildlife Service. n.d. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C.

Source: FERC 2023

9. Financial and Personnel Resources

The Licensee possesses the financial and personnel resources necessary to fulfill its obligations under a new license for the Pillager Project. With a long-standing record of safe and reliable hydroelectric operations, it is supported by a skilled and dedicated workforce fully qualified to operate and maintain facilities in accordance with regulatory requirements and industry standards. A complete staff of engineers, environmental professionals, operators, mechanics, and electricians is available, all trained and experienced in hydroelectric project operations. Administrative, regulatory, and support personnel are also in place to ensure ongoing compliance with license terms. Standardized maintenance and operational procedures are applied across the hydro portfolio, ensuring consistent performance and regulatory compliance. These resources and capabilities support continued effective management of the Pillager Project under a new license.

10. Project Expansion Notification

The Licensee proposes the following modifications to the FERC Project Boundary at the Pillager Project: (1) addition of land that is necessary for the operation and maintenance of the Pillager Project; and (2) removal of land that is not required for operations, maintenance, or any other project purpose. The proposed Project Boundary around the reservoir is based on elevation 1200.0 feet National Geodetic Vertical Datum of 1929. Property owners within modified areas will be notified of the Final License Application by certified mail.

11. Electricity Consumption Efficiency Improvement Program

i. Customer Energy Efficiency Program

Minnesota Power's Energy Conservation and Optimization (ECO) Program is a statewide initiative that replaced the former Conservation Improvement Program (CIP). It promotes energy efficiency through rebates, audits, and infrastructure upgrades, while also supporting efficient fuel switching and load optimization. The ECO Program is designed to help customers reduce energy use and costs, and it aligns with Minnesota's broader goals for clean energy and carbon reduction. The ECO Program is regulated by the Minnesota Department of Commerce, which reviews utility plans and performance to ensure compliance with statutory requirements, cost-effectiveness, and measurable energy savings. Minnesota Power's ECO Program includes initiatives for residential, commercial, and low-income customers and demonstrates ongoing efforts to reduce electricity consumption through rebates, audits, infrastructure upgrades, and efficient fuel switching. The current ECO Program for Minnesota Power is outlined in the *2024-2026 Triennial Energy Conservation and Optimization Program Plan* (Minnesota Power 2023).

ii. Compliance of Energy Conservation Programs with Regulatory Requirements

Minnesota Power's 2024–2026 Triennial ECO Plan meets the requirements of Minnesota Statute §§ 216B.2401, 216B.241, 216B.2411 and Minnesota Rule 7690.0500, which requires all regulated electric utilities in Minnesota to invest in conservation and efficiency programs.

12. Indian Tribe Names and Mailing Addresses

The Pillager Project includes no Tribal lands, and there are no Tribes affected by the Pillager Project. Although no specific Tribal effects has been identified at the Projects, the following Tribes are included in the Licensee's Distribution List for the Pillager Project relicensing process.

Apache Tribe of Oklahoma
P.O. Box 1330
Anadarko, Oklahoma 73005

Bad River Band of Lake Superior Chippewa Indians of the Bad River Reservation, Wisconsin
P.O. Box 39
Odanah, Wisconsin 54861

Cheyenne and Arapaho Tribes of Oklahoma
P.O. Box 38
Concho, Oklahoma 73022

Flandreau Santee Sioux Tribe of South Dakota
P.O. Box 283
Flandreau, South Dakota 57028

Fort Belknap Indian Community of the Fort Belknap Reservation of Montana
158 Tribal Way
Harlem, Montana 59526

Iowa Tribe of Kansas and Nebraska
3345 Thrasher Road
White Cloud, Kansas 66439

Keweenaw Bay Indian Community, Michigan
16429 Beartown Road
Baraga, Michigan 49908

Lac du Flambeau Band of Lake Superior Chippewa Indians of the Lac du Flambeau Reservation of Wisconsin
P.O. Box 67
Lac du Flambeau, Wisconsin 54538

Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
P.O. Box 249
Watersmeet, Michigan 49969

Lower Sioux Indian Community in the State of Minnesota
P.O. Box 308
Morton, Minnesota 56270

Menominee Indian Tribe of Wisconsin
P.O. Box 910
Keshena, Wisconsin 54135

Minnesota Chippewa Tribe – Bois Forte Band (Nett Lake)
5344 Lake Shore Drive
Nett Lake, Minnesota 55772

Minnesota Chippewa Tribe – Fond du Lac Band
1720 Big Lake Road
Cloquet, Minnesota 55720

Minnesota Chippewa Tribe – Grand Portage Band
P.O. Box 428
Grand Portage, Minnesota 55605

Minnesota Chippewa Tribe – Leech Lake Band
190 Sailstar Drive NW
Cass Lake, Minnesota 56633

Minnesota Chippewa Tribe – Mille Lacs Band
43408 Oodena Drive
Onamia, Minnesota 56359

Minnesota Chippewa Tribe – White Earth Band
P.O. Box 418 (Hwy 224)
White Earth, Minnesota 56591

Minnesota Chippewa Tribe, Minnesota
P.O. Box 217
Cass Lake, Minnesota 56633

Prairie Island Indian Community in the State of Minnesota
5636 Sturgeon Lake Road
Welch, Minnesota 55089

Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin
88385 Pike Road Highway 13
Bayfield, Wisconsin 54814

Red Lake Band of Chippewa Indians
P.O. Box 550
Red Lake, Minnesota 56671

Santee Sioux Nation, Nebraska
108 Spirit Lake Avenue West
Niobrara, Nebraska 68760-7219

Shakopee Mdewakanton Sioux Community of Minnesota
2330 Sioux Trail, NW
Prior Lake, Minnesota 55372-9077

Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota
P.O. Box 509
Agency Village, South Dakota 57262

Sokaogon Chippewa Community, Wisconsin
3051 Sand Lake Road
Crandon, Wisconsin 54520

Spirit Lake Tribe, North Dakota
P.O. Box 359
Fort Totten, North Dakota 58335

Standing Rock Sioux Tribe of North & South Dakota
P.O. Box D
Fort Yates, North Dakota 58538

Rosebud Sioux Tribe of the Rosebud Indian Reservation, South Dakota
P.O. Box 430
Rosebud, South Dakota 57570

Turtle Mountain Band of Chippewa Indians of North Dakota
P.O. Box 900
Belcourt, North Dakota 58316

Upper Sioux Community, Minnesota
P.O. Box 147
Granite Falls, Minnesota 56241

B. INFORMATION TO BE SUPPLIED BY LICENSEES THAT ARE EXISTING LICENSEES (18 CFR § 16.10[B])

1. The Information Specified in Paragraph (a)

This information is provided in Section A of this Exhibit H, above.

2. Measures Planned to Ensure Safe Management, Operation, and Maintenance of the Project

i. Existing and Planned Operation of the Project during Flood Conditions

The Pillager Project has an Emergency Action Plan (EAP), containing instructions for key personnel on notification and other operating procedures. The EAP is designed to provide early warning to upstream and downstream inhabitants, property owners, operators of water-related facilities, recreational users, and other people who might be affected by an impending or actual sudden release of water caused by natural disaster, accident, or failure of project works.

Flood events require increased vigilance by the hydro operator, maintenance personnel, and dam safety engineers. The hydro operator monitors river conditions and weather forecasts; an additional operator is called on-duty to assist during flood operations. Maintenance completes additional debris control as needed to keep water flowing freely through the gates. Pike poles and pole saws are available to help flush woody debris through the gates. Additional engineering inspections are completed at the discretion of the dam safety engineer.

The trigger level for activating the EAP under a High Flow Condition is 12,000 cubic feet per second (cfs). Most gates are fully open at this point, and maintenance personnel are dispatched to complete inspections more frequently. When the flow reaches 13,000 cfs, all gates must be fully open to maintain the pond level within the license operating band. If the flood continues to increase, the pond will surcharge.

If the pond elevation reaches 1201 feet National Geodetic Vertical Datum of 1929 (NGVD 29)[2] (flow is approximately 18,000 cfs), the hydro operator and the dam safety engineer review the weather forecast. If flow is expected to continue increasing, the dam safety engineer may activate the EAP under a Potential Failure Condition and recommend the emergency management agencies evacuate the downstream residents at risk. If the pond elevation exceeds 1202 feet, the embankments will overtop and the EAP is activated under an Imminent Failure Condition.

The EAP was developed in consultation and cooperation with appropriate federal, state, and local agencies responsible for public health and safety. There are no proposed changes to the operating plan of the Pillager Project.

ii. Downstream Warning Devices

The Licensee maintains an EAP for the Pillager Project, which specifies a preplanned notification sequence to be followed in the event of structure failure. The Licensee also maintains a Public Safety Plan (PSP). The Licensee collaborates closely with FERC personnel during operations and safety inspections, ensuring full compliance with all FERC safety requirements. There are numerous safety signs at the Pillager Project advising the public of the Pillager Project and safety considerations.

iii. Operational Changes that Might Affect the Emergency Action Plan

There are no proposed changes to the operation of the Pillager Project at this time that might affect the existing Pillager Project EAP.

iv. Existing and Planned Monitoring Devices

The monitoring program is described in the Dam Safety Surveillance Monitoring Plan (DSSMP) as approved by FERC D2SI.

v. Employee Safety and Public Safety Record

There have been no Project-related deaths or serious injuries to members of the public within the Pillager Project Boundary during the license term.

[2] All elevations are in NGVD 29.

The Licensee has an excellent record of operating in a work-safe environment. During the license period, there have been no employee deaths at the Pillager Project, and in the past ten years there have been no lost time injuries at the Pillager Project. The Licensee maintains a very proactive safety program that encompasses monthly safety meetings, formal safety rules, special training sessions, adoption of applicable Occupational Safety and Health Administration (OSHA) rules and regulations, and a safety recognition program. Appropriate personal safety equipment is provided to the staff.

3. Current Operations

As described in Exhibit A of the License Application, the Pillager Project is operated in run-of-river mode by the hydro operator located at Minnesota Power's Thomson Station located in Carlton, Minnesota. Numerous parameters are continuously monitored by the hydro operator including reservoir and tailwater elevations, unit and waste gate flows, and generating unit status. The need for flow changes to maintain run-of-river is determined by the hydro operator. If local gate operation is required, maintenance personnel are dispatched as needed from the Little Falls Project. The Pillager Project is operated in a run-of-river mode whereby inflows at the dam match outflows, to the greatest extent possible. The pond level at the Pillager dam is maintained at elevation 1,199.25 +/- 0.25 feet for flows less than 1,040 cfs and at elevation 1,199.25 +/- 0.50 feet for higher flows. The water flow to the turbines is adjusted to match available river flow.

The rate of change (ramping rate) in Pillager Project outflow (the total of both turbine and spillway discharges) is not to exceed 10 percent per hour unless the inflow changes at a greater rate. In the case of the inflow changing at a rate greater than 10 percent per hour, the actual rate of change in inflow or the 10 percent outflow change limit, whichever is greater, is considered the maximum outflow change limit. The need to exceed a 10 percent per hour outflow change limit is determined by whether the pond level change trend can be arrested with a 10 percent per hour change in outflow.

The Licensee is proposing to continue run-of-river operations. No changes to operations are proposed.

4. Project History

The Pillager Project was constructed between 1916 and 1917 by the Cuyuna Range Power Company to meet rising electricity demand. The dam, which was designed by T.L. Croswell, was completed in 1917, and the Pillager Project began generating power in December of that year. Throughout the twentieth century and into the present day, the Pillager Project has undergone a series of modernization efforts, including infrastructure upgrades, equipment replacements, and structural improvements. These enhancements have supported continued operational reliability and reflect the Licensee's long-standing commitment to maintaining the safety, efficiency, and integrity of the facility.

5. Generation Losses over Previous Five Years

There have been 35 unscheduled outages at the Pillager Project during the 5-year period from August 31, 2020 through August 31, 2025 (Table 3). To maximize energy production from the facility, the Licensee has a consistent record of addressing outages immediately and taking preventative measures to prevent future occurrences.

Table 3: Unscheduled Outages at the Pillager Project (8/31/2020 – 8/31/2024)

Date / Time Off	Date / Time On	Duration (hrs:min)	Description
10/28/2020 8:54	10/28/2020 12:37	17:12	Mercury work
10/29/2020 9:33	10/29/2020 10:19	18:24	PM and brake adjustment
10/29/2020 10:15	10/29/2020 13:13	23:12	unit trip crew looking for cause
11/2/2020 10:23	11/2/2020 13:20	22:48	testing, brake adjust
12/1/2020 21:26	12/2/2020 8:49	9:12	tripped and went to lock out on start up
12/17/2020 17:38	12/17/2020 17:44	2:24	Lockout
4/8/2021 12:03	4/8/2021 12:03	0:00	change brushes
5/13/2021 8:36	7/20/2021 12:49	5:12	Unit Inspection
10/4/2021 15:03	10/4/2021 15:53	20:00	Feeder trip
12/29/2021 11:38	12/29/2021 13:21	17:12	cleaning collector ring
1/14/2022 13:38	1/14/2022 14:30	20:48	534 feeder trip

Date / Time Off	Date / Time On	Duration (hrs:min)	Description
6/20/2022 2:32	6/20/2022 9:43	4:24	multiple Feeder trips
6/20/2022 17:16	6/20/2022 21:50	13:36	lockout
8/22/2022 9:01	8/22/2022 9:15	5:36	brushes changed and trashing
10/11/2022 8:37	10/11/2022 13:13	14:24	Electrical pm.
10/12/2022 12:00	10/12/2022 12:59	23:36	Governor issues
11/10/2022 14:50	11/11/2022 8:55	2:00	lockout? no alarms for why
11/10/2022 15:04	11/11/2022 11:49	18:00	unit lockout
11/14/2022 13:20	11/14/2022 14:02	16:48	unit testing
11/16/2022 10:01	11/16/2022 13:10	3:36	Electrical testing
12/15/2022 11:55	12/15/2022 12:15	8:00	534 feeder momentary
1/21/2023 12:28	1/21/2023 13:50	8:48	Feeder Trip
4/11/2023 9:13	4/11/2023 9:55	16:48	Brush Change out
4/14/2023 7:58	4/14/2023 8:00	0:48	534 Feeder trip
5/24/2023 11:15	5/25/2023 9:55	16:00	Power Outage
8/28/2023 13:12	8/28/2023 14:03	20:24	Gate position indication lost.
10/19/2023 5:58	10/19/2023 9:05	2:48	lower guide bearing Hi Hi temp trip
11/11/2023 8:55	11/11/2023 11:57	0:48	feeder tripped
11/13/2023 9:18	11/14/2023 12:50	12:48	FM Global inspection, Per Steve L
11/22/2023 10:00	11/22/2023 10:10	4:00	Installing Shaft covers for winterization
3/19/2024 11:17	3/19/2024 14:28	4:24	inspection, diver safety
4/2/2024 1:13	4/2/2024 11:45	12:48	Feeder Trip
4/23/2024 23:22	4/24/2024 8:30	3:12	534 feeder trip and unit lockout
8/3/2024 18:45	8/3/2024 19:20	14:00	Feeder Trip
8/22/2024 10:10	8/22/2024 10:07	1:12	Momentary trip on 155 Line

6. Compliance with Terms and Conditions of Existing License

The Licensee has maintained full compliance with the existing FERC license throughout the license term, except for two non-compliance notices.

On October 8, 2008, FERC issued a non-compliance notice with dam safety issues at the Pillager dam. On October 8, 2008, the Licensee submitted the required documents, and additionally, on October 13, 2008, the Licensee provided a schedule for outstanding needs, including the Inflow Design Flood report.

On December 9, 2014, FERC issued a non-compliance notice informing the Licensee that it was in non-compliance for failing to submit a plan and schedule for dam safety repairs, and that to avoid further actions the required documents must be submitted by January 31, 2015. The Licensee subsequently submitted the requested documents in a timely manner and fully complied with FERC's requirements.

7. Actions Taken by Licensee Related to the Project That Affect the Public

The Licensee allows public access to the reservoir for recreation use, and there are four Pillager Project recreation sites as described in Exhibit E in further detail. A PSP for the Pillager Project describes public safety signs.

8. Ownership and Operating Expense Reductions if the Project License was Transferred

If the license was transferred from the existing Licensee, ownership and operating expenses associated with the Pillager Project would shift to the new Licensee. These expenses include operation and maintenance expenses, depreciation, and property taxes. However, this section is not applicable because there is no competing application or proposal to transfer the license.

9. Annual Fees for Federal or Indian Lands

There are no federal or Tribal lands within the Pillager Project Boundary; therefore, the Licensee is not subject to annual charges under Part I of the FPA for the use of federal or Native American Tribal reservation lands.

REFERENCES

Federal Energy Regulatory Commission (FERC). 2023, September 14. List of Comprehensive Plans. Office of Energy Projects, 20426. Washington, D.C. Available online: https://www.ferc.gov/media/comprehensive-plans Accessed: May 2025

Midcontinent Independent System Operator (MISO). 2025. Market Reports – Real-Time Market Data. Available online: https://www.misoenergy.org/markets-and-operations/real-time--market-data/market-reports/ Accessed: September 2025

Minnesota Power. 2023, June 30. 2024–2026 Triennial Energy Conservation and Optimization Plan. Docket No. E015/CIP-23-93. Available online: https://efiling.web.commerce.state.mn.us/documents/%7BE0500D89-0000-CE13-BA93-6B77D0861190%7D/download?contentSequence=0&rowIndex=1 Accessed: September 2025

Minnesota Power. 2025, March 3. 2025–2039 Integrated Resource Plan. Minnesota Public Utilities Commission. Available online: https://efiling.web.commerce.state.mn.us/documents/%7BA0446195-0000-C339-B88F-8CE00FEBADAA%7D/download?contentSequence=0&rowIndex=360 Accessed: September 2025

APPENDIX H-1

MINNESOTA POWER'S 2025-2039 INTEGRATED RESOURCE PLAN

minnesota power
AN ALLETE COMPANY

EnergyForward

2025-2039 Integrated Resource Plan

March 3, 2025 | MPUC Docket No. E015/RP-25-127



minnesota power
AN ALLETE COMPANY

30 West Superior Street
Duluth, MN 55802-2093
www.mnpower.com

March 3, 2025

VIA E-FILING
Will Seuffert
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

Re: In the Matter of Minnesota Power's Application for Approval of its 2025-2039 Integrated Resource Plan
Docket No. E015/RP-25-127

Dear Mr. Seuffert:

With this filing, Minnesota Power hereby presents its 2025-2039 Integrated Resource Plan ("IRP") for Minnesota Public Utilities Commission (or the "Commission") approval.

Minnesota Power is pleased to submit this IRP, referred to throughout the filing as the "2025 Plan," which outlines the next chapter in the Company's *Energy**Forward*** resource strategy. *Energy**Forward*** has reshaped the Company's power supply from an energy mix that was 95 percent coal in 2005 to one that is now delivering the most renewable energy to customers in the State of Minnesota, between 50 and 60 percent renewable energy. The 2025 Plan, if approved, will enable an annual energy portfolio that is 80 percent renewable by 2030 and 90 percent renewable by 2035, demonstrating Minnesota Power's proposed actions for a sustainable path to compliance with Minnesota's Carbon-Free Standard ("CFS") passed into law on in 2023. The 2025 Plan represents continued progress in reducing carbon on the electric system, including ceasing coal for customers at the Company's last two remaining coal fired units, and will result in 95 percent carbon reduction from 2005 levels while maintaining energy reliability.

Importantly, this IRP outlines Minnesota Power's plan to achieve critical next steps in the energy transition that are centered on a commitment to provide increasingly clean electricity to customers while ensuring safe and reliable service at a reasonable cost to customers. The 2025 Plan also demonstrates Minnesota Power's continued commitment to the region and communities it serves by outlining the importance of reliable local supply and refueling options as part of the Company's cease coal plan. Moreover, Minnesota Power recognizes its responsibility and the importance of serving new economic growth emerging in the region, and the 2025 Plan outlines and is responsive to its customer plans for load growth. Having served some of the nation's largest industrial customers for decades, Minnesota Power specializes in its ability to serve large industrial customers and therefore presents a plan that incorporates near-term and long-term actions that will

ensure the Company has flexibility to meet the region's economic needs and projected customer growth.

The 2025 Plan incorporates feedback from customers, community members and organizations, state agencies, advocates, and Tribal Nations, who participated in a year-long engagement process that informed both technical modeling and societal cost-benefit analyses. Minnesota Power is grateful for the time and collaboration from those who provided input that helped shape the 2025 Plan.

This IRP is organized into seven sections with supporting appendices, as presented in the enclosed Table of Contents. With the core plan evaluation submitted with this filing, the Company's analysis will be supplemented with information in additional appendices by the end of the month.

Certain portions of the IRP contain trade secret information and are marked as such, pursuant to the Commission's Revised Procedures for Handling Trade Secret and Privileged Data, which procedures further the intent of Minn. Stat. § 13.37 and Minn. Rule 7829.0500. As required by the Commission's Revised Procedures, a statement providing the justification for excising the Trade Secret Data is attached to this letter.

As reflected in the Affidavit of Service, the Executive Summary has been e-filed on the attached service list.

Please contact me at (218) 355-3297 or jkuklenski@mnpower.com with any questions regarding this filing.

Respectfully,



Jennifer Kuklenski
Regulatory Strategy and Policy Manager
Minnesota Power
30 W Superior Street
Duluth, MN 55802

JK:th
Attach.
cc: Service List

STATEMENT REGARDING JUSTIFICATION FOR EXCISING TRADE SECRET INFORMATION

Pursuant to the Minnesota Public Utilities Commission's Revised Procedures for Handling Trade Secret and Privileged Data in furtherance of Minn. Stat. § 13.37 and Minn. Rule 7829.0500, Minnesota Power has designated portions of its 2025-2039 Integrated Resource Plan ("2025 Plan") as Trade Secret.

The 2025 Plan contains confidential financial information that is materially sensitive and commercially valuable to Minnesota Power. Minnesota Power follows strict internal procedures to maintain the secrecy of this information in order to capitalize on the economic value of the information. As a result of public availability, Minnesota Power and its customers would suffer severe competitive implications, including a detrimental effect on energy costs paid by Minnesota Power's customers. The 2025 Plan also contains specific customer data that consists of "private data on individuals" and "confidential customer data" as recognized under the Minnesota Data Practices Act. As such, any unique information that can identify an individual customer is maintained by the Company as not public data and protected from public disclosure.

Minnesota Power believes that this statement and the attached "Index of Trade Secret/Nonpublic Information Contained in the 2025 Plan" provides the justification as to why the information excised from the 2025 Plan should remain trade secret under Minn. Stat. § 13.37. Minnesota Power respectfully requests the opportunity to provide additional justification in the event of a challenge to the trade secret designations provided herein.

Index of Trade Secret/Nonpublic Information Contained in 2025 Plan

Location/Item	Trade Secret Justification
Appendix A: Minnesota Power's 2024 Annual Electric Utility Forecast	The information contained in this appendix is confidential, competitive information regarding Minnesota Power's methods, techniques, and process for supplying electric service to its customers and customer data and is designated as trade secret, as defined by Minn. Stat. § 13.37, subd. 1(b). Specific customer data (including the name, address, or related usage) consists of "private data on individuals" and "confidential customer data" as recognized under the Minnesota Data Practices Act. As such, any unique information that can identify an individual customer is maintained by the Company as not public data and protected from public disclosure.
Appendix J: Assumptions and Outlooks	The information contained in this appendix is confidential information related to generation, fuel supply, transmission, and wholesale market energy prices that the Company considers to be trade secret, as defined by Minn. Stat. § 13.37, subd. 1(b). This information has economic value to Minnesota Power, as a result of this information remaining not public, and Minnesota Power has taken reasonable precautions to maintain its confidentiality.



MINNESOTA POWER 2025-2039 INTEGRATED RESOURCE PLAN

PETITION FOR APPROVAL

March 3, 2025
Docket No. E015/RP-25-127

minnesota power
AN ALLETE COMPANY

EnergyForward

THE NEXT CHAPTER



A reliable path to 90% renewable energy and replacing coal by 2035

Our 2025 Integrated Resource Plan outlines the realistic next steps in our *EnergyForward* strategy to reduce carbon while maintaining 24/7 reliable energy to customers.

We're adding new renewable resources and energy storage, positioning to meet increasing demand for energy, reducing carbon emissions, and ceasing coal at Boswell Energy Center for our customers by 2035.

Through this diverse combination of resources, Minnesota Power will meet the requirements of the state of Minnesota's carbon-free standard while continuing to safeguard energy security, provide reliable electric service to customers and continue investing in our region.

Together we're moving *EnergyForward.*

PLAN HIGHLIGHTS

400 megawatts of new wind
Add 400 megawatts of new wind projects by 2035 in addition to the 700 megawatts of renewables now in development

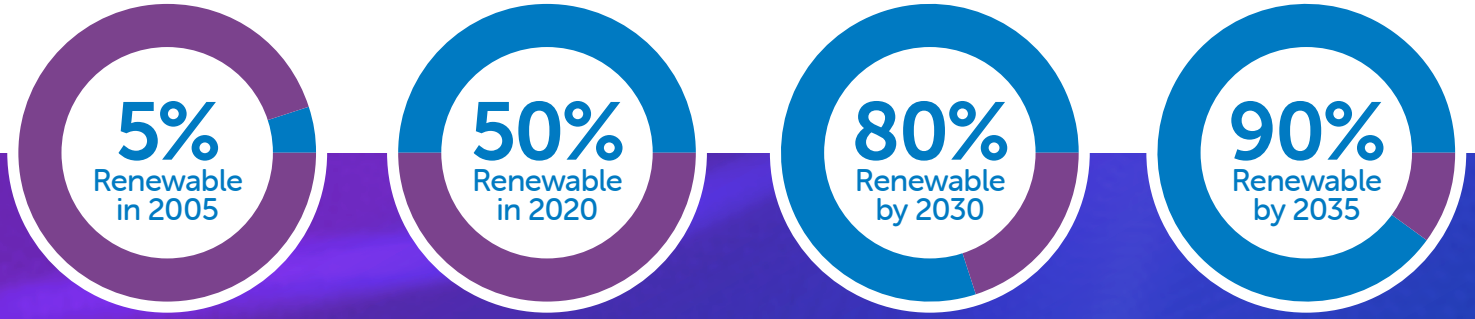
Expand energy storage resources by 100 megawatts by 2035

Maximize and expand customer-focused programs
Including energy efficiency and demand response

Add approximately 1,000 megawatts of natural gas capacity
Replacing the company's last coal-fired baseload generation at Boswell Energy Center for immediate carbon reductions

- Refuel Boswell Unit 3 to natural gas by 2030—355 megawatts
- Add about 750 megawatts of new natural gas
- Boswell Unit 4—Committed to cease utilizing coal in our power supply by 2035
- Will develop refueling options for Boswell Unit 4 and revisit in next Integrated Resource Plan

OUR PROGRESS: 2005-2035



mnpower.com/EnergyForward

Minnesota Power calculates and reports carbon emissions based on the GHG Protocol. Details in ALLETE's Corporate Sustainability Report

TABLE OF CONTENTS

I. About Minnesota Power 1
- A. Background 1
- B. Minnesota Power's Unique Customer Mix 2
- C. Minnesota Power's *Energy**Forward*** Journey 2

II. 2025 Resource Plan Summary 5
- A. Key Themes for the 2025 Plan 7
- B. Critical Items Shaping this IRP 10
- C. A Plan Responsive to Customers, Communities, the Climate, and the Region 12
- D. Thoughtful, Sustainable, and Just Carbon Reduction 15
- E. Action Taken to Support Continued Renewable Energy Integration 17
- F. Energy Efficiency, Distributed Generation, and Electrification Efforts 19
- G. Managing Uncertainty with Flexibility for a Unique Region 21
- H. Resource Plan Overview: Short- and Long-term Action Plans 24
- I. Meaningful Progress with Reasonable Rate Impacts 27

III. Current Outlook 28
- A. Minnesota Power Load and Capability and Energy Need Forecast 28
- B. Current Outlook – Base Case and Growth Scenario 31
- C. Minnesota Power's Large Industrial Customer Base 36

IV. 2025 Modeling Approach 39
- A. Analysis Process 40
- B. Early Retirement Scenarios and Refueled Alternatives Evaluated 41
- C. Demand and Supply Side Alternatives 42
- D. Environmental Futures Considered in the IRP Analysis 43

V. 2025 Plan Development 45
- A. Key Planning Principles 45
- B. Handling Uncertainty with a Flexible Plan 46
- C. Steps 1-4: Capacity Expansion Analysis 50
- D. Step 5: Preferred Plan Selection 58
- E. Step 6: 2025 Plan Reliability Criteria Evaluation 70
- F. Step 7: 2025 Plan Energy and Capacity Outlook 73

VI. Short-term Action Plan 85
- Steps to Meet Short-term Action Plan (2025 through 2029) 85

VII. Long-term Action Plan 86
- Plans to Meet Long-term Need (2030-2039) 86

Table of Figures

Figure 1: Minnesota Power's IRP Impact Map 15
Figure 2: Peak Demand by Season – Base Case Demand Outlook 32
Figure 3: Energy Sales by Class – Base Case Demand Outlook 33
Figure 4: Hourly Load Shape Comparison Between Minnesota Power and Typical Utility 34
Figure 5: Demand Outlook Sensitivities for MISO Coincident Peak 35
Figure 6: Energy Outlook Sensitivities 35
Figure 7: U.S. Paper Demand 2008-2025 37
Figure 8: Capacity Expansion Analysis Results for 2025 Plan with Base Case Forecast 52
Figure 9: Capacity Expansion Analysis Results for 2025 Plan with +1100 MW Growth Scenario 54
Figure 10: 2025 Plan for BEC Power Supply Cost Compared to Alternatives – Base Demand Outlook 56
Figure 11: 2025 Plan for BEC Power Supply Cost Compared to Alternatives – +1100 MW Growth Scenario 56
Figure 12: Minnesota Power Reliability Criteria 71
Figure 13: 2025 Base Plan Energy Resources Needed to Serve Minnesota Power's System 74
Figure 14: 2025 Growth Plan Energy Resources Needed to Serve Minnesota Power's System 75
Figure 15: Energy Supply Performance During Winter Storm Uri with Base Plan 81
Figure 16: Energy Supply Performance During Winter Storm Uri with Growth Plan 82

Table of Tables

Table 1: Capacity Position for Base Case and +1100 MW Growth Scenario Customer Outlooks 29
Table 2: Unserved Energy Outlook for Base Case and +1100 MW Growth Scenario Customer Outlooks 31
Table 3: Minnesota Power Taconite Customer Production 36
Table 4: Six Futures Considered in 2025 IRP Analysis 44
Table 5: Comparison of Plan Costs 55
Table 6: Capacity Expansion Analysis Results with CFS Enforced 57
Table 7: 2025 Base Plan Capacity Outlook - Summer 77
Table 8: 2025 Base Plan Capacity Outlook - Winter 78
Table 9: 2025 Growth Plan Capacity Outlook - Summer 79
Table 10: 2025 Growth Plan Capacity Outlook - Winter 80

Table of Appendices

Appendix A: Minnesota Power's 2024 Annual Electric Utility Forecast Report
Appendix B: Demand Side Management
Appendix C: Existing Power Supply
Appendix D: Future Resource Options
Appendix E: Environmental Policy and Compliance Assessment
Appendix F: Transmission Planning Activities
Appendix G: Distribution Planning Activities
Appendix H: Minnesota Power's Renewable Energy
Appendix I: Carbon Free Standard Compliance
Appendix J: Assumptions and Outlooks
Appendix K: Detailed Analysis Section
Appendix L: Cost Impact Analysis by Customer Class
Appendix M: Socioeconomic Impacts
Appendix N: Engagement Report and Societal Cost-Benefit Analysis
Appendix O: Hibbard Retirement Study
Appendix P: Compliance Index/Cross Reference List
Appendix Q: List of Acronyms, Terms, and Descriptions

I. ABOUT MINNESOTA POWER

Minnesota Power (or the "Company"), a division of ALLETE, Inc., is an investor-owned utility that serves approximately 150,000 retail electric customers and 14 non-affiliated municipal customers. Minnesota Power is defined by Minnesota statute as a public utility[38] and is the sole electricity provider across a 26,000-square-mile service area in central and northeastern Minnesota, where it employs over 1,000 people. The Company got its start in 1906 by harnessing the energy of the St. Louis River near Duluth, Minnesota. Hydroelectricity powered the homes and businesses of the Duluth area for years. Then, during and after World War II, the region saw a significant expansion of iron ore mining, forestry, and paper industries, grain exports, and ship building on Lake Superior. To accommodate northeastern Minnesota's industrial growth, Minnesota Power's generation fleet grew through the construction of the coal generating power plants at Laskin Energy Center ("LEC"), Taconite Harbor Energy Center ("THEC"), and Boswell Energy Center ("BEC"), which were built during the 1950s through the 1970s. Minnesota Power's *Energy**Forward*** strategy to diversify its energy supply portfolio began in the 2000s, and since then the Company has closed or re-missioned seven of its nine coal plants, and transitioned from being 95 percent coal to between 50 and 60 percent renewable today. Minnesota Power remains committed to providing safe, reliable, affordable, and increasingly clean electricity to its customers.

This section covers the following topics:

- Background;
- Minnesota Power's Unique Customer Mix; and
- Minnesota Power's *Energy**Forward*** Journey.

A. Background

Public utilities provide essential services needed by every individual, business, and institution in society, and have a responsibility to ensure services are available and reliable. The investor-owned public utility model allows Minnesota Power to fund investments in infrastructure, such as transmission lines or renewable energy projects, through upfront money invested by shareholders. The costs for project development and delivery are recovered over time from customers through electric service rates to help mitigate the rate impact of large investments needed to maintain and upgrade the electric system.

As a public utility, Minnesota Power provides safe and reliable power to all customers within its service territory at a reasonable cost. The Company is regulated by the Minnesota Public Utilities Commission (or the "Commission") which ensures that customers are charged just and reasonable rates, that infrastructure investments are prudent and useful, and that utility actions comply with state policy. Minnesota Power is currently a publicly traded company, meaning its ownership, and upfront capital investment needed for electric infrastructure, are distributed among many shareholders through public markets such as stock exchanges.

The Company is currently undergoing an acquisition proceeding before the Commission that if approved, will result in private ownership of ALLETE and Minnesota Power distributed among two experienced infrastructure investors – Global Infrastructure Partners and the Canada Pension

[38] At a high level, Minn. Stat. § 216B.02, subd. 4 defines a public utility as "persons, corporations, or other legal entities, their lessees, trustees, and receivers, now or hereafter operating, maintaining, or controlling in this state equipment or facilities for furnishing at retail natural, manufactured, or mixed gas or electric service to or for the public or engaged in the production and retail sale thereof . . . ."

Plan Investment Board.[39] The private acquisition of Minnesota Power will not change the Company's public utility designation under Minnesota statute and the Company will continue to be regulated by the Commission. The acquisition will provide stable access to the upfront capital needed to fund important infrastructure investments to support the Company's continued reliable service and carbon reduction actions outlined in the 2025 Integrated Resource Plan ("2025 Plan").

B. Minnesota Power's Unique Customer Mix

Minnesota Power serves 150,000 total customers today, including some of the nation's largest industrial operations. In 2023, 74 percent of Minnesota Power's kilowatt-hour ("kWh") total sales served retail industrial customers primarily in the taconite mining, paper, pulp and secondary wood products, and pipeline industries. The Company has a long history of serving these large industrial customers and today has eight Large Power customer contracts, each serving at least 10 megawatts ("MW") of load. Under these eight contracts, the Company provides electric service to six taconite producing facilities and four paper and pulp mills. In fact, 80 percent of American steel is born on Minnesota's Iron Range in the mining operations that Minnesota Power serves.

Most of these customers operate 24/7, which gives the utility a uniquely high load factor featuring power requirements with less variation in demand than most utilities. This high load factor ensures efficient utilization of Minnesota Power's system, creating value for all of its customers. Additionally, Minnesota Power has the largest amount of industrial demand response capability on its system in the state due to the unique partnership it has with these customers.

In part because of its uniquely high concentration of industrial customers and relatively low proportion of residential customers from a kWh sales perspective, Minnesota Power is expected to remain a winter-peaking utility for the foreseeable future. The Company's peak load is currently approximately 1,625 MW.

C. Minnesota Power's Energy*Forward* Journey

Minnesota Power continues to transform the way it energizes communities and businesses through its *Energy**Forward*** strategy. Today, the Company has evolved its energy supply mix by bringing more renewable power to all customers while reducing dependence on fossil fuels. *Energy**Forward,*** through the last several approved Integrated Resource Plans ("IRPs"), has reshaped the Company's power supply from an energy mix that was 95 percent coal in 2005 to one that is now delivering between 50 and 60 percent renewable energy to customers. The Company was the first Minnesota utility to achieve the milestone of delivering 50 percent renewable energy to customers and is proud of how far it has come on this clean-energy transformation. The Company is continuing its leadership in the renewable energy space and ALLETE is the largest investor in renewable energy of any investor-owned utility in the country for its size. There is more work to do to achieve Minnesota's Carbon-Free Electricity Standard ("CFS") by 2040 and the 2025 Plan ensures necessary investments will be made in new resources and grid resiliency to maintain an electric system that is safe and reliable at a reasonable cost. Over the past two decades, the Company has undertaken actionable steps to integrate renewable generation into its power supply portfolio. In 2006 and 2007, Minnesota Power began purchasing the entire output of the Oliver County Wind Energy Center 1 and 2 (just under 100 MW), wind farms built and operated by NextEra Energy in North Dakota. In 2008, Minnesota Power constructed the Taconite Ridge Wind Energy Center ("Taconite Ridge"), the first commercial wind generating station in northern Minnesota. The Bison Wind Energy Center ("Bison") in North Dakota came next, with four phases of the project completed between 2010 and 2015. Bison,

[39] *In the Matter of the Petition of Minnesota Power for the Acquisition of ALLETE by Canada Pension Plan Investment Board and Global Infrastructure Partners*, Docket No. E-015/PA-24-198.

now the largest wind farm in North Dakota with a capacity of just under 500 MW, leverages premier wind resources to deliver carbon-free energy via the Company's 465-mile High Voltage Direct Current line ("HVDC Line") to the Company's customers. In 2024, the Commission approved Minnesota Power's certificate of need ("CN") application for the HVDC Modernization Project, which will replace and upgrade the existing HVDC Line converter stations that are beyond their anticipated operational lives.[40] The upgraded converter stations will make it possible to increase the capacity of the HVDC Line from 550 MW to up to 1,500 MW if needed in the future. Minnesota Power secured $75 million in state and federal funding awards to support this project and reduce overall costs for customers.

The Company operates a hydroelectric system capable of generating 120 MW of renewable energy across 11 hydroelectric facilities on five rivers in central and northeastern Minnesota, making it the largest producer of hydroelectricity in Minnesota. After record rainfall and flooding in June 2012, Minnesota Power had to repair and restore its Thomson Hydro Station. In 2014, Thomson returned to generating electricity enabling to the Company to maintain a key 72 MW hydroelectric resource on its system. The Company was recently selected for $3.1 million in federal awards to maintain the Scanlon and Blanchard hydroelectric dams. In 2020, the Company implemented a Power Purchase Agreement ("PPA") with Manitoba Hydro, providing 250 MW of hydroelectric power to Minnesota after the 500 kilovolt ("kV") Great Northern Transmission Line ("GNTL") was energized. Minnesota Power also operates the Hibbard Renewable Energy Center ("HREC") in Duluth, Minnesota – a 50 MW biomass facility that utilizes primarily waste wood and forest residue that operates on the Day-Ahead Midcontinent Independent System Operator ("MISO") energy market, supporting critical reliability needs in the region.

In 2016, Minnesota Power completed the 10 MW Camp Ripley solar project. In 2018, the Company's 1.04 MW Community Solar Garden program officially started. In late 2020, Minnesota Power added 250 MW of wind energy through a PPA with the completion of the Nobles 2 Wind Farm. In 2020, the Commission asked the state's utilities to accelerate planned projects to help kick-start local economies affected by the COVID-19 pandemic. The Company's three resulting utility-scale solar projects generate 22.4 MW of carbon-free energy for customers, boost the tax base of local economies, created local union jobs, contracted with local and diverse suppliers whenever possible, and were built with solar panels from regional manufacturers. Minnesota Power also offers rebates for distributed residential and commercial solar generation and a first-of-its-kind income-qualified ("IQ") solar grant program for low-income customers through its unique SolarSense program.

Combined, Minnesota Power's renewable energy portfolio includes over 1,450 MW of generation. In its approval of Minnesota Power's 2021 IRP ("2021 Plan"), the Commission ordered the Company to procure additional cost-effective resources to meet its customer and renewable product needs between 2025 and 2030 by acquiring additional wind, solar, and storage demonstration projects with up to 400 MW of wind in service, up to 300 MW of regional/in-service territory or net-zero solar, and storage demonstration projects of at least 100 MW by 2026, as practicable.[41]

[40] *In the Matter of the Application of Minnesota Power for a Certificate of Need for a High Voltage Transmission Line for the HVDC Modernization Project in Hermantown, Saint Louis County*, Docket No. E-015/CN-22-607, Order Granting Certificate of Need and Issuing Route Permit (Oct. 25, 2024).
[41] *In the Matter of Minnesota Power's 2021-2035 Integrated Resource Plan*, Docket No. E-015/RP-21-33, Order Approving Plan and Setting Additional Requirements at 13 (Jan. 9, 2023).

In its effort to implement additional solar energy, Minnesota Power has filed petitions for approval of the Regal Solar Project[42] near Royalton, Minnesota, and the Boswell Solar Project[43] in Cohasset, Minnesota. The Regal Solar Project will have a capacity of 119.5 MW, while the Boswell Solar Project will have a capacity of 85 MW. Both projects are expected to be in-service by mid-2027. Additionally, the Company issued a Request for Proposals ("RFP") on January 30, 2025 in an effort to procure an additional 65 to 85 MW of DG solar by 2030.[44]

Minnesota Power filed an RFP for up to 400 MW of wind resources regionally located within MISO Local Resource Zone 1 for the Commission's review in December of 2023, and issued the RFP in February 2024. The RFP sought to maximize the economic benefits of wind development by including preferences for diverse bidders and domestically-sourced materials, project labor resource requirements for using local union labor for construction and permanent staffing, and the development of apprenticeship programs. The Company is currently conducting further evaluation on a short list of qualified projects. Final project selection has been delayed by widespread price and schedule uncertainties that have emerged during the shortlist period and delays in market interconnection studies. Minnesota Power continues to monitor and engage with bidders, contractors, and market representatives to resolve these uncertainties and will announce project selection as soon as possible.

Minnesota Power is also actively exploring various technologies to determine the optimal integration of energy storage within the Company's electric system. Notably, Minnesota Power partnered with Lockheed Martin to submit a grant application for $30 million in federal funding for a demonstration project of the GridStar Flow ("GSF") long duration energy storage ("LDES") battery. This partner demonstration project sought to install and operate a 4 MW/10-hour (40 MWh) GSF system at BEC and would have demonstrated the first operation of a grid connected GSF unit that could provide flexible support to the MISO market at a cold climate location. Minnesota Power's LDES project was ultimately not selected for an award, which made the project infeasible for customers at this time. The Company continues to evaluate options to integrate energy storage projects into its electric system.

Minnesota Power is committed to providing safe, reliable, and increasingly clean energy for customers at a reasonable cost. In the 2025-2039 IRP, Minnesota Power has established a plan to deliver an annual energy portfolio that is 80 percent renewable by 2030 and 90 percent renewable by 2035, demonstrating compliance with the milestones outlined in the CFS. The Company will continue evaluating technology options and economic pathways to develop an annual energy portfolio that is compliant with the 100 percent by 2040 milestone in the CFS without sacrificing reliability, and while ensuring incremental cost increases to support the infrastructure buildout required to meet the state's clean energy goals are transparent and reasonable.

[42] *In the Matter of the Petition of Minnesota Power for Approval of Investments and Expenditures in the Regal Solar Project for Recovery through Minnesota Power's Renewable Resources Rider under Minn. Stat. § 216B.1645 and Related Tariff Modifications*, Docket No. E-015/24-343, Petition (Nov. 13, 2024).
[43] *In the Matter of the Petition of Minnesota Power for Approval of Investments and Expenditures in the Boswell Solar Project for Recovery through Minnesota Power's Renewable Resources Rider under Minn. Stat. § 216B.1645,* Docket No. E-015/M-24-344, Petition (Nov. 13, 2024).
[44] "Minnesota Power is seeking proposals for distributed solar resources," available at *https://www.mnpower.com/Environment/DSESRFP*.

II. 2025 RESOURCE PLAN SUMMARY

This filing presents Minnesota Power's 2025 Plan for the period of 2025 through 2039. The 2025 Plan is filed pursuant to Minn. Stat. § 216B.2422, Minn. Rules Ch. 7843, and the Commission's January 9, 2023 Order on extending the filing deadline and setting additional requirements for this IRP.[45]

Minnesota Power is pleased to submit the 2025 Plan, which outlines the next chapter in the Company's *Energy**Forward*** resource strategy and the Company's commitment to continuing its carbon reduction journey. *Energy**Forward*** has reshaped the Company's power supply from an energy mix that was 95 percent coal in 2005 to one that is now delivering between 50 and 60 percent renewable energy to customers, making Minnesota Power the top provider of renewable energy in the state of Minnesota. The 2025 Plan, if approved, will enable an annual energy portfolio that is 80 percent renewable by 2030 and 90 percent renewable by 2035, demonstrating Minnesota Power's commitment to a sustainable path to compliance with Minnesota's CFS.[46] The 2025 Plan represents Minnesota Power's continued progress in decarbonizing its electric system, including ceasing coal utilization for its customers, resulting in a 95 percent carbon reduction from 2005 levels. Minnesota Power looks forward to iterative resource planning over the next 15 years to thoughtfully and sustainably identify a path toward full compliance with the CFS.

Importantly, this IRP outlines Minnesota Power's plan to achieve critical next steps in the energy transition that are centered on a commitment to provide increasingly clean electricity to customers without sacrificing reliability and affordability. The 2025 Plan also demonstrates Minnesota Power's continued commitment to the communities it serves by outlining refueling options as part of the Company's cease coal plan that provide reinvestment opportunities in our BEC host community. Moreover, Minnesota Power recognizes the importance of adding new economic growth to the region and communities it serves and the 2025 Plan is responsive to potential load growth scenarios. The Company specializes in its ability to serve large industrial load and therefore presents a plan that incorporates near-term and long-term actions that will allow flexibility for plans that optimize the economic and reliability needs for the region while accounting for anticipated growth.

As we look ahead to the next 15 years, Minnesota Power finds itself with a strong foundation of clean energy leadership, having ensured both reliability and affordability as it has transitioned to a power supply that is now over half renewable. The Company continues to serve a high load factor, energy-intensive customer base that presents unique challenges associated with it; therefore, progressing to the next levels of carbon reduction will become more complex and require technological innovation, while maximizing existing infrastructure to keep the transition affordable for customers. Both Minnesota Power's historical roots and its future success are tied to the region's unique natural resources-based economy, as it serves some of the nation's largest industrial customers in iron mining and forest product industries. Having served a large industrial base for decades, Minnesota Power looks forward to the opportunity to add new economic growth

[45] *In the Matter of Minnesota Power's 2021-2035 Integrated Resource Plan*, Docket No. E015/RP-21-33, Order Approving Plan and Setting Additional Requirements (Jan. 9, 2023).

[46] Minn. Stat. § 216B.1691, subd. 2g requires "each electric utility must generate or procure sufficient electricity generated from a carbon-free energy technology to provide the electric utility's retail customers in Minnesota, or the retail customers of a distribution utility to which the electric utility provides wholesale electric service, so that the electric utility generates or procures an amount of electricity from carbon-free energy technologies that is equivalent to at least" 80 percent by the end of 2030 for public utilities, 90 percent by the end of 2035 for all electric utilities, and 100 percent by the end of 2040 for all electric utilities.

to the region, while continuing to serve all customers' electricity needs. As Minnesota Power charts the next 15 years of its energy transformation, safeguarding reliability, supporting energy security, providing transparency, and maintaining reasonable rates for existing and new customers within the Minnesota planning framework are critical considerations as the Company continues to decarbonize its electric system.

Following Commission approval of Minnesota Power's 2021 Plan, the Company has taken several actions to continue its clean energy transition while maintaining safe and reliable service for customers. The Company has made several notable achievements in compliance with the Commission's Order in the 2021 IRP, including:

- Activated over 20 MW of utility scale solar across three sites at Laskin Energy Park near Hoyt Lakes, Minnesota, near Minnesota Power's Sylvan Hydro Station, west of Brainerd, Minnesota, and in Duluth, Minnesota.[47]
- Retired the THEC in 2023.
- Petitions filed with the Commission for approval of the Boswell Solar Project and Regal Solar Project, which combined, will have a capacity of approximately 200 MW of regional solar in-service before the end of 2027.[48]
- RFP issuance for 65 to 85 MW of DG solar projects.[49]
- RFP issuance and evaluation for up to 400 MW of wind projects.[50]
- Commission approval of a CN for the Duluth Loop Reliability Project, which will enhance power system stability and support, which was previously provided by local coal-fired generators that are now idled.[51]
- Commission approval of a CN for the HVDC Modernization Project, which will facilitate the continued delivery of high efficiency resources directly to Minnesota Power customers and pave the way for additional transmission capacity.[52]

[47] "Local Solar, Local Benefits," available at www.mnpower.com/Environment/SolarProjects.
[48] *In the Matter of the Petition of Minnesota Power for Approval of Investments and Expenditures in the Regal Solar Project for Recovery through Minnesota Power's Renewable Resource Rider under Minn. Stat. § 216B.1645*, Docket Nos. E-015/M-24-343, Petition (Nov. 13, 2024); *In the Matter of the Petition of Minnesota Power for Approval of Investments and Expenditures in the Boswell Solar Project for Recovery through Minnesota Power's Renewable Resource Rider under Minn. Stat. § 216B.1645*, Docket No. E015/M-24-344, Petition (Nov. 13, 2024).
[49] *In the Matter of the Implementation of the New Distributed Solar Energy Standard pursuant to 2023 Amendments to the Minnesota Statutes, Section 216B.1691*, Docket No. E-002,E-015,E-017/CI-23-403, Request for Proposals Compliance Filing (Nov. 1, 2024).
[50] "Minnesota Power advances *Energy**Forward*** with request for proposals for up to 400 megawatts of wind energy," (Feb. 13, 2024), available at https://investor.allete.com/news-releases/news-release-details/minnesota-power-advances-energyforward-request-proposals-400.
[51] *In the Matter of the Application of Minnesota Power for a Certificate of Need and a Route Permit for the Duluth Loop Reliability Project in St. Louis County, Minnesota*, Docket No. E-015/CN-21-140, Order Granting Certificate of Need and Issuing Route Permit (April 3, 2023).
[52] *In the Matter of the Application of Minnesota Power for a Certificate of Need for a High Voltage Transmission Line for the HVDC Modernization Project in Hermantown, Saint Louis County*, Docket No. E-015/CN-22-607, Order Granting Certificate of Need and Issuing Route Permit (Oct. 25, 2024).

- Commission approval of two MISO Tranche 1 Long Range Transmission Planning ("LRTP") projects that will support reliability needs in Minnesota and regionally as the electricity system continues to transition to cleaner sources of generation.[53]
- Securing $78.1 million in state and federal funding awards to support needed upgrades to the Company's existing transmission and hydroelectric infrastructure.
- Achieved the Company's 15th consecutive year of meeting or exceeding state energy conservation goals in 2024.
- Commission approval of an extension of the Company's SolarSense customer-sited distributed solar generation ("DG solar") rebate and income-qualified solar grant program with modifications to improve equity within the program.
- Acquired new distribution system planning software to improve forecasting and hosting capacity mapping to support distributed energy resource deployment.

The 2025 Plan builds on these achievements and outlines actions to continue the Company's efforts to reduce carbon while maintaining a resilient and reliable electricity system that is responsive to customer needs and conscious of community and environmental impacts. The following components of Section II are organized as follows:

- Subsection A: Key Themes for the 2025 Plan;
- Subsection B: Critical Items Shaping this IRP;
- Subsection C: A Plan Responsive to Customers, Communities, the Climate, and the Region;
- Subsection D: Thoughtful, Sustainable, and Just Carbon Reduction;
- Subsection E: Action Taken to Support Continued Renewable Energy Integration;
- Subsection F: Leading on Energy Efficiency, Distributed Generation and Electrification Efforts;
- Subsection G: Managing Uncertainty with Flexibility for a Unique Region;
- Subsection H: Resource Plan Overview: Short- and Long-Term Action Plans; and
- Subsection I: Meaningful Progress with Reasonable Rate Impacts.

A. Key Themes for the 2025 Plan

Minnesota Power's 2025 Plan represents a sound approach to delivering safe and reliable energy while making necessary investments to advance the clean energy transition. The key themes of the 2025 Plan reflect the Company's long-held resource planning principles while meeting current state policy objectives.

[53] *In the Matter of the Application of Minnesota Power and Great River Energy for a Certificate of Need and Route Permit for an Approximately 180-mile, Double Circuit 345 kV Transmission Line*, Docket No. E-015,ET2/CN-22-416, Order Granting Certificate of Need and Issuing Route Permit (Feb. 28, 2025); *In the Matter of the Application of for a Certificate of Need for the Big Stone South – Alexandria – Big Oaks Transmission Project*, Docket No. E-002,E-017,E-T2,E-015, E-T10/CN-22-538, Order Granting Certificate of Need and Issuing Route Permit (Oct. 30, 2024).

Reliability

The 2025 Plan prioritizes reliability and energy security to ensure customer electricity needs are met and system resiliency is not degraded, helping minimize disruptions in electricity service. Minnesota Power recognizes that the next steps of its *Energy**Forward*** strategy must be carefully coordinated to maintain the strong and resilient electricity system needed to serve its customers. This IRP has identified the largest need of dispatchable generation for Minnesota Power in the past 45 years. Minnesota Power's last remaining source of baseload capable generation – the BEC – continues to play a critical role in providing reliable energy to residents, businesses, and the unique industries that operate in northern Minnesota. As Minnesota Power advances its cease coal plan at BEC Unit 3 ("BEC3") and BEC Unit 4 ("BEC4"), reliable fuel source alternatives are necessary before the Company can transition from existing coal generation. An innovative and new approach to ensuring reliability was integrated into the planning process with the addition of "reliability criteria" designed to monitor and inform planning decisions. Minnesota Power is committed to replacing coal and has identified natural gas as the cleanest, most reliable, flexible, and least cost option to replace nearly 1,000 MW of baseload generation supported by BEC3 and BEC4 in order to continue providing 24/7 electricity service to Minnesota Power's customers. Accordingly, to meet the Company's existing customer load, the 2025 Plan calls for the refuel of BEC3 with natural gas by 2030 and the immediate development of combined cycle natural gas generation to replace power removed at the cease coal dates for Minnesota Power customers by 2035 for BEC4. Additionally, the 2025 Plan incorporates future customer-driven activities like energy conservation and demand response, as well as additional investigation into biomass as a fuel source to support dispatchable and baseload energy needs.

Sustainability

The 2025 Plan offers bold next steps and necessary actions required to advance additional carbon reductions and complying with Minnesota's CFS while also considering the social and economic needs of Minnesota Power's customers and communities. The electric system must continue to provide increasingly sustainable and reliable sources of electricity that meets the necessary physical criteria to protect customers. The Company continues to make progress on its 2021 Plan, including approximately 200 MW of additional utility-scale solar, approximately 65 to 85 MW of DG solar additions, up to 400 MW of additional wind energy, and up to 500 MWh of new energy storage, by 2030 or sooner.

The 2025 Plan will result in the Company providing a transition to a coal-free power supply and, along with the cleaner natural gas support identified above, will include up to an additional 400 MW of wind energy, at least 100 MW of enhanced industrial demand response with economic curtailments, and 100 MW of energy storage by 2035. The 2025 Plan calls for continued operations at the HREC and will explore additional biomass investments as a future solid fuel alternative. This exploration will be based on the outcome of the Commission proceeding to develop a Life-Cycle Analysis ("LCA") for biomass to be utilized as a carbon-free fuel source in compliance with the CFS and ongoing consultation with Tribal Nations and other stakeholders. This IRP represents an iterative planning approach and the 2025 Plan, if approved, will deliver an annual energy portfolio that is 80 percent carbon-free by 2030 and pave the path to deliver 90 percent carbon-free energy by 2035. Furthermore, the 2025 Plan results in 95 percent carbon reductions from 2005 levels.

The pursuit of cleaner technologies and evolution are paramount as we move forward. While not all technology is commercially available for full grid deployment at this time, the Company maintains its commitment to work with customers to support ongoing development of carbon minimizing alternatives. In the 2025 Plan, the Company has proposed a research and

development (“R&D”) fund to support new firm clean technology development, pilots, and demonstrations to support ongoing sustainability goals. Recognizing the importance of compliance with the CFS and continued progress on reducing carbon, the 2025 Plan presents a balanced approach to sustainability that considers environmental impacts of resource decisions along with social and economic needs of customers and communities served by Minnesota Power.

Transparency

Minnesota Power remains committed to working with customers, the communities it serves, and local and regional advocates in advancing the 2025 Plan. There are a number of uncertainties regarding the readiness of and costs associated with clean energy technology’s ability to reliably support 24/7 energy needs, as well as questions about expected customer load growth as electrification advances and prospective large power customers advance their economic interests in northern Minnesota. The action plans and timelines proposed in this IRP are meant to create greater certainty for customers and communities so they can do their necessary planning for the future. Additionally, the 2025 Plan identifies the incremental requirements for meeting state energy goals and incorporates actions associated with the infrastructure buildout necessary to comply with the CFS to encourage awareness for all customers and stakeholders. Minnesota Power is committed to continued work with regional partners to support its customers and communities during this time of historic energy transition. The Company completed a socioeconomic evaluation of the impact of HREC as well as a societal cost benefit analysis of HREC and BEC4 to ensure benefits of being a host utility were identified and were used to inform the 2025 Plan. The 2025 Plan recognizes the critical infrastructure located in both Duluth and Cohasset, Minnesota, and identifies actions that will continue leveraging existing infrastructure for cleaner energy options going forward.

Load Readiness

A unique feature of this IRP is the prospect for significant customer load additions. While uncertainty in customer demand outlook is inherently part of any IRP analysis, the 2025 Plan includes a future where Minnesota Power’s customer load could more than double with existing and new prospective customer operations. Indeed, the energy sector is experiencing historic levels of load growth across the nation as re-industrialization, beneficial electrification, advances in artificial intelligence (“AI”) technology, and associated data centers are prompting increased customer electricity demand. Minnesota Power recognizes that utilities must be ready to meet this moment, as the load growth the Company is anticipating will have the potential for positive economic impacts for the state, the region, and Minnesota Power customers specifically. At the same time, the Company understands the importance of the resource planning process in Minnesota and wants to help ensure that its planning can efficiently pivot should new customer load be added to its system and has proposed a set of actions that, if approved, would take effect should new customer load up to 1100 MW emerge. Minnesota Power’s uniquely large industrial customer mix has often resulted in large swings in customer demand for which the Company is accustomed to planning (reference Figure 3 in Section III to see how industrial demand has varied since 1990). The magnitude of load growth potential Minnesota Power is planning for is unmatched in recent study periods, but the Company is well positioned to accommodate an expanded industrial sector given its history in serving these types of customers both reliably and cost-effectively. To capture the variety of possible future demand scenarios, the 2025 IRP analysis included a range of load sensitivities from a large industrial customer increase (+1500 MW) to the loss of industrial load (-200 MW).

B. Critical Items Shaping this IRP

Minnesota Power's 2025 Plan presents the next phase of the Company's *Energy**Forward*** resource strategy and while some resources included in our near-term and long-term plans have naturally changed from the Company's 2021 Plan in response to a changing policy landscape and market conditions, the overall direction is the same.

Stakeholder Input

In 2019, Minnesota Power established a first-of-its-kind stakeholder engagement process to inform its last IRP. Minnesota Power enhanced this engagement process by working intentionally to include stakeholders from groups historically not represented in these types of regulatory proceedings and expanded engagement opportunities to include opportunities for stakeholders to interact outside of formal meetings and tour Minnesota Power generation facilities. Stakeholders participated in a series of in person, virtual, and hybrid meetings to inform the Company's modeling inputs and help create a societal cost-benefit analysis framework used to assess the impacts of the 2025 Plan as well as the costs and benefits of associated with BEC4 and HREC.

Together, stakeholders evaluated the positive and negative impacts of these generation facilities on host communities, local economies and workforce, customer costs, public health, the environment, and system reliability. It was clear throughout the engagement process that stakeholders were concerned about reliability as Minnesota Power advances its cease coal plan, and that ratepayer impacts of the Company's clean energy transition be transparent, incremental, and reasonable. Commitment to maintaining jobs in host communities, particularly at BEC, was also noted as a priority among stakeholders, as was the importance of additional economic opportunities for transitioning communities, such as those associated with large power load growth.

Capacity Replacement at BEC

The consideration of replacing the power capability of the remaining two units at BEC makes this 2025 IRP one of the largest planning deficits identified in many decades. BEC makes up approximately 30 percent of customers' energy supply and is a strong baseload pillar for the Company's energy-intensive customer base making up 40 percent of the capacity that serves customers. Evaluation in this IRP has demonstrated that in order to maintain Minnesota Power's current customer load and meet the timeline for cease coal commitments, new natural gas generation is the cleanest, least cost resource that can match BEC's current capacity and contributions to the reliable and flexible power supply that Minnesota Power customers require and expect.

Natural gas allows for a significant reduction in the carbon profile from coal on an ongoing basis and can provide additional flexibility in an increasingly variable system. Hearing feedback from stakeholders and recognizing the need for capacity replacement after ceasing coal at BEC, Minnesota Power's 2025 Plan proposes a near-term gas refuel at BEC3. Doing so will allow the Company to leverage existing infrastructure to support cost efficiencies for capacity replacement needs and will allow the Company to reinvest in the host community surrounding BEC while maintaining existing jobs at BEC. In concert with the refuel, the Company has identified that 750 MW of combined cycle natural gas generation is needed by 2035 to modernize and prepare Minnesota Power's system for operating without coal-fired generation. New natural gas additions will position the Company for minimizing carbon emissions with additional fuel or technology advancements as available.

Additionally, to position the Company for compliance with existing federal greenhouse gas ("GHG") emissions rules for 2030, the 2025 Plan proposes preparing for a partial gas refuel at BEC4 with at least 40 percent natural gas capability. Further review of this project will be done if there are changes to GHG rules or requirements.

Finally, the Company's 2025 Plan, if approved, will allow Minnesota Power to make R&D investments to integrate emerging clean firm technology with customers and investigate biomass as a future solid fuel alternative. Pending a Commission decision deeming biomass an eligible energy technology for compliance with the CFS,[54] federal recognition for Production Tax Credit ("PTC") qualification, and ongoing consultation with Tribal Nations and other stakeholders, Minnesota Power will work to advance the ability to co-fire biomass as part of the annual BEC fuel plan.

Preparing for Load Growth

Minnesota Power understands the importance of its responsibility in serving customers and supporting regional economic opportunities that result from customer load additions. Therefore, the Company is actively planning for approximately 1100 MW of expected load growth based on existing customer plans and commitments. The 2025 IRP evaluation distinctly identifies the resources and least cost plans needed to serve new load at these levels while also continuing to meet CFS requirements.

The 2025 Plan offers an innovative and flexible approach that will prepare the Company's system as new load emerges by requesting approval of a Growth Plan adaptable to developing economic conditions as new customer load is added to the Company's service territory, and resulting in benefits to customers and the region. Minnesota Power's approved plan must be nimble enough to meet the economic moment and position for load growth possibilities in a way that is unique to past IRPs.

The Company's long-term action plan therefore seeks to prepare plans to implement up to 750 MW of new peaking generation and increase renewable implementation to include up to 2200 MW of wind, 200 MW of solar, and 300 MW of energy storage to ensure Minnesota Power's renewable portfolio is positioned to comply with the CFS. Minnesota Power will also work with new industrial customers on incorporating demand response into their operations, where it is feasible and economic. Furthermore, any new supply additions will be brought forward to the Commission as part of a power supply agreement that outlines the new customer's responsibility for resource additions and the benefits they will provide to existing customers. If additional load emerges above the 2025 planning level, Minnesota Power will submit a dedicated power supply plan for Commission approval as needed prior to its next IRP submission date.

Compliance with the Carbon-Free Standard

Underlying the development of the 2025 Plan is compliance with the CFS, which requires Minnesota utilities to generate an amount of carbon-free electricity equivalent to their Minnesota retail sales by 2040. The Company is proud to be able to present a plan in 2025 that results in an annual energy portfolio that is 90 percent carbon-free and compliant with the CFS requirement to be 90 percent carbon-free by 2035. In this IRP, Minnesota Power evaluated what would be required to develop an annual energy portfolio that results in 100 percent compliance with the CFS with the commercially available technology anticipated to be available by the cease coal commitment timeline. The preliminary results indicated that exorbitant amounts of wind, solar,

[54] *In the Matter of a Commission Investigation into a Fuel Life-Cycle Analysis Framework for Utility Compliance with Minnesota's Carbon-Free Standard*, Docket No. E-999/CI-24-352, Order Initiating New Docket and Clarifying "Environmental Justice Area" (Nov. 7, 2024).

and storage overbuild would be required at very high and volatile cost to customers while destabilizing the system and increasing the likelihood of power outages. With 15 years left to plan for compliance with the CFS, Minnesota Power is encouraged by the considerable progress made to date in its carbon-free energy portfolio and is confident that the Company will continue to get closer to full compliance with the 2040 CFS with each subsequent IRP. Further, this IRP proposes a first-of-its-kind for Minnesota Power R&D fund to continue exploring clean firm technologies for future implementation.

The 2025 Plan's proposal for an R&D budget, in addition to the evaluation of biomass as a future solid fuel capacity replacement at BEC, would allow the Company to explore other projects with customers on emerging clean, firm technology. Recognizing that public utilities are usually not early adopters of emerging technology, due to reliability requirements and the costs associated with developing pilot and demonstration projects, the proposed R&D budget will provide Minnesota Power an avenue to explore projects with interested customers during this historic time as technology continues to evolve as we near 2040.

For example, Minnesota Power submitted a partnership grant application for $30 million in U.S. Department of Energy ("DOE") funding available through the Bipartisan Infrastructure Law ("BIL") and federal Infrastructure Investment and Jobs Act ("IIJA") for a demonstration project of the GSF LDES battery. This partner demonstration project sought to install and operate a 4 MW/10-hour (40 MWh) GFS system at BEC and would have demonstrated the first operation of a grid connected GSF unit that could provide flexible support to the MISO market at a cold climate location. While the application was a finalist for consideration, Minnesota Power's LDES project was ultimately not selected for an award which made the project too expensive for customers to move forward with at this time. However, innovative partnerships with new customers on projects like this demonstration project are the kinds of efforts the new R&D fund could support.

In its next IRP, Minnesota Power will evaluate additional actions needed to meet the 2040 CFS requirement, including a review of the Manitoba Hydro and other renewable PPAs' terms and replacement alternatives, as well as progress on biomass including the outcome of the ongoing CFS LCA proceeding expected to conclude at the end of 2025.[55] The Company will also continue exploration of additional transmission alternatives for accessing broader regional capacity and optimization in its next IRP. Finally, Minnesota Power affirms its commitment and takes meaningful steps to advance ceasing coal at BEC4 in the 2025 Plan, and the Company intends to further clarify its cease coal plan for BEC4 and provide specific actions to be taken at the facility in its next IRP in coordination with the facility's co-owner partner, WPPI Energy, while continuing to prioritize reliability of the system and affordability as customer needs and the power supply evolves.

C. A Plan Responsive to Customers, Communities, the Climate, and the Region

As noted above, Minnesota Power engaged again for this 2025 IRP in a year-long stakeholder engagement process to inform the development of the 2025 Plan. The engagement process brought together a diverse group of participants representing various customer groups, environmental organizations, economic development entities, local government, industry, the host communities, and others. Multiple engagement meetings allowed participants the opportunity to provide their perspectives regarding Minnesota Power's future energy mix and the impacts of

[55] *In the Matter of a Commission Investigation into a Fuel Life-Cycle Analysis Framework for Utility Compliance with Minnesota's Carbon-Free Standard*, Docket No. E-999/CI-24-352, Order Initiating New Docket and Clarifying "Environmental Justice Area" (Nov. 7, 2024).

transitioning the current power system. In response to the Commission's Order in the Company's last IRP, participants also provided input on a societal cost-benefit analysis of BEC4 and HREC, considering impacts on host communities, workforce, economics, public health, system reliability, the environment, and customers.[56] The Center for Energy and the Environment and the Great Plains Institute were hired as independent facilitators of the stakeholder process.

The engagement process included three overlapping groups of interested parties:

1. *The Engagement Group:* a broad set of participants that convened four times to build a shared understanding of the policy, technology, and socio-economic landscape for the 2025 IRP.
2. *The Societal Advisory Group:* a subgroup of participants from the Engagement Group that convened three times to inform the development of a societal cost-benefit analysis ("SCBA") for any Minnesota Power generation facility, including but not limited to HREC and BEC4.
3. *The Technical Advisory Group ("TAG"):* a subgroup of participants from the Engagement Group that convened regularly over several months to discuss modeling assumptions and methodologies for the IRP, as well as technical topics such as MISO's transmission planning process and seasonal resource adequacy construct.

The work of these three subgroups were intended to be complementary to one another. At the onset of this IRP's engagement process that began in February 2024, Minnesota Power heard from participants – many of whom participated in the Company's last IRP engagement process – that they did not want to reinvent a process but rather preferred to refine and build from the first-of-its-kind engagement process developed for the 2021 IRP. Minnesota Power appreciates the time that participants and facilitators dedicated to this process and has incorporated their feedback to evaluate the social, economic, and environmental impacts of the 2025 Plan in addition to the societal costs and benefits of HREC and BEC4.

While the full engagement report is included in Appendix N to this IRP, in order to organize stakeholder feedback in a way that could be used to inform the development of the 2025 Plan, participants developed a framework for what an "acceptable," "unacceptable," and "best case" future situation might look like for a refined set of impact areas from the customer, environmental, local economy, and utility perspective as shown in Figure 1 below.

Minnesota Power used this forward-looking impact map to develop a plan that is responsive to what engagement participants shared was most important. The Company heard clearly from participants that stakeholders were concerned about the costs of compliance with the CFS, as well as reliability concerns, as Minnesota Power advances its cease coal plan. Uncertainty about the readiness of technologies that could replace the capacity currently provided by BEC3 and BEC4 was a common theme throughout the engagement meetings, as were the customer impacts of the overbuild of wind and solar resources required if replacement technologies do not prove to be commercially available or reliable prior to 2040.

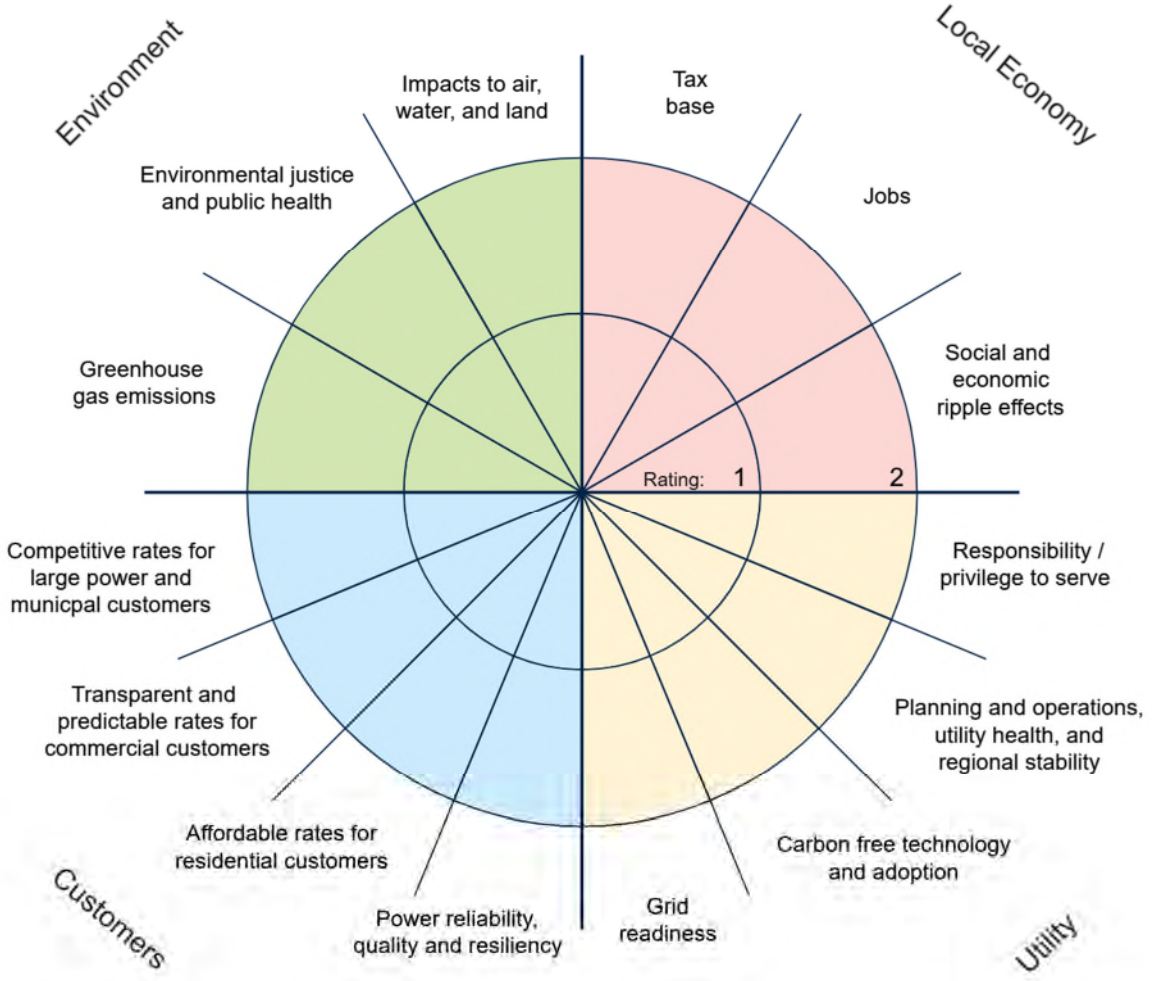
As was identified in the 2021 IRP engagement process, commitment to maintaining jobs in host communities, particularly at BEC, continues to be a priority among participants along with the importance of additional economic opportunities for transitioning communities, such as those associated with large power load growth. Impacts to the local tax base and school district funding in Cohasset as BEC3 and BEC4 cease coal were also identified as a high priority among

[56] *In the Matter of Minnesota Power's 2021- 2035 Integrated Resource Plan*, Docket No. E-015/RP-21-33. Order Approving Plan and Setting Additional Requirements at Order Point 11b (Jan. 9, 2023).

participants in northern Minnesota. While participants clearly recognized the importance of transitioning the electric power system amidst extreme weather events that are increasing in frequency and severity as the climate changes, participants are concerned about the costs associated with the infrastructure buildout necessary to make that transition in the timeframe outlined in the CFS. Minnesota Power heard that transparent and incremental cost increases were important to participants to avoid rate shocks and ensure that households, businesses, and communities can effectively plan for their economic futures.

Finally, in addition to the formal facilitated stakeholder process, Minnesota Power gave all customers an opportunity to share their preferences related to their future energy supply via an electronic survey. The survey included questions regarding system reliability, affordability, carbon-free energy renewable goals, and local economic impacts. Despite a limited response rate, the survey results clearly indicated that reliability and affordability were the top concern for the majority of respondents, with over 80 percent indicating one of these two concerns were most important to them, and approximately 20 percent of customers indicating the environmental impacts of electricity generation was their top concern. Survey respondents ultimately signaled a preference for a balanced approach to resource planning to ensure reliability and affordability while managing environmental impacts. Minnesota Power values all input from customers, community members, and regional advocates, and will continue to engage them through bill messages, social media, the Minnesota Power website, and additional engagement meetings after the submission of this IRP filing.

Figure 1. Minnesota Power's IRP Impact Map[57]



D. Thoughtful, Sustainable, and Just Carbon Reduction

Thoughtful planning for compliance with the CFS and transitioning Minnesota Power's last remaining coal units is not only critical to ensuring reliability for energy customers at rates they can afford, but also key to ensuring the Company's commitment to a just transition for employees and host communities who have helped power the region for decades. Since 2005, Minnesota Power has reduced carbon emissions by 50 percent and retired, idled, or re-missioned seven of its nine coal-fired generation units, removing approximately 700 MW of coal-fired generation from its approximately 1600 MW system. The 2025 Plan identifies actions that will deliver an annual energy portfolio that is 80 percent carbon-free by 2030 and pave a sustainable path to meet the 90 percent carbon-free electricity CFS requirement by 2035. Minnesota Power's *Energy**Forward*** strategy has already made significant carbon emissions reductions by leveraging existing

[57] The impact map and corresponding discussion is captured in Appendix N.

infrastructure and maintaining a dispatchable generation portfolio to deliver near perfect reliable electric service to customers. The 2025 Plan, as described in detail in Section V, will take further carbon reduction actions while modernizing the dispatchable generation portfolio that is responsible for ensuring necessary reliability in all 24/7 operating conditions and by 2035 will result in 95 percent carbon reductions from 2005 levels.

Minnesota Power is continually following and studying technology developments to determine the best path forward in meeting the CFS. While this IRP identifies specific steps the Company will take to reduce carbon emissions, new technology deployment is needed to meet the CFS by 2040. Technology evolution in the energy industry is occurring rapidly, and the Company is optimistic that due to technological advances in lower carbon dispatchable alternatives, renewable energy, energy storage, and demand side resources, more cost-effective options will be available in future years to support the next chapters in carbon reduction efforts. Minnesota Power's customers are best served by a resource strategy that is diverse, flexible, and nimble to be able to help develop and capitalize on these technology developments at the right time to maintain affordability. Advancing too soon, or adopting unproven technologies at large scale, can create unnecessary risk and cost for customers.

Refueling with natural gas at BEC represents a thoughtful, sustainable approach to maintaining a reliable electricity supply for customers while working toward the CFS requirement that Minnesota Power generate or procure an amount of electricity from carbon-free energy technologies that is equivalent to 100 percent of its total retail electric sales to retail customers by the end of 2040. While exact carbon emissions associated with coal and natural gas can vary depending on environmental controls at the generating facility, as well as the type of coal used as fuel, burning natural gas for energy results in significantly fewer carbon dioxide emissions than burning coal to produce an equal amount of energy. Natural gas consumption for electricity generation produces approximately 45 percent less carbon emissions compared to coal. Additionally, natural gas-fired generators, particularly those that operate in a combined-cycle configuration, are more efficient than coal-fired generators, requiring significantly less energy input to produce the same amount of electricity and further reducing carbon emissions.[58] A natural gas refuel at BEC will result in other immediate benefits, including significant reduction in coal handling and associated dust, including a reduction in the size of the coal pile, no new coal ash waste, and coal no longer being transported by rail to the facility. Refueling with natural gas at BEC therefore offers an efficient and economical source of capacity replacement that will result in immediate carbon emissions reductions for Minnesota Power's energy portfolio and meet the 2030 commitment to cease coal operations at BEC3 by 2030. Progress on carbon emissions reductions in the 2025 Plan is discussed further in Section V.

For Minnesota Power, sustainability means more than just reaching the landmark environmental goal of providing a carbon-free power supply. Sustainability also extends to supporting the Company's customers and unique region. As such, for a carbon-free energy future to be truly sustainable it needs to ensure a just transition for workers and communities directly affected by energy system changes and ensure our customers can afford the energy they rely on. A natural gas refuel at BEC allows the Company to leverage existing infrastructure while making investments that support the transitioning BEC host community by maintaining some of the existing jobs at the facility and the tax base the surrounding communities rely on. Minnesota Power is committed to charting a future energy path that considers the quality of life in our region,

[58] U.S. Energy Information Administration, "Electric power sector CO_2 emissions drop as generation mix shifts from coal to natural gas," (June 9, 2021), available at https://www.eia.gov/todayinenergy/detail.php?id=48296.

while addressing climate change, promoting economic growth, and supporting strong communities.

While this 2025 Plan represents meaningful action on carbon reduction, the Company is also investigating carbon neutrality efforts and the ability to make key advancements in that field in the near term. Minnesota Power is particularly interested in carbon neutrality efforts that leverage the natural resources in northern Minnesota and that invest in the unique region it serves. As an example of this effort, in January 2021, Minnesota Power partnered with the University of Minnesota's Natural Resources Research Institute on a grant application to the United States Forest Service to investigate the production of biochar at Minnesota Power facilities, evaluate carbon credit opportunities, and deploy a biochar soil amendment at a Minnesota Power or customer site. Biochar is carbonized biomass that is obtained from sustainable sources (like northern Minnesota timber) and sequestered in soils to sustainably enhance their agricultural and environmental value.[59] In 2022, the Company applied roughly three tons of balsam fir biochar to an ash landfill at BEC as part of a re-vegetation study.[60] In 2023, the Company was awarded a $271,480 U.S. Department of Agriculture ("USDA") Forest Service Wood Innovations Grant to study biochar soil application and production methods.[61] As the paper industries that have supported northern Minnesota's economy for over a century are in decline, finding new and sustainable markets for wood resources is critical to the regional economy and forest management. Minnesota Power looks forward to investigating this, and other, carbon neutrality efforts on its path to a carbon-free energy future.

E. Action Taken to Support Continued Renewable Energy Integration

In addition to ceasing all coal operations, the 2025 Plan identifies Minnesota Power's near-term plan to further reduce carbon emissions by adding renewable energy. Minnesota Power was the first utility in the state to offer a power supply that was 50 percent renewable, exceeding the state's Renewable Energy Standard ("RES") a full decade early. Today, the Company is proud to offer between 50 to 60 percent renewable energy to customers. With wind and solar being implemented from the 2021 IRP, Minnesota Power will exceed the state's newly updated RES several years early, which requires that 55 percent of electric retail sales be generated from eligible energy technologies by 2035.[62] In the 2025 Plan, Minnesota Power is proposing to continue its state-leading renewable energy additions by adding an estimated 400 MW of new wind energy and 100 MW of additional energy storage for implementation by 2035 in its Base Plan[63] and even more with its Growth Plan.[64] The Company also intends to bring forward a proposal for Commission consideration for up to 500 MWh of new energy storage in 2026 and finalize the implementation of wind and solar projects called for in the 2021 IRP. These actions will bring the total RES eligible renewable percentage to just over 90 percent by 2035. Additional information about Minnesota Power's renewable energy portfolio can be found in Appendix H.

[59] Biochar for Sustainable Soils, "What is Biochar?," available at https://biochar.international/the-biochar-opportunity/what-is-biochar/.
[60] University of Minnesota Duluth, "Ancient biochar method revamped for modern challenges," (Feb. 7, 2023), available at https://nrri.umn.edu/news/balsam-fir-biochar.
[61] Dovetail Partners, "Dovetail Partners Receives $271,480 from USDA Forest Service Wood Innovations Grant Program," (July 6, 2023), available at https://dovetailinc.org/blogdetail.php?id=64a7158aa706d.
[62] Minn. Stat. § 216B.1691, subd. 2(a).
[63] The proposed plan to meet the Base Case discussed in Section V.
[64] The proposed plan to meet the +1100 MW Growth Scenario discussed in Section V.

Solar and Wind Resource Acquisitions

Minnesota Power continues to advance its last approved IRP by submitting for Commission approval projects that will add approximately 200 MW of regional in-service territory solar capacity to the Company's electricity portfolio by end of 2027. Since filing its 2021 IRP, Minnesota Power has energized three local utility-scale solar projects that have a combined capacity of 22.4 MW.[65] Additionally, in January 2025, Minnesota Power issued its first RFP in an effort to add an additional 65 to 85 MW of DG solar by 2030. In early 2024, the Company issued an RFP for up to 400 MW of regionally located wind projects and has since shortlisted four wind projects for further evaluation.

Hydro Power Upgrades

Minnesota Power operates 10 regulated hydroelectric facilities and one non-regulated hydroelectric facility on five rivers in central and northeastern Minnesota. The facilities are operated under seven licenses from the Federal Energy Regulatory Commission ("FERC") and produce more than 120 MW of electricity in total. While the Company has no current plans to construct new hydroelectric stations, the relicensing process with FERC will continue for existing stations. The Final License Application ("FLA") was submitted for the Prairie River Project in 2021. The Pre-Application Documents ("PAD") and Notice of Intents ("NOI") for re-licensure of the Little Falls, Sylvan, and Pillager facilities were submitted in 2023 and will be submitted for the Saint Louis River Project in 2030, Blanchard in 2038, and Winton in 2039. The Company recently received $3.1 million in federal awards from the DOE under section 247 Hydro Maintaining and Enhancing Hydroelectricity Incentives to maintain the Scanlon and Blanchard dams, reducing operations and maintenance ("O&M") costs for customers.

Biomass Operations

Sustainably managed wood species provide a renewable energy option for power generation in northern Minnesota. Minnesota Power currently operates one biomass generation facility: HREC in Duluth, Minnesota. HREC utilizes primarily waste wood and forest residue, which provides a renewable, recyclable, low sulfur fuel source. Previously, HREC also sold steam to a pulp and paper mill in Duluth, Minnesota. Following a change in ownership of the paper mill and a transition from printing and writing papers to the production of tissue papers, steam from HREC was no longer needed at the Duluth mill. HREC now exclusively operates as a dispatchable resource in the Day-Ahead MISO energy market, while supporting critical reliability needs. The 2025 Plan proposes to continue operations at HREC to support regional reliability needs and renewable integration, making investments in the facility as necessary to support efficiency and environmental improvements, such as the installation of Fuel Feeders on both boilers in 2025 and 2026. As mentioned above, Minnesota Power continues to explore biomass generation options, both as potential new facilities and as generation alternatives such as co-firing at BEC. The evaluation of these options is detailed in Appendix J.

[65] "Local Solar, Local Benefits," available at www.mnpower.com/Environment/SolarProjects.

F. Energy Efficiency, Distributed Generation, and Electrification Efforts

As Minnesota Power continues its state-leading path in adding renewable energy and reducing carbon, customer-driven resources like energy efficiency, demand response, distributed generation ("DG"), and electrification will play an important role in reducing carbon on the system.

Energy Efficiency and Conservation

Minnesota Power, together with its customers, community stakeholders, and trade allies, has achieved success through its energy conservation programs and has surpassed Minnesota's energy savings goal each year since it was implemented in 2010. On average, nearly 70 million kWh of energy savings were achieved each year over that decade. The Company intends to continue building upon its successful track record of supporting energy efficiency and has committed in its most recent Energy Conservation and Optimization ("ECO") Triennial Filing to an energy savings goal between 2.8 and 2.9 percent through 2026, well above the state's 1.75 percent energy savings goal.[66] Minnesota Power has committed to continued, ambitious energy savings goals over the next several years.

Partnerships with the Company's customers for efficiently meeting their energy needs is at the core of Minnesota Power's business. Through decades of optimizing the infrastructure in the region, Minnesota Power has created a strong reputation and trust with its customers as the Company helps educate and implement new programs and energy options. Minnesota Power has offered a rebate program for customers to install their own DG solar systems since 2004, nearly a decade before Minnesota passed the 2013 Solar Energy Standard ("SES"). The Company has since expanded that program and was the first in Minnesota to offer a dedicated solar grant program to help income-qualified customers overcome solar adoption barriers. Between 2014 and 2023, the Company provided grant funding for more than 20 low-income solar projects. On January 8, 2025, the Commission approved Minnesota Power's petition to extend the SolarSense rebate and grant program for an additional three years with modifications that would improve equity within the program.[67]

Electrification

In addition to conservation and renewable energy programs for customers, Minnesota Power is committed to facilitating electrification and offers a number of electric vehicle ("EV") programs to customers. The Company has offered a Residential Off-Peak EV Service Tariff since 2015.[68] Specifically for commercial customers, Minnesota Power's EV Commercial Charging Rate Pilot was approved by the Commission on December 12, 2019.[69] On July 31, 2020, the Company also filed a petition for approval of a portfolio of EV programs designed to address persistent barriers to residential EV adoption in northern Minnesota, including a Residential EV Charging Rebate Program, and a dedicated Education and Outreach budget for EV programs. The Company is nearing construction of the first of 16 public Direct Current Fast Chargers ("DCFC"), intended to equitably expand access to charging infrastructure across Minnesota Power's service territory.

[66] *Minnesota Power's 2024-2026 Triennial Energy Conservation and Optimization Program Filing*, Docket No. E-015/CIP-23-93, Minnesota Power's ECO Triennial Compliance Filing (June 30, 2023).
[67] *In the Matter of Minnesota Power's Ongoing Compliance of its SolarSense Program with Minnesota's Solar Energy Standards*, Docket No. E-015/M-20-607, Order Accepting Report and Approving Program Extension with Certain Proposed Modifications (Jan. 8, 2025).
[68] *In the Matter of Minnesota Power's Petition for Approval of a Residential Off-Peak Electric Vehicle Service Tariff,* Docket No. E-015/M-15-120, Order Approving Tariffs and Requiring Filings (June 22, 2015).
[69] *In the Matter of the Petition for Approval of Minnesota Power's Portfolio of Electric Vehicle Programs,* Docket No. E-015/M-20-638, Order Approving Proposals with Modifications (April 21, 2021).

When this project is complete, no driver in Minnesota Power's service area will be more than 30 miles from EV charging infrastructure. In December of 2024, the Company proposed a make-ready pilot to enable at-home charging for residents of multiple unit dwellings to continue expanding charging infrastructure for customers wherever they live. More information about Minnesota Power's electrification efforts can be found in its annual Transportation Electrification Plan filing, submitted to the Commission as part of its Integrated Distribution Plan ("IDP") on November 1, 2023.[70]

Demand Response

Minnesota Power has been optimizing, with its industrial customers, one of the largest demand response programs in the nation, implementing a robust emergency demand response program that will continue to evolve. Leveraging the flexibility of its unique customers to assist in managing the electricity needs of the region will continue to be vital as Minnesota Power moves towards an efficient decarbonization of the system. The need for long-term demand response opportunities is emerging as Minnesota Power bridges and manages volatility in available resources and paves the pathway with new innovative technologies. The continued energy system transformation will require all tools to be available and provide value to the grid. Minnesota Power will continue to work with its customers to implement a long-term enhanced demand response product, which would add energy curtailment needed to help manage renewables, and monitor MISO requirements for qualification as a capacity resource to maximize this resource for our region. The Company utilizes this customer-focused program to augment its portfolio and reduce capacity deficits, reducing the need for additional generation capacity.

Distributed Solar Energy

In 2023, the Minnesota Legislature established the Distributed Solar Energy Standard ("DSES") in Minnesota Statute § 216B.1691, subd. 2h, which requires that at least 3 percent of Minnesota Power's total retail electric sales in Minnesota be generated from solar energy generating systems by the end of 2030. Compliance with the DSES is meant to be an iterative process that incorporates stakeholder feedback into multiple "rounds" of RFPs to identify projects that will help meet the DSES. Minnesota Power issued its first DSES RFP on January 30, 2025[71] and currently expects to need approximately 65 to 85 MW of DSES projects to be in compliance with the DSES by the end of 2030. The DSES presents an opportunity to work with interested customers and communities to support their direct participation in the clean energy transition and local renewable energy goals.

Rate Design and Advanced Metering

Finally, Minnesota Power continues to prepare both the technical infrastructure and electric rate structure to facilitate a future clean energy system that leverages a more dynamic grid, capturing the benefits of conservation, distributed energy resources, electrification, and more. In December 2020, the Company submitted to the Commission an innovative proposal, developed with extensive stakeholder engagement, to transition its electric rate design from its historical Inverted Block Rate structure to a modern Time of Day rate for all residential customers – which

[70] *In the Matter of a Commission Inquiry into Electric Vehicle Charging and Infrastructure*, Docket No. E-999/CI-23-258, Integrated Distribution Plan (Nov. 1, 2023).

[71] *In the Matter of the Implementation of the New Distributed Solar Energy Standard Pursuant to 2023 Amendments to the Minnesota Statutes, Section 216B.1691*, Docket No. E-002, E-015, E-017/CI-23-403, DSES Request for Proposals Issuance Notice (Jan. 31, 2025).

is the first such proposal in Minnesota.[72] The Commission approved the Company's transition from Inverted Block Rates to Time of Day rates on August 27, 2021. Minnesota Power has a fully deployed Advanced Metering Infrastructure ("AMI") metering system and is working diligently to develop strong use cases for the data which will enhance innovative rate design. These infrastructure investments, coupled with an innovative rate design, have helped the Company prepare for a future that incentivizes and optimizes the grid for clean energy options like conservation, distributed energy resources, and electrification.[73]

G. Managing Uncertainty with Flexibility for a Unique Region

Minnesota Power presents the 2025 Plan with robust power supply options to position its customers towards a sustainable energy future, while mitigating unnecessary reliability and cost risk. The Company's planning process evaluates and compares resource strategy outcomes with a series of sensitivities that focus on various levels of demand growth. The 2025 Plan has also identified key areas of uncertainty as the Company looks ahead to the next 15 years, including maintaining reliability, availability of transmission, customer demand outlooks, and technology advancements.

Maintaining Reliability

Minnesota Power has an established history of robust resource planning processes that ensure reliable energy service, while at the same time positioning for an energy future with less carbon-intensive resources. As coal generation continues to retire in the region, the electricity system is becoming more reliant on intermittent wind and solar resources that are not always available when demand is high. Along with traditional resource adequacy planning methods, Minnesota Power has incorporated reliability criteria into its IRP development process to plan a reliable power supply across operating conditions and position the Company to have sufficient capacity to meet MISO resource adequacy requirements while these programs continue to evolve. The Company takes its responsibility seriously to plan its system and ensure its integrity for providing vital electric services to its customers.

The core tenets of the resource adequacy construct in place when Minnesota Power filed its last IRP were formed when MISO's energy mix contained mostly dispatchable coal and gas generation. As the power supply transitioned and accommodated the addition of more renewable energy, MISO's resource adequacy construct has adapted to include enhanced requirements for demand response and better capturing storage and renewable contribution to resource adequacy in the region. MISO, along with Minnesota Power, recognizes that the resource adequacy construct needed to continue to adapt for even higher levels of renewable energy penetration, and to ensure there can be energy coverage for all system conditions to ensure reliability. Since the 2021 IRP, MISO worked with stakeholders on several changes to the MISO resource adequacy construct that better capture availability of generation resources when needed by the system during stressed periods. MISO refers to these changes as the Seasonal Accredited Capacity ("SAC") and Direct Loss of Load ("DLOL") resource adequacy methodologies. MISO has also proposed material changes to the requirements for demand response to qualify as a capacity resource. These proposed changes could impact the quantity of demand response industrial customers make available to Minnesota Power, because the requirements as currently proposed are more onerous for customers and their industrial operations.

[72] *In the Matter of the Petition for Approval of Changes to Minnesota Power's Residential Rate Design*, Docket No. E-015/M-20-850, Petition (Dec. 1, 2020).
[73] *In the Matter of Minnesota Power's 2023 Integrated Distribution Plan,* Docket No. E-015/M-23-258 Minnesota Power's 2023 Integrated Distribution Plan (Oct. 16, 2023).

As MISO noted in its February 2024 update[74] to the December 2020 Reliability Imperative report,[75] current reliability challenges are more concerning with higher levels renewable energy being added to the system and traditional baseload generation retirements. Extreme weather events also highlight the importance of ensuring reliability during system transformation. During the Polar Vortex of January 2019, the coldest temperature recorded in the lower 48 states was set in the northern Minnesota community of Cotton, with a temperature of -56 degrees Fahrenheit.[76] Winter Storm Uri in February 2021 and Winter Storm Elliot in December 2022 also stressed system resources. MISO and the local utilities are responsible for working together to ensure there are adequate resources including dispatchable resources and demand response, to manage reliability on an ongoing basis.

These reliability challenges are further evidenced by the fact that MISO has declared an increasing number of emergencies since the summer of 2016, which is changing MISO's overall risk profile. The Company evaluated the reliability profile of its proposed Base Plan and Growth Plan to ensure the actions being brought forward meet the needs of the transformation underway in the energy portfolio. Reliability criteria considered in the development of the 2025 Plan are further discussed in Section V and Appendix K.

Transmission Planning

An important component of a successful transition to an energy future with more variable generation is having a robust transmission system that can integrate increasing levels of renewable energy, while facilitating the retirement of baseload generation and ensuring energy can be delivered to where it is needed when it is needed. Minnesota Power has been at the leading edge of integrated system planning – from distribution to resource to transmission planning. The Company has been leading the development and implementation of transmission in the upper Midwest for decades while transitioning its system to lower carbon alternatives. A strong transmission planning presence in an integrated planning environment is vital to the energy transition and the Company's track record in its last IRP submittals demonstrates this excellence.

In 2024, the Commission approved Minnesota Power's HVDC Modernization Project,[77] which was developed to upgrade and replace the existing converter stations for the Company's 465-mile HVDC Line, enabling to the continued reliable operation of HVDC Line that currently transports 550 MW of generation from energy-rich North Dakota to the Company's customers in northeast Minnesota. To mitigate customer cost impacts for the project, the Company submitted a federal funding application for $50 million through the Grid Resilience and Innovation Partnerships ("GRIP") Program created as part of the IIJA. Minnesota Power was selected for the $50 million award in October 2023 and secured its contract for the award in September 2024.

[74] MISO, "MISO's Response to the Reliability Imperative," (Feb. 2024), available at https://cdn.misoenergy.org/2024%20Reliability%20Imperative%20report%20Feb.%2021%20Final504018.pdf?v=20240221104216.

[75] MISO, "MISO's Response to the Reliability Imperative," (Dec. 2020), available at https://cdn.misoenergy.org/MISO%20Response%20to%20the%20Reliability%20Imperative%20FINAL504018.pdf.

[76] National Weather Service, "Late January 2019 Cold," available at https://www.weather.gov/dlh/January2019Cold.

[77] *In the Matter of the Application of Minnesota Power for a Certificate of Need for a High Power Voltage Transmission Line for the HVDC Modernization Project in Hermantown, Saint Louis County,* Docket Nos. E-015/CN-22-607 and E-015/TL-22-611, Order Granting Certificate of Need and Issuing Route Permit (Oct. 25, 2024).

Additionally, the Company has been awarded $25 million in state funding to support the HVDC Modernization Project.

MISO's LRTP initiative has begun to address this issue for its region and, to date, has approved two tranches of transmission projects to improve reliability and support the energy transition underway in the Midwest.

The Tranche 1 portfolio consists of 18 projects that span the MISO Midwest subregion and includes two Minnesota Power partner projects. At a January agenda meeting, the Commission approved the CN and route permit for the Northland Reliability Project, a partner project with Great River Energy that includes construction of a new double-circuit 345 kV high-voltage transmission line and improvements to the power grid, from the Grand Rapids area in Itasca County to the Becker area in Sherburne County.[78] The Northland Reliability Project, expected to be in-service in 2030, will ensure that the power grid in northern and central Minnesota continues to operate safely and reliably as energy resources in Minnesota and the region continue to evolve. On October 30, 2024, the Commission issued an order granting a CN for the Big Stone South – Alexandria – Big Oaks 345 kV Project in central Minnesota, a partner project between Minnesota Power, Xcel Energy, Great River Energy, Otter Tail Power, and Western Minnesota Municipal Power Agency, for which Minnesota Power owns a small share of the eastern (Alexandria – Big Oaks) segment, expected to be in service in 2027.[79] The project will address regional reliability issues, capacity issues, and issues concerning the addition of renewable resources on the existing 230 kV system in western and central Minnesota, eastern North Dakota, and South Dakota.

The Tranche 2.1 portfolio consists of 24 projects across the MISO Midwest subregion and includes three Minnesota Power partner projects. The Maple River – Cuyuna 345 kV Project, expected to be in service in 2033, is a partner project with Otter Tail Power and Great River Energy that involves installing new, 166-mile single-circuit 345 kV line on double-circuit capable structures between the Maple River and Cuyuna substations. The Iron Range – St. Louis County – Arrowhead 345 kV Project, expected to be in service in 2032, is a partner project with American Transmission Company that involves installing new single circuit 345 kV line between Iron Range and St. Louis County, and installing double circuit 345 kV lines between St. Louis County and Arrowhead. The Bison – Alexandria 345 kV Project, expected to be in service in 2032, is a partner project with the same ownership structure as Alexandria – Big Oaks Project and will provide outlets for generation from the west, supports large power transfers to load centers, and reduces congestion. Notices of Intent to Construct, Own, and Maintain for all three projects were filed in February 2025.[80] CN applications for the projects will be filed with the Commission by February

[78] *In the Matter of the Application of Minnesota Power and Great River Energy for a Certificate of Need and Route Permit for an Approximately 180-mile, Double Circuit 345 kV Transmission Line,* Docket No. E-015, E-T2/CN-22-416 and E-015, E-T2/TL-22-415, Order Granting Certificate of Need and Issuing Route Permit (Feb. 28, 2025).

[79] *In the Matter of the Application of Minnesota Power and Great River Energy for a Certificate of Need and Route Permit for an Approximately 180-mile, Double Circuit 345 kV Transmission Line,* Docket No. E-015,ET-2/CN-22-416, Order Granting Certificate of Need and Issuing Route Permit (Feb. 28, 2025); *In the Matter of the Application of for a Certifiate of Need for the Big Stone South – Alexandria – Big Oaks Transmission Project*, Docket No. E-002,E-017,E-T2,E-015, ET-10/CN-22-538, Order Granting Certificate of Need and Issuing Route Permit (Oct. 30, 2024).

[80] *In the Matter of the Application for a Certificate of Need for the Maple River to Cuyuna 345 kV Transmission Line Project*, Docket No. E-015,ET-2,E-017/CN-25-109, Notice of Intent to Construct, Own, and Maintain the Maple River – Cuyuna 345 kV Transmission Project LRTP Project #20 (Feb. 7, 2025); *In the Matter of the Application for a Certificate of Need for the Iron Range – St. Louis County – Arrowhead*

2026. Additional information on Minnesota Power's transmission planning can be found in Appendix F.

Customer Load Growth

The 2025 Plan offers a flexible approach to planning during a time of historic load growth potential. Based on discussions with existing and prospective customers, Minnesota Power's customer load has the potential to more than double in this planning period. Therefore, the 2025 Plan includes a "Growth Scenario," which outlines a set of actions the Company will take if additional customer load for up to 1100 MW emerges. This planning approach will allow the Commission to approve actions that will take effect if prospective customer load does become a reality for Minnesota Power's system. This approach provides some flexibility in planning and negates the need to file an entirely new IRP to address the load growth Minnesota Power currently anticipates but cannot say definitely will emerge, or if it does, how much will emerge. This approach also ensures that certain actions are not taken based on prospects but are taken when they are needed to meet confirmed demand increases.

In this IRP, Minnesota Power is therefore requesting Commission approval of specific actions if up to 1100 MW of new customer load emerges, as outlined in Section H below. If additional load emerges above this planning level, Minnesota Power will increase these initial activities with a dedicated power supply plan brought to the Commission as needed prior to submission of the Company's next IRP.

Technology Advancements

Finally, advancement in carbon-free technologies will be a key driver of how quickly and cost effectively Minnesota Power can move towards compliance with the CFS. While the Company recognizes that achieving a 100 percent carbon-free electricity system today based on current technological readiness is not possible, while maintaining reliability and reasonable cost, Minnesota Power is confident that the industry will continue to make progress in the coming years through pilots and demonstration projects. Like with the Company's last IRP, uncertainties remain about how quickly costs will decline for critical technologies trying to reach full commercialization, such as LDES, carbon capture, advanced nuclear (i.e., Small Modular Reactor ("SMR")), enhanced geothermal, and carbon-free fuels (i.e., hydrogen, and biofuels) needed to achieve compliance with the CFS. Additional uncertainty exists concerning their contributions as a reliable energy solution for customers and the policy landscape for incorporating some of the emerging technology into a utility's power supply continue to challenge planning efforts. However, Minnesota Power has proposed a flexible plan that will create opportunities for these innovative technologies to be included as future actions once they are proven and commercially available.

H. Resource Plan Overview: Short- and Long-term Action Plans

Minnesota Power's robust resource planning analysis considered a number of options in developing the 2025 Plan and identifying the path to 90 percent renewable generation in compliance with the CFS 2035 milestone. The proposed short- and long-term action plans identified below include the steps needed to achieve ambitious carbon goals, while also maintaining reliability of the regional grid and reasonable costs for customers within Minnesota's

345 kV Transmission Project, Docket No. E-015,ET-2,E-017/CN-25-111, Notice of Intent to Construct, Own, and Maintain the Iron Range – St. Louis County – Arrowhead 345 kV Transmission Project, (Feb. 7, 2025); and *In the Matter of the Application for a Certificate of Need for the Bison to Alexandria Second Circuit 345 kV High Voltage Transmission Line Project*, Docket No. E-002,E-T2,E-015,E-017,ET-6135/CN-25-116, Notice of Intent to Construct, Own, and Maintain the Bison-Alexandria 345 kV Transmission Line Project, (Feb. 7, 2025).

approved utility planning framework. Supported by the information and analysis in the appendices of this IRP, the actions outlined in the following sections identify both short- and long-term steps that will help Minnesota Power continue to meet customer needs near term (over the next five years) and be poised to deliver safe and reliable service to customers for many years to come.

Short-Term Action Plan (2025 through 2030)

Minnesota Power's short-term action plan during the five-year period of 2025 through 2030 is comprised of steps that will immediately reduce carbon emissions in the near term and continue the addition of carbon-free energy renewables, conservation, and other demand side resources to the Company's resource portfolio. The specific strategic and necessary actions to achieve these steps include:

- Complete the 2021 IRP actions already in progress, including finalizing the Company's implementation plan for 400 MW of new wind energy by 2028 and completing the implementation of the Regal Solar Project and the Boswell Solar Project, which will result in an approximately 200 MW of additional utility-scale solar resources. The Company will also bring forward a filing outlining the Company's plan for up to 500 MWh of new energy storage in 2026 and progress on IDP non-wires alternatives.
- Maximize demand side management and customer options by continuing the Company's ECO and energy efficiency programs and creating the necessary tariff mechanisms to acquire at least 100 MW of new long-term demand response capacity by 2028 that includes an annual energy curtailment requirement. The Company will also work to complete the addition of 65 to 85 MW of new DG solar resources and implement an EV multi-dwelling unit ("MDU") program to further support customers' electrification needs.
- Add new renewable energy to the Company's portfolio by releasing an RFP for 400 MW of additional wind energy and 100 MW of energy storage for implementation by 2035.
- Advance the Company's plan to cease coal at BEC3 by 2030 by beginning the engineering and acquisition of materials required for a natural gas refuel of the unit. Pending the outcome of state and federal regulatory processes and economic evaluations related to biomass as a net carbon-free resource, Minnesota Power will conduct additional investigation into the economic prospects of co-firing biomass as part of the refuel plan at BEC. The Company will cease coal at BEC3 once new gas refuel capability is in service. This refueling will result in an immediate carbon emissions reduction while supporting reliability in the region and continuing to provide economic benefits for the local host community.
- In order to comply with the Environmental Protection Agency's ("EPA") Section 111(d) carbon regulations, begin development and engineering required for at least a 40 percent natural gas capability for BEC4, in coordination with WPPI Energy.
- Continue operations at HREC to support regional reliability needs and ensure all environmental requirements are met for this renewable facility.
- Work with customers to integrate emerging clean firm technology with a proposal requesting $30 million to pursue R&D projects that will be rider recoverable.

Long-Term Action Plan (2030 through 2039)

Minnesota Power will focus its long-term action plan on a strategy to further reduce carbon emissions in its portfolio and reshape its generation mix after it ceases utilizing coal. This long-term strategy will continue resource diversification and position Minnesota Power to be able to

successfully adapt to a range of economic and environmental futures while maintaining service to its customers at a reasonable cost. Each component of this long-term action plan has been proven through the least cost planning analysis to be flexible and robust to keep progress toward the Company's strategic resource goals on track in a variety of future scenarios. However, these transition dates are dependent upon the ability to replace the needed system attributes required to maintain the quality of customer electric service in place today. Planned components include:

- To ensure Minnesota Power has dispatchable reliability resources to meet expected customer needs, immediately begin to develop 750 MW of combined cycle natural gas generation to be in service by 2035 to enable ceasing coal on Minnesota Power's system. BEC infrastructure reinvestment will be prioritized in siting activities.
  - → On receipt of final permits for the Nemadji Trail Energy Center ("NTEC"), and if available to meet IRP needs, the Company will refile with the Commission as required.[81]
  - → Any new natural gas resource additions will position the Company for minimizing carbon emissions with alternative fuel or technology as it reasonably becomes available.
- Cease utilizing coal in Minnesota Power's supply portfolio once new combined cycle generation replacement is complete to ensure reliability is not degraded. To ensure Minnesota Power meets the latest GHG requirements, including EPA's Section 111(d) carbon regulations by 2030, Minnesota Power will develop along with WPPI Energy, a refueling alternative of BEC4 for operating capability of at least 40 percent natural gas, which will create additional emission reductions for the facility five years ahead of the Company's cease coal plan.
- Continue developing and implementing transmission solutions to address reliability issues related to the Company's cease coal plan, including working with regional partners to complete three approved MISO LRTP Tranche 2.1 projects and continued work with MISO to determine if additional transmission solutions are necessary for regional reliability needs as decarbonization of the electricity system continues.

Load Growth Scenario

As additional load growth emerges for 1100 MW, Minnesota Power will need to be flexible and nimble and will add the following actions under the Growth Plan as necessary:

- Increase natural gas additions to 1500 MW to meet system requirements.
- Increase renewable implementation to include up to 2200 MW of wind and 200 MW of solar resources to position the Company for compliance with the CFS.
- Increase energy storage to 300 MW to ensure economic management of Minnesota Power's renewable portfolio.
- New supply additions identified in the Growth Plan will be brought forward for Commission consideration and approval as part of a power supply agreement that outlines customer responsibility for the additions required and benefits provided to existing customers.

[81] *In the Matter of Minnesota Power's 2021-2035 Integrated Resource Plan*, Docket No. E-015/RP-21-33, Order Approving Plan and Setting Additional Requirements at Order Point 3 (Jan. 9, 2023).

- If additional load emerges above the Growth Scenario planning level, Minnesota Power will increase these initial activities with a dedicated power supply plan brought to the Commission as needed prior to submission of the Company's next IRP.

IRPs offer an iterative planning process and Minnesota Power will continue to evaluate carbon-free technology adoption and economic pathways for CFS compliance. In its next IRP, Minnesota Power will evaluate options to continue its transition from an annual energy portfolio that is 90 renewable in compliance with the CFS 2035 requirement to compliance with the 100 percent CFS 2040 requirement. Minnesota Power will also:

- Evaluate the economic prospects of biomass as an additional fuel source if state and federal policy indicates biomass is a net carbon-free resource based on a life-cycle analysis.
- Review its Manitoba Hydro contract and other renewable PPA terms, as well as alternatives for replacement if necessary.
- Evaluate additional transmission alternatives for accessing broader regional capacity and optimization.
- Clarify the cease coal plan for BEC4 and action being taken at the facility.
- Continue to prioritize reliability needs of the system as it continues to transform.

I. Meaningful Progress with Reasonable Rate Impacts

The 2025 Plan evaluation identified that the Company's short- and long-term action plans result in meaningful progress toward compliance with the CFS while ensuring least cost energy supply scenarios within Minnesota's approved utility planning framework. Providing reliable electric service for customers at a reasonable cost continues to be a priority for Minnesota Power.

The 2025 Plan will result in an annual energy portfolio that is 80 percent renewable by 2030 and 90 percent renewable by 2035, demonstrating full compliance with the CFS requirements during the planning period. The 2025 Plan, if approved, includes bold carbon reduction actions while modernizing the dispatchable generation portfolio that is responsible for ensuring 24/7 reliability in all operating conditions and will result in 95 percent carbon reductions from 2005 levels. Minnesota Power will continue to evaluate additional actions needed to develop an annual energy portfolio that meets the CFS requirements for 100 percent carbon-free by 2040.

In accordance with Minn. R. 7843.0400, subp. 4, Minnesota Power's 2025 resource planning analysis considers the likely effect of plan implementation on electric rates. Appendix L includes additional details of the incremental cost of the "5 Year Power Supply Plan" by customer class from 2025 to 2029. This outlook includes both the approved actions from the 2021 IRP and the actions from this 2025 Plan in the five-year timeframe. These actions advance the Company's progress and compliance with the CFS will result in a reasonable increase of approximately 2 percent per year. Minnesota Power believes its 2025 Plan will continue to serve its customers in a thoughtful and forward-looking way during the 2025-2039 planning period and proudly presents a plan that reflects our commitment to providing safe, affordable, reliable electric service to our customers, as well as our commitment to the climate and the communities we are privileged to serve. Minnesota Power respectfully submits this 2025 Plan for the Commission's review and approval.

III. CURRENT OUTLOOK

This section identifies the major items contributing to Minnesota Power's outlook for customer demand for electricity and the existing supply resources that will be utilized as the foundation for the 2025 IRP. The Company enters this IRP planning period with significant generation deficiencies in the mid- to long-term with the Company's commitment to cease coal operations for its customers at BEC3 and BEC4 from the 2021 IRP and customer plans that require additional power to expand their operations. The 2025 IRP includes a range of outlooks and proposes a resource plan that meets two primary outlooks: the "Base Case" and a "+1100 MW Growth Scenario" (or "Growth Scenario"), which includes approximately 1100 MW of load growth within the industrial class, as described in Appendix A.

A core focus of the 2025 IRP is developing the plan to replace 815 MW of baseload coal energy and capacity capability, while meeting the CFS, reliability standards, and a growing need for energy in the region. This IRP has identified a significant need for dispatchable generation to meet Minnesota Power's power supply and reliability requirements – the largest need identified in the past 45 years. With Minnesota Power's commitment to reduce carbon emissions in its portfolio and comply with the Minnesota CFS, additional carbon-free energy will also be needed to optimize the portfolio so that any dispatchable energy resources are only needed when wind and solar are not available and energy storage has been depleted.

Since the 2021 Plan, Minnesota Power has added over 20 MW of utility-scale solar and is working toward adding approximately another 300 MW of solar, 400 MW of wind, and up to 500 MWh of energy storage prior to 2030. With these renewable additions, Minnesota Power will be about 70 percent renewable by 2030 which is ahead of the current RES requirement of 55 percent by 2035.

This section covers the following topics:

- Current Outlook – Base Case and Growth Scenario
- Minnesota Power Load and Capability Forecast
- Minnesota Power's Large Industrial Customer Base

A. Minnesota Power Load and Capability and Energy Need Forecast

The Load and Capability ("L&C") combines peak customer demand levels in the most recent Annual Electric Utility Forecast Report ("AFR 2024")[82] and other customer plans with the capacity resources in Minnesota Power's portfolio to understand the potential capacity outlook for the next 15-year planning period. For more information on the Company's approach to developing customer demand forecast scenarios, refer to Appendix A of this IRP. The 2025 IRP includes a "Base Case" and a "+1100 MW Growth Scenario," which represents the latest planning information from customers at the time of this IRP filing and includes 1100 MW of additional demand.

Minnesota Power creates the L&C with the Planning Year 2024-2025 MISO Module E L&C calculations as a starting point. The L&C calculation takes into consideration Minnesota Power's customer load forecast for peak demand coincident with MISO's peak, expected demand-side resources, bilateral purchases and sales, the SAC changes to the accredited capacity value of wind and solar as those resources increase on the system using an Effective Load Carrying

[82] *In the Matter Annual Electric Utility Reports*, Docket No. E-999/PR-24-11, Minnesota Power's 2024 Annual Electric Utility Forecast Report (Aug. 1, 2024). The AFR 2024 is the foundation for the forecast used in the 2025 IRP analysis and can be found in Appendix A.

Capability methodology, and MISO's required percent planning reserve margin from Planning Year 2024-2025.

New generation resources approved by the Commission or anticipated new resources identified in prior IRPs are included, such as the 700 MW of renewables and 500 MWh of storage approved in the 2021 IRP. NTEC is not included in this starting point L&C given Minnesota Power is restudying the need for natural gas generation in this IRP per the requirement ordered in the 2021 IRP. Lastly, BEC3 and BEC4 capacity is removed for Minnesota Power customers at the cease coal commitment dates of 2030 and 2035, respectively. As shown in Table 1 below, the result of the L&C calculation is a capacity surplus or deficit for each MISO Planning Year in the 15-year outlook.

Minnesota Power is a winter peaking utility and monitors the capacity position for all four MISO seasons to ensure year-round reliability for its customers. The Company's winter peak demand coincident with MISO is typically between 15 and 45 MW higher than its summer peak. MISO's existing resource adequacy construct requires utilities to demonstrate they have sufficient capacity resources for each season. For the purposes of the IRP analysis, the capacity expansion analysis was performed over the four seasons.

Table 1 shows the L&C capacity position for the summer and winter seasons and the starting capacity position in the 2025 IRP and the EnCompass Power Planning Software ("EnCompass") evaluation for the Base Case and Growth Case. A positive number demonstrates excess capacity on Minnesota Power's system, while a negative number denotes the capacity deficiency or need in that year. The capacity position for the spring and fall season are shown in Appendix K. In this outlook, without coal operations at BEC and NTEC removed, Minnesota Power has a need for capacity in both summer and winter. Minnesota Power's capacity deficit increases to approximately 700 MW after BEC3 and BEC4 cease coal operations and increases to over 800 MW by 2039. With these large capacity deficits, Minnesota Power cannot remove coal from the power supply until the capacity and energy is replaced with adequate generation resources. Note that Minnesota Power's customers maintain a critical portfolio of generation resources and Demand Side Management ("DSM") resources that contribute to meeting the capacity need and this is factored into the capacity position.

Table 1. Capacity Position for Base Case and +1100 MW Growth Scenario Customer Outlooks

(Positive = Surplus / Negative = Deficit)

	Summer		Winter	
	Base Case MW	**Growth Scenario +1100 MW**	**Base Case MW**	**Growth Scenario +1100 MW**
2025	16	16	139	139
2026	-89	-89	218	218
2027	82	82	61	61
2028	48	-27	331	243
2029	72	-153	278	34
2030	-245	-634	-67	-503
2031	-248	-802	-69	-701
2032	-250	-970	-80	-933
2033	-252	-1139	-108	-1158
2034	-255	-1307	-138	-1385
2035	-655	-1799	-684	-2040

	Summer		Winter	
	Base Case MW	**Growth Scenario +1100 MW**	**Base Case MW**	**Growth Scenario +1100 MW**
2036	-658	-1803	-719	-2075
2037	-662	-1807	-755	-2111
2038	-667	-1811	-793	-2149
2039	-674	-1823	-821	-2182

Minnesota Power expects industrial customers' demand for energy will grow significantly over the study period. To capture the impact of the significant demand growth, Minnesota Power included three load growth scenarios and one load decrease scenario in the analysis. The timing and size of the load growth will have significant impacts on Minnesota Power's capacity needs and will need to be carefully planned for, so the Company has sufficient resources available to reliably serve the changes in demand. The impact the load scenarios have on the capacity position is discussed further Appendix K. The specific load scenarios and associated assumptions are explained later in this section and in Appendix A and Appendix J.

The L&C capacity accreditation values and planning reserve margins used in the EnCompass model are based on MISO's current SAC methodology for accreditation and Accredited Unforced Generating Capability ("UCAP") methodology for the planning reserve margin. After Minnesota Power started its set-up of the EnCompass model for this IRP, FERC approved MISO's DLOL methodology for the supply-side portion of resource adequacy. MISO has not submitted to FERC how demand obligations will be calculated for DLOL, which is still being discussed with stakeholders and will be filed later in 2025. The DLOL methodology replaces some of the elements in the SAC and UCAP methodology, including how the total capacity by class is accredited for resources, what demand is used (moved from demand at system peak to demand when system is stressed), and the reserve margin calculation. Minnesota Power included a sensitivity on how the DLOL methodology could impact the capacity needs in the 2025 Plan. The MISO DLOL methodology will begin in Planning Year 2028-2029. MISO has provided limited information on the impact to Minnesota Power's current portfolio and has provided some system level outlooks on how accredited capacity for wind, solar, and energy storage will likely decline with DLOL. In general, Minnesota Power is anticipating that the capacity needs on the system will increase with the DLOL methodology, and it will require more dispatchable generation in the portfolio to meet that need because the accredited capacity value of wind, solar, and energy storage will decline when MISO moves to DLOL and as more renewable generation is added to the MISO system.

The Base Case and Growth Scenario unserved energy outlook is shown in Table 2, which identifies that the Company also has extensive energy needs to be addressed over the study period given the current outlooks for demand, generation available to serve customers, future cease coal operations at BEC, and removal of NTEC. In the Base Case, without energy replacement, Minnesota Power cannot serve nearly 20 percent of its customer demand. This deficit increases to over 50 percent in the +1100 MW Growth Scenario. Table 2 shows the need for significant resource additions to fill the unserved energy gap.

Table 2. Unserved Energy Outlook for Base Case and +1100 MW Growth Scenario Customer Outlooks

	Base Case		Growth Scenario +1100 MW	
	GWh of Unserved Energy	Percent of Power Supply	GWh of Unserved Energy	Percent of Power Supply
2025	104	1%	95	1%
2026	342	3%	334	3%
2027	140	1%	136	1%
2028	84	1%	146	1%
2029	86	1%	322	2%
2030	458	4%	2,316	16%
2031	730	6%	4,145	26%
2032	607	5%	4,924	29%
2033	569	5%	6,431	35%
2034	503	4%	7,734	39%
2035	2,487	18%	12,071	58%
2036	2,600	19%	12,170	58%
2037	2,696	19%	12,135	58%
2038	2,696	19%	12,176	58%
2039	2,626	19%	12,234	58%

Minnesota Power's customer mix is uniquely weighted with resource-based industry and trends in sales are largely driven by global demand for iron ore, steel, paper, and oil transportation. About 74 percent of the Company's retail and required resale energy sales serve industrial customers. Demand for iron and steel is highly cyclical across economic cycles and the impacts of the general economic downturn (2009), the industry-specific downturn (2015-2016), and recent COVID-19 pandemic induced recession have resulted in dramatic reductions in Minnesota Power's overall retail sales that have since rebounded post-2022. The Company's paper customers' demand has stabilized with the mills being cost competitive in their markets and expected to operate at a steady rate. Oil and natural gas pipeline customers served by the Company tend to have more consistent operations, though they require significantly smaller amounts of energy than the Company's mining or paper customers. The dynamics of Minnesota Power's industrial customers is changing with green steel, electrification, and demand opportunities from new sectors. Customers are expecting their energy demand will increase significantly and that Minnesota Power will plan to meet these needs through an IRP. Customers are indicating growth of 1100 MW in energy demand by 2035. Minnesota Power worked closely with its customers to develop the forecast assumptions used in the 2025 IRP to ensure consistency with customer expectations and the current macroeconomic outlook.

B. Current Outlook – Base Case and Growth Scenario

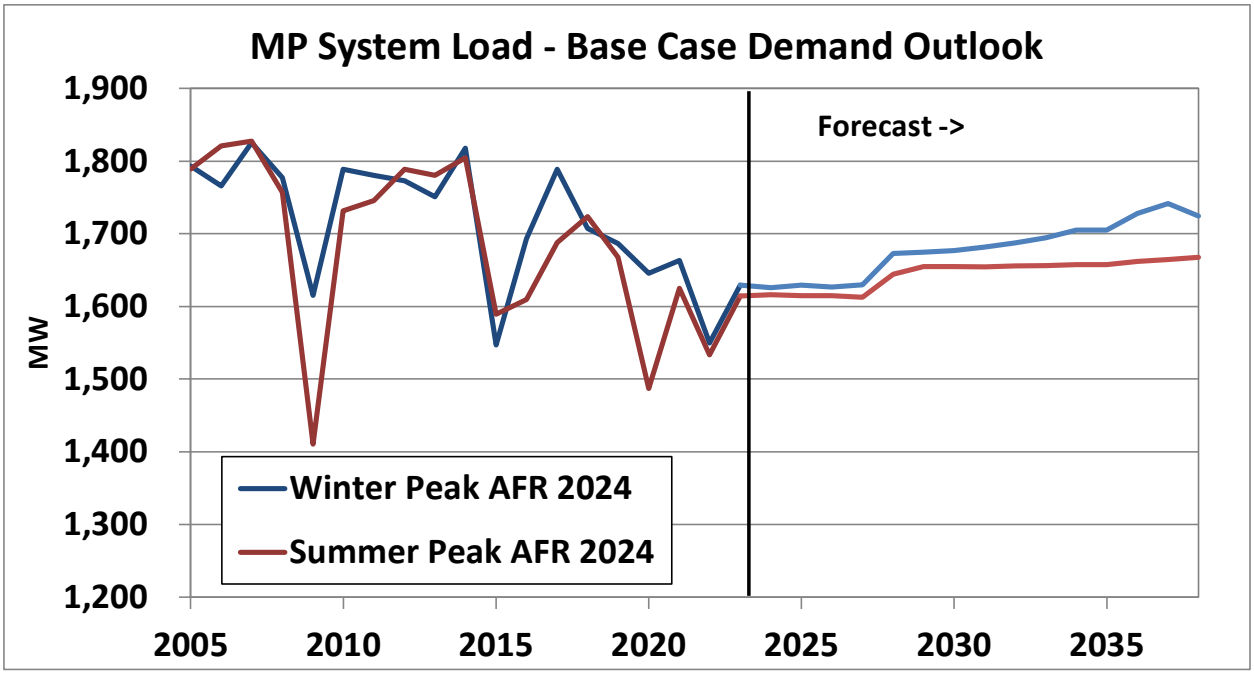
As noted above and discussed in Appendix A, the 2025 IRP considered a range of potential customer load forecast scenarios. Minnesota Power's developed the 2025 Plan to meet two outlooks: the "Base Case" and a "+1100 MW Growth Scenario," reflecting the latest outlook for customer needs on the Company's system. Additionally, the Company evaluated other scenarios as sensitivities in the IRP analysis process including a "+1500 MW" scenario, which includes an additional 1500 MW of industrial load growth between 2027 and 2032, along with 150 percent load growth in the residential and commercial classes; a "-200 MW" scenario, which includes a 200 MW decline in industrial demand starting in 2028; and a "+500 MW" scenario, based on the AFR 2024 load growth planning scenario that takes into consideration potential load growth from accelerated rates of EV and DG solar adoption.

The AFR 2024 Expected Scenario is utilized as the Base Case outlook in this IRP. The AFR 2024 Expected Scenario features an annual energy sales increase of about 0.3 percent per year (on average) from 2024 through 2038. Summer and winter peak demands are projected to increase at average annual rates of 0.2 percent and 0.4 percent, respectively. The AFR 2024 Expected Scenario load forecast reflects 74 MW of system load gain by 2034.[83]

Minnesota Power is historically a winter peaking utility, and based on monthly trends in load behavior is expected to remain winter peaking for the AFR 2024 period of 2024 to 2038. Throughout the forecast timeframe, the seasonal peaks run in parallel with some slight divergence in the later years of the forecast due to increasing saturation of DG solar and EVs.

Figure 2 presents the Company's historical and forecast peak demand by season from the Expected Scenario in AFR 2024, which is the foundation for the Base Case in this IRP. Figure 2 depicts the significant near-term impacts of the COVID-19 pandemic recession (2020), a partial recovery by industrial customers (2021), an anticipated load increase for mining and metals customers, and the long-term underlying decline in loads due to conservation.

Figure 2. Peak Demand by Season - Base Case Demand Outlook

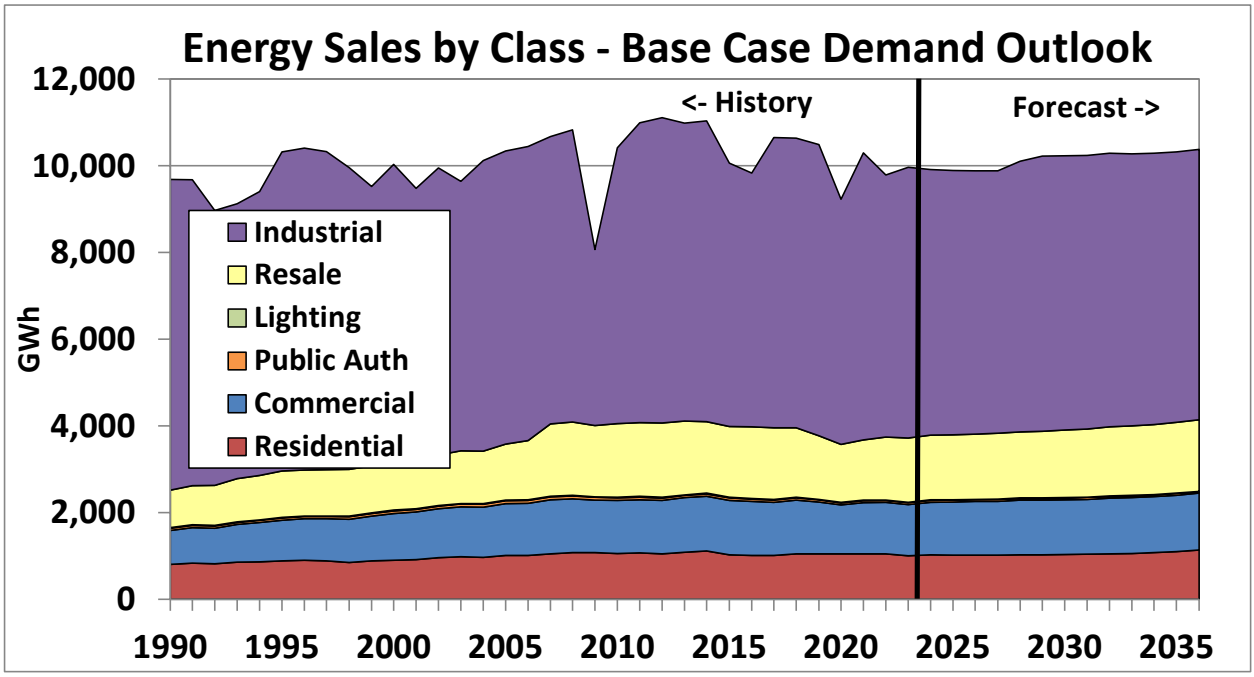


Minnesota Power's Base Case system load forecast reflects projected (summer) peak demands with an annual average of 1660 MW for the post-2030 timeframe with winter peaks averaging 46 MW higher. It is also important to note that an industrial customer load factor of nearly 80 percent drives the energy supply requirements of the Company.

Figure 3 shows historical and forecast energy requirements by customer class and depicts the large influence the industrial class continues to have on the Company's energy requirements.

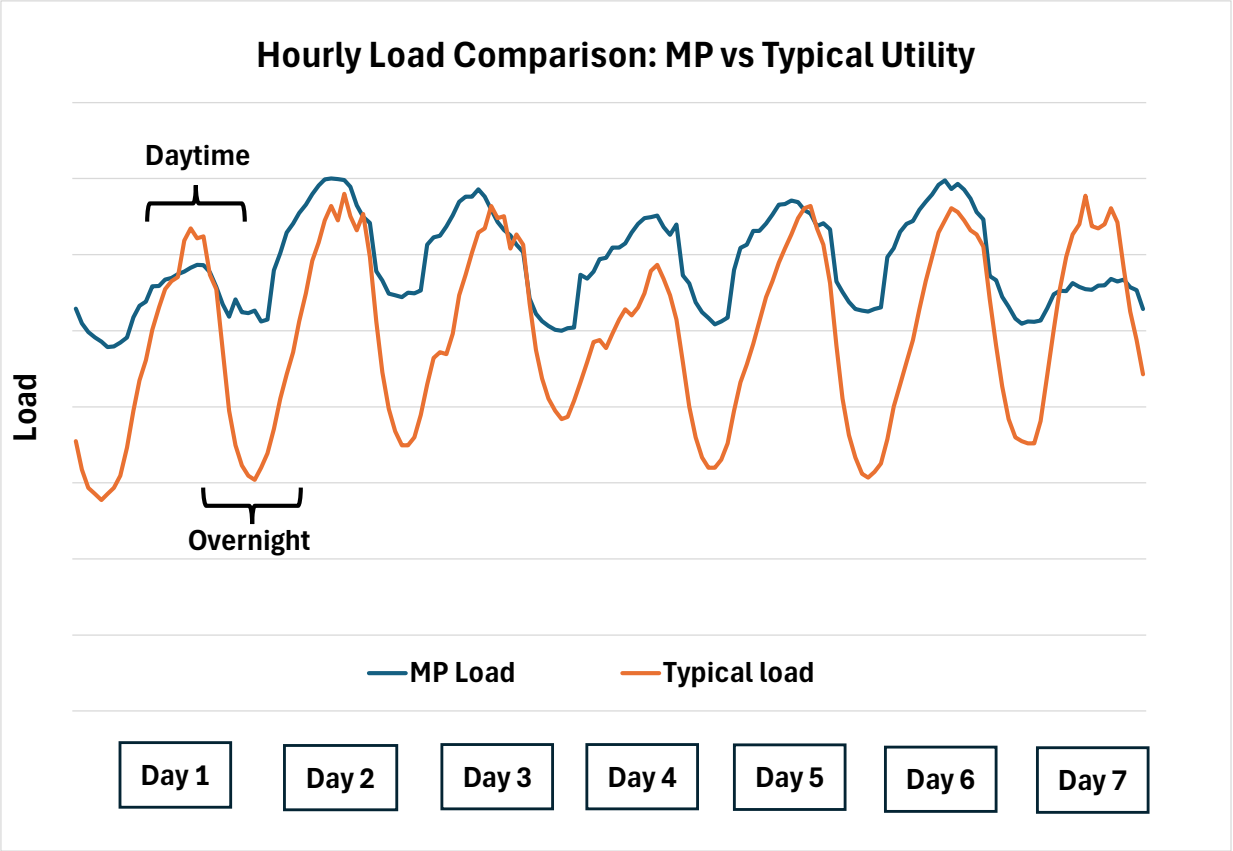
[83] Relative to the 2023 annual peak.

Figure 3. Energy Sales by Class - Base Case Demand Outlook



Minnesota Power has a unique load profile compared to typical electric utilities, due to the higher levels of industrial customers as shown in Figure 3 above. The large industrial customers Minnesota Power serves operate 24/7 with a constant need for energy. The higher percentage of industrial load drives up the average load factor to nearly 80 percent compared to a typical utility load factor of 55 to 60 percent. This results in a relatively steady load, with less energy peaks, meaning throughout a typical day, the total energy demand does not increase or decrease to the level of neighboring utilities. Figure 4 compares a sample typical week hourly load of Minnesota Power with a typical utility load, illustrating the fact that Minnesota Power's load does not decrease overnight, as a typical electric utility's load does. This hourly shape profile affects the IRP planning evaluation and the type of generation resources Minnesota Power requires to reliably serve customers. More energy is needed around the clock to meet a high load factor system and ensure reliability metrics can be met. Minnesota Power's customer mix has a direct impact on system planning that differentiates its system from other utilities, which serve a customer mix with higher concentrations of residential and commercial demand.

Figure 4. Hourly Load Shape Comparison Between Minnesota Power and Typical Utility



Sensitivities for Demand and Energy used in the 2025 Plan Development

To capture the plausible ranges of uncertainty in Minnesota Power's customer outlooks, three load growth sensitivities were chosen for further examination. They are included as the "+500 MW," "+1100 MW Growth Scenario", and "+1500 MW" sensitivities. The +1100 MW Growth Scenario, along with the Base Case are the two primary outlooks used to develop the 2025 Plan as they represent the latest in customer expectations. The evaluation of the other growth scenarios, +500 MW and +1500 MW, are included to inform how the 2025 Plan would change if demand growth was slower or faster than anticipated. Minnesota Power also studied how the 2025 Plan would be impacted if there is a net loss of a large industrial customer with the inclusion of a "-200 MW" sensitivity. These outlooks, shown in Figures 5 and 6, demonstrate that the 2025 IRP evaluated the range of uncertainty that exists within the Company's unique customer base.

The +1100 MW Growth Scenario includes approximately 1100 MW of load coming online within the industrial customer class by 2035. The +1500 sensitivity includes 150 percent load growth in the residential and commercial classes compared to the Base case. Additionally, it includes 1500 MW of industrial load growth by 2038. The -200 sensitivity includes 200 MW of load loss within the industrial class by 2028. Appendix A contains additional details on the +500 MW, +1100 MW Growth Scenario, +1500 MW, and -200 MW load change scenarios.

Figure 5. Demand Outlook Sensitivities for MISO Coincident Peak (CP)

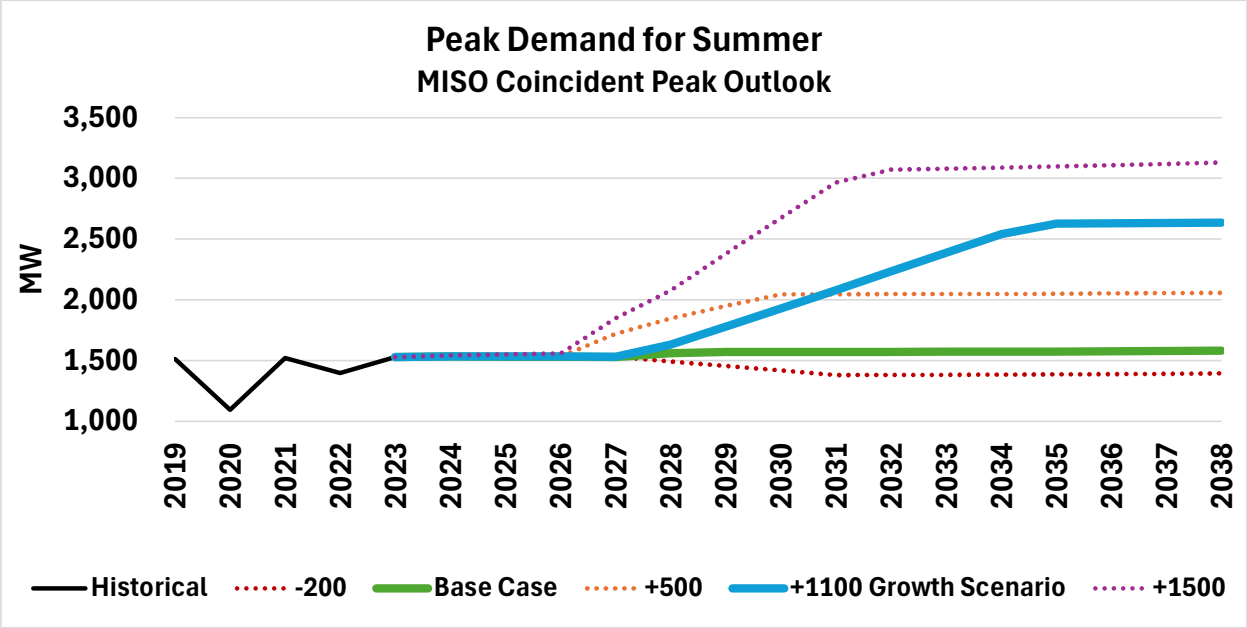
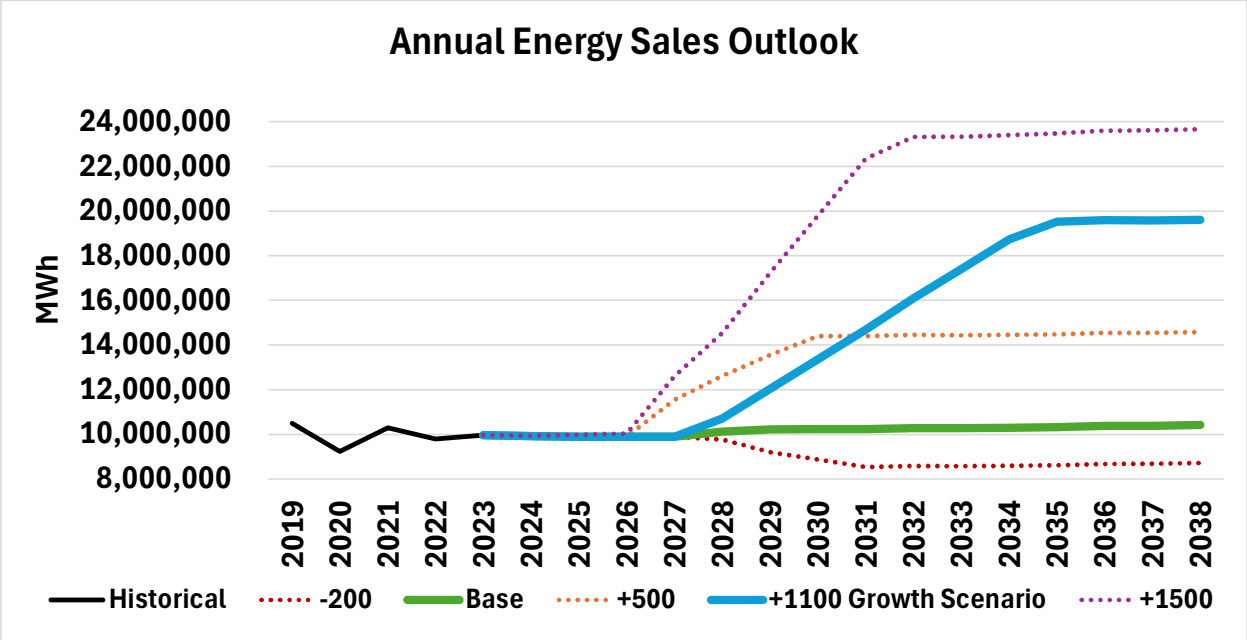


Figure 6. Energy Outlook Sensitivities



Minnesota Power continually monitors rate competitiveness, industry trends, and opportunities for load growth in northeastern Minnesota. The 2025 IRP is demonstrating historic potential for the region. Hence, making prudent and reasonable power supply plans for meeting the future electric needs of its customers is critical to maintain reliability, sustainability, and economic benefits available as the region grows.

C. Minnesota Power's Large Industrial Customer Base

Major industries served by Minnesota Power are summarized below.

Mining Customers

Minnesota Power provides electric service to six taconite mining facilities with current annual production capability of up to 41 million tons of taconite pellets (see Table 3). Taconite pellets produced in Minnesota are primarily shipped to North American steel making facilities and are part of the integrated steel industry. Steel produced from these North American facilities is used primarily in the manufacture of automobiles, appliances, pipe and tube products for the gas and oil industry, and in the construction industry.

Table 3. Minnesota Power Taconite Customer Production

Minnesota Power Taconite Customer Production	
Year	**Tons (Millions)**
2008	39
2009	17
2010	35
2011	39
2012	39
2013	37
2014	39
2015	31
2016	29
2017	38
2018	39
2019	37
2020	30
2021	39
2022	32
2023	35
Average	35

Business cycles and short-term market corrections have and will continue to impact Minnesota's large mining operations. The Base Case and +1100 MW Growth Scenario load forecasts assume continued operation at all six of mining customers through the end of the forecast timeframe. This equates to a 35-million-ton level of production and is consistent with the long-term (2008-2023) historical average.

The Company's Base Case load forecast assumes operations begin at the NewRange Copper Nickle Project ("NewRange"). NewRange is a joint venture between Glencore and Teck Resources that took ownership of the former PolyMet mine development company with plans to develop an open-pit copper-nickel mine on the Iron Range that will annually produce 72 million pounds of copper, 15.4 million pounds of nickel, 720,000 pounds of cobalt, and 106,000 troy ounces of precious metals.

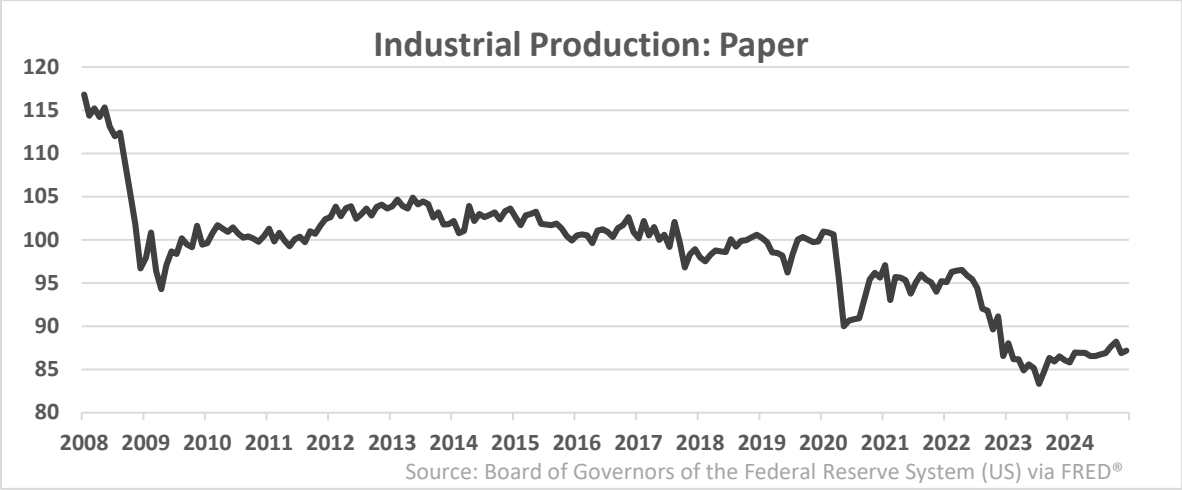
Minnesota Power is also seeing interest in green steel manufacturing opportunities. Steel manufacturing is transitioning to less carbon intensive methods, which increase the utilization of electricity for advanced processing of minerals and ultimate manufacturing of cleaner steels. Green steel methods are electric and hydrogen intensive. The potential for higher demand driven by mining is factored into the load growth evaluated in this IRP. Minnesota Power continues to work closely with mining customers to ensure their latest outlook ranges for energy demand are captured in the load forecast sensitivities.

Paper & Pulp Customers

Minnesota Power serves four paper and pulp customers that produce market pulp and various grades of printing and writing paper used in office papers, magazines, catalogs, tissue, and print advertising/direct mail. The North American printing and writing paper manufacturing industry has experienced a decline resulting in mill consolidation and closures. Minnesota Power's customers' operations have reflected the industry's decline; Boise Paper (owned by Packaging Corporation of America) idled its number 2 and number 4 paper machines and Blandin Paper Company (owned by UPM-Kymmene) idled its number 5 paper machine.

As shown in Figure 7, U.S. printing and writing paper demand was projected to continue to decline prior to the COVID-19 pandemic recession, which reduced consumption of printing and writing papers by over 20 percent. The decline in demand for printing and writing paper was driven by electronic media substitution and the associated migration of advertising budgets away from catalogs, newspaper inserts, brochures, and direct mail. However, starting in 2023, demand for paper started to stabilize, indicating more steady demand going forward.

Figure 7. U.S. Paper Demand 2008-2025 (est.)



The four operating paper mills served by the Company, representing approximately 1.5 million tons of paper production and about 360 thousand tons of dissolving pulp, are owned by well-established, major paper industry leaders (Sappi, Blandin Paper Company, Boise Paper, and Sofidel America). As reflected in this 2025 Plan, Minnesota Power's assessment is that these corporations view their Minnesota assets as strategic to their respective business strategies. Each of the Minnesota mills is well positioned and cost-competitive in their respective paper markets with excellent customer relationships. The Company projects steady capacity utilization rates for

these mills over the forecast period, as these mills successfully control costs, reshape their products, and compete for market share.

Pipeline Customers

Minnesota Power has two pipeline customers, Enbridge Energy and Minnesota Pipe Line Company, both of which rely heavily on Western Canadian crude oil production. Enbridge Energy transports crude oil across North America. Minnesota Pipe Line Company receives oil from Enbridge Energy at Clearbrook, Minnesota, and delivers it to refining centers in the Twin Cities metropolitan area. A significant oil discovery in northern Alberta in the early 1990s has led to increased throughputs on both the Enbridge Energy and Minnesota Pipe Line Company systems. At the same time, shale oil production in North Dakota has also been increasing. Oil sands and North Dakota shale oil production are forecast to continue to increase over present day levels over the next few years. This will prompt the need for increased transport capacity on the Enbridge Energy and Minnesota Pipe Line Company systems.

Both Enbridge Energy and Minnesota Pipe Line Company take service under Minnesota Power's Large Light and Power Service Schedule ("LLP Schedule"). Neither Enbridge Energy nor Minnesota Pipe Line Company is currently required to provide Minnesota Power with demand nominations under the LLP Schedule. Pipeline maintenance and replacement activities at these companies is not expected to result in a net load increase across the Minnesota Power and Superior Water, Light and Power service territories.

IV. 2025 MODELING APPROACH

Consistent with the Company's previous 2021 IRP, the 2025 IRP analysis utilized the EnCompass to help inform planning decisions. EnCompass is a granular modeling tool that can analyze complex power supply scenarios under various assumptions, while helping the Company identify pathways to meet the Minnesota CFS milestones for the planning period. Minnesota Power believes EnCompass has sufficient granular modeling capabilities to accurately reflect alternatives to meet customer energy and capacity needs and can be relied upon to provide additional insights and support critical reliability analysis.

Minnesota Power is following a similar approach used in prior IRP submittals where the Company evaluated removing coal from its system along with replacement energy and capacity needs. This IRP includes performing a multi-step Capacity Expansion Analysis that selects resources to replace coal energy and capacity at BEC3 and BEC4 across Minnesota's designated carbon regulation and environmental cost futures and meets the Minnesota CFS requirements. Minnesota Power also performed a retirement study for HREC, where the Company evaluated the impacts of retirement of this facility on the power supply and transmission system. Lastly, the IRP analysis looks beyond the planning period and evaluated pathways to reach Minnesota's 100 percent CFS by studying a wind, solar, battery only system, and evaluated impacts to the 2025 Plan if emerging technologies were commercially available today.

In its January 9, 2023 Order in the 2021 IRP, the Commission directed Minnesota Power to consult with stakeholders to develop the modeling inputs and parameters to be used in the Company's next IRP.[84] As part of the formal IRP engagement process, independent third-party facilitators from the Great Plains Institute and Center for Energy and Environment convened a subgroup of interested participants, identified as TAG, to work with Minnesota Power staff on developing modeling assumptions. A description of the specific activities to date can be found in Appendix N. Multiple participants expressed that they did not want to be asked to reach a final consensus on modeling assumptions. While agreed upon assumptions were not a direct product of the engagement process, the input and feedback received during the meetings helped shape some of the key modeling inputs Minnesota Power used in the EnCompass analysis. The Company appreciates the feedback received and enjoyed the conversations with participants in the engagement process. The assumptions resulting from working with internal subject matter experts and external participants are provided in Appendix J.

New to this IRP and as its system reaches new levels of transformation of its supply portfolio, Minnesota Power felt it was critical to clearly demonstrate that as the Company reduces carbon in the power supply, the reliable energy service delivered today will not change. Minnesota Power reviewed the resulting plans from the analysis to ensure they met specific reliability criteria that were developed by the Company, in alignment with North American Electric Reliability Corporation ("NERC") and regional standards, referred to as the Minnesota Power Reliability Criteria ("MPRC"). At the TAG meetings, Minnesota Power reviewed the proposed reliability criteria framework with participants and sought feedback. As a result of that work and feedback, the Company developed a set of reliability criteria it can use as part of its integrated planning that focuses on four core areas: (1) Traditional Planning, (2) Energy Adequacy, (3) Operational Flexibility, and (4) Grid Essential Services. Components of the reliability criteria can be used as a valuable benchmarking tool that helps identify deficiencies or degradation to reliability of the power supply system and provides insights into identifying options that could mitigate issues. How

[84] *In the Matter of Minnesota Power's 2021-2035 Integrated Resource Plan*, Docket No. E-015/RP-21-33, Order Approving Plan and Setting Additional Requirements at Order Point 11 (Jan. 9, 2023).

the reliability criteria were applied in this IRP analysis, and how it could be applied to future planning, is discussed further in Section V and Appendix K.

This section introduces the analysis process used to develop the 2025 Plan, the cease coal scenarios at BEC3 and BEC4 and alternative operational scenarios, pathways to Minnesota's CFS, Hibbard Retirement Study, and new resource alternatives that were available for EnCompass to select.

This section covers the following topics:

- Analysis Process;
- Early Retirement Scenarios and Refueled Alternatives Evaluated;
- Demand and Supply Side Alternatives; and
- Environmental Futures Considered in the IRP Analysis.

A. Analysis Process

A multi-step planning evaluation was used to conduct an extensive analysis, evaluating different scenarios for ceasing coal at BEC3 and BEC4, retirement at HREC, and to select the least cost resource alternatives to augment the Company's power supply for long-term customer requirements and to meet carbon-free requirements. The extensive scope of the 2025 IRP as it identifies replacement for its last baseload capable resources and historic load growth scenarios is a complex evaluation that includes consideration of Minnesota Power's current and future power supply needs, cost to replace the energy and capacity, environmental profiles, and impacts to the reliability of the power supply and transmission systems. To accomplish this, the 2025 IRP introduces several new steps that thoroughly evaluate different load growth scenarios, clarifies additional actions needed to meet the CFS, dives into power supply reliability, and began evaluating the impact emerging technology could have on a power supply plan. The analysis and associated EnCompass modeling incorporate the Minnesota planning requirements per Minn. Stat. §§ 216B.2422 and 216H.06 for carbon regulation and environmental cost. The 2025 IRP evaluation was done by using the following steps:

1. "Traditional Capacity Expansion Analysis" – Identify which resource alternatives should be added to the power supply. This includes resource alternatives that replace BEC3 and BEC4 coal capacity and energy at the cease coal commitment dates from the approved 2021 Plan.
2. "Pathways for Industrial Demand Scenarios" – Identify the resource alternatives mix needed to meet multiple demand forecasts.
3. "Pathways to Minnesota CFS Analysis" – Identify which additional carbon-free resource alternatives are needed to augment the 2025 Plan established in Step 1 and 2 to meet Minnesota's CFS requirements. This step also explores what Minnesota Power's system could look like and operate under if only wind, solar, and energy storage are available to augment the energy portfolio to meet the loss of baseload supply and the CFS Requirements.
4. "Emerging Technology Capacity Expansion Analysis" – Identify how the capacity expansion analysis changes if emerging technologies, that are not expected to be commercially available at the time of BEC3 and BEC4 cease coal dates, were available.
5. "2025 Plan Selection" – Finalize two preferred plans, one for the base customer forecast ("Base Plan") and one for the +1100 MW Growth Scenario ("Growth Plan").

6. “2025 Plan Reliability Criteria Evaluation” – This is the core analysis that evaluates the resiliency and reliability of the two plans and identifies if any modifications are needed to improve resiliency and reliability.
7. “2025 Plan Energy and Capacity Outlook” – Detailed review of Minnesota Power’s 2025 Plan.
8. “Hibbard Retirement Study” – Identify the impacts to the 2025 Plan if HREC’s renewable dispatchable energy and capacity is retired. The results of this analysis are discussed in more detail in the Hibbard Retirement Study in Appendix O.

For this IRP analysis, Minnesota Power included several carbon-free emerging technologies as resource alternatives. Many of these technologies are still in development and have not reached commercialization or full pilot stage. With emerging technologies there is uncertainty on actual generation performance and cost until the technology reaches commercialization and several years of operations. Included in the analysis are the latest operational and cost expectations for these emerging technologies. In order to continue to advance the development and evolution of carbon reducing technologies, Minnesota Power is requesting in this 2025 IRP, a development fund for initially $30 million to support working with customers to advance the development and integration of emerging technologies. Minnesota Power will continue to report in future IRPs on advancements in design and economics of emerging technologies for customers.

There are several considerations and variables that contribute to the decision to continue current operations, refuel, or retire a facility. For example, time to engineer, procure, and construct new transmission needed to mitigate transmission issues caused by retirement can take several years and needs to be factored into choosing the dates considered for early retirement. The Hibbard Retirement Study (Appendix O) identified that there is a need for local transmission upgrades and was one of the key factors in determining the earliest feasible retirement date, along with time to build replacement capacity and renewable energy and community impacts caused by retirement. The EnCompass analyses factors in the appropriate cost for studying early retirement, including transmission upgrades, decommissioning costs, environmental costs, and changes to O&M and capital cost at the facility. The dates considered for BEC3 and BEC4 cease coal and refuel options are based on the cease coal commitments from the 2021 IRP, by 2030 and 2035, respectively. The retirement date considered for HREC is discussed further in Appendix O.

See Appendix K for more details on the analysis used to screen resource alternatives and demand-side resources to select the most cost-effective options for customer needs.

B. Early Retirement Scenarios and Refueled Alternatives Evaluated

The Capacity Expansion Analysis evaluated retirement and/or refuel scenarios for BEC3, BEC4 and HREC. Factored into the earliest timing for a HREC retirement was the magnitude of the impact to the bulk and local electric system and the timing to implement solutions to address these impacts, which could include new transmission or new local generation.[85] Shown below are the retirement scenarios included in the EnCompass Capacity Expansion Analysis.

Retirement Scenarios:

1. BEC3 retires by end of 2029;

[85] Refer to Minnesota Power’s Hibbard Retirement Study (Appendix O), on how the Company identified a retirement scenario for HREC.

2. BEC4 retires by end of 2034; and
3. HREC retires by end of 2032.

The Capacity Expansion Analysis evaluated refueling opportunities at BEC3 and BEC4, which included biomass and natural gas, along with demand and supply side replacement options. The options studied to replace BEC3 and BEC4 coal operations are discussed later in this section. Factored into the biomass refuel scenarios was biomass availability based on recent fuel availability studies performed by Minnesota Power. Because of the availability of biomass, the Company studied co-firing biomass and natural gas in the IRP, along with a 100 percent natural gas refuel scenario. Also included for BEC4 was a 40 percent natural gas refuel scenario that meets the requirements for the current EPA's Section 111(d) carbon regulation.

Refuel Scenarios:

1. BEC3 refueled with 100 percent natural gas by end of 2029;
2. BEC3 refueled with co-firing biomass and natural gas by end of 2029;
3. BEC4 refueled with co-firing biomass and natural gas by end of 2034; and
4. BEC4 refueled with 40 percent natural gas by end of 2029 and cease coal operations by end of 2034.

Lastly, at the request of engagement participants, a scenario was included as a reference case for cost impact comparisons where BEC3 and BEC4 continue to operate on coal. Additional information on this scenario is included in Appendix K.

Given the potential for significant remaining customer energy and capacity requirements when evaluating extensive retirements such as BEC and load growth scenarios, several generation alternatives and supply-side resource alternatives were modeled to replace the energy and capacity retired and meet long-term customer demand for electricity. These resource alternatives can also be selected to reduce overall system carbon emissions if it is economical to do so or to meet the CFS.

C. Demand and Supply Side Alternatives

For Steps 1-3 of the Capacity Expansion Analysis, EnCompass selected from the following demand and supply side resource options:[86]

Demand Side Alternatives:

1. Up to 100 MW Long-Term Enhanced Industrial Demand Response with Energy Curtailment;
2. Air Conditioning Load Control and Hot Water Load Control; and
3. High and Higher Energy Efficiency Scenarios.

Supply Side Alternatives:[87]

1. 100 MW Wind Farm;

[86] Appendix K includes a complete list of resource alternatives considered in the analysis. This list was screened to remove higher cost alternatives due to limitations on the number of resource alternatives that can be evaluated in EnCompass.

[87] In the higher load scenarios, to improve the efficiency of the EnCompass model's Capacity Expansion Analysis, Minnesota Power increased the minimum block size of renewables and storage (i.e., increase wind from 100 MW to 200 MW) that could be selected.

2. 100 MW Solar Farm;
3. 110 MW Natural Gas-Fired Reciprocating Internal Combustion Engine ("RICE");
4. 228 MW Natural Gas-Fired Simple-Cycle Gas Turbine;
5. 414 MW Natural Gas-Fired Simple-Cycle Gas Turbine;
6. 636 MW Natural Gas-Fired 1x1 Combined-Cycle;
7. 719 MW Natural Gas-Fired 1x1 Combined-Cycle;
8. 100 MW Lithium-Ion Battery with 4 hours of Storage;
9. 100 MW Lithium-Ion Battery with 8 hours of Storage;
10. 100 MW Non-Lithium-Ion Battery with 12 hours of Storage;[88]
11. 100 MW Non-Lithium-Ion Battery with 100 hours of Storage; and
12. 50 MW Biomass.

For Step 4, the Emerging Technology Analysis, the following technologies were made available to be selected during the study period:

1. 541 MW Natural Gas-Fired 1x1 Combined-Cycle with Carbon Capture;
2. 611 MW Natural Gas-Fired 1x1 Combined-Cycle with Carbon Capture;
3. 200 MW Pumped Hydro with 20 hours of Storage;
4. 391 MW Supercritical Pulverized Coal with Carbon Capture in North Dakota;
5. 442 MW Advanced Nuclear SMR;
6. 30 MW Deep Enhanced Geothermal in North Dakota; and
7. 30 MW Deep Enhanced Geothermal in Minnesota.

Minnesota Power modeled the benefits from production tax credits and investment tax credits made available through the Inflation Reduction Act of 2022 for technologies that met the eligibility requirements.

Note that more than one of each resource alternative mentioned above can be chosen during the Capacity Expansion Analysis. Also, the capacity listed is the installed capacity value for each resource. For information on capital costs, please refer to Appendix J.

D. Environmental Futures Considered in the IRP Analysis

The Capacity Expansion Analysis and 2025 IRP analysis was conducted for the four Commission-ordered environmental cost scenarios and the Reference Case scenario with mid-carbon regulatory costs starting in 2028.[89] At the request of engagement participants, Minnesota

[88] Several of the non-li-ion battery technology with 12 to 100 hours of storage capability is still in development or considered "emerging technology". Minnesota Power modeled these technologies as part of the Step 1-3 because the Company believes these technologies will reach commercial maturity within the study period.

[89] *In the Matter of Establishing an Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minnesota Statutes § 216H.06* and *In the Matter of Establishing an Updated 2022 Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. § 216H.06*, Docket Nos. E-999/CI-07-1199 and E-999/DI-22-236, Order Addressing Environmental and Regulatory Costs (Dec. 19, 2023).

Power included a "no carbon regulation cost and no environmental cost" scenario to clearly identify customer cost impacts, given carbon regulation cost and other environmental cost adders are currently not included in rates. Reflected in Table 4 are the futures included in the 2025 IRP analysis, in total, there were five environmental futures and approximately 20 sensitivities that were evaluated. The insights gathered from the 2025 IRP analysis assisted in the Company's development of the 2025 Plan.

Table 4. Six Futures Considered in 2025 IRP Analysis

		Carbon Dioxide (CO_2)[90]				Other Criteria Pollutants
		Prior to 2028		2028 and Thereafter		
Futures	EnCompass Case Name	Environmental Cost	Regulation Cost	Environmental Cost	Regulation Cost (2025)	Environmental Costs
Low Environmental Cost	CLE1S	$143		$160		Low
High Environmental Cost	CHE1S	$397		$438		High
Low Environmental Cost and Low Carbon Regulation Cost	CLER1S	$143		$155	$5	Low
High Environmental Cost and High Carbon Regulation Cost	CHER1S	$397		$363	$75	High
Reference Case	CREF1S	$270		$259	$40	Mid
"Customer Look": no carbon regulation cost and no environmental cost	CCUST1S	-	-	-	-	-

[90] Carbon cost are shown in dollars per ton.

V. 2025 PLAN DEVELOPMENT

Minnesota Power's 2025 Plan outlines additional actions to further reduce carbon emissions, identifies steps required to reliably replace its coal-fired generation, and augments its portfolio with additional clean energy to meet the Minnesota CFS 90 percent carbon-free milestone by 2035. Since the submission of the 2021 Plan, Minnesota Power has refined and updated its key assumptions, modeling practices, and conducted the Hibbard Retirement Study (found in Appendix O) to evaluate feasible scenarios for potential retirement of the HREC, but the 2025 Plan ultimately supports continuing operation of HREC. Through its broad engagement process, the Company gathered insights into the issues most important to the participants and incorporated the feedback received during the IRP engagement meetings. The 2025 Plan is the next phase of Minnesota Power's *Energy**Forward*** strategy and was created using core resource planning principles that address reliability, customer costs, environmental regulations, new Minnesota planning requirements, technology evolution, and consideration of host community impacts.

This section covers the following topics:

- Key Planning Principles;
- Handling Uncertainty with a Flexible Plan;
- Steps 1-4: Capacity Expansion Analysis;
- Step 5: 2025 Plan Selection;
- Step 6: 2025 Plan Reliability Criteria Evaluation; and
- Step 7: 2025 Plan Energy and Capacity Outlook.

A. Key Planning Principles

Key Principles

Minnesota Power takes a principled approach to its analysis to ensure the resulting strategy is robust, sustainable, and in the best interest of customers. The principles below helped shape the resulting 2025 Plan, which embodies the Company's *Energy**Forward*** strategy, is forward looking to the future needs of customers, and incorporates the key insights participants identified through the IRP engagement process:

1. Remaining a Trusted, Reliable Electric Service Provider – Our customers receive energy service that is 99.99 percent reliable today and expect it to continue as Minnesota Power transitions toward providing increasingly cleaner energy. The Company has the responsibility to plan and bring forward a resource strategy and accompanying grid improvements that provide adequate energy resources that can be available during extreme conditions, such as a polar vortex or heat wave, and under varying levels of renewable production and system conditions. This IRP introduces reliability criteria that are integrated into the plan development and analysis to ensure a reliable power supply system as Minnesota Power reaches new levels in reducing carbon and integrating significant amounts of renewable energy. Furthermore, it is becoming evident that with the retirement action taken to date on Minnesota Power's system and in the broader MISO region, that utilities must remain disciplined and diligent to protect the integrity of the power supply it utilizes to serve customers. Becoming over-reliant on regional markets increases exposure that has system reliability and customer cost consequences. Minnesota Power will not recommend ceasing operation of an energy supply asset until an adequate replacement(s) are

operating to ensure no loss or gap in our ability to provide reliable service. The permitting, procurement, and implementation processes of new resources can no longer be trusted to be timely, and the consequences are too significant if action on existing generation is taken too early. This 2025 Plan will demonstrate how the Company plans to cease all coal operations for its customers and bring forward an action plan that is realistic and reasonable for meeting the reliability requirements over the planning period.

2. Advance Sustainability – Minnesota Power is committed to climate action and working towards a sustainable future for both its customers and communities. The resource planning evaluation considered scenarios that continue the carbon reduction journey that began in prior IRPs and aligns with Minnesota Power's long-term vision to provide increasingly clean energy and meet the 90 percent carbon-free electricity CFS requirement by 2035. Minnesota Power is a clean energy leader, already delivering more than 50 percent renewable energy to its customers and will be 70 percent renewable after the wind and solar identified in the 2021 IRP goes into service. A successful plan also needs to be sufficiently robust and flexible to adapt to changing customer demand, leave room for advancements and innovation in existing and new carbon-free technologies, leverage existing infrastructure to minimize cost impacts, and be informed by our customers and host communities.

3. Transparency with Planning Insights – An IRP is designed to deliver several planning insights that will help build trust with employees, customers, regulators, communities, advocates, and Tribal Nations on the recommended 2025 Plan. Minnesota Power has developed the 2025 Plan based on a sound IRP analysis that manages customer costs and reliability from multiple perspectives and outcomes, while incorporating Minnesota's environmental planning criteria and new carbon-free requirements. Minnesota Power is committed to being transparent with the impacts of the 2025 Plan from retirements and required federal and state laws in the IRP process.

4. Preparing for Load Growth – A robust IRP will bring forward planning that meets the needs of tomorrow's system, requiring flexible plans and insights that can efficiently be used to adapt to changes in the demand forecast as required. Minnesota Power's customers are communicating that their demand will grow rapidly in the next five to ten years, potentially doubling the size of Minnesota Power's energy demand, resulting in economic benefits for the region, communities, and all customers. Minnesota Power is requesting approval for both a Base Plan and a Growth Plan that meets this moment, more efficiently utilizes the existing system, and identifies additional needs to meet reliability requirements along with achieving the Minnesota CFS requirements for these new outlooks. The Growth Plan provides a key planning foundation and will be augmented as more information becomes known from individual customers while also demonstrating benefits to our broad customer base. Allowing flexibility within an approved plan gives Minnesota Power the capability to act on a prudent plan designed to meet changing demand using least cost planning.

B. Handling Uncertainty with a Flexible Plan

Utilities continually plan in an uncertain business environment and recognize that not all assumptions will become reality. Resource planning in Minnesota is robust, dynamic, and allows additional information to be gathered and applied to adjust resource strategies on an ongoing basis, in the best interests of customers.

Minnesota Power endeavored to create a 2025 Plan that contains power supply options to position its customers for a sustainable carbon-free future, while working to mitigate unnecessary reliability and cost risk. The Company's planning process evaluates the 2025 Plan with a series of sensitivities, including additional resources to meet the increasing energy needs. There are three key areas of uncertainty the Company identified for the 2025 Plan: (1) system adequacy and strength of the transmission grid, (2) customer demand outlooks, and (3) technology advancements.

MISO Resource Adequacy and Strength of Transmission

Resource Adequacy

Minnesota has an established history of robust resource planning processes that ensure reliable energy service, while at the same time positioning for a future of less carbon-intensive resources. The backdrop for the 2025 IRP study period includes significant energy system transformation. As older coal generation retires in the region, the system is becoming more reliant on wind and solar resources that are only available when the wind is blowing, or the sun is shining. Along with traditional resource adequacy planning methods, Minnesota Power has incorporated additional reliability criteria into its IRP development process for its 2025 IRP. Incorporating reliability criteria will create additional transparency and clarity on planning that includes the development of a reliable power supply across operating conditions and position the Company to have sufficient capacity to meet MISO's evolving resource adequacy requirements. This section focuses on planning uncertainties at MISO that pertain to resource adequacy. Minnesota Power further discusses its reliability criteria later in this section and in Appendix K.

Minnesota Power is monitoring two key areas of uncertainty at MISO during the study period: (1) MISO resource adequacy construct changes; and (2) the timing on when the transmission system can accommodate new renewable and dispatchable generation resources as additional coal generation is retired and new transmission is built.

The core tenets of the MISO resource adequacy construct in place at the time of Minnesota Power's last IRP were formed when MISO's energy mix contained mostly dispatchable coal and gas generation. As the power supply transitioned and accommodated the addition of more renewable energy, MISO's resource adequacy construct had to also adapt, such as enhancing requirements for demand response and more detailed evaluation of storage and renewable contributions to resource adequacy. MISO, along with Minnesota Power, recognizes that the resource adequacy construct needs to continue to adapt for even higher levels of renewable energy penetration, and to ensure there can be energy coverage for all hours and extreme system conditions to ensure reliability. Since the 2021 IRP, MISO worked with stakeholders on several changes to the MISO resource adequacy construct that better capture availability of generation resources when needed by the system during stressed periods. MISO refers to these changes as the SAC and DLOL resource adequacy methodologies.[91]

The SAC methodology started in MISO Planning Year 2023-2024 and the DLOL methodology will start in MISO Planning Year 2028-2029. Another change to MISO's resource adequacy construct is the implementation of the Reliability-Based Demand Curve ("RBDC") for MISO Planning Year 2025-2026, which is intended to more accurately reflect the value of capacity and contribution to reliability. Lastly, MISO has proposed material changes to the requirements for demand response to qualify as a capacity resource. These proposed changes could impact the

[91] FERC approved the supply side methodology for DLOL on October 25, 2024. MISO is working with stakeholders on developing how the Load Serving Entity allocation of system demand requirements will be calculated under the DLOL methodology. This is expected to be filed with FERC in 2025.

quantity of demand response industrial customers make available to Minnesota Power, because the requirements could prove to be too onerous for customers. The aggregate of these changes is a drastic shift away from MISO's more traditional resource adequacy construct where capacity value and reserve margin were based on system peak conditions. With the volume of significant changes to MISO's resource adequacy construct over the last couple of years, Minnesota Power will continue monitoring the following key areas to better understand the impacts to Minnesota Power's plans for the capacity and energy needs in future IRPs:

- Variability of accredited capacity values of supply side and demand side resources;
- Quantity of available demand resources customers make available;
- Impact of RBDC on the final Planning Reserve Margin ("PRM") and the market clearing price and associated bilateral capacity markets; and
- Impact of resource portfolio transformation and the DLOL methodology on portfolio level resource accreditation values and planning reserve margin.

Minnesota Power will continue to actively participate and provide feedback to MISO on resource adequacy reform and the Reliability Imperative[92] to ensure Minnesota Power's generation and demand response is properly valued for its reliability contribution.

Strength of Transmission Grid

An important component of a successful transition to a decarbonized future is having a robust transmission system. The grid must be ready to integrate increasing variable renewable energy, while allowing for the retirement of baseload generation and delivering energy from where it is created to where it is needed on a 24/7 basis. It will take the coordination and collaboration of all regulatory entities to help ensure we can meet needs for this infrastructure.

MISO has started answering the call and looking to these futures and acting through the LRTP process. To date, two tranches of regional transmission projects have been brought forward that improve reliability and support the changing capacity profile on the system. A number of these projects support Minnesota Power's system and the broader region to help enable the Company's continued transition.

The Tranche 1 portfolio consists of 18 projects that traverse the MISO Midwest subregion. The double-circuit 345 kV Northland Reliability Project, which is a collaboration between Great River Energy and Minnesota Power, is included in Tranche 1 and targeted to be in-service by 2030. The Northland Reliability Project is an example of transmission that will improve reliability, strengthen voltage support, and improve the capability to transfer energy to northeastern Minnesota. The Tranche 2.1 portfolio consists of 24 projects across the MISO Midwest subregion. There are several projects included in MISO Tranche 2.1 that will improve reliability and energy transfer in and around Minnesota Power's service territory. These projects are targeted to go into service from 2032 to 2034 if they are able to stay on track with permitting and implementation.

Lastly, and as part of the modernization of the grid that is underway, Minnesota Power received Commission approval for its HVDC Modernization Project.[93] The HVDC Modernization

[92] In 2020, MISO developed the Reliability Imperative framework to address the urgent and complex challenges facing the grid. MISO defines the Reliability Imperative as the shared responsibility that MISO, its members, and states have to address the urgent and complex challenges facing the MISO grid.
[93] *In the Matter of the Application of Minnesota Power for a Certificate of Need for a High Voltage Transmission Line for the HVDC Modernization Project in Hermantown, Saint Louis County* and *In the*

Project which will replace and upgrade the existing HVDC Line converter stations that are beyond their anticipated operational lives. The upgraded converter stations will make it possible to continue to delivery of high-capacity factor wind located in North Dakota directly to Duluth, Minnesota. This transmission project, along with new transmission projects identified by Minnesota Power and through the MISO LRTP process, will be needed to continue to pursue compliance with the 100 percent CFS in Minnesota. For this IRP planning period, the uncertainty Minnesota Power will need to monitor is the timing of the transmission projects that will enable additional capability and reliability to meet the interim CFS and reliability requirements. These transmission projects must efficiently work through permitting and local regulatory approval to meet the anticipated in-service dates.

A real-time indication of this system-wide complication of timing of new transmission is seen in the MISO interconnection queue, where the addition of large volumes of new renewable energy is already requiring significant upgrades to the transmission system and resulting in project implementation delays.

Minnesota Power, along with Minnesota regulators, policymakers, and MISO, must continue to address this challenge to maintain system reliability during the rapid decarbonization and transition of the regional power supply. Identifying the problems and finding solutions to ensure reliability during this transition will take time, and maximizing critical infrastructure is key to an efficient transition. To the extent possible, the resource planning analysis and resulting plans must try to anticipate changes in the future resource availability as a central part of a plan and adapt as the rules and requirements for a reliable system evolve to accommodate a future with less carbon and more variability in resource availability.

Customer Demand Outlook

There is inherent uncertainty in any customer demand outlook used in the IRP analysis. An IRP plan should be robust and flexible to adjust to customer needs across multiple outcomes. In this IRP, Minnesota Power is planning for a future where customer demand could more than double based on customer information and plans. Also, with Minnesota Power's uniquely large industrial customer mix, there will be swings in industrial customer demand depending on the health of customers' respective industries (see Figure 3 in Section III to see how industrial demand has varied since 1990). In the Company's last IRP, Minnesota Power experienced a declining load caused by idling of industrial customers and lasting effects from the economic recession caused by the COVID-19 pandemic. In this IRP, Minnesota Power has industrial customers preparing for significant load growth over the study period. Minnesota Power has not experienced this magnitude of load growth potential for several decades, but the Company is well positioned to serve the expanding industrial sector given its history serving energy intensive industries. To capture the variety of possible future demand scenarios and prepare a robust set of near- and long-term actions, the IRP analysis included a range of load sensitivities for planning the system that increase current industrial demand up to 1500 MW and decrease it by 200 MW.

Advancements in Technology

The advancement in carbon minimizing technologies will be a key driver of how quickly and cost effectively Minnesota Power can meet the requirements of the Minnesota CFS. Minnesota Power recognizes that currently, the technology does not exist to cost-effectively achieve a 100 percent carbon-free system but believes the industry will continue to make advancements in

Matter of the Application of Minnesota Power for a Route Permit for a High Voltage Transmission Line for the HVDC Modernization Project in Hermantown, Saint Louis County, Docket Nos. E-015/CN-22-607 and E-015/TL-22-611, Order Granting Certificate of Need and Issuing Route Permit (Oct. 25, 2024).

gaining additional commercial alternatives in the coming years through pilots and demonstration projects. Similar to the last IRP, there remains uncertainty as to how quickly commercialization will occur and supporting reductions in costs are realized for critical technologies needed to achieve 100 percent carbon-free. Emerging technologies like LDES batteries, carbon capture, advanced nuclear, (i.e., SMRs) and carbon-free fuels (i.e., hydrogen and biofuels) will need to advance so that they can be implemented as part of a cost effective, reliable energy solution for customers. These technologies, in addition to a suite of demand response and energy efficiency efforts, could be important complements to the Company's growing renewable portfolio.

Minnesota Power's analysis took into consideration the potential for declining capital costs for renewables, energy storage, and emerging dispatchable technologies like advanced nuclear and carbon capture. Furthermore, Minnesota Power is recommending that a new R&D fund of $30 million be established to better understand, develop, and pilot emerging technologies. Minnesota Power will use these funds to partner with interested customers to advance development of emerging technologies needed to meet the CFS that support reliability and the 24/7 energy needs of our customers. A flexible plan should create opportunity for these innovative technologies to be included as future actions, which is the intent of the emerging technology development fund being proposed.

It is difficult to develop a plan that can hedge against all uncertainties over a 15-year study period. The Company's commitment and *Energy**Forward*** strategy has already reduced carbon emissions by over 50 percent by leveraging existing infrastructure and maintaining a dispatchable generation portfolio to meet energy needs, while putting the Company on a path to meet the Minnesota CFS. The 2025 Plan, as described below, will take further action on carbon reduction while modernizing the dispatchable generation portfolio that is responsible for ensuring reliability in all 24/7 operating conditions. The Company will continue to monitor and take measured actions to manage uncertainties in the coming years.

C. Steps 1-4: Capacity Expansion Analysis

Minnesota Power arrived at its 2025 Plan using an innovative multi-step planning process that is described in further detail in Section IV. This section discusses the analytical results from the evaluation process. The analysis is broken into two important planning phases: (1) the Capacity Expansion Analysis (Steps 1-5); and (2) detailed evaluation of the 2025 Plan (Steps 6 and 7). The analysis also included Step 8, a retirement study for HREC, the results of which are discussed further in Appendix O.

The objective of the first phase is to identify the least cost supply side and demand side alternatives to replace the energy and capacity needed as BEC3 and BEC4 cease coal operations and to meet the latest customer demand outlooks. The second phase is a detailed evaluation of the performance of the proposed 2025 Plan including how the plan performs when stressed.

Three BEC operational scenarios were included in the Capacity Expansion Analysis, along with a "Status Quo" scenario, which was used as a reference case to evaluate changes in plan costs:[94]

1. 2025 Plan: BEC3 refuels with natural gas by the end of 2029; BEC4 refuels with 40 percent natural gas by end of 2029 and ceases coal operations by the end of 2034;[95]

[94] For all retirement scenarios, reference to a year indicates retirement on December 31 of that year.
[95] In the 2025 Plan, BEC4 is removed from the power supply at the end of 2034 when coal operations cease.

2. Full Retirement: Retirement of BEC3 and BEC4: BEC3 retires by the end of 2029 and BEC4 retires by the end of 2034;
3. Full Biomass/Gas Refuel: BEC3 cofires with biomass and natural gas by the end of 2029; BEC4 cofires with biomass and natural gas by the end of 2034;
4. Continue Coal Operations ("Status Quo"): No ceasing coal action is taken for BEC3 and BEC4 during the study period.

The Capacity Expansion Analysis was broken into multiple steps to transparently evaluate the impacts load and implementation of the CFS have on the resources selected by EnCompass. The analysis was designed to evaluate the impact to the Plan when industrial demand changes (Step 2), when the Minnesota CFS is enforced (Step 3), and if commercial availability of emerging technologies accelerates faster than expected (Step 4). By having multiple steps in the analysis process, Minnesota Power could see and measure the impacts these changes have on the plan, which assisted in the development of a robust and flexible plan, including identifying the preferred BEC pathway.

The preferred 2025 Plan for transitioning BEC operations is to refuel BEC3 with natural gas by end of 2029 and prepare to meet required environmental rules by adding natural gas capability to BEC4 for a 40 percent refuel by end of 2029 and cease coal operations for customers by end of 2034, referred to as the "2025 Plan." Minnesota Power selected its preferred plan for BEC operations after completing Steps 1 and 2 of the analysis, by comparing plan costs for each BEC option and what can realistically be accomplished in the planning timeframe. In the following sections for Steps 1 through 4, the results and associated figures shown are for the "2025 Plan," unless noted otherwise. The Capacity Expansion Analysis results for the other options considered at BEC are shown in Appendix K.

Step 1: Traditional Capacity Expansion Analysis – Base Case Forecast

The following includes the results from Step 1, the Traditional Capacity Expansion Analysis, where resources are selected using the EnCompass planning model under the Base Case forecast and the Minnesota environmental futures – making up the "Traditional Planning" look. The Minnesota CFS is not enforced during this step in the analysis; that occurs in Step 3 which is discussed later. Using this look, the Company is able to identify the pre-policy enforcement actions that are needed to serve its customer outlook. There are more details on the modeling process and results included in Appendix K. The following results informed the recommended path for BEC3 and BEC4 and initial resources to be included in the 2025 Plan. Following this section is a discussion on how Minnesota Power further developed the 2025 Plan using results from Steps 1-4.

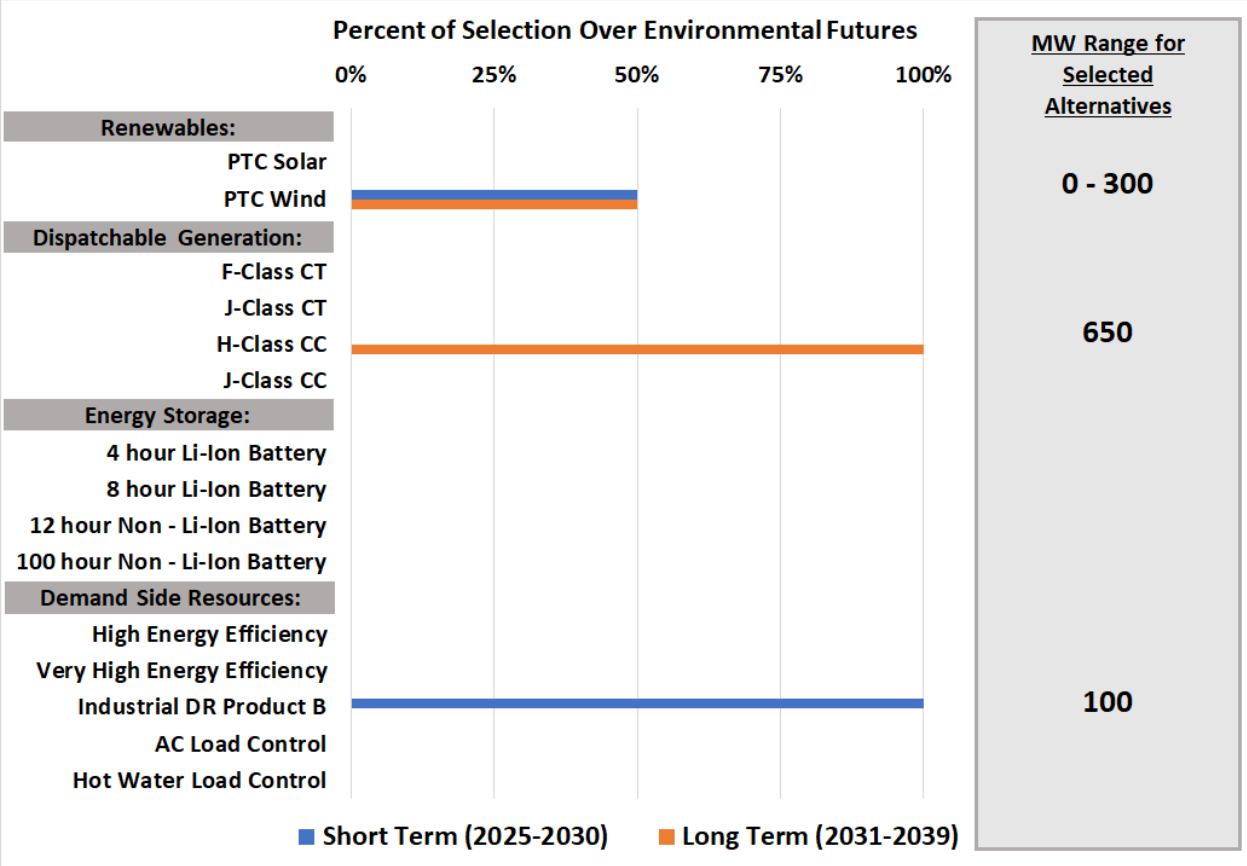
A summary of the results of the EnCompass Capacity Expansion Analysis for the proposed 2025 Plan that includes the recommended BEC outcome under the Base Case forecast is shown in Figure 8. Recall that this includes BEC3 refueled with natural gas by end of 2029 and BEC4 refueled with 40 percent natural gas by the end of 2029 and ceases coal operations in the power supply portfolio by end of 2034.[96] The figure also demonstrates the robustness of the IRP analysis that includes diverse supply and demand side technology alternatives that Minnesota Power considered in the EnCompass Capacity Expansion Analysis. This is also the first time Minnesota Power included emerging technologies to be selected in the EnCompass model. Above and

[96] Minnesota Power focused on the "2025 Plan" BEC scenario because it was identified as a least cost action in the 2025 Plan.

beyond this list were additional resource alternatives that were evaluated in the pre-screening process that are discussed in Appendix K.

The resource selections shown below are based on an expansion analysis that was done on the following environmental futures: the Reference Case, High Carbon Regulation Cost and High Environmental Costs, Low Carbon Regulation Cost and Low Environmental Costs, and No Carbon Regulation Costs and No Environmental Costs as required for integrated resource planning in Minnesota.[97]

Figure 8. Capacity Expansion Analysis Results for 2025 Plan with Base Case Forecast



The Capacity Expansion Analysis clearly indicates that wind, industrial demand response, and combined cycle generation are the least cost resources to reduce carbon on the system and replace the capacity and energy when BEC4 ceases coal operations. The higher the carbon regulation cost that is modeled, the more wind that is selected, with 200 MW selected in the Reference Case for Environmental Cost (mid-carbon regulation cost). In general, wind is being selected over solar because of the lower cost and the higher energy output of wind is a better fit

[97] The Reference Case and High Carbon Regulation Cost and High Environmental Cost are required to be evaluated as part of the IRP process consistent with the Commission's decision *In the Matter of Establishing an Updated 2022 Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation under Minn. Stat. § 216H.06*, Docket Nos. E999/CI-07-1199 and E999/DI-22-236, Order Addressing Environmental and Regulatory Costs (Dec. 19, 2023). Minnesota Power chose to include a "no carbon regulation cost and no environmental cost" scenario to provide an additional perspective that captures a market without a carbon tax.

with Minnesota Power's high load factor. Minnesota Power's Base Case has already incorporated the outcome of the last IRP which added nearly 300 MW of solar prior to 2030. The existing 300 MW of solar in the model appear to be sufficient to meet the solar needs under Base Case forecast conditions.

Due to the magnitude of alternatives being considered and the size of the capacity and energy need in the optimization of the expansion plan, Minnesota Power had to innovate with additional modeling steps for how natural gas was included in the Capacity Expansion Analysis in order to allow the model to complete the Capacity Expansion Analysis runs required (see Appendix K for additional details).

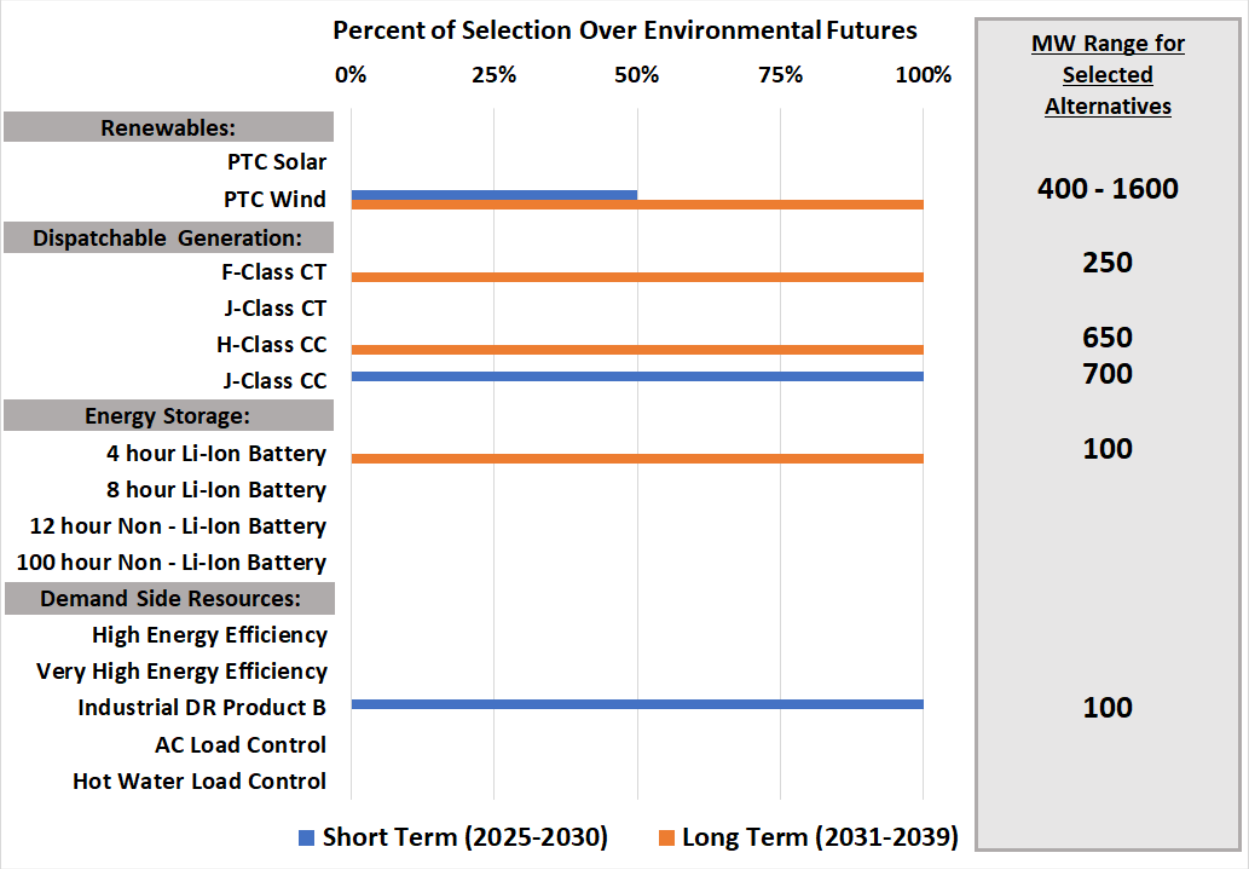
Step 2: "Pathways for Industrial Demand Scenarios" Capacity Expansion Analysis

New to this IRP, Minnesota Power introduced a Step 2 that focused on evaluating pathways to serve multiple load outlooks that increase and decrease customer demand. As discussed earlier, customers have expectations for a significant increase in energy needs over the study period for this IRP. The study includes four load sensitivities ranging from -200 MW to +1500 MW, and when combined with cease coal scenarios, there is a significant energy and capacity need created that must be addressed by the Capacity Expansion Analysis. This section focuses on the Capacity Expansion Analysis results for the +1100 MW Growth Scenario used to develop the Growth Plan as it is the expected customer growth outlook. The Capacity Expansion Analysis results for the other load growth scenarios are provided in Appendix K. A summary of the EnCompass Capacity Expansion Analysis results with the "2025 Plan" for BEC under the +1100 MW Growth Scenario is shown in Figure 9.[98] The results demonstrate the significant increased need for renewable energy and dispatchable generation to meet the higher load scenario. The energy requirements for this case more than double, as additional high capacity factor load comes onto the system.

More wind is added due to the increased carbon regulation cost. In the Reference Case for Environmental Cost, 1400 MW of wind was selected. There is also a significant increase in the need for capacity and dispatchable generation to meet the higher demand and fill the energy gaps when wind and solar are not generating. Results identify the need for 1500 MW of gas generation under this load growth outlook, with most of it being lower carbon emitting and more efficient combined cycle technology to meet the energy intensive customer growth. The results also included an increase in additional storage to help manage the renewable generation.

[98] The resource selections shown in Figure 9 are based on the following futures: the Reference Case, High Carbon Regulation Cost and High Environmental Costs, Low Carbon Regulation Cost and Low Environmental Costs, and No Carbon Regulation Costs and No Environmental Costs.

Figure 9. Capacity Expansion Analysis Results for 2025 Plan with +1100 MW Growth Scenario



After the analysis was complete for Steps 1 and 2, Minnesota Power performed a cost performance comparison between the different BEC operational scenarios evaluated in the IRP. Table 5 below illustrates how the scenarios performed over the Base Case and +1100 MW Growth Scenario, the two load scenarios used to develop the Base Plan and Growth Plan recommendations. The results of this analysis clearly indicate how close the costs are, and the influence federal PTCs have on the value proposition for biomass. The two lowest cost BEC plans were the 2025 Plan and Full Biomass/Gas Refuel (with 100 percent PTC for biomass).

Both plans performed well across the Base Case and +1100 MW Growth Scenario. The Full Biomass/Gas Refuel did not perform as well when the PTC benefit was removed, indicating the importance of biomass being recognized as a net carbon-free resource through a life-cycle analysis. There currently exists uncertainty if biomass will qualify for PTCs, since there has been no Internal Revenue Service ("IRS") guidance issued yet on how to demonstrate biomass is a net carbon-free resource. It is recognized by the IRS as a potential fuel option to qualify for a PTC, but instructions on how to demonstrate it are forthcoming. We assume some form of a life-cycle analysis will be required to qualify for a PTC, but what form that will take is unknown. Minnesota Power's position is biomass is a net carbon-free renewable resource based on performing a life-cycle analysis, and believe, given how well it performs, it warrants further investigation as an action item for this IRP.

Table 5. Comparison of Plan Costs

15-year Net Present Value (2025-2039) $Billions	Environmental Future: Reference Case[99]	
BEC Operational Scenario	Base Case	+1100 MW Growth Scenario
2025 Plan	$8.4	$11.7
Full Biomass/Gas Refuel 100% PTC for Biomass	$8.2	$11.6
Full Biomass/Gas Refuel No PTC for Biomass	$8.5	$11.9
Full Retirement	$8.6	$12.0

As Minnesota Power transitions away from coal generation, Minnesota Power is forecasting an increase in power supply cost for replacement energy and capacity. Figures 10 and 11 show the change in power supply cost of the BEC operational scenarios from the "status quo." This figure can be useful in informing where customer costs could directionally go if the actions in that scenario are taken and are not meant to be an indication of specific electric rates. The figure demonstrates that the 2025 Plan for BEC has one of the lowest cost impacts when compared to the other scenarios studied under Base Case and +1100 MW Growth Scenario.

The figures also highlight the benefit increasing industrial demand could have for all customers as the power supply additions are utilized more efficiently. This optimization creates a smaller cost increase profile in the +1100 MW Growth Scenario. It is important to note, however, that actual electric rates are decided by the Commission through a formal rate case proceeding once projects and plans are in the implementation phase, and those outcomes will be reflected on the customer bill. This planning exercise assists in supporting IRP decision making as the Company works across many scenarios and alternatives. Furthermore, Minnesota Power is actively engaged in identifying opportunities to mitigate customer rates, and those future efforts are not directly captured in a resource planning analysis.

[99] The costs shown in this table include power supply cost and carbon regulation cost but exclude the environmental cost. In Docket No. E-999/CI-22-236, the Commission ordered carbon regulation cost to be included in the Capacity Expansion Analysis to influence resource selection and environmental cost are an "add-on" in the post-processing. The table reflects the cost used by EnCompass to optimize the plan because that best reflects how well a plan performed given the model set-up. Please refer to Appendix K for the results with the environmental cost included.

Figure 10. 2025 Plan for BEC Power Supply Cost Compared to Alternatives – Base Demand Outlook

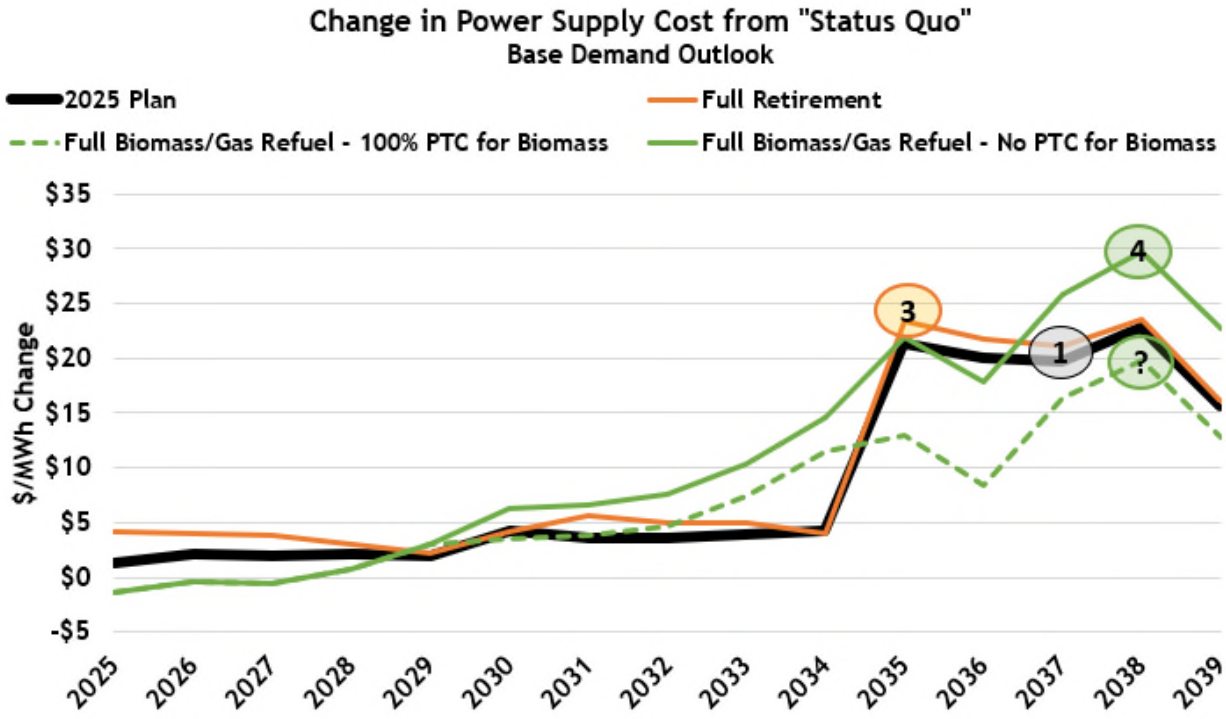
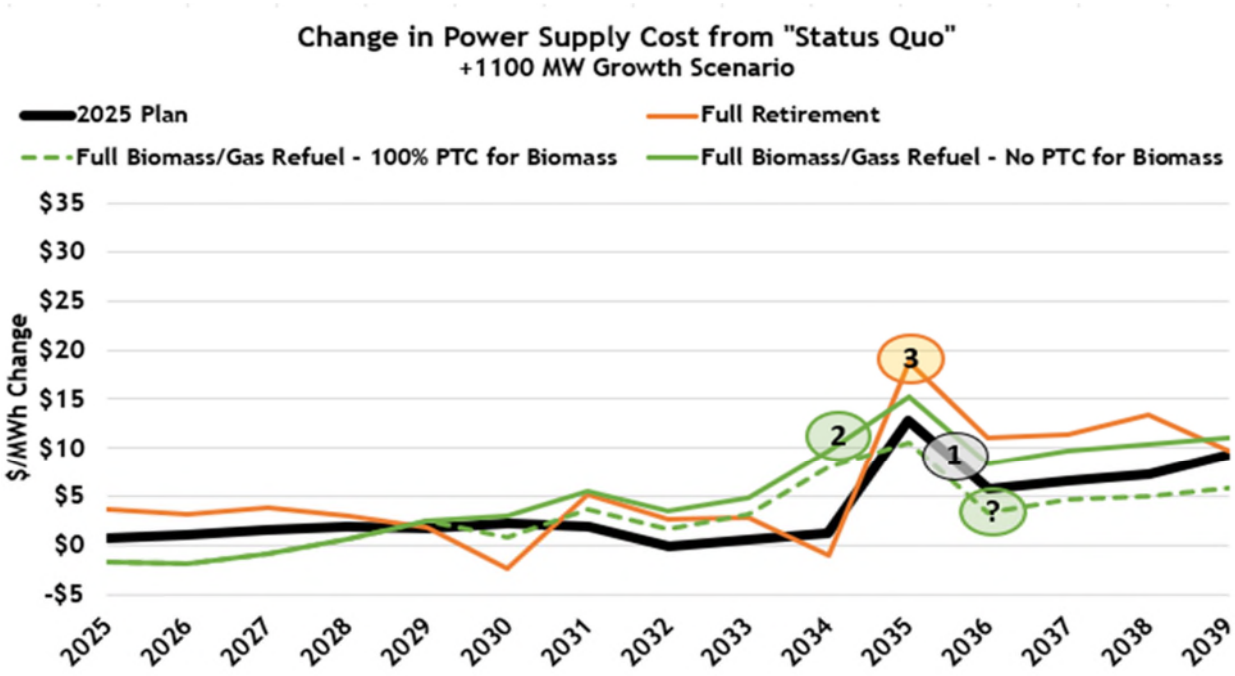


Figure 11. 2025 Plan for BEC Power Supply Cost Compared to Alternatives – +1100 MW Growth Scenario



Based on the analysis from Steps 1 and 2, and the performance across the two key load scenarios, Minnesota Power selected the "BEC3 refuel with natural gas by end of 2029; BEC4

refuels with 40 percent natural gas by end of 2029 and ceases coal operations by end of 2034" as the BEC operational scenario to include in the 2025 Base Plan and Growth Plan. These actions provide the opportunity to leverage existing assets to advance carbon reduction, meet current environmental rules in place, and position the power supply for modernization while at the same time leaving the flexibility to add on additional carbon neutral or minimizing technology in the future. Next, the preferred plan for BEC operations was moved into Step 3 to evaluate if additional carbon-free resources were needed to meet the Minnesota CFS.

Step 3: "Pathways to Minnesota Carbon Free Standard Analysis" Capacity Expansion Analysis

After Step 2 was complete, the least cost operational plan for BEC3 and BEC4 along with necessary capacity and energy additions were moved to the Step 3: "Pathways to Minnesota CFS Analysis." A Capacity Expansion Analysis was performed where carbon-free energy was allowed to be re-selected to meet the CFS. A constraint was added to the EnCompass model that forced the model to select the least cost plan to meet the CFS milestone requirements of 80 percent in 2030 and 90 percent in 2035. The results were evaluated to see how the volume and timing of new resources being selected changed with the CFS enforced. In general, more renewables were selected and the timing of the additions were accelerated to meet the CFS milestones when compared to results from the traditional capacity expansion planning in Steps 1 and 2.

For example, in the Base Case scenario with the 2025 Plan for BEC, in Step 1 there was 100 MW of wind selected in 2030 and 2031, totaling 200 MW. With the CFS enforced, there was 200 MW of wind selected in 2030 and 2035, totaling 400 MW of wind. In the Base Case scenario, the enforcement of the CFS resulted in doubling the volume of wind. We also observed an increase in energy storage and solar being selected in cases where the CFS was required. Table 6 below summarizes the additional carbon-free resources selected to meet the Minnesota CFS with the 2025 Plan for BEC, the Reference Case environmental future, under the Base Case and +1100 MW Growth Scenario. Note that in the table "TRD" are the results from Step 1 and Step 2, and "CFS" are the results from Step 3. Also, this figure only includes the resource types that were affected by enforcement of the CFS in the EnCompass model, these scenarios also include natural gas generation and industrial demand response that was selected in Steps 1 and 2.

Table 6. Capacity Expansion Analysis Results with CFS Enforced

	Customer Demand Scenarios	
	Base Case	***+1100 MW Growth Scenario***
Wind	TRD: 200 MW CFS: 200 MW	TRD: 1400 MW CFS: 800 MW
Solar		CFS: 200 MW
Storage		TRD: 100 MW CFS: 300 MW

	Customer Demand Scenarios	
	Base Case	***+1100 MW Growth Scenario***
Total Additions for CFS Affected Resources	TRD: 200 MW CFS: 200 MW Total: 400 MW	TRD: 1500 MW CFS: 1300 MW Total: 2800 MW

It is important to note that Minn. Stat. § 216B.2422, subd. 2(c) requires, "As a part of its resource filing, a utility shall include the least cost plan for meeting 50 and 75 percent of all new and refurbished capacity needs through a combination of conservation and renewable resource." Since the 2025 Plan meets the Minnesota CFS requirement, this 2025 Plan meets these requirements such that no further analysis of the requirement is needed.

Next Minnesota Power will discuss how the results from the Capacity Expansion Analysis, along with Minnesota policy, host community impacts, and insights from the engagement process, help inform the recommended actions in the 2025 Plan.

D. Step 5: Preferred Plan Selection

The Capacity Expansion Analysis clearly indicates that new dispatchable gas generation, wind, solar, storage, and enhanced industrial demand response are the least cost resources to replace coal operations at BEC4, to meet the incremental demand in the +1100 MW Growth Scenario, and to comply with the Minnesota CFS. The timing of the gas additions aligns with when retiring or ceasing coal occur at BEC3 or BEC4 and with the increase in demand in the +1100 MW Growth Scenario. Renewables follow a similar timeframe with additions being driven by action at BEC3 and BEC4 and the timing of load growth, although to meet the CFS, we see significant renewable additions in 2030 and 2035 at the 80 percent and 90 percent milestones, respectively. Industrial demand response and storage have a similar role, both help manage a large renewable portfolio to operate more efficiently, with demand response being selected prior to storage additions. No other resource technologies or demand side resources were directly selected by EnCompass in Steps 1-3. The following sections provide additional insights into how Minnesota Power used the Capacity Expansion Analysis to determine the new resources utilized in the 2025 Base Plan and Growth Plan. Note that the results are referring to the resource selections for the BEC operational scenario recommended in the 2025 Plan.

Wind

Minnesota Power has over 850 MW of wind generation in its current power supply, located in Minnesota and North Dakota. Minnesota Power issued an RFP for up to 400 MW of wind on February 15, 2024. Bids from the RFP were received on April 11, 2024, and Minnesota Power is in discussions with several wind projects that were shortlisted after a detailed review of bids. Minnesota Power plans to file the petition requesting approval later in 2025. After these wind projects are operational, Minnesota Power's wind portfolio is projected to increase by 1.7 million MWh, resulting in nearly 4.7 million MWh of total wind generation in its energy mix.

The Capacity Expansion Analysis included the 100 percent PTC for wind projects throughout the entire study period. Minnesota Power customers benefit from the PTC and it keeps costs lower for compliance with the Minnesota CFS. If the PTC benefit were no longer available, the cost to meet the CFS would materially increase for customers.

In the Base Case scenario, the Capacity Expansion Analysis selected 200 MW of PTC-qualified wind in the early 2030s. To meet the CFS, another 200 MW of wind was selected in the mid-2030s. In the +1100 MW Growth Scenario, 1400 MW of wind was selected and another 800 MW of wind is added to meet the CFS, totaling 2200 MW of wind. This demonstrates that wind is part of a robust least cost option for replacing coal generation at BEC4, to meet incremental demand in the +1100 MW Growth Scenario, and to comply with the Minnesota CFS. Typically, Minnesota Power has seen more wind selected than solar due to the high load factor of Minnesota Power's system.

Wind clearly continues to be a cost-effective resource for customers, and the volume that is needed is significant. It could be challenging to bring this volume of wind online prior to the requirements in the CFS due to potential delays in interconnection, permitting, procurement of key components, and/or labor availability. Renewable Energy Credits ("RECs") might be needed in the interim to manage the potential gap between when wind projects are brought online and milestone dates in the CFS. Minnesota Power is recommending the following wind additions for the 2025 Plan:

1. Base Plan: Add 400 MW of wind energy by 2035. Minnesota Power will make best efforts to procure wind in time to meet the CFS but may need to use RECs to address any gaps in compliance.
2. Growth Plan: Increase the addition of wind energy by another 1800 MW of wind to meet the needs of incremental load growth and the CFS. Minnesota Power will make best efforts to procure wind in time to meet the CFS but might need to use RECs to address any gaps in compliance.

Solar

Minnesota Power is making great progress in building out a solar portfolio across its service territory. The Company's last IRP included the next phase in the Company's solar strategy to meet the SES and RES requirements. Since the 2021 IRP, Minnesota Power added 22 MW of solar across three projects (Laskin, Sylvan, and Duluth solar projects) in 2023 to support economic development and recovery within the Company's service territory following the COVID-19 pandemic. Minnesota Power's solar portfolio to meet the SES also includes the 10 MW solar array located at Camp Ripley, a 1.04 MW Community Solar Garden ("CSG") program, along with approximately 4 MW of DG solar from which Minnesota Power receives solar renewable credits.

In the 2021 IRP, Minnesota Power was ordered to add up to 300 MW of solar by 2030. Since then, the Minnesota legislature passed the DSES requiring three percent of retail sales (excluding industrial customers) to be met by DG solar projects by 2030. Minnesota Power issued an RFP seeking up to 300 MW of solar on November 15, 2023. Minnesota Power reviewed bids and selected two solar projects, the 85 MW Boswell Solar Project and the 119.5 MW Regal Solar Project. Both solar projects are expected to be operational by 2029. The Boswell Solar Project is located at BEC in Cohasset and shares interconnection service with BEC3. BEC3 and the solar project will co-dispatch, resulting in BEC3 reducing energy production during the day, displacing coal generation and carbon emissions, to allow the solar energy onto the grid. This interaction between the Boswell Solar Project and BEC3 is captured in the EnCompass modeling. Minnesota Power is currently requesting Commission approval to pursue the Boswell and Regal solar

projects. The Company also recently released the first phase of its DSES RFPs in which it is seeking between 65 and 85 MW of new DG solar within its region and communities.

The Capacity Expansion Analysis included the 100 percent PTC for solar projects throughout the entire study period. A solar project qualifies for an ITC or PTC under the Inflation Reduction Act ("IRA"). For the generic solar modeling in the IRP, based on the capital cost and energy profile, the cost of solar with an ITC or PTC was nearly identical. Given the costs were close, the solar was modeled with a PTC similar to wind. Minnesota Power customers benefit from the PTC and it keeps cost for compliance with the Minnesota CFS lower. If the PTC benefit were no longer available, the cost to meet the CFS would materially increase for customers.

In the Capacity Expansion Analysis, solar was selected less often than wind, by a sizable margin. This can be explained by its higher cost profile and Minnesota Power's high load factor. The high concentration of industrial demand results in a 24/7 need for energy, which wind does a better job providing than solar. With Minnesota Power already having plans to add nearly 300 MW of utility and DG solar to the power supply, that addition appears to be sufficient to meet the needs in our Base Plan. In the +1100 MW Growth Scenario, there was 200 MW of solar selected to meet the CFS. As discussed earlier, there are benefits within the power supply to diversify the energy portfolio by adding solar to augment the large wind portfolio proposed in the +1100 MW Growth Plan. It will be important for Minnesota Power to continue monitoring the cost of solar and advancements in the technology to see how those advancements impact the economics for customers in future IRPs.

Minnesota Power is recommending the following solar additions for the 2025 Plan:

1. Base Plan: Take no additional action on solar.
2. Growth Plan: Add 200 MW of solar to meet the needs of incremental load growth and the CFS. Similar to the wind recommendation, Minnesota Power will make best efforts to procure solar in time to meet the CFS but might need to use RECs to address any gaps in compliance.

Demand Response

Minnesota Power currently has approximately 250 MW of interruptible demand response capability with industrial customers on its system, which it utilizes for limited peak market price shaving and emergency operations. Existing demand response programs include close coordination with large industrial customers and their manufacturing processes and dual fuel rate programs with residential and commercial customers. These existing programs are a valuable component of Minnesota Power's power supply mix and help to ensure reliability for the region. Included in the IRP analysis as alternatives are new demand response programs for both industrial customers and residential/commercial customers.

The industrial demand response alternative modeled in the IRP expands Minnesota Power's program for industrial customers to include energy curtailment and longer contract commitments, along with emergency curtailment. The enhanced demand response program is referred to as Product B. This capacity is available in 2028, when the Product C demand response program subscription ends. The Product C program was approved by the Commission in 2021.[100]

Product B includes long-term capacity commitment with economic energy curtailment. This product would offer meaningful demand payments to customers for the opportunity to utilize their industrial capability for meeting the broader system needs. For purposes of the IRP evaluation,

[100] *In the Matter of the Petition by Minnesota Power for Approval of its Industrial Demand Response Product C Contracts*, Docket No. E-015/M-21-28, Order Establishing Pilot Program (Oct. 29, 2021).

this proxy program included a $7 per kW-month capacity credit and a $30 per MWh energy credit for curtailed energy. These provisions would be refined further when an actual tariff is brought forward with customers.

The multi-year commitment is important to Minnesota Power because it allows us to plan the system with confidence knowing the demand response will be available over a long period of time, in comparison to the one-year commitments customers make today. The addition of economic energy curtailments is needed to better align customer demand when renewables are available to more efficiently use such resources to meet the CFS.

The Company also continues to investigate additional demand response opportunities for residential and commercial customers through the evaluation of two peak-shaving programs for central air conditioning ("CAC") customers and electric hot water ("HW") customers. As a winter peaking utility, the Company previously focused its residential and commercial demand response programs on the electric heating characteristics of its load. However, both types of demand response programs could benefit customers, and both programs were available for the EnCompass model to select in the IRP.

In the Capacity Expansion Analysis, the enhanced industrial response program with economic energy curtailment, "Product B," was selected consistently as a valuable program for customers. The HW and CAC demand response programs were selected infrequently, demonstrating that these programs could have value and should continue to be evaluated in future IRPs. As discussed earlier in Section V, MISO is proposing changes to the requirements to receive capacity accreditation in the MISO Resource Adequacy Construct. The proposed changes by MISO could impact the level of demand response industrial customers make available due to overly onerous requirements. For example, to meet the proposed requirements, a customer might have to curtail demand at a speed that could jeopardize the safety of the customer's facility and workers. Minnesota Power took into consideration the risk of the availability of industrial demand response in its recommendation. Minnesota Power is recommending the following Demand Response actions for the 2025 Plan:

1. Base Plan: Create a new tariff mechanism and acquire at least 100 MW of industrial demand response capacity by 2028 that includes an annual economic energy requirement.
2. Growth Plan: Execute the Base Plan, along with working with new industrial customers on incorporating demand response into their operations where it is feasible and economic to do so.

Natural Gas

Minnesota Power has a minimal level of natural gas generation in its power supply. The 100 MW Laskin Energy Center, a coal unit refueled with natural gas in 2015, is the sole peaking gas unit on Minnesota Power's system today. The Company's share of NTEC and associated contracts are still in effect but given the desire from engagement participants in the last IRP wanting NTEC to be restudied, NTEC was removed from the Capacity Expansion Analysis to restudy the wholistic need for new natural gas generation on the Company's system.

New, modern, and efficient gas generation can serve an important role on the system as a bridge energy resource to a carbon-free future. A typical characteristic of gas generation is flexibility, the ability to quickly generate energy when needed by the system when renewables are unavailable, or storage is depleted. It can fit well with variable generation like wind and solar, especially with a utility with a high load factor like Minnesota Power. Furthermore, over the long term the natural gas generation industry has begun to build a sustainable future as vendors

finalize plans and develop flexible options for lower carbon operations through hydrogen or biofuels as a fuel source or with carbon capture technologies. Natural gas brings an immediate reduction in carbon profiles (50 to 65 percent) when it is used to replace coal and also has the modern features to be adapted to even lower carbon technology in the future.

The IRP evaluated several different natural gas technologies ranging from small peakers (RICE and aeroderivatives), large peakers (frame combustion turbine), and efficient combined cycle units with carbon capture as an option. Furthermore, gas generation could be considered for co-location at BEC to utilize existing infrastructure. With Minnesota Power's need for additional capacity, the Capacity Expansion Analysis strongly showed that gas generation was the least cost resource to meet these combined needs.[101] Minnesota Power saw in the modeling that combined cycle was the first selected gas technology. Furthermore, in the "Step 4: Emerging Technology Capacity Expansion Analysis" the combined cycle with carbon capture was the first emerging technology to be selected when capital cost was decreased by 50 percent for all emerging technologies. This shows that carbon capture could be a promising technology in the future for converting a traditional combined cycle generator to a carbon-free resource if costs can decline further. Minnesota Power will continue to evaluate carbon minimizing options for gas turbines and other technologies in future IRPs as these needed technologies develop further.

Minnesota Power is monitoring the capacity factor on the natural gas generation recommended in the 2025 Plan to measure against compliance with the EPA's Section 111(b) carbon regulations. The carbon emission limits, and associated capacity factors observed in the 2025 Plan are at or below the requirements in most scenarios. Minnesota Power did observe for a handful of years in some scenarios a gas generator exceeding the capacity factor limit, although there were other gas generation resources in the portfolio that are well below the capacity factor limit. Minnesota Power anticipates that if the gas generation that exceeded the capacity factor limit was forced to decrease generation, other gas generation in the fleet would replace that energy and still be below the capacity factor limit. Therefore, Minnesota Power concluded that in aggregate the gas generation portfolio in the 2025 Plan will meet the EPA Section 111(b) carbon regulations.

Natural gas generation also has a critical role in meeting Minnesota Power's reliability criteria, especially for reliability support during a system event or to minimize the risk of loss of load. This is more evident when evaluating generator performance during an event, such as Winter Storm Uri, where the gas generation has the capability to dispatch all week. In comparison, when Minnesota Power studied how the system would operate if gas generation was replaced with longer duration energy storage, the storage was unable to keep up with demand because of the charge and discharge cycling required. A challenge with storage during a multi-day event with lower renewable generation available is that there is not sufficient renewable generation for serving load and charging batteries. The Capacity Expansion Analysis and Reliability Criteria showed that natural gas was the least cost option to meet customer needs as Minnesota Power transitions away from coal as a fuel source and plans for additional load.

When developing the recommendation for the dispatchable need, Minnesota Power took into consideration future needs beyond what was modeled in the IRP. Part of a robust and flexible plan is to look beyond the current need in anticipation of future actions in upcoming IRPs. To replace the coal capacity and energy at BEC4, the modeling showed an initial base need for one

[101] Refer to Appendix K for additional information regarding how Minnesota Power approached evaluating natural gas generation in the Capacity Expansion Analysis. Due to the complexity of modeling large energy and capacity needs in a system with a high concentration of renewables, a multi-step process was used to determine the economic level of new gas generation needed.

combined cycle generator (approximately 650 MW – 700 MW). Minnesota Power's existing dispatchable generation fleet is aging, and key PPAs are reaching the end of their terms. At the same time, there is load growth emerging that requires long-lead time assets to provide reliable service. Lastly, there is uncertainty on how MISO's resource adequacy reform, and the impacts to renewable and energy storage accreditation (which Minnesota Power relies on), will change the capacity needs. Minnesota Power anticipates capacity needs for dispatchable generation will increase as resource adequacy requirements are modernized for a high renewable future. The potential cumulative impact of all these factors led Minnesota Power to recommend a slightly higher need for gas generation than what the Capacity Expansion Analysis was showing. Approving the need for 750 MW of gas generation in the Base Plan would give Minnesota Power certainty that a robust pathway is being pursued in its Base Plan for firm and reliable generation to support its transition, as we will need this optionality and flexibility to address several decisions that will be evaluated in future IRPs.

Minnesota Power cannot cease all coal operations in its portfolio without addressing the large capacity and energy deficits and the degradation of power supply and system reliability. A new combined cycle generation addition is required to be operational before taking the last of the cease coal actions at BEC4 to ensure reliability is restored and energy needs are met.

Minnesota Power is recommending the following natural gas additions for the 2025 Plan to meet the needs of customers:

1. Base Plan: Add 750 MW of combined cycle natural gas generation by 2035 to modernize and prepare Minnesota Power's system to enable ceasing coal-fired generation.
2. Growth Plan: Increase natural gas additions to 1500 MW to meet the needs of incremental load growth.

Energy Storage

Energy storage is a dispatchable technology area that continues to develop and expand its capability. Energy storage options continue to mature and technology costs decline, specifically for technologies with longer duration storage capabilities that can support significant time periods when other renewable resources are not available. Furthermore, energy storage is needed to manage renewables to more efficiently integrate them into the power supply and grid. The IRP evaluated several storage technologies, including lithium-ion batteries, several LDES technologies, and pumped hydro energy storage. For LDES, technologies with 12 to 100 hours of storage were studied. There are several emerging storage technologies that are promising approximately 12 hours of storage. Minnesota Power modeled in EnCompass a generic 12-hour battery that represented several types of designs in the 12-hour range. However, Minnesota Power recognizes that any of these technologies can evolve in the near future with technological changes that would impact their cost trajectory. The Company will continue to monitor storage technology alternatives and the expanded role they can play as a dispatchable resource in its power supply as technology to help Minnesota Power meet the CFS.

Minnesota Power applied a technology curve that assumed improvements in technology advancements in energy storage results in declining capital costs in real dollars (Appendix K). The modeling assumed that storage received a 30 percent ITC. If the ITC benefit were no longer available, the cost to add energy storage to the power supply would increase for customers.

In the Capacity Expansion Analysis, energy storage was selected to manage excess renewables in Minnesota Power's power supply. Minnesota Power's growing renewable portfolio has the capability in some cases to produce more carbon-free energy in an hour than customers

need. Energy storage can act as a load during these periods and store excess energy. When renewable energy production declines, the renewable energy stored can be used to serve customers for a defined period of time before it must be recharged. This can be an efficient way to manage renewable volatility over a short period, but as discussed earlier, is not an efficient solution to maintain a reliable grid 24/7. Storage has a key role in augmenting a reliable system, and is useful during a short duration system event, but it needs the support of other dispatchable resources to enable the caliber of reliable service customers receive today. To meet the Minnesota CFS, storage technology will have a critical role in ensuring that the wind and solar portfolio is optimized by storing excess energy instead of curtailing as renewable penetration on the system increases. Minnesota Power reviewed the reliability attributes of a system that only contained solar, wind, and storage to gain insights into the characteristics of this portfolio. The combination of 24/7 generation technology along with storage performed markedly better under the reliability criteria and cost efficiency. When reviewing capacity expansion results across the BEC operational scenarios, energy storage was selected in some of the scenarios – demonstrating storage has economic value for customers. Typically, energy storage was selected by the model more consistently in scenarios with higher demand and where the CFS requirements were included. Storage has benefits that the modeling might not fully capture, such as storing surplus renewables to preserve the carbon-free attribute by reducing the risk of curtailments. For these reasons, Minnesota Power believes that including some additional energy storage in the Base Plan and Growth Plan will benefit customers as it is growing its renewable energy portfolio.

Minnesota Power is recommending the following energy storage additions for the 2025 Plan to meet the needs of customers:

1. Base Plan: Add 100 MW of energy storage by 2035. As Minnesota Power's energy intensive system sees value in the longer duration of storage, it will install the most reasonable duration storage that is cost effective for customers.
2. Growth Plan: Add up to another 200 MW of energy storage to meet the needs of incremental load growth and the diverse system that will be required to serve customers.

Transmission

Strengthening and expanding the local and regional transmission system is a critical aspect of the transformation to a more sustainable and increasingly cleaner energy future. There has been meaningful progress in advancing grid enhancement to support the new generation patterns emerging and maintaining a reliable system. Since the last IRP, several projects have been identified and are in various stages of early project development, regulatory review, and implementation. To date, Minnesota Power has already seen the need for additional transmission to transition its small baseload resources as BEC Units 1 and 2 and THEC were retired. Further, the 500 kV GNTL project, that went into service in 2020, facilitates the delivery of nearly 1.5 million MWh of carbon-free hydro energy into Minnesota Power's service territory, accessing large volumes of renewable energy sources. More recently, Minnesota Power began the process of modernizing its aging HVDC system that will strengthen and increase the capability to deliver energy from North Dakota to Duluth, Minnesota. Minnesota Power and Great River Energy are jointly developing the Northland Reliability Project, a 180-mile double-circuit 345 kV line identified and approved as part of MISO LRTP Tranche 1. Both projects anticipate being online by the end of this decade. Most recently, in December 2024, MISO approved its second tranche of regionally-beneficial LRTP projects, which includes additional 345 kV transmission development in Northern Minnesota, including the Bison – Alexandria 345 kV Project, the Maple River – Cuyuna 345 kV Project, and the Iron Range – Arrowhead 345 kV Project. All of these LRTP Tranche 2.1 projects

are targeted for in-service dates in 2032-2033. Minnesota Power recognizes that utilizing new transmission to support transitioning the fleet to a carbon-free power supply is necessary and will grow in complexity as higher levels of decarbonization occur.

In the 2021 IRP, Minnesota Power identified several reliability transmission projects that would be needed to enable the transmission system to handle a retirement of BEC3 and/or BEC4.[102] These grid evaluations were designed to identify what additional transmission would be needed to support reliable electric service in the region if no generating resources were located at the BEC facility. These studies helped guide Minnesota Power in identifying projects that were proposed to MISO for evaluation and ultimately selected in MISO's LRTP Tranche 1 and 2.1 to prepare the region for ceasing coal operations. This is a great example of how integrated planning is occurring at Minnesota Power between transmission and generation. Minnesota Power is making great progress on early project development, seeking regulatory approvals, and preparing for construction on several transmission projects that once in place between 2030-2033, will be major milestones in preparing the system for ceasing coal operations at BEC3 and BEC4. Apart from these projects already planned and in progress, there is one additional voltage support and system strength project required to facilitate retirement of BEC4 to maintain an acceptable level of voltage support in northeast Minnesota. The IRP analysis included the cost for this project in the operational scenarios where BEC4 was retired. With Minnesota Power re-affirming cease coal operations at BEC4 by 2035 in the 2025 Plan, the recommendation is to continue evaluating voltage support needs in the region and how those might change with the addition of new gas generation that is recommended in the 2025 Plan.

Minnesota Power followed a similar approach to prior IRPs where transmission studies were performed as part of a retirement study. For this IRP, transmission studies were performed to better understand the impacts of early retirement of HREC. The study results show that there are local network upgrades required in the Duluth area that are required before retirement of HREC can occur. The results of those studies and projects required to facilitate a retirement is discussed further in Appendix F and in the Appendix O.

New transmission that connects Minnesota Power to other regions, such as the Southwest Power Pool ("SPP") and the Western Electricity Coordinating Council ("WECC"), creates an opportunity to co-optimize the Company's energy portfolio with other entities. For example, Minnesota Power could diversify its renewable portfolio by purchasing wind energy from the Pacific Northwest. When wind energy is not available in Minnesota and North Dakota, Minnesota Power could purchase wind energy from Oregon instead of dispatching batteries or carbon-based generation. To access these renewables, long distance high voltage transmission must be built to connect to new regions.

Energy Conservation

Additional energy efficiency above Minnesota Power's state leading ECO programs was also evaluated in the Capacity Expansion Analysis, but were not selected by the EnCompass model. While not being prominent in the 2025 Plan, these may be necessary to manage customer costs as the Company continues to move forward to meet the CFS.

Minnesota Power will continue its strong performance in energy efficiency programs with a planned 2.9 percent average annual savings target, well above the state goal of 1.75 percent annual savings. The Company is also exploring opportunities to expand its ECO program to include efficient fuel-switching and load management opportunities through program modifications and future Triennial filings. The Company anticipates that as power supply

[102] Appendix F provides a status update on these transmission solutions.

transitions and electrification continues, energy efficiency will have a prominent role to help customers control rising energy costs and adapt behavior for new Time of Day pricing models. Please refer to Appendix B for more detail on the additional energy efficiency programs evaluated in the EnCompass IRP analysis. The analysis indicates additional energy efficiency was not selected because of the rising cost to achieve higher levels of energy efficiency and the model preferring lower cost wind and storage with the PTC/ITC to meet the energy and capacity need during the same period energy efficiency was available. Additional information on how the cost of additional energy efficiency is compared to the cost of wind can be found in the busbar analysis in Appendix K.

Emerging Technologies

The industry is preparing for the transition to carbon-free energy with several companies planning to supply technologies to meet this need. Often referred to as "emerging technologies," this is a category of resources that are still in various stages of development and federal approval processes, but not commercially available. In the IRP analysis there are several emerging technologies included in the EnCompass analysis, including LDES, advanced nuclear, carbon capture on gas and coal generators, and enhanced geothermal. Minnesota Power engaged with the Electric Power Research Institute ("EPRI") to develop a more in-depth understanding of proven milestones of any new development for the specific emerging technology options being considered. EPRI participated in an IRP engagement meeting to present on "Energy Technology Deployment Timelines," where participants had an opportunity to discuss and ask questions about the timing and state of emerging technology readiness for inclusion in the plan. Minnesota Power leveraged this third-party study work to help develop a perspective on when emerging technologies can realistically be included in an IRP. The review concludes that only LDES will likely be commercially available at a scale that is sustainable before 2040. All other options are not considered viable resource options during this IRP study period. With many of these technologies in various stages of development, there is uncertainty on project cost, operating cost, permitting requirements, supply chain support, and actual operational characteristics. Furthermore, many of these technologies have not been permitted before in Minnesota or there are moratoriums in place, such as the case with nuclear in Minnesota. These considerations could result in a longer timeline to implement such resources compared to a traditional generation resource.

To better understand the impact potential emerging technologies could have in a future power supply, in Step 4 of the Capacity Expansion Analysis, all emerging technologies were made available in 2030, at the earliest retirement date studied for a BEC unit. The Company wanted to study whether, if emerging technologies were available today, it would impact the recommendations in the 2025 Plan. The key takeaway from the analysis was emerging technologies were not as cost effective as the resource portfolio proposed in the 2025 Plan to meet power supply needs and the CFS. Appendix K offers additional insight into the costs modeled for emerging technologies. This analysis did include tax incentives for all carbon-free emerging technologies, including ITC for advanced nuclear and the 45Q tax credit for capture and storage of carbon dioxide. As part of this analysis, the capital cost for emerging technologies was decreased by 50 percent and the Capacity Expansion Analysis was re-run. When cost dropped by 50 percent, the EnCompass model did select a small amount of combined cycle generation with carbon capture, along with other traditional resources like gas generation, wind, solar, demand response, and energy storage. Given the current development state of emerging technologies where capital declines will likely not be constant across technologies, it is a challenge to draw too much from these results other than capital cost will need to decrease by at

least 50 percent before some technologies become economical for customers. The results from Step 4 are discussed further in Appendix K.

Minnesota Power believes that continued support of emerging technologies is important for achieving a carbon-free future that is reliable and affordable. This will require the right policies, incentives, and research to achieve. For utilities, such as Minnesota Power, additional funding is needed to engage in these activities to research, develop, and become more familiar with these emerging technologies. The Company can pilot and select the best technologies to comply with the CFS at a reasonable cost and meet the reliability expectations customers have. Furthermore, Minnesota Power customers are also interested in advancing development of emerging technologies that support their climate goals along with Minnesota Power and the State of Minnesota. To support these activities, Minnesota Power is recommending that a new development fund of initially $30 million be established with an annual cost recovery mechanism. Minnesota Power will use these funds to partner with interested customers to advance development of emerging technologies needed to meet the CFS that support reliability and the 24/7 energy needs of our customers.

As emerging technologies advance, there are several carbon-free technologies that exist today such as wind, solar, storage, demand response, and biomass that Minnesota Power can act on in the 2025 Plan. This IRP is reducing carbon by utilizing technologies that can be implemented in the timeframe coal is being removed, while positioning the Company to make further advancements towards the CFS by requesting an initial $30 million fund to start development efforts on emerging technologies.

Market Purchases

An important component of a utility's power supply is contracted purchases and sales, conducted to optimize the energy surpluses and deficits that occur due to load and supply changes in the shorter-term. These agreements are called bilateral transactions, and they allow Minnesota Power to work with other entities to procure energy and capacity from existing resources. Often, bilateral purchases are a cost-effective tool to meet a power need that exists over shorter periods of time, when compared to adding a new generation resource. See Appendix C, Part 2 for a list of the Company's current bilateral transactions, which were included in the Base Case. Minnesota Power included bridge energy purchases in the load growth scenarios to bridge the energy need gap between when customers are anticipating load growth and when resources could be selected in EnCompass. The bridge purchases were modeled before 2030, prior to when new resources could be selected at the beginning of 2030.

The Company continues to use bilateral transactions to manage its short-term energy position, for example to replace energy during planned outages or during periods of lower renewable production. Although, purchasing energy in the market is becoming more difficult and costly as low-cost baseload coal generation continues to be retired in the upper Midwest. Minnesota Power is seeing fewer counterparties willing to sell energy in our region due to price volatility and the lack of new dispatchable generation being built to replace coal generation. In the long-term, this is signaling that new dispatchable generation must be built because relying on the energy market could result in volatile costs for customers and a decline in reliability.

BEC3

BEC3 is an economic capacity and energy resource for customers, is well controlled for pollution, and transitioned its operations to economic dispatch back in 2021. Minnesota Power has worked diligently to maintain and improve the flexibility of all of its thermal units, including BEC3, to maximize customer benefits as renewable energy penetration continues to increase.

Since 2015, through operational optimization and capital investments, the minimum dispatch level on BEC3 and BEC4 have been reduced. Since the last IRP, Minnesota Power implemented a project at BEC3 that reduced the minimum dispatch level from 175 MW down to 75 MW. These actions to improve the flexibility of the fleet have opened new opportunities for utilizing existing assets at BEC3 to co-locate solar. Minnesota Power is requesting approval from the Commission to add 85 MW of solar that will share interconnection service with BEC3, requiring the unit to decrease generation during the day to make room for solar energy to go onto the grid. This is a great example of Minnesota Power's foresight to invest in improving flexibility, creating an opportunity to add cost effective solar to meet the CFS, and directly reducing carbon emissions by allowing for additional renewable energy to flow onto the system.

In the IRP analysis, Minnesota Power screened two alternative fuel options at BEC3 to continue producing energy after ceasing coal operations by 2030, along with a retirement scenario. This included refueling the boiler with 100 percent natural gas or co-firing with biomass and natural gas. Both refueling alternatives would require a capital investment to install the natural gas capability or retrofit the existing coal handling system to handle biomass. The capital investment for the biomass option also includes costs for a biomass palletization facility on site that would take regional biomass and convert it to pellets that can be used in the boiler. The 100 percent gas refuel option also included a reduction in O&M due to fewer staff needed to operate a natural gas fired steam unit. A concern with refuel is that the large peaking asset would have long lead time startup operations in comparison to modern combustion turbines, although the Company believes that is manageable with the recommendation to refuel one BEC unit on 100 percent natural gas in the 2025 Plan. The need for flexible and dispatchable generation will continue to be evaluated in future IRPs as Minnesota Power prepares to meet the CFS.

The Capacity Expansion Analysis demonstrates that refueling BEC3 is a least cost option for customers versus retirement and replacing BEC3 with new gas generation. Furthermore, with Minnesota Power showing a growing capacity need with ceasing coal operations and in the +1100 MW Growth Scenario, BEC3 cannot be retired prior to replacement generation with similar operational characteristics being brought online. With a commitment to cease coal by 2030, it would be challenging or impossible to have replacement generation online given the Company's recent experience with permitting the NTEC project. Refueling by co-firing with biomass and natural gas shows economic promise, especially if biomass receives net carbon-free treatment through a life-cycle analysis to qualify for the PTC and CFS. Unfortunately, the requirements for performing a life-cycle analysis on biomass have not been finalized at the federal and state level, creating uncertainty on the viability of biomass in the future.

There are regional environmental benefits accompanying ceasing coal operation and refueling BEC3 with natural gas. With coal no longer needed to operate BEC3, there will be less coal handling occurring onsite, along with less rail cars delivering coal to the facility. The trickle-down impact to operations will also affect ash handling, where the transportation activities and storage of ash will cease. Although there are environmental benefits to the reduced coal and ash handling, the jobs associated with these activities will be negatively impacted. Minnesota Power will work with any affected employees and the union on a transition plan if the refueling of BEC3 with natural gas is approved.

For the reasons stated above, Minnesota Power is recommending in the 2025 Plan additional investigation, including submitting a life-cycle analysis for biomass to be utilized as a net-carbon free source to meet the Minnesota CFS. If net-carbon free status is achieved for biomass and this refuel option continues to show economic benefits for customers, Minnesota Power will submit necessary permitting to advance the ability to co-fire biomass at BEC3. In the short-term action plan, the 2025 Plan recommends the Company begin engineering and acquisition of necessary

materials for a 100 percent natural gas refuel of BEC3. Note that this 100 percent natural gas refuel recommendation meets the requirements of the EPA's Section 111(d) carbon regulations.

An outcome of the 2021 IRP was a requirement for Minnesota Power to evaluate the conversion of BEC3 to a synchronous condenser upon retirement. A study was performed to determine the feasibility of converting BEC3 to a synchronous condenser, for both seasonal operation and following unit retirement. The study found it is technically feasible to convert the unit to synchronous condenser operation. However, the length of time needed to switch between generating and synchronous condenser operating modes makes conversion infeasible until unit retirement. Because the 2025 Plan includes a BEC3 refuel with natural gas, Minnesota Power recommends taking no action on converting BEC3 to a synchronous condenser and will continue to consider the option in future IRPs. Appendix F contains additional information on the synchronous condenser conversion study.

BEC4

BEC4 will be one of the last baseload operating units in northern Minnesota after BEC3 ceases coal operations in 2030. As approved in the 2021 IRP, the Company continues to be committed to ceasing coal-fired operations for its customers in 2035. Like BEC3, BEC4 is an economic capacity and energy resource for customers and is well controlled for emissions. The Company continues to take actions as needed to prepare a transition to economic dispatch in a similar manner as BEC3 operates today. Action can be taken if it is economical for customers and regional reliability of the system can be maintained with no dispatchable generation online in northern Minnesota. BEC4 is jointly owned with WPPI Energy and any changes will be coordinated with this co-owner, including moving to economic dispatch, remission, or retirement. Minnesota Power will continue to work closely with its partner on future plans at BEC4.

The IRP analysis evaluated multiple refuel options and retirement at the 2035 cease coal date for BEC4. The refuel options evaluated are a 40 percent natural gas refuel by 2030 or co-firing with biomass and natural gas by 2035. Per the EPA Section 111(d) carbon regulation requirements, BEC4 cannot continue to operate exclusively on coal through 2035 and additional action is required for Section 111(d) compliance. One option per the EPA regulation is to refuel BEC4 to 40 percent natural gas by 2030. Given the demonstrated need for capacity and energy in 2030, and the inability to feasibly add new generation in this timeframe, Minnesota Power is recommending in the 2025 Plan to take action at BEC4 to prepare the unit for compliance with Section 111(d) by starting the engineering and acquisition of necessary materials for a 40 percent natural gas refuel by 2030. The Company is monitoring litigation of the final Section 111 rules, which is proceeding in federal court. Outcomes from ongoing litigation may impact both the timing of rule effectiveness and the ultimate compliance obligations required by the rule. If this rule is vacated through legal proceedings, remanded by the new federal administration, or replaced with a new federal carbon regulation, Minnesota Power will re-evaluate this recommendation and provide an update in the next IRP.

In the 2021 IRP, the Commission ordered Minnesota Power in its next IRP to "…continue to evaluate additional transmission system reliability mitigations needed to maintain the option of retiring the Boswell facility entirely, including unit 4, by no later than 2030." Minnesota Power continues to make progress on transmission system upgrades to strengthen the system for considering a BEC retirement. Please refer to Appendix F for further discussions on the significant projects that are in progress. The limiting constraint on potentially removing BEC4 as early as 2030 is a power supply reliability concern along with the infeasibility to add new generation in that timeframe to replace such a large component of capacity and dispatchable energy for customers. Therefore, this IRP studied an earliest retirement date for customers of 2035 for BEC4.

HREC

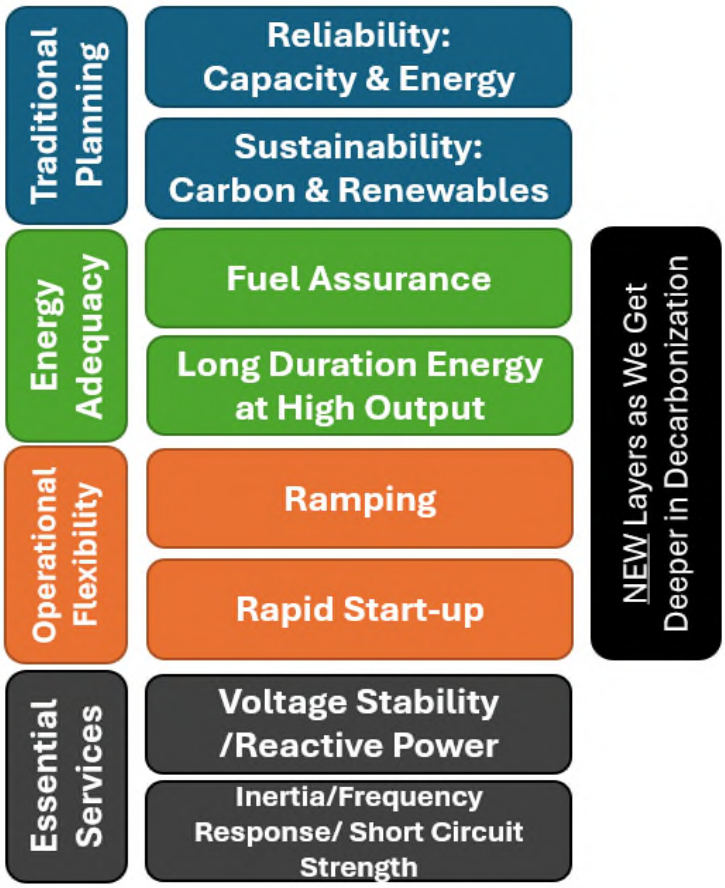
HREC is a dispatchable and renewable energy and capacity source that uses biomass to produce energy when other forms of renewable energy are unavailable. Furthermore, HREC provides an important outlet for unmerchantable roundwood affected by emerald ash borer, spruce budworm, and other pests. HREC is the only biomass facility north of the Twin Cities within an emerald ash borer quarantine zone, allowing it to receive infested wood for combustion without a compliance agreement. In the 2021 IRP, Minnesota Power was ordered to include a societal cost-benefit analysis of HREC, which must include impacts on host communities, workforce, economics, health, system reliability, the environment, and customer costs – results are shown in Appendix O. Minnesota Power also performed a retirement study of HREC, similar to the prior study performed for BEC3 and BEC4 in the last IRP, where the Company evaluated the impact of removing HREC from the power supply. This study included, for example, evaluating impacts to the host community, energy and capacity needs, transmission system, and environmental impacts. The results of that study work are discussed in Appendix O.

HREC is a valuable generation asset for customers that provides renewable energy when it is needed by the system, versus other renewable sources that provide energy when available. That dispatchable operational characteristic of HREC results in delivering higher levels of accredited capacity, contributes to meeting Minnesota Power's reliability criteria, and is used to relieve local reliability issues in the Duluth region – all important attributes when there is declining dispatchable capacity on the system while customers are requesting more energy from Minnesota Power. For these reasons, Minnesota Power recommends in the 2025 Plan to continue operating HREC and restudy the retirement decision in the next IRP. Please refer to Appendix O for additional discussion and a more detailed evaluation that support the recommendation.

E. Step 6: 2025 Plan Reliability Criteria Evaluation

The Company has developed a MPRC process that provides additional insights into the selection and implementation of the 2025 Plan. The MPRC has four categories including: (1) Traditional Planning, (2) Energy Adequacy, (3) Operational Flexibility, and (4) Grid Essential Services, as shown in Figure 12 below. Each of these categories have sub criteria for a complete review of total system reliability. Details on the MPRC are included in Appendix K.

Figure 12. Minnesota Power Reliability Criteria



Application of the MPRC is an innovative approach to quantifiably defining and applying a set of reliability criteria to a preferred plan. The MPRC allows Minnesota Power to establish a baseline of system performance across several of the reliability criteria. As Minnesota Power ceases coal operations and brings forward replacement plans to meet the Minnesota CFS, the Company can measure if reliability is improving or declining against a baseline where the system operates reliably today. This is valuable information to incorporate into an IRP evaluation to ensure the planning considers the important aspect that customers should receive the same reliable service as they do today.

Traditional Planning

Minnesota Power continues to use Traditional Planning mechanisms as in previous IRPs using the core data elements of the load and capability, system load forecast, and resource assessments as outlined in Steps 1-4. The plan must have sufficient capacity to serve all four seasons with physical generation resources. Also, the plan must have sufficient energy to minimize unserved energy and market price risk, while also meeting the Minnesota CFS requirements and other state sustainability requirements/goals. Minnesota Power performed the Traditional Planning evaluation by using the EnCompass model to assess and develop the most reasonable plan for customers to meet the capacity, energy, and sustainability requirements. Traditional Planning is the minimum requirement for ensuring an adequate resource plan.

Minnesota Power includes additional processes for a more encompassing assessment of reliability.

Energy Adequacy

The Energy Adequacy component of the MPRC takes the Traditional Planning components one layer deeper by performing a more granular evaluation. For the 2025 IRP, Minnesota Power pursued two specific analytical constructs to evaluate the Energy Adequacy of the Base Plan and Growth Plan. The first was having a third-party perform a loss of load evaluation and the second is hourly extreme event reliability analysis.

Minnesota Power outsourced a Loss of Load Expectation ("LOLE") modeling effort using Astrape Consulting. The intent of the LOLE study is to gain insights and develop a benchmarking tool into Minnesota Power's unserved energy risk. The model has provided comparative benchmarking analysis for the current portfolio, the 2025 Plan, and a scenario where only wind, solar, and storage was allowed to meet Company's incremental energy need. Each case was evaluated for its standalone capabilities using the LOLE metric as well as additional metrics looking at the depth and distribution of events across the 43 weather years and five load sensitivities. Minnesota Power views the LOLE analysis as being an effort that will be a benchmark to be reviewed and compared to in this IRP and for future planning analysis.

The LOLE analysis showed that the proposed Base Plan and Growth Plan has equal to or higher level of energy adequacy reliability compared to the existing portfolio today. Minnesota Power also performed a LOLE study where only storage, wind, and solar was allowed to replace coal energy at BEC3 and BEC4. That study showed a decline in energy adequacy reliability, there were several loss of load events for customers identified that lasted for more than a day due to the limited dispatch duration of energy storage. Note that in this scenario there was 1200 MW of energy storage, including 600 MW with 100 hours of storage capability, replacing the 800 MW of dispatchable generation at BEC.

Major event analysis is another means that Minnesota Power has applied the MPRC Energy Adequacy category, looking at the actual hourly information of specific events such as Winter Storm Uri and Winter Storm Elliot. Minnesota Power has also looked at events known as wind droughts, where there is not a major storm event, but a lower level of wind output that typically extends for up to 4-5 days. Event analysis provides insights on resource availability and the ability for serving load from Minnesota Power resources under the profiles of these real-world events that have occurred. The performance of the Base Plan and Growth Plan during Winter Storm Uri like event is discussed in more detail in the Step 7: 2025 Plan Energy and Capacity Outlook.

Minnesota Power is continuing to refine the components of the energy adequacy area in collaboration with MISO and the electric industry sector as it is a critical arena for the broader transition underway in the nation.

Operational Flexibility

Operational Flexibility needs must be understood to reliably integrate and optimize renewables by having a generation portfolio with sufficient flexibility characteristics. These operational flexibility characteristics include ramp rate and duration, cycling on and off, and rapid start up capabilities. Minnesota Power will monitor the operational flexibility need and 2025 Plan capabilities, and plan to use it to evaluate the characteristic needs of the recommended dispatchable generation in the 2025 Plan. Also, MISO included a conclusion from the January

2025 Regional Resource Assessment ("RRA")[103] indicating a three-fold increase in the need for system ramping capabilities, supporting the need to include Operational Flexibility in the MPRC.

Grid Essential Services

Grid Essential Services is one of the key areas where integrated planning occurs between resource planning and transmission/distribution planning. Minnesota Power coordinates internally among resource, transmission, and distribution system planners on study work needed when significant action (i.e., baseload retirement) is taken that could impact the reliability of the grid. A Grid Essential Services evaluation could include transmission studies that evaluate local and regional aspects of any of the following depending on the need: steady state power flow and voltage regulation, voltage stability, transient stability, inertia, frequency response, and short circuit strength. Many of these types of studies are also occurring on a regional level in MISO's LRTP process, which Minnesota Power is a participant in and has brought forward regionally beneficial solutions to address system issues that were identified in prior IRPs. There is also coordination on how future transmission projects could impact the capability of integrating new generation onto the system, which is factored into the 2025 Plan. Please refer to Appendix F for more on areas where integrated planning occurred between resource and transmission planners in this IRP, such as the Hibbard Retirement Study.

F. Step 7: 2025 Plan Energy and Capacity Outlook

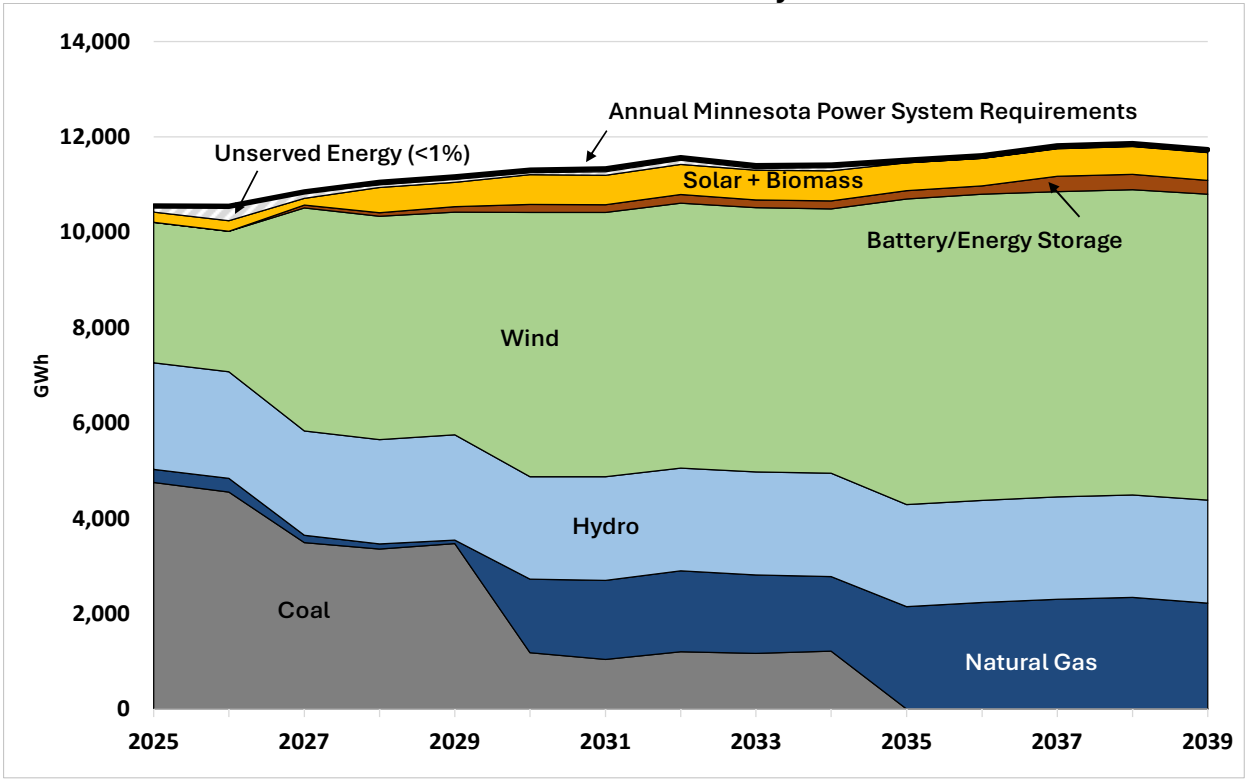
The 2025 Plan proposed by the Company continues the transition of Minnesota Power's fleet through the next chapter of the *Energy**Forward*** strategy by strengthening the electric grid, preparing for customer expectations for increasing energy demand, continue to enhance the generation portfolio to meet the CFS, and optimizing existing assets for customers. In this IRP Minnesota Power is bringing forward two distinct and strategic plans for the Commission to approve that meet the needs of the current system, the Base Plan, and prepares for significant increase in energy sales that customers today are anticipating, the Growth Plan. Both plans advance clean energy and meet the Minnesota CFS requirements and also address maintaining the reliability needs of the system by taking measured steps to cease utilizing coal in the Company's portfolio by utilizing cleaner natural gas as a replacement fuel through a refuel at BEC3 and replacing BEC4 coal generation with efficient combined cycle generation. The 2025 Plan will move Minnesota Power towards a power supply that is 80 percent renewable in 2030 and 90 percent renewable generation in 2035 while preserving the reliability of the power supply at a reasonable cost for customers.

Energy Outlook

The most significant change in Minnesota Power's recent history is demonstrated by looking at the resulting energy profile for customers. By removing coal-fired energy, a transformational shift will be enabled with the proposed 2025 Plan. Reducing reliance on coal and making room for more flexible natural gas reduces carbon and enables a diverse portfolio that is 90 percent renewable by 2035. Figure 13 and 14 further provides a long-term look at Minnesota Power's expected energy position. The 2025 Plan provides sufficient energy resources to serve customer requirements in both the Base Plan and Growth Plan, the result is a power supply that maximizes renewable energy, while keeping unserved energy to less than 1 percent over the study period by utilizing the dispatchable generation portfolio – see Figures 13 and 14.

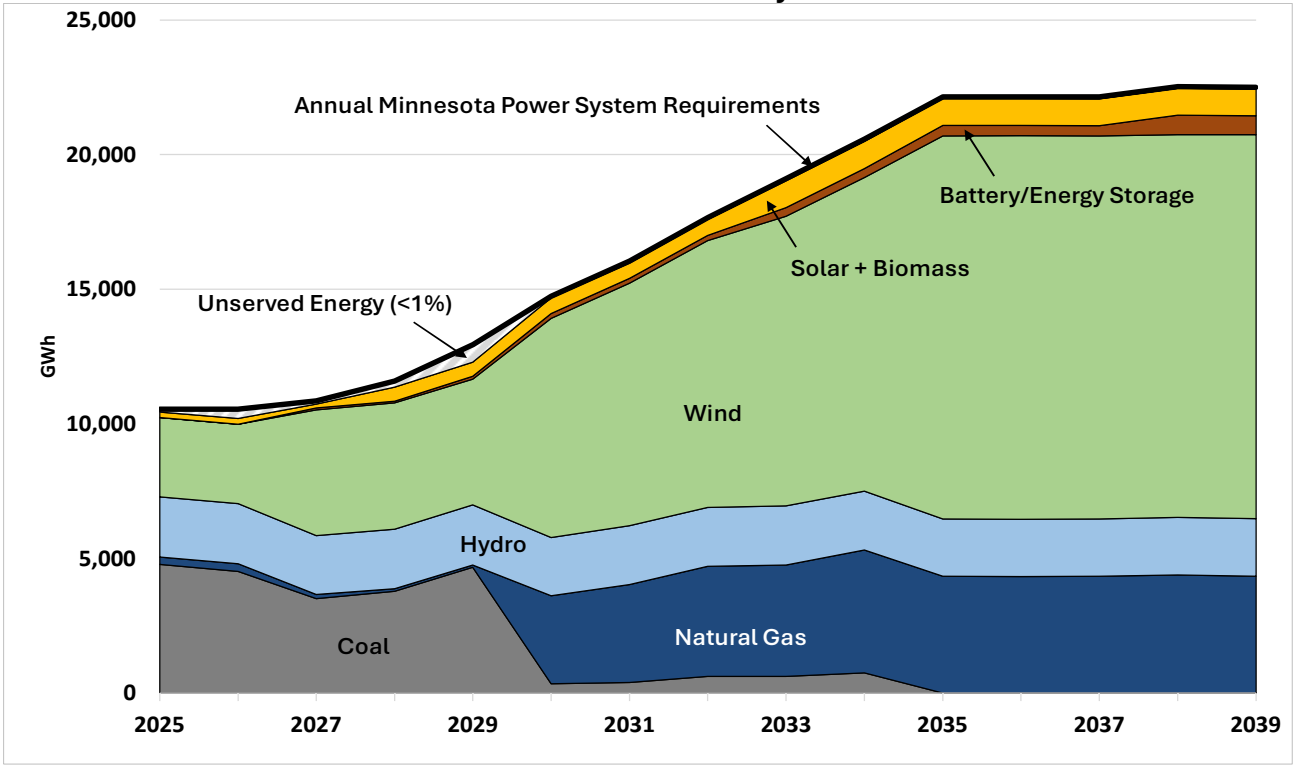
[103] MISO 2024 Regional Resource Assessment (Jan. 2025), available at https://cdn.misoenergy.org/2024%20RRA%20Report_Final676241.pdf

Figure 13. 2025 Base Plan Energy Resources Needed to Serve Minnesota Power's System



Like the Base Plan shown above, the Growth Plan's power supply maximizes renewable energy and energy storage to meet growing customer demand, while keeping unserved energy to less than 1 percent over the study period by utilizing the recommended dispatchable generation portfolio – see Figure 14. The Growth Plan provides sufficient energy resources to serve customer requirements as Minnesota Power transitions away from utilizing coal in its portfolio.

Figure 14. 2025 Growth Plan Energy Resources Needed to Serve Minnesota Power's System



Capacity Considerations

Tables 7 through 10 on the following pages demonstrate the resulting summer and winter capacity position outlooks for the proposed Base Plan and Growth Plan. Due to ceasing coal starting in 2029, there is an identified need for additional capacity resources. In the Growth Plan, the need for capacity increases significantly when combining ceasing coal with a higher customer demand forecast. Incorporating the proposed additions of wind, solar, energy storage, industrial demand response, and new gas generation, combined with continued investment in conservation and DG solar, the Company's capacity position is brought back into an acceptable range. This is especially the case given upcoming changes in MISO resource adequacy requirements (DLOL in 2028) and to meet Minnesota Power's reliability criteria.

Minnesota Power anticipates that when DLOL changes are incorporated into the resource adequacy program, there will be a significant shift in its capacity position starting in Planning Year 2028-2029. Based on preliminary snapshots of Minnesota Power's system under DLOL that MISO provided, Minnesota Power is anticipating a significant decrease in accredited capacity. For example, in the 2035 winter of the Base Plan, the Company is expecting the accredited capacity value of the portfolio will decrease several hundred MWs. The decrease is partly driven by renewables and energy storage having lower capacity value under DLOL. With the new program there will also be reductions in reserve margin requirements, however, for Minnesota Power, the decrease in accredited capacity is expected to be larger than the decline in demand requirements, resulting in a net decrease in the capacity position. The more significant decrease in accredited capacity is occurring mostly across Minnesota Power's renewable portfolio. With wind and solar unable to dispatch when the system is in stressed conditions, these resources receive lower

accredited capacity value in the DLOL construct. To capture this planned implementation, there is an adjustment for DLOL in the Load and Capability tables shown on the following pages.

The Base Plan and Growth Plan are projected to have sufficient capacity resources for the transition to DLOL in most Planning Years. Although, there are remaining uncertainties on what the final impact of DLOL will be given the limited information provided so far and how accredited capacity values will change as the power supply transforms in the MISO region. Minnesota Power will continue to monitor the impact DLOL has to the 2025 Plan and provide updates in future IRPs as more information becomes available from MISO. More on the potential impact from DLOL to Minnesota Power's capacity position in fall and spring is discussed and shown in Appendix K.

Table 7. 2025 Base Plan Capacity Outlook - Summer

	2025	2030	2035
System Needs: Summer			
Forecasted Gross Load	1615	1655	1660
FAC/FERC System Coincidence	95.02%	95.02%	95.02%
Coincident Load	1535	1573	1577
MISO Planning Reserve Margin (UCAP)	9%	9%	9%
MP Obligation (Summer)	1673	1714	1719
Existing 2021 Plan & Approved Resources (Seasonal Accredited Capacity, Summer)			
Demand Response, Existing	173	56	56
Coal	666	238	0
Natural Gas	98	259	101
Biomass	53	52	52
Energy Storage	0	77	77
Hydro	332	333	333
Wind	192	245	242
Solar	21	40	36
Distributed Solar Energy Standard (DSES)	0	16	14
Customer Distributed Generation	153	153	153
Existing Resources	**1689**	**1469**	**1064**
Summer Net Resource (Need)/Surplus After Existing and Approved Resources	**16**	**(245)**	**(655)**
2025 Plan Incremental Distributed Resources (Season Accredited Capacity, Summer)			
Incremental Distributed Resources Brought Forth in This Plan	**0**	**109**	**109**
Summer Net Resource (Need)/Surplus After Additional Distributed Resources	**16**	**(136)**	**(546)**
2025 Plan Resource Additions (Seasonal Accredited Capacity, Summer)			
Energy Storage	0	0	0
BEC3 Gas Conversion	0	330	330
Natural Gas	0	0	605
Wind	0	36	64
Solar	0	0	0
Preferred Plan Resource Additions	**0**	**366**	**999**
Projected Net Position (Need)/Surplus	**16**	**230**	**453**
DLOL Projected Impact to 2025 Plan Net Position (Direct Loss Of Load (DLOL) Capacity, Summer)			
DLOL Resourse Accreditation Adjustment (+ Increased Capacity / - Decreased Capacity)	0	(326)	(370)
Planning Reserve Margin System Adjustment (+ Increase Obligation / - Decrease Obligation)	0	(98)	(98)
Projected Change In Capacity Position	0	(228)	(272)
DLOL Projected Net Position (Need)/Surplus	**16**	**2**	**181**

Table 8. 2025 Base Plan Capacity Outlook - Winter

	2025	2030	2035
System Needs: Winter			
Forecasted Gross Load	1626	1675	1705
FAC/FERC System Coincidence	96.33%	96.33%	96.33%
Coincident Load	1566	1613	1642
MISO Planning Reserve Margin (UCAP)	27%	27%	27%
MP Obligation (Winter)	1995	2055	2092
Existing 2021 Plan & Approved Resources (Seasonal Accredited Capacity, Winter)			
Demand Response, Existing	70	66	66
Coal	944	308	0
Natural Gas	71	267	62
Biomass	54	57	57
Energy Storage	0	77	77
Hydro	357	361	361
Wind	493	706	638
Solar	1	0	0
Distributed Solar Energy Standard (DSES)	0	0	0
Customer Distributed Generation	146	146	146
Existing Resources	**2134**	**1989**	**1408**
Summer Net Resource (Need)/Surplus After Existing and Approved Resources	**139**	**(67)**	**(684)**
2025 Plan Incremental Distributed Resources (Season Accredited Capacity, Winter)			
Incremental Distributed Resources Brought Forth in This Plan	**0**	**127**	**127**
Summer Net Resource (Need)/Surplus After Additional Distributed Resources	**139**	**61**	**(557)**
2025 Plan Resource Additions (Seasonal Accredited Capacity, Winter)			
Energy Storage	0	0	0
BEC3 Gas Conversion	0	380	380
Natural Gas	0	0	622
Wind	0	74	148
Solar	0	0	0
Preferred Plan Resource Additions	**0**	**454**	**1151**
Projected Net Position (Need)/Surplus	**139**	**515**	**594**
DLOL Projected Impact to 2025 Plan Net Position (Direct Loss Of Load (DLOL) Capacity, Winter)			
DLOL Resourse Accreditation Adjustment (+ Increased Capacity / - Decreased Capacity)	0	(808)	(813)
Planning Reserve Margin System Adjustment (+ Increase Obligation / - Decrease Obligation)	0	(442)	(450)
Projected Change In Capacity Position	0	(366)	(363)
DLOL Projected Net Position (Need)/Surplus	**139**	**149**	**231**

Table 9. 2025 Growth Plan Capacity Outlook - Summer

	2025	2030	2035
System Needs: Summer			
Forecasted Gross Load	1615	2031	2765
FAC/FERC System Coincidence	95.02%	95.02%	95.02%
Coincident Load	1535	1930	2627
MISO Planning Reserve Margin (UCAP)	9%	9%	9%
MP Obligation (Summer)	1673	2104	2864
Existing 2021 Plan & Approved Resources (Seasonal Accredited Capacity, Summer)			
Demand Response, Existing	173	56	56
Coal	666	238	0
Natural Gas	98	259	101
Biomass	53	52	52
Energy Storage	0	77	77
Hydro	332	333	333
Wind	192	245	242
Solar	21	40	36
Distributed Solar Energy Standard (DSES)	0	16	14
Customer Distributed Generation	153	153	153
Existing Resources	**1689**	**1469**	**1064**
Summer Net Resource (Need)/Surplus After Existing and Approved Resources	**16**	**(634)**	**(1799)**
2025 Plan Incremental Distributed Resources (Season Accredited Capacity, Summer)			
Incremental Distributed Resources Brought Forth in This Plan	**0**	**109**	**109**
Summer Net Resource (Need)/Surplus After Additional Distributed Resources	**16**	**(525)**	**(1690)**
2025 Plan Resource Additions (Seasonal Accredited Capacity, Summer)			
Energy Storage	0	0	98
BEC3 Gas Conversion	0	330	330
Natural Gas	0	697	1517
Wind	0	144	352
Solar	0	0	46
Preferred Plan Resource Additions	**0**	**1171**	**2343**
Projected Net Position (Need)/Surplus	**16**	**645**	**653**
DLOL Projected Impact to 2025 Plan Net Position (Direct Loss Of Load (DLOL) Capacity, Summer)			
DLOL Resourse Accreditation Adjustment (+ Increased Capacity / - Decreased Capacity)	0	(456)	(667)
Planning Reserve Margin System Adjustment (+ Increase Obligation / - Decrease Obligation)	0	(120)	(163)
Projected Change In Capacity Position	0	(337)	(504)
DLOL Projected Net Position (Need)/Surplus	**16**	**309**	**149**

Table 10. 2025 Growth Plan Capacity Outlook - Winter

	2025	2030	2035
System Needs: Winter			
Forecasted Gross Load	1626	2051	2810
FAC/FERC System Coincidence	96.33%	96.33%	96.33%
Coincident Load	1566	1975	2707
MISO Planning Reserve Margin (UCAP)	27%	27%	27%
MP Obligation (Winter)	1995	2517	3448
Existing 2021 Plan & Approved Resources (Seasonal Accredited Capacity, Winter)			
Demand Response, Existing	70	66	66
Coal	944	308	0
Natural Gas	71	292	62
Biomass	54	57	57
Energy Storage	0	77	77
Hydro	357	361	361
Wind	493	706	638
Solar	1	0	0
Distributed Solar Energy Standard (DSES)	0	0	0
Customer Distributed Generation	146	146	146
Existing Resources	**2134**	**2013**	**1408**
Summer Net Resource (Need)/Surplus After Existing and Approved Resources	**139**	**(503)**	**(2040)**
2025 Plan Incremental Distributed Resources (Season Accredited Capacity, Winter)			
Incremental Distributed Resources Brought Forth in This Plan	**0**	**127**	**127**
Summer Net Resource (Need)/Surplus After Additional Distributed Resources	**139**	**(376)**	**(1913)**
2025 Plan Resource Additions (Seasonal Accredited Capacity, Winter)			
Energy Storage	0	0	98
BEC3 Gas Conversion	0	380	380
Natural Gas	0	698	1526
Wind	0	296	814
Solar	0	0	0
Preferred Plan Resource Additions	**0**	**1375**	**2819**
Projected Net Position (Need)/Surplus	**139**	**998**	**906**
DLOL Projected Impact to 2025 Plan Net Position (Direct Loss Of Load (DLOL) Capacity, Winter)			
DLOL Resourse Accreditation Adjustment (+ Increased Capacity / - Decreased Capacity)	0	(1069)	(1417)
Planning Reserve Margin System Adjustment (+ Increase Obligation / - Decrease Obligation)	0	(541)	(742)
Projected Change In Capacity Position	0	(528)	(675)
DLOL Projected Net Position (Need)/Surplus	**139**	**471**	**231**

Event Analysis – Winter Storm Uri Performance

The actions proposed in the 2025 Plan will change how Minnesota Power provides a reliable power supply to its customers by transitioning away from coal to relying on natural gas generation and energy storage during periods when renewable energy is unavailable. As discussed earlier, Minnesota Power applied reliability criteria to ensure that this transition to decarbonize the power supply does not result in a decline in the quality-of-service customers receive today. One of the criteria that gives the Company comfort in its proposed actions is performing an event analysis, where a detailed evaluation is performed of a portfolio's performance during a period when the system is stressed.

One event Minnesota Power looked at is the Winter Storm Uri event that occurred from February 13 – 17, 2021. This was a multi-day event of high demand due to extreme cold combined with stretches of low renewable production and higher forced outages of traditional resources. This is becoming a common tool for planners to evaluate system performance during historical stressed periods to help augment the traditional energy and capacity modeling performed with a tool like EnCompass. For this plan, this additional insight into system performance was also used to affirm the recommendation for dispatchable generation. The proposed energy portfolio in the Base Plan and Growth Plan optimizes a diverse and flexible generation mix of wind, solar, hydro, energy storage, demand response, biomass, and natural gas generation to meet the customer needs during winter the Winter Storm Uri – shown in Figures 15 and 16 below.

Figure 15. Energy Supply Performance During Winter Storm Uri with Base Plan

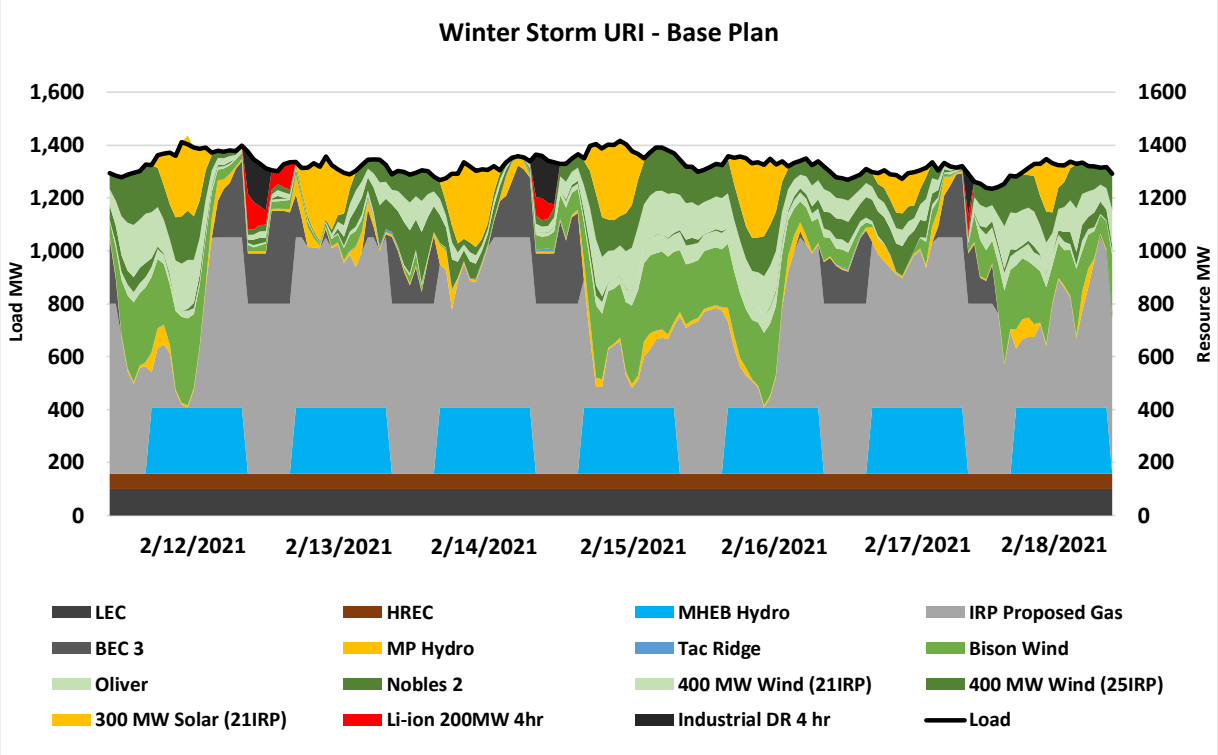
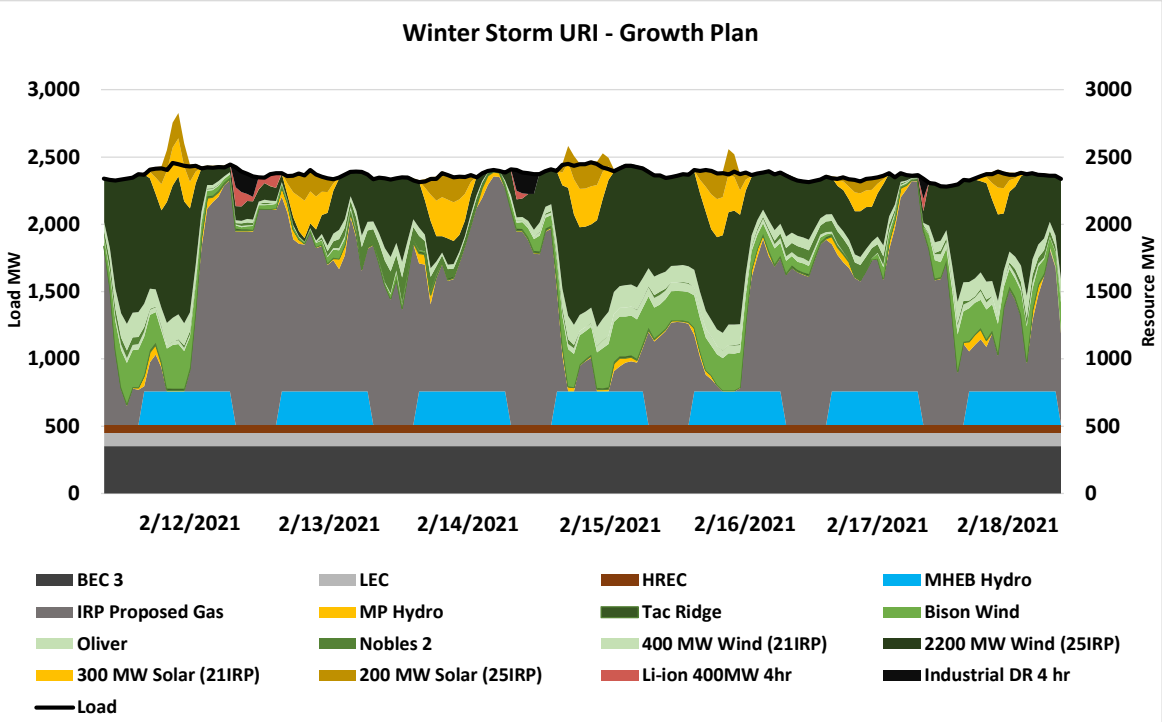


Figure 16. Energy Supply Performance During Winter Storm Uri with Growth Plan



The event analysis above is an example of how Minnesota Power's Base Plan and Growth Plan have the capability to dispatch during a Winter Storm Uri like event. Actual performance and what generation resources are dispatched will vary depending on unit availability, price of fuel, and state of charge for batteries, for example. This analysis demonstrates that with the proposed power supply fully operational and available the Company can reliably serve customers during a similar type of event.

Socioeconomic Impacts of the 2025 Plan

The actions proposed in the 2025 Plan will have socioeconomic impacts to northeastern Minnesota that will result in changes to jobs and gross domestic product ("GDP"). Minnesota Power is performing a socioeconomic impact study using the industry accepted model built by Regional Economic Model, Inc. Not all actions in the 2025 Plan will have direct economic impacts on the region and for this study, only the resource actions that are expected to have direct impacts were included:

Base Plan

1. BEC3 natural gas refuel and BEC4 40 percent natural gas refuel;
2. Construction of 100 MW of energy storage; and
3. Construction of 750 MW natural gas fired combined cycle.

Growth Plan

1. BEC3 natural gas refuel and BEC4 40 percent natural gas refuel;
2. Construction of 1500 MW of natural gas fired combined cycle and combustion turbines;
3. Construction of 200 MW of solar;

4. Construction of 300 MW of energy storage.

The socioeconomic impact assessment is included in Appendix M.

Carbon Reduction Progress

The 2025 Plan identifies Minnesota Power's near-term plan to further reduce carbon emissions by adding renewable energy, energy storage, enhanced industrial demand response, and ceasing utilization of coal in its portfolio completely by 2035 and replacing with more efficient and lower carbon emitting natural gas combined cycle. These actions increase the renewable portfolio to 90 percent renewable and achieve CFS requirements by 2035 in both the Base Plan and Growth Plan, while ensuring cost-effective rates for customers. How Minnesota Power will meet the CFS is discussed further in Appendix I. Furthermore, in the Base Plan carbon emissions are reduced by 95 percent and in the Growth Plan reduced by more than 90 percent from 2005 levels, demonstrating even with load growth Minnesota Power continues to be a leader in serving increasing demand while still making significant progress on carbon reductions.

Sensitivity Risk Analysis

For the 2025 Plan, Minnesota Power stressed the Base Plan and Growth Plan by putting them through a series of approximately 20 sensitivities that stressed the main drivers for resource decisions. These drivers include fuel costs, technology cost, market prices, and renewable performance. This sensitivity analysis helped determine whether the 2025 Plan and its resource actions is a robust plan for customers. The sensitivity analysis results are discussed further in Appendix K.

Key Contingencies

The planning process and resource plan analysis discussed in this IRP allowed Minnesota Power to consider several contingencies that address the uncertainty that is present with the business environment, customer cost impacts, and climate compliance policy. Each gave the Company the insight needed to be prepared for the potential paths each of these can take in the near term. The key contingencies and their anticipated implications that Minnesota Power will continue to monitor are:

Uncertainty in Customer Demand due to Business Climate: Customers are anticipating large increases in their energy demand and expect Minnesota Power to have flexible plans to serve this energy. Depending how quickly this demand ramps up and the size, Minnesota Power could have capacity and energy deficits and will need to consider making market purchases to mitigate the gap period between customer needs and when new generation can be brought online. On the contrary, if a recession re-emerges or customers are forced under additional economic pressure impacting Minnesota Power's demand, the Company will have excess capacity and will consider making commitments for power sales to mitigate the effect of the reduced customer load.

Availability of Federal Tax Incentives: The affordability of the 2025 plan relies on federal tax incentives for carbon free resources needed to meet the Minnesota CFS. If there are changes to the availability of tax incentives, Minnesota Power will monitor the impact and communicate those impacts to the Commission in future IRPs or as necessary.

EPA Section 111 Carbon Regulation: If there are changes to the EPA Section 111 Carbon Regulation requirements, Minnesota Power would re-evaluate its long-term actions that are impacted and bring forward a revised plan.

Technology Advancements: If advancements in carbon-free energy technologies occur quicker and costs decline at a faster rate than expected, Minnesota Power would re-evaluate its long-term actions to reduce carbon quicker and consider the addition of more carbon minimizing technologies.

Implementation of New Generation in 2025 Plan: With the significant demand for new generation that the industry is planning for during this IRP study period there is the potential for cost and timing to shift due to availability of transmission, permitting and regulatory bottlenecks, constrained supply chains, and skilled labor shortages. Minnesota Power will monitor these risks during the execution of the IRP 2025 Plan and provide updates in future IRPs or as necessary through individual project updates.

MISO Resource Adequacy and Availability of Transmission: MISO is preparing to transition its resource adequacy requirements to implement changes to its capacity accreditation construct. Minnesota Power will continue to monitor the cost of interconnecting new resources as Minnesota Power seeks to implement its short and long-term action plans and incorporate additional renewables into the system.

Minnesota Power will also continue to closely monitor the business environment, affordability of the plan, and potential changes to other climate compliance policy outlooks and evaluate its short-term action plan as the landscape unfolds to ensure that customers and communities are served in a reliable and forward-looking way during the planning period.

Conclusion

The 2025 Plan analysis identified actions for customers that meet the current and future growth needs of the system, resulting in flexible short- and long-term action plans that include the most reasonable cost actions and meet the Minnesota CFS for the study period through 2039. The evaluations resulted in definitive plans for replacing coal generation at BEC3 and BEC4 with a mix of wind, solar, natural gas, energy storage, and enhanced demand response. This portfolio of additional renewables and dispatchable generation is supported through the Capacity Expansion Analysis. Continued leadership in conservation programs, distributed generation, and grid strengthening implementation puts Minnesota Power on a sustainable path to 90 percent renewable generation by 2035, in compliance with the milestones outlined in the CFS, as customers are expecting higher levels of energy demand. The 2025 Plan, in its entirety, is a flexible, innovative, bold, and reasonable cost plan that reflects Minnesota Power's commitment to our customers, communities, and climate action.

VI. SHORT-TERM ACTION PLAN

Minnesota Power's short-term action plan communicates the Company's vision for a sustainable energy future and outlines bold next steps in the Company's *Energy**Forward*** resource strategy that are centered on a commitment to providing safe, reliable, and increasingly clean energy at a reasonable cost.

Steps to Meet Short-Term Action Plan (2025 through 2030)

Minnesota Power's short-term action plan during the near term period of 2025 through 2030 is comprised of action items that will immediately reduce carbon emissions in the near term and continue the addition of renewable energy, conservation, and other demand side resources to the Company's resource portfolio.

1. Complete the 2021 IRP actions already in progress, including finalizing the Company's implementation plan for 400 MW of new wind energy by 2028 as practicable and completing the implementation of the Regal and Boswell Solar Projects, which will result in approximately 200 MW of additional utility-scale solar resources. The Company will also bring forward a filing outlining the Company's plan for up to 500 MWh of new energy storage in 2026 and progress on Integrated Distribution Plan non-wires alternatives.
2. Maximize demand side management and customer options by continuing the Company's ECO and energy efficiency programs and creating the necessary tariff mechanisms to acquire at least 100 MW of new long term demand response capacity by 2028 that includes an annual energy curtailment requirement. The Company will also work to complete the addition of 65 to 85 MW of new DG solar resources and implement an EV MDU program to further support customers' electrification needs.
3. Add new renewable energy to the Company's portfolio by releasing an RFP for 400 MW of additional wind energy and 100 MW of energy storage for implementation by 2035.
4. Advance the Company's plan to cease coal at BEC3 by the end of 2029. Begin the engineering and acquisition of materials required for a natural gas refuel of the unit. Pending the outcome of state and federal regulatory processes and economic evaluations related to biomass as a net carbon-free resource, Minnesota Power will conduct additional investigation into the economic prospects of co-firing biomass as part of the refuel plan at BEC. The Company will cease coal at BEC3 once new gas refuel capability is in service. This refueling will result in immediate carbon emissions reduction while supporting reliability in the region and continuing to provide economic benefits for the local host community.
5. In order to comply with the current EPA Section 111(d) carbon regulations, begin engineering and development required for at least 40 percent natural gas capability for BEC4 in coordination with WPPI Energy.
6. Continue operations at HREC to support regional reliability needs and ensure all environmental requirements are met for this renewable facility.
7. Work with customers to identify and integrate emerging clean firm technology with a proposal requesting $30 million to pursue R&D projects that will be rider recoverable.

VII. LONG-TERM ACTION PLAN

Minnesota Power's long-term action plan communicates the Company's vision for transitioning to a sustainable clean energy future and outlines bold next steps in the Company's *Energy**Forward*** resource strategy that are centered on a commitment to providing safe, reliable, and increasingly clean energy at a reasonable cost.

Plans to Meet Long-Term Need (2030 through 2039)

Minnesota Power will focus its long-term plan on a strategy to further reduce carbon emissions in its portfolio and reshape its generation mix after it ceases utilizing coal. This long-term strategy will continue resource diversification and position Minnesota Power to be able to successfully adapt to a range of economic and environmental futures while maintaining reliable service to its customers at a reasonable cost. Each component of this long-term plan has been proven through the planning analysis to be flexible and robust to keep progress toward the Company's strategic resource goals on track in a variety of future scenarios. Planned components include:

- To ensure Minnesota Power has dispatchable reliability resources to meet expected customer needs, immediately begin to develop 750 MW of combined cycle natural gas generation to be in service by 2035 to enable ceasing coal on Minnesota Power's system. BEC infrastructure reinvestment will be prioritized in siting activities.
    1. On receipt of final local permits for NTEC, and if available to meet IRP needs, the Company will refile with the Commission as required.
    2. Any new natural gas resource additions will position for minimizing carbon emissions with alternative fuel or technology as it becomes available.
- Cease utilizing coal in Minnesota Power's supply portfolio once new combined cycle generation replacement is complete to ensure reliability is not degraded. To ensure Minnesota Power meets the latest GHG requirements including EPA Section 111(d) carbon regulations by 2030, Minnesota Power will develop, along with WPPI Energy, a refueling alternative of BEC4 for operating capability of at least 40 percent natural gas, which will create additional emission reductions for the facility five years ahead of the Company's cease coal plan.
- Continue developing and implementing transmission solutions to address reliability issues related to the Company's cease coal plan, including working with regional partners to complete three approved MISO LRTP Tranche 2.1 projects and continued work with MISO to determine if additional transmission solutions are necessary for regional reliability needs as decarbonization of the electricity system continues.

As additional load growth emerges, Minnesota Power will need to be flexible and nimble and will add the following actions under the Growth Plan as necessary:

- Increase natural gas additions to 1500 MW to meet system requirements.
- Increase renewable implementation to include up to 2200 MW of wind and 200 MW of solar resources to position the Company for compliance with the CFS.
- Increase energy storage to 300 MW to ensure economic management of Minnesota Power's renewable portfolio.

- New supply additions identified in the Growth Plan will be brought forward for Commission consideration and approval as part of a power supply agreement that outlines customer responsibility for the additions required and benefits provided to existing customers.
- If additional load emerges above the Growth Scenario planning level, Minnesota Power will increase these initial activities with a dedicated power supply plan brought to the Commission as needed prior to submission of the Company's next IRP.

IRPs offer an iterative planning process, and Minnesota Power will continue to evaluate carbon-free technology adoption and economic pathways for CFS compliance in 2040. In its next IRP, Minnesota Power will:

1. Evaluate the economic prospects of biomass as an additional fuel source if state and federal policy indicates biomass is a net-carbon free resource based on a life-cycle analysis;
2. Review its Manitoba Hydro contract and other renewable PPA terms, as well as alternatives for replacement if necessary;
3. Evaluate additional transmission alternatives for accessing broader regional capacity and optimization;
4. Clarify the cease coal plan for BEC4 and action being taken at the facility; and
5. Continue to prioritize reliability needs of the system as it continues to transform.

In the Matter of Minnesota Power's Application for Approval of its 2025-2039 Integrated Resource Plan

MPUC Docket No. E-015/RP-25-127

CERTIFICATE OF SERVICE

I, Kristin M. Stastny, hereby certify that on the 3rd day of March, 2025, on behalf of Minnesota Power, I electronically filed a true and correct copy of the Company's **2025-2039 Integrated Resource Plan** on www.edockets.state.mn.us. Said documents were also served via U.S. mail and electronic service as designated on the attached service lists.

/s/ Kristin M. Stastny
Kristin M. Stastny

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
1	Jessica L	Bayles	jessica.bayles@stoel.com	Stoel Rives LLP		1150 18th St NW Ste 325 Washington DC, 20036 United States	Electronic Service		No	2025-2039 IRP
2	Alissa	Bemis	abemis@gpisd.net	Great Plains Institute		2801 21st Ave S #220 Minneapolis MN, 55407 United States	Electronic Service		No	2025-2039 IRP
3	Laura	Bishop	laura.bishop@state.mn.us		Minnesota Pollution Control Agency	520 Lafayette Rd Saint Paul MN, 55155 United States	Electronic Service		No	2025-2039 IRP
4	Elizabeth	Brama	ebrama@taftlaw.com	Taft Stettinius & Hollister LLP		2200 IDS Center 80 South 8th Street Minneapolis MN, 55402 United States	Electronic Service		No	2025-2039 IRP
5	Jon	Brekke	jbrekke@grenergy.com	Great River Energy		12300 Elm Creek Boulevard Maple Grove MN, 55369-4718 United States	Electronic Service		No	2025-2039 IRP
6	Matthew	Brodin	mbrodin@allete.com	Minnesota Power		30 West Superior Street Duluth MN, 55802 United States	Electronic Service		No	2025-2039 IRP
7	Christina	Brusven	cbrusven@fredlaw.com	Fredrikson Byron		60 S 6th St Ste 1500 Minneapolis MN, 55402-4400 United States	Electronic Service		No	2025-2039 IRP
8	Jennifer	Cady	jjcady@mnpower.com	Minnesota Power		30 W Superior St Duluth MN, 55802 United States	Electronic Service		No	2025-2039 IRP
9	Greg	Chandler	greg.chandler@upm.com	UPM Blandin Paper		115 SW First St Grand Rapids MN, 55744 United States	Electronic Service		No	2025-2039 IRP
10	Cathy	Chavers	cchavers@boisforte-nsn.gov	Bois Forte Band of Chippewa		Bois Forte Tribal Government 5344 Lakeshore Drive Nett Lake MN, 55772 United States	Electronic Service		No	2025-2039 IRP
11	Generic	Commerce Attorneys	commerce.attorneys@ag.state.mn.us		Office of the Attorney General - Department of Commerce	445 Minnesota Street Suite 1400 St. Paul MN, 55101 United States	Electronic Service		No	2025-2039 IRP
12	Hillary	Creurer	hcreurer@allete.com	Minnesota Power		30 W Superior St Duluth MN, 55802 United States	Electronic Service		No	2025-2039 IRP
13	George	Damian	gdamian@cleanenergyeconomymn.org	Clean Energy Economy MN		13713 Washburn Ave S Burnsville	Electronic Service		No	2025-2039 IRP

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
						MN, 55337 United States				
14	Tom	Dicklich	tdicklich@mntrades.org	Minnesota Building & Construction Trades Council		353 W. 7th St Rm 105 Saint Paul MN, 55102 United States	Electronic Service		No	2025-2039 IRP
15	Trevor	Drake	tdrake@gpisd.net			2801 21st Ave S Minneapolis MN, 55405 United States	Electronic Service		No	2025-2039 IRP
16	Brian	Edstrom	briane@cubminnesota.org	Citizens Utility Board of Minnesota		332 Minnesota St Ste W1360 Saint Paul MN, 55101 United States	Electronic Service		No	2025-2039 IRP
17	Sharon	Ferguson	sharon.ferguson@state.mn.us		Department of Commerce	85 7th Place E Ste 280 Saint Paul MN, 55101-2198 United States	Electronic Service		No	2025-2039 IRP
18	Barb	Freese	bfreese@mncenter.org	Minnesota Center for Environmental Advocacy		1919 University Ave W Ste 515 Saint Paul MN, 55104-3435 United States	Electronic Service		No	2025-2039 IRP
19	Gregory	French	gfrench@vpuc.com	Virginia Dept. Of Public Utilities		618 Second Street, South P.O. Box 1048 Virginia MN, 55792 United States	Electronic Service		No	2025-2039 IRP
20	Edward	Garvey	garveyed@aol.com	Residence		32 Lawton St Saint Paul MN, 55102 United States	Electronic Service		No	2025-2039 IRP
21	Allen	Gleckner	gleckner@fresh-energy.org	Fresh Energy		408 St. Peter Street Ste 350 Saint Paul MN, 55102 United States	Electronic Service		No	2025-2039 IRP
22	Bree	Halverson	breeh@bluegreenalliance.org			null null, null United States	Electronic Service		No	2025-2039 IRP
23	Adam	Heinen	aheinen@dakotaelectric.com	Dakota Electric Association		4300 220th St W Farmington MN, 55024 United States	Electronic Service		No	2025-2039 IRP
24	Valerie	Herring	vherring@taftlaw.com	Taft Stettinius & Hollister LLP		2200 IDS Center 80 S. Eighth Street Minneapolis MN, 55402 United States	Electronic Service		No	2025-2039 IRP
25	Raymond	Higgins	rayhiggins@mfitpa.com	Minnesota Timber Producers Association		324 West Superior St Ste 903 Duluth MN, 55802 United States	Electronic Service		No	2025-2039 IRP
26	Katherine	Hinderlie	katherine.hinderlie@ag.state.mn.us		Office of the Attorney General - Residential Utilities Division	445 Minnesota St Suite 1400 St. Paul MN, 55101-2134 United States	Electronic Service		No	2025-2039 IRP

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
27	Rick	Horton	rhorton@minnesotaforests.com	Minnesota Forest Industries		324 West Superior Street 903 Medical Arts Building Duluth MN, 55802 United States	Electronic Service		No	2025-2039 IRP
28	Sarah	Johnson Phillips	sjphillips@stoel.com	Stoel Rives LLP		33 South Sixth Street Suite 4200 Minneapolis MN, 55402 United States	Electronic Service		No	2025-2039 IRP
29	Sherry	Kemmetmueller	sherry.kemmetmueller@centerpointenergy.com	CenterPoint Energy		505 Nicollet Mall F3 Minneapolis MN, 55402 United States	Electronic Service		No	2025-2039 IRP
30	Julie	Kennedy	jkennedy@ci.grand-rapids.mn.us	Grand Rapids - Itasca County Airport		420 North Pokegama Ave Grand Rapids MN, 55744 United States	Electronic Service		No	2025-2039 IRP
31	William	Kenworthy	will@votesolar.org			1 South Dearborn St Ste 2000 Chicago IL, 60603 United States	Electronic Service		No	2025-2039 IRP
32	Will	Keyes	wkeyes@ibew31.com			2002 London Road Ste 105 Duluth MN, 55812 United States	Electronic Service		No	2025-2039 IRP
33	Jennifer	Kuklenski	jkuklenski@mnpower.com	Minnesota Power		30 W Superior St, Duluth, MN, 55802 Duluth MN, 54534 United States	Electronic Service		No	2025-2039 IRP
34	Jennifer	Kuklenski	jkuklenski@mnpower.com	Minnesota Power		30 West Superior Street Duluth MN, 55082 United States	Electronic Service		No	2025-2039 IRP
35	Becky	Lammi	cityclerk@ci.aurora.mn.us	City of Aurora		16 W 2nd Ave N PO Box 160 Aurura MN, 55705 United States	Electronic Service		No	2025-2039 IRP
36	Emily	Larson	elarson@duluthmn.gov	City of Duluth		411 W 1st St Rm 403 Duluth MN, 55802 United States	Electronic Service		No	2025-2039 IRP
37	James D.	Larson	james.larson@avantenergy.com	Avant Energy Services		220 S 6th St Ste 1300 Minneapolis MN, 55402 United States	Electronic Service		No	2025-2039 IRP
38	Patti	Leaf	patricia.b.leaf@xcelenergy.com	Northern States Power Company dba Xcel Energy-Elec		414 Nicollet Mall (401-7) Minneapolis MN, 55401 United States	Electronic Service		No	2025-2039 IRP
39	Brian	Lebens	brian.lebens@ag.state.mn.us		Office of the Attorney General - Residential Utilities Division	445 Minnesota Street St. Paul MN, 55101 United States	Electronic Service		No	2025-2039 IRP
40	Amber	Lee	amber.lee@stoel.com	Stoel Rives LLP		33 S. 6th Street	Electronic Service		No	2025-2039

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
						Suite 4200 Minneapolis MN, 55402 United States				IRP
41	Annie	Levenson Falk	annielf@cubminnesota.org	Citizens Utility Board of Minnesota		332 Minnesota Street, Suite W1360 St. Paul MN, 55101 United States	Electronic Service		No	2025-2039 IRP
42	Eric	Lipman	eric.lipman@state.mn.us		Office of Administrative Hearings	PO Box 64620 St. Paul MN, 55164-0620 United States	Electronic Service		No	2025-2039 IRP
43	Susan	Ludwig	sludwig@mnpower.com	Minnesota Power		30 West Superior Street Duluth MN, 55802 United States	Electronic Service		No	2025-2039 IRP
44	Jamie	MacAlister	jamie.macalister@state.mn.us		Department of Commerce	85 7th Place East, Ste. 500 St. Paul MN, 55101 United States	Electronic Service		No	2025-2039 IRP
45	Daryl	Maxwell	dmaxwell@hydro.mb.ca	Manitoba Hydro		360 Portage Ave FL 16 PO Box 815, Station Main Winnipeg MB, R3C 2P4 Canada	Electronic Service		No	2025-2039 IRP
46	Jess	McCullough	jmccullough@mnpower.com	Minnesota Power		30 W Superior St Duluth MN, 55802 United States	Electronic Service		No	2025-2039 IRP
47	Tony	Mendoza	tony.mendoza@sierraclub.org	Sierra Club Environmental Law Program		2101 Webster St. 13th Floor Oakland CA, 94612 United States	Electronic Service		No	2025-2039 IRP
48	Hannah	Mitchell	hmitchell@mnpower.com	Minnesota Power		30 West Superior Street Duluth MN, 55802 United States	Electronic Service		No	2025-2039 IRP
49	Andrew	Moratzka	andrew.moratzka@stoel.com	Stoel Rives LLP		33 South Sixth St Ste 4200 Minneapolis MN, 55402 United States	Electronic Service		No	2025-2039 IRP
50	Evan	Mulholland	emulholland@mncenter.org	Minnesota Center for Environmental Advocacy		1919 University Ave W Ste 515 Saint Paul MN, 55101 United States	Electronic Service		No	2025-2039 IRP
51	David	Niles	david.niles@avantenergy.com	Minnesota Municipal Power Agency		220 South Sixth Street Suite 1300 Minneapolis MN, 55402 United States	Electronic Service		No	2025-2039 IRP
52	Will	Nissen	will.nissen@state.mn.us		Public Utilities Commission	85 7th Place East Suite 280 Saint Paul MN, 55101 United States	Electronic Service		No	2025-2039 IRP
53	Patrick	O'Connell	poconnell@linnagroc.com			27 3rd St SE Chisholm MN,	Paper Service		No	2025-2039

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
						55719 United States				IRP
54	Logan	O'Grady	lograd y@mnseia.org	Minnesota Solar Energy Industries Association		2288 University Ave W St. Paul MN, 55114 United States	Electronic Service		No	2025-2039 IRP
55	Paul	Peltier	paul@ramsmn.org			5525 Emerald Avenue Mountain Iron MN, 55768 United States	Electronic Service		No	2025-2039 IRP
56	Bret	Pence	bretpence@mnipl.org	Minnesota Interfaith Power and Light		106 Waverly Place Duluth MN, 55803 United States	Electronic Service		No	2025-2039 IRP
57	Max	Peters	maxp@cohasset-mn.com	City of Cohasset		305 NW First Ave Cohasset MN, 55721 United States	Electronic Service		No	2025-2039 IRP
58	Jennifer	Peterson	jjpeterson@mnpower.com	Minnesota Power		30 West Superior Street Duluth MN, 55802 United States	Electronic Service		No	2025-2039 IRP
59	Kevin	Pranis	kpranis@liunagroc.com	Laborers' District Council of MN and ND		81 E Little Canada Road St. Paul MN, 55117 United States	Electronic Service		No	2025-2039 IRP
60	Kristin	Renskers	krenskers@ibew31.com	IBEW Local 31		2002 London Rd Ste 105 Duluth MN, 55812 United States	Electronic Service		No	2025-2039 IRP
61	Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us		Office of the Attorney General - Residential Utilities Division	1400 BRM Tower 445 Minnesota St St. Paul MN, 55101-2131 United States	Electronic Service		No	2025-2039 IRP
62	Susan	Romans	sromans@allete.com	Minnesota Power		30 West Superior Street Legal Dept Duulth MN, 55802 United States	Electronic Service		No	2025-2039 IRP
63	Nathaniel	Runke	nrunke@local49.org			611 28th St. NW Rochester MN, 55901 United States	Electronic Service		No	2025-2039 IRP
64	Will	Seuffert	will.seuffert@state.mn.us		Public Utilities Commission	121 7th Pl E Ste 350 Saint Paul MN, 55101 United States	Electronic Service		No	2025-2039 IRP
65	Janet	Shaddix Elling	jshaddix@janetshaddix.com	Shaddix And Associates		7400 Lyndale Ave S Ste 190 Richfield MN, 55423 United States	Electronic Service		No	2025-2039 IRP
66	Brett	Skyles	brett.skyles@co.itasca.mn.us	Itasca County		123 NE Fourth Street Grand Rapids MN, 55744-2600 United States	Electronic Service		No	2025-2039 IRP

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
67	Benjamin	Stafford	bstafford@gpisd.net	Great Plains Institute for Sustainable Development		2801 21st Ave S Suite 220 Minneapolis MN, 55407 United States	Electronic Service		No	2025-2039 IRP
68	Kristin	Stastny	kstastny@taftlaw.com	Taft Stettinius & Hollister LLP		2200 IDS Center 80 South 8th Street Minneapolis MN, 55402 United States	Electronic Service		No	2025-2039 IRP
69	Tammy	Sundbom	tsundbom@mnpower.com	Minnesota Power		null null, null United States	Electronic Service		No	2025-2039 IRP
70	Charles	Sutton	charles@suttonconsultingllc.com			1389 Hoyt Ave W Falcon Heights MN, 55108 United States	Electronic Service		No	2025-2039 IRP
71	Eric	Swanson	eswanson@winthrop.com	Winthrop & Weinstine		225 S 6th St Ste 3500 Capella Tower Minneapolis MN, 55402-4629 United States	Electronic Service		No	2025-2039 IRP
72	Peter	Teigland	peter.teigland@state.mn.us		Department of Commerce	85 7th Pl. E Ste. 280 St. Paul MN, 55101 United States	Electronic Service		No	2025-2039 IRP
73	Brandy	Tofte	brandy.toft@llojibwe.net	Leech Lake Bank of Ojibwe		190 Sailstar Drive NW Cass Lake MN, 56633 United States	Electronic Service		No	2025-2039 IRP
74	Chad	Troumbly	cmtroumbly@grpuc.org	Grand Rapids Public Utilities Commission		500 SE 4th Street Grand Rapids MN, 55744 United States	Electronic Service		No	2025-2039 IRP
75	Analeisha	Vang	avang@mnpower.com			30 W Superior St Duluth MN, 55802-2093 United States	Electronic Service		No	2025-2039 IRP
76	Carla	Vita	carla.vita@state.mn.us	MN DEED		Great Northern Building 12th Floor 180 East Fifth Street St. Paul MN, 55101 United States	Electronic Service		No	2025-2039 IRP
77	Greg	Wannier	greg.wannier@sierraclub.org	Sierra Club		2101 Webster St Ste 1300 Oakland CA, 94612 United States	Electronic Service		No	2025-2039 IRP
78	Elizabeth	Wheeler	ewheeler@cleangridalliance.org	Clean Grid Alliance		570 Asbury Street Suite 201 St. Paul MN, 55104 United States	Electronic Service		No	2025-2039 IRP
79	Laurie	Williams	laurie.williams@sierraclub.org	Sierra Club		Environmental Law Program 1536 Wynkoop St Ste 200 Denver CO, 80202 United States	Electronic Service		No	2025-2039 IRP

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
80	Scott	Zahorik	scott.zahorik@aeoa.org	Arrowhead Economic Opportunity Agency		702 S. 3rd Avenue Virginia MN, 55792 United States	Electronic Service		No	2025-2039 IRP
81	Michael	Zajicek	michael.zajicek@state.mn.us		Department of Commerce	85 East Seventh Place Suite 500 St. Paul MN, 55101 United States	Electronic Service		No	2025-2039 IRP
82	Ari	Zwick	ari.zwick@state.mn.us		Department of Commerce	85 7th Place East Suite 280 Saint Paul MN, 55101 United States	Electronic Service		No	2025-2039 IRP