Preliminary Application Document

Gile Flowage Storage Reservoir Project

FERC Docket No. UL20-1-000

Montreal River, Iron County, Wisconsin

Submitted by
Northern States Power Company - Wisconsin
Eau Claire, Wisconsin

November 2020

Report prepared by

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List of Abbreviations

ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
Applicant	Northern States Power Company – Wisconsin, d/b/a Xcel Energy
APE	Area of Potential Effect
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
Commission	Federal Energy Regulatory Commission
Dam	Gile Flowage dam
EGLE	Michigan Department of Environment, Great Lakes, and Energy
DLA	Draft License Application
DO	Dissolved oxygen
EA	Environmental Assessment
EIS	Environmental Impact Statement
°F	Temperature in degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
FLA	Final License Application
hp	Horsepower
IPaC	Information for Planning and Consultation
JAM	Joint Agency Meeting
kV	Kilovolts
kVA	Kilovolt-amperes
kW	Kilowatts
Licensee	Northern States Power Company - Wisconsin
MDNR	Michigan Department of Natural Resources
MWh	Megawatts per Hour
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NHI	National Heritage Inventory
NLEB	Northern long-eared bat
No.	Number
Nos.	Numbers
NOI	Notice of Intent
NOAA	National Oceanic Atmospheric Association
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NR	Natural Resources
NR 40	Chapter NR 40 of the Wisconsin Administrative Code
NRHP	National Register of Historic Places
NSPW	Northern States Power Company – Wisconsin d/b/a Xcel Energy
PAD	Preliminary Application Document
PCB	Polychlorinated biphenyl
PDF	Portable Document Format
Project	Gile Flowage Storage Reservoir Project
RAW	River Alliance of Wisconsin
RUSLE2	Revised Universal Soil Loss Equation, Version 2
§	Section
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SHPO	Wisconsin Historical Society State Historic Preservation Office
TLP	Traditional Licensing Process
USDA	United States Department of Agriculture

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UW-M	University of Wisconsin-Madison
WDNR	Wisconsin Department of Natural Resources
WDOA	Wisconsin Department of Administration
WHPD	Wisconsin Historic Preservation Database
WDPI	Wisconsin Department of Public Instruction

1. Introduction

Northern States Power Company-Wisconsin (NSPW, Applicant), d/b/a Xcel Energy, owns and operates the Gile Flowage Storage Reservoir Project (Gile Flowage, Project). The Project is located on the West Fork of the Montreal River in Iron County, Wisconsin and operates under a permit issued by the Public Service Commission of Wisconsin. The purpose of the Project is to augment flow in the West Fork of the Montreal River during low flow periods for hydroelectric generation at NSPW's two downstream projects, the Saxon Falls Hydroelectric Project (Saxon Falls) and the Superior Falls Hydroelectric Project (Superior Falls). Both downstream projects are licensed by the Federal Energy Regulatory Commission (FERC, Commission). The location of all three facilities is shown in **Figure 1-1.**

On December 30, 2019, NSPW filed a Preliminary Application Document (PAD) and Notice of Intent (NOI) to relicense both Saxon Falls and Superior Falls. Subsequent to FERC's review of the PAD, they requested additional information regarding the generation benefits that the two downstream projects receive from the Gile Flowage. NSPW provided a downstream benefits analysis for the Gile Flowage to the Commission on February 22, 2020. Upon reviewing the analysis, FERC determined that Gile Flowage provides a significant contribution to generation for both downstream projects. Consequently, the Commission issued an order on August 19, 2020 determining that the Gile Flowage Storage Reservoir Project is required to be licensed by the Commission[1]. The order requires NSPW to submit a schedule for relicensing by November 17, 2020 such that a license application is submitted to the Commission no later than August 18, 2023 (FERC, 2020b).

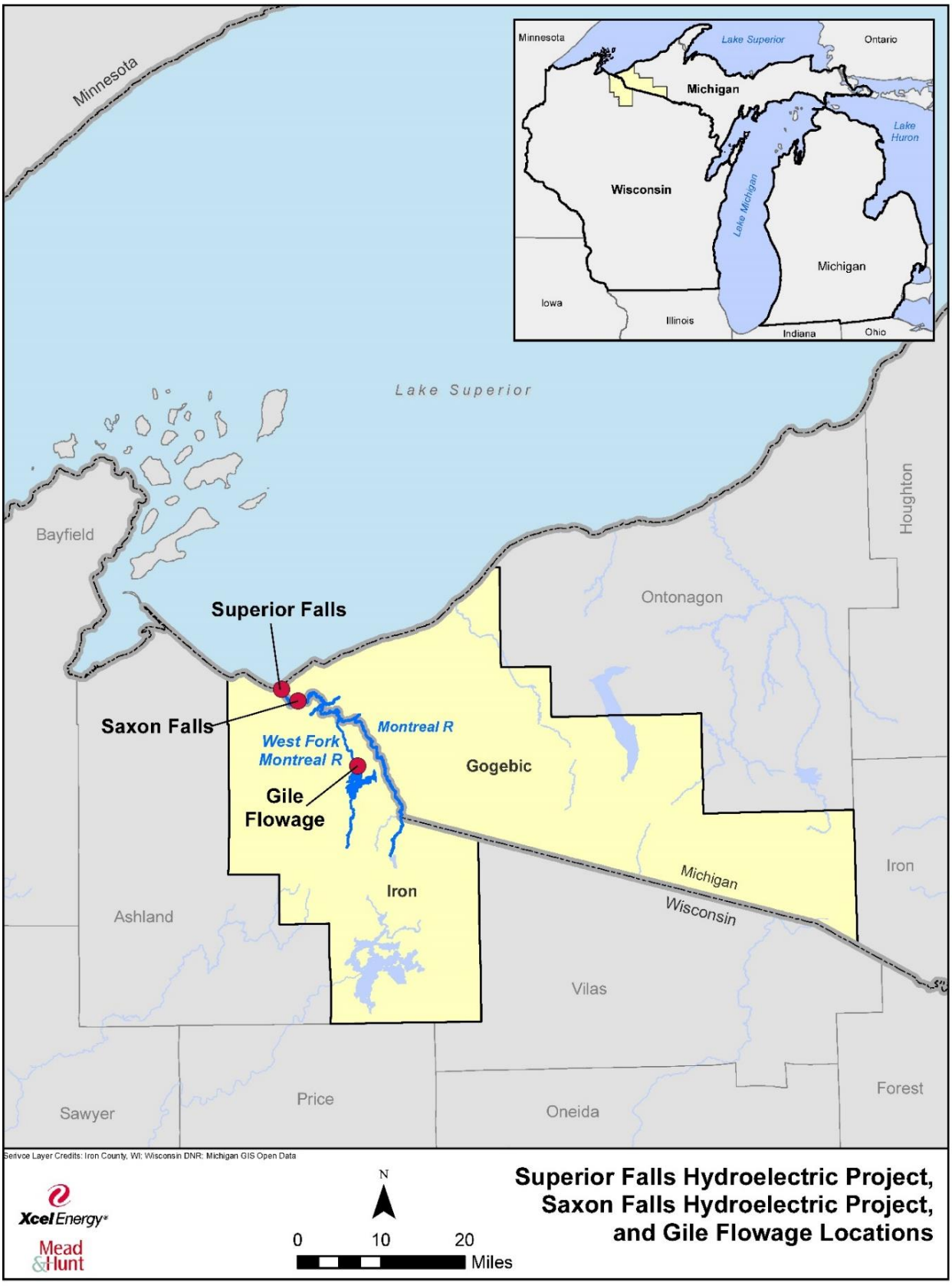
Applying for a new license requires the Licensee to first prepare an NOI and PAD pursuant to 18 Code of Federal Regulations (CFR) Part 5 (CFR, 2016).

The FERC requires a Licensee to use the Integrated Licensing Process unless the Commission grants a request to use an alternative process. Pursuant to 18 CFR § 5.3, such a request must accompany the NOI and PAD and set forth specific information justifying the request. A request to use the FERC's Traditional Licensing Process (TLP) for the Gile Flowage Storage Reservoir Project will also be included with the NOI and PAD. This PAD includes the required information consistent with 18 CFR § 5.6 for the Project.

When the license application is filed for the Project, a public notice will be published in a local newspaper providing interested persons and agencies an opportunity to present any concerns they may have.

[1] *Northern States Power Company – Wisconsin, 172 FERC ¶ 62,093 (2020 Order)*

Figure 1-1: Locations along the Montreal River in Wisconsin and Michigan



1.1 Authorized Agents (18 CFR § 5.6(d)(2)(i))

The following are authorized to act as agents for the Applicant pursuant to 18 CFR § 5.6(d)(2)(i):

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1.2 PAD Content

The PAD is generally organized based upon requirements set forth in 18 CFR § 5.6(c), § 5.6(d), and § 16.7 (CFR, 2018). The purpose of the PAD is to:

- Describe the existing hydroelectric project and its proposed operations,
- Summarize existing information relevant to the evaluation of the project's impact on the area,
- Determine initial concerns or issues various resource agencies may have concerning the Project, and
- Begin to identify potential studies that may need to be conducted to support a new license application.

To assist with this PAD development, various entities at the federal, state, regional, and local level, as well as Indian tribes, were contacted to gather input regarding information and studies that may be relevant to the Projects, as well as any possible concerns or issues they may have. Consultation is summarized in Section 6 of this PAD.

1.3 References

- Federal Energy Regulatory Commission. 2020a. Additional Information Request Regarding the Gile Flowage. Issued January 31, 2020.
- Federal Energy Regulatory Commission. 2020b. Order Ruling on Jurisdictional Inquiry and Finding Licensing Required. Under Docket No. UL-20-1-000. Issued August 19, 2020.
- United States Code of Federal Regulations. 2016. Title 18, Part 5. Revised April 1, 2016.
- United States Code of Federal Regulations. 2018. Title 18, Part 16. Updated April 1, 2018.

2. Process Plan and Schedule (18 CFR § 5.6(d)(1))

2.1 Process Plan and Schedule Through Filing of License Application

This PAD represents one of the first steps in the Licensee's effort to obtain an original license from the FERC which will allow for the continued operation and maintenance of the Project. Concurrent with the filing of this PAD, NSPW filed an NOI. Pursuant to 18 CFR § 5.5, the NOI filings mark the beginning of the relicensing process and set the schedule for further licensing activities. In addition to filing the PAD and NOI, NSPW filed a request with the FERC seeking approval to utilize the TLP for the Project. The request to use the TLP was filed as a related submittal under 18 CFR § 5.3. NSPW's justification to utilize the TLP for the Project is included in the request.

Initial activities under the plan and schedule (**Figure 2.1-1** and **Table 2.1-1**) include filing the PAD and NOI, as well as requests to use the TLP, by November 17, 2020. Based upon this filing date, comments regarding the proposed use of the TLP must be filed with the FERC no later than December 17, 2020. It is anticipated the FERC will approve the Licensee's request to use the TLP by January 16, 2021, at which time Stage 1 of the formal three-stage consultation process would begin for the Project.

In accordance with the above-referenced plan and schedule, within 30 days of receiving TLP approvals from the FERC, NSPW will issue a Notice for a Joint Agency Meeting (JAM) with stakeholders that includes resource agencies and Indian tribes. Based upon the anticipated January 16, 2021 approval to utilize the TLP, the JAM will be held no later than March 17, 2021. Based upon this schedule, stakeholder comments on the PAD would be due by May 12, 2021.

Stage 2 consultation begins after written comments are received on the PAD, or 120 days after the JAM, whichever occurs first. It is anticipated this stage will include consultations with resource agencies regarding study requests. Coordination with resource agencies for the development of study plans is expected to occur prior to the implementation of the studies.

Preparation of the DLA will begin after the studies begin and will be filed in early 2023. Stakeholder review of the DLA will occur for 90 days after the filing of the DLA.

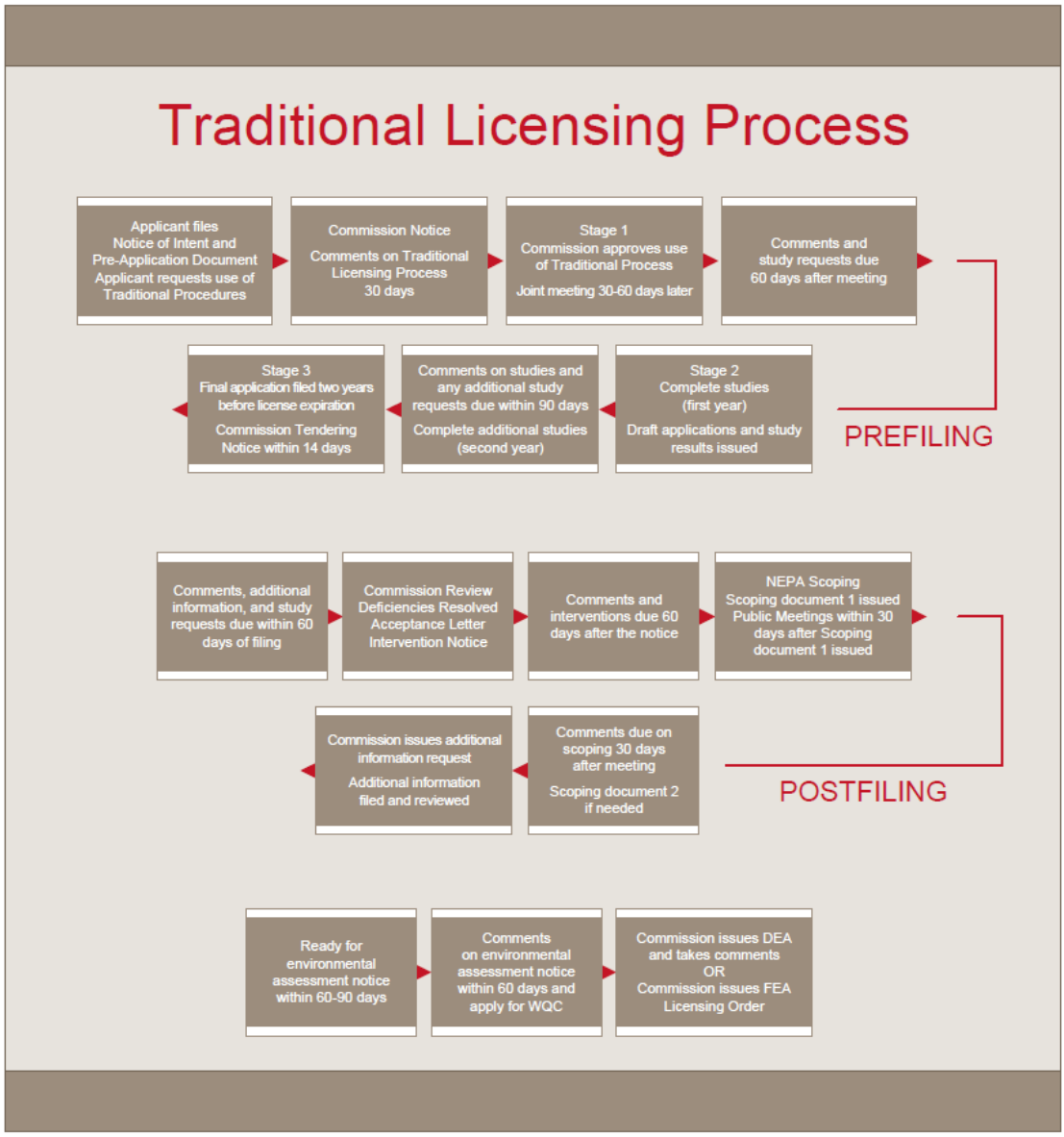
Preparation of the Final License Application (FLA) is expected to begin after comments on the DLA are received. The FLA will be filed with the FERC no later than August 18, 2023. Once the FLA is filed, Stage 3 consultation would begin. Based on the August 18, 2023 FLA filing date, it is anticipated the following will occur between August 18, 2023 and August 18, 2025:

- Review of the FLA by the FERC
- Issuance of the FERC FLA acceptance letter
- Submittal of stakeholder comments, terms, and conditions
- Scoping under the National Environmental Policy Act (NEPA)
- Preparation of Draft Environmental Assessment (EA) or Environmental Impact Statement (EIS)
- Resolution of issues, if any, under Federal Power Act § 10(j)
- Preparation of final EA or EIS

Based on this anticipated schedule, the FERC would issue a License Order by August 18, 2025.

A graphic outlining the TLP schedule is displayed below in **Figure 2.1-1**.

Figure 2.1-1: FERC Traditional Licensing Process Planned Schedule



The TLP plan and schedule for both Projects are summarized in **Table 2.1-1.**

Table 2.1-1: Traditional Licensing Process Plan and Schedule

TLP Steps	Timelines	Due Date*
Initial Activities		
Licensee submits PAD, NOIs, and TLP Requests		11/17/2020
Stakeholders provide comments regarding TLP	30 days after the request	12/17/2020
FERC approval of TLP	60 days after the request	01/16/2021
Stage 1 Consultation		
Licensee conducts Joint Meeting and site visits with potential stakeholders	30 to 60 days after the TLP approval	03/17/2021
Stakeholders submit comments on PAD/Study Requests	Comments and study requests due 60 days after Joint Meeting	05/12/2021
Stage 2 Consultation		
Licensee's Study, Year 1	Begins after receipt of study requests	2021
Licensee's Study, Year 2, if necessary	Begins after completion of Study Year 1	2022
Licensee submits Draft License Application to FERC and relicensing participants for comment	Begins after completion of Study Year 2 (soft deadline)	Early 2023
Stakeholders and FERC provide comments on the Draft Application	Within 90-days after receipt of Draft License Application	Mid 2023
Licensee Files Final Application	At least two years prior to license expiration	08/18/2023
Stage 3 Consultation		
FERC review of Final Application	Planned for 6 months	TBD*
FERC Additional Information Request	Response planned within 90 days	TBD
FERC Notice Ready for Environmental Analysis	Task expected to take 90 days	TBD
NSPW Applies for 401 Water Quality Certification	Apply no earlier than Final License Application filing and later than 60 days after FERC Notice Ready for Environmental Analysis	TBD
FERC NEPA Scoping	Planned for 6 months	TBD
FERC Issues EA/EIS	Comment period planned for 65 days	TBD
FERC Order Issuing New License	FERC goal is to issue the new license before the current license expires	08/18/2025

* Once the Final License Application is filed, the FERC determines the actual schedule for activities.

2.2 Proposed Communications Protocols

The TLP is a consultation-intensive process during which stakeholders have an opportunity to provide input during several stages. The current distribution list for this PAD is included as part of the Certificate of Service. The distribution list will be updated throughout the relicensing process based upon feedback from the participants.

2.2.1 General Communications

Primary means of communication and document distribution will be via email, unless email addresses are not available or unless otherwise requested. A mailing service will be used for distribution of hardcopies. The telephone will serve as an informal method of communication. In addition, a relicensing website, as shown below in Section 2.2.3, has been developed to include major document submissions, major FERC orders, and other relevant documents. All filings related to the relicensing process are available from the FERC's eLibrary website at elibrary.ferc.gov. Search for filings by Project using UL20-1-000 for information regarding the Gile Flowage Storage Reservoir Project.

2.2.2 Meetings

All meetings that are an essential part of the relicensing process will be scheduled on weekdays (Monday through Friday) to allow for participation during the hours of 9:00 a.m. to 3:00 p.m. Central Standard Time (CST). Meetings will occur in person at a reasonable location in close proximity to the Projects or by conference call. It may become impractical to accommodate each relicensing stakeholder's unique schedule; however, every effort will be made to schedule meetings to accommodate the majority of stakeholders. NSPW will strive to provide all stakeholders with a notification of any process-required meeting at least two weeks prior to the scheduled meeting date. A meeting agenda and any necessary meeting materials will be provided prior to the meeting as well.

2.2.3 Documents

A hard copy of the NOIs, TLP requests, and this PAD will be available for public viewing in the public reference file in the City of Hurley, Wisconsin at the following location:

- Hurley Public Library – 405 5th Avenue North, Hurley, Wisconsin

Copies of process-related documents can be viewed and printed electronically in portable document format (PDF) from the relicensing website at: Hydrorelicensing.com or FERC's eLibrary system. Certain documents will contain Critical Energy Infrastructure Information (CEII) or will contain sensitive/privileged information and will be designated as such. Not all stakeholders will be able to view CEII or privileged documents. Information on obtaining access to view CEII, sensitive/privileged information can be found by following the instructions contained at: https://ferc.gov/legal/ceii-foia/foia.asp.

Requests for hard copies of relicensing documents should be sent to Matthew J. Miller using the contact information provided in Section 1.1 and should clearly indicate the document name, publication date (if known), and the FERC Project No. A reproduction charge ($0.25/page) and postage costs may be assessed for hard copies requested by the public. The United States Fish and Wildlife Service (USFWS), Wisconsin Department of Natural Resources (WDNR), and Indian tribes will not be subject to document processing or postage fees.

2.2.4 Study Requests

The TLP allows stakeholders to request studies in order to provide information that was not available during the development of this PAD. Study requests must be submitted within 60 days after the JAM resulting from the filing of this PAD.

As specified by 18 CFR § 16.8(b)(5) of the FERC regulations, each interested resource agency, Indian tribe, or member of the public must provide the following information in their study request:

- Identify its determination of necessary studies to be performed or information to be provided by the Applicant;
- Identify the basis for its determination;
- Discuss its understanding of the resource issues and goals and objectives for these resources;
- Explain why each study methodology recommended is more appropriate than any other methodology alternatives, including those by the Applicant;
- Document the use of each study methodology recommended is a generally accepted practice; and
- Explain how the studies and information requested will be useful to the agency, Indian tribe, or member of the public in furthering its resource goals and objectives.

Any study requests should be filed directly with the Commission with a courtesy copy provided to Shawn Puzen at shawn.puzen@meadhunt.com.

3. Project Location, Facilities, and Operation (18 CFR § 5.6(d)(2))

3.1 Project Location (18 CFR § 5.6(d)(2)(ii))

The Gile Flowage Storage Reservoir Project is a headwater storage reservoir that provides seasonally uniform streamflow for hydroelectric generation downstream at Saxon Falls and Superior Falls. The Project is located on the West Fork of the Montreal River approximately 20 miles upstream of Saxon Falls. The Project is located within the Towns of Pence and Carey, Iron County, Wisconsin; approximately 2.5 miles southwest of the neighboring Cities of Hurley, Wisconsin and Ironwood, Michigan; and approximately 33 miles southeast of the City of Ashland, Wisconsin.

3.2 Project Facilities (18 CFR § 5.6(d)(2)(iii))

3.2.1 Current Facilities

From right to left looking downstream[2], Project structures include a right earthen dam section, concrete spillway section with two gates, and left earthen dam section. The current Project facilities are shown in **Figure 3.2.1-1** on the following page. A description of each structure from right to left, as well as the reservoir and appurtenant equipment is provided in the following paragraphs.

3.2.1.1 Dam

Right Earthen Dam Section

The right earthen dam section is approximately 30 feet high and 575 feet long and has a 10-foot-wide top with 3:1 side-slopes. The dam crest elevation is 1,495.0 feet. A vertical sheet pile wall forms a cutoff under the concrete gated section and the center of the embankments has a top elevation of 1,493.0 feet. The sheet pile wall extends approximately 323 feet from the outside face of the right abutment. The upstream side of the embankment is protected by riprap on filter fabric to elevation 1,493.0 feet. The downstream portion of the embankment near the tailrace is also protected with riprap. A drain system consisting of vitrified clay pipe spaced 14 feet wide on center extends from the sheet pile cutoff wall to the embankment toe. A seepage drainage ditch collects water from the drains and conveys it to the tailrace (Ayres, 2016).

Concrete Spillway Section

The concrete spillway section consists of a reinforced concrete structure with a left abutment, one left sluiceway bay, a pier, one right tainter gate bay, and a right abutment. A steel sheet pile cutoff is located under the structure on the upstream side of the spillway. The majority of the structure is founded on wood piles. A concrete operator's bridge spans the structure (Ayres, 2016).

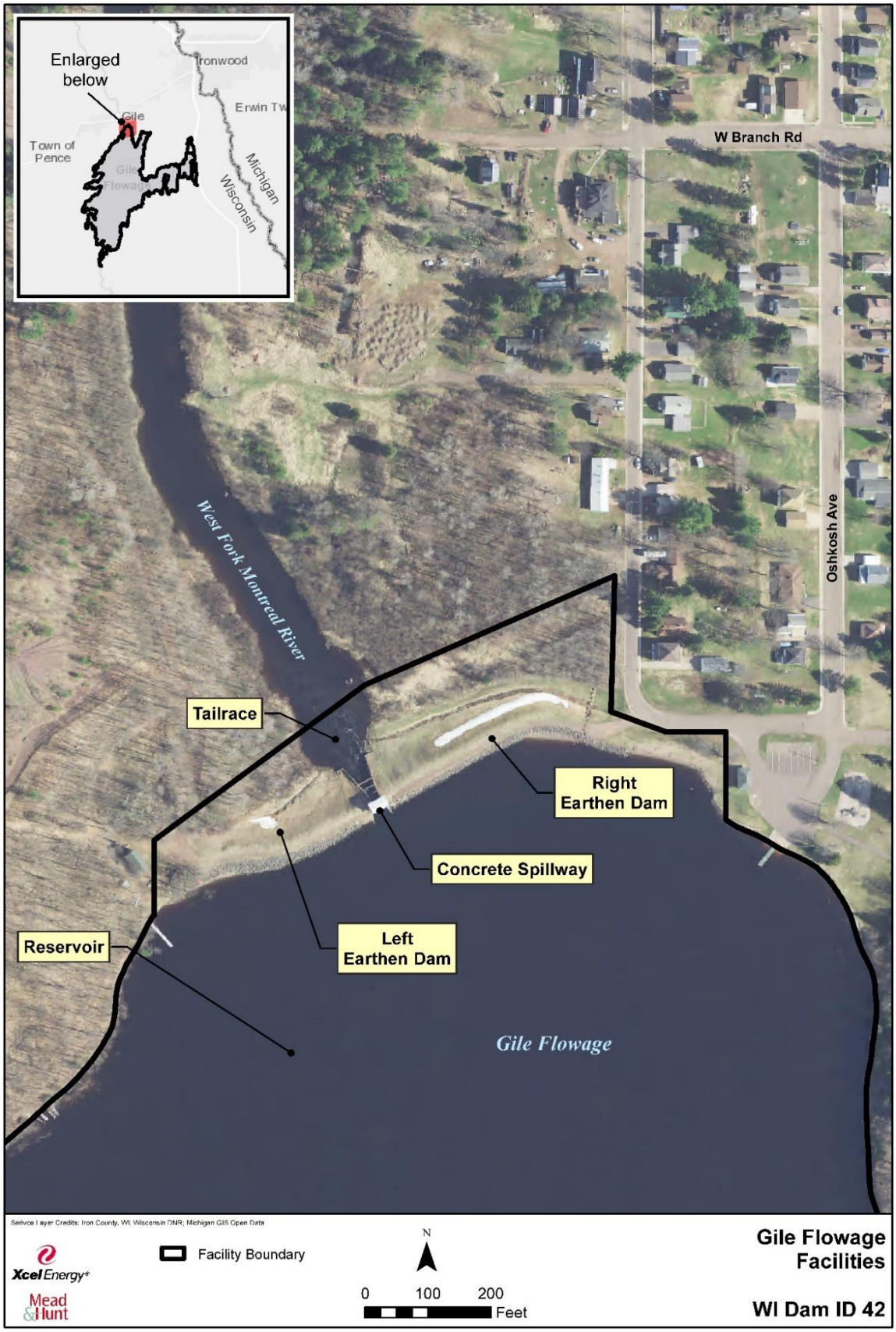
The sluiceway bay consists of an intake structure with a trashrack, vertical slide gate, and a rectangular outlet that conveys flow to the stilling basin. The slide gate is 6 feet wide and 6 feet high and the outlet is approximately 35 feet long, 6 feet wide, and 5 feet high. The sluiceway bay has an invert elevation of 1,465.5 feet. The sluice gate is operated by an electric hoist located inside the gate house. There is no back up method for sluice gate operation (Ayres, 2016).

[2] Direction of right or left, when describing facilities, is given looking downstream.

The tainter gate bay is a hollow structure with foundation drains and a crest elevation of 1,478.0 feet. The riveted steel tainter gate is 16 feet wide and 12 feet high and is operated with an electric hoist located inside the gatehouse. A powerhead with a generator and a handwheel is available for backup power. The handwheel is located inside the gatehouse. The powerhead and generator are available from the Superior Falls Project, located about 30 minutes from the dam (Ayres, 2016).

A concrete slab supports the rollway and downstream walls and forms the bottom of the stilling basin. The upstream wingwalls are constructed at a 15-degree skew to the centerline of the water flows and the downstream wingwalls are constructed at a 12-degree skew to the centerline of the water flow. The wingwalls vary in height to match the embankment cross-section. Buttresses are located on the outside of the wingwalls and concrete strut beams brace the downstream walls. Weep holes are located at various locations through the wingwalls (Ayres, 2016).

Figure 3.2.1-1: Project Facilities



The large tainter gate is typically only used to pass water downstream during periods of high flow (i.e. precipitation events, spring runoff). The small sluice gate is used to pass water downstream, both during periods of low and high flow (NSPW, 2019). A block was installed on the sill of the sluice gate to pass the minimum flow of 10 cfs downstream, which approximates the natural inflow into the Project reservoir (Friends of the Gile Flowage, 2019).

Left Earthen Dam Section

The left earthen dam section is approximately 30 feet high and 300 feet long and has a 10-foot-wide top with 3:1 side-slopes. The dam crest elevation is 1,495.0 feet. A vertical sheet pile wall forms a cutoff under the concrete gated section and the center of the embankment has a top elevation of 1,493.0 feet. The sheet pile wall extends approximately 204 feet from the outside face of the left abutment. The upstream side of the embankment is protected by riprap on filter fabric to elevation 1,493.0 feet. The downstream portion of the embankment near the tailrace is also protected with riprap. A drain system consisting of vitrified clay pipe spaced 14 feet wide on center extends from the sheet pile cutoff wall to the embankment toe. A seepage drainage ditch collects water from the drains and conveys it to the tailrace (Ayres, 2016).

3.2.1.2 Reservoir

The Project reservoir encompasses approximately 3,317 acres and has a maximum depth of 25 feet, as shown in **Figure 3.2.1.2-1** on the following page. The reservoir has a usable storage capacity of 37,064 acre-feet with a 15-foot drawdown (NSPW, 2019). The substrate consists of 45% sand, 15% gravel, 20% rock, and 20% muck (WDNR, 2019a).

3.2.2 Project Boundary

The Gile Flowage Storage Reservoir Project is not currently a FERC-licensed facility and thus no FERC project boundary exists. For the purpose of this PAD, the Licensee has developed a proposed boundary for the Project that includes the facilities, dam, reservoir, and shoreline areas to the maximum allowed reservoir elevation of 1,490 feet (NSPW, 2019). NSPW operates and maintains the facility and currently owns approximately 1,200 acres of land around the reservoir (Friends of the Gile Flowage, 2019). Most submerged lands are owned in fee title or NSPW has obtained flowage rights for them. Approximately 90% of the shoreline is in NSPW or public ownership (Towns of Pence and Carey, Iron County), resulting in the existing natural shoreline (NSPW, 2019). A review of the Licensee's land holdings around the Project reservoir is currently underway. The Licensee is in discussions with adjacent property owners and Iron County regarding the potential sale of some land parcels. Any parcels identified for sale will be located outside of the proposed Project boundary and would not be subject to this proceeding.

3.2.3 Proposed Facilities

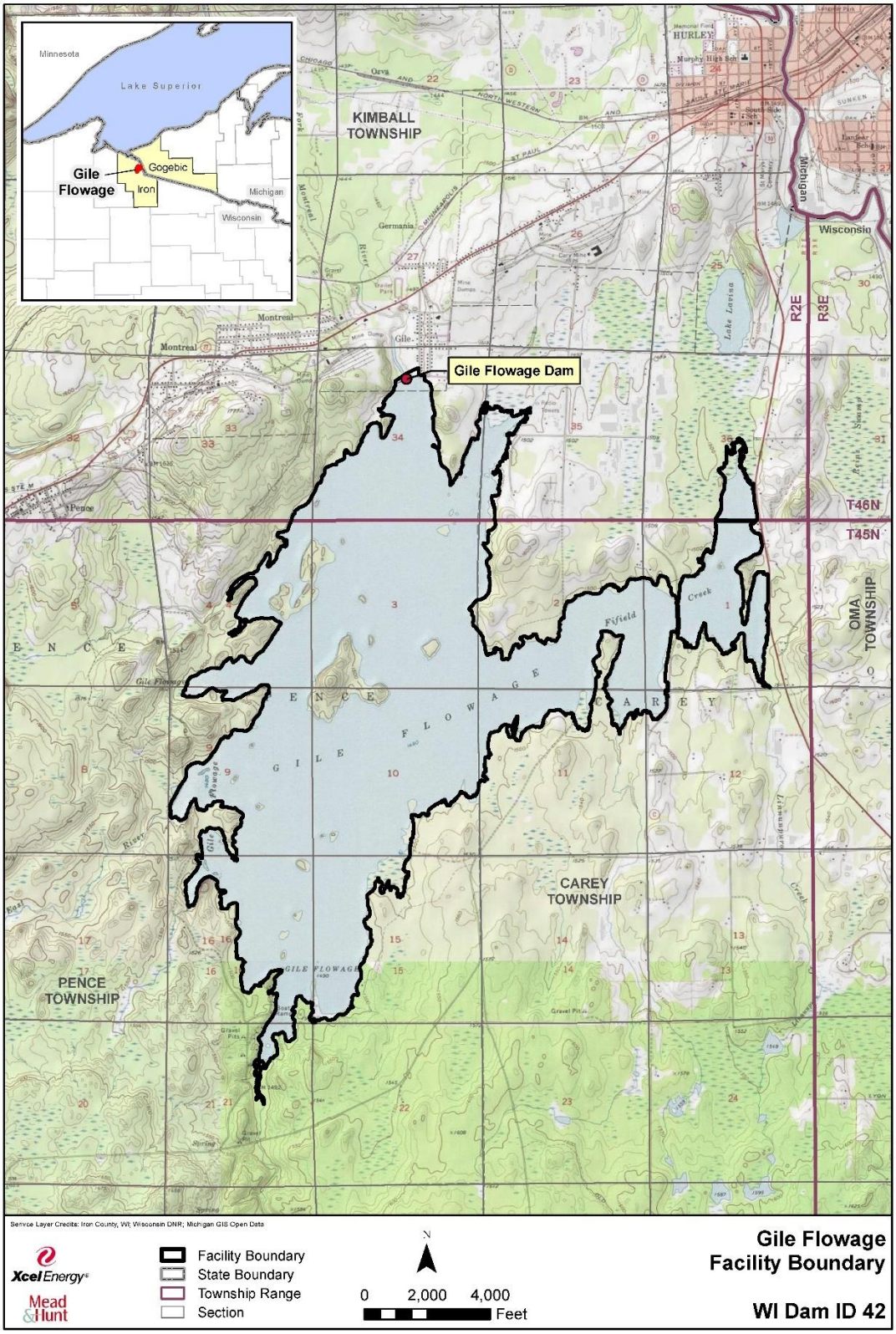
No new facilities are proposed as part of this relicensing effort.

3.2.4 References

- Ayres Associates. 2016. 2016 Consultant Safety Inspection Report, Gile Reservoir Dam, Iron County, Wisconsin, WDNR Field File No. 26.09. October 2016.
- Friends of the Gile Flowage. 2019. Brief History of the Gile Flowage. http://www.friendsofthegile.org/home/flowage-. Accessed September 12, 2019.

- Northern States Power Company-Wisconsin (NSPW), 2019. Matt Miller personal communication. October 3, 2019.
- Wisconsin Department of Natural Resources, 2019a. WDNR Lake Pages-Gile Flowage. https://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=2942300&page=facts. Accessed September 13, 2019.

Figure 3.2.1.2-1: Project Reservoir



3.3 Project Operation (18 CFR § 5.6(d)(2)(iv))

3.3.1 Current Operation

The Wisconsin Public Service Commission issued an Order on August 26, 1937, authorizing construction of the Gile Flowage Storage Reservoir Project Dam and set the maximum pool elevation at 1,490.0 feet. The Licensee's records document a "gentleman's agreement" allowing for a maximum drawdown of 15 feet or elevation 1475.0'. The dam was completed in 1940 and the gates were closed in April 1941 commencing the initial fill of the reservoir. The Project was created to augment river flows during summer and winter low-flow periods for hydroelectric generation downstream at Saxon Falls and Superior Falls. Both facilities are heavily dependent upon flow augmentation from the Project reservoir during these low-flow periods. A minimum flow of 10 cfs has historically been passed downstream of the Project dam in accordance with an agreement with the village of Montreal. A block in the bottom of the sluice gate is used to ensure 10 cfs of flow is maintained at all times.

While a 15-foot drawdown is allowed, NSPW has minimized the drawdowns. The summer drawdown averaged 5.2 feet and the winter drawdown averaged 6.8 feet between 1984 and 2017. The maximum summer drawdown during this timeframe was 7.8 feet and the minimum was 1.8 feet. The maximum winter drawdown during this timeframe was 10.9 feet and the minimum was 1.4 feet. **Table 3.3.1-1** on the following page shows the extent of the summer and winter drawdowns to supplement low flows in the West Fork of the Montreal River between 1984 and 2017. Summer drawdown typically begins around May 1 of each year or after spring runoff has passed. Autumn rains replenish the reservoir. Winter drawdowns generally begin around December 1 each year and continue into the spring when the flowage is replenished from spring runoff and rainfall.

There are two operators that typically maintain the dam and make necessary spillway gate changes. Operators typically check the reservoir two to three times per week under normal flow conditions. The reservoir is checked on a daily basis during high river flows and significant runoff events.

3.3.2 Proposed Operation

NSPW is proposing to continue operating the Project in the same manner it is currently operated.

Table 3.3.1-1: Gile Flowage Storage Reservoir Project Historical Drawdown Levels

Year	Summer Minimum Elevation	Summer Drawdown (ft)	Winter Minimum Elevation	Winter Drawdown (ft)
1984	1483.5	6.5	1485.4	4.6
1985	1486.9	3.1	1481.2	8.8
1986	1483.9	6.1	1479.1	10.9
1987*	1484.6	5.4	1482.9	7.2
1988*	1482.2	7.8	1482.7	7.3
1989	1483.8	6.2	1481.0	9.0
1990	1487.0	3.0	1481.3	8.7
1991	1485.6	4.4	1483.0	7.0
1992	1484.6	5.4	1485.5	4.5
1993	1483.7	6.3	1482.1	7.9
1994	1485.0	5.0	1481.4	8.6
1995	1482.9	7.1	1482.1	7.9
1996	1484.6	5.4	1481.5	8.5
1997	1484.0	6.0	1481.1	8.9
1998	1482.4	7.6	1483.7	6.3
1999	1486.1	3.9	1483.2	6.8
2000	1483.6	6.4	1485.0	5.0
2001	1482.7	7.3	1482.2	7.8
2002	1483.8	6.2	1484.6	5.4
2003	1484.8	7.2	1483.3	6.7
2004	1484.2	5.8	1482.4	7.6
2005	1483.8	6.2	1482.5	7.5
2006*	1483.7	6.3	1485.0	5.0
2007*	1484.0	6.0	1483.0	7.0
2008*	1485.5	4.5	1482.5	7.5
2009*	1483.5	6.5	1483.0	7.0
2010	1487.7	2.3	1482.9	7.1
2011*	1485.2	4.8	1484.2	5.8
2012*	1484.9	5.1	1483.9	6.1
2013	1488.1	1.9	1483.8	6.2
2014	1486.6	3.4	1482.4	7.6
2015	1485.8	4.2	1485.4	4.6
2016	1488.8	1.2	1487.2	2.8
2017	1487.7	2.3	1488.6	1.4

* drought year

3.4 Other Project Information (18 CFR § 5.6(d)(2)(v))

3.4.1 Current License Requirements

While the purpose of the Project is to supplement flows in the Montreal River for hydroelectric generation downstream at Saxon Falls and Superior Falls, it is not currently licensed by the FERC and therefore has no existing FERC license requirements. The Wisconsin Public Service Commission issued an Order in 1937 authorizing construction, operation, and maintenance of the Gile Flowage Dam to augment river flows during summer and winter low-flow periods for hydroelectric generation downstream. The 1937 Order set the maximum reservoir elevation at 1490.0 feet (NSPW, 2019).

3.4.2 Compliance History

There is no history of non-compliance.

3.4.3 Summary of Project Generation and Flow Records

The Project is a headwater storage reservoir and does not generate any electricity. Flow records for the last five years are summarized in **Table 3.4.3-1**.

Table 3.4.3-1: Summary of Project Generation and Flow Records

Time Period	Annual Generation (MWh)	Monthly Average Generation (MWh)	Average Outflow* (cfs)
1/1/2013 to 12/31/2013	NA	NA	136
1/1/2014 to 12/31/2014	NA	NA	140
1/1/2015 to 12/31/2015	NA	NA	85
1/1/2016 to 12/31/2016	NA	NA	166
1/1/2017 to 12/31/2017	NA	NA	115

*Note: Average outflow as measured at Gile USGS Gage No. 40299000; average outflow is adjusted according to drainage basin area at the Project dam.

3.4.4 Current Net Investment

Project net investment will be provided in the DLA.

3.4.5 References

- Friends of the Gile Flowage. 2019. Brief History of the Gile Flowage. http://www.friendsofthegile.org/home/flowage-. Accessed September 12, 2019.
- Northern States Power Company-Wisconsin (NSPW). 2019. Matt Miller personal communication. October 3, 2019.
- Wisconsin Department of Natural Resources, 2019a. WDNR Lake Pages-Gile Flowage. https://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=2942300&page=facts. Accessed September 13, 2019.

4. Description of Existing Environment and Resource Impacts

This section summarizes the existing environment and resources related to the Project.

4.1 General Description of the Project Area (18 CFR § 5.6(d)(3)(xiii))

The Montreal River originates near Pine Lake in east-central Iron County, Wisconsin and flows for approximately 53 miles while descending nearly 1,000 feet in elevation until it empties into Oronto Bay of Lake Superior. The Montreal River flows approximately 18 miles from its headwaters northwesterly until it meets with the West Branch of the Montreal River and then continues westerly for an additional 35 miles. The Montreal River is the political boundary that separates Iron County, Wisconsin and Gogebic County, Michigan for roughly 40 miles (USGS, 2016). The West Fork of the Montreal River flows approximately 26 miles from its headwaters until it reaches the Montreal River. **Figure 4.1-1** shows where the hydroelectric projects are located on the Montreal River and the Gile Flowage Storage Reservoir Project is located on the West Fork of the Montreal River. Most of the watershed is wooded or wild land, with an estimated 10% cleared for agricultural and urban development. The small size of the watershed and the steep gradient of the river and rocky nature of the terrain produce rapid changes in stream flow (NSPW, 1991).

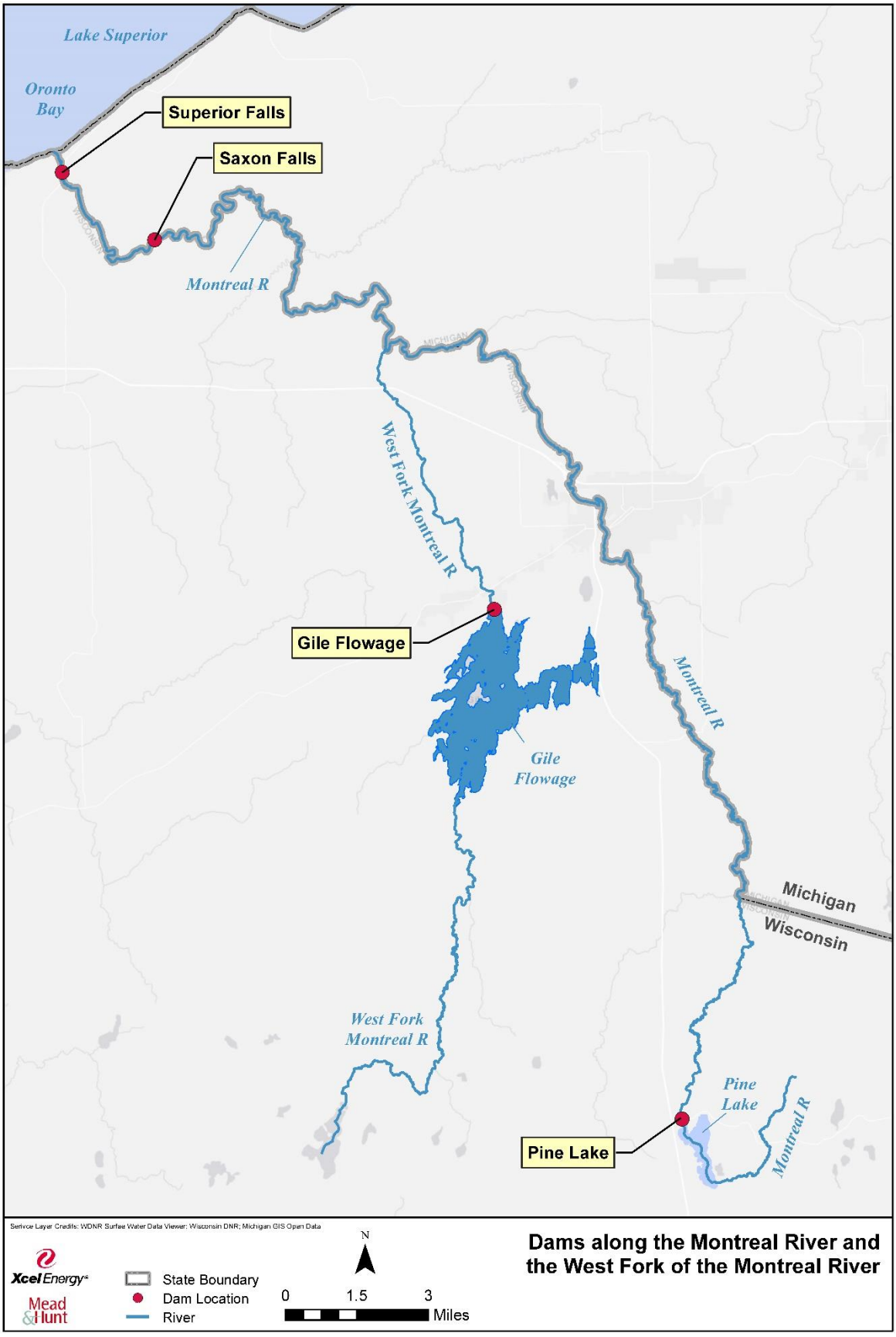
The Montreal River Watershed has a drainage area of approximately 264 square miles. The drainage area is 75 square miles upstream of the Project (NSPW, 1988; NSPW, 1991). The main tributaries to the Gile Flowage include East River, Fifield Creek, Linnunpuro Creek, and West Fork of the Montreal River.

In addition to the Gile Flowage Storage Reservoir Project, there are three other dams located on the Montreal River; all are listed from upstream to downstream in **Table 4.1-1**. The FERC-regulated dams include the Gile Flowage Storage Reservoir Project dam, Saxon Falls dam and Superior Falls dam. The state-regulated facility does not generate power and is regulated by the State of Wisconsin.

Table 4.1-1: Hydroelectric Projects and Dams Located on the Montreal River

Dam Name	Location	River	FERC or State Regulated	FERC No.	Authorized Capacity
Pine Lake	Town of Oma, WI	Montreal River	State	N/A	N/A
Gile	Town of Pence, WI and Town of Carey, WI	Montreal River-West Branch	State	UL20-1	N/A-Storage Reservoir
Saxon Falls	Town of Saxon, WI and Ironwood Township, MI	Montreal River	FERC	P-2610	1,500 kW
Superior Falls	Town of Saxon, WI and Ironwood Township, MI	Montreal River	FERC	P-2587	1,650 kW

Figure 4.1-1: Regulated Dams on the Montreal River and West Fork of the Montreal River



4.1.1 Gile Flowage Storage Reservoir Project

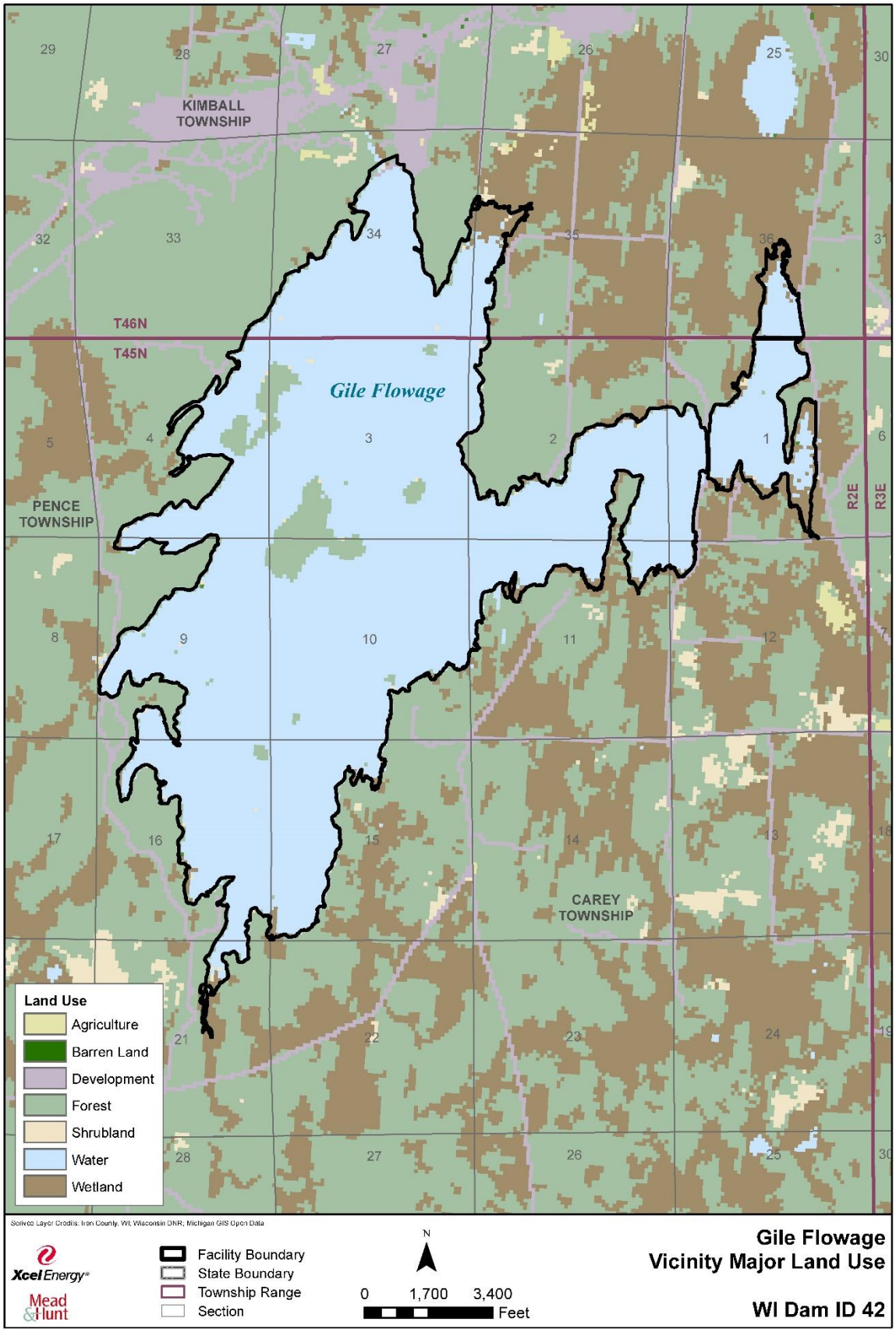
The Gile Flowage Storage Reservoir Project is located in northeastern Iron County, Wisconsin, approximately 2.5 miles southwest of the neighboring cities of Hurley, Wisconsin and Ironwood, Michigan and 33 miles southeast of the City of Ashland, Wisconsin. The Project dam and structural facilities are located in Section 34, Township 46 North, Range 02 East. The dam impounds the West Fork of the Montreal River creating a 3,317-acre reservoir, which extends about 4.25 miles upstream. The Project is located within the City of Montreal, Town of Pence, and Town of Carey.

4.1.2 Major Land Uses

Based on the United States Geological Survey (USGS) National Land Cover Database (USGS, 2016), major land uses within the vicinity of the Project include deciduous forest, wooded wetlands, mixed forest, emergent herbaceous wetlands, and a limited amount of low and medium intensity development on the north end of the reservoir, which is associated with the City of Montreal. A map showing the major land uses in the vicinity of the Project is shown in **Figure 4.1.2-1**.

The Project is located within the Town of Pence and Town of Carey in Iron County, Wisconsin. Major land uses in the Town of Pence consist of 99.7% woodlands or other natural areas, 0.1% primary residential, 0.1% open space, and less than 0.1% each for parks and recreation, industrial, government and institutional, and commercial (Town of Pence, 2005). The Town of Carey has similar land uses with 98.9% woodlands or other natural areas, 0.6% open space, 0.3% agriculture, and 0.1% residential (Town of Carey, 2012).

Figure 4.1.2-1: Major Land Uses in the Vicinity of the Project



4.1.3 Major Water Uses

Prior to European settlement, the Montreal River was not used as a transportation route due to the presence of waterfalls and steep canyons along the lower portion of the river. However, the Flambeau Trail, which began at the mouth of the Montreal River, was used as one of the few routes from the south shore of Lake Superior to the interior of northern Wisconsin. The Flambeau Trail was the only practical way to reach the interior and was used by travelers from prehistoric times into the 19th century (NSPW, 1988). Hydroelectric power was introduced to the Montreal River when the Saxon Falls Dam was completed in 1912 and the Superior Falls Dam in 1917 (NSPW, 2014a, NSPW, 2014b). The two hydroelectric projects provide a combined capacity of 3,250 kW of electricity to the local distribution system. The Gile Flowage Storage Reservoir Project dam was completed in 1940 on the West Fork of the Montreal River and was built in the same location as a former lumber company dam originally constructed in 1885.

Aside from hydroelectric power and headwater storage, the Montreal River is also utilized for fish and wildlife habitat and recreational activities that include fishing, boating, whitewater rafting, canoeing, kayaking, hiking, sightseeing, and hunting.

4.1.4 Project Impoundment

The Project Dam impounds the West Fork of the Montreal River approximately 17 miles upstream of the Saxon Falls Dam. The resulting reservoir spans approximately 3,317 acres with a useable storage capacity of 37,064 acre-feet with a 15-foot drawdown (NSPW, 2019).

4.1.5 Climate

Iron County, Wisconsin is located within the continental climate region and experiences some variation due to lake effects caused by Lake Superior. The continental climate is generally characterized by hot summers and cold winters (UW-M, 2003). This pattern is modified along the Lake Superior coast by the cold lake waters that serve to moderate summer temperatures and increase winter temperatures (Iron County, 2016).

The average monthly minimum temperatures range from 3 degrees Fahrenheit (°F) in January to 56°F in July. The average monthly maximum temperatures range from 21°F in January to 77°F in July. The overall monthly average temperatures range from 12°F in January to 66.5°F in July. The average annual precipitation is 36.11 inches, with about one half of the precipitation falling during the growing season from May through September. The area is located within the Lake Superior snowbelt and receives an average of 166 inches of snow each year (US Climate Data, 2019).

4.1.6 References

- Iron County. 2016. Iron County Outdoor Recreation Plan 2016-2020. Iron County and Northwest Regional Planning Commission. April 2016.
- Northern State Power Company-Wisconsin (NSPW). 1988. Application for a Minor Water Power Project Pursuant to Section 4(e) of the Federal Power Act for the Saxon Falls Hydro Project, FERC No. 2610. December 16, 1988.
- Northern States Power Company-Wisconsin (NSPW). 1991. Application for a License for a Minor Water Power Project, Superior Falls Hydroelectric Project, FERC Project No. 2587. December 17, 1991.

- Northern States Power Company-Wisconsin (NSPW). 2014a. Saxon Falls Hydroelectric Project FERC No. 2610. Supporting Technical Information Document. March 13, 2014.
- Northern States Power Company-Wisconsin (NSPW). 2014b. Superior Falls Hydroelectric Project FERC No. 2587. Supporting Technical Information Document. March 22, 2014.
- Northern States Power Company-Wisconsin (NSPW). 2019. Matt Miller, personal communication. October 3, 2019.
- Town of Carey. 2005. Town of Carey Comprehensive Plan. October 2005.
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- United States Geological Survey. 2016. National Hydrography Dataset (NHD). August 1, 2016.
- University of Wisconsin-Madison (UW-M), Atmospheric and Oceanic Studies. Climate of Wisconsin. Adapted from Climatography of the United States, No. 60, NOAA. March 25, 2003.
- Wisconsin Department of Natural Resources, 2019. WDNR Lake Pages-Gile Flowage. https://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=2942300&page=facts. Accessed September 13, 2019.

4.2 Geology and Soils (18 CFR § 5.6(d)(3)(ii))

4.2.1 Geology

The Gile Flowage Storage Reservoir Project is located in the North Central Forest Ecological Landscape. The North Central Forest Ecological Landscape is characterized by end and ground moraines with some pitted outwash and bedrock-controlled areas. Kettle depressions and steep ridges are found in the northern portion of the North Central Forest (WDNR, 2015a). The topography surrounding the Project varies up to 280 feet with the highest land surface elevation of about 1,760 feet descending to the West Fork of the Montreal River surface elevation of 1,480 feet downstream of the Project Dam (USGS, 2019).

The Project area is part of the Gogebic Range and Trap Range, just north of the Northern Highlands Region. The ranges form two prominent ridges in Ashland and Iron Counties in Wisconsin and extend over the state border into Michigan near Ironwood. Both ridges are composed of relatively steeply dipping rock layers (to the north) which are more resistant to erosion than the surrounding rock units underlying the valley separating the two ridges. The southern ridge is the Gogebic Range and composed of interbedded iron-rich and silica-rich layers about 650 feet thick. The bedrock is Precambrian, approximately 1.9 billion years old. The northern ridge is the Trap Range and composed of younger volcanic rock that is approximately 1.1 billion-years-old and primarily basaltic lava flows. The basaltic lava intruded the older Gogebic Range rock as a part of the activity associated with the Midcontinent Rift System, an extension of the earth's crust extending from Lake Superior in a gentle arc through Michigan's Upper Peninsula, Wisconsin, and Minnesota (Ayres Associates, 2016).

The Gogebic Range is underlain conformably by the older Palms Formation, which is composed of quartzite, slate, and conglomerate. The Palms Formation is found on the southeast side of the Gogebic Range where it overlies the Bad River dolomite, where present, or lower Precambrian granite, metamorphosed basalt, and other igneous rock where the dolomite is absent. The younger Tyler Formation is located northwest of the Gogebic Range and includes slate with greywacke and siltstone that was deposited as a thick layer of sediment, up to 10,000 feet thick, which accumulated when the

Gogebic Range was located at the Superior Craton edge along the Niagara Escarpment (Ayres Associates, 2016).

The surficial deposits are mainly glacial deposits characterized as ground moraines and end moraines. The thickness of unconsolidated materials in the vicinity of the Project is mapped at the transition between 0-50 feet deep and 50-100 feet deep (Ayres Associates, 2016).

4.2.2 Soils

There are 26 soil types found throughout the vicinity of the Project, which are grouped into 21 major soil associations with distinct soil patterns, relief, and drainage factors (USDA-NRCS, 2019c). **Appendix 4.2.2-1** presents a custom soils report and map for the general vicinity.

Gogebic-Peshekee complex, Tula-Gogebic complex, and Gogebic silt loam soils are the most prevalent soils found in the Project vicinity. The most commonly identified soil classifications in respective order of abundance are the Gogebic-Peshekee complex with 6-18% slopes, very stony, very rocky soils (5429C); Tula-Gogebic complex stony soils with 0-6% slopes (5353B); and Gogebic silt loam soils with 6-18% slopes (5351C). Soil characteristics are shown in **Table 4.2.2-1**.

Table 4.2.2-1: Prevalent Soil Characteristics in the Project Vicinity

Soil Series	Drainage Classification	Formation	Water Transmittal Capacity	Runoff Class
Gogebic-Peshekee	Moderately well-drained to well-drained	Hill and backslope	Very low to low	Medium to high
Tula-Gogebic	Moderately well-drained to somewhat poorly drained	Till plain, summit, and footslope	Very low to moderately low	Low to high
Gogebic Silt Loam	Moderately well-drained	Till plain, summit, backslope, and footslope	Very low to moderately low	High

4.2.3 Impoundment Shoreline Conditions

The Project shoreline consists of approximately 26 miles of irregular shaped points and bays with numerous areas of exposed bedrock. Approximately 90% of the shoreline is in public or NSPW ownership and is maintained in a natural forested state, reducing the likelihood of erosion (Whitewater Associates, 2005).

In Wisconsin, comprehensive floodplain and shoreland zoning is a function of the county. Iron County enforces floodplain and shoreland zoning ordinances for navigable waters to maintain safe and healthful conditions; prevent and control water pollution; protect spawning grounds, fish, and aquatic life; control building sites, structure placement, and land uses; and preserve and restore vegetation and enhance natural scenic beauty (Iron County, 2019).

The combination of NSPW shoreline ownership, existing native riparian vegetation buffers, and local shoreland regulations, work together to provide adequate protection from wide-spread shoreline erosion and over development.

4.2.4 Erosion

The United States Department of Agriculture (USDA)-Natural Resource Conservation Service (NRCS) uses a computer software model called Revised Universal Soil Loss Equation Version 2 (RUSLE2) to estimate soil loss from erosion caused by rainfall on cropland. The following factors are reviewed in RUSLE2 to estimate soil erosion based upon erodibility.

4.2.4.1 Hydrologic Group

The Hydrologic Group for each soil is based upon runoff potential for saturated and bare soils and range from Group A through Group D, with Group A having the lowest runoff potential and Group D having the highest (USDA-NRCS, 2019c).

Gogebic-Peshekee complex (5429C) resides in Group D, Tula-Gogebic (5353B) resides in Group C/D, and Gogebic silt loam (5351C) resides in Group D.

4.2.4.2 T Factor

The T Factor is an estimate of the maximum average rate of soil erosion in tons per acre per year that can occur without affecting crop productivity over a sustained period (USDA-NRCS, 2019d). T Factor also relates to the soil's ability to revegetate once it is disturbed.

Gogebic-Peshekee complex (5429C) has a T Factor of 1 to 4 tons per acre, Tula-Gogebic complex (5353B) has a T Factor of 4 tons per acre, and Gogebic silt loam (5351C) has a T Factor of 4 tons per acre.

4.2.4.3 Kf Factor

The Kf Factor gives an indication of how susceptible a soil surface is to erosion caused by water. The factors range from 0.02 to 0.69, with 0.69 having the highest susceptibility to erosion (USDA-NRCS, 2019d). Based upon the RUSLE2 information, the lands in the vicinity of the Project have Kf Factors in the moderate range because the soil particles are moderately susceptible to detachment and can produce moderate runoff.

Gogebic-Peshekee complex (5429C), Tula-Gogebic complex (5353B), and Gogebic silt loam (5351C) do not have Kf Factors listed in the soil report since the soils are very rocky and do not contain the fine earth fragments (less than 2mm) the Kf Factor measures.

4.2.4.4 Percent Sand, Percent Silt, and Percent Clay

The USDA-NRCS also provides a representative value of the sand, silt, and clay composition in the dominant soils (USDA-NRCS, 2019d).

Gogebic-Peshekee complex (5429C) and Tula-Gogebic complex (5353B) are not broken down into the amounts of sand, silt, and clay because these soils are very rocky. Gogebic silt loam (5351C) is composed of 5% sand, 90% silt, and 5% clay.

4.2.5 References

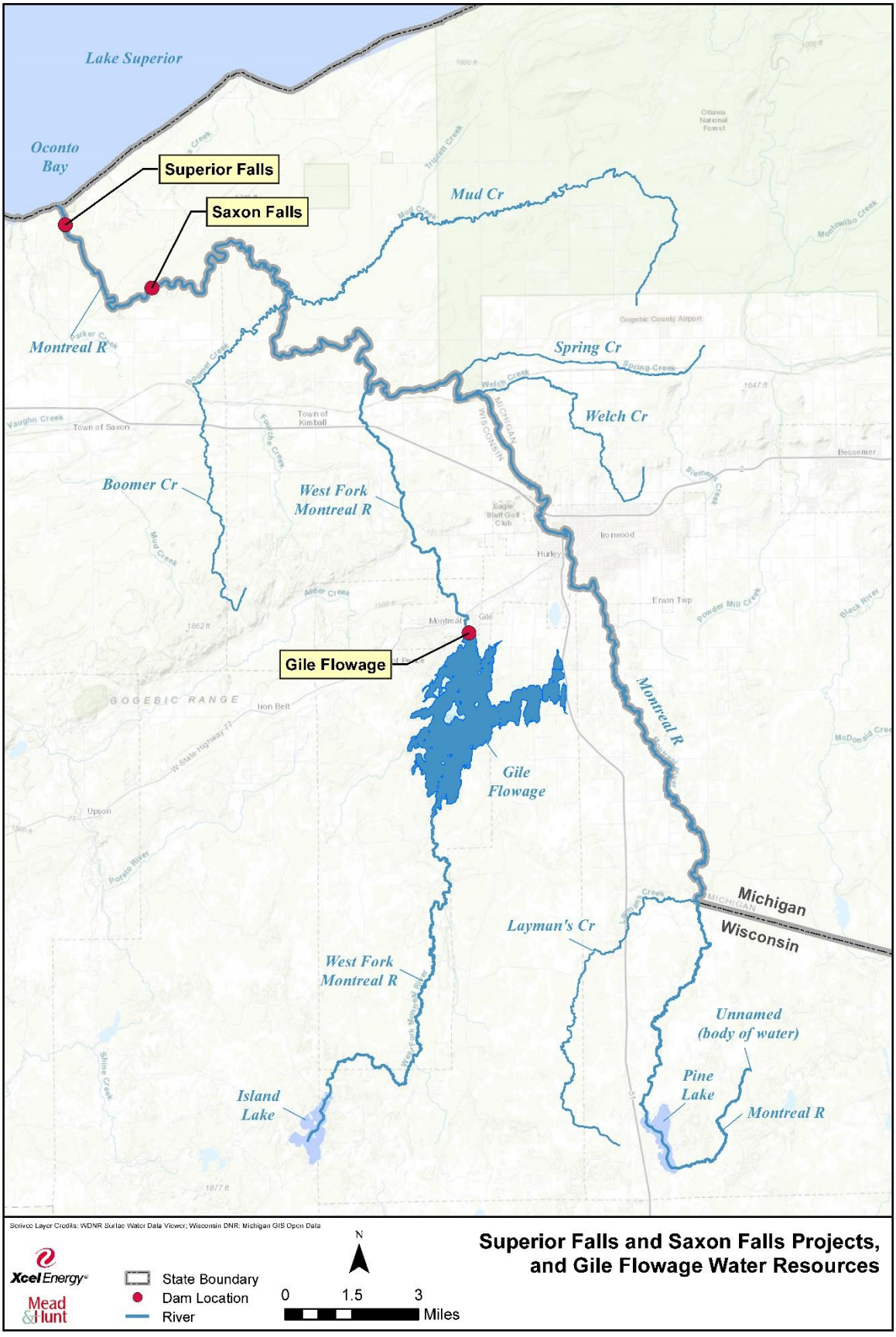
- Ayres Associates. 2016. 2016 Consultant Safety Inspection, Gile Reservoir Dam, Iron County Wisconsin, WDNR Field File No 26.09. October 2016.
- Iron County. 2019. Iron County Ordinances. Accessed September 25, 2019. http://www.co.iron.wi.gov/docs_by_cat_type.asp?doccatid=138&locid=180.
- Martin, Lawrence. 1965. The Physical Geography of Wisconsin.
- Northern States Power Company-Wisconsin (NSPW). 1988. Application for a Minor Water Power Project Pursuant to Section 4(e) of the Federal Power Act for the Saxon Falls Hydro Project, FERC No. 2610. December 16, 1988.
- Northern States Power Company-Wisconsin (NSPW). 1991. Application for a License for a Minor Water Power Project, Superior Falls Hydroelectric Project, FERC Project No. 2587. December 17, 1991.
- United States Department of Agriculture-Natural Resource Conservation Service. 2019. Custom Soil Resource Report for Iron County, Wisconsin, Gile Flowage Soils Information.
- United States Department of Agriculture-Natural Resource Conservation Service. 2019d. https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed September 12, 2019.
- United States Geological Survey. 2019. The National Map Viewer. https://viewer.nationalmap.gov/advanced-viewer/. Accessed September 19, 2019.
- White Water Associates. 2005. Gile Flowage Watershed Project Report: Environmental Information Review, and Water Quality Monitoring (Iron County Wisconsin). November 17, 2005.
- Wisconsin Department of Natural Resources. 2015a. The Ecological Landscapes of Wisconsin: an assessment of ecological resources and a guide to planning sustainable management. Chapter 21 Superior Coastal Plain Ecological Landscape. PUB-SS-1131J2014, Madison.
- Wisconsin Department of Natural Resources. 2015b. The Ecological Landscapes of Wisconsin: an assessment of ecological resources and a guide to planning sustainable management. Chapter 12 North Central Forest Ecological Landscape. PUB-SS-1131J2014, Madison.

4.3 Water Resources (18 CFR § 5.6(d)(3)(iii))

The Montreal River is roughly 53.5 miles in length and originates from an unnamed body of water located approximately 1.8 miles upstream from where the river passes through a culvert under County Road G in Oma Township, Wisconsin. The Montreal River flows southwesterly for about 3.8 miles from the unnamed body of water until it enters Pine Lake at the southeast shoreline. The Montreal River then flows northerly for another 9.5 miles, at which point it begins to flow northwesterly for an additional 40.2 miles along the Wisconsin and Michigan border while passing through Saxon Falls and Superior Falls, until it reaches Oronto Bay in Lake Superior. Primary tributaries include Boomer Creek and Layman's Creek in Wisconsin and Mud Creek, Spring Creek, and Welch Creek in Michigan, as shown in **Figure 4.3-1** on the following page (USGS, 2016).

The West Fork of the Montreal River is about 26.1 miles in length and originates from Island Lake, which straddles the boundary between the Towns of Knight and Cary in Iron County, Wisconsin. The West Fork of the Montreal River flows north and east for 13.8 miles until it enters the southern end of the Project reservoir. From there, the West Fork of the Montreal River continues northeast for an additional 12.3 miles until it meets the Montreal River, at which point the Montreal River continues to flow another 17.7 miles before it reaches Oronto Bay.

Figure 4.3-1: Superior Falls and Saxon Falls and Gile Flowage Water Resources



4.3.1 Drainage Area

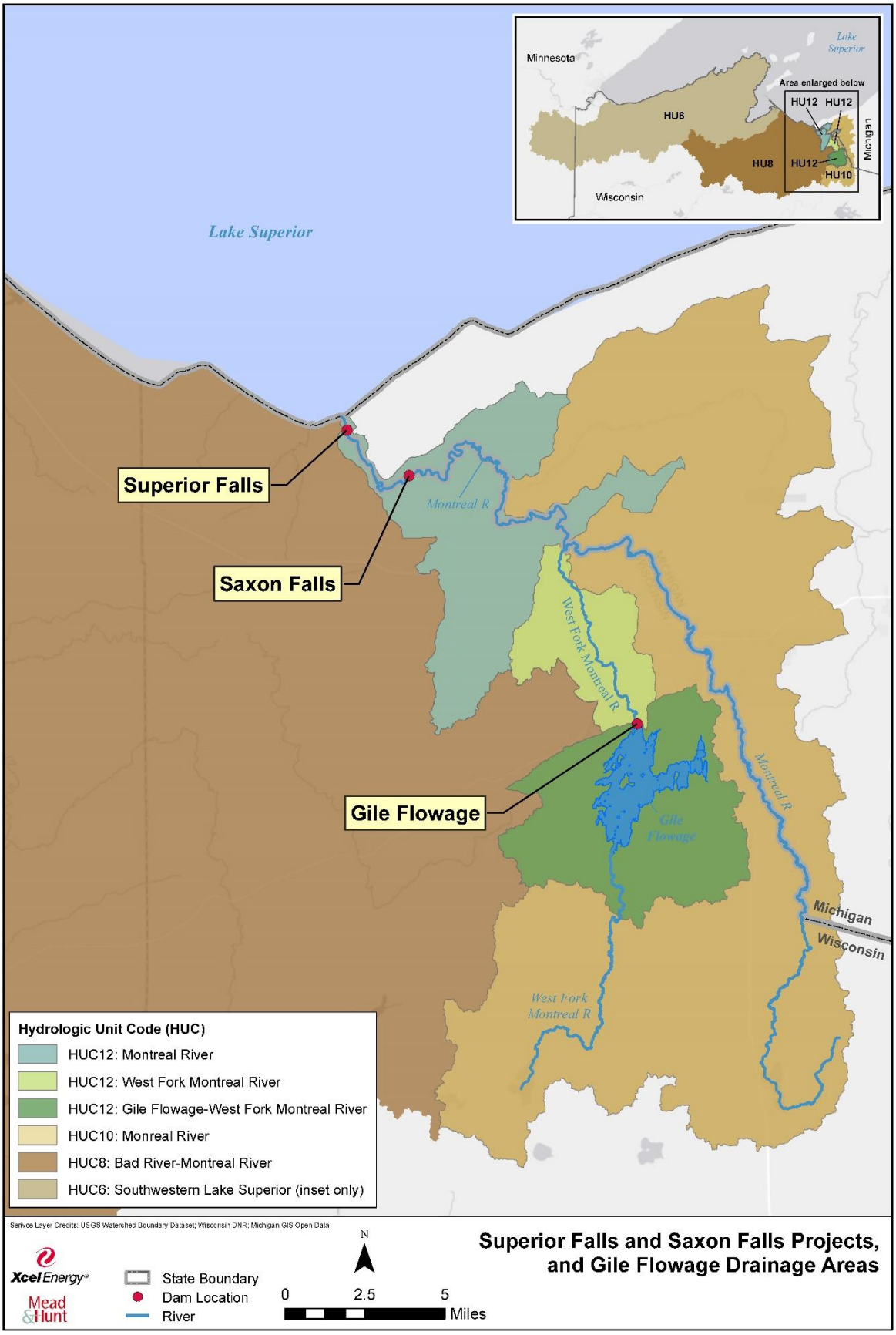
The Project is located in the Bad-Montreal River Subbasin in northeast Wisconsin. The drainage area lies within portions of Iron County, Wisconsin and Gogebic County, Michigan. The Bad-Montreal Subbasin is further divided into watershed and subwatershed hierarchies as shown in **Figure 4.3.1-1**. The National Watershed Boundary hierarchy is listed in **Table 4.3.1-1** (WDNR, 2019b).

Table 4.3.1-1: National Watershed Boundary Dataset Hydrologic Unit Designation

Hierarchy	WBDHU[1]	Hydrologic Unit Name
Region	WBDHU2	Great Lakes
Subregion	WBDHU4	Western Lake Superior
Basin	WBDHU6	Southwestern Lake Superior
Subbasin	WBDHU8	Bad River - Montreal River
Watershed	WBDHU10	Montreal River
Subwatershed	WBDHU12	Gile Flowage-West Fork Montreal River

[1] National Watershed Boundary Dataset Hydrologic Unit (USGS-USDA-NRCS, 2013)

Figure 4.3.1-1: Superior Falls and Saxon Falls Projects and Gile Flowage Water Drainage Areas



4.3.2 Streamflow, Gage Data, and Flow Statistics

Monthly flow duration curves for the Project were developed based on data recorded at USGS Gage No. 04029990, which is located approximately 20 miles downstream of the Project at the Saxon Falls powerhouse. The gage location has a drainage area of 262 square miles adjusted for the drainage area of 75 square miles at the Project dam. Based on the adjusted data for the analyzed period of January 1986 to December 2017, the average annual calendar year flow at the Project is 89 cfs; the maximum annual calendar year flow was 166 cfs in 2016; and the minimum annual calendar year flow was 44 cfs in 1987.

The monthly minimum, mean, and maximum flows are depicted in **Table 4.3.2-1** and the monthly flow duration curves and exceedance table for the analyzed period is available in **Appendix 4.3.2-1**.

Table 4.3.2-1: Gile Flowage Storage Reservoir Project Monthly Minimum, Mean, and Maximum Flows (1986 to 2017)

Month	Monthly Minimum (cfs)	Monthly Mean (cfs)	Monthly Maximum (cfs)
January	17	45	123
February	16	49	487
March	18	113	1,174
April	24	272	2531
May	17	158	2,439
June	11	82	1,005
July	11	78	2,828
August	7	46	335
September	5	42	415
October	9	61	550
November	15	65	824
December	14	54	429

*Note: Measured at Saxon USGS Gage No. 04029990.

4.3.3 Existing and Proposed Uses of Water

4.3.3.1 Existing Uses

Beginning in the early 1900's, the Montreal River provided water for hydroelectric power production, recreation, and fish and wildlife habitat. The primary uses of the Montreal River today remain the same.

There are no known surface water withdrawals from the Project. One permitted point-source municipal discharge from the City of Montreal sewer treatment plant is located 0.8 miles downstream of the Project dam (WDNR, 2019a, WDNR 2019c).

4.3.3.2 Proposed Uses

The Project is operated to supplement flows on the West Fork of the Montreal River during periods of low river flows for hydroelectric generation downstream at Saxon Falls and Superior Falls. NSPW does not propose any changes to the current operation of the facility.

4.3.4 Existing Instream Flow Uses

The Project is a currently unlicensed headwater storage reservoir. It has historically released a minimum flow of 10 cfs into the West Fork of the Montreal River (Friends of the Gile Flowage, 2019). NSPW does not propose any operational changes to the minimum flow.

4.3.5 Existing Water Rights

The Licensee owns or has the rights necessary to operate the Project.

4.3.6 Reservoir Bathymetry

The Project reservoir encompasses approximately 3,317 acres and has a maximum depth of 25 feet. The reservoir has a usable storage capacity of 37,064 acre-feet with a 15-foot drawdown (NSPW, 2019). A bathymetric map of the area near the embankment is located in **Appendix 4.3.6-1**. NSPW does not have a bathymetric map of the entire reservoir.

4.3.7 Water Quality

4.3.7.1 Wisconsin Regulations

The State of Wisconsin has established water quality standards with Wisconsin Administrative Code Chapter Natural Resources (NR) 102 in order to protect, maintain, and enhance surface waters for a variety of designated uses. The standards set limits for each designated use described below for which water quality cannot be artificially lowered unless a variance has been provided. NR 102 standards are consistent with § 303(c) of the Clean Water Act.

<u>River Water Quality Standards</u>

Wisconsin DNR classifies the West Fork of the Montreal River from State Highway 77 to the mouth of the Saxon Falls reservoir as a cold-water stream. Under NR 102.03, the portion of the Montreal River upstream of State Highway 77, including the Project reservoir, is defined as a surface water and no variances are provided. This portion is categorized as a warm water sport fish community for fish and other aquatic life uses and for general recreational, public health and welfare, and fish consumption

uses. The Wisconsin state standards for fish and aquatic life criteria classifications in the warm water sport fish category include the following requirements:

- pH shall be between 6.0 and 9.0.
- Dissolved oxygen (DO) shall not be lowered below 5 milligrams per liter (ug/l) at any time.
- Temperature shall not exceed 86ºF.
- Total phosphorus of less than 100 ug/l.

A recreational use classification requires the geometric mean of bacterial counts of E. coli (*Escherichia coli)* to be below 126 counts per 100 ml based on a rolling 90-day period during the recreation season.

NR 102.14 establishes taste and odor criteria standards for public health and welfare, which are outlined by specific substance. The full text of Chapter NR 102 Water Quality Standards is provided in **Appendix 4.3.7.1-1**.

NR 105.07 establishes wildlife use standards, which are outlined based upon specific substance concentrations. The full text of Chapter NR 105 Surface Water Quality Criteria for Toxic Substances is provided in **Appendix 4.3.7.1-2**.

Reservoir Water Quality Standards

Under NR 102.06, a waterbody is considered a reservoir if there is a dam that raises water depth more than two times to conditions prior to dam construction, and that has a mean water residence time of 14 days or more under summer mean flow conditions. Under this definition the Gile Flowage Storage Reservoir Project has a water residence time exceeding 14 days and is considered an unstratified reservoir under NR 102.06, with a total phosphorous criterion of 40 ug/l.

4.3.8 Water Quality Data

4.3.8.1 Existing Water Monitoring Data

None of the waters associated with the Project are designated as impaired waters (WDNR 2019a).

Two water quality monitoring stations were identified on the Project reservoir. Monitoring Station 263041 is located within the reservoir about 0.75 miles upstream of the dam and has monitoring data from 1994, 1997, and 2000. Monitoring Station 10029743 is located at the intersection of West Branch Road and the West Fork of the Montreal River and has monitoring data from 2017. Data indicates the Gile Flowage meets Wisconsin's water quality standards for all monitoring events. The pH, DO, and temperature data for each monitoring station is shown in **Table 4.3.8.1-1**. Water quality monitoring data for the Gile Flowage is located in **Appendix 4.3.8.1-1**.

Table 4.3.8.1-1: Gile Flowage Storage Reservoir Project Water Quality Monitoring Data

Monitoring Station	Date	pH	DO (mg/l)	Temp (°F)
263041	June 21, 1994	6.9*	5.7*	69.4*
263041	August 3, 1994	7.5*	7.6*	73.0*
263041	August 14, 1997	7.2	8.5	66.2
263041	June 13, 2000	7.3*	7.9*	65.9*

263041	July 20, 2000	7.0*	6.6*	70.1*
263041	August 9, 2000	N/A	7.0	70.7
10029743	May 30, 2017	6.4	13.9	55.8
10029743	June 28, 2017	6.6	10.6	62.6
10029743	July 31, 2017	7.3	11.2	73.0
10029743	August 15, 2017	6.8	9.8	67.8
10029743	September 27, 2017	6.1	10.1	59.5
10029743	September 29, 2017	6.6	10.7	57.0
10029743	October 24, 2017	7.3	11.1	46.8

* Average of readings taken for date

The Friends of the Gile Flowage (FOG) also conducted citizen lake monitoring of several sites on the Gile Flowage. Annual reports detailing citizen monitoring from 1993, 1997, 2012, 2015, 2017, 2018, and 2019 are in **Appendix 4.3.8.1-2**.

4.3.8.2 Future Water Quality Monitoring

Based upon historical monitoring data, sufficient information exists to evaluate water quality at the Project. In addition, the Licensee is not proposing any changes to the current operation, or the addition of any new facilities. As such, the existing water quality data is representative and continued operation at the Project is not expected to adversely impact water resources in the area.

4.3.9 References

- Friends of the Gile Flowage. 2019. Brief History of the Gile Flowage. http://www.friendsofthegile.org/home/flowage-. Accessed September 12, 2019.
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- Northern States Power Company-Wisconsin (NSPW), 2019. Matt Miller personal communication. October 3, 2019.
- Wisconsin Department of Natural Resources. 2019a. WDNR website. WDNR Surface Water Data Viewer. https://dnrmaps.wi.gov/H5/?Viewer=SWDV. Accessed September 6, 2019.
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4.4 Fish and Aquatic Resources (18 CFR § 5.6(d)(iv))

4.4.1 Fish and Aquatic Communities

Several specific fish and aquatic community related studies that are relevant to the Project have been completed within the Project reservoir. The WDNR Fish Mapping Application is a web application available to the public designed to provide precise geographic data on the distribution and relative abundance of Wisconsin fishes (WDNR, 2019a). The fish mapping application produces detailed maps and tables of occurrences and relative abundances of all fish species reported. The associated

database is updated regularly and contains historic data from a variety of sources, as well as past and current surveys from the WDNR.

The WDNR Fish Mapping Application was used to identify fish species within the Project reservoir that are representative of the Project. Eight data points were located within the Project reservoir.

4.4.1.1 Fisheries

Nineteen species of fish were identified in the Project reservoir based on data collected between 1973 and 1994. Of the 11,049 fish collected during that timeframe, the five most predominant species included (WDNR, 2019a):

- Yellow perch (*Perca flavescens*) at 9,783 or 88.5% (most abundant fish)
- Walleye (*Sander vitreus*) at 706 or 6.4%
- Smallmouth bass (*Micropterus dolomieu*) at 173 or 1.6%
- Rock bass (*Ambloplites rupestris*) at 97 or 0.9%
- Northern pike (*Esox lucius*) at 73 or 0.7%

The species list is provided in **Table 4.4.1.1-1** and the data list is enclosed in **Appendix 4.4.1.1-1**.

Table 4.4.1.1-1: Fish Species Identified in the Project Reservoir

Fish Species	Scientific Name
Black bullhead	*Ameiurus melas*
Black crappie	*Pomoxis nigromaculatus*
Blacknose shiner	*Notropis heterolepis*
Bluegill	*Lepomis macrochirus*
Bullheads	*Ameiurus spp.*
Central mudminnow	*Umbra limi*
Common shiner	*Luxilus cornutus*
Crappies	*Pomoxis spp.*
Golden shiner	*Notemigonus crysoleucas*
Iowa darter	*Etheostoma exile*
Johnny darter	*Etheostoma nigrum*
Muskellunge	*Esox masquinongy*
Northern pike	*Esox lucius*
Rock bass	*Ambloplites rupestris*
Smallmouth bass	*Micropterus dolomieu*
Suckers spp.	
Walleye	*Sander vitreus*
White sucker	*Catostomus commersonii*
Yellow perch	*Perca flavescens*

Additional Data

According to the WDNR Fish Stocking Database, the WDNR has been routinely stocking the Montreal River from 1972 through 2018. During that timeframe, a total of 44,545 smallmouth bass

and 34,828 muskellunge (*Esox masquinongy*) were stocked in the Project reservoir (WDNR, 2019b). The fish stocking data is located in **Appendix 4.4.1.1-2**.

4.4.1.2 Mussels

The WDNR maintains a database of mussel observations that can be searched by county and stream. A review of the database for Iron County identified two mussel species within the Montreal River, Cylindrical papershell (*Anodontoides ferussacianus*) and Eastern elliptio (*Elliptio complanata*) (WDNR, 2019c).

4.4.2 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act does not apply because no mapped Essential Fish Habitat is identified in the vicinity of the Project (NOAA, 2019).

4.4.3 Fish Entrainment and Mortality

The Gile Flowage Storage Reservoir Project is a headwater storage reservoir and does not have a water intake, trashracks, or turbine. All water is passed downstream through the sluice and tainter gates.

4.4.4 References

- National Oceanic and Atmospheric Administration (NOAA). 2019. Essential Fish Habitat Mapper: https://www.habitat.noaa.gov/protection/efh/efhmapper/. Accessed September 11, 2019.
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4.5 Wildlife and Botanical Resources (18 CFR § 5.6(d)(3)(v))

A map depicting the 16 ecological landscapes within Wisconsin is included in **Appendix 4.5-1**. Ecological landscapes in their natural state are primarily defined by the physical environment which includes climate, geology and landforms, and hydrology. The Project is located within the North Central Forest Ecological Landscape.

4.5.1 Botanical Species

In the mid-1800's, the majority of the lands within the North Central Hardwoods Ecological Landscape contained the most contiguous area of Hemlock-Yellow Birch-Sugar Maple-Pine Forest in Wisconsin (WDNR, 2015b). A map showing Wisconsin's land cover in the 1800s is included in **Appendix 4.5.1-1**.

The shorelines upstream and downstream of the dam and the shoreline of the Project reservoir are primarily undeveloped. A review of the vegetation types shown on the USGS "The National Map" indicates vegetation in the vicinity of the Project consists of three main cover types, deciduous forest, mixed forest, and wooded wetlands (USGS, 2019). The main hardwood forest species in the North Central Ecological Landscape include sugar maple (*Acer saccharum)*, basswood (*Tilia americana*), red

maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), and white ash (*Fraxinus americana*). Mixed forest areas also include conifer species such as white pine (*Pinus strobus*), white spruce (Picea glauca), balsam fir (*Abies balsamea*), and eastern hemlock (*Tsuga canadensis*). Wooded wetlands include northern white cedar (*Thuja occidentalis*), white pine, black ash (*Fraxinus nigra*), and yellow birch *(Betula alleghaniensis*) (WDNR, 2015b).

4.5.2 Wildlife

4.5.2.1 Mammal Species

The mammal species likely to be found in the vicinity of the Project are detailed in **Table 4.5.2.1-1** (NSPW, 1988; NSPW, 1991; WDNR 2015a; WDNR 2015b).

Table 4.5.2.1-1: Mammal Species in the Project Vicinity

Mammal Species	Scientific Name
Badger	*Taxidea taxus*
Big brown bat	*Eptesicus fuscus*
Black bear	*Ursus americanus*
Deer mouse	*Peromyscus maniculatus*
Coyote	*Canis latrans*
Eastern chipmunk	*Tamias striatus*
Fisher	*Martes pennanti*
Gray wolf	*Canis lupus*
Masked shrew	*Sorex cinereus*
Least chipmunk	*Tamias minimus*
Little brown bat	*Myotis lucifugus*
Long-tailed weasel	*Mustela frenata*
Marten	*Martes americana*
Masked shrew	*Sorex cinerus*
Meadow jumping mouse	*Zapus hudsonius*
Meadow vole	*Microtus pennsylvanicus*
Muskrat	*Ondontra zibethicus*
Mink	*Mustela vison*
Porcupine	*Erethizon dorsatum*
Northern flying squirrel	*Glaucomys sabrinus*
Northern long-eared bat	*Myotis septentrionalis*
Raccoon	*Procyon lotor*
Redbacked vole	*Clethrionomys gapperi*
Red fox	*Vulpes vulpes*
Red squirrel	*Tamiasciurus hudsonicus*
River otter	*Lutra canadensis*
Short-tailed weasel	*Mustela erminea*
Shorttail shrew	*Blarina brevicauda*
Shrew mole	*Neurotrichus gibbsi*
Snowshoe hare	*Lepus americanus*
Striped skunk	*Mephitis mephitus*

White-tailed deer	*Odocoileus virginianus*
Woodland jumping mouse	*Napaeozapus insignis*
Woodchuck	*Marmota monax*

4.5.2.2 Bird Species

The bird species likely to be found in the vicinity of the Project are detailed in **Table 4.5.2.2-1** (NSPW, 1988; NSPW, 1991; WDNR, 2015a; WDNR, 2015b; Cornell E-bird, 2019).

Table 4.5.2.2-1: Bird Species in the Project Vicinity

Bird Species	Scientific Name
American bittern	*Botaurus lentiginosus*
American crow	*Corvus brachyrhynchos*
American goldfinch	*Spinus tristis*
American robin	*Turdus migratorius*
American woodcock	*Scolopax minor*
Bald eagle	*Haliaeetus leucocephalus*
Black and white warbler	*Mniotilta varia*
Blackburnian warbler	*Dendroica fusca*
Belted kingfisher	*Megaceryle alcyon*
Black-capped chickadee	*Poecile atricapillus*
Black tern	*Childonias niger*
Bluejay	*Cyanocitta cristata*
Boreal chickadee	*Parus hudsonicus*
Broad-winged hawk	*Buteo platypterus*
Chestnut-sided warbler	*Dendroica pensylvanica*
Common snipe	*Gallinago gallinago*
Downy woodpecker	*Picoides pubescens*
Eastern kingbird	*Tyrannus tyrannus*
Eastern wood pewee	*Contopus virens*
Field sparrow	*Spizella pusilla*
Great blue heron	*Ardea herodias*
Hairy woodpecker	*Leuconotopicus villosus*
Hermit Thrush	*Catharus guttatus*
House wren	*Troglodytes aedon*
Least flycatcher	*Empidonax minimus*
LeConte's sparrow	*Ammospiza leconteii*
Mallard	*Anas platyrhynchos*
Nashville warbler	*Vermivora ruficapilla*
Northern flicker	*Colaptes auratus*
Northern goshawk	*Accipiter gentilis*
Northern waterthrush	*Parkesia noveboracensis*
Olive-sided flycatcher	*Contopus borealis*
Osprey	*Pandion haliaetus*
Ovenbird	*Seirus aurocapilla*
Pied-billed grebe	*Podilymbus podiceps*
Pileated woodpecker	*Dryocopus pileatus*
Red-breasted nuthatch	*Sitta canadensis*
Red-eyed vireo	*Vireo olivaceus*

Red-winged blackbird	*Agelaius phoeniceus*
Rose-breasted grosbeak	*Pheucticus ludovicianus*
Ruby crowned kinglet	*Regulus calendula*
Ruby throated hummingbird	*Archilochus colubris*
Ruffed grouse	*Bonasa umbellus*
Song sparrow	*Melospiza melodia*
Sora rail	*Porzana carolina*
Swainson's thrush	*Catharus ustulatus*
Swamp sparrow	*Melospiza georgiana*
Tree swallow	*Tachycineta bicolor*
Veery	*Catharus fuscescens*
Warbling vireo	*Vireo gilvus*
White-throated sparrow	*Zonotrichia albicollis*
Wood duck	*Aix sponsa*
Yellow-bellied sapsucker	*Sphyrapicus varius*
Yellow-headed blackbird	*Xanthocephalus zanthocephalus*
Yellow-rumped warbler	*Dendroica coronata*

4.5.2.3 Reptile and Amphibian Species

Although no records of herpetological species surveys were found during literature review, based on the existing habitat within Iron County, Wisconsin, and the geographical range, it is likely a variety of frogs, snakes, turtles, and salamanders exist in the area. Reptiles and amphibians likely to be found in the vicinity of the Project are detailed in **Table 4.5.2.3-1** (NSPW, 1988; NSPW, 1991; WDNR, 2015a; WDNR, 2015b).

Table 4.5.2.3-1: Reptile and Amphibian Species Presumed in Project Vicinity

Reptiles and amphibians	Scientific Name
American toad	*Bufo americanus*
Eastern gartersnake	*Thamnophis sirtalis*
Eastern gray treefrog	*Hyla versicolor*
Fox snake	*Elaphe vulpina*
Leopard frog	*Rana pipiens*
Northern ring-necked snake	*Diadophis punctatus edwardsii*
Northern spring peeper	*Hyla crucifer*
Painted turtle	*Chrysemys picta*
Wood frog	*Rana sylvatica*
Wood turtle	*Glyptemys insculpta*

4.5.3 Invasive Species

In the state of Wisconsin, the invasive species rule makes it illegal to possess, transport, transfer, or introduce certain invasive species into the state without a permit (WDNR, 2019a), as outlined in Chapter NR 40 of the Wisconsin Administrative Code (NR 40). NR 40 requirements are often used as guidance at hydroelectric projects to determine which species should be considered invasive.

NR 40.03 classifies invasive species into two categories: prohibited and restricted. Prohibited species are invasive species not currently found in Wisconsin or are only found in a few places, but if introduced are likely to survive, spread, and potentially cause negative environmental and economic impacts. Restricted

species are invasive species already widely established in Wisconsin and have caused or are believed to cause negative environmental and economic impacts. Since restricted species are already widely established, complete eradication is unlikely. NR 40 further categorizes invasive species by group, which include: plants, aquatic invertebrates, terrestrial and aquatic vertebrates (except fish), fungus, algae and cyanobacteria, fish and crayfish, and terrestrial invertebrates and plant disease-causing microorganisms.

The WDNR Lakes and AIS Mapping Tool identified three invasive invertebrate species in the Project reservoir: the prohibited spiny water flea (*Bythotrephes cederstroemi*), first identified in 2003, the restricted Chinese mystery snail (*Cipangopaludina chinensis*), first identified in 2004, and the restricted banded mystery snail (*Viviparus georgianus*), first identified in 2011 (WDNR, 2019b; WDNR, 2019c). The WDNR developed a flier to assist in early detection of aquatic invasive species, as shown in **Figure 4.5.3-1a** and **Figure 4.5.3-1b** on the following pages.

The Iron County Land and Water Conservation Department noted the spiny water flea was identified in the West Fork of the Montreal River downstream of the Project dam for the first time in 2018 (LWCD, 2019).

4.5.4 References

- Cornell Ebird. 2019. Ebird Field Checklist, Iron County, Wisconsin, U.S. https://ebird.org/printableList?regionCode=US-WI-051&yr=all&m=, Accessed December 6, 2019.
- Iron County Land and Water Conservation Department (LWCD). 2019. Xcel Energy Gile Flowage Questionnaire.
- Northern State Power Company-Wisconsin (NSPW). 1988. Application for a Minor Water Power Project Pursuant to Section 4(e) of the Federal Power Act for the Saxon Falls Hydro Project, FERC No. 2610. December 16, 1988.
- Northern States Power Company-Wisconsin (NSPW). 1991. Application for a License for a Minor Water Power Project, Superior Falls Hydroelectric Project, FERC Project No. 2587. December 17, 1991.
- Wisconsin Department of Natural Resources. 2015a. The Ecological Landscapes of Wisconsin: an assessment of ecological resources and a guide to planning sustainable management. Chapter 21 Superior Coastal Plain Ecological Landscape. PUB-SS-1131J2014, Madison.
- Wisconsin Department of Natural Resources. 2015b. The Ecological Landscapes of Wisconsin: an assessment of ecological resources and a guide to planning sustainable management. Chapter 12 North Central Forest Ecological Landscape. PUB-SS-1131J2014, Madison.
- Wisconsin Department of Natural Resources Website. 2019a. https://dnr.wi.gov/topic/Invasives/classification.html. Accessed September 11, 2019.
- Wisconsin Department of Natural Resources. 2019b. WDNR Lakes and AIS Mapping Tool. https://dnrmaps.wi.gov/H5/?viewer=Lakes_AIS_Viewer. Accessed September 11, 2019.
- Wisconsin Department of Natural Resources Website. 2019c. Regulated Invasive Aquatic Invertebrates Except Crayfish. https://dnr.wi.gov/topic/Invasives/speciesNR40list.asp?filterBy=Category&filterVal=Aquatic%20Invertebrates%20Except%20Crayfish&addFilter=Classification. Accessed September 11, 2019.

Figure 4.5.3-1a: Selected Regulated Aquatic Invasive Species in Wisconsin (side one)

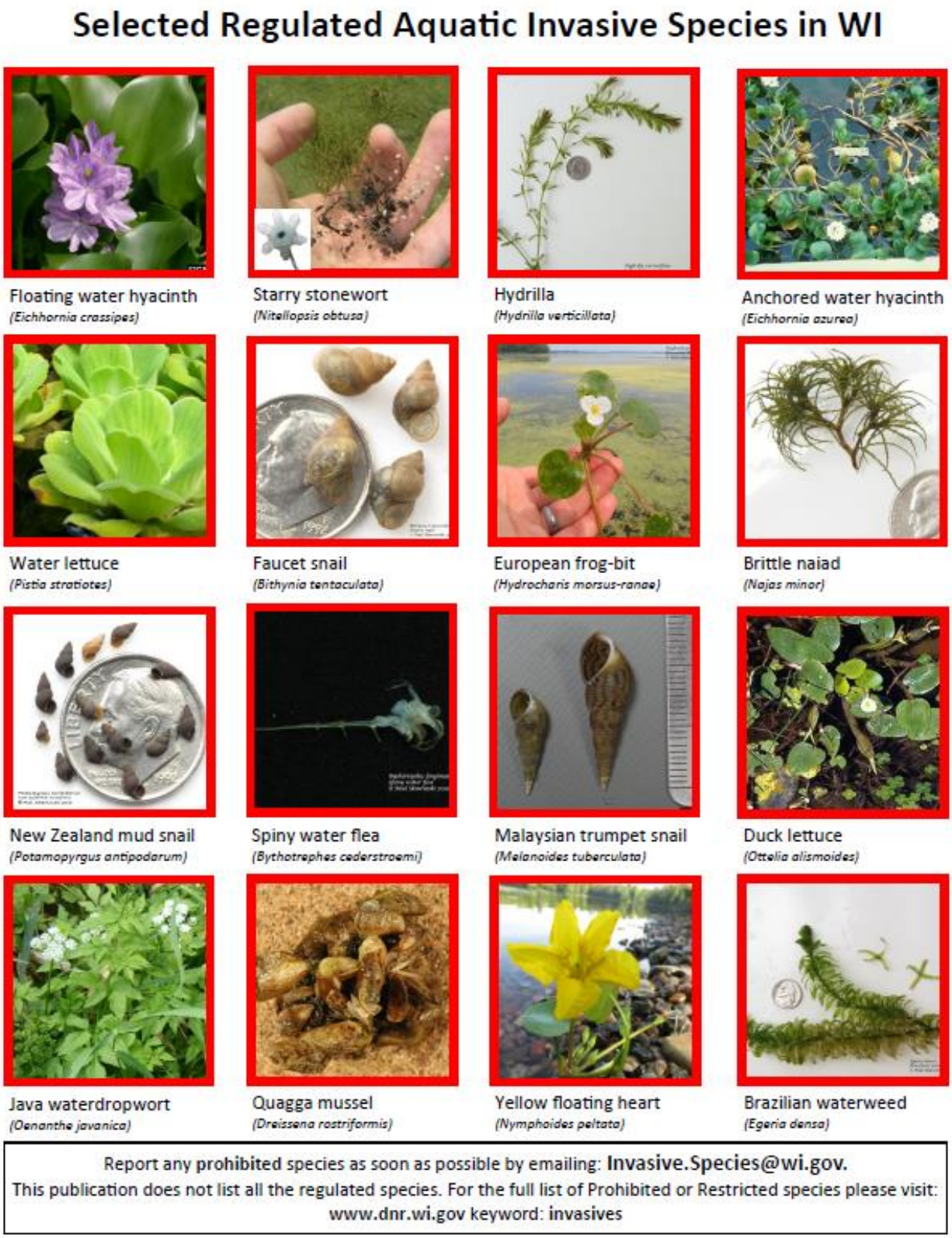
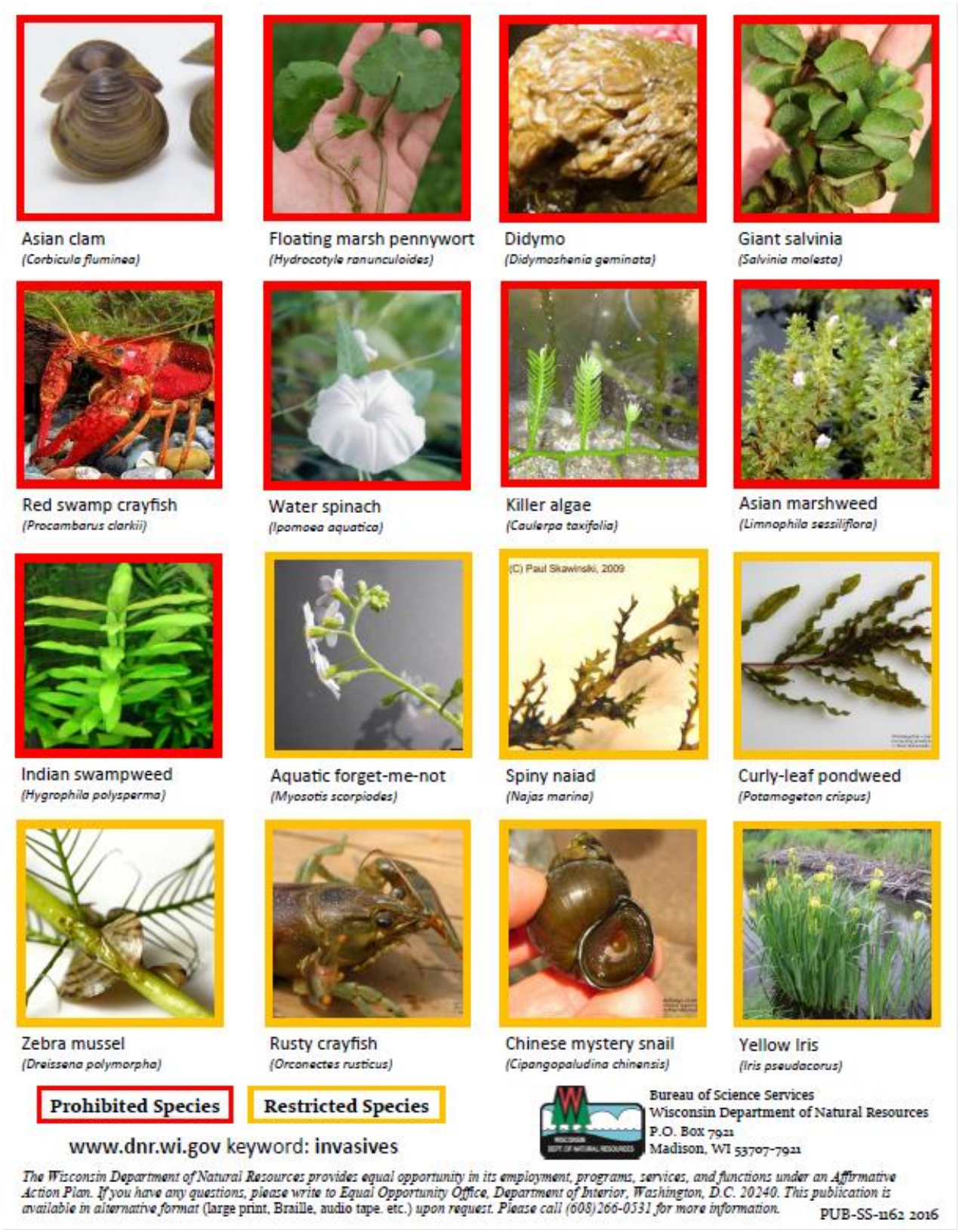


Figure 4.5.3-1b: Selected Regulated Aquatic Invasive Species in Wisconsin (side two)



4.6 Wetlands, Riparian and Littoral Habitat (18 CFR § 5.6(d)(3)(vi))

4.6.1 Riparian Habitat

Riparian habitat refers to reservoir margins where vegetation exists but is not regularly submerged. The riparian habitat in the vicinity of the Project is relatively undeveloped except for formal recreation sites.

The riparian habitat at the Project is typical North Central Forest Ecological Landscape Vegetation with a primary mixture of upland forest and forested wetlands. Typical upland forest cover types include a mix of sugar maple, ash, American basswood, quaking aspen (*Populus tremuloides*), red maple, paper birch (*Betula papyrifera*), eastern hemlock, and balsam fir. Typical forested wetland cover types consist of coniferous swamp species including northern white cedar, white pine, black ash, and yellow birch (WDNR, 2015b).

4.6.2 Wetlands Habitat

Wetland habitat includes terrestrial areas that are permanently, intermittently, or seasonally flooded. Wetlands help improve water quality and provide for wildlife habitat, nutrient cycling and storage, aesthetics, and recreation. In riverine systems such as the Gile Flowage Storage Reservoir Project reservoir, wetland functions include flood water storage, filtration, sedimentation reduction, and wildlife habitat and corridors. The value of wetlands in the vicinity of the Project includes flood peak mitigation, surface water quality enhancement, biodiversity preservation and enhancement, and recreational activities support and enhancement.

The Wisconsin Wetlands Inventory classifies wetlands according to vegetation, cover type, hydrology, human influence factors, and special wetland characteristics. According to this classification system, wetland vegetation is divided into seven major classes or cover types with several more precisely defined subclasses (WDNR, 2019).

Wetland boundaries are delineated based upon unique hydrologic, soil, and vegetational parameters. Wetlands identified at the Project are primarily adjacent to the Project reservoir. The Wisconsin Wetland Inventory identified two main classes of wetlands within the Project outside of open water lake, pond, and riverine areas. The remaining two main wetland classes within the boundaries of the Project include freshwater forested/shrub wetlands and freshwater emergent wetlands. A figure displaying the wetlands in the vicinity of the Project is included in **Appendix 4.6.2-1**.

In general, forested wetlands include bogs and forested floodplain complexes characterized by trees that are 20 feet or more in height including species such as tamarack *(Larix laricina),* northern white cedar, white pine, and black ash. Shrub-carr wetlands are typically dominated by willow (S*alix spp*.) and dogwood (*Cornus spp*.) species. Emergent wetlands include species such as cattails (*Typha spp*.), sedges (*Carex spp*.), grasses, and rushes (WDNR, 2015a; WDNR 2015b).

4.6.3 Littoral Habitat

Littoral habitat is the transition between aquatic and terrestrial habitats and is prevalent along most reservoir margins. The littoral habitat of the Project is more prevalent in the southern half of the reservoir which includes tributary streams and wetlands.

A littoral zone study was conducted in 2005 evaluating the vegetation and substrate of the top six feet of the allowed operating range (1,084.0 feet to 1,090 feet). The survey identified the mean width and area of the littoral zone at three intervals as shown in **Table 4.6.3-1** below.

Table 4.6.3-1: Widths and Areas of Gile Flowage Littoral Zone Contour Intervals

Contour Interval	Mean Width (yards)	Total Area of Interval (acres)	Percentage of Total Flowage Area
0-2 feet	*7.3*	*87.3*	*2.6*
2-4 feet	*23.3*	*278.8*	*8.2*
4-6 feet	*27.9*	*333.8*	*9.9*

Source: (Friends of the Gile Flowage, 2005)

The Gile Flowage Littoral Zone Survey also summarized the reservoir bed substrates located within the littoral zone. **Table 4.6.3-2** summarizes the substrates found at each contour interval.

Table 4.6.3-2 Summarized Substate Data for the Gile Flowage Littoral Zone

Substrate Type	Percent of Substrate Grouping at Each Depth		
	0-2 feet	2-4 feet	4-6 feet
Bedrock, boulder, cobble	*27.7*	*25.9*	*20.3*
Gravel, gravel with cobble, gravel with boulders	*6.5*	*13.0*	*26.9*
Sand, muck, detritus	*58.3*	*55.6*	*39.8*
Sand with gravel, cobble and/or boulders	*7.4*	*5.6*	*13.0*

In 2005, Whitewater Associates prepared a report titled “Gile Flowage Watershed Project Report: Environmental Information Review and Water Quality Monitoring (Iron County, Wisconsin).” The report identified aquatic plant communities within the Gile Flowage. **Table 4.6.3-3** summarizes aquatic plants found in the Gile Flowage.

Table 4.6.3-3 Aquatic Plants Found in the Gile Flowage in August 1994

Plant Species		Type	Relative Frequency on Transects
Common Name	Scientific Name		
No vegetation	-	-	*78.1*
Western waterweed	*Elodea nutallii*	*Submergent*	*6.1*
Frie’s pondweed	*Potamogeton fresii*	*Submergent*	*3.2*
Stonewort	*Nitell sp.*	*Submergent*	*2.9*
Green-fruited burr reed	*Sparganium chlorocarpum*	*Emergent*	*2.5*
Water stonewort	*Callitriche verna*	*Submergent*	*2.2*
Spikemoss	*Eleocharis acicularis*	*Submergent*	*1.5*
Alpine pondweed	*Potamogeton alpinus*	*Submergent*	*0.8*
Variable pondweed	*Potamogeton gramineus*	*Submergent*	*0.5*
Water plantain	*Alisma plantago-aquatica*	*Emergent*	*0.5*
Thread rush	*Juncus filiformus*	*Emergent*	*0.5*
Giant burr reed	*Sparganium eurycarpum*	*Emergent*	*0.5*

Plant Species		Type	Relative Frequency on Transects
Common Name	Scientific Name		
Bushy pondweed	*Najas flexilis*	*Submergent*	*0.1*
Natall's pondweed	*Potamogeton epihydrus*	*Submergent*	*0.1*
Arrowhead	*Sagittaria sp.*	*Emergent*	*0.1*
River pondweed	*Potamogeton nodusus*	*Submergent*	*0.1*
Woolgrass	*Scirpus cypernus*	*Emergent*	*
Narrow leaf cattail	*Typha angustifolia*	*Emergent*	*
Arrowhead	*Sagitaria latifolia*	*Emergent*	*
Intermediate spikerush	*Eleocharis intermedia*	*Emergent*	*
Water stonewort	*Callitriche hermaphrodictica*	*Submergent*	*
Reed canary grass	*Phalaris arundinacea*	*Emergent*	*
Floating leaf pondweed	*Potamogeton natans*	*Submergent*	*
Water smartweed	Polygonium amphibium	*Emergent*	*

**Plants not found in transects, but identified elsewhere on the flowage*

Source: (Whitewater Associates, 2005)

4.6.4 References

- Friends of the Gile Flowage. 2005. Gile Flowage Littoral Zone Survey, 2005. https://docs.google.com/file/d/0B75MzL2b1_KCaWtGN0UxSFhKbTQ/edit. Accessed October 6, 2020.
- Whitewater Associates. 2005. Gile Flowage Watershed Project Report: Environmental Information Review and Water Quality Monitoring (Iron County, Wisconsin). November 17, 2005.
- Wisconsin Department of Natural Resources. 2015a. The Ecological Landscapes of Wisconsin: an assessment of ecological resources and a guide to planning sustainable management. Chapter 21 Superior Coastal Plain Ecological Landscape. PUB-SS-1131J2014, Madison.
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- Wisconsin Department of Natural Resources. 2019. WDNR Surface Water Data Viewer. https://dnrmaps.wi.gov/H5/?Viewer=SWDV. Accessed October 9, 2019.

4.7 Rare, Threatened and Endangered Species (18 CFR § 5.6(d)(3)(vii))

4.7.1 Overview

The United States Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) website was accessed to develop an IPaC Resource List for the Project. Also, an Endangered Resources Review was completed by the WDNR to identify potential threatened, endangered, and special concern species located at the Project.

4.7.2 IPaC Resource Lists

The IPaC Resource List identified one federally endangered and two federally threatened species likely to occur within the vicinity of the Project. They include the Canada lynx (*Lynx canadensis*), Gray wolf (*Canis lupus*), and northern long-eared bat (NLEB) (*Myotis septentriolnalis*). The IPaC Resource List for the Project is included in **Appendix 4.7.2-1.**

4.7.2.1 Canada Lynx

The Canada lynx is a federally endangered mammal species that is associated with moist, cool, boreal spruce-fir forests, with rolling terrain. They are dependent upon snowshoe hare populations and need persistent deep powdery snow, which limits competition from other predators. There is no designated critical habitat for the species in any of the three developments (USFWS, 2019a). The species may pass through any of the three developments.

4.7.2.2 Gray Wolf

The gray wolf is a federally threatened mammal species that lives in family groups or packs and is a habitat generalist that can have territories ranging from 20 to 120 square miles (WDNR, 2019a). Gray wolves are present throughout northern Wisconsin and the Upper Peninsula of Michigan and may pass through the Project along the upland property.

The gray wolf was removed from the Wisconsin endangered species list in 2004 (WDNR, 2019a). The USFWS evaluated the classification status of the gray wolf and has proposed to remove the species from the federal endangered species list due to recovery. On May 15, 2019, the proposed rule list was printed in the Federal Register. If a final determination is made to remove the species from the federal endangered species list, management of the species will be returned to the state (USFWS, 2019b).

4.7.2.3 Northern Long-Eared Bat

The Northern long-eared bat (NLEB) is a state of Wisconsin and federally threatened mammal species. The NLEB roosts during the summer months underneath loose bark or in cavities or crevices of both live and dead trees. Non-reproducing females and males may also roost in cool places such as caves or mines. The NLEB feeds in the forest interior and hibernates in caves and mines during the months of October through April. Iron County, Wisconsin and Gogebic County, Michigan are within the NLEB range (USFWS, 2019c). However, according to a Natural Heritage Inventory (NHI) search, no element occurrences of hibernacula or maternity roost trees were identified within or adjacent to any of the three developments.

4.7.3 Wisconsin Natural Heritage Inventory Review

Review of the Natural Heritage Inventory indicates 4 state-listed threatened or endangered species are likely to occur within Project vicinity. These species are shown in **Table 4.7.3-1** and described in the following paragraphs (WDNR 2019b).

Table 4.7.3-1: Threatened and Endangered Species Likely to Occur in the Project Vicinity

Species	Scientific Name	Group	WI Status*	Federal Status**
Bald eagle	*Haliaeetus leucocephalus*	Bird		Eagle Act
Little brown bat	*Myotis lucifugus*	Mammal	THR	
Wood turtle	*Gleptemys insculpta*	Turtle	THR	
Cherrystone drop	*Hendersonia occulta*	Snail	THR	
Broad-leaved twayblade	*Listera convallarioides*	Plant	THR	
Maidenhair spleenwort	*Asplenium trichomanes*	Plant	SC	

* State Status: END = Endangered, THR = Threatened, SC = Special Concern

** Federal Status: THR = Threatened, Eagle Act = Bald and Golden Eagle Protection Act

4.7.3.1 Bald Eagle

The NHI review indicates bald eagles are located along the Montreal River in the vicinity of the Project (WDNR, 2019b). As of August 9, 2007, the Bald Eagle population had recovered to the extent that it no longer required the protection of the federal Endangered Species Act. The Bald Eagle is protected by the Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Lacey Act (USFWS, 2007). The bald eagle is no longer listed as a threatened, endangered, or special concern species in Wisconsin.

4.7.3.2 Little Brown Bat

The little brown bat is a Wisconsin threatened mammal species. It is insectivorous and feeds on aquatic soft-bodied insects. The species is found roosting in warm microclimates provided by tree snags, bat houses, and buildings during the summer. It forages primarily over open water and along edge habitat. The bat hibernates in caves and mines from October through April. Mating occurs in the fall. Usually one pup is born in early June and matures after six weeks (WNDR, 2019c). According to the WDNR website, the little brown bat is known to occur in Iron County and additional counties, as shown in **Figure 4.7.3.2-1** to the left.

Figure 4.7.3.2-1: General Known Occurrence of the Little Brown Bat

4.7.3.3 Wood Turtle

The wood turtle is a Wisconsin threatened reptile that forages in open wet meadows or in shrub-carr habitats dominated by speckled alder. The turtle overwinters in streams and rivers in deep holes or undercut banks where there is enough water flow to prevent freezing. The turtle becomes active in spring as soon as the ice is gone and air temperatures reach around 50°F, which can occur as early as mid-March. They may remain active into late October. This semi-terrestrial species typically remains within 300 meters of rivers and streams. Wood turtles can breed at any time of year but breeding primarily occurs during the spring or fall. Nesting usually begins in late May in southern Wisconsin and early June in Northern Wisconsin and continues through June. The species nests in open or semi-open canopy areas containing gravel or sandy soils, typically within 61 meters of the water. Hatching occurs from mid-July through mid-September depending upon air temperatures. This species does not overwinter in nests, unlike other turtle species (WDNR, 2019d). According to the WDNR website, the wood turtle is known to occur in Iron County and additional counties, as shown in **Figure 4.7.3.3-1** to the left. Wood turtles typically do not inhabit lakes, ponds, and intermittent streams. The Project reservoir is a large impoundment that does not provide suitable habitat for the species. However, tributaries entering the reservoir, including Fifield Creek, Linnunpuro Creek, and the southern West Branch of the Montreal River, may provide suitable habitat for the species.

Figure 4.7.3.3-1: General Known Occurrence of the Wood Turtle

4.7.3.4 Cherrystone Drop

Cherrystone drop is a Wisconsin threatened snail that inhabits small areas of algific habitat or the similar cool, moist, shaded sites of cliffs where algific conditions occur without substantial talus or ice. The species is most often found on wooded alluvial-soil banks and bluffs (WDNR, 2019e). According to the WDNR website, Cherrystone drop is known to occur in Iron and other counties as shown in **Figure 4.7.3.4-1** to the left.

Figure 4.7.3.4-1: General Known Occurrence of the Cherrystone Drop

4.7.3.5 Broad-leaved Twayblade

Broad-leaved twayblade is a Wisconsin threatened plant that is found on seepage slopes and ravine bottoms in hardwoods or mixed forests. Blooming occurs from early June through late July and fruiting occurs from early July through late August. The optimal identification period for the species is from late June through late July (WDNR, 2019f). According to the WDNR website, broad leaved twayblade is known to occur in Ashland, Bayfield, and Iron Counties as shown in **Figure 4.7.3.5-1** to the left.

Figure 4.7.3.5-1: General Known Occurrence of Broad-leaved Twayblade

4.7.3.6 Maidenhair Spleenwort

Maidenhair spleenwort is a Wisconsin special concern plant that is found on cool, shaded cliffs primarily in hardwood forests on basal and related rocks. The species can be identified year-round (WDNR, 2019g). According to the WDNR website, the maidenhair spleenwort is known to occur in Iron County and additional counties, as shown in **Figure 4.7.3.6-1** to the left.

Figure 4.7.3.6-1: General Known Occurrence of Maidenhair Spleenwort

4.7.4 Summary

The Licensee is not proposing any new facilities or changes to the current operations for the Project. As such, continued operation of each is not expected to adversely impact the rare, threatened, or endangered species in the area.

Maintenance activities at any facility or removal of trees within the boundary of the Project will need to be completed in accordance with requirements outlined in the § 4(d) rule created for the NLEB, which is located in **Appendix 4.7.4-1**.

4.7.5 References

- U.S. Fish and Wildlife Service. 2007. Midwest Region. Fact Sheet: Natural History, Ecology, and History of Recovery, June 2007. https://www.fws.gov/midwest/eagle/recovery/biologue.html. Accessed July 1, 2019.
- U.S. Fish and Wildlife Service. 2019a. Canada Lynx Factsheet. https://www.fws.gov/mountain-prairie/es/species/mammals/lynx/CandaLynxFactSheet_091613.pdf. Accessed September 9, 2019.
- U.S. Fish and Wildlife Service. 2019b. Conserving the Nature of America Gray Wolf (*Canis lupus*). https://www.fws.gov/home/wolfrecovery/. Accessed September 9, 2019.

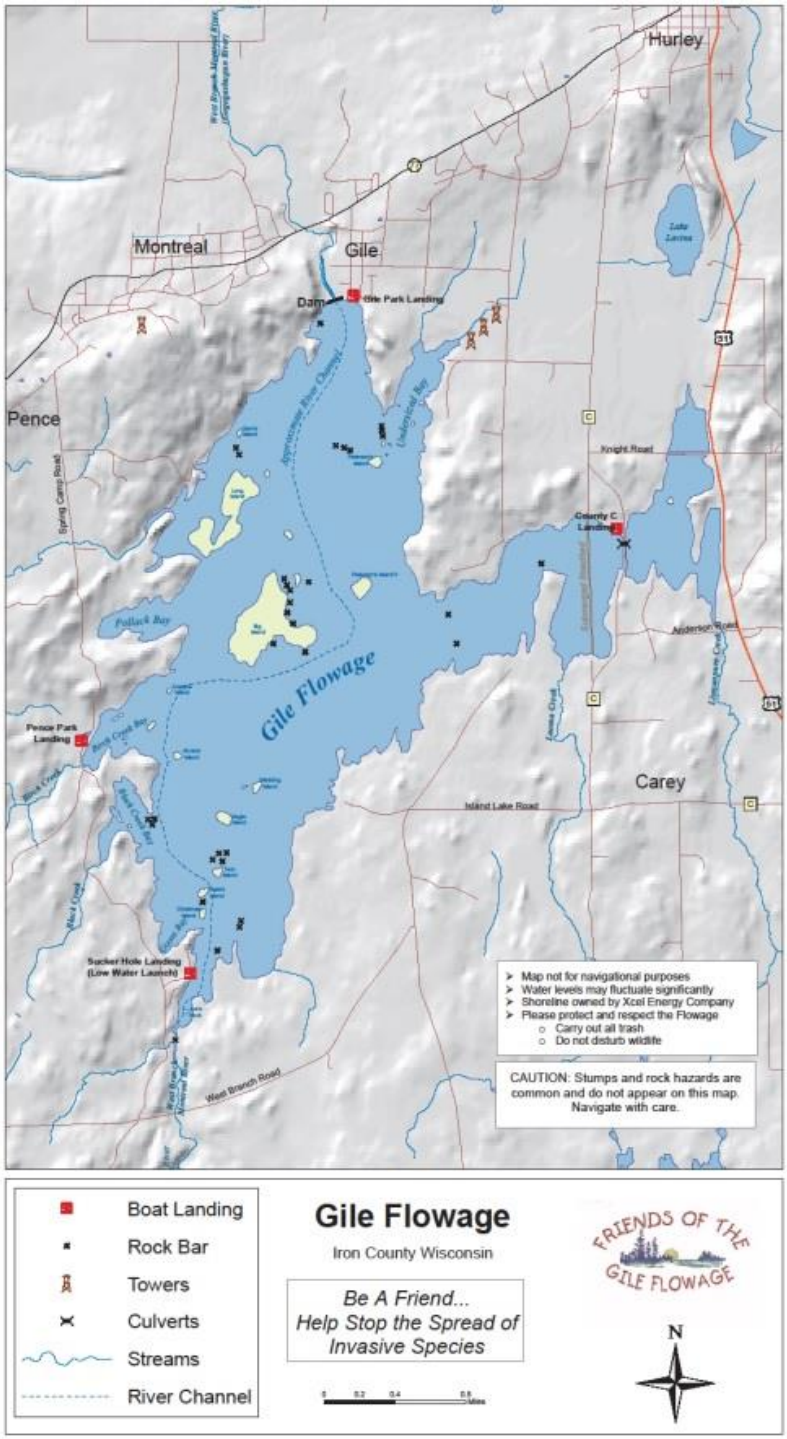
- U.S. Fish and Wildlife Service Website. 2019c. Northern Long-eared Bat. https://www.fws.gov/midwest/Endangered/mammals/nleb/index.html. Accessed September 9, 2019.
- Wisconsin Department of Natural Resources. 2019a. Gray Wolf Factsheet. https://dnr.wi.gov/topic/wildlifehabitat/wolf/facts.html. Accessed September 9, 2019.
- Wisconsin Department of Natural Resources. 2019b. Gile Flowage Endangered Resource Review ERR Log #19-734. October 28, 2019.
- Wisconsin Department of Natural Resources. 2019c. Little Brown Bat. https://dnr.wi.gov/topic/EndangeredResources/Animals.asp?mode=detail&SpecCode=AMACC01010. October 28, 2019.
- Wisconsin Department of Natural Resources. 2019d. Wood Turtle. https://dnr.wi.gov/search/index.asp?q=wood%20turtle#gsc.tab=0&gsc.q=wood%20turtle&gsc.page=1. Accessed October 28, 2019.
- Wisconsin Department of Natural Resources. 2019e. Cherrystone Drop. https://dnr.wi.gov/topic/EndangeredResources/Animals.asp?mode=detail&SpecCode=IMGAS03010. Accessed October 28, 2019.
- Wisconsin Department of Natural Resources. 2019f. Broad-leaved Twayblade. https://dnr.wi.gov/topic/EndangeredResources/Plants.asp?mode=detail&SpecCode=PMORC1N050. Accessed October 21, 2019.
- Wisconsin Department of Natural Resources. 2019g. Maidenhair Spleenwort. https://dnr.wi.gov/topic/EndangeredResources/Plants.asp?mode=detail&SpecCode=PPASP021K0. Accessed October 28, 2019.

4.8 Recreation and Land Use (18 CFR § 5.6(d)(3)(viii))

4.8.1 Existing Recreational Facilities and Opportunities

There are many opportunities for fishing, wildlife viewing, and water sports within the vicinity of the Project. Existing recreation facilities are shown in **Figure 4.8.1-1** and described in the following paragraphs from upstream to downstream.

Figure 4.8.1-1: Gile Flowage Storage Reservoir Project Vicinity Recreation Facilities



4.8.1.1 Sucker Hole Landing

Sucker Hole Landing is located on the south end of the Project reservoir near the mouth of the West Fork of the Montreal River. Sucker Hole Landing serves as a low water access point and provides a single-lane boat ramp composed of concrete planks with a gravel driveway and parking lot, as shown in **Figure 4.8.1.1-1**. The parking lot can accommodate up to four vehicles with trailers. A kiosk provides information about invasive species and fishing regulations. Sucker Hole Landing is owned and maintained by Iron County.

Figure 4.8.1.1-1: Sucker Hole Landing

4.8.1.2 Town of Pence Landing

The Town of Pence landing is located along the west shoreline of the Project reservoir about midway in the reservoir. The landing consists of a single lane concrete boat ramp with a gravel parking area along the shoulder of Spring Camp Road. The parking area can accommodate up to two vehicles with trailers. A kiosk provides information about invasive species and local fishing regulations. The landing is owned and maintained by the Town of Pence and is shown in **Figure 4.8.1.2-1**.

Figure 4.8.1.2-1: Town of Pence Boat Landing

4.8.1.3 County C Landing

The County C Landing is located on the west side of County Highway C on the east side of the reservoir, approximately 0.5 miles south of the intersection of County Highway C and Knight Road. The landing provides a two-lane boat ramp composed of concrete planks. The boat ramp plank includes a courtesy pier in between lanes. The landing also has a large gravel parking lot capable of holding 15-20 vehicles with trailers, as shown in **Figure 4.8.1.3-1**. The County C Landing is owned and maintained by Iron County.

Figure 4.8.1.3-1: County C Landing

Google Earth, earth.google.com/web/. Map showing Location of County C Landing. Image date May 4, 2015.

4.8.1.4 Gile Park Landing

The Gile Park Landing is located on the north end of the Project reservoir at the east end of the Project dam. The landing provides a two-lane concrete boat ramp with a courtesy pier located between the lanes and a paved parking lot with space for up to eight vehicles with trailers and up to four vehicles without trailers. The park also includes a picnic area with tables, fireplace, drinking water, pavilion, restrooms, changing rooms, playground facilities, a swimming beach, and bank fishing (Iron County, 2016). According to the Iron County website, Gile Park is owned and maintained by the City of Montreal (Iron County, 2020a; Iron County, 2020b)[3]. The landing is shown in **Figure 4.8.1.4-1**.

Figure 4.8.1.4-1: Gile Park Boat Landing

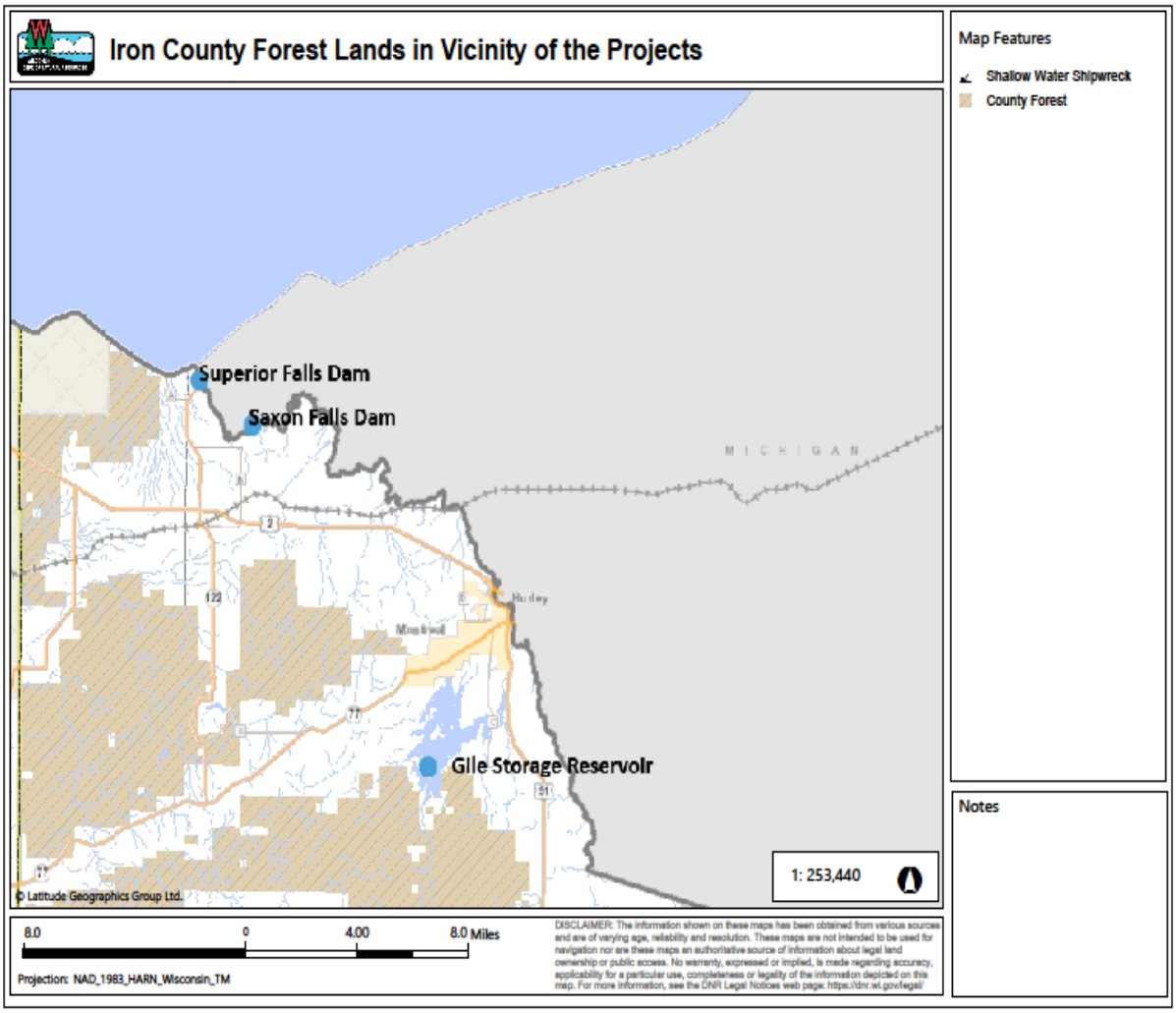
[3] Friends of the Gile comments on the Saxon Falls and Superior Falls PAD indicated that the Gile Park Landing was owned and maintained by Iron County. According the Iron County Tax Parcel Mapping system, the park is listed as being owned by the City of Montreal. The Iron County Economic Development Website indicated that questions regarding Gile Park should be directed to the Montreal Clerk.

4.8.1.5 Iron County Forest

The Iron County Forest encompasses over 174,000 acres. The forest is actively managed for timber production. It provides numerous recreational opportunities including 118 miles of ATV trails and 304 miles of snowmobile trails (Iron County, 2016). Other recreational opportunities include cross-country skiing, snowshoeing, hiking, biking, site-seeing, hunting, fishing, and boating.

The south end of the Project reservoir is adjacent to Iron County Forest lands as shown in **Figure 4.8.1.5-1**. The Licensee does not own or maintain any portion of the Iron County Forest lands.

Figure 4.8.1.5-1: Iron County Forest Lands in the Vicinity of the Project



4.8.1.6 West Fork of the Montreal River Whitewater Boating

The West Fork of the Montreal River downstream of the Project dam to U.S. Highway 2 is a low volume popular class IV whitewater river. This stretch of river hosted the Pan Am races in the 1980's and the National Whitewater Championships in 1992 (American Whitewater, 2007). The river is generally used by paddlers during runoff events, typically in the spring. In 2007, American Whitewater completed a survey-based flow study where users self-reported flows and responded to an online survey. The study determined that the optimal flow range was between 400 and 1,000 cfs (American Whitewater, 2007). A copy of the study is located in **Appendix 4.8.1.4-1**.

4.8.2 Recreational Needs Identified in Management Plans

4.8.2.1 State of Wisconsin

The 2019 to 2023 Statewide Comprehensive Outdoor Recreation Plan (SCORP) was released in March 2019. The SCORP identified a need to support nature-based recreation including trails and water and shore access for fishing and boating (WDNR, 2019). The recreation amenities provided in the vicinity of the Project help fulfill these goals. A copy of this SCORP is provided in **Appendix 4.8.2.1-1**.

4.8.2.2 Iron County, Wisconsin

The Iron County Outdoor Recreation Plan 2016-2020 (2016-2020 Plan) puts a high priority on maintenance of existing facilities and increasing the promotion of recreation opportunities in the county. The plan specifies continued maintenance of existing ATV and snowmobile trails and continued cooperation with the North Country Trail Association in expansion of certified portions of the North Country National Scenic Trail. No specific needs identified in the plan are located within the immediate vicinity of the Project. A copy of the 2016-2020 Plan is provided in **Appendix 4.8.2.2-1**.

4.8.3 Recreation Accessibility Under the Americans with Disabilities Act

Americans with Disabilities Act (ADA) needs are accommodated in several locations in the vicinity of the Project. Gile Park Landing provides ADA accessible parking, restrooms, and picnic areas.

4.8.4 References

- Iron County. 2016. Iron County Outdoor Recreation Plan 2016-2020. Iron County and Northwest Regional Planning Commission. April 2016.
- Iron County. 2020a. Iron County Web Map. https://maps.ags.ruekert-mielke.com/Html5Viewer/index.html?viewer=ironcounty. Accessed October 14, 2020.
- Iron County. 2020b. Iron County Economic Development Website. Iron County Parks and Campgrounds. https://ironcountywi.com/recreation/campground-and-parks/. Accessed October 14, 2020.
- Wisconsin Department of Natural Resources. 2019. Statewide Comprehensive Outdoor Recreation Plan (SCORP) 2019-2023.

4.9 Aesthetic Resources (18 CFR § 5.6(d)(3)(ix))

Iron County is 2,285 square miles and includes 758 square miles of surface waters; Gogebic County is 6,076 square miles and includes 1,102 square miles of surface waters (Worldatlas.com, 2019a; Worldatlas.com, 2019b). The topography of the area was created when glacial activity eroded the remnant mountain range known as the Penokee-Gogebic Range (**Figure 4.9-1**). North of the range, glacial activity left behind a sloping lake plain with numerous river valleys, creating a fissured pattern. Elevations within the lake plain generally increase from north to south, from a low of 601 feet at Lake Superior to 1863 feet in the Gogebic-Penokee Range (Town of Saxon, 2005). South of the range, glacial activity left behind a pitted outwash plain with heavily forested terrain and many lakes, potholes, and wetlands with generally low to moderate relief (Town of Pence, 2005).

Figure 4.9-1: General Location of the Penokee-Gogebic Range

W.F. Cannon (USGS) - https://commons.wikimedia.org/w/index.php?curid=39161950

4.9.1 Visual Character of Project Land and Waters

The Project dam creates a 3,317-acre reservoir with several large islands. A view upstream of the dam shows the wooded, undeveloped shorelines typical of the reservoir (**Figure 4.9.1-1**).

Figure 4.9.1-1: Project Reservoir Upstream of Dam

The Project dam as viewed from the Gile Park Landing is shown in **Figure 4.9.1.-2**. The Project dam discharges to the West Fork of the Montreal River. **Figure 4.9.1-3** shows the West Fork of the Montreal River downstream of the dam.

Figure 4.9.1-2: View of Project Dam

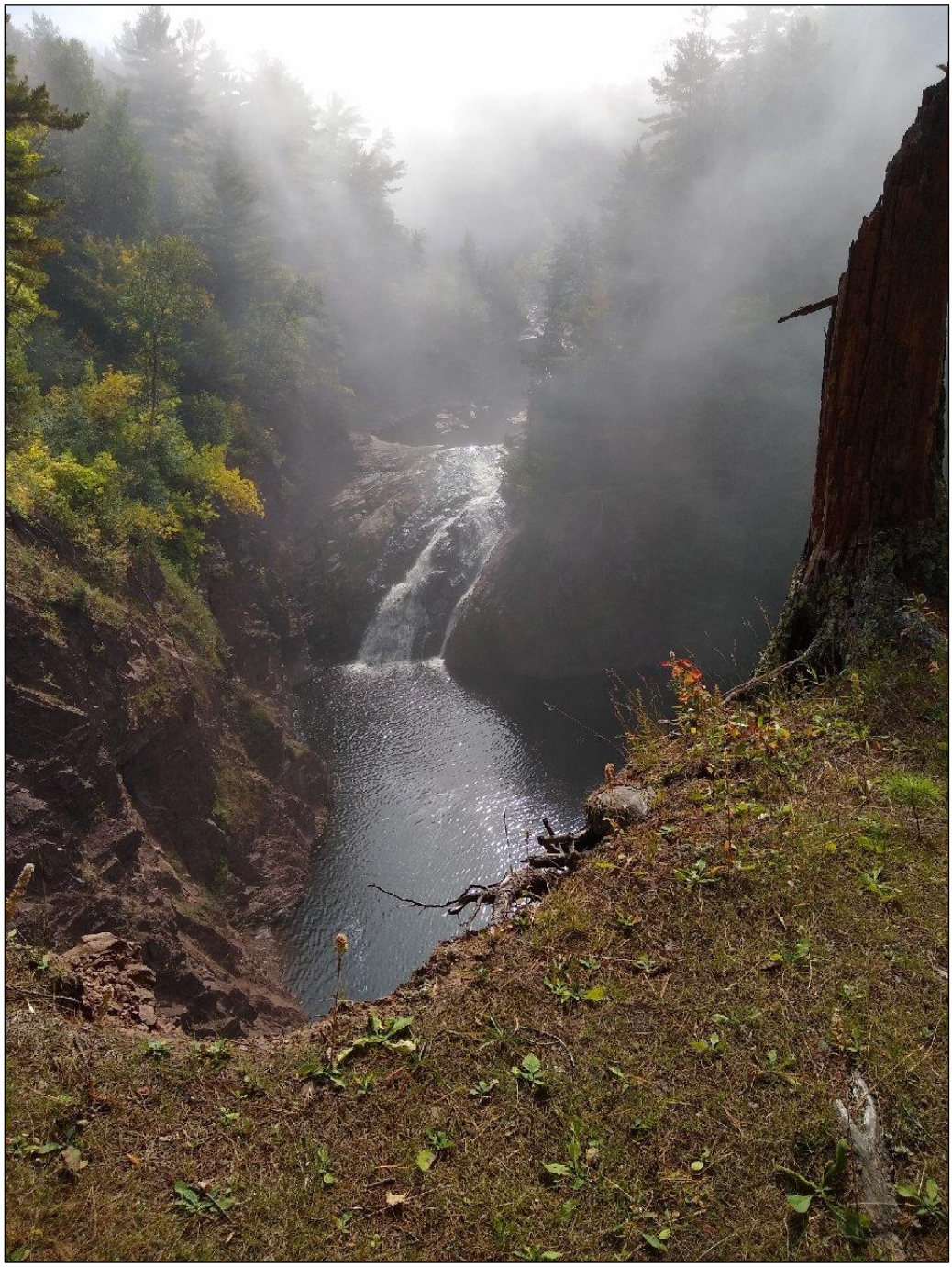
Figure 4.9.1-3: West Fork Montreal River Downstream of Project Dam

4.9.2 Nearby Scenic Attractions

4.9.2.1 Superior Falls

The Superior Falls waterfall is located on the Montreal River, approximately 0.4 miles upstream of its confluence with Lake Superior in the Town of Saxon, Wisconsin and Ironwood Township, Michigan. The waterfall is accessible via a gravel road off of State Hwy 122. NSPW maintains a parking area and trail which leads to an observation area overlooking the 90-foot high waterfall. The waterfall is shown in **Figure 4.9.2.1-1**.

Figure 4.9.2.1-1: Superior Falls



4.9.2.2 Saxon Falls

The Saxon Falls waterfall is located on the Montreal River approximately 4.3 miles upstream of its confluence with Lake Superior in the Town of Saxon, Wisconsin and Ironwood Township, Michigan. The falls are accessible from a town road. NSPW maintains a parking lot and trail which leads to an observation area overlooking the 75-foot high waterfall. The waterfall is shown in **Figure 4.9.2.2-1.**

Figure 4.9.2.2-1: Saxon Falls

4.9.2.3 Potato River Falls

Potato River Falls is located on the Potato River near Gurney, Wisconsin. The falls are accessible from a town park with hiking trails, picnic area, and several primitive campsites. The Potato River Falls consist of an upper falls and lower falls with a total height of 90 feet. (Iron County Economic Development, 2019). The waterfall is shown in **Figure 4.9.2.3-1**.

Figure 4.9.2.3-1: Potato River Waterfall

4.9.2.4 Interstate Falls

Interstate Falls is located on the Montreal River approximately 0.6 miles northwest of Hurley, Wisconsin and is accessible via a 0.3-mile long hiking path from the parking area. Interstate Falls is 18 feet high and is shown in **Figure 4.9.2.4-1** (Iron County Economic Development, 2019).

Figure 4.9.2.4-1: Interstate Falls

4.9.2.5 Kimball Falls

Kimball Falls is located on the West Fork of the Montreal River in the area of Hurley, Wisconsin. The 10-foot high waterfall, shown in **Figure 4.9.2.5-1**, is accessible via Kimball Town Park, which provides picnic tables, a pavilion, restrooms, and playground equipment (Iron County Economic Development, 2019).

Figure 4.9.2.5-1: Kimball Falls and Kimball Town Park

Google Earth, earth.google.com/web/. Map showing Location of Kimball Town Park. Image date May 4, 2015.

4.9.3 References

- Friends of the Gile Flowage. 2019. Brief History of the Gile Flowage. http://www.friendsofthegile.org/home/flowage. Accessed September 12, 2019.
- Iron County Economic Development. 2019. Waterfalls/Points of Interest/Parks & Campgrounds. https://ironcountywi.com/waterfalls/. Accessed October 10, 2019.
- Worldatlas.com, 2019a. Iron County Wisconsin. https://www.worldatlas.com/na/us/wi/c-iron-county-wisconsin.html. Accessed October 9, 2019.
- Worldatlas.com, 2019b. Gogebic County Michigan. https://www.worldatlas.com/na/us/mi/c-gogebic-county-michigan.html. Accessed October 9, 2019.

4.10 Historical and Cultural Resources (18 CFR § 5.6(d)(3)(x))

The Wisconsin Historical Society - Division of Historic Preservation Office (SHPO) maintains a Wisconsin Historic Preservation Database (WHPD) that includes information on the locations of historic buildings, historic sites, and archaeological sites in the National Register of Historic Places (NRHP). An area of potential effect (APE) will need to be established in coordination with the SHPO to identify historic and archaeological resources within the Project boundary.

4.10.1 Historic/Architectural Resources

NSPW conducted a thorough literature search of the WHPD database to identify known historic and archaeological resources within the boundaries of the Gile Flowage Storage Reservoir Project.

The Project Dam was authorized by the Wisconsin Public Service Commission in 1937. The dam was built at the site of the former Montreal River Log Company Dam dating back to the late 1800's. Lake Superior District Power Company, which was later acquired by NSPW, was the initial owner. The dam was completed in 1940 and the reservoir began filling in 1941 with the spring snowmelt (Friends of the Gile, 2019).

A review of the Wisconsin Architecture and History Inventory did not locate any structures within the immediate vicinity of the Project (SHPO, 2019).

4.10.2 Archaeological Resources

The Wisconsin Historic Preservation Database (WHPD) includes information on previously surveyed areas and the locations of any known archaeological sites within the Project.

A review of the WHPD database did not identify any historic structures, past archaeological surveys, or previously unidentified archaeological sites in the vicinity of the Project boundary (SHPO, 2019).

4.10.3 Tribal Cultural Resources (18 CFR § 5.6(d)(3)(xii))

Native Americans occupied the area now known as Wisconsin for thousands of years. The federal government currently recognizes 11 tribes in Wisconsin and has established Native American Reservations (tribal lands) for each of these tribes (Loew, 2001). The tribes include the Forest County Potawatomi, Ho-Chunk Nation, Menominee Indian Tribe of Wisconsin, Oneida Nation of Wisconsin, Stockbridge-Munsee Band of Mohican Indians, and six Ojibwe (Chippewa) tribes. The Ojibwe tribes include the Bad River Band of Lake Superior Chippewa, Lac Courte Oreilles Band of Lake Superior Chippewa, Lac du Flambeau Band of Lake Superior Chippewa, Red Cliff Band of Lake Superior Chippewa, St. Croix Band of Chippewa Indians of Wisconsin, and Sokaogon Chippewa (Mole Lake) Community (WDPI, 2019).

4.10.3.1 Forest County Potawatomi

The Potawatomi arrived in Wisconsin in the mid-17th century from Canada and the western United States. In the early 1800s, the government took away Potawatomi land rights. In 1913, the Forest County Potawatomi bought back approximately 12,000 acres located in northern Wisconsin (Loew, 2001).

4.10.3.2 Ho-Chunk Nation

The Ho-Chunk people, who were driven from Wisconsin to the west, have gradually returned to reclaim their ancestral lands. No treaty lands have been reserved, so present Ho-Chunk lands are tribal lands that have been re-purchased. Today, 4,700 members of the Wisconsin Ho-Chunk hold title to 2,000 acres of land in Wisconsin (Loew, 2001).

4.10.3.3 Menominee Indian Tribe of Wisconsin

The Menominee people are believed to have occupied Wisconsin for more than 5,000 years. As Europeans arrived, the Menominee lost most of their lands, but maintained a significant presence in the state. Menominee County was created from part of Shawano County in 1959 in anticipation of the Menominee Indian Reservation termination in 1961. Reservation status was restored in 1973. Today,

most land within Menominee County is designated as tribal trust lands by the U.S. Bureau of Indian Affairs; non-tribal regulations generally do not apply. The Menominee also holds a small amount of land within the Town of Red Springs, Shawano County (Loew, 2001).

4.10.3.4 Oneida Nation of Wisconsin

The Oneida people were part of the New York Iroquois League prior to the Revolutionary War. In 1822, the Oneida purchased land in a territory that would later become the state of Wisconsin. Much of these lands were taken away by the 1900s, but 1,270 acres were repurchased in 1937 (Loew, 2001).

4.10.3.5 Stockbridge-Munsee Band of Mohican Indians

The Stockbridge-Munsee are a blend of Mohican Tribes from Massachusetts and Delaware who moved west, settling near Lake Winnebago. In 1856, they obtained their present treaty lands from neighboring Menominee Native Americans. Tribal fee lands are owned by the Stockbridge-Munsee and remain subject to non-tribal regulations. As such, lands held in fee title are subject to County zoning and subdivision regulation. The Stockbridge-Munsee population was estimated at 1,527 in 2000, which represents a nearly 163% increase from 1990 (Loew, 2001).

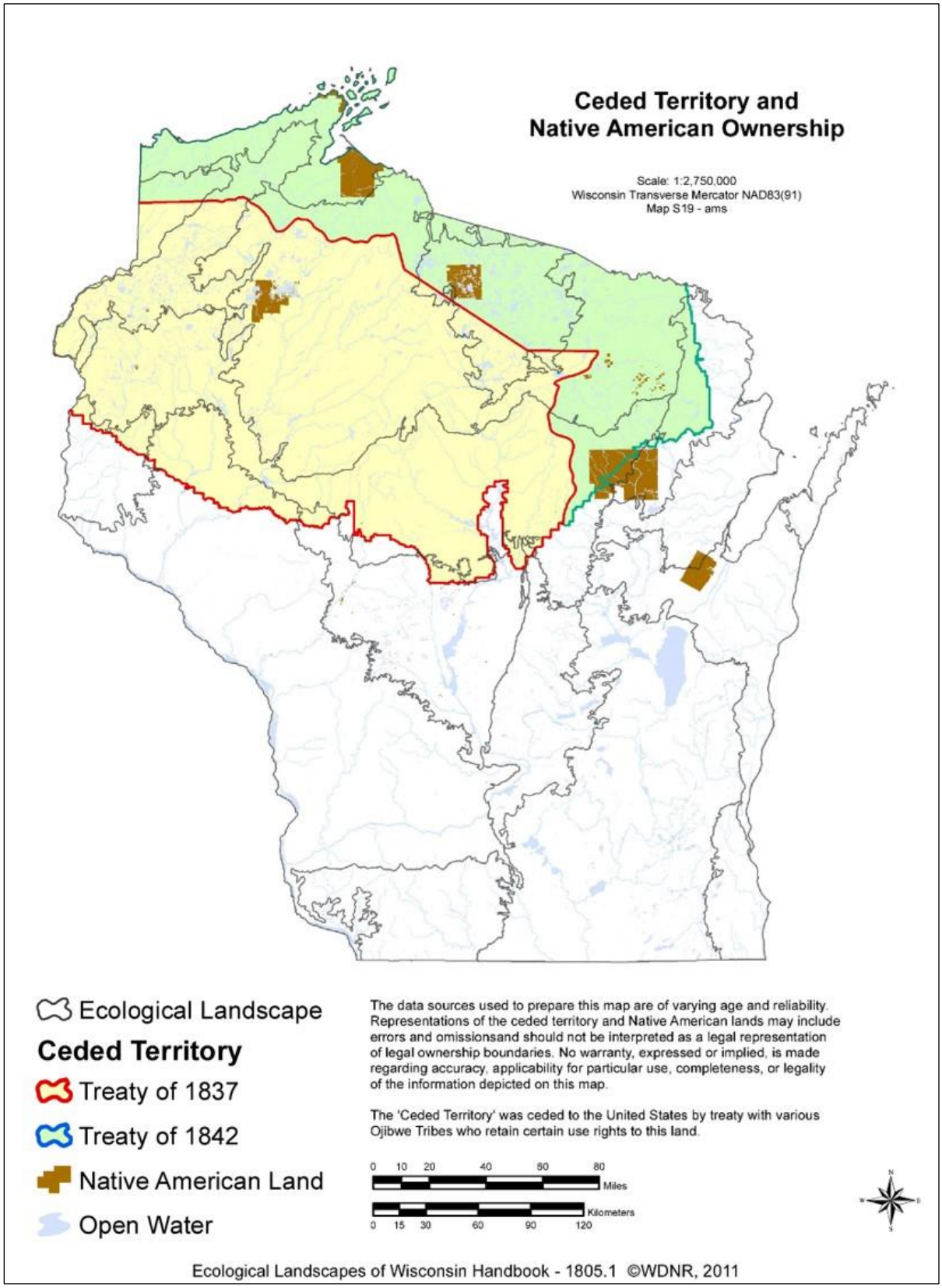
4.10.3.6 Ojibwe (Chippewa) Tribes

The Ojibwe (Chippewa) originated from the Great Lakes and moved east to areas near the Atlantic Ocean. The Ojibwe returned to the Great Lakes Region over 1,000 years ago and settled within fertile wild rice beds, with a resting stop of Madeline Island, Wisconsin. The Ojibwe had a close relationship with the French, but efforts to convert the Ojibwe people to Christianity divided their belief systems into various bands of Ojibwe who established themselves in other locations.

As the pursuit of furs for trade progressed inland, conflicts with other Tribes, including the Dakotas, culminated with a Treaty assembled by the U.S. Government in 1825. The Treaty forced the Ojibwe to cede their territory to the U.S. under negotiations in 1837 and 1842. The Ojibwe ceded territories are shown in **Figure 4.10.3.6-1**. The Project is located within the territory ceded in 1842.

The Ojibwe retained their right to hunt, fish, and gather on ceded lands in Wisconsin. In 1850, the U.S. began to relocate the Ojibwe to Minnesota territory. Through negotiations, an 1854 treaty established the Bad River Band, Lac Courte Oreilles Band, Lac du Flambeau Band, and Red Cliff Band Reservations. Reservation lands were not established for the St. Croix Band or the Sokaogon (Mole Lake) Community in the 1854 Treaty (Loew, 2001).

Figure 4.10.3.6-1: Ojibwe Ceded Territories of 1837 and 1842



4.10.3.7 Tribal Representatives Consulted with Questionnaires

A questionnaire was sent to tribal representatives in September 2019 asking for any known information or potential impacts of the Gile Flowage Storage Reservoir Project operations. The tribal representatives who were sent questionnaires are listed in **Table 4.10.3.7-1**. No responses to the questionnaire were received by the Licensee.

Table 4.10.3.7-1: Tribal Representatives Consulted Through Questionnaires

Name	Organization
Ms. Edith Leoso	Bad River Band of Lake Superior Chippewa
Mr. Clinton Parish	Bay Mills Indian Community of Michigan
Mr. Marcus Ammesmaki	Fond du Lac Band of Lake Superior Chippewa
Mr. Michael LaRonge	Forest County Potawatomi Community of Wisconsin
Mr. Michael Blackwolf	Fort Belknap Indian Community
Ms. Mary Ann Gagnon	Grand Portage Band of Chippewa Indians
Mr. Earl Meshigaud	Hannahville Potawatomi Indian Community
Mr. William Quackenbush	Ho-chunk Nation Executive Offices
Cultural Preservation Office	Iowa Tribe of Oklahoma
Mr. Chris Swartz	Keweenaw Bay Indian Community
Mr. Brian Bisonette	Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin
Ms. Melinda Young	Lac du Flambeau Band of Lake Superior Chippewa Indians
Mr. James Williams	Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Ms. Amy Burnette	Leech Lake Band of Minnesota
Mr. David Grignon	Menominee Indian Tribe of Wisconsin
Ms. Diane Hunter	Miami Tribe of Oklahoma
Ms. Natalie Weyaus	Mille Lacs Band of Ojibwe
Ms. Corina Williams	Oneida Nation of Wisconsin
Mr. Warren Wahweotten, Jr.	Prairie Band Potawatomi Nation
Mr. Ryan Howell	Prairie Island Indian Community
Mr. Larry Balber	Red Cliff Band of Lake Superior Chippewa Indians
Mr. Marvin Defoe*	Red Cliff Band of Lake Superior Chippewa Indians
Mr. Gary Bahr	Sac and Fox Nation of Missouri in Kansas and Nebraska
Mr. Jonathan Buffalo	Sac and Fox of the Mississippi in Iowa
Ms. Sandra Massey	Sac and Fox Nation of Oklahoma
Mr. Chris McGeshick	Sokaogon Chippewa Community/Mole Lake Band of Lake Superior Chippewa
Mr. Adam VanZile	Sokaogon Chippewa Community/Mole Lake Band of Lake Superior Chippewa
Mr. Cecil E. Pavlat, Sr.	Sault Ste. Marie Tribe of Chippewa Indians
Mr. Lewis Taylor	St. Croix Chippewa Indians of Wisconsin

Ms. Wanda McFaggen	St. Croix Chippewa Indians of Wisconsin
Ms. Bonnie Hartley	Stockbridge-Munsee Community Band of Mohican Indians
Ms. Sherry White	Stockbridge-Munsee Community of Wisconsin
Ms. Cayla Olson	White Earth Band of the Minnesota Chippewa

4.10.4 Programmatic Agreement

Standard archaeological and cultural resource concerns for Licensees to address during the FERC relicensing process are outlined in the pre-licensing procedure section of the *Programmatic Agreement among the Federal Energy Regulatory Commission; the Advisory Council on Historic Preservation (ACHP); the State of Wisconsin, State Historic Preservation Officer; and the State of Michigan, State Historic Preservation Officer, for Managing Historic Properties That May Be Affected By New and Amended Licenses Issuing for the Continued Operation of Existing Hydroelectric Projects in the State of Wisconsin and Adjacent Portions of the State of Michigan,* executed in December 1993 (ACHP, 1993).

The Project will be subject to the Programmatic Agreement once it is licensed. Under the terms of the Programmatic Agreement, it is the Licensee's responsibility to ensure historic and archaeological properties are protected throughout the term of its federal license.

It is unlikely that the continued operation of the Project will have an adverse effect upon historic resources if is operated according to the information provided herein and pursuant to the provisions of the Programmatic Agreement

4.10.5 References

- Advisory Council on Historic Preservation (ACHP). 1993. Programmatic Agreement among the Federal Energy Regulatory Commission; the Advisory Council on Historic Preservation; the State of Wisconsin, State Historic Preservation Officer; and the State of Michigan, State Historic Preservation Officer, for Managing Historic Properties That May Be Affected By New and Amended Licenses Issuing for the Continued Operation of Existing Hydroelectric Projects in the State of Wisconsin and Adjacent Portions of the State of Michigan, executed in December 1993.
- Federal Energy Regulatory Commission. 2018a. Consultation with Tribes for the Superior Falls Hydroelectric Project No. 2587. October 9, 2010.
- Federal Energy Regulatory Commission. 2018b. Consultation with Tribes for the Saxon Falls Hydroelectric Project No. 2610. October 9, 2018.
- Federal Energy Regulatory Commission. 2019. Telephone Memo: Consultation with Tribes for the Saxon Falls Hydroelectric Project No. 2610. February 25, 2019.
- Friends of the Gile Flowage. 2019. Brief History of the Gile Flowage. http://www.friendsofthegile.org/home/flowage-. Accessed September 12, 2019.
- Keweenaw Bay Indian Community of Michigan. 2018. Letter responding to the FERC Consultation with the Tribes for the Saxon Falls Hydroelectric Project No. 2610. November 9, 2018.
- Lac du Flambeau Band of Chippewa Indians. 2108. Letter responding to the FERC consultation with the Tribes for the Superior Falls Project under P-2587. October 18, 2019.
- Loew, Patty. 2001. Indian Nations of Wisconsin-Histories Endurance and Renewal.
- Miami Tribe of Oklahoma. 2018. Comments from Miami Tribe of Oklahoma under P-2160 Saxon Falls Hydroelectric Project. November 8, 2018.

- Northern States Power Company-Wisconsin (NSPW), 2014. Saxon Falls Hydroelectric Project, FERC No 2610 Supporting Technical Information Document. March 13, 2014.
- Wisconsin Department of Public Instruction (WDPI). 2019. Tribal Nations of Wisconsin. https://dpi.wi.gov/amind/tribalnationswi. Accessed September 17, 2019.
- Wisconsin Historical Society - State Historic Preservation Office. Wisconsin Historic Preservation Database. Accessed September 17, 2019.

4.11 Socio-economic Resources (18 CFR § 5.6(d)(3)(xi))

This section outlines historical population patterns and employment information for the City of Hurley, Wisconsin; City of Ironwood, Michigan; Iron County, Wisconsin; and Gogebic County, Michigan.

4.11.1 Population and Housing Patterns

The 2010 populations for the City of Hurley, WI, City of Ironwood, MI, Iron County, WI and Gogebic County, MI were 1,547; 5,387; 5,916; and 16,427, respectively. The population density in Iron County is 7.8 people per square mile with a housing unit density of 7.9 housing units per square mile. The population density in Gogebic County is 14.9 people per square mile with a housing unit density of 9.8 housing units per square mile (US Census Bureau American Factfinder, 2010).

The population of the City of Hurley and the City of Ironwood declined from 2000 and 2010. From the 1970's through 2000, the population of Iron County was fairly stable and then began declining in 2010. The population of Gogebic County has shown a consistent population decline since the 1970s. Historical population information and population forecasts can be found in **Table 4.11.1-1** and **Table 4.11.1-2**, respectively (US Census Bureau American Factfinder, 2010; Population.US, 2019; Worldpopulationreview.com, 2019).

Table 4.11.1-1: Historical Population Data

Municipality	1970	1980	1990	2000*	2010*	Population Change 2000-2010
City of Hurley, WI	N/A	N/A	N/A	1,818	1,547	(-14.9%)
City of Ironwood, MI	N/A	N/A	N/A	6,293	5,387	(-14.4%)
Iron County, WI	6,533	6,733	6,153	6,861	5,916	(-13.8%)
Gogebic County, MI	20,676	19,686	18,052	17,730	16,427	(-7.3%)

Source: *US Census Bureau; Population.US, 2019; worldpopulationreivew.com, 2019

Table 4.11.1-2: Population Forecast Data

Year	2010-Census	2020	2030	2040
City of Hurley, WI	1,547	1,505*	1,464*	1,424*
City of Ironwood, MI	5,387	4,563**	4,390**	4,188**
Iron County, WI	5,916	5,756*	5,601*	5,450*
Gogebic County, MI	16,427	13,914	13,384	12,758

Source: U.S. Census Bureau, WDOA 2013, and MBLMISI, 2019

* Calculated using WDOA growth estimate; ** Calculated using MBLMISI Growth Estimates

The Wisconsin Department of Administration projects an 8% population decrease in Iron County from 5,916 to 5,450 between 2010 to 2040. When using the same population growth rate for the City of Hurley, the projected population decrease is anticipated to drop from 1,547 to 1,424 (WDOA, 2013).

The Michigan Bureau of Labor Market Information and Strategic Initiatives (MBLMISI) projects a population decrease of 22% between 2010 and 2040 for Gogebic County, which will result in the population decreasing from 16,427 to 12,758. When using the same population growth rate for the City of Ironwood, the projected population decrease anticipated to drop from 5,916 to 4,188 (MBLMISI, 2019).

4.11.2 Economic Patterns

The City of Ironwood's employment trend follows the same trend as Iron and Gogebic Counties. No data was available for the City of Hurley. Employment sectors, from largest to smallest, for the City of Ironwood, Iron County, and Gogebic County are educational services, health care, social assistance, and manufacturing. These sectors have historically been the largest employers in the area.

Employment status based on industry sector, estimated number of jobs, and percentage of jobs is summarized in **Table 4.11.2-1**, **Table 4.11.2-2**, and **Table 4.11.2-3** for the City of Ironwood, Iron County, and Gogebic County, respectively.

Table 4.11.2.1-1: Employment Status, City of Ironwood, Michigan

Industry Sector	Estimated # of Jobs	% Jobs
Civilian employed population 16 years and over	2,234	-
Agriculture, forestry, fishing, hunting, and mining	112	5%
Construction	110	5%
Manufacturing	391	18%
Wholesale trade	48	2%
Retail trade	325	15%
Transportation, warehousing, and utilities	52	2%
Information	22	1%
Finance and insurance, real estate, rental, and leasing	76	3%
Professional, scientific, and management; administrative; and waste management services	101	5%
Educational services, health care, and social assistance	410	18%
Arts, entertainment, recreation, accommodation, and food services	364	16%
Other services, except public administration	79	4%
Public administration	144	6%

Source: U.S. Census Bureau, 2017 American Community Survey

Table 4.11.2.1-2: Employment Status, Iron County, Wisconsin

Industry Sector	Estimated # of Jobs	% Jobs
Civilian employed population 16 years and over	2,536	-
Agriculture, forestry, fishing, hunting, and mining	98	4%
Construction	187	7%
Manufacturing	333	13%
Wholesale trade	67	3%
Retail trade	234	9%
Transportation, warehousing, and utilities	100	4%
Information	49	2%
Finance and insurance, real estate, rental, and leasing	119	5%
Professional, scientific, and management; administrative; and waste management services	159	6%
Educational services, health care, and social assistance	578	23%
Arts, entertainment, recreation, accommodation, and food services	308	12%
Other services, except public administration	123	5%
Public administration	181	7%

Source: U.S. Census Bureau, 2017 American Community Survey

Table 4.11.2.1-3: Employment Status, Gogebic County, Michigan

Industry Sector	Estimated # of Jobs	% Jobs
Civilian employed population 16 years and over	5,968	-
Agriculture, forestry, fishing, hunting, and mining	280	5%
Construction	374	5%
Manufacturing	920	15%
Wholesale trade	112	2%
Retail trade	667	11%
Transportation, warehousing, and utilities	211	4%
Information	57	1%
Finance and insurance, real estate, rental, and leasing	195	3%
Professional, scientific, and management; administrative; and waste management services	304	5%
Educational services, health care, and social assistance	1,342	22%
Arts, entertainment, recreation, accommodation, and food services	792	13%
Other services, except public administration	253	4%
Public administration	461	8%

Source: U.S. Census Bureau, 2017 American Community Survey; *Does not add to 100% due to rounding

The City of Ironwood, Iron County, and Gogebic County all have a strong economic base in the educational services, health care, and social assistance sectors, followed by the manufacturing sector and the arts, entertainment, recreation, accommodation, and food services sector. The City of Ironwood and Gogebic County have seen a slight increase in the number of jobs in the manufacturing sector and the arts, entertainment, recreation, accommodation, and food services sector; and a decrease in the number of jobs in the education services, health care, and social assistance sector. Iron County has seen a decrease in the number of jobs in all these sectors (US Census Bureau American Factfinder, 2017).

NSPW is not proposing any new facilities or changes to the current operation of the Project. As such, continued operation of each is not expected to adversely impact the socioeconomic resources in the area.

4.11.3 References

- Michigan Bureau of Labor Market Information and Strategic Initiatives. 2019. Population Projections. https://milmi.org/DataSearch/POPPROJ. Accessed September 4, 2019.
- Population.us. 2019. Population of Gogebic County. https://population.us/county/mi/gogebic-county/. Accessed September 4, 2019.
- Wisconsin Department of Administration (WDOA) Demographic Services Center. 2013. Wisconsin's Future Population Projections for the State, Its Counties and Municipalities, 2010 to 2040.
- Worldpopulationreview.com. 2019. Iron County Wisconsin Population 2019. http://worldpopulationreview.com/us-counties/wi/iron-county-population/. Accessed September 4, 2019.
- US Census Bureau, American Factfinder. 2000. Profile of General Demographic Characteristics: 2000 Census 2000 Summary File 1. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF. Accessed September 3, 2019.
- US Census Bureau, American Factfinder. 2010. General Population and Housing Characteristics: 2010 Demographic Profile Data 010 Demographic Profile Data https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=. Accessed September 3, 2019.
- U.S. Census Bureau, American Factfinder. 2017. American Community Survey-Selected Economic Characteristics. https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml. Accessed September 3, 2019.

5. Preliminary Issues and Studies List (18 CFR § 5.6(d)(4))

The PAD must include a list of issues pertaining to the identified resources outlined in Section 4, potential studies, or information gathering requirements associated with the identified issues, relevant qualified federal and state or Tribal comprehensive waterway plans, and relevant resource management plans.

5.1 Known or Potential Negative Impacts to the Identified Resources

For the purposes of this relicensing process, potential negative impacts are new impacts to the resources that are documented to occur, believed to be occurring, or believed will occur because of the continued operation of each Project through a successful relicensing.

5.1.1 Geology and Soils

EGLE, the Friends of the Gile, and the MDNR identified bank/shoreline erosion as a potential issue in their response to the questionnaire. Approximately 90% of the Gile Flowage shoreline is owned by NSPW or local governments. Of that 90%, that portion of the shoreline not located within existing public recreational facilities is maintained in a natural state where development is not permitted.

In addition, Iron County, Wisconsin has existing shoreline regulations that limit ground disturbance in shoreline areas. The requirements outlined in the regulations will help reduce the potential for future shoreline erosion on the Project reservoir.

5.1.2 Water Resources

Water resource issues identified from responses to the Gile Flowage Storage Reservoir Project questionnaire include:

- EGLE identified DO and temperature concerns as potential water resource issues.
- MDNR identified drawdown timing, rate, frequency, and downstream flows as potential water resource issues.
- RAW identified minimum flow adequacy for aquatic habitat as a potential water resource issue.

There are no planned changes to operations, reservoir levels, or minimum flows that would cause adverse impacts to water resources at the Project.

5.1.3 Fish and Aquatic Resources

Fish and aquatic resource issues identified from responses to the Gile Flowage Storage Reservoir Project questionnaire include:

- EGLE identified PCBs in fish and sediments as a potential fish and aquatic resource issue.
- Iron County and Friends of the Gile identified the presence of the spiny water flea within the Gile Flowage and the downstream West Fork of the Montreal River as a potential fish and aquatic resource issue.
- MDNR identified drawdown timing, rate, frequency, and downstream flows as potential fish and aquatic resource issues.
- RAW identified the adequacy of minimum flows for fish and need for a study to update fisheries information as potential fish and aquatic resource issues.

There are no planned changes to operations, water levels, or flows that would cause new impacts to water resources.

5.1.4 Terrestrial Wildlife and Botanical Resources

No terrestrial wildlife or botanical resources issues were identified through the Gile Flowage Storage Reservoir Project questionnaire. There is no proposed construction that would impact terrestrial wildlife or botanical resources.

5.1.5 Wetlands, Riparian, and Littoral Habitat

Iron County and the Friends of the Gile identified the presence of the spiny water flea within the Gile Flowage and in the West Fork of the Montreal River as a potential littoral habitat issue. There are no planned changes to operation, reservoir levels, or minimum flows that would cause new impacts to wetlands, riparian, and littoral habitat.

5.1.6 Critical Habitat and Threatened and Endangered Species

Several state-listed and federal-listed species were identified in the vicinity of the Gile Flowage. The Licensee will need to consult with the USFWS and WDNR to determine potential impacts to threatened and endangered species from Project operation. No specific issues were identified through the questionnaire.

5.1.7 Recreation and Land Use

Recreation and land use resource issues identified from responses to the Gile Flowage Storage Reservoir Project questionnaire include:

- Friends of the Gile identified increased public use and the need to maintain the shoreline buffer zone as potential recreation and land use issues.
- MDNR identified the need to inventory and assess recreation facilities and use as potential recreation and land use issues.
- NPS identified the need to inventory and assess recreation facilities and use, as wells as the potential for recreation flow releases as potential recreation and land use issues.
- RAW identified the need to assess recreation facilities and use as a potential recreation and land use issue.

Recreation within the vicinity of the Project is dominated by Iron County and Town of Pence parks, which are regularly monitored and maintained by County and Town staff. Since the sites are regularly monitored for recreational use and there is no information indicating a need to increase capacity, the Licensee is not proposing any recreational improvements.

5.1.8 Aesthetic Resources

Aesthetic resource issues identified from responses to the Gile Flowage Storage Reservoir Project questionnaire include:

- Friends of the Gile identified loss of “wilderness character” as a potential aesthetic resource issue.
- MDNR identified the need to evaluate land use practice impacts on aesthetics as a potential aesthetic resource issue.

NSPW maintains the Project shoreline in a natural condition and releases a continuous minimum flow to the West Fork of the Montreal River to maintain aesthetics. There are no proposed operational, reservoir level, minimum flow, or land use changes that would cause adverse impacts to aesthetic resources.

5.1.9 Cultural and Tribal Resources

The Project dam is over 50 years old and its NRHP eligibility has not been evaluated.

5.1.10 Socio-Economic Resources

5.1.10.1 Gile Flowage

Friends of the Gile identified the increased recreational use of the Gile Flowage bringing new economic development and tourism opportunities as a potential socio-economic resource issue. NSPW is not proposing any changes to the operations, reservoir levels or minimum flows, that would cause adverse impacts to socio-economic resources.

5.1.11 References

- Xcel Energy. 2004. Five-Year Reservoir Shoreline Surveys for Eroding Archaeological Sites. January 9, 2004.
- Xcel Energy, 2008. Results of 2008 Erosion Survey of Saxon Falls Flowage (FERC Project # 2610). November 13, 2008.

5.2 Potential Studies or Information Gathering

This section identifies potential studies or information gathering that may be needed to analyze the preliminary resource issues identified in Section 5.1. In accordance with 18 CFR § 16.8(b)(5), within 60 days of the Joint Agency Meeting, each interested resource agency, Indian tribe, and member of the public must provide any and all study requests to the Licensee, as described in Section 2.1.

All study requests must comply with the following criteria:

- Identify its determination of necessary studies to be performed or the information to be provided by the potential applicant.
- Identify the basis for its determination.
- Discuss its understanding of resource issues and its goals and objectives for these resources.
- Explain why each recommended study methodology is more appropriate than any other available methodology alternatives, including those identified by the potential applicant.
- Document each recommended study methodology is a generally accepted practice.
- Explain how the requested studies and information will be useful to the agency, Indian tribe, or member of the public in furthering its resource goals and objectives that are affected by the proposed project.

The following Sections identify potential studies and information gathering that may be needed to analyze the resource issues identified in Section 5.1.

5.2.1 Geology and Soils

The Licensee is not proposing any studies specific to geologic or soil resources. In Section 5.2.9, the Licensee is proposing a shoreline survey of the Project to search for previously unidentified archaeological sites along currently eroding shoreline areas. As a result, currently eroding shoreline areas will be identified as part of that study.

5.2.2 Water Resources

The Licensee is not proposing any studies specific to water resources.

5.2.3 Fish and Aquatic Resources

The Licensee is not proposing any studies specific to fish and aquatic resources.

5.2.4 Terrestrial Wildlife and Botanical Resources

The Licensee is not proposing any studies specific to terrestrial wildlife and botanical resources.

5.2.5 Wetlands, Riparian, and Littoral Habitat

The Licensee is not proposing any studies specific to wetlands, riparian, and littoral habitat.

5.2.6 Critical Habitat and Threatened and Endangered Species

Should the consultation process outlined in Section 5.1.6 not identify any adverse effects from operations at the Project, more specifically to either critical habitat or threatened or endangered species, the Licensee will not propose any studies. However, maintenance activities involving work on any Project structure or removal of trees within the Project boundary could impact unknown critical habitat for the NLEB or the species themselves. Instead of completing a study to determine their presence or absence, the Licensee proposes to implement the requirements outlined in the § 4(d) rule for the protected bat species throughout the term of the license to assure the NLEB is not adversely impacted by facility operations. These requirements, in addition to consulting with the USFWS prior to removing any bats that are not posing an immediate threat to project structures, shall provide for the necessary protection of the NLEB.

5.2.7 Recreation and Land Use

Recreation within the vicinity of the Project is dominated by Iron County and Town of Pence parks, which are regularly monitored by County and Town staff. Since the sites are regularly monitored for recreational use and there is no information indicating that there is a need to increase their capacity, the Licensee is not proposing any studies specific to recreation or land use.

5.2.8 Aesthetic Resources

The Licensee is not proposing any studies specific to aesthetic resources.

5.2.9 Historical and Cultural Resources

The Licensee is proposing to consult with the SHPO to determine whether the Project facilities need to be evaluated for NRHP eligibility. A shoreline survey will be completed by a qualified archaeologist according to the requirements of the Programmatic Agreement.

5.2.10 Socio-Economic Resources

The Licensee is not proposing any studies specific to socio-economic resources.

5.2.11 Tribal Resources

NSPW will continue to provide process documentation to tribal stakeholders and address, as necessary, any concerns they may have. The Licensee is not proposing any studies related to tribal resources.

5.3 Mitigation Enhancement

The Licensee is proposing the following mitigation and enhancement measures at the Gile Flowage:

- Continue to maintain a minimum flow of 10 cfs, or inflow, whichever is less, into the West Fork of the Montreal River to protect aquatic resources.
- Continue to maintain reservoir elevation of the Gile Flowage between a minimum elevation of 1475.0 feet and a maximum elevation of 1490.0 feet.

The Project dam has operated since 1940. The existing information available does not identify any significant concerns or adverse effects upon the resources from the current operation. Additionally, no changes to the existing operation are proposed. As a result, the Licensee does not propose any additional protection, mitigation, or enhancement measures for the purposes of this relicensing process.

5.4 Federal, State, or Tribal Comprehensive Waterway Plans

Section 10(a)(2) of the Federal Power Act requires the FERC to consider the extent to which a project is consistent with existing federal or state comprehensive plans, as defined in § 2.19 under Part 2 of Chapter 1, Title 18, Code of Federal Regulations. According to FERC Order No. 481-A, issued on April 27, 1998 which revised Order No. 481, issued on October 26, 1997, the FERC will provide comprehensive plan status to any federal or state plan that is a comprehensive study of one or more beneficial uses of a waterway(s), specifies standards, data and methodology used, and is filed with the FERC Secretary.

A current listing of FERC-approved comprehensive plans that may be applicable to relicensing the Project is presented below. If an updated version of a plan is available, the updated plan is listed (FERC, 2019).

- National Park Service, The Nationwide Rivers Inventory. U.S. Department of the Interior. 1993.
- U.S. Fish & Wildlife Service, Canadian Wildlife Service. North American Waterfowl Management Plan. 2012.
- U.S. Fish & Wildlife Service, Upper Mississippi River & Great Lakes Region joint venture implementation plan: A component of the North American waterfowl management plan. 1998.
- U.S. Fish & Wildlife Service, Fisheries USA: The Recreational Fisheries Policy of the U.S. Fish & Wildlife Service. No date.
- Wisconsin Department of Natural Resources, Lake Superior Basin area wide water quality management plan. 1979.
- Wisconsin Department of Natural Resources, Statewide Comprehensive Outdoor Recreation Plan (SCORP) for 2019-2023. 2019.

- Wisconsin Department of Natural Resources, Wisconsin Water Quality Assessment Report to Congress. 2018.
- Wisconsin Department of Natural Resources, Wisconsin's Biodiversity as a Management Issue. 1995.
- Wisconsin Department of Natural Resources, Wisconsin's forestry best management practices for water quality. 1995.

5.5 Relevant Resource Management Plans

In addition to the plans listed in Section 5.4, other resource management plans have been developed by other entities to provide guidance with managing specific resources. The plans listed below are believed to be relevant to the Projects.

- Iron County. Iron County Comprehensive Plan. 2005.
- Iron County. Iron County Outdoor Recreation Plan 2016-2020. 2016.
- Town of Carey. Town of Carey Comprehensive Plan. 2005.
- Town of Pence. Town of Pence Comprehensive Plan. 2005.
- Wisconsin Department of Natural Resources, Wisconsin’s Wildlife Action Plan (2015-2025). 2016.

5.6 References

- Federal Energy Regulatory Commission. July 2020. List of Comprehensive Plans.

6. Consultation in preparation of the PAD (18 CFR § 5.6(d)(5))

NSPW began consultation in preparation of the PAD by developing a questionnaire with a fact sheet and providing it to pertinent stakeholders included on the FERC Mailing List and Service List for the Gile Flowage Storage Reservoir Project and any other entities thought to be potential stakeholders[4]. The information was sent via postal mail service on September 20, 2019. A copy of the questionnaire, fact sheet, and stakeholder list is enclosed in **Appendix 6-1.**

NSPW received several written responses to the questionnaire. A summary of the comments is provided below. The information contained in the responses is incorporated into the PAD as appropriate. Responses are also included in **Appendix 6-1**.

- The EGLE responded to the questionnaire indicating they intend to participate in the relicensing process, had pertinent information available, and had concerns with the use of the TLP. In a follow-up email, EGLE indicated they support use of the TLP. EGLE indicated they had information regarding water resources; fish and aquatic resources; wildlife and botanical resources; wetlands, riparian, and littoral habitat; recreation, and land use. EGLE identified DO, temperature, and PCBs in fish as water quality concerns.

  EGLE recommended the following studies for both Projects:
  - DO and water temperature monitoring
  - Fish sampling
  - Sediment sampling

- Friends of the Gile Flowage responded to the questionnaire indicating they had pertinent information available and supported use of the TLP. Friends of the Gile Flowage recommended development of a comprehensive plan for the Gile Flowage and its watershed.

- Iron County responded to the questionnaire indicating they had information regarding invasive species and water resources, provided contact information, supported use of the TLP, and would participate in the relicensing process.

- MDNR responded to the questionnaire indicating they intend to participate in the relicensing process, had pertinent information available, and conditionally supported use of the TLP. If the TLP is used, MDNR wants assurance that scoping meetings are appropriately timed and that the Licensee is committed to open communication and acting as a partner in fisheries and aquatic resource protection and mitigation. MDNR identified several issues relating to fish and aquatic resources, aesthetic resources, recreation, and land use.

  MDNR recommended the following studies:
  - Collect aquatic organism data including fish community inventory of pond and riverine areas to include threatened or endangered species.
  - Evaluate potential for organism stranding, stress, and mortality associated with reservoir fluctuations.

[4] The State of Michigan and its agencies are no longer included in the stakeholder list because the Project is wholly-located with the State of Wisconsin.

- Conduct wildlife inventory in riverine and pond areas to include threatened or endangered species.
- Conduct inventory of recreational facilities that includes written descriptions, maps, photos, and diagrams for resource agency evaluation.
- Conduct assessment of current recreational use and regional trends to identify appropriate options and alternatives for recreation amenities.
- Evaluate current and proposed minimum and maximum reservoir elevations and downstream flows for recreation, water quality, resource protection, aesthetic, and habitat values.
- Provide Project hydrology information including daily fluctuation in tailwater, bypass channels, and reservoir for previous year, normal year, and high and low water years.
- If changes in Project operations are proposed, an Instream Flow Incremental Methodology study may be required.

- NPS responded to the questionnaire indicating they intend to participate in the relicensing process, provided information sources regarding recreation, and provided additional stakeholder contact information for American Whitewater. NPS expressed they had concerns with use of the TLP, indicating that the ILP provides more opportunity for collaboration. NPS identified issues related to recreation including recreational flow releases.

  NPS recommended the following studies for both Projects:
  - Recreation use and need (Land based).
  - Instream flow for recreation evaluation.

- RAW responded to the questionnaire indicating they intend to participate in the relicensing process, did not have any pertinent information, and did not have any concerns with the use of the TLP. They identified several issues pertaining to water, recreation, fish, and wildlife resources.

  RAW recommended the following potential studies for both Projects:
  - Study to determine if minimum flow is adequate.
  - Study of drawdown impacts on fish and wildlife habitat and plant communities.
  - Update fishery community information.
  - Federal/state threatened and endangered species evaluation.
  - Recreational use survey.

- The Town of Carey responded to the questionnaire indicating that they intended to participate in the relicensing process and provided information sources regarding recreational and land use. They did not support or oppose use of the TLP.

- The Town of Kimball responded to the questionnaire indicating that they did not have any information regarding the Project, did not intend to participate in the relicensing process, and did not support use of the TLP. Follow-up communication to determine why the Town did not support use of the TLP was not returned.

- WDNR did not respond to the questionnaire.

7. Public Utilities Regulatory Policies Act

The Licensee is not seeking benefits under the Public Utilities Regulatory Policies Act for the Gile Flowage Storage Reservoir Project.