

Preliminary Application Document

White River Project
FERC Project No. 2444



Ashland County, Wisconsin

Submitted by
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Eau Claire, Wisconsin

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July 2020

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List of Abbreviations

AC	Alternating Current
ACHP	Advisory Council on Historic Preservation
Applicant	Northern States Power Company-Wisconsin d/b/a Xcel Energy
AIS	Aquatic Invasive Species
CEII	Critical Energy Infrastructure Information
Center	Northern Great Lakes Visitor Center
CFR	Code of Federal Regulations
CNNF	Chequamegon-Nicolet National Forest
cfs	Cubic Feet per Second
Commission	Federal Energy Regulatory Commission
Dam	White River Dam
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
GIS	Geographic Information System
hp	Horsepower
IPaC	Information for Planning and Consultation
JAM	Joint Agency Meeting
kV	Kilovolts
kW	Kilowatts
Licensee	Northern States Power Company-Wisconsin d/b/a Xcel Energy
mg/L	Milligrams per liter
MWh	Megawatts per Hour
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum 1929
NHI	National Heritage Inventory
NLEB	Northern long-eared bat
No.	Number
NOI	Notice of Intent
NOAA	National Oceanic Atmospheric Association
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
NWR	National Wildlife Refuge
Ojibwe	Chippewa
PAD	Preliminary Application Document
PDF	Portable Document Format

Project	White River Hydroelectric Project
rpm	Revolutions per minute
Register	National Register of Historic Places
RUSLE2	Revised Universal Soil Loss Equation, Version 2
§	Section
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SHPO	State Historic Preservation Office
SNA	State Natural Area
TLP	Traditional Licensing Process
U.S.	United States
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UW Extension	University of Wisconsin Extension Service
UW-M	University of Wisconsin-Madison
WCNW Refuge	Whittlesey Creek National Wildlife Refuge
WDNR	Wisconsin Department of Natural Resources
WDOA	Wisconsin Department of Administration
WDPI	Wisconsin Department of Public Instruction
White River Project	White River Hydroelectric Project
WHPD	Wisconsin Historic Preservation Database

1. Introduction

Northern States Power Company-Wisconsin, a Wisconsin Corporation (Licensee or Applicant), d/b/a Xcel Energy, is currently licensed by the Federal Energy Regulatory Commission (FERC or Commission) to operate the White River Hydroelectric Project (White River Project or Project).

The White River Project (FERC Project No. 2444) is located on the White River in Ashland County, Wisconsin. The White River Project license was issued on August 29, 1995 for a term of 30 years with an effective date of August 1, 1995 and an expiration date of July 31, 2025 (FERC, 1995). The location of the facility is shown in **Figure 1-1**.

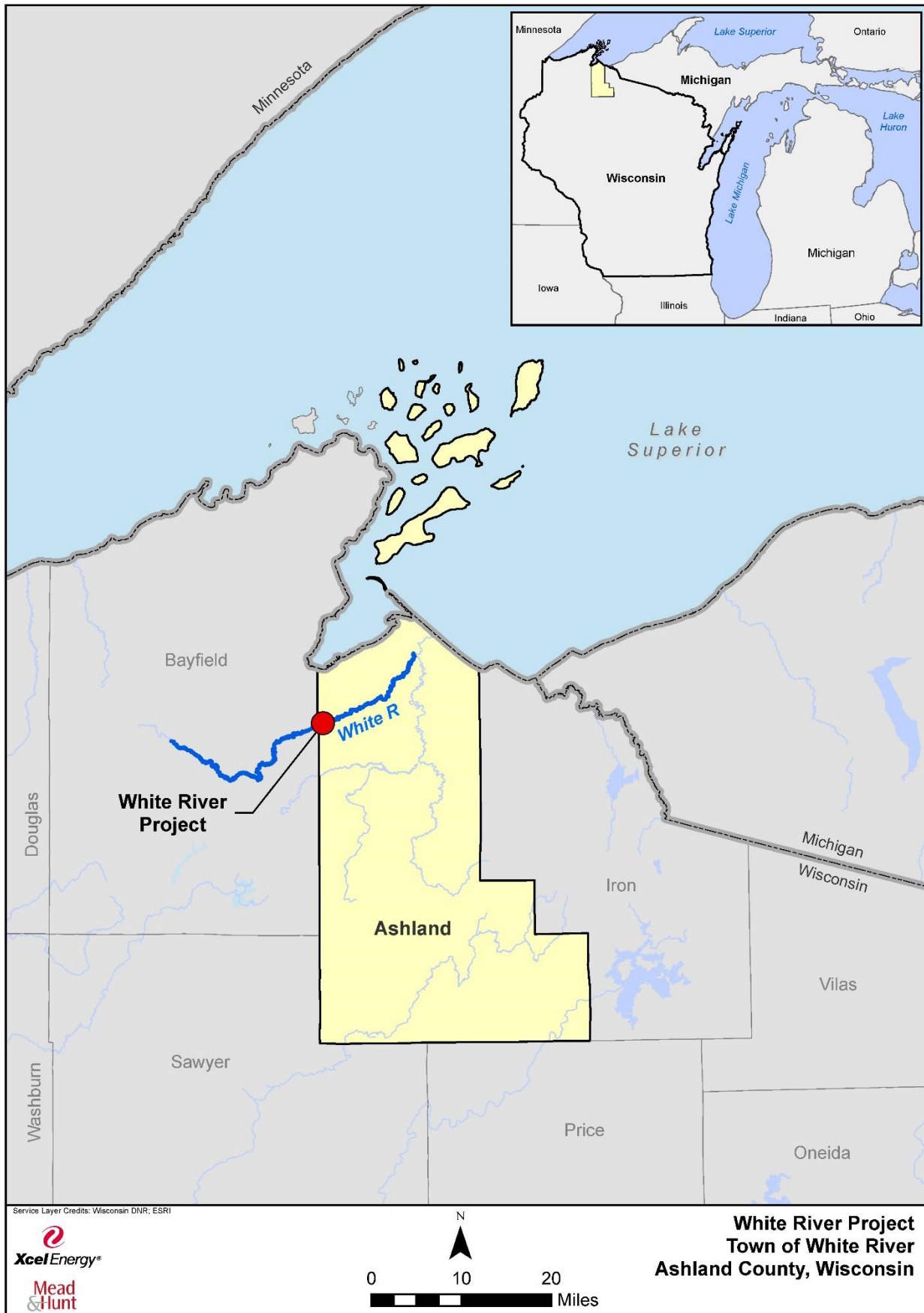
Northern States Power Company-Wisconsin (NSPW), d/b/a Xcel Energy, must submit a new license application for the Project to the Commission no later than July 31, 2023 in order to receive a new license prior to the July 31, 2025 expiration date.

Applying for a new license requires the Licensee to first prepare a Notice of Intent (NOI) and Pre-Application Document (PAD) pursuant to 18 Code of Federal Regulations (CFR) Part 5 (CFR, 2016). Accordingly, an NOI and PAD will be developed for the Project.

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 Section (§) 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 White River Project will also be included with the NOI and PAD submittal. This PAD includes the required information consistent with 18 CFR § 5.6 for the White River Project.

At the time of the filing of the license application for the Project, a public notice will be published in the appropriate local newspaper providing interested persons and agencies an opportunity to present any concerns they may have.

Figure 1-1: White River Project Location



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 on 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 Project, 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 (FERC). 1995. Order Issuing Subsequent License P-2444 (Minor Project). Issued August 29, 1995.
- United States Code of Federal Regulations (CFR). 2016. Title 18, Part 5. Revised April 1, 2016.
- United States Code of Federal Regulations (CFR). 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 a new 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 for the Project. Pursuant to 18 CFR § 5.5, the NOI filing marks the beginning of the relicensing process and sets forth the schedule for future licensing activities. In addition to filing the NOI and PAD, NSPW filed a request with the FERC seeking approval to utilize the Traditional Licensing Process. The request to use the TLP was filed as related submittals 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 NOI and PAD, as well as requesting to use the TLP, by July 31, 2020¹. Based on a tentative filing date of July 30, 2020, comments regarding the proposed use of the TLP must be filed with the FERC no later than August 31, 2020. It is anticipated the FERC will approve the Licensee's request to use the TLP by September 29, 2020, at which time Stage 1 of the formal three-stage consultation process would begin.

In accordance with the above-referenced plan and schedule, within 30 days of receiving the TLP approval from the FERC, NSPW will issue a Notice for a Joint Agency Meeting (JAM) with the resource agencies and Indian tribes. Based upon the anticipated September 29, 2020 approval to utilize the TLP, the JAM will be held no later than November 28, 2020 with stakeholder comments on the PAD due by January 27, 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 consultation with the resource agencies regarding study requests. Coordination with the resource agencies in the development of study plans is expected to occur prior to the implementation of the studies.

NSPW will submit a Draft License Application (DLA) for the Project. Preparation of the DLA will begin by July 3, 2022 and will be filed by approximately March 3, 2023. Stakeholder review of the DLA is expected to occur between March 3, 2023 and June 02, 2023 (90 days).

Preparation of the Final License Application (FLA) is expected to begin by June 2, 2023 and be filed with the FERC no later than July 31, 2023. Once filed, Stage 3 consultation will begin. Based on the July 31, 2023 FLA filing date, it is anticipated the following will occur between July 31, 2023 and July 31, 2025:

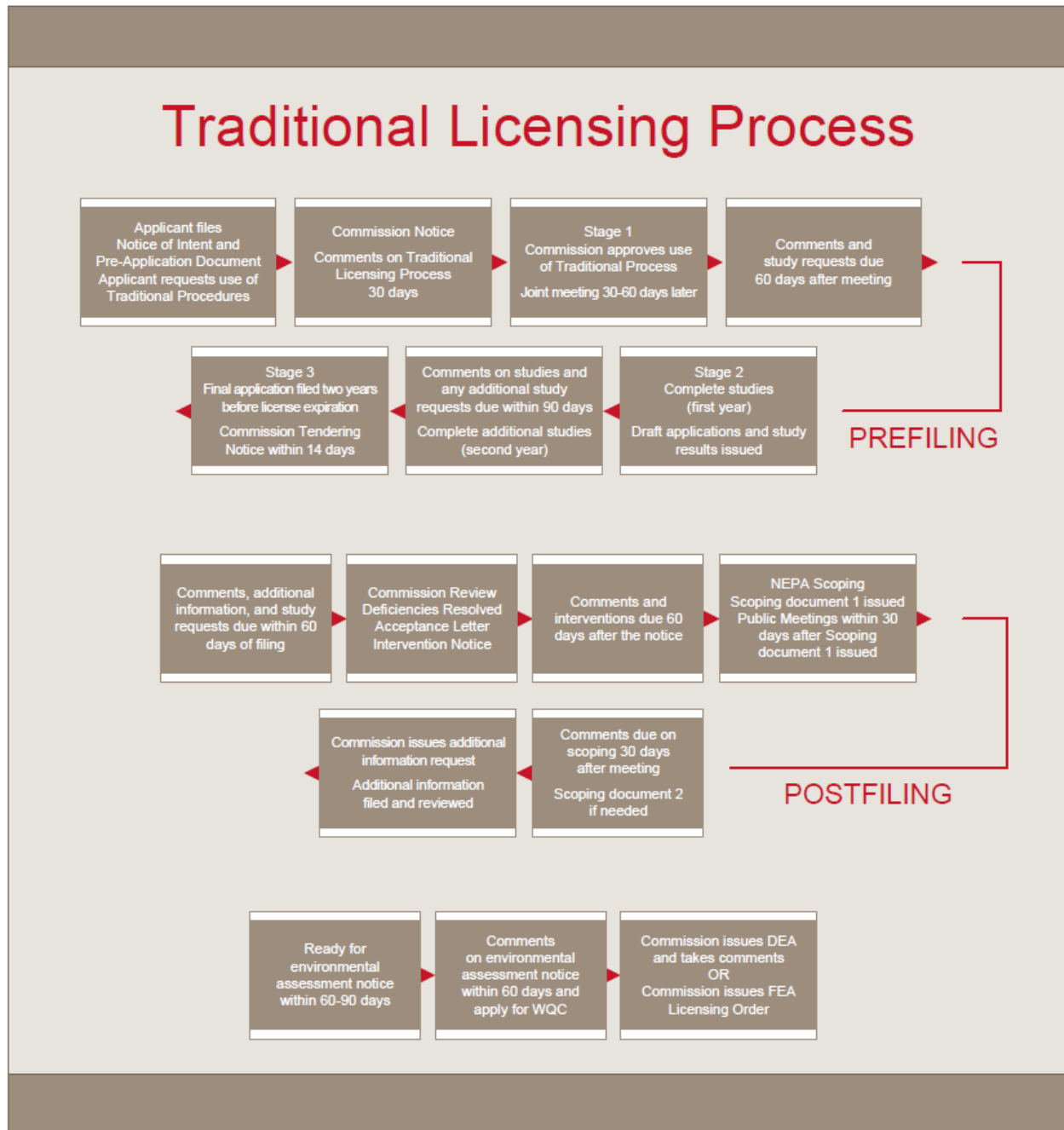
- Review of the FLA by the FERC
- Issuance of the FERC FLA acceptance letter
- Submittal of stakeholder comments, terms, and conditions
- Scoping under the National Environmental Policy Act (NEPA)
- Preparation of Draft Environmental Assessment (EA) or Environmental Impact Statement (EIS)
- Resolution 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 July 31, 2025.

¹ NSPW intends to file the NOI, PAD, and request to use the TLP one day earlier than the required date.

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 tentative TLP plan and schedule for the Project is summarized below in **Table 2.1-1**.

Table 2.1-1: Traditional Licensing Process Tentative Plan and Schedule

TLP Steps	Timelines	Due Date*
Initial Activities		
Licensee submits NOI, PAD, and TLP requests	5 years before the license expiration date	07/30/2020
Stakeholders provide comments regarding TLP	30 days after the request	08/31/2020
FERC approval of TLP	60 days after the request	09/29/2020
Stage 1 Consultation		
Licensee conducts JAM and site visit with potential stakeholders	30 to 60 days after the TLP approval	11/28/2020
Stakeholders submit comments on PAD/study requests	Comments and study requests due 60 days after JAM	01/27/2021
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 DLA to FERC and stakeholders for comment	Begins after completion of Study Year 2 (soft deadline)	03/03/2023
Stakeholders and FERC provide comments on the DLA	Within 90-days after receipt of DLA	06/02/2023
Licensee Files FLA	At least two years prior to license expiration	07/31/2023
Stage 3 Consultation		
FERC review of FLA	Planned for 6 months	TBD*
FERC Additional Information Request	Response planned within 90 days	TBD
FERC Notice Ready for EA	Task expected to take 90 days	TBD
NSPW Applies for 401 Water Quality Certification	Apply no earlier than FLA filing and later than 60 days after FERC Notice Ready for EA	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	07/31/2025

* 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 on feedback from the stakeholders.

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 hardcopy distribution. 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, 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 number using P-2444 for the White River Project.

2.2.2 Meetings

All meetings that are considered an essential part of the relicensing process will be scheduled on weekdays (Monday through Friday) to allow for participation during the hours of 8:00 a.m. to 3:00 p.m. Central Standard Time. Meetings will occur in person at a reasonable location near the Project or by conference call. It may become impractical to accommodate each 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 NOI, PAD, and TLP request will be available for public viewing in the public reference file in the City of Ashland, Wisconsin at the following location:

- Vaughn Public Library – 502 Main St. W., Ashland, 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 sensitive/privileged documents. Information on obtaining access to view CEII or sensitive/privileged information can be found by following the instructions provided 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 in 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;
- Provide a detailed study methodology and explain how the methodology is consistent with generally accepted practice in the scientific community; and
- Explain how the studies and information requested will be useful to the resource 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 White River Dam is located on the White River, approximately 13 miles upstream of its confluence with the Bad River and about 18 miles upstream from the mouth of the Bad River at Lake Superior, within the Town of White River, Ashland County, Wisconsin (NSPW, 1991). The Project is located 5 miles south of the City of Ashland, Wisconsin and roughly 120 miles northeast of the City of Eau Claire, Wisconsin.

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

3.2.1 Current Facilities

Project structures include a dam with four sections, a steel conduit downstream from the dam which conveys water to the surge tank, and two penstocks which extend from the surge tank to the powerhouse. The current Project facilities are shown in **Figure 3.2.1-1**. A description of each structure from left to right, including the tailrace, transmission equipment, reservoir, and appurtenant equipment is provided in the following paragraphs.²

3.2.1.1 Dam

The dam is 775 feet long, 46 feet high, and consists of four sections. From left to right looking downstream³ these include: a left earthen embankment section, an intake structure section, a gated spillway section, and a right earthen embankment section.

Left Earthen Embankment Section

The left earthen embankment section extends 400 feet north from the left abutment of the intake structure. This embankment has a maximum height of approximately 37 feet above bedrock at or above elevation 720.4 feet National Geodetic Vertical Datum (NGVD) of 1929⁴. Riprap is present along the upstream shoreline.

Intake Structure Section

The intake structure section is located between the left earthen embankment and the gated spillway section. It is approximately 20 feet wide and has a massive reinforced concrete-stepped form on its downstream side, from whose northernmost edge the north retaining wall of the spillway is formed. This section consists of the intake structure for the 7-foot diameter pipeline which includes a metal trashrack and mechanical trash-rake for maintenance. Both the trashrack and mechanical trash-rake are housed in a small metal shed that is placed directly over the intake. The pipeline intake is protected by a steel bar trashrack approximately 14.25 feet wide and 20 feet high with a clear spacing of 1.25 inches between vertical bars (NSPW, 1991).

² Unless otherwise cited, all facility description attributes are from the Supporting Technical Information Document filed with the FERC in December 2008 (NSPW, 2008).

³ Direction of left or right, when describing facilities, is given looking downstream.

⁴ All elevations listed in this PAD are given in National Geodetic Vertical Datum (NGVD) of 1929.

A reinforced concrete walkway spans the intake channel between the bridge and the trashracks. A steel handrail is located on the upstream edge and the right end of the walkway in the area upstream of the bridge. Concrete piers extend approximately 15 feet upstream of the walkway. The steel trashracks are nearly vertical, sloping slightly upstream and downward from the upstream edge of the walkway. The upstream gate located in the intake area was removed in 1976. There is currently no gate in the intake area. Stoplog slots are located approximately 2 feet upstream of and parallel to the trash rack. As part of the rebuilding of the State Highway 112 bridge superstructure in 1985, the intake was extended upstream approximately 9 feet. A log boom is located approximately 5 feet upstream from the spillway piers to prevent large floating debris from entering the intake and spillway areas. The log boom spans approximately 100 feet right of the right spillway abutment to approximately 100 feet left of the left intake abutment.

Gated Spillway Section

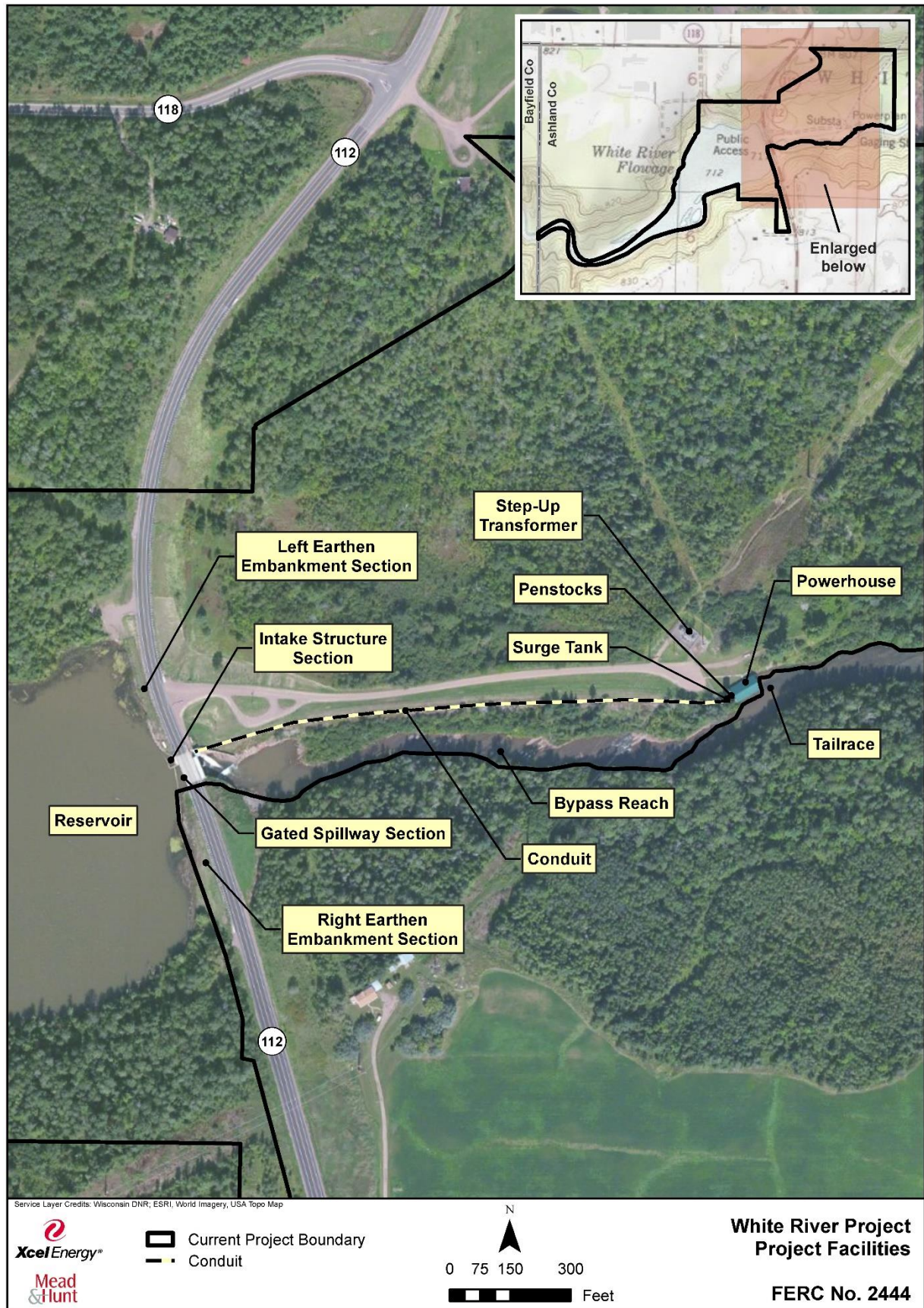
The gated spillway section is a concrete structure comprised of two gated spillway bays separated by a concrete pier. The gated spillway section is approximately 55 feet wide, 35 feet high with a gate sill crest elevation of approximately elevation 685.2 feet. Each of the two steel tainter gates are 25 feet wide by 19.75 feet high. The concrete pier separating the spillway bays is 3.25 feet wide and extends to an elevation of 713.95 feet. The left tainter gate is constructed in two parts. The top six feet of the gate is hinged separately and can be operated independently of the lower gate. A bubbler system in front of the spillway can be used to prevent ice buildup on both gates. Heaters can be used to thaw ice from both gate support arms. Both side seals and the bottom seal for the 6-foot portion of the left gate are heated during the winter months.

The spillway has a maximum discharge capacity of 23,600 cubic feet per second (cfs) with both gates fully open and the reservoir elevation at top of dam elevation of 718.3 feet. At normal reservoir elevation of 711.2 feet, the spillway capacity is 14,600 cfs (NSPW, 1991). Downstream walls at each spillway abutment contain the flow in the exit channel and protect the adjacent earthen embankments from erosion. A concrete apron overlies the bedrock foundation immediately downstream from both gates and extends approximately 70 feet downstream. An operator's bridge spans the spillway section directly over the gate sills. Both gates are set up for automatic operation based on headwater elevation but can be operated locally when needed. The State Highway 112 bridge spans the top of the spillway section upstream of the operator's bridge.

Right Earthen Embankment Section

The right earthen embankment section extends 300 feet south from the right abutment of the gated spillway structure. The right embankment has a maximum height of 37 feet above bedrock and a crest elevation at or above 720.4 feet. Riprap is present along upstream shoreline.

Figure 3.2.1-1: White River Project Facilities



3.2.1.2 Conduit

The conduit is a 7-foot diameter, concrete reinforced pipe. It follows a path approximately 3 feet underground, downstream from the dam for approximately 1,345 feet to the surge tank (NSPW, 1991). The conduit path is covered in soil and is located between the Project entrance road and the north shoreline of the bypass channel.

3.2.1.3 Surge Tank

The surge tank is 16 feet in diameter and 62 feet high with a concrete base. The surge tank is located just upstream of the penstocks and powerhouse.

3.2.1.4 Penstocks

A bifurcation in the penstock at the surge tank results in two individual penstocks that extend above-ground for about 30 feet downstream from the surge tank into the powerhouse. Each individual penstock is roughly 5.5 feet in diameter.

3.2.1.5 Powerhouse

The powerhouse is a reinforced concrete and brick masonry structure with a wooden roof. It is a single-story structure approximately 25 feet high from floor to ceiling and measures about 39 feet wide and 69 feet long (NSPW, 1991).

Turbines

The powerhouse contains two horizontal-type units. Unit 1 has double Francis runners with 15 blades that was manufactured by Kiser and is rated at 940 horsepower (hp). Unit 1 output cannot be adjusted. Therefore, the minimum and maximum hydraulic capacity to operate the turbine is the same at 200 cfs with 49.5 feet of head (NSPW, 2017).

Unit 2 has double Francis runners with 16 blades that was manufactured by S. Morgan Smith Company and is rated at 667 hp. The minimum flow to operate the turbine is 50 cfs. The maximum capacity of Unit 2 is 150 cfs at 49.5 feet of head (NSPW, 2017).

Generators

The Project uses two different generators. Unit 1, which was installed in 2017, is a GE 2300-volt, 450 revolutions per minute (rpm), 1.0 power factor Alternating Current (AC) generator with a nameplate capacity of 700 kilowatt (kW). Unit 2, which was installed in 1954, is a Westinghouse 2300-volt, 450 rpm, 1.0 power factor AC generator with a nameplate capacity of 500 kW (NSPW, 2017). The combined plant capacity is 1,200 kW.

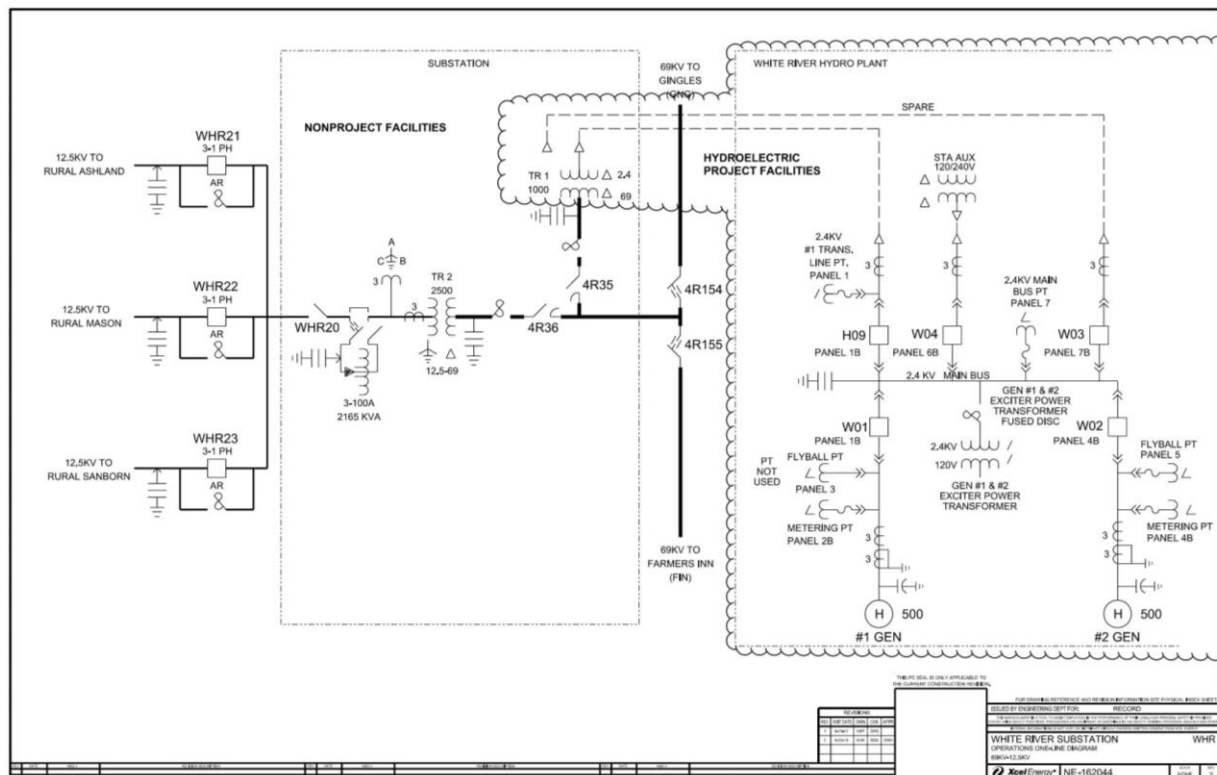
3.2.1.6 Tailrace

Water is released from the powerhouse directly to the White River. The current Project boundary extends downstream of the powerhouse for approximately 660 feet.

3.2.1.7 Transmission Equipment

Electric leads extend from the powerhouse to the adjacent non-project distribution substation. Equipment required to transmit the electricity generated at the facility to the non-project distribution system contains a step-up transformer. The transformer steps up the voltage that connects to the non-project distribution system from 2.4 kilovolt (kV) to 69 kV. A second non-project transformer steps down the voltage from 69 kV to 12.5 kV to serve the local electric distribution system. A one-line diagram of principal electrical circuits associated with the Project is included in **Figure 3.2.1.7-1**.

Figure 3.2.1.7-1: White River Project One-Line Diagram of Principal Electrical Circuits



3.2.1.8 Reservoir

The reservoir encompasses approximately 45.1 acres with a storage capacity of about 315.7 acre-feet at the normal reservoir elevation of 712.1 feet under the current Project boundary⁵ (Mead & Hunt, 2020). It has a maximum depth of 26 feet and an estimated average depth of 7 feet. The substrate consists of 10% rock and 90% muck (WDNR, 2020).

3.2.1.9 Appurtenant Equipment

Appurtenant equipment includes but is not limited to bearing lubrication systems, generator ventilation systems, switchboards, additional gate hoist equipment, switchgear, protective devices, and metering devices.

⁵ Reservoir acreage derived by digitizing existing Exhibit G map and calculating the reservoir area using geographic information system (GIS). Water storage capacity was calculated by multiplying the GIS-derived reservoir surface area by the average reservoir depth of 7 feet.

3.2.2 Project Boundary

The current FERC license, issued on August 29, 1995, established the Project boundary to include a total area of 125.1 acres (FERC, 1995). This includes the 45.1-acre reservoir, 3.1 acres of open water downstream of the dam, and 76.9 acres of land owned in fee by NSPW (Mead & Hunt, 2020). The current Project boundary includes lands that are not necessary for Project operations; the Licensee is proposing to include only lands necessary for Project operation. These lands that are considered necessary are referred to as the proposed Project boundary in the paragraphs below.

The proposed Project boundary includes all Project structures, FERC approved recreation facilities, and lands necessary for Project operation. Proposed Project lands upstream of the dam include the reservoir and undeveloped land to an elevation of 712.6 feet, as well as the boat landing/canoe portage take-out and parking area. Proposed Project lands downstream of the dam encompass the Project structures, tailrace, bypass reach, canoe portage trail and put-in, and bank fishing area. The proposed Project boundary would be reduced to include a total of 64.4 acres. This includes the 47.5-acre reservoir, 3.5 acres of open water downstream of the dam, and 13.4 acres of land owned in fee by NSPW (Mead & Hunt, 2020).

The current and proposed Project boundaries are depicted in **Figure 3.2.2-1** on the following page and the existing Exhibit G is enclosed in **Appendix 3.2.2-1**.

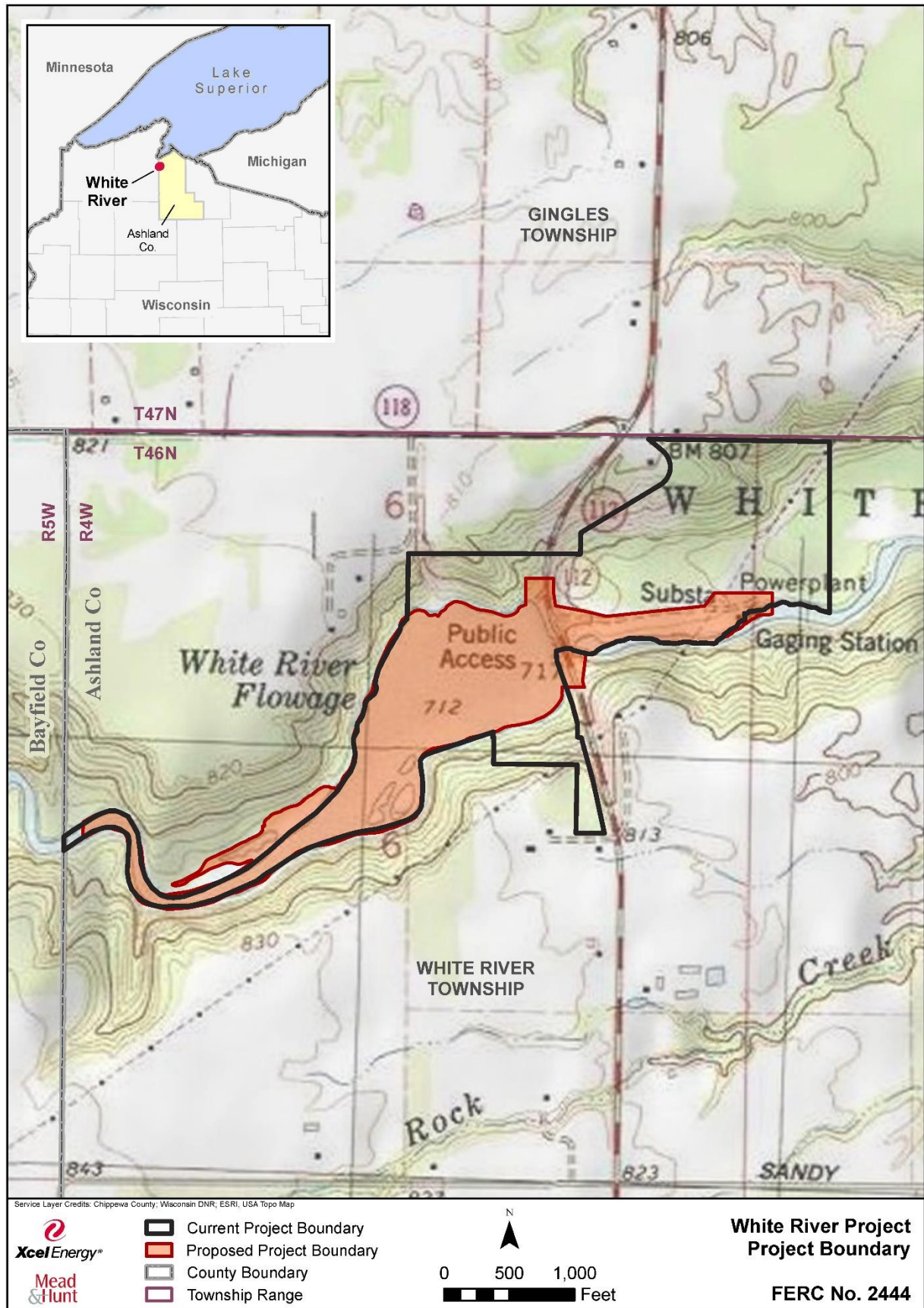
3.2.3 Proposed Facilities

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

3.2.4 References

- Federal Energy Regulatory Commission (FERC). 1995. Order Issuing Subsequent License P-2444 (Minor Project). Issued August 29, 1995.
- Mead & Hunt. 2020. Geographic Information System-derived current Project boundary, proposed Project boundary, and associated reservoir acreages. May 26, 2020.
- Northern States Power Company-Wisconsin (NSPW). 1991. Application for a Subsequent License for a Minor Water Power Project for the White River Hydroelectric Project, FERC No. 2444. December 1991.
- Northern States Power Company-Wisconsin (NSPW). 2008. White River Hydroelectric Project FERC No. 2444 Supporting Technical Information Document. December 2008.
- Northern States Power Company-Wisconsin (NSPW). 2017. Application for License Amendment – Non-Capacity (18CFR 4.201) White River Project P-2444. April 28, 2017.
- Wisconsin Department of Natural Resources (WDNR). 2020. WDNR Website. WDNR Lakes Pages-White River Flowage. Accessed April 28, 2020.
<https://dnr.wi.gov/lakes/LakePages/LakeDetail.aspx?wbic=2894200&page=facts>.

Figure 3.2.2-1: White River Project Boundary



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

3.3.1 Current Operation

The Project currently operates in a modified run-of-river mode where discharge measured immediately downstream of the Project tailrace approximates the inflows into the Project reservoir. This operating mode protects the fishery, riparian vegetation, and recreational opportunities both upstream and downstream of the dam. The approved Reservoir Operating Plan directs NSPW to operate the reservoir between elevations 710.4 and 711.6 feet.

In 2016, NSPW submitted a request to the FERC seeking a temporary increase in the upper limit of the reservoir operating range, from 711.6 to 712.6 feet. The temporary increase would accommodate the Licensee's historic practice of overtopping the spillway gates (top elevation 711.6 feet) during runoff events that exceed the powerhouse hydraulic capacity without the need to notify the resource agencies or the FERC. The FERC granted NSPW's request via their August 1, 2016 Order Granting Temporary Amendment of Reservoir Operating Plan (FERC, 2016). In 2017, NSPW requested the FERC extend the temporary amendment through January 31, 2021 to allow for a three-year reservoir operations test period beginning in 2018. The three-year test period would provide sufficient operating data for both NSPW and the WDNR to evaluate when determining if the temporary upper limit of the reservoir operating range (712.6 feet) should become permanent. The FERC granted NSPW's request via their March 1, 2018 Order Granting Extension of Time Pursuant to Reservoir Operating Plan (FERC, 2018). After 2.5 years into the reservoir operations test period, it is NSPW's intention to submit a request to the FERC seeking to have the upper reservoir elevation limit permanently revised to 712.6 feet.

A minimum flow of 16 cfs or inflow, whichever is less, is released at all times into the bypass reach of the White River immediately below the dam. This release provides the fish community with additional access to the bypass reach and additional spawning habitat.

One operator is assigned to oversee the daily operation and routine maintenance of the Project. An operator visits the site daily, Monday through Friday. A facility operator is always on call to respond to any concerns at the site. The plant is operated automatically based on headwater elevation. A malfunction at the plant sends an automated alarm to the facility operator's phone, as well as to a computer terminal at the Licensee's Wisconsin Control Center located near Chippewa Falls, Wisconsin.

During emergency Project operations, facility operators may be supported by operators from the Superior Falls Hydroelectric Project and/or Saxon Falls Hydroelectric Project (both approximately 25 miles east of Ashland), local line crews, and personnel from Xcel Energy's Hydro Maintenance Department in Chippewa Falls (approximately 115 miles southwest of Ashland).

3.3.2 Proposed Operation

NSPW intends to request that the temporary operating range of 710.4 to 712.6 feet be made permanent. No other operational changes are proposed.

3.3.3 References

- Federal Energy Regulatory Commission (FERC). 2016. Order Granting Temporary Amendment of Reservoir Operating Plan Pursuant to Article 401. August 1, 2016.
- Federal Energy Regulatory Commission (FERC). 2018. Order Granting Extension of Time Pursuant to Reservoir Operating Plan. March 1, 2018.

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

3.4.1 Current License Requirements

The Project license includes a series of articles that specify actions the Licensee must take to remain in compliance with its license terms and conditions. FERC issued the Project license on August 29, 1995 with an effective date of August 1, 1995 (FERC, 1995). FERC issued its Order on Rehearing on February 12, 1997, which amended License Article 405 and 407 and deleted License Article 409. The license conditions are summarized in **Table 3.4.1-1** below and a copy of the existing license and Order on Rehearing is provided in **Appendix 3.4.1-1**.

Table 3.4.1-1: White River Project Current License Conditions

License Article	Brief Description	Comments
Article 201	Article required Licensee to pay the United States based on the installed capacity of 1,000 kW. A 2017 license amendment increased authorized installed capacity to 1,200 kW.	License Amendment approved November 2, 2017
Article 401	Article required Licensee to operate the Project in a run-of-river mode for protection of fish in and downstream of the impoundment, riparian vegetation above and below the Project, and recreational opportunities in the Project impoundment on the White River. Licensee must minimize the reservoir surface elevation fluctuation by maintaining a discharge from the Project so that at any point in time, flows as measured immediately downstream of the Project tailrace approximate Project reservoir inflows. Also required Licensee to file an operations plan for Commission approval. The operations plan also requires Licensee to maintain the reservoir elevation between 710.4 feet and 711.6 feet NGVD.	Plan approved March 11, 2003 Temporary Amendment to plan approved August 1, 2016 (see section 3.3.1)
Article 402	Article required Licensee to manage any non-emergency drawdown, so the Project reservoir drawdown rate does not exceed 12 inches per 24 hours for the first 48 hours and 6 inches per 24 hours after that. The drawdown must be evenly spread such that the 12 inches per 24-hour drawdown rate occurs at 2 inches every 4 hours. Also required Licensee to submit a drawdown management plan to WDNR for comment and recommendation at least 90 days prior to any non-emergency drawdown. The plan must be filed with the Commission and address how the plan accommodates WDNR recommendations or Licensee's reasons based on project specific information for not incorporating agency recommendations.	
Article 403	Article required Licensee to file a plan with the Commission to monitor the fly ash/cinders used during the "Cindering" process for sealing spillway gates within 180 days of License issuance.	Plan approved September 30, 1998
Article 404	Article reserved Commission authority to require Licensee to construct, operate, and maintain or arrange for the construction, operation, and maintenance of fishway facilities that may be prescribed by the Secretary of the Interior pursuant to Section 18 of the Federal Power Act.	
Article 405	Order on Rehearing amended Article 405 to read as follows: Within one year of the date of this license, Licensee shall release from the White River Dam to the bypassed reach a minimum flow of 16 cubic feet per second to allow for additional access to the bypassed reach by all components of the fish community, to provide additional spawning habitat and recreational opportunity.	February 13, 1997 Order on Rehearing

Article 406	Article required Licensee to file a report with the Commission within 30 days if the flows through the Project fail to meet run-of-river requirements under Article 401 or if the minimum flow fails to meet the requirements of Article 405.	
Article 407	Article required Licensee to file a land management plan for all Licensee-owned land in the project area to maintain project lands in their natural state to provide aesthetic benefits and wildlife habitat. The plan must identify all Licensee-owned land in the project area, land management goals and objectives, allowed uses and activities, and provide a statement about how this plan would protect the bald eagle, osprey, timber wolf, wood turtle, and Tremblay's salamander.	Plan approved June 11, 1997 Amended Plan including threatened and endangered species concerns approved August 21, 1997
Article 408	Article required Licensee to develop a plan to monitor purple loosestrife in project waters.	Plan approved April 25, 1997
Article 409	Article required Licensee to develop and file a plan with the Commission to protect state and federally listed threatened and endangered species and their critical habitat.	February 13, 1997 Order on Rehearing deleted Article 409 and amended Article 405 to include threatened and endangered species
Article 410	Article required Licensee to consult and cooperate with the Wisconsin State Historic Preservation Office (SHPO) prior to the commencement of any construction or development of any project works or other facilities at the project to determine the need for and extent of any archaeological or historic resource surveys and any mitigating measures. Also required Licensee to periodically search all eroded reservoir shorelines for any visible traces of artifacts, objects, or remains of potential archaeological significance. Surveys were required to be completed 5 and 10 years after license issuance.	5-year survey completed in 2003 10-year survey completed in 2008
Article 411	Standard Land Use Article	

3.4.2 Project Compliance History

A FERC elibrary review identified two non-compliance instances during the current license term:

- On August 1, 2016, the Licensee received notice from the FERC that the Licensee’s failure to report all deviations outside of the Reservoir Operations Plan approved band of operation to the Commission was considered a violation of Article 406 (FERC, 2016).
- On July 2, 2019, the Licensee received a letter from the FERC indicating the reservoir elevation deviations occurring from April 22 to 23, 2019 and May 19 to 20, 2019 were considered violations of License Article 406 (FERC, 2019).

3.4.3 Summary of Project Generation and Flow Records

Generation and flow records from 2012 through 2019 are summarized below in **Table 3.4.3-1**. Dependable capacity based on a 10-year average of actual generation data was 400 kW.

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

Time Period	Annual Generation (MWh)	Monthly Average Generation (MWh)	Average Outflow* (cfs)
1/1/2012 to 12/31/2012	3,328.7	277.4	252
1/1/2013 to 12/31/2013	3,062.1	255.2	442
1/1/2014 to 12/31/2014	4,906.8	408.9	421
1/1/2015 to 12/31/2015	4,649.7	387.5	255
1/1/2016 to 12/31/2016	3,668.6	305.7	373
1/1/2017 to 12/31/2017	3,879.6	323.3	329
1/1/2018 to 13/31/2018	4,782.2	398.5	471
1/1/2019 to 12/31/2019	5,335.0	444.6	439

*Note: Average outflow as measured at White River USGS Gage No. 04027500

3.4.4 Current Net Investment

Project net investment will be provided in the DLA.

3.4.5 References

- Federal Energy Regulatory Commission (FERC). 1995. Order Issuing Subsequent License P-2444 (Minor Project). Issued August 29, 1995.
- Federal Energy Regulatory Commission (FERC). 2016. Order Granting Temporary Amendment of Reservoir Operating Plan Pursuant to Article 401. August 1, 2016.
- Federal Energy Regulatory Commission (FERC). 2018. Order Granting Extension of Time Pursuant to Reservoir Operating Plan. March 1, 2018.
- Federal Energy Regulatory Commission (FERC). 2019. Letter informing Northern States Power Company that the 4/22/2019-4/23/2019, etc. deviations from the required reservoir elevation will be considered violations of license Article 406 re the White River Hydroelectric Project under P-2444. July 2, 2019.

4. Description of Existing Environment and Resource Impacts

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

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

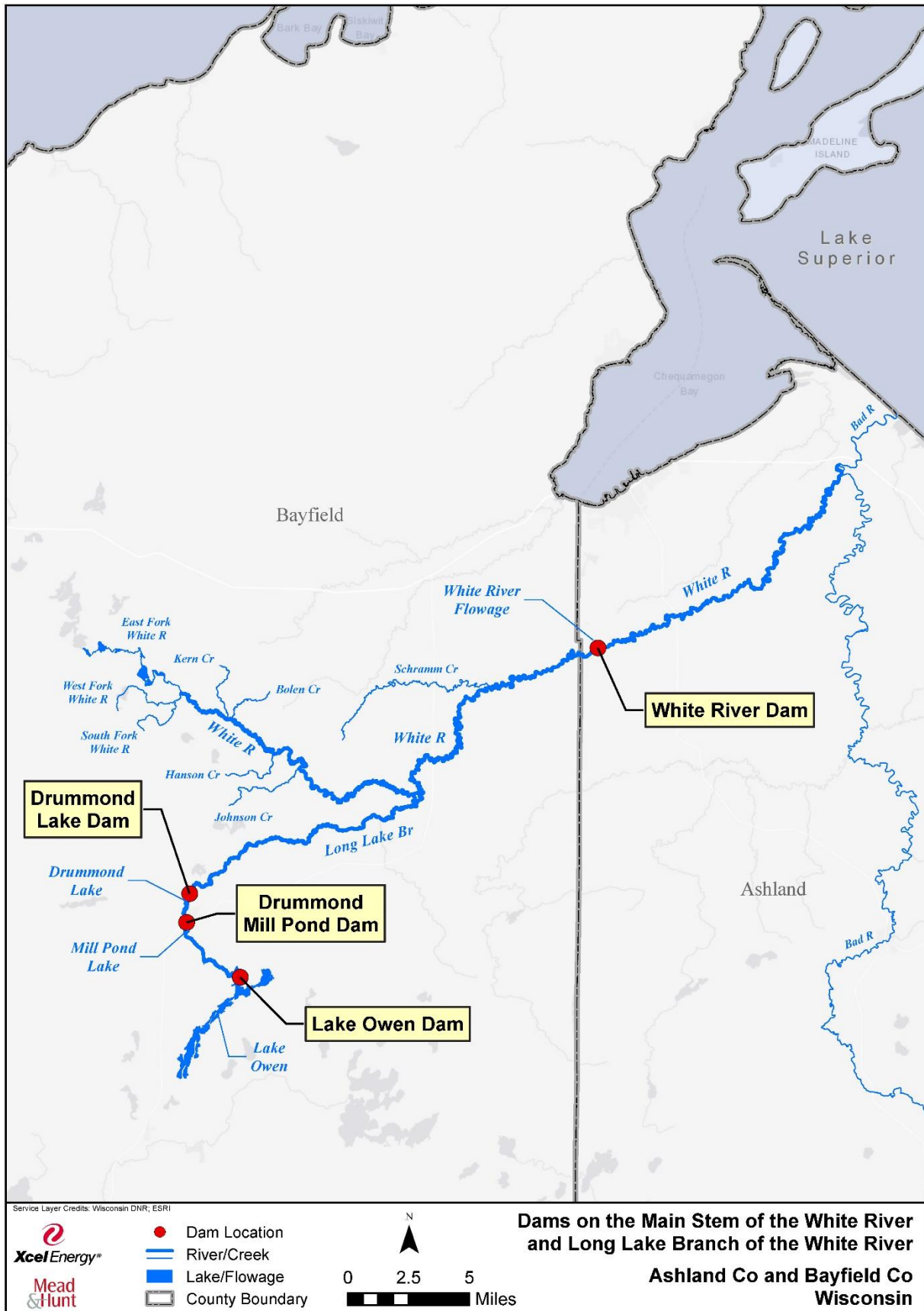
The White River watershed drains 350 square miles of agriculture, woodland, and wetland in Bayfield and Ashland County. The river begins in the Drummond-Delta area of western Bayfield County where the East Fork and South Fork combine to form the main stem of the White River. The White River flows east and north through the 10,000-acre Bibon Swamp State Natural Area (SNA), continues through the village of Mason, into the White River Hydroelectric Project flowage, and ultimately to the river's confluence with the Bad River at Odanah (Trout Unlimited et. al., 2004). The drainage area above the White River Project is 301 square miles (NSPW, 1991). The main tributaries upstream of the Project include Schramm Creek and the Long Lake Branch of the White River. Most of the White River watershed contains wooded lands, with approximately 74% of lands consisting of forests, woodlands, and shrublands and only 10% of lands cleared for agricultural and urban development (Trout Unlimited et al, 2004).

There is one FERC-licensed hydroelectric project dam on the main stem of the White River and three state-regulated dams on the Long Lake Branch of the White River. All four dams are listed from upstream to downstream in **Table 4.1-1** below. The FERC-regulated dam is the White River Project dam. The state-regulated facilities do not generate power and are regulated by the State of Wisconsin. **Figure 4.1-1** on the following page shows the dam locations on the White River.

Table 4.1-1: Dams Located on the White River

Dam Name	Location	River	FERC or State Regulated	FERC No.	Authorized Capacity
White River	Town of White River Ashland County	White River	FERC	P-2444	1,200 kW
Drummond Lake	Town of Drummond Bayfield County	Long Lake Branch of the White River	State	N/A	N/A
Drummond Mill Pond	Town of Drummond Bayfield County	Long Lake Branch of the White River	State	N/A	N/A
Lake Owen	Town of Drummond Bayfield County	Long Lake Branch of the White River	State	N/A	N/A

Figure 4.1-1: Regulated Dams on the Main Stem of the White River and Long Lake Branch of the White River



4.1.1 White River Project

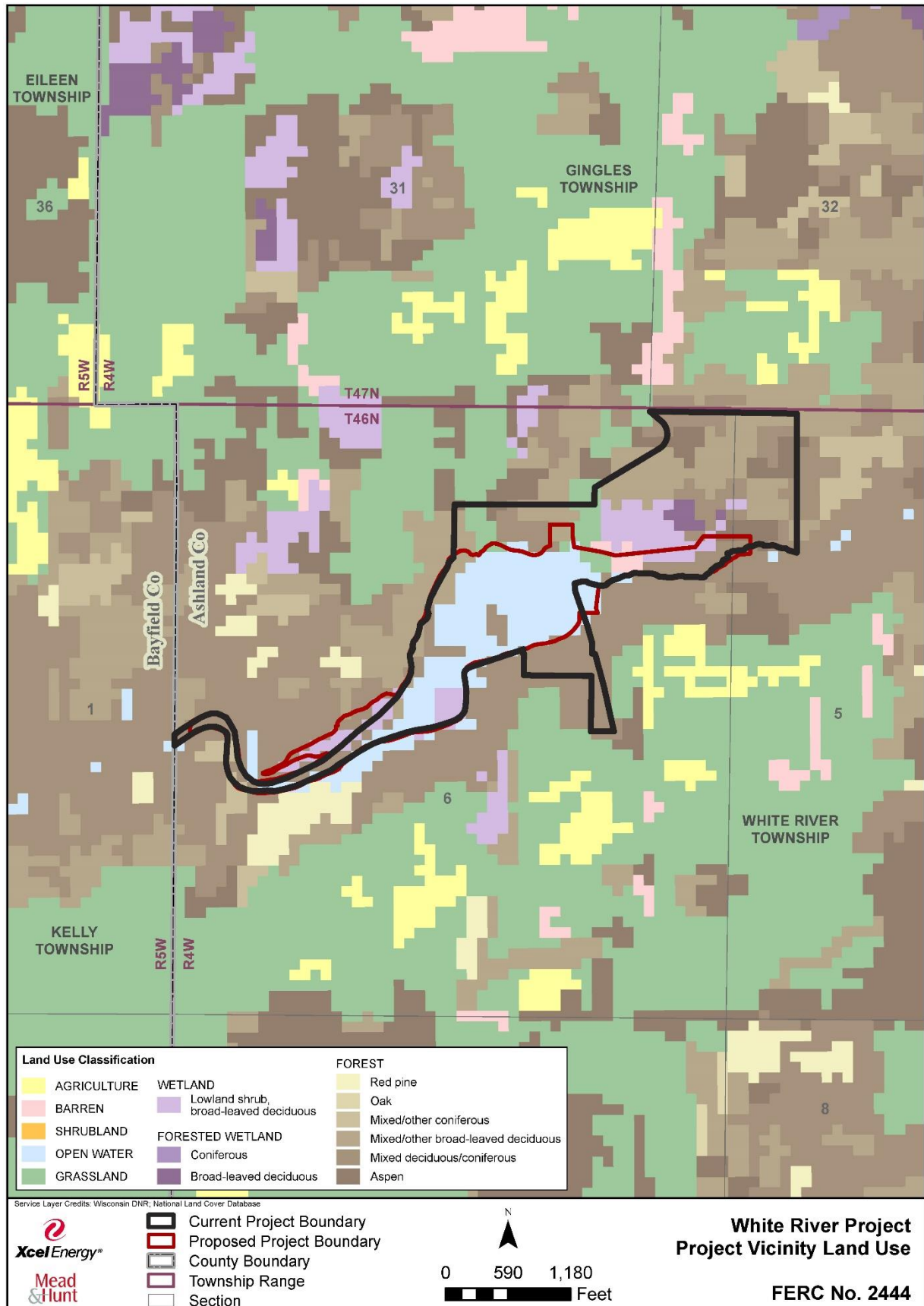
The White River Project is located in northwestern Ashland County, Wisconsin, approximately 5 miles south of the City of Ashland and 120 miles northeast of the City of Eau Claire, Wisconsin. The Project's structural facilities, including the dam and powerhouse, are located in Section 6, Township 46 North, Range 04 West. The White River Dam impounds the White River creating a 45.1-acre reservoir, which extends about 1 mile upstream of the Project Dam (Mead & Hunt 2020). The Project is included entirely within the Town of White River, Wisconsin.

4.1.2 Major Land Uses

Based on the United States Geological Survey (USGS) National Land Cover Database, major land uses within the White River Project vicinity include mixed forest, deciduous forest, coniferous forest, wooded/shrub wetlands, and grassland (USGS, 2016). A map showing the major land uses in the White River Project vicinity is shown in **Figure 4.1.2-1** on the following page.

According to the Ashland County Comprehensive Plan, major land use in the county consists of 94% woodlands or open space (including agriculture), 2.46% residential, 1.6% infrastructure, 1.15% parks and recreation, and less than 1% commercial (UW Extension, 2016).

Figure 4.1.2-1: Major Land Uses in the White River Project Vicinity Boundary



4.1.3 Major Water Uses

The White River Dam was originally constructed prior to 1884 to provide mechanical power for a sawmill and was reconstructed to generate electricity in 1907. The Project in its present form was completed in 1927 after the dam washed out the previous year (NSPW, 1991). The Project provides a capacity of 1,200 kW of electricity to the local distribution system.

Aside from hydroelectric power, the White 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 Reservoir

The White River Dam impounds the White River approximately 13 miles upstream of its confluence with the Bad River and about 18 miles upstream from the mouth of the Bad River at Lake Superior. The resulting reservoir spans approximately 45.1 acres with a storage capacity of 315.7 acre-feet at reservoir elevation of 712.1 feet, as shown in the current Exhibit G map provided in **Appendix 3.2.2-1** (Mead & Hunt, 2020).

4.1.5 Climate

Ashland County, Wisconsin is located within the continental climate region and experiences some variation due to lake effects caused by Lake Superior. A 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.

The average monthly minimum temperatures range from 1 degree Fahrenheit (°F) in January to 55°F in July. The average monthly maximum temperatures range from 22°F in January to 80°F in July. The overall monthly average temperatures range from 11.5°F in January to 67.5°F in July. The average annual precipitation is 30.77 inches, with about 60% of the precipitation falling during the growing season from May through September (U.S. Climate Data, 2020).

4.1.6 References

- Mead & Hunt. 2020. Geographic Information System-derived current Project boundary, proposed Project boundary, and associated reservoir acreages. May 26, 2020.
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4.2 Geology and Soils (18 CFR § 5.6(d)(3)(ii))

4.2.1 Geology

The Superior Coastal Plain Ecological Landscape is characterized by till-covered hills of the Bayfield peninsula and level plains that gently slope towards Lake Superior on both sides of the peninsula. The plains are dissected by many deeply incised streams and large rivers that flow towards Lake Superior. Sandspits, often enclosing lagoons and wetlands, are well developed at river mouths and in the Apostle Islands (WDNR, 2015). The topography surrounding the White River Project varies up to 180 feet in elevation; the highest land surface elevation of about 850 feet descending to the White River surface elevation of about 670 feet downstream of the powerhouse (USGS, 2020).

The White River Project is located in a region of nearly flat but deeply dissected lake plain of glacial origin. Up to 300 feet of red lake clay deposits overlie sandstone, shale, and conglomerate bedrock of Precambrian age, which can reach a thickness up to 25,000 feet (NSPW, 2008).

The White River has eroded through about 50 feet of red clay overburden and exposed sedimentary bedrock consisting of sandstone and shale at the Project site. The dam and powerhouse are founded on bedrock. Bedrock downstream of the spillway consists of a very hard sandstone. Visible bedrock along the lower portions of the right bank downstream from the dam is a layered sandstone overlying the clayey sandstone (shale) bedrock (NSPW, 2008).

4.2.2 Soils

There are nine soil types found throughout the White River Project vicinity, which are grouped into nine major soil associations with distinct soil patterns, relief, and drainage factors (USDA-NRCS, 2020a).

Appendix 4.2.2-1 presents a custom soils report and map for the general Project vicinity.

Odanah silt loam, Sanborg-Badriver complex, and Moquah fine sandy loam soils are the most prevalent soil series found in the Project vicinity. The most commonly identified soil classifications in respective order of abundance are the Odanah silt loam soils with 25-60% slopes (280F), Sanborg-Badriver complex soils with 0-6% slopes (580B), and Moquah fine sandy loam-frequently flooded soils with 0-3% slopes (6A). Soil characteristics are shown below in **Table 4.2.2-1**.

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

Soil Series	Drainage Classification	Formation	Water Transmittal Capacity	Runoff Class
Odanah	Well-drained	Till plain, shoulder, backslope	Moderately low to moderately high	Very High
Sanborg-Badriver complex	Moderately well-drained to somewhat poorly drained	Till plain, summit, footslope	Moderately low to moderately high	High
Moquah	Moderately well-drained	Floodplains	Moderately high to high	Negligible

4.2.3 Reservoir Shoreline Conditions

A survey of the White River Project reservoir in the fall of 2003 indicated the flowage shorelines are fundamentally stable and well-vegetated with only slight signs of erosion due to animal activity, primarily beaver, and high-water events at the head-end of the flowages (NSPW, 2004). The Licensee owns approximately 25% of the reservoir shoreline, based on the current Project boundary. The remaining reservoir shoreline is privately owned (NSPW, 1991). Other than the Project Dam and boat landing, the entire reservoir shoreline is undeveloped.

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 on erodibility.

4.2.4.1 Hydrologic Group

The Hydrologic Group for each soil is based on 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, 2020b).

Odanah silt loam soils (280F) reside in Group C/D, Sanborg-Badriver complex soils (580B) reside in Group C/D, and Moquah fine sandy loam soils (6A) reside in Group C (USDA-NRCS, 2020a).

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, 2020b). T Factor also relates to the soil's ability to revegetate once it is disturbed.

Odanah silt loam soils (280F), Sanborg-Badriver complex soils (580B), and Moquah fine sandy loam soils (6A) all have a T Factor of 5 tons per acre (USDA-NRCS, 2020a).

4.2.4.3 Kf Factor

The Kf Factor indicates 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, 2020b). Based on the RUSLE2 information, lands in the White River Project vicinity have Kf Factors in the moderate range because soil particles are moderately susceptible to detachment and can produce moderate runoff.

Odanah silt loam soils (280F) have a Kf Factor of 0.37, Sanborg-Badriver complex soils (580B) have a Kf Factor of 0.17 to 0.55, and Moquah fine sandy loam soils (6A) have a Kf Factor of 0.15 (USDA-NRCS, 2020a).

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, 2020b).

Odanah silt loam soils (280F) are composed of 29% sand, 51% silt, and 20% clay; the majority of Sanborg-Badriver complex soils (580B) are composed of 30% sand, 55% silt, and 15% clay, and Moquah fine sandy loam soils (6A) are composed of 71% sand, 17% silt, and 12% clay.

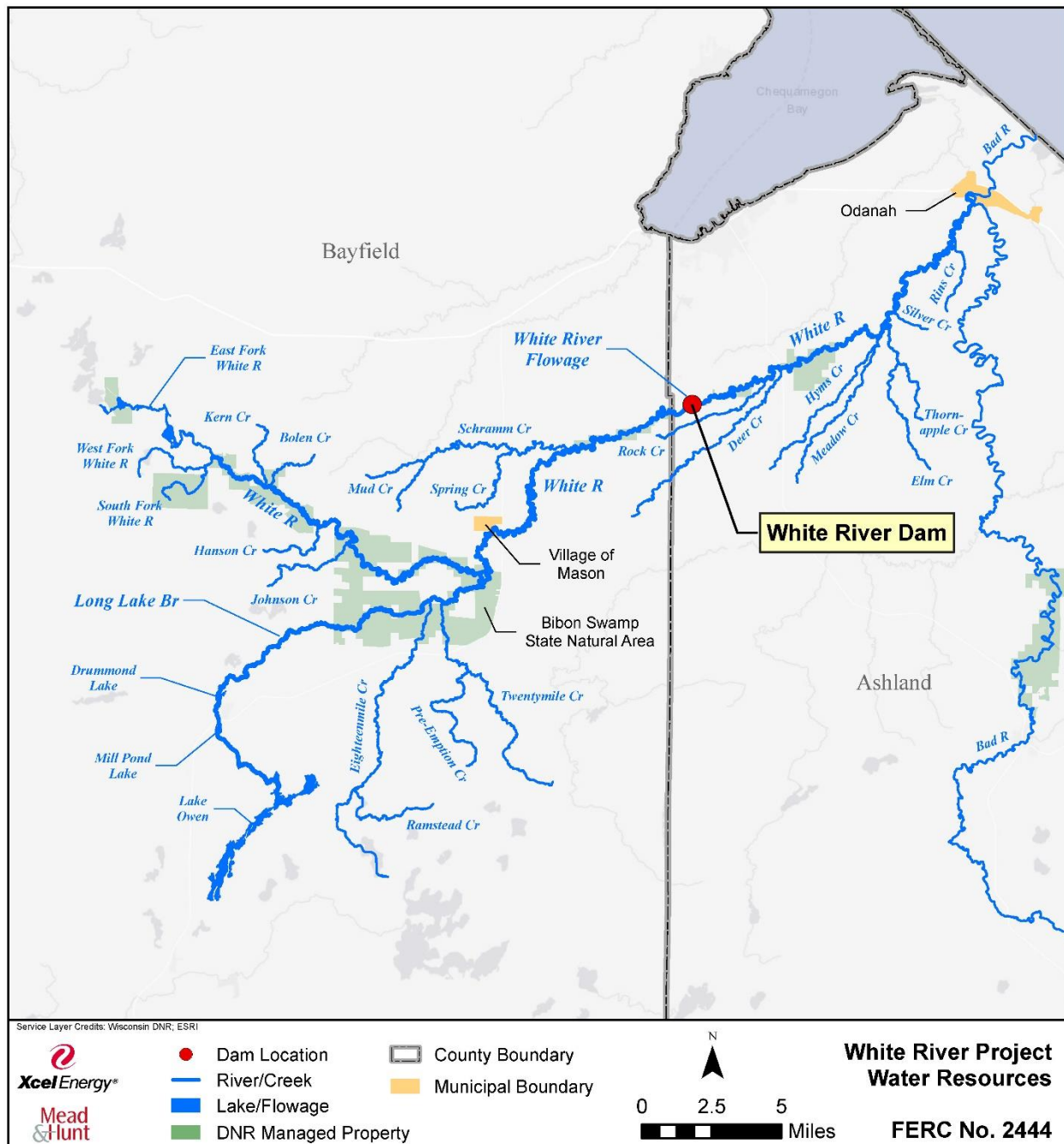
4.2.5 References

- Northern States Power Company-Wisconsin (NSPW). 1991. Application for a Subsequent License for a Minor Water Power Project, White River Hydroelectric Project (FERC No. 2444). December 1991.
- Northern States Power Company-Wisconsin (NSPW). 2004. Letter providing Five-year Reservoir Shoreline Surveys for Eroding Archaeological Sites. January 5, 2004.
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4.3 Water Resources (18 CFR § 5.6(d)(3)(iii))

The White River begins in the Drummond-Delta area of western Bayfield County where the East Fork and South Fork combine to form the main stem of the White River. The White River flows east and north through the 10,000-acre Bibon Swamp State Natural Area, continues through the village of Mason, into the White River Flowage, and ultimately to the confluence with the Bad River at Odanah (Trout Unlimited et. al., 2004). Primary tributaries include Schramm Creek and the Long Lake Branch of the White River, as shown in **Figure 4.3-1** below.

Figure 4.3-1: White River Water Resources



4.3.1 Drainage Area

The White River Project is located in the Bad-Montreal River Sub-basin in northern Wisconsin. The associated drainage area lies within portions of Ashland and Bayfield Counties. The Bad-Montreal Sub-basin is further divided into watershed and sub-watershed hierarchies. The Project is located in the White River Watershed. The portion of the Project upstream of the dam is located in the White River Flowage-White River Sub-watershed. The portion of the watershed located downstream of the dam is located in the Deer Creek-White River Sub-watershed, as shown in **Figure 4.3.1-1** on the following page (WDNR, 2020a). The National Watershed Boundary hierarchy is listed below in **Table 4.3.1-1** (USGS-USDA-NRCS, 2020).

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

Hierarchy	WBDHU ¹	Hydrologic Unit Name
Region	WBDHU2	Great Lakes
Sub-region	WBDHU4	Western Lake Superior
Basin	WBDHU6	Southwestern Lake Superior
Sub-basin	WBDHU8	Bad River - Montreal River
Watershed	WBDHU10	White River
Sub-watershed	WBDHU12	Deer Creek - White River (downstream of dam)
		White River Flowage - White River (upstream of dam)

¹ National Watershed Boundary Dataset Hydrologic Unit (USGS-USDA-NRCS, 2020)

Figure 4.3.1-1: White River Project Water Drainage Areas



4.3.2 Streamflow, Gage Data, and Flow Statistics

Monthly flow duration curves for the White River Project were developed based on data recorded at USGS Gage No. 04027500, which is located at the Project tailrace. The gage location has a drainage area of 301 square miles. Based on the data for the analyzed period of January 1948 to December 2019, the average annual calendar year flow at the Project is 280.6 cfs; the maximum annual calendar year flow was 471 cfs in 2018 and the minimum annual calendar year flow was 175 cfs in 2009.

The White River Project monthly minimum, mean, and maximum flows are shown below 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: White River Project Monthly Minimum, Mean, and Maximum Flows (1948 to 2019)

Month	Monthly Minimum (cfs)	Monthly Mean (cfs)	Monthly Maximum (cfs)
January	89	190	388
February	102	199	883
March	76	324	3,110
April	103	569	3,590
May	120	375	3,050
June	96	299	6,390
July	100	256	3,940
August	71	228	4,100
September	61	232	2,800
October	134	245	2,500
November	65	243	1,710
December	70	207	954

*Note: Measured at White River USGS Gage No. 0407500.

4.3.3 Existing and Proposed Uses of Water

4.3.3.1 Existing Uses

Beginning in the late 1800's, the White River Dam provided mechanical power for a sawmill. The Project was reconstructed in 1907 to generate electricity. The Project in its present form was completed in 1927, providing water for hydroelectric power production, recreation, and fish and wildlife habitat. The primary uses of the White River today remain the same (NSPW, 1991).

There are currently no known surface water withdrawals or point source discharges within the Project boundary (WDNR, 2020a; WDNR, 2020b).

4.3.3.2 Proposed Uses

The White River Project is operated in a run-of-river mode and does not store water for future releases. As discussed in Section 3.3.1 NSPW intends to request that the temporary operating range of 710.4 feet to 712.6 feet be made permanent. No other operational changes or changes to minimum flows are proposed.

4.3.4 Existing Instream Flow Uses

Article 402 of the current White River Project license requires a minimum flow of 16 cfs or inflow, whichever is less, to be released at all times to protect aquatic resources within the bypass reach. The Licensee does not propose any changes to the minimum flow.

4.3.5 Existing Water Rights

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

4.3.6 Reservoir Bathymetry

The White River reservoir is approximately 45.1 acres at elevation 712.1 feet (Mead & Hunt 2020). According to the bathymetric map available on the WDNR Lakes webpage for the White River Flowage, the reservoir is shallow, having an average depth of 7 feet. Approximately one-third of the reservoir is less than three feet in depth. The maximum reservoir depth is 26 feet (WDNR, 2020c). A bathymetric map of the reservoir is provided in **Appendix 4.3.6-1**.

4.3.7 Water Quality 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.

4.3.7.1 River Water Quality Standards

Wisconsin classifies the White River upstream of the Project reservoir and downstream of the Project Dam as a cold-water stream. These reaches are also classified as exceptional resource waters and listed as a class II trout stream. The waters downstream of the reservoir are also classified as sturgeon waters. Under NR 102.03, the portion of the White River flowing through the Project reservoir is defined as a surface water and no variances are provided. This portion is not categorized as a cold-water stream, trout stream, or exceptional water. The White River Project reservoir is categorized as a

wild rice water and as an impounded flowing water with designated uses for fish and aquatic life, general recreation, public health and welfare, and fish consumption. The Wisconsin state standards for fish and aquatic life criteria classifications in the Project include the following requirements:

- pH shall be between 6.0 and 9.0 for all surface waters.
- Surface water dissolved oxygen (DO) shall not be lowered below 5 milligrams per liter (mg/L) at any time.
- DO in classified trout streams shall not be lowered to less than 6 mg/L, nor be lowered to less than 7 mg/L during the spawning season.
- Total phosphorus of less than 100 ug/l (0.1mg/L).

The waters within the Project are subject to two different temperature standards. The Project reservoir is classified as a “Warm-Small” water and the White River upstream and downstream of the reservoir is classified as a “Cold” water. **Table 4.3.7.1-1** shows the maximum temperatures allowed by month for each of the water classifications.

Table 4.3.7.1-1: Maximum Temperatures for Cold and Warm-Small Water Classifications

Month	Maximum Acute Temperatures (°F)	
	Cold Waters	Warm-Small Waters
January	68	76
February	68	76
March	69	77
April	70	79
May	72	82
June	72	84
July	73	85
August	73	84
September	72	82
October	70	80
November	69	77
December	69	76

Source: NR102, see Appendix 4.3.7.1-1

A recreational use classification requires the average fecal coliform count to not exceed a most probable number of 200 counts per 100 milliliters based on five or more samples per month.

NR 102.14 also 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 based on 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**.

4.3.7.2 Reservoir Water Quality Standards

Under NR 102.06, a waterbody is classified as a “reservoir” by the State of Wisconsin if there is a dam that raises water depth more than two times compared 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 White River impoundment is classified as an “impounded flowing water” but not as a “reservoir” since the water does not have a residence time exceeding 14 days. Therefore, the White River impoundment is subject to the stream total phosphorous criterion of less than 100 micrograms per liter rather than the more restrictive “reservoir” criterion of less than 40 micrograms per liter.

4.3.8 Water Quality Data

4.3.8.1 Historic Water Quality Data

NSPW conducted water quality monitoring during 1989-1990 in conjunction with the last Project relicensing effort. Sampling encompassed monthly collections between May and October of 1989 and a late winter collection in March of 1990 at three locations on the Project reservoir. Sampling Site 1 was located upstream of the Project reservoir. Sampling Site 2 was located approximately 300 feet upstream of the Project Dam. Sampling Site 3 was located in the tailrace downstream of the powerhouse (NSPW, 1991). **Table 4.3.8.1-1**, on the following page, shows the results of the historic water quality monitoring.

pH

The water pH decreased from Site 1 (upstream of reservoir) to the location of Site 3 (powerhouse tailrace). One pH reading at 11.8 exceeded the NR 102 water quality standard of 9.0. This has been interpreted as an instrumentation error (NSPW, 1991).

Dissolved Oxygen

Dissolved oxygen levels remained above the standard of 7 mg/L for cold water streams during the spawning season and above 6.0 mg/L during the remainder of the year. A slight temperature stratification was detected from May through September within the reservoir, but there was no concurrent appreciable change in dissolved oxygen. DO levels downstream of the Project remained high in the tailwater (>8.5 mg/L) during all monitoring events, indicating there was no adverse impact downstream of the Project (NSPW, 1991).

Temperature

Water temperature increased slightly when passing through the flowage. The largest temperature difference of 5.9 °F occurred in May, while June through August temperatures increased an average of only 1.8 °F (NSPW, 1991). All temperature readings met state standards.

Total Phosphorous

The sampling event that took place on March 1, 1990 showed total phosphorous levels exceeding the NR 102 water quality standard of 0.1 mg/L. Phosphorus readings of 0.23 mg/L and 0.3 mg/L were identified at Site 1 and Site 2C, respectively. The high total phosphorous is interpreted to have been caused by the release of nutrients from the decomposition of organic material and aquatic plants (NSPW, 1991). No other sampling events identified total phosphorous levels exceeding the NR 102 water quality standard.

Table 4.3.8.1-1: Historic White River Water Quality Monitoring Data

Monitoring Site	Date	pH	DO (mg/L)	Temp (°F)	Total Phosphorous (mg/L)
SITE 1 Upstream of reservoir	05/16/1989	8.5	10.6	61.2	0.02
	06/14/1989	8.7	12.2	52.3	0.06
	07/19/1989	9.2	10.0	65.3	0.03
	08/15/1989	11.8	9.8	62.6	0.03
	09/19/1989	8.5	9.1	59.4	0.03
	10/23/1989	8.2	11.5	44.6	0.01
	03/01/1990	6.7	11.2	32.7	0.23**
SITE 2A Upstream of dam (1 ft deep)	05/16/1989	8.3	9.2	66.2	0.02
	06/14/1989	8.4	10.6	57.2	0.05
	07/19/1989	8.5	8.2	70.7	0.02
	08/15/1989	8.5	7.4	69.8	0.03
	09/19/1989	8.4	8.6	62.6	0.02
	10/23/1989	8.3	11.4	44.6	0.01
	03/01/1990	8.4	9.4	32.7	0.14
SITE 2B Upstream of dam (6-15 ft deep)	05/16/1989	N/A	N/A	N/A	N/A
	06/14/1989	8.5	10.0	57.2	0.05
	07/19/1989	8.2	7.6	66.2	0.03
	08/15/1989	8.3	7.8	66.2	0.08
	09/19/1989	8.3	8.3	62.6	0.03
	10/23/1989	8.2	12.1	41.0	0.01
	03/01/1990	N/A	N/A	N/A	N/A
SITE 2C Upstream of dam (20 ft+ deep)	05/16/1989*	7.9	8.0	60.8	0.03
	06/14/1989	8.5	9.2	55.4	0.05
	07/19/1989	8.5	7.0	66.2	0.06
	08/15/1989	8.3	6.1	63.5	0.02
	09/19/1989	8.0	6.9	59.0	0.05
	10/23/1989	N/A	N/A	N/A	N/A
	03/01/1990*	8.2	11.0	33.4	0.3**
SITE 3 Powerhouse tailrace	05/16/1989	7.8	10.4	67.1	0.02
	06/14/1989	8.5	9.2	53.6	0.05
	07/19/1989	8.4	8.7	66.2	0.04
	08/15/1989	8.5	8.5	66.2	0.04
	09/19/1989	8.2	8.7	62.2	0.04
	10/23/1989	8.0	13.0	41.7	0.01
	03/01/1990	8.0	10.4	32.9	0.08

Source: NSPW, 1991

* sample site labeled as 2B-but sampled in 20+ feet of water (no mid depth sample taken on this date)

** Exceeds state standard of 0.1 mg/L

4.3.8.2 Existing Wisconsin Water Monitoring Data

No waters associated with the White River are designated as impaired waters (WDNR 2020a).

A search of the WDNR Surface Water Data Viewer identified water quality data for two stations within the White River Project, invasive species monitoring data for two stations within the Project reservoir, and one station downstream of the Project boundary (WDNR, 2020a). Water quality monitoring data for the existing White River Project is summarized in **Table 4.3.8.2-1**. The water quality monitoring and invasive monitoring data is included in **Appendix 4.3.8.2-1**.

Table 4.3.8.2-1: Existing White River Water Quality Monitoring Data

Monitoring Site	Date	pH	DO (mg/L)	Temp (°F)	Total Phosphorous (mg/L)
0231127 Project Tailrace	09/26/2007	8.0	9.8	60.3	0.035
	08/30/2007	7.7	8.7	65.1	0.039
	06/27/2007	7.9	8.8	75.6*	0.042
	04/24/2007	7.6	10.9	52.9	0.044
	03/27/2007	6.9	12.7	38.5	0.143*
	10/15/2003	-	-	-	0.028
	09/17/2003	-	-	-	0.036
	08/20/2003	-	-	-	0.050
	07/16/2003	-	-	-	0.046
010020884 White River Flowage at Hwy 112	07/31/2007	-	8.0	75.6	0.041
	05/29/2007	7.2	9.0	59.2	0.040

SOURCE: WDNR, 2020a

*Exceeds state standard

All pH and DO readings met the applicable state standards. The White River upstream and downstream of the Project reservoir must meet the temperature standards of the Cold-Water Classification. One temperature reading downstream of the Project tailrace did not meet the June Cold-Water temperature standard of 72°F. The Project reservoir must meet the temperature standards of the Warm-Small Water Classification; the standards were met. One total phosphorous reading exceeded the state standard of 0.1 mg/L. Similar to the historic water quality monitoring that took place in March of 1990, it is interpreted that the high total phosphorous level could have been caused by the release of nutrients from the decomposition of organic material and aquatic plants.

4.3.8.3 Future Water Quality Monitoring

Based on historical monitoring data, sufficient information exists to evaluate water quality at the White River 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 Project operation is not expected to adversely impact water resources in the area.

4.3.9 References

- Mead & Hunt. 2020. Geographic Information System-derived current Project boundary, proposed Project boundary, and associated reservoir acreages. May 26, 2020.
- Northern States Power Company-Wisconsin (NSPW). 1991. Application for a Subsequent License for a Minor Water Power Project, White River Hydroelectric Project (FERC No. 2444). December 1991.
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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 relevant to the White River Project have been completed within the White River. 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, 2020a). 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 White River that are representative of the Project. One data point was located within the White River Project reservoir and one data point was located downstream of the powerhouse.

4.4.1.1 Fisheries

White River Project Flowage

Twenty-two species of fish were identified in the Project reservoir based on data collected between 1989 and 2015. Of the 1,193 fish identified during that timeframe, the five most predominant species collected included (WDNR, 2020a):

- Bullheads (*Ameiurus spp.*) at 260 or 21.8% (most abundant fish)
- Northern pike (*Esox lucius*) at 200 or 16.8%
- Shorthead redhorse (*Moxostoma macrolepidotum*) at 188 or 15.8%
- White sucker (*Catostomus commersonii*) at 176 or 14.8%
- Blacknose shiner (*Notropis hererolepis*) at 98 or 8.2%

White River Downstream of Powerhouse

Ten species of fish were identified in the Project reservoir based on data collected in 1980. Of the 53 fish identified during that timeframe, the four most predominant species collected included (WDNR, 2020a):

- Troutperch (*Percopsis omiscomaycus*) at 10 or 18.9% (most abundant fish)
- Shorthead redhorse (*Moxostoma macrolepidotum*) at 188 or 15.8%
- Longnose dace (*Rhinichthys cataractae*) at 6 or 11.3%
- Common shiner (*Luxilus cornutus*) at 3 or 5.7%

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

Table 4.4.1.1-1: Fish Species Identified in the WDNR Fish Mapping Application

Fish Species	Scientific Name	White River Project Reservoir	White River Downstream of Powerhouse
Black crappie	<i>Pomoxis nigromaculatus</i>	X	
Blacknose shiner	<i>Notropis heterolepis</i>	X	
Bluegill	<i>Lepomis macrochirus</i>	X	
Bluntnose minnow	<i>Pimephales notatus</i>	X	
Brook trout	<i>Salvelinus fontinalis</i>	X	
Brown bullhead	<i>Ameiurus nebulosus</i>	X	
Brown trout	<i>Salmo trutta</i>	X	
Bullheads	<i>Ameiurus spp.</i>	X	
Common shiner	<i>Luxilus cornutus</i>	X	X
Crappies	<i>Pomoxis spp.</i>	X	
Golden shiner	<i>Aplodinotus grunniens</i>	X	X
Hornyhead chub	<i>Nocomis biguttatus</i>		X
Largemouth bass	<i>Micropterus salmoides</i>	X	
Logperch	<i>Percopsis omiscomaycus</i>		X
Longnose dace	<i>Rhinichthys cataractae</i>		X
Northern pike	<i>Esox lucius</i>	X	
Pumpkinseed	<i>Lepomis gibbosus</i>	X	
Rainbow trout	<i>Oncorhynchus mykiss</i>	X	
Rock bass	<i>Ambloplites rupestris</i>	X	
Shorthead redhorse	<i>Moxostoma macrolepidotum</i>	X	X
Silver redhorse	<i>Moxostoma anisurum</i>		X
Troutperch	<i>Percopsis omiscomaycus</i>		X
Walleye	<i>Sander vitreus</i>	X	X
Warmouth	<i>Lepomis gulosus</i>	X	
White sucker	<i>Catostomus commersonii</i>	X	X
Yellow bullhead	<i>Amerius natalis</i>	X	
Yellow perch	<i>Perca flavescens</i>	X	

Additional Fisheries Information

On June 3, 2020, WDNR provided fish monitoring data within the Project reservoir, creel survey data, and long-term trend monitoring data in response to NSPW's questionnaire requesting information regarding the Project. This information is provided in [Section 6](#).

The trend monitoring data provides fishery information on a 5.8-mile reach of the White River, approximately 12 miles upstream of the White River Project within the Bibon Swamp. Monitoring

information from 2006 through 2019 identified a total of six fish species. Of the 4,323 fish identified during that timeframe, the five most predominant species collected included (WDNR, 2020b):

- Brown trout at 4,031 or 93.2% (most abundant fish)
- White sucker at 255 or 5.9%
- Brook trout at 31 or 0.70%
- Northern pike at 3 or 0.07%
- Tiger trout (*Salmo trutta x Salvelinus fontinalis*) at 2 or 0.05%

According to the WDNR Fish Stocking Database, a total of 2,000 brown trout (*Salmo trutta*) were stocked in the White River Project reservoir. The WDNR stocked these brown trout only one time in 1977 (WDNR, 2020c). The Project Dam serves as an important barrier to upstream migration of the sea lamprey (*Petromyzon marinus*), which WDNR considers a nuisance species that has affected the lake trout (*Salvelinus namaycush*) population in the Great Lakes. The dam prevents sea lamprey from reaching potential upstream spawning areas and prevents potential parasitic infestations in upstream waters (FERC, 1995).

4.4.1.2 Mussels

The WDNR maintains a mussel observation database searchable by county and stream. A database review for Ashland County did not identify any mussel information for the White River (WDNR, 2020d). In response to the questionnaire, the WDNR provided information that states giant floaters (*Pyganodon grandis*) were identified within the reservoir by WDNR staff during a recent drawdown of the Project reservoir. WDNR also provided information regarding mussel species present in the West Branch of the White River. This tributary is located approximately 24 miles upstream of the Project and is considerably narrower than the reach within the Project vicinity. In addition, the tributary has different soil types, bed substrates, and topography than the main stem of the White River within the Project Vicinity. Therefore, the mussel community in the West Branch is likely not representative of mussels found within the White River Project.

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 White River Project vicinity (NOAA, 2020).

4.4.3 Fish Entrainment and Mortality

The White River Project contains a 20-foot-high by 14.25-foot-wide main trashrack with 1.25-inch clear spacing (NSPW, 1991). The approach velocities at the trash racks are calculated to be approximately 2 feet per second. No entrainment studies were requested by WDNR during the last relicensing process. In FERC's final environmental analysis issued on August 29, 1995, the types of fisheries upstream and downstream of the Project Dam were described as markedly different in character. WDNR stated that their management goals for the upstream fishery would not be served by a reduction in the numbers of entrained fish. Further, they describe the fishery upstream as having good quality (FERC, 1995).

4.4.4 References

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- National Oceanic and Atmospheric Administration (NOAA). 2020. Essential Fish Habitat Mapper: <https://www.habitat.noaa.gov/protection/efh/efhmapper/>. Accessed May 5, 2020.
- Northern States Power Company. 1991. Application for a Subsequent License for a Minor Water Power Project, White River Hydroelectric Project (FERC No. 2444). December 1991.
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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 White River Project is located within the Superior Coastal Plain Ecological Landscape (WDNR, 2015).

4.5.1 Botanical Species

In the mid-1800's, most lands within the Superior Coastal Plain were covered by boreal forest (WDNR, 2015). A map showing Wisconsin's land cover in the 1800s is included in **Appendix 4.5.1-1**.

Vegetation in the White River Project vicinity is primarily hardwood forest with scattered pines. The main hardwood species include: black ash (*Fraxinus nigra*), big-toothed aspen (*Populus grandidentata*), quaking aspen (*Populus tremuloides*), American basswood (*Tilia americana*), paper birch (*Betula papyrifera*), yellow birch (*Betula alleghaniensis*), black cherry (*Prunus serotina*), sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), and red oak (*Quercus rubra*). The main conifer species present include: red pine (*Pinus resinosa*), eastern white pine (*Pinus strobus*), balsam fir (*Abies balsamea*), white spruce (*Picea glauca*), eastern hemlock (*Tsuga canadensis*), and white cedar (*Thuja occidentalis*) (NSPW, 1991).

4.5.2 Wildlife

4.5.2.1 Mammal Species

Mammal species likely to be found in the White River Project vicinity are detailed in **Table 4.5.2.1-1**. The list is based on the mammal species list for the Whittlesey Creek National Wildlife Refuge (WCNW Refuge), which is located a few miles northwest of the Project (USFWS, 2020).

Table 4.5.2.1-1: Mammal Species likely to be found in the Project Vicinity

Mammal Species	Scientific Name
Arctic shrew	<i>Sorex arcticus</i>
American beaver	<i>Castor canadensis</i>
Badger	<i>Taxidea taxus</i>
Big brown bat	<i>Eptesicus fuscus</i>
Black bear	<i>Ursus americanus</i>
Bobcat	<i>Lynx rufus</i>
Canada Lynx	<i>Lynx canadensis</i>
Coyote	<i>Canis latrans</i>
Eastern chipmunk	<i>Tamias striatus</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Eastern gray squirrel	<i>Sciurus carolinensis</i>
Eastern pipistrelle	<i>Pipistrellus subflavus</i>
Fisher	<i>Martes pennanti</i>
Gray fox	<i>Urcyon cineoargenteus</i>
Gray wolf	<i>Canis lupis</i>

Hoary bat	<i>Lasiurus cinereus</i>
House mouse	<i>Mus musculus</i>
Masked shrew	<i>Sorex cinereus</i>
Least chipmunk	<i>Eutamias minimus</i>
Least weasel	<i>Mustela nivalis</i>
Little brown bat	<i>Myotis lucifugus</i>
Long-tailed weasel	<i>Mustela frenata</i>
Marten	<i>Martes americana</i>
Meadow jumping mouse	<i>Zapus hudsonius</i>
Meadow vole	<i>Microtus pennsylvanicus</i>
Muskrat	<i>Ondontra zibethicus</i>
Mink	<i>Mustela vison</i>
Moose	<i>Alces alces</i>
Plains pocket gopher	<i>Geomys bursarius</i>
Northern flying squirrel	<i>Glaucomys sabrinus</i>
Northern long-eared bat	<i>Myotis septentrionalis</i>
Norway rat	<i>Rattus norvegicus</i>
Porcupine	<i>Erethizon dorsatum</i>
Pygmy shrew	<i>Sorex hoyi</i>
Raccoon	<i>Procyon lotor</i>
Red-backed vole	<i>Clethrionomys gapperi</i>
Red bat	<i>Lasiurus borealis</i>
Red fox	<i>Vulpes vulpes</i>
Red squirrel	<i>Tamiasciurus hudsonicus</i>
River otter	<i>Lutra canadensis</i>
Silver-haired bat	<i>Lasionycteris noctivagans</i>
Short-tailed weasel	<i>Mustela erminea</i>
Short-tailed shrew	<i>Blarina brevicauda</i>
Snowshoe hare	<i>Lepus americanus</i>
Southern bog lemming	<i>Synaptomys cooperi</i>
Southern flying squirrel	<i>Glaucomys volans</i>
Star-nosed mole	<i>Condylura cristata</i>
Striped skunk	<i>Mephitis mephitis</i>
Thirteen-lined ground squirrel	<i>Spermophilus tridecemlineatus</i>
Virginia opossum	<i>Didelphis virginiana</i>
Water shrew	<i>Sorex palustris</i>
White-footed deer mouse	<i>Peromyscus maniculatus</i>
White-tailed deer	<i>Odocoileus virginianus</i>
Woodland jumping mouse	<i>Napaeozapus insignis</i>
Woodchuck	<i>Marmota monax</i>

4.5.2.2 Bird Species

The bird species likely to be found in the White River Project vicinity are detailed in **Table 4.5.2.2-1**. The table is based on the eBird Field Checklist for the White River Flowage (Cornell eBird, 2020).

Table 4.5.2.2-1: Bird Species likely to be found in the Project Vicinity

Bird Species	Scientific Name
American crow	<i>Corvus brachyrhynchos</i>
American goldfinch	<i>Spinus tristis</i>
American kestrel	<i>Falco sparverius</i>
American robin	<i>Turdus migratorius</i>
American woodcock	<i>Scolopax minor</i>
Baird's sandpiper	<i>Calidris bairdii</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Barn swallow	<i>Hirundo rustica</i>
Barred owl	<i>Strix varia</i>
Belted kingfisher	<i>Megaceryle alcyon</i>
Black-capped chickadee	<i>Poecile atricapillus</i>
Bluejay	<i>Cyanocitta cristata</i>
Blue-winged teal	<i>Anas discors</i>
Broad-winged hawk	<i>Buteo platypterus</i>
Buff-breasted sandpiper	<i>Tryngites subruficollis</i>
Bufflehead	<i>Bucephala albeola</i>
Canada Goose	<i>Branta canadensis</i>
Cedar waxwing	<i>Bombycilla cedrorum</i>
Cliff swallow	<i>Petrochelidon pyrrhonota</i>
Common merganser	<i>Mergus merganser</i>
Common raven	<i>Corvus corax</i>
Dark-eyed junco	<i>Junco hyemalis</i>
Downy woodpecker	<i>Picoides pubescens</i>
Eastern bluebird	<i>Sialia sialis</i>
Eastern kingbird	<i>Tyrannus tyrannus</i>
European starling	<i>Sturnus vulgaris</i>
Great blue heron	<i>Ardea herodias</i>
Greater yellowlegs	<i>Tringa melanoleuca</i>
Hairy woodpecker	<i>Leuconotopicus villosus</i>
Hooded merganser	<i>Lophodytes cucullatus</i>
Killdeer	<i>Charadrius vociferus</i>
Least sandpiper	<i>Calidris minutilla</i>
Lesser yellowlegs	<i>Tringa flavipes</i>
Mallard	<i>Anas platyrhynchos</i>
Merlin	<i>Falco columbarius</i>
Mute swan	<i>Cygnus olor</i>
Northern flicker	<i>Colaptes auratus</i>
Pectoral sandpiper	<i>Calidris melanotos</i>

Pie-billed grebe	<i>Podilymbus podiceps</i>
Pileated woodpecker	<i>Dryocopus pileatus</i>
Pine siskin	<i>Spinus pinus</i>
Red-breasted nuthatch	<i>Sitta canadensis</i>
Red crossbill	<i>Loxia curvirostra</i>
Red-eyed vireo	<i>Vireo olivaceus</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Ring-billed gull	<i>Larus delawarensis</i>
Ruby crowned kinglet	<i>Regulus calendula</i>
Ruffed grouse	<i>Bonasa umbellus</i>
Semipalmated plover	<i>Charadrius semipalmatus</i>
Semipalmated sandpiper	<i>Charadrius pusilla</i>
Short-billed dowitcher	<i>Limnodomus griseus</i>
Song sparrow	<i>Melospiza melodia</i>
Solitary sandpiper	<i>Tringa solitaria</i>
Spotted sandpiper	<i>Actitis macularius</i>
Stilt sandpiper	<i>Calidris himantopus</i>
Tree swallow	<i>Tachycineta bicolor</i>
Trumpeter swan	<i>Cygnus buccinator</i>
Turkey vulture	<i>Cathartes aura</i>
White-breasted nuthatch	<i>Sitta carolinensis</i>
White-throated sparrow	<i>Zonotrichia albicollis</i>
Wild turkey	<i>Meleagris gallopavo</i>
Wood duck	<i>Aix sponsa</i>

4.5.2.3 Reptile and Amphibian Species

Reptiles and amphibians likely to be found in the White River Project vicinity are listed in **Table 4.5.2.3-1**. Species information is based on Whittlesey Creek National Wildlife Refuge data (USFWS, 2020).

Table 4.5.2.3-1: Reptile and Amphibian Species likely to be found in the Project Vicinity

Reptiles and Amphibians	Scientific Name
American bullfrog	<i>Rana catesbeiana</i>
American toad	<i>Bufo americanus</i>
Blue spotted salamander	<i>Ambystoma laterale</i>
Central newt	<i>Diemictylus viridescens</i>
Chorus frog	<i>Pseudacris triseriata</i>
Common snapping turtle	<i>Chelydra septentina</i>
Eastern gartersnake	<i>Thamnophis sirtalis</i>
Eastern gray treefrog	<i>Hyla versicolor</i>
Eastern hog-nosed snake	<i>Heteron platirhinos</i>
Eastern red-backed salamander	<i>Plethodon cinereus</i>
Four-toed salamander	<i>Hemidactylium sctatum</i>
Fox snake	<i>Elaphe vulpina</i>

Green frog	<i>Ranidae clamitans</i>
Leopard frog	<i>Rana pipiens</i>
Mink frog	<i>Rana septentrionalis</i>
Mudpuppy	<i>Necturus maculosus</i>
Northern prairie skink	<i>Eumeces septentrionalis</i>
Northern ring-necked snake	<i>Diadophis punctatus edwardsii</i>
Northern spring peeper	<i>Hyla crucifer</i>
Northern water snake	<i>Nerodia sepidon</i>
Painted turtle	<i>Chrysemys picta</i>
Ring-necked snake	<i>Diadophis punctatus</i>
Smooth green snake	<i>Opheodrys vernalis</i>
Spotted salamander	<i>Ambystoma maculatum</i>
Wood frog	<i>Rana sylvatica</i>
Wood turtle	<i>Glyptemys insculpta</i>

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, 2020a), 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.

A review of the WDNR Lakes and Aquatic Invasive Species (AIS) Mapping Tool only identified one species in the Project vicinity, reed canary grass (*Phalaris arundinacea*) (WDNR, 2020b). Currently only the ribbon grass cultivar is proposed to be listed as a restricted species under the rule (WDNR, 2020c). The remaining cultivars of reed canary grass are not currently or proposed to be classified as restricted or prohibited species.

The Ashland County Land and Water Conservation Department conducted aquatic invasive species monitoring on the White River Project reservoir in 2019. Narrowleaf cattail (*Typha angustifolia*), a restricted species under NR40, was identified within the reservoir during the surveys (WDNR, 2020d).

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.

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

Selected Regulated Aquatic Invasive Species in WI



Floating water hyacinth
(*Eichhornia crassipes*)



Starry stonewort
(*Nitellopsis obtusa*)



Hydrilla
(*Hydrilla verticillata*)



Anchored water hyacinth
(*Eichhornia azurea*)



Water lettuce
(*Pistia stratiotes*)



Faucet snail
(*Bithynia tentaculata*)



European frog-bit
(*Hydrocharis morsus-ranae*)



Brittle naiad
(*Najas minor*)



New Zealand mud snail
(*Potamopyrgus antipodarum*)



Spiny water flea
(*Bythotrephes cederstroemi*)



Malaysian trumpet snail
(*Melanoides tuberculata*)



Duck lettuce
(*Ottelia alismoides*)



Java waterdropwort
(*Oenanthe javanica*)



Quagga mussel
(*Dreissena rostriformis*)



Yellow floating heart
(*Nymphoides peltata*)



Brazilian waterweed
(*Egeria densa*)

Report any prohibited species as soon as possible by emailing: Invasive.Species@wi.gov.
This publication does not list all the regulated species. For the full list of Prohibited or Restricted species please visit:
www.dnr.wi.gov keyword: invasives

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



Asian clam
(*Corbicula fluminea*)



Floating marsh pennywort
(*Hydrocotyle ranunculoides*)



Didymo
(*Didymosphenia geminata*)



Giant salvinia
(*Salvinia molesta*)



Red swamp crayfish
(*Procambarus clarkii*)



Water spinach
(*Ipomoea aquatica*)



Killer algae
(*Caulerpa taxifolia*)



Asian marshweed
(*Limnophila sessiliflora*)



Indian swampweed
(*Hygrophila polysperma*)



Aquatic forget-me-not
(*Myosotis scorpioides*)



Spiny naiad
(*Najas marina*)



Curly-leaf pondweed
(*Potamogeton crispus*)



Zebra mussel
(*Dreissena polymorpha*)



Rusty crayfish
(*Orconectes rusticus*)



Chinese mystery snail
(*Cipangopaludina chinensis*)



Yellow Iris
(*Iris pseudacorus*)

Prohibited Species

Restricted Species

www.dnr.wi.gov keyword: invasives



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4.5.4 References

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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 White River Project vicinity is undeveloped except for formal recreation sites and the Project structures.

The riparian habitat at the White River Project is typical Superior Coastal Plain Ecological Landscape vegetation with a primary mixture of upland forest and forested wetlands. Typical upland forest cover types include a mix of aspen, basswood, birch, black cherry, red maple, sugar maple, and red oak. Typical forested wetland cover types consist of coniferous swamp species including northern white cedar, white pine, black ash, and yellow birch (WDNR, 2015).

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 White River reservoir, wetland functions include flood water storage, filtration, sedimentation reduction, and wildlife habitat and corridors. The value of wetlands in the White River Project vicinity include 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, 2020a).

Wetland boundaries are delineated based on unique hydrologic, soil, and vegetational parameters. Wetlands displayed at the Project are restricted to areas within and immediately adjacent to the White River and Project reservoir. The Wisconsin Wetland Inventory identified five classes of wetlands within the proposed Project boundary. In order of abundance, they include lake, freshwater forested/shrub, riverine, freshwater emergent, and freshwater pond wetlands. Figures displaying the wetlands in the White River Project vicinity for the current and proposed Project boundaries are 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, black spruce (*Picea mariana*), black ash, green ash (*Fraxinus pennsylvanica*), and silver maple (*Acer sacharinum*). Forested shrub wetlands are typically dominated by willow (*Salix spp.*), dogwood (*Cornus spp.*), and alder (*Alnus spp.*) species. Emergent wetlands include species such as cattails (*Typha spp.*), sedges (*Carex spp.*), grasses, and rushes. Freshwater pond wetlands include plant species such as pondweeds (*Potamogeton spp.*), common duckweed (*Lemna minor*), lotus (*Nelumbo spp.*), and water lilies (*Nymphaeaceae spp.*) (WDNR, 2020b).

4.6.3 Littoral Habitat

Littoral habitat is the transition between aquatic and terrestrial habitats and is prevalent along most reservoir margins. Within the White River Project boundary, littoral habitat is more prevalent within the main body of the reservoir, as compared to the more riverine areas. According to the WDNR White River Flowage Lakes Page, approximately one-third of the Project reservoir is less than three feet in depth (WDNR, 2020c).

4.6.4 References

- Wisconsin Department of Natural Resources (WDNR). 2015. 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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4.7 Rare, Threatened and Endangered Species (18 CFR § 5.6(d)(3)(vii))

4.7.1 Overview

The USFWS Information for Planning and Conservation (IPaC) website was accessed to develop an IPaC Resource List for the White River Project. Also, a state Endangered Resources Review was completed to identify potential threatened, endangered, and special concern species located within the White River Project vicinity.

4.7.2 IPaC Resource List

The IPaC Resource Lists identified two federally endangered and three federally threatened species likely to occur within the Project vicinity. These include the Canada lynx (*Lynx canadensis*), gray wolf (*Canis lupus*), Northern long-eared bat (*Myotis septentrionalis*), piping plover (*Charadrius melodus*), and Fassets locoweed (*Oxytropis campestris* var. *chartacea*). The IPaC Resource List for the White River Project is included in **Appendix 4.7.2-1**.

4.7.2.1 Canada Lynx

The Canada lynx is a federally endangered mammal species associated with moist, cool, boreal spruce-fir forests, with rolling terrain. The lynx depends on snowshoe hare populations for food and needs persistent deep powdery snow, which limits predator competition. There is no designated critical habitat for this species in the Project vicinity (USFWS, 2020a). The species may pass through the Project.

4.7.2.2 Gray Wolf

The gray wolf is a federally endangered mammal that lives in family groups or packs. The wolf is a habitat generalist that can have territories ranging from 20 to 120 square miles (WDNR, 2020a). 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, 2020a). 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, a proposed rule delisting the gray wolf was printed in the Federal Register. The public comment period on the proposed rule closed on July 31, 2019. A final determination on whether to remove the species from the federal endangered species list should be made within one year of that date. If the species is removed from the list, management of the species will be returned to the states (USFWS, 2020b).

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. Ashland County is within the NLEB range (USFWS, 2020c). However, according to a Natural Heritage Inventory (NHI) search, no element occurrences of hibernacula or maternity roost trees were identified within or adjacent to the White River Project.

4.7.2.4 Piping Plover



The piping plover (*Charadrius melodus*) is a state and federally endangered bird species. It prefers large isolated cobble beaches on the shores of Lake Superior and Lake Michigan. The recommended avoidance period is May 15 to July 30. According to the WDNR website, the species is located in Ashland and other counties as shown in **Figure 4.7.2.4-1** (WDNR, 2020b). There is no suitable habitat for the species within the Project vicinity.

Figure 4.7.2.4-1: General Known Occurrence of the Piping Plover

4.7.2.5 Fasset's Locoweed



Fasset's locoweed (*Oxytropis campestris var. chartacea*) is a state endangered and federally threatened plant species. It is found in sandy fluctuating lakeshores and its appearance is sporadic depending on water level. Blooming occurs from early May through late June and fruiting occurs from late June through late July. According to the WDNR website, the species is located in Bayfield and other counties as shown in **Figure 4.7.2.5-1** (WDNR, 2020c).

Figure 4.7.2.5-1: General Known Occurrence of the Fasset's Locoweed

4.7.3 Wisconsin Natural Heritage Inventory Review

Review of the Natural Heritage Inventory indicates two state-listed threatened species and one special concern species are likely to occur within the White River Project vicinity. These species are shown in **Table 4.7.3-1** below and described in the following paragraphs (WDNR, 2020d).

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	<i>Haliaeetus leucocephalus</i>	Bird	-	Eagle Act
Flat-headed mayfly	<i>Maccaffertium pulchellum</i>	Insect	SC	-
Upland sandpiper	<i>Bartramia longicauda</i>	Bird	THR	-
Wood turtle	<i>Gleptemys insculpta</i>	Reptile	THR	-

* 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 IPaC resource list identified the bald eagle (*Haliaeetus leucocephalus*) as likely to occur within the Project vicinity. The state NHI review indicates bald eagles are located along the White River; however, no eagle nests were identified within a 1-mile buffer of the Project boundary (WDNR, 2020d). 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 Flat-headed Mayfly

Flat-headed mayfly (*Maccaffertium pulchellum*) is a Wisconsin special concern insect species. The insect spends most of its life in the water as a nymph and then emerges as an adult for only a short period, typically only a day or so. Females deposit eggs in the water, usually in streams and rivers that are relatively clean. Larvae feed on detritus and other plant materials. Adults do not feed (National Wildlife Federation, 2020). According to the WDNR website, the species is known to occur in Ashland County and additional counties, as shown in **Figure 4.7.3.2-1**.



Figure 4.7.3.2-1: General Known Occurrence of Flat-headed Mayfly

4.7.3.3 Upland Sandpiper

The upland sandpiper (*Bartramia longicauda*) is a Wisconsin threatened bird species. The sandpiper prefers grasslands with low to moderate forb cover, less than 5% woody cover, moderate grass cover, moderate litter cover, and little bare ground. Dominant breeding habitats in Wisconsin include lightly grazed pastures, old fields, idle upland grasslands, barrens, and hayfields for nesting. Heavily grazed pasture, hayfields, fallow fields, and row crops are used for foraging. The recommended avoidance period is April 30 to July 25 (WDNR, 2020e). According to the WDNR website, the upland sandpiper is known to occur in Ashland County and additional counties, as shown in **Figure 4.7.3.3-1**.



Figure 4.7.3.3-1: General Known Occurrence of the Upland Sandpiper

4.7.3.4 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. The turtle may remain active into late October. This semi-terrestrial species typically remains within about 1,000 feet of rivers and streams. They 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 200 feet of the water. Hatching occurs from mid-July through mid-September depending on air temperatures. This species does not overwinter in nests, unlike other turtle species (WDNR, 2020f). According to the WDNR website, the wood turtle is known to occur in Ashland County and additional counties, as shown in **Figure 4.7.3.4-1**.



Figure 4.7.3.4-1: General Known Occurrence of the Wood Turtle

4.7.4 Summary

The Licensee is not proposing any new facilities or changes to the current operations for the White River Project. As such, continued operation is not expected to adversely impact any rare, threatened, or endangered species in the area. Maintenance activities at any facility or removal of trees within the boundary of the White River Project will need to be completed in accordance with requirements outlined in the § 4(d) rule created for the NLEB, which is provided in **Appendix 4.7.4-1**.

4.7.5 References

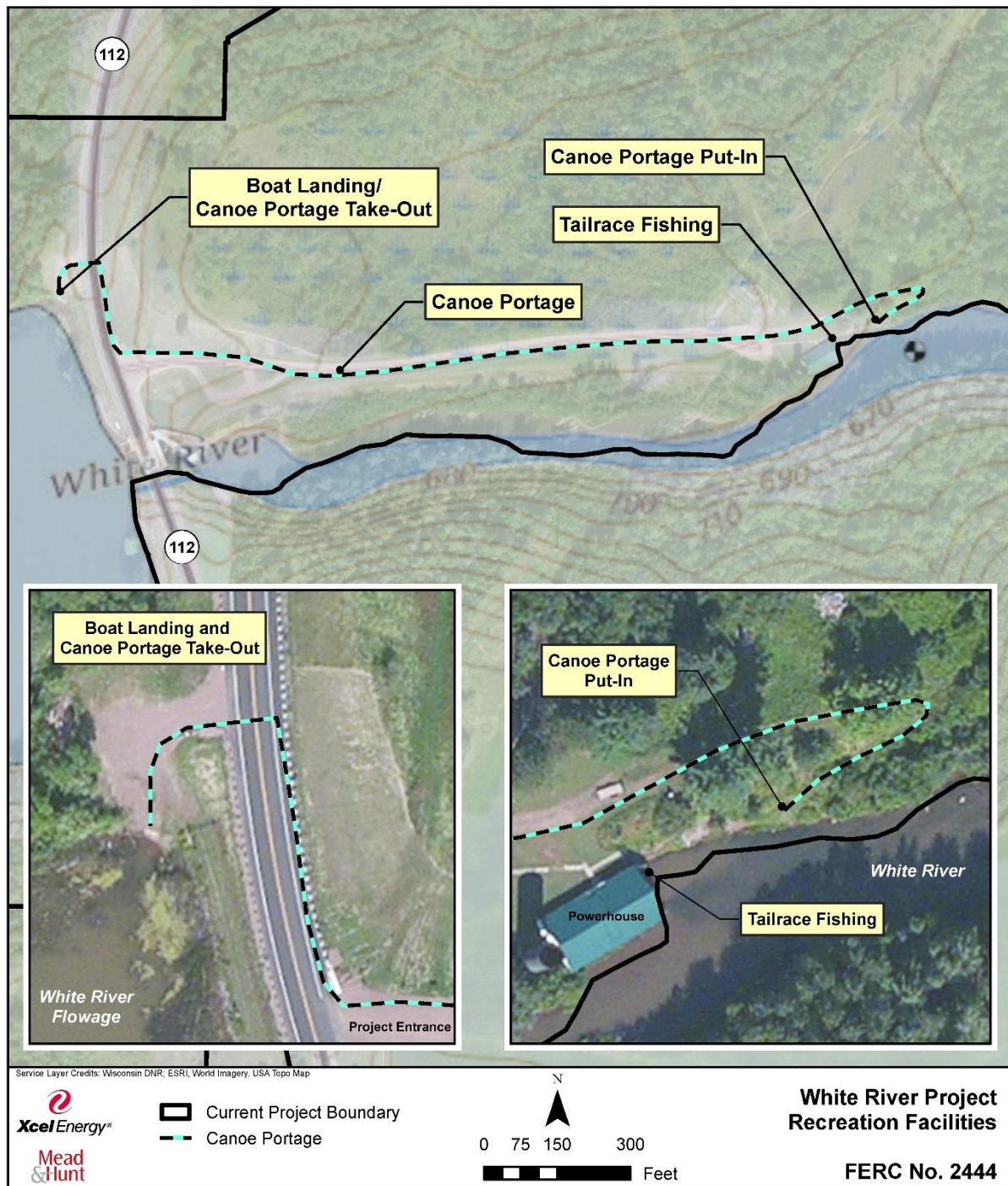
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4.8 Recreation and Land Use (18 CFR § 5.6(d)(3)(viii))

4.8.1 White River Project Existing Recreational Facilities and Opportunities

Many opportunities for fishing, wildlife viewing, and water sports are available within the White River Project vicinity. Existing recreation facilities within the Project boundary are shown in **Figure 4.8.1-1**. Recreation opportunities are described in the following paragraphs.

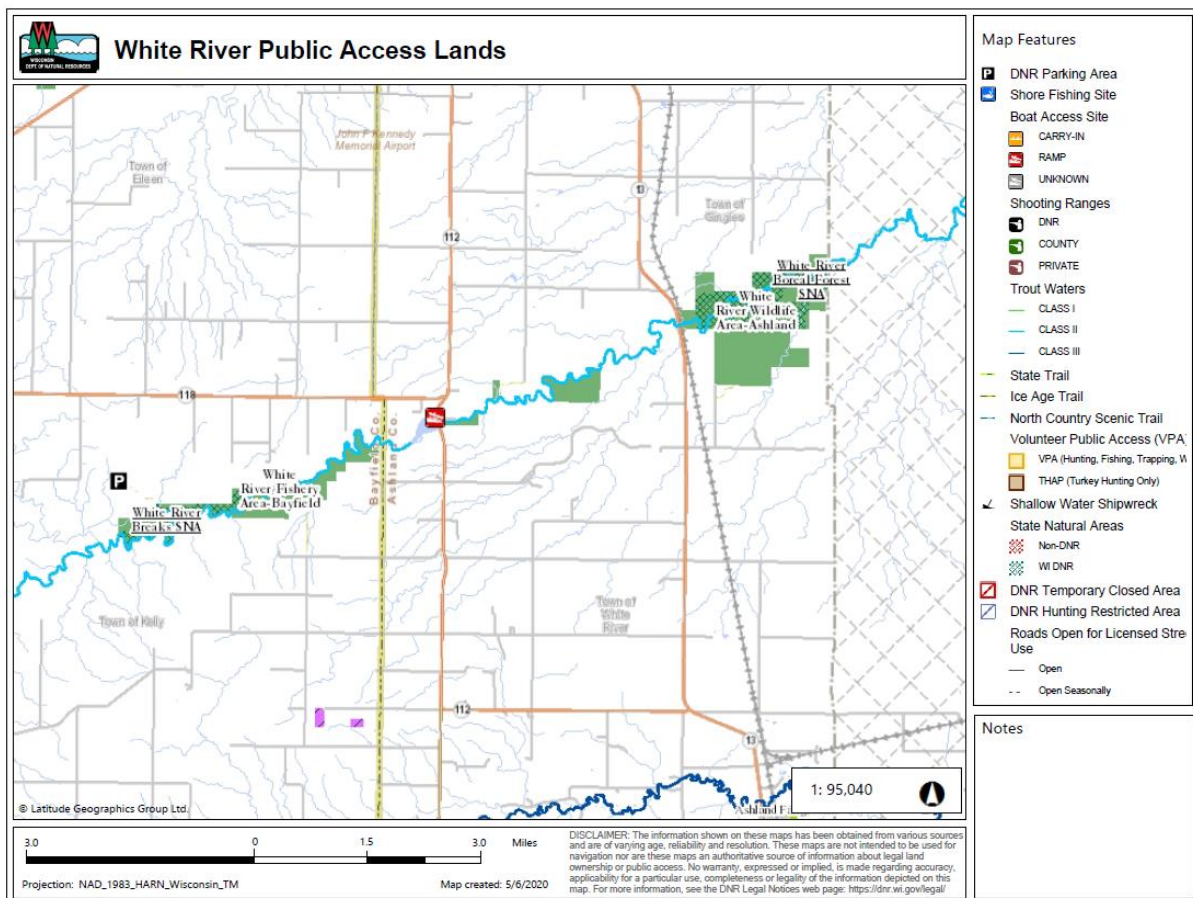
Figure 4.8.1-1: Recreation Facilities within the White River Project Boundary



4.8.1.1 White River Fishery Area

The White River Fishery Area was established in 1961 to manage and protect this unique and scenic trout stream and watershed. The eastern portion of the White River Fisheries area is located on scattered riverfront parcels of land upstream and downstream of the Project within both Bayfield and Ashland Counties. The multiple use area is dedicated to trout fishing, hunting, canoeing, and other outdoor recreational and educational activities (WDNR, 2020a). One state natural area, White River Breaks SNA, is located within the eastern portion of the fishery area and is situated along the steep banks of the White River. The area features unique forests comprised of boreal forest species and was designated as a SNA in 2013 (WDNR, 2020b). **Figure 4.8.1.1-1** shows the location of the White River Fishery Area and White River Breaks SNA and other public access lands in the Project vicinity.

Figure 4.8.1.1-1: White River Public Access Lands



4.8.1.2 White River Boat Landing, Canoe Portage, and Tailrace Fishing Area

The White River Boat Landing is located on the north shoreline of the White River Flowage adjacent to State Highway 112. The landing provides a concrete plank ramp and gravel parking lot which can accommodate four cars. The landing serves as a take-out location for canoers and kayakers to bypass the dam and bypass reach, as well as an area to launch small boats onto the reservoir for recreational activities such as fishing and waterfowl hunting (**Figure 4.8.1.2-1**). The canoe portage extends from the boat landing, east across State Highway 112, then along the Project entry road to the powerhouse, and to the tailrace area downstream from the powerhouse. The canoe portage put-in and tailrace bank fishing area is shown in **Figure 4.8.1.2-2**. All facilities are owned and maintained by NSPW.

Figure 4.8.1.2-1: White River Flowage Boat Landing/Canoe Portage Take-out



Figure 4.8.1.2-2: Canoe Portage Put-In/Tailrace Fishing Area

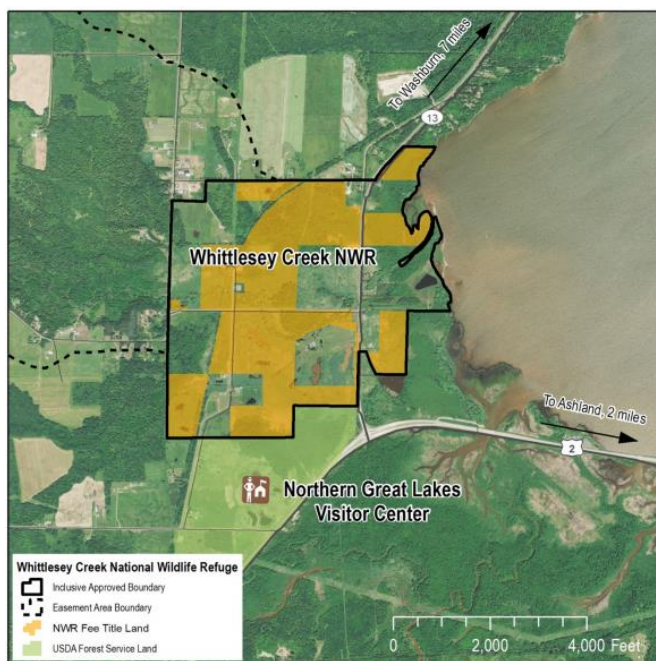


4.8.1.3 White River Wildlife Area

The White River Wildlife Area is located approximately 5.8 river miles downstream of the White River Project and immediately downstream of State Highway 13. The 1,120-acre area was established in 1946 to protect winter deer habitat and is still used to some extent today by wintering deer. However, the once dense balsam fir and young white pine that lined the steep and deep gullies along the White River have since matured or have been heavily browsed, significantly decreasing the value of winter habitat. The area is entirely wooded and features several habitats important to a range of wildlife species. The White River is an important tributary to the Bad River and provides fishing opportunities, with an annual anadromous run of steelhead from Lake Superior (WDNR 2020c). The White River Boreal Forest SNA is within the wildlife area. This SNA supports good quality boreal forest and mesic floodplain terrace communities and helps maintain a critical connection between the White River Breaks SNA, upstream of the White River Project, and Bad River Indian Reservation. The boreal forest occurs on the narrow ridge-tops and steep clay slopes along the White River and is one of the best examples of this forest type outside of the area immediately adjacent to Lake Superior (WDNR, 2020d). The location of the White River Wildlife Area, White River Boreal Forest SNA, and other public access lands in the Project vicinity are shown in **Figure 4.8.1.1-1** in Section 4.8.1.1 above.

4.8.1.4 Whittlesey Creek National Wildlife Refuge

The Whittlesey Creek National Wildlife Refuge was established in 1999 to protect, restore, and manage coastal wetland and spring fed stream habitat in Bayfield County. The area was used to



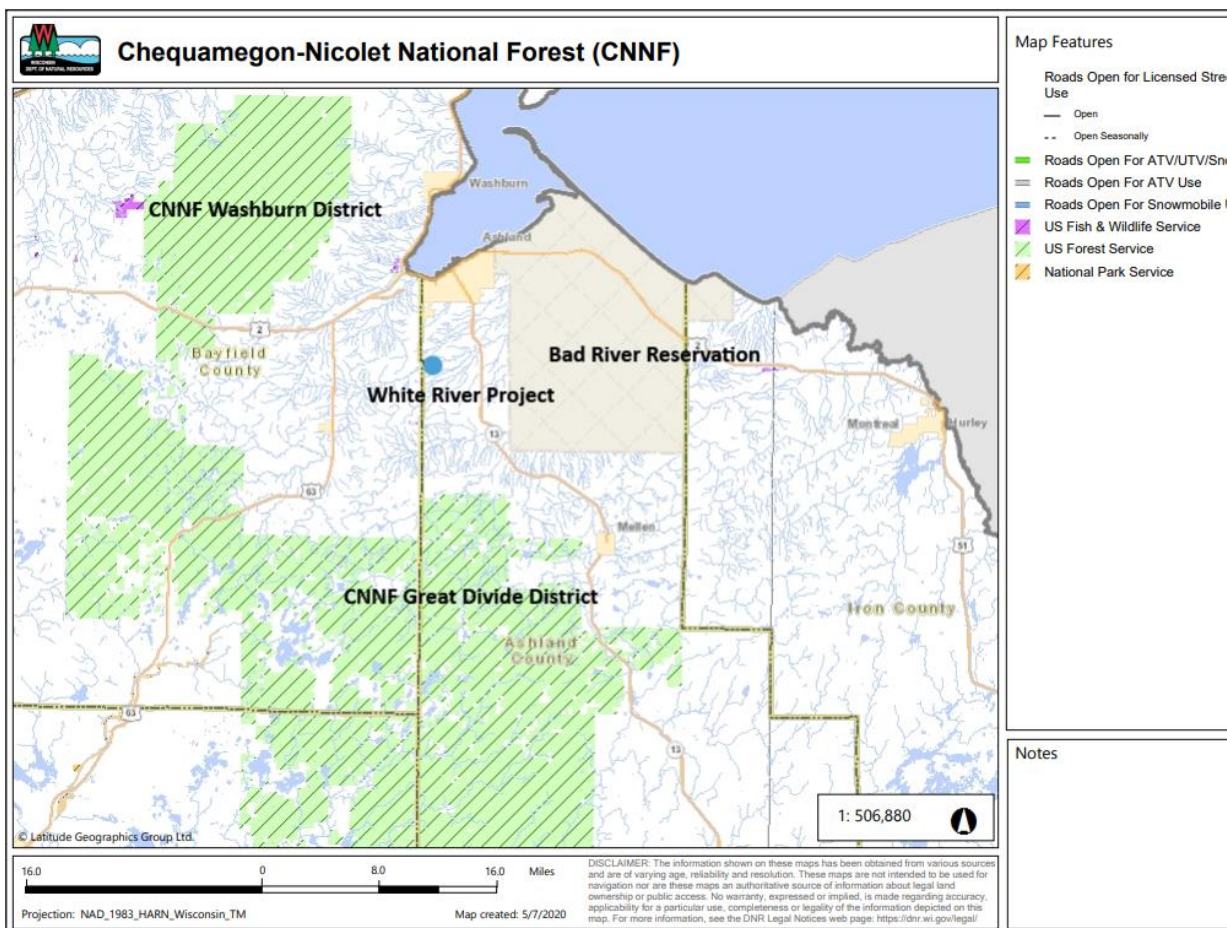
restore the coaster brook trout (*Salvelinus fontinalis*), a native trout that spawns in Whittlesey Creek and spends its adult life in Lake Superior. The WCNW Refuge is about two miles west of the City of Ashland and is part of a large wetland and floodplain complex on the south shore of Lake Superior. A total of 304 acres have been acquired by the WCNW Refuge (USFWS, 2020). The Northern Great Lakes Visitor Center, which is described in **Section 4.9.2.1**, is located directly to the south, as shown in **Figure 4.8.1.4-1**. Recreational activities allowed on the WCNW Refuge include archery deer hunting, waterfowl hunting, fishing, wildlife observation, and wildlife photography.

Figure 4.8.1.4-1: Whittlesey Creek National Wildlife Refuge

4.8.1.5 Chequamegon-Nicolet National Forest

The Chequamegon-Nicolet National Forest (CNNF) was formed when the former Chequamegon and Nicolet National Forests were combined into one forest in February of 1998. The Chequamegon portion of the CNNF covers about 858,400 acres in Ashland, Bayfield, Sawyer, Price, Taylor, and Vilas Counties (USFS, 2020a). The Washburn and Great Divide Ranger Districts are located near the White River Project. The lands within the CNNF are managed for multiple uses including forestry, wildlife habitat, outdoor recreation, fisheries management, special forest products gathering, wilderness, and natural area management. Available outdoor recreation activities include: all-terrain vehicle trail riding, bicycling, camping, fishing, hiking, horseback riding, hunting, nature viewing, picnicking, water based activities (swimming, boating, canoeing, kayaking), and winter sports activities (cross-country skiing, snowmobiling, snowshoeing) (USFS, 2020b). **Figure 4.8.1.5-1** on the following page shows the location of the Project relative to the CNNF (WDNR, 2020e).

Figure 4.8.1.5-1: Chequamegon-Nicolet National Forest



WDNR, 2020e

4.8.2 Recreation Needs Identified in Management Plans

4.8.2.1 State of Wisconsin

The Statewide Comprehensive Outdoor Recreation Plan (SCORP) 2019-2023 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 White River Project vicinity help fulfill these goals. A copy of the SCORP is provided in **Appendix 4.8.2.1-1**.

4.8.2.2 Ashland County, Wisconsin

Ashland County maintains a 40,083-acre county forest. The forest is located in the southeastern portion of the county, well outside of the Project vicinity (Ashland County, 2020). No comprehensive county-wide outdoor recreation plan was identified in the literature review.

4.8.2.3 Town of White River, Wisconsin

The Town of White River Comprehensive Plan 2006-2025 Policy Document was approved on November 28, 2006. The plan describes the goals, objectives, and policies to implement the community's vision. From a recreation standpoint, the town identified a need to increase the number of public recreational facilities and trails within its boundary and expressed support for the establishment and maintenance of recreational boat landings (Town of White River, 2006). NSPW has an existing

boat landing to launch motorized and non-motorized boats on the reservoir and non-motorized boats downstream of the powerhouse. NSPW intends to continue to maintain these facilities throughout the term of any subsequent issued license. A copy of the township's plan is provided in **Appendix 4.8.2.3-1**.

4.8.3 Recreation Accessibility Under the Americans with Disabilities Act

There are no known Americans with Disabilities Act recreational facilities in the Project vicinity.

4.8.4 References

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

Ashland County encompasses a total of 2,294 square miles, with more than half of the area in the form of water (Lake Superior, inland lakes, rivers, and streams). Approximately 25% of the county's land base consists of wetlands that are two-acres or greater in size (UW Extension, 2016). In the Project vicinity, the Lake Superior Coastal Plain is dissected by the deeply incised White River and its tributaries as it flows towards Lake Superior. The topography surrounding the White River Project varies up to 188 feet in elevation; the highest land surface elevation of about 850 feet descending to the White River surface elevation about 662 feet downstream of the powerhouse (USGS, 2020).

4.9.1 Visual Character of Project Land and Waters

The view from the White River Project Dam upstream is dominated by the reservoir, safety buoys, and undeveloped scenic wooded shoreline, as shown below in **Figure 4.9.1-1**.

Figure 4.9.1-1: View Upstream from the White River Dam



Looking south from the left upstream earthen embankment provides a view of the intake section, safety buoys, and right earthen embankment, as shown below in **Figure 4.9.1-2**.

Figure 4.9.1-2: View of the White River Reservoir



The White River downstream of the Project powerhouse can be seen in **Figure 4.9.1-3**.

Figure 4.9.1-3: White River Downstream of the Powerhouse



The bypass reach of the White River between the dam and powerhouse is shown in **Figure 4.9.1-4**.

Figure 4.9.1-4: White River Bypass Reach



4.9.2 Nearby Scenic Attractions

4.9.2.1 Northern Great Lakes Visitor Center

The Northern Great Lakes Visitor Center (Center) is located about two miles west of the City of Ashland. The Center, shown in **Figure 4.9.2.1-1** on the following page, provides a geographic and natural history museum with interactive exhibits and serves as the contact station for the WCNW Refuge. There are several interactive and educational exhibits that focus on the history and heritage of Lake Superior. Visitors can use the large maps to plan trips in the area. There are nature trails around the facility and environmental education activities scheduled throughout the year. A five-story observation deck provides 360-degree views of the Whittlesey Creek National Wildlife Refuge and Lake Superior. The Center also provides a gift shop and meeting rooms for public use (Superiortrails.com, 2020).

Figure 4.9.2.1-1: Northern Great Lakes Visitor Center



4.9.2.2 Ashland Breakwater Lighthouse

The Ashland Breakwater Lighthouse is a reinforced concrete lighthouse built in 1915 and is located at the end of a long and detached breakwater, which creates an artificial harbor. The tower is cylindrical, with a watch room on a hexagonal white pyramid tower with a red cap on the lantern, which flashes every six seconds (Travelwisconsin.com, 2020). The lighthouse is shown in **Figure 4.9.2.2-1**.

Figure 4.9.2.2-1: Ashland Breakwater Lighthouse



4.9.2.3 Copper Falls State Park

Copper Falls State Park is located approximately 15.5 miles southeast of the White River Project, near Mellen, Wisconsin. The park contains 2,251 acres of land along the Bad River, which tumbles over the 29-foot high Copper Falls into a scenic, narrow gorge as shown below in **Figure 4.9.2.3-1**.

The coppery hue of the water gives the falls its name. Amenities include 17 miles of hiking trails, two one-way mountain biking trails, a campground, swimming beach, picnic areas, playground, and concession stand. In the winter, the park features 13.7 miles of classic ski trails and 6.5 miles of skate ski trails (WDNR, 2020).

Figure 4.9.2.3-1: Copper Falls



4.9.3 References

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

The Wisconsin Historical Society - State 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 or Register). An area of potential effect was established to identify historic and archaeological resources within the current Project boundary (NSPW,1991).

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 White River Project.

The original dam was constructed prior to 1884 to provide mechanical power for a sawmill and was reconstructed in 1907 to generate electricity by the White River Power Company. The dam was washed out by a flood in 1926 and the present dam was rebuilt by the Lake Superior District Power Company in 1927 (NSPW, 2008).

A review of the Wisconsin Architecture and History Inventory located three structures within the Project boundary. Site number 26204 is the White River State Highway 112 Bridge, site number 26205 is the White River Dam, and site number 26206 is the White River powerhouse and surge tank. All facilities were evaluated in 1990 and determined not eligible for inclusion in the Register (SHPO, 2020).

Site 26204, the State Highway 112 Bridge was rebuilt in 1985 and is under 50 years old. Sites 26205 and 26206 were evaluated for potentially having local significance under NRHP criterion A and C under the significance areas of Industry and Engineering. Based on criterion A, the sites were determined not of special significance. Based on criterion C, the modernization of the facilities since they were installed has altered the level of their integrity such that it is too low to justify inclusion in the NRHP based on the importance of its connection with the theme of engineering. Additionally, none of the facilities are of sufficient importance or rarity that their survival in an altered state would warrant inclusion in the NRHP (NSPW, 1991).

4.10.2 Archaeological Resources

WHPD includes information on previously surveyed areas and locations of any known archaeological sites within the White River Project. A search for previously surveyed areas and archaeological sites within the White River Project boundary identified only one prior survey which is summarized in **Table 4.10.2-1**. The survey did not reveal any previously unidentified archaeological sites (SHPO, 2020).

Table 4.10.2-1: Previous Archaeological Surveys within the White River Project Boundary

SHPO Project #	Report Author	Type of Survey	Results
89-2348	Christina Harrison	Phase 1 Survey of White River Hydro Project Shoreline	No new cultural material or features identified

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, 2020).

4.10.3.1 Forest County Potawatomi

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

4.10.3.2 Ho-Chunk Nation

The Ho-Chunk, 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 repurchased. 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 United States Bureau of Indian Affairs; non-tribal regulations generally do not apply. The Menominee also hold a small amount of land within the Town of Red Springs in 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, however 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).

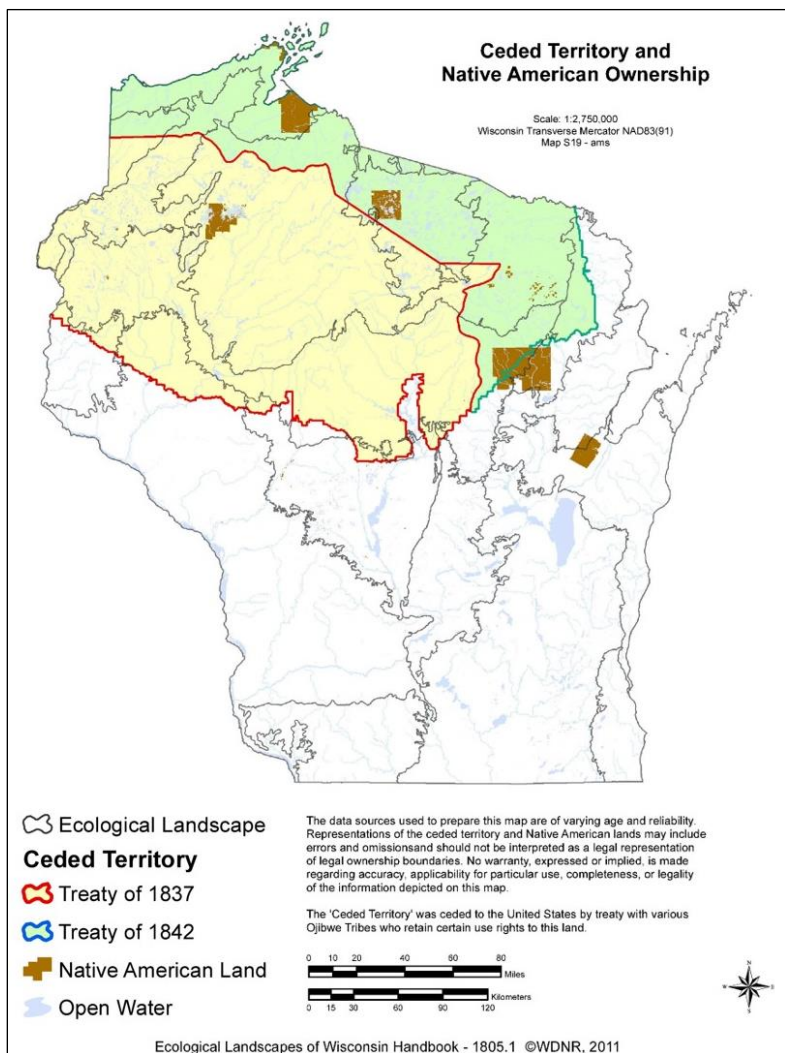
4.10.3.6 Ojibwe (Chippewa) Tribes

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 United States Government in 1825. The Treaty forced 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** below. The White River 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 June 2019 asking for any known information or known potential impacts of the White River Project operations. Tribal representatives who were sent questionnaires are listed below in **Table 4.10.3.7-1**. No tribal responses to the questionnaire were received by NSPW. A discussion of the questionnaire and responses received is included in [Section 6](#).

Table 4.10.3.7-1: Tribal Representatives Consulted Through Questionnaires

Name	Organization
Mr. Michael Wiggins	Bad River Band of Lake Superior Chippewa
Ms. Edith Leoso	Bad River Band of Lake Superior Chippewa
Mr. Clinton Parish	Bay Mills Indian Community of Michigan
Mr. Marcus Ammesmake	Fond du Lac Band of Lake Superior Chippewa
Ms. Karen Diver	Fond du Lac Band of Lake Superior Chippewa
Mr. Ned Daniels, Jr.	Forest County Potawatomi Community of Wisconsin
Mr. Michael LaRonge	Forest County Potawatomi Community of Wisconsin
Mr. Mark Azure	Fort Belknap Indian Community
Mr. Michael Blackwolf	Fort Belknap Indian Community
Mr. William Quackenbush	Ho-chunk Nation Executive Offices
Mr. Gary Loonsfoot	Keweenaw Bay Indian Community
Mr. Warren Swartz	Keweenaw Bay Indian Community
Mr. Brian Bisonette	Lac Courte Oreilles Band of Lake Superior Chippewa Indians
Mr. Mic Isham	Lac Courte Oreilles Band of Lake Superior Chippewa Indians
Ms. Melinda Young	Lac du Flambeau Band of Lake Superior Chippewa Indians
Joseph Wildcat, Sr.	Lac Du Flambeau Band of Lake Superior Chippewa Indians
Ms. Daisy McGeshick	Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Mr. James Williams	Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Ms. Amy Burnette	Leech Lake Band of Chippewa Indians
Ms. Carri Jones	Leech Lake Band of Chippewa Indians
Ms. Regina Gasco-Bentley	Little Traverse Bay Band of Odawa Indians
Ms. Melissa Waitrolik	Little Traverse Bay Band of Odawa Indians
Ms. Joan Delabreau	Menominee Indian Tribe of Wisconsin
Mr. David Grignon	Menominee Indian Tribe of Wisconsin
Ms. Diane Hunter	Miami Tribe of Oklahoma
Mr. Douglas Lankford	Miami Tribe of Oklahoma
Ms. Melanie Benjamin	Mille Lacs Band of Ojibwe
Ms. Natalie Weyaus	Mille Lacs Band of Ojibwe
Ms. Catherine Chavers	Minnesota Chippewa Tribe
Ms. Tehassi Hill	Oneida Nation of Wisconsin
Mr. Chad Able	Red Cliff Band of Lake Superior Chippewa Indians
Mr. Brian Brainbridge	Red Cliff Band of Lake Superior Chippewa Indians
Mr. Marvin Defoe	Red Cliff Band of Lake Superior Chippewa Indians
Mr. Chris McGeshick	Sokaogon Chippewa Community/Mole Lake Band
Mr. Adam VanZile	Sokaogon Chippewa Community/Mole Lake Band
Mr. Lewis Taylor	St. Croix Chippewa Indians of Wisconsin
Ms. Shannon Holsey	Stockbridge-Munsee Community Band of Mohican Indians
Ms. Sherry White	Stockbridge-Munsee Community of Wisconsin
Ms. Jamie Arsenault	White Earth Band of the Minnesota Chippewa
Ms. Erma Vizenor	White Earth Band of Minnesota Chippewa

4.10.3.8 Tribal Representatives Consulted via FERC Letter

On July 18, 2019, the FERC issued letters to tribal representatives outlined in **Table 4.10.3.8-1**, initiating Tribal consultation for the relicensing process for the White River Project (FERC, 2019). The FERC followed up with the tribes by telephone and email on August 30, 2019 to determine if any were interested in participating in consultation for the White River Project (FERC, 2020).

On August 5, 2019, the Leech Lake Band of Ojibwe stated by email that the Tribe has no sites of religious or cultural significance in the Project area. The tribe also requested to be notified in the event of an inadvertent discovery of cultural artifacts or human remains (Leech Lake Band of Ojibwe, 2019).

On August 16, 2019, the Miami Tribe of Oklahoma filed a letter accepting the invitation to consult and requested that the Tribe be notified if artifacts or human remains are discovered (Miami Tribe of Oklahoma, 2019). The FERC was unable to reach the Tribe via a follow-up phone call in January 2020 and a follow-up email on March 12, 2020 to discuss the Tribe's interest in consulting (FERC, 2020).

On September 3, 2019, the Little Traverse Bay Band of Odawa Indians was reached by phone and expressed a possible interest in consulting. The band indicated it would review the Project and notify the FERC if it wanted to consult. No further communication was received (FERC, 2020).

On September 5, 2019, the Bad River Band of Ottawa and Chippewa Indians expressed interest in a consultation meeting for the Project. The FERC was unable to reach the Bad River Band via a follow-up phone call in January 2020 or a follow-up email on March 9, 2020 (FERC, 2020).

Table 4.10.3.8-1: Tribal Representatives Invited by the FERC to Participate

Name	Organization
Ms. Edith Leoso	Bad River Band of the Lake Superior Tribe of Chippewa Indians
Mr. Michael Wiggins	Bad River Band of the Lake Superior Tribe of Chippewa Indians
Mr. Marcus Ammesmake	Fond du Lacey Band of Minnesota Chippewa Tribe
Ms. Karen Driver	Fond du Lac Band of Minnesota Chippewa Tribe
Mr. Mark L. Azure	Fort Belknap Indian Community
Mr. Michael Blackwolf	Fort Belknap Indian Community
Norman Des Champe	Grand Portage Band of Chippewa Indians
Mary Ann Gagnon	Grand Portage Band of Chippewa Indians
Mr. Gary Loosnfoot	Keweenaw Bay Indian Community
Mr. Warren Swartz	Keweenaw Bay Indian Community
Mr. Michael Isham	Lac Courte Oreilles Band of Lake Superior Chippewa Indians
Mr. Jerry Smith	Lac Courte Oreilles Band of Lake Superior Chippewa Indians
Mr. Henry Butch St. Germain	Lac du Flambeau Band of Lake Superior Indians
Ms. Melinda Young	Lac du Flambeau Band of Lake Superior Chippewa
Ms. Daisy McGeshick	Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan

Mr. James Williams	Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
Ms. Amy Brunette	Leech Lake Band of Minnesota Chippewa Tribe
Ms. Carri Jones	Leech Lake Band of Minnesota Chippewa Tribe
Ms. Regina Gasco-Bentley	Little Traverse Bay Band of Odawa Indians
Ms. Melissa Waitrolik	Little Traverse Bay Band of Odawa Indians
Ms. Joan Delabreau	Menominee Indian Tribe of Wisconsin
Mr. David Grignon	Menominee Indian Tribe of Wisconsin
Ms. Diane Hunter	Miami Tribe of Oklahoma
Mr. Douglas Lankford	Miami Tribe of Oklahoma
Ms. Melanie Benjamin	Mille Lacs Band of Ojibwe
Ms. Natalie Weyaus	Mille Lacs Band of Ojibwe
Mr. Norman Deschampe	Minnesota Chippewa Tribe
Mr. Bryan Bainbridge	Red Cliff Band of Lake Superior Chippewa Indians
Mr. Marvin Defoe	Red Cliff Band of Lake Superior Chippewa Indians
Mr. Chris McGeshick	Sokaogon Chippewa Community of Wisconsin
Mr. Lewis Taylor	St. Croix Chippewa Indians of Wisconsin
Ms. Cayla Olson	White Earth Band of the Minnesota Chippewa Tribe
Ms. Erma Vizenor	White Earth Band of the Minnesota Chippewa Tribe

4.10.4 Programmatic Agreement

Standard archaeological and cultural resource concerns that a Licensee must address during the FERC relicensing process are outlined in the pre-licensing procedure section of the *Programmatic Agreement among the Federal Energy Regulatory Commission, et al., 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 Programmatic Agreement assigns each Licensee the responsibility to ensure historic properties are considered in the continued operation and maintenance of hydroelectric facilities during the term of their federal licenses. Based on information available herein and the requirements outlined in the Programmatic Agreement, if future operation continues to follow the requirements outlined in the Programmatic Agreement, it is unlikely continued operation of the Project will have an adverse effect on historic resources.

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. 2019. Letter Inviting Tribal Leaders to Participate in the Relicensing Process for the White River Hydroelectric Project under P-2444. July 19, 2019.
- Federal Energy Regulatory Commission. 2020. Telephone Memo: Consultation with Tribes for the White River Hydroelectric Project No. 2444. March 12, 2020.
- Leech Lake Band of Ojibwe. 2019. Tribal Historic Preservation Office Submits Comment regarding the Proposed White River Hydroelectric Project under P-2444. July 31, 2019.
- Loew, Patty. 2001. Indian Nations of Wisconsin-Histories Endurance and Renewal.
- Miami Tribe of Oklahoma. 2019. Comments from Miami Tribe of Oklahoma under P-2444 White River Hydroelectric Project. August 16, 2019.
- Northern States Power Company-Wisconsin (NSPW). 1991. Application for a Subsequent License for a Minor Water Power Project, White River Hydroelectric Project (FERC No. 2444). December 1991.
- Northern States Power Company-Wisconsin (NSPW), 2008. White River Hydroelectric Project, FERC No 2444 Supporting Technical Information Document. December 2008.
- Wisconsin Department of Public Instruction (WDPI). 2020. Tribal Nations of Wisconsin. <https://dpi.wi.gov/amind/tribalnationswi>. Accessed April 1, 2020.
- Wisconsin Historical Society - State Historic Preservation Office (SHPO). 2020. Wisconsin Historic Preservation Database. Accessed May 8, 2020.

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 Ashland and Ashland County, Wisconsin.

4.11.1 Population and Housing Patterns

The 2010 populations for the City of Ashland and Ashland County were 8,216 and 16,157, respectively. The population density in the City of Ashland is 612 people per square mile with 262.0 households per square mile. The population density in Ashland County is 15.5 people per square mile with 3.4 households per square mile (U.S. Census Bureau, 2010).

The population of the City of Ashland and Ashland County declined from 2000 and 2010. Between 1970 and 1980 the population of Ashland County increased slightly. Beginning in 1980, the population of the county has shown a consistent decline. Historical population information and population forecasts can be found in **Table 4.11.1-1** and **Table 4.11.1-2**, respectively. Data used to populate the historic and forecasted populations tables is located in **Appendix 4.11.1-1**.

Table 4.11.1-1: Historical Population Data

Municipality	1970	1980	1990	2000	2010	Population Change 2000-2010
City of Ashland, WI	N/A	N/A	N/A	8,620	8,216	(-4.7%)
Ashland County, WI	16,743	16,783	16,307	16,866	16,157	(-4.2%)

Source: WDOA, 2020

Table 4.11.1-2: Population Forecast Data

Year	2010-Census	2020*	2030*	2040*
City of Ashland, WI	8,216	8,079	7,944	7,811
Ashland County, WI	16,157	15,887	15,622	15,361

Source: U.S. Census Bureau, 2000; U.S. Census Bureau, 2010; WDOA, 2013

* Calculated using WDOA growth estimate from 2010 to 2040

The Wisconsin Department of Administration projects a 5% population decrease in Ashland County from 16,157 to 15,361 between 2010 to 2040 (WDOA, 2013). When using the same population growth rate for the City of Ashland, the projected population is anticipated to decline from 8,216 to 7,811.

4.11.2 Economic Patterns

The City of Ashland's top three employment sectors are the educational services, health care, and social assistance sector; retail trade sector; and arts, entertainment, recreation, accommodation, and food services sector. Ashland County's top three employment sectors are the educational services, health care, social assistance sector, the manufacturing sector, and the retail trade sector. City of Ashland and Ashland County employment status based on industry sector, estimated number of jobs, and percentage of jobs are summarized in **Table 4.11.2-1** on the following page. Raw data used to populate the employment status tables is provided in **Appendix 4.11.2-1**.

Table 4.11.2-1: Employment Status, City of Ashland and Ashland County, Wisconsin

Industry Sector	City of Ashland		Ashland County	
	Estimated # of Jobs	% Jobs*	Estimated # of Jobs	% Jobs*
Civilian employed population 16 years and over	3,970	-	7,366	-
Agriculture, forestry, fishing, hunting, mining	85	2%	259	4%
Construction	203	5%	537	7%
Manufacturing	378	10%	943	13%
Wholesale trade	46	1%	80	1%
Retail trade	535	14%	882	12%
Transportation, warehousing, utilities	109	3%	266	4%
Information	36	1%	79	1%
Finance and insurance, real estate, rental, leasing	122	3%	263	4%
Professional, scientific, management; administrative; waste management services	187	5%	318	4%
Educational services, health care, social assistance	1,347	34%	2,144	29%
Arts, entertainment, recreation, accommodation, food services	525	13%	863	12%
Other services, except public administration	179	5%	293	4%
Public administration	218	5%	439	6%

*May not add to 100% due to rounding. Source: U.S. Census Bureau, 2017a; U.S. Census Bureau, 2017b

The City of Ashland and Ashland County have a strong economic base in the educational services, health care, and social assistance sector, followed closely by the retail trade sector, manufacturing sector, and arts, entertainment, recreation, accommodation, and food services sector. The City of Ashland has seen an increase in the manufacturing; retail trade; and educational services, health care, and social assistance sectors and a decrease in the number of jobs in the arts, entertainment recreation, accommodation, and food services sector. Ashland County has seen a decrease in the number of jobs in the manufacturing and retail trade sectors, and an increase in the number of jobs in the education services, health care, and social assistance sector and the arts, entertainment recreation, accommodation, and food services sector (U.S. Census Bureau, 2017a; U.S. Census Bureau, 2017b).

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

4.11.3 References

- Wisconsin Department of Administration Demographic Services Center (WDOA). 2013. Wisconsin's Future Population Projections for the State, Its Counties and Municipalities, 2010 to 2040.
- Wisconsin Department of Administration Demographic Services Center (WDOA). 2020. Time Series Population Estimates. County Totals 1970-2019. Accessed March 30, 2020. https://doa.wi.gov/Pages/LocalGovtsGrants/Population_Estimates.aspx.
- U.S. Census Bureau. 2010. QuickFacts Ashland City Wisconsin; Ashland County Wisconsin; United States. Accessed March 30, 2020. <https://www.census.gov/quickfacts/fact/table/ashlandcitywisconsin,ashlandcountywisconsin,US/PO010210>.
- U.S. Census Bureau, American Factfinder. 2000. City of Ashland Profile of General Demographic Characteristics: 2000 Census 2000 Summary File 1. Accessed March 30, 2020. https://factfinder.census.gov/rest/dnldController/deliver?_ts=603632495781.
- U.S. Census Bureau, American Factfinder. 2010. City of Ashland General Population and Housing Characteristics: 2010 Demographic Profile Data 010 Demographic Profile Data. Accessed March 30, 2020. https://factfinder.census.gov/rest/dnldController/deliver?_ts=603631742436.
- U.S. Census Bureau, American Factfinder. 2017a. American Community Survey-Selected Economic Characteristics. Ashland County. Accessed March 30, 2020. <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>.
- U.S. Census Bureau, American Factfinder. 2017b. American Community Survey-Selected Economic Characteristics. City of Ashland. Accessed March 30, 2020. <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>.

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, 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 the Project through a successful relicensing.

5.1.1 Geology and Soils

No concerns regarding geology and soils were identified from the White River Project questionnaire. A survey of the White River Project reservoir conducted in the fall of 2003 indicated the shorelines of the flowage are fundamentally stable and well-vegetated with only slight sign of erosion due to animal activity, primarily beaver, and high water events at the head-end of the flowage (NSPW, 2004). Other than the Project Dam and boat landing, the entire reservoir shoreline is undeveloped. Ashland County has existing regulations that limit ground disturbance in shoreline areas which will help reduce the potential for future shoreline erosion in the Project boundary. As described in Section 3.1.1, NSPW intends to request that the temporary reservoir elevation range in effect since 2016 allowing a maximum reservoir elevation of 712.6 feet be made permanent. No adverse impacts have been identified since the temporary elevation range was approved. Therefore, continued operations under the same conditions (with no other planned changes to operations or minimum flows) are not expected to cause adverse impacts to geology and soils.

5.1.2 Water Resources

No concerns regarding water resources were identified from the White River Project questionnaire. As described in Section 3.1.1, NSPW intends to request that the temporary reservoir elevation range in effect since 2016 allowing a maximum reservoir elevation of 712.6 be made permanent. No adverse impacts have been identified since the temporary elevation range was approved. Therefore, continued operations under the same conditions (with no other planned changes to operations or minimum flows) are not expected to cause adverse impacts to water resources.

5.1.3 Fish and Aquatic Resources

No fish and aquatic resource concerns were identified from the White River Project questionnaire. There are no planned changes to operations, reservoir levels, or minimum flows that would cause adverse impacts to fish and aquatic resources.

5.1.4 Terrestrial Wildlife and Botanical Resources

No terrestrial wildlife or botanical resource concerns were identified through the White River Project questionnaire. There are no proposed construction activities that would impact terrestrial wildlife or botanical resources.

5.1.5 Wetlands, Riparian, and Littoral Habitat

No wetland, riparian habitat, or littoral habitat concerns were identified through the White River Project questionnaire. There are no planned changes to operation, reservoir levels, or minimum flows that would cause adverse impacts to wetlands, riparian, or littoral habitat.

5.1.6 Critical Habitat and Threatened and Endangered Species

No specific critical habitat or threatened and endangered species concerns were identified through the White River Project questionnaire. Several state-listed and federal-listed species were identified in the Project vicinity. The Licensee will consult with the USFWS and WDNR to determine potential impacts to threatened and endangered species due to Project operation.

5.1.7 Recreation and Land Use

No recreation or land use resource concerns were identified in the White River Project questionnaire. Form 80 surveys (**Appendix 5.1.7.1-1**) indicate existing facilities are utilized significantly below capacity; therefore, no new recreation facilities or improvements are being proposed. There are no planned changes to operation, reservoir levels, or minimum flows that would cause adverse impacts to recreation or land use.

5.1.8 Aesthetic Resources

No aesthetic resource concerns were identified in the White River Project questionnaire. There are no proposed operational, reservoir level, minimum flow, or land use changes that would impact aesthetic resources.

5.1.9 Cultural and Tribal Resources

No cultural or tribal resource concerns were identified through the White River Project questionnaire. The Project Dam, surge tank, and powerhouse are over 50 years old and were determined ineligible for the NRHP in 1990.

5.1.10 Socio-Economic Resources

No socio-economic resource concerns were identified through the White River Project questionnaire. There are no proposed operational, reservoir level, minimum flow, or land use changes that would impact socio-economic resources.

5.1.11 References

- Northern States Power Company-Wisconsin (NSPW). 2004. Letter providing Five-year Reservoir Shoreline Surveys for Eroding Archaeological Sites. January 5, 2004.

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, or 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 reservoir within the Project boundary 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 White River Project operations, 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 facility 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 Project 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

Form 80 surveys completed by the Licensee showed all monitored recreation facilities were utilized significantly below their capacity (**Appendix 5.1.7-1**). Since the facilities are regularly monitored for recreational use and are used below 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 White River Project Dam, surge tank, and powerhouse are over 50 years old. The facilities were evaluated in 1990 and determined ineligible for inclusion in the NRHP. The facilities were not of special significance under criterion A as a collection of resources whose history is important locally or especially representative of the pattern of development of similar hydroelectric project facilities. Due to modernization of the structures, the level of integrity present is too low to justify inclusion under criterion C. No additional evaluation of eligibility for the NRHP is proposed by the Licensee.

A shoreline survey will be completed by a qualified archaeologist according to the requirements of the Programmatic Agreement⁶.

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.

⁶ Standard concerns for Licensees to address during the 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; 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.

5.3 Mitigation Enhancement

The Licensee is proposing the following mitigation and enhancement measures at the White River Project:

- Continue minimizing reservoir fluctuations by operating the Project in a run-of-river mode so that flows measured immediately downstream of the tailrace approximate the sum of inflows into the reservoir.
- Continue to maintain a minimum flow of 16 cfs, or inflow, whichever is less, into the bypass reach of the White River at all times to protect aquatic resources.
- If a reservoir drawdown is needed, the Licensee will continue to limit the drawdown rate to a maximum of 1 foot per 24 hours for the first 2 feet of drawdown and 0.5 feet per 24 hours thereafter.

The White River Project has operated since 1927. The existing information available for the Project does not identify any significant concerns or adverse effects on the resources from the current Project operation. Additionally, no changes to Project operations 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 White River 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.

5.4.1 References

- Federal Energy Regulatory Commission (FERC). May 2019. List of Comprehensive Plans.

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 for managing specific resources. The following plans are considered relevant to the White River Project:

- Ashland County Comprehensive Plan.
- Town of White River. Town of White River Comprehensive Plan.
- Wisconsin Department of Natural Resources, Lake Superior Fisheries Management Plan (2020-2029).
- Wisconsin Department of Natural Resources, Superior Coastal Plain Regional Master Plan. February 2019.
- Wisconsin Department of Natural Resources. White River Property Group (Bayfield and Ashland Counties) Draft Master Plan and Environmental Assessment. July 15, 2013.
- Wisconsin Department of Natural Resources, Wisconsin's Wildlife Action Plan (2015-2025).

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

NSPW began consultation in preparation of this PAD by developing a questionnaire that included a fact sheet. The questionnaire and fact sheet were sent via postal mail service to pertinent stakeholders included on the FERC Mailing List and Service List for the White River Project, as well as any other entities thought to be potential stakeholders. A copy of the questionnaire, fact sheet, and stakeholder list is provided in **Appendix 6-1**.

NSPW received a written response from the WDNR. No other responses to the questionnaire were received. A summary of the WDNR comments is provided below. The information contained in the WDNR response is incorporated into the PAD as appropriate; the response is included in **Appendix 6-1**.

- WDNR provided an email on May 27, 2020 indicating that they would be providing Surface Water Information Management System (SWIMS) data for the stations within the Project boundary for the previous 10 years. The data was received on May 29, 2020. WDNR provided additional fisheries data on June 3, 2020.

7. Public Utilities Regulatory Policies Act

The Licensee is not seeking benefits under the Public Utilities Regulatory Policies Act for the White River Project.