Brookfield
Renewable N.A.

June 3, 2026

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

Subject: Bar Mills Project (FERC No. 2194-000) Draft Surrender Application and Decommissioning Plan

Secretary Reese:

Brookfield White Pine Hydro LLC (hereinafter "BWPH" or "Licensee") will be applying to the Federal Energy Regulatory Commission (hereinafter "FERC" or "Commission") to surrender the license for the Bar Mills Waterpower Project (hereinafter "Project"), as described below. The Project is currently licensed to BWPH as Project No. 2194 (124 FERC ¶ 62,153 (2008)). The current license expires July 31, 2048.

The Bar Mills Project includes an existing concrete dam, granite headworks, an intake canal, downstream fish passage facility, powerhouse, appurtenant equipment, and an approximately 5.3 mile long, 263-acre impoundment. The Project has two generating units with a total rated generating capacity of 4.0 megawatt (MW) and a maximum hydraulic capacity (total turbine capacity) of 3,120 cubic feet per second (cfs). A more detailed description can be found in the draft Surrender Application, Exhibit A and the draft Decommissioning Plan.

The Bar Mills Project has significant operational challenges that have prevented the generating units from running since 2017. These challenges are associated with an unavoidable condition called Alkali Aggregate Reactivity (AAR) which occurs when certain aggregates used in the concrete for the dam and/or powerhouse absorb water and cause expansion and cracking over a period of many years. There is no long-term remedy for AAR at the Bar Mills Project except for full reconstruction, which is not financially viable when coupled with existing migratory fish passage requirements. Thus, BWPH is proposing surrender of the license with decommissioning and dam removal. Certain structures as described in the attached draft Surrender Application, Exhibit A and draft Decommissioning Plan will remain in place and continue to be maintained by BWPH.

Based upon the studies conducted and available resource information for the project, an environmental analysis of the proposed action is described in Section 4 of the Exhibit E. Associated mitigation measures are described in Section 2.1.2 of the draft Decommissioning Plan.

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3 Company Road, Hollis, ME 04042
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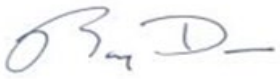
The draft Surrender Application and draft Decommissioning Plan are being distributed to agencies and the public for a 90-day review period with **written comments due by September 1, 2026**. The documents are available for download at https://barmills.brookfieldusprojects.com/documents/ and on FERC's eLibrary (https://elibrary.ferc.gov/eLibrary/search) under docket number P-2194. Comments received will be addressed, as appropriate, in the Final Decommissioning Plan and Surrender Application which will be submitted to FERC in the fall of 2026. FERC will then initiate the process of application review and development of an environmental assessment (EA). It is anticipated that FERC will issue a draft EA for public comment prior to any approval of the surrender application. BWPH will also submit state, federal, and local (i.e., the Towns of Buxton and Hollis) permit applications in the fall of 2026. During the federal and state agency review, public comments are encouraged and help guide the decisions of each respective agency. For example, the U.S. Army Corps of Engineers will issue a public notice seeking comments after an application is submitted. The Maine Department of Environmental Protection, under the Maine Waterway Development and Conservation Act, also encourages and accepts public comments throughout the permitting process. BWPH will also be required to submit a permit application to the Saco River Corridor Commission (SRCC). BWPH will be further consulting with these entities during the public comment period for the Surrender Application and Decommissioning Plan.

BWPH will hold a public meeting to provide an overview of the draft Surrender Application and draft Decommissioning Plan June 25, 2026 at 6:00 p.m. located at the Hollis Town Hall, 34 Town Farm Road, Hollis, Maine 04042.

If you have questions about the DSR or would like additional information, please contact David Heidrich at 207-755-5608 or by email at david.heidrich@brookfieldrenewable.com.

Sincerely,



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Senior Compliance Manager – New England and Rest of Country (LA, NC, and TN)

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BEFORE THE
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

APPLICATION FOR LICENSE SURRENDER
BAR MILLS PROJECT NO. 2194

(1) Brookfield White Pine Hydro LLC (hereinafter "BWPH" or "Licensee") applies to the Federal Energy Regulatory Commission (hereinafter "FERC" or "Commission") for a surrender of the license for the Bar Mills waterpower project (hereinafter "Project"), as described in the attached exhibits. The Project is currently licensed to BWPH as Project No. 2194 (124 FERC ¶ 62,153 (2008)). The current license expires July 31, 2048. BWPH is the only entity that has any proprietary right or interest in the Project.

The FERC license requires run-of-river operations and seasonal minimum bypass and downstream flows from the Project, consistent with the 1997 Flow Agreement[1], and the FERC approved Minimum Flow Monitoring Plan (2011)[2]. The Project is also subject to the 2007 Saco River Fisheries Assessment Agreement[3], amended in 2019[4], which sets the operational date for upstream fish passage facilities at the Project (or an alternative developed in consultation with fisheries agencies) to be May 1, 2025. On November 30, 2020, in accordance with the fish passage alternative specified in the 2019 Amendment, BWPH filed a letter with FERC indicating its intent to surrender the license for the Bar Mills Project.

The Bar Mills Project has significant operational challenges that have prevented the generating units from running since 2017. These challenges are associated with an unavoidable condition called Alkali Aggregate Reactivity (AAR) which occurs when certain aggregates used in the concrete for the dam and/or powerhouse absorb water and cause expansion and cracking over a period of many years. There is no long-term remedy for AAR at the Bar Mills Project except for full reconstruction.

[1] The April 30, 1997 Instream Flow Agreement for Hydroelectric Projects on the Saco River was incorporated as appropriate into the individual project licenses for the Hiram, Bonny Eagle, and Skelton projects.
[2] FERC. 2011. Order Amending Flow Monitoring Plan. Issued January 4, 2011. Accession No.: 20110104-3002.
[3] FERC 2007. Order Modifying and Approving Fish Passage Assessment Report and Recommendations for Fish Passage and Fisheries Management. 120 FERC ¶ 62,050
[4] FERC 2019. Order Approving Revised Fish Passage Assessment and Fish Passage Installation Schedule. 168 FERC ¶ 62,035

(2) The location of the Project is:

State:	Maine
County:	York
Township or nearby town:	Towns of Buxton and Hollis
Stream or other body of water:	Saco River

(3) The exact name and business address and telephone number of the applicant are:

Brookfield White Pine Hydro LLC
460 Civic Center Drive
Augusta, ME 04330

(4) The exact name and business address of each person authorized to act as agent for the applicant in this application are:

Mr. Nathan Stevens
Vice President
Brookfield White Pine Hydro LLC
460 Civic Center Drive
Augusta, ME 04330

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

Ryan Nadeau	Andy Qua
Brookfield White Pine Hydro LLC	Kleinschmidt Associates
460 Civic Center Drive	PO Box 650, 141 Main Street
Augusta, ME 04330	Pittsfield, ME 04967

(5) The applicant is a domestic corporation and is not claiming preference under section 7(a) of the Federal Power Act.

(6) (a) The statutory or regulatory requirements of the State of Maine, in which the Project is located, which would, assuming jurisdiction and applicability, affect the Project with respect to bed and banks, and to the appropriation, diversion and use of water for power purposes, and with respect to the right to engage in the business of developing, transmitting and distributing power, and in any other business necessary to accomplish the purposes of the license under the Federal Power Act are:

(i) Maine Waterway Development and Conservation Act, Maine Revised Statutes Annotated (M.S.R.A.) Title 38, §630 et. seq.

(ii) Mill and Dam Act, M.S.R.A Title 38, §651 et. seq.

(iii) Small Power Production Act, M.S.R.A Title 35-A, §3302 et. seq.

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

(i) The Maine Waterway Development and Conservation Act (MWDCA), enacted in 1983, regulates certain construction or reconstruction of hydropower projects which change water levels or flows above or below a dam. Because BWPH is proposing to remove spillway structures, approval from Maine Department of Environmental Protection will be required under the MWDCA.

(ii) The Mill Act, enacted in 1821, in part allows riparian owners to maintain dams and raise water. The statute does not require any permits and has been interpreted by the Maine Supreme Judicial Court to apply to hydroelectric generating plants. See Veazie v. Dwinel, 50 Me. 479 (1862). Maine case law has also held that owners of the riverbed have the right to the natural flow of a stream as it passes through their land, Wilson & Son v. Harrisburg, 107 Me. 207 (1910). Licensee either owns or has flowage rights to all project lands and waters.

(iii) The Small Power Production Act is Maine's "mini-PURPA" statute, which exempts small power production facilities, including small hydroelectric sites not exceeding 80 MW capacity, from control or regulation by the Maine Public Utilities Commission, except for some retail rate-making purchases. When it was operating, the power from the Project was less than 80 megawatts (MW) and no approval was required for this Project.

(7) The Bar Mills Project includes an existing concrete dam, granite headworks, an intake canal, downstream fish passage facility, powerhouse, appurtenant equipment, and an approximately 5.3 mile long, 263-acre impoundment. The Project has two generating units with a total rated generating capacity of 4.0 MW and a maximum hydraulic capacity (total turbine capacity) of 3,120 cubic feet per second (cfs).

(8) No lands of the United States are affected by the Project.

(9) This is an existing Project that is proposed for decommissioning and dam removal. Certain structures as described in Exhibit A will remain in place and continue to be maintained by BWPH. BWPH is the owner and operator of all existing Project facilities. BWPH either owns or has flowage rights to all Project lands.

(10) (a) The Project is located entirely within York County. The mailing address for York County is:

York County Commissioners
45 Kennebec Road
Alfred, ME 04002

(b) Towns having a population of 5,000 or more and located within 15 miles of the Project dam are:

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(207) 284-9313

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Town of Old Orchard Beach
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Danielle West
City Manager
City of Portland
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Scott Morelli
City Manager
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David Morse
Mayor
City of Westbrook
2 York Street
Westbrook, ME 04092

Robert Burns
Town Manager
Town of Windham
8 School Street
Windham, ME 04062

(c) There are no special purpose political subdivisions affected by the Project, or that would likely be interested in, or affected by, the application.

(d) There are no Native American tribes affected by the Project.

(11) Applicant has, in accordance with 18 CFR § 4.32 (a) (3) made a good faith effort to notify, by certified mail, the following entities of the filing of this application:

(a) Every property owner of record of any interest within the bounds of the Project;

(b) The entities listed in (10) above;

(c) Other governmental agencies that would likely be interested in or affected by the application.

(12) In accordance with Section 4.61 of the Commission's regulations, the following Exhibits are attached to and made a part of this application:

Exhibit A – Project Description
Exhibit E – Environmental Report
Exhibit F – General Design Drawings (*provided under separate cover for security purposes*)
Exhibit G – Project Maps
Exhibit H – Description of Project Management and Need for Project Power

SUBSCRIPTION

This Application for License Surrender for the Bar Mills Project, FERC No. 2194 is executed in the State of Maine, County of Kennebec, by Nathan Stevens, Vice President, Brookfield White Pine Hydro LLC, 460 Civic Center Drive, Augusta, Maine, 04330, who, being duly sworn, deposes and says that the contents of this application are true to the best of his knowledge or belief and that he is authorized to execute this application on behalf of Brookfield White Pine Hydro LLC. The undersigned has signed this application this _____ day of _____.

BROOKFIELD WHITE PINE HYDRO LLC

By _____
Nathan Stevens
Vice President
Brookfield White Pine Hydro LLC

VERIFICATION

Subscribed and sworn to before me, a Notary Public of the State of Maine this _____ day of [Date].

_____
(Notary Public)

(My Commission Expires _____)/seal

BAR MILLS HYDROELECTRIC PROJECT

FERC NO. 2194

APPLICATION FOR LICENSE SURRENDER

EXHIBIT A

PROJECT DESCRIPTION AND OPERATIONS

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1.0 INTRODUCTION

The Bar Mills Hydroelectric Project (Bar Mills Project or Project), Federal Energy Regulatory Commission (FERC) Project No. 2194, is an existing 4.0 megawatt (MW) licensed development owned and operated by Brookfield White Pine Hydro LLC, (BWPH). The original license for Bar Mills was issued May 11, 1956. An Order Issuing Subsequent License (Minor Project) was issued by FERC on August 26, 2008. The current license expires July 31, 2048. On November 30, 2020, BWPH notified the Federal Energy Regulatory Commission (FERC) of its intent to surrender the FERC license (P-2194).

The FERC license requires run-of-river operations and seasonal minimum bypass and downstream flows from the Project, consistent with the 1997 Flow Agreement[1], and the FERC approved Minimum Flow Monitoring Plan (2011)[2]. The Project is also subject to the 2007 Saco River Fisheries Assessment Agreement[3], amended in 2019[4], which sets the operational date for upstream fish passage facilities at the Project (or an alternative developed in consultation with fisheries agencies) to be May 1, 2025. On November 30, 2020, in accordance with the fish passage alternative specified in the 2019 Amendment, BWPH filed a letter with FERC indicating its intent to surrender the license for the Bar Mills Project.

The Bar Mills Project has significant operational challenges that have prevented the generating units from running since 2017. These challenges are associated with an unavoidable condition called Alkali Aggregate Reactivity (AAR) which occurs when certain aggregates used in the concrete for the dam and/or powerhouse absorb water and cause expansion and cracking over a period of many years. There is no long-term remedy for AAR at the Bar Mills Project except for full reconstruction.

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[3] FERC 2007. Order Modifying and Approving Fish Passage Assessment Report and Recommendations for Fish Passage and Fisheries Management. 120 FERC ¶ 62,050
[4] FERC 2019. Order Approving Revised Fish Passage Assessment and Fish Passage Installation Schedule. 168 FERC ¶ 62,035

2.0 PROJECT LOCATION

The Bar Mills Project is located in the towns of Buxton and Hollis, York County, Maine (See Figure 2-1). The Project is situated on the Saco River at river mile (RM) 19, 14.5 miles above head-of-tide. There are seven hydroelectric facilities on the main stem of the Saco River; all are located in Maine. The uppermost project on the main stem, Swans Falls (FERC No. 11365), followed by Hiram (FERC No. 2530), Bonny Eagle (FERC No. 2529), West Buxton (FERC No. 2531), Bar Mills (FERC No. 2194), Skelton (FERC No. 2527), and Cataract (FERC No. 2528). A map locating the Saco River hydro projects is included as Figure 2-1.

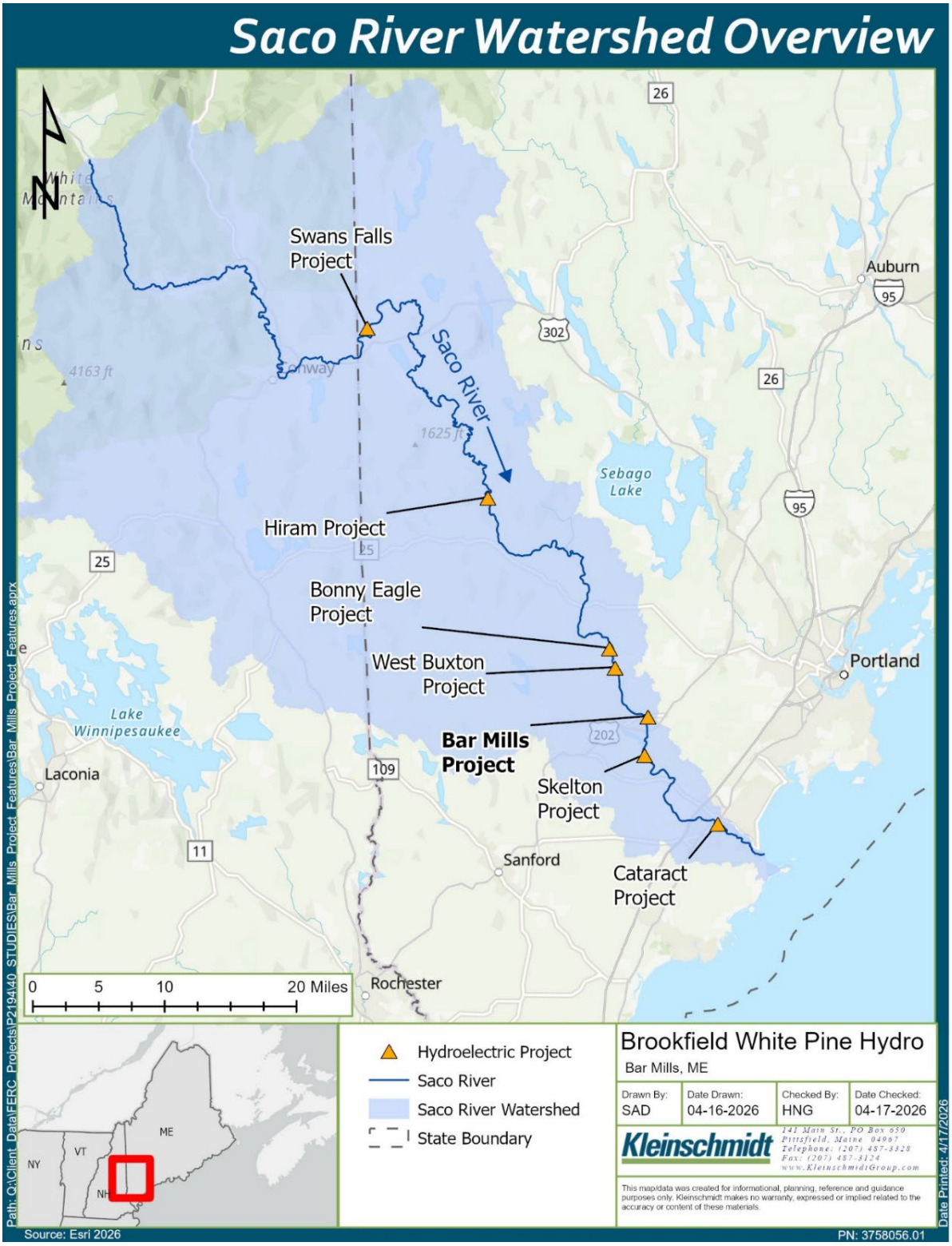

Figure 2-1 Saco River Watershed Overview

3.0 DESCRIPTION OF PROJECT

3.1 Existing Project Facilities

3.1.1 Project Structures

The Project structures include a concrete dam that spans the river, a granite headwork structure located at the entrance to the intake canal, a canal that conveys flow to the powerhouse, a downstream fish passage facility, a powerhouse, and appurtenant equipment. An aerial view of these Project structures is included in Figure 3-1.

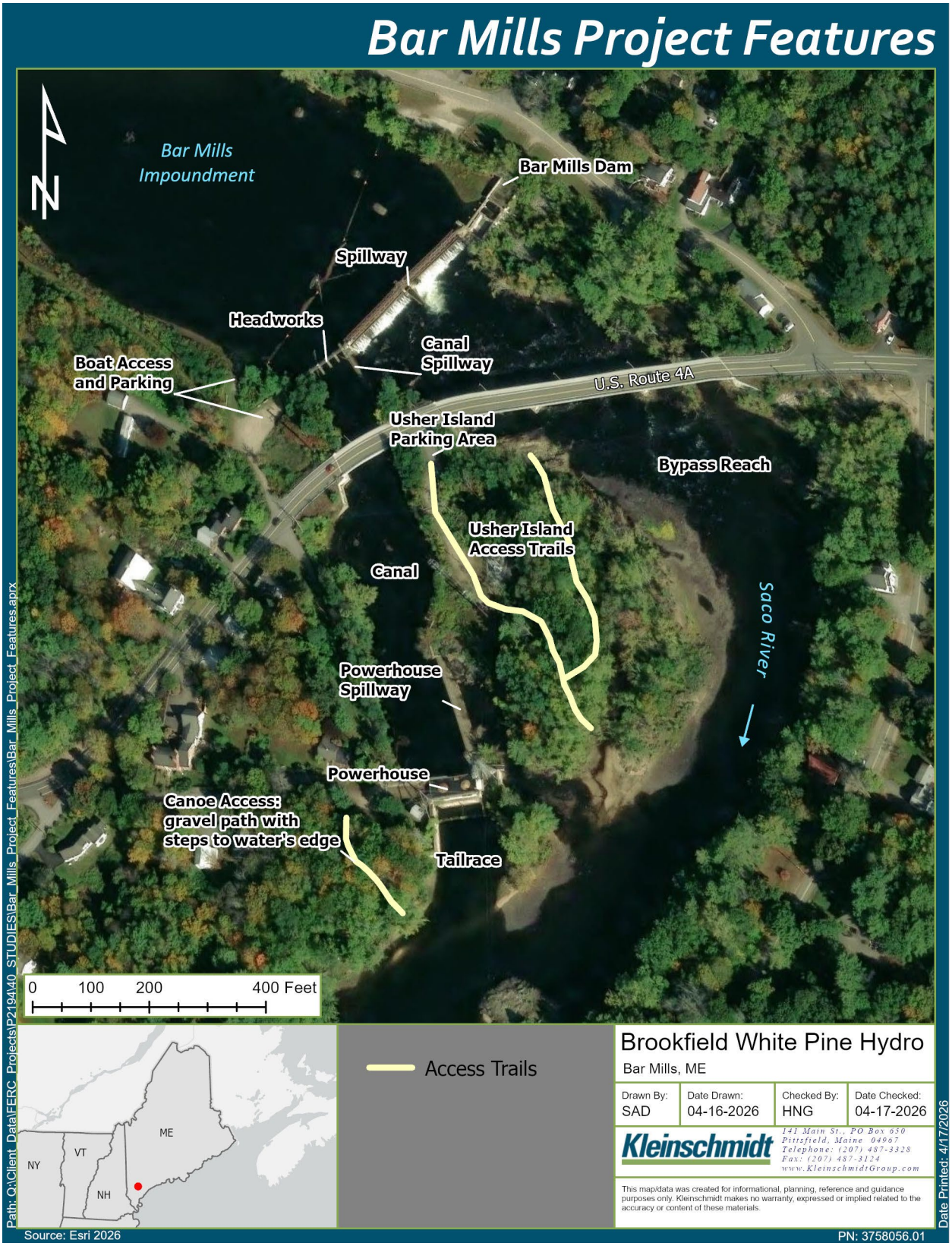

Figure 3-1 Bar Mills Project Features

3.1.2 Reservoir

The Project reservoir is approximately 263-acre, 5.3-mile-long impoundment. Normal pond elevation for the Project is 148.5 feet NGVD. Since the Project is run-of-river, there is no useable storage behind the dam.

3.1.3 Dam

The main dam is founded on bedrock, with a maximum height of approximately 21 feet with an average height of approximately 15 feet. The permanent spillway crest is at Elevation 141.75 feet and is topped with 6.75-foot-high hinged steel flashboard panels. The project includes the remnants of the Rogers Fibre Mill foundation, consisting of an approximately 100-foot long concrete structure on the east side connected to a 14-foot wide spillway abutment. The concrete spillway is approximately 264 feet long including a 14-foot wide low flow gate structure located in the center of the spillway. An approximately 14-foot wide concrete abutment is located on the western end of the spillway and joins the spillway to the canal headworks structure and canal wall/auxiliary spillway. An operating bridge spans the entire length of the spillway with an electric hoist located on the bridge used for operating the hinged flashboard panels. Beyond the canal headworks (discussed below) the dam includes an earthen embankment containing a buried concrete cut-off wall, approximately 50 feet in length. The Project dam develops a head of 21 feet between the normal full headpond elevation (148.5') and normal tailwater elevation (127.5').

Photo 3-1 Downstream View of Spillway

3.1.4 Intake Canal

An approximately 94-foot long headworks structure is located at the entrance to the canal. The headworks structure consists of four stone masonry piers and two concrete abutments which can be fitted with stoplogs to allow for the dewatering of the canal for maintenance. There are no gates at the headworks structure, and the structure is not used to control flow into the canal. A steel walkway extends across the headworks structure to provide access from the west end of the dam to the spillway abutment and operating bridge.

The canal extends approximately 735 feet from the headworks structure to the powerhouse. The minimum width of the canal is approximately 75 feet, near the headworks. The maximum width of the canal is approximately 180 feet, about mid-way in its length. The canal was excavated into soil and bedrock and includes concrete saddle dikes to maintain the normal operating levels. The west side of the canal is primarily an earthen slope. At the top of the slope is the powerhouse access road. The east side of the canal is formed by the canal spillway composed of a 90-foot long masonry/concrete overflow section adjacent to the spillway, excavated bedrock slopes and various masonry and concrete non-overflow saddle dams approximately 311 feet long, and a 175-foot long concrete overflow section near the powerhouse, referred to as the powerhouse spillway. The overflow portions of the canal wall have a crest elevation of 148.5', matching the

normal full impoundment elevation. Non-overflow sections have crest elevations ranging from 149.5′ to greater than 155.0′.

The powerhouse spillway includes a seven-foot-wide surface gate and sluice for downstream fish passage immediately adjacent to the powerhouse. There is a 6-foot by 6-foot opening located at the base of the powerhouse spillway used for draining the canal with stoplogs that can be removed manually.

Photo 3-2 Headworks Structure

Photo 3-3 Canal Looking from Bridge Towards Powerhouse Under Drawdown

3.1.5 Powerhouse

The Project powerhouse substructure and a large part of the 40-feet wide by 80-feet long super-structure are constructed of reinforced concrete. The majority of the powerhouse is located below grade level and is not readily visible from the access road. The powerhouse roof is built of waterproof membrane overlaying wood planks and supported by structural steel framing. Roof hatches are located over each of the two units. A stiff leg 25-ton outdoor derrick crane is located at the west end of the powerhouse. The crane house is mounted on concrete piers and is steel framed and covered with corrugated aluminum siding. The powerhouse substructure includes the two turbine water intakes and draft tubes, two headgates, and trashracks.

The powerhouse substructure includes the two turbine water intakes and draft tubes, two headgates, and trashracks. The existing turbines are vertical-shaft, fixed-propeller Leffel units, each rated at 3,000 Hp (2.25 MW). Wicket gates control flow to each of the units. The combined maximum hydraulic capacity of the turbines is approximately 3,120 cfs.

Photo 3-4 Aerial Image of Powerhouse

3.1.6 Tailrace

The tailrace consists of an excavated channel extending from the powerhouse to the river and is approximately 200 feet long with a normal water elevation of 127.5’. The Project tailwater is influenced by the downstream Skelton Project headpond which, at a full pond of 127.5', backwaters into the Bar Mills tailrace.

3.1.7 Bypass Reach

The bypass reach consists of the natural river channel extending from the dam spillway to the powerhouse tailrace and is approximately 1,500 feet from the dam to the confluence with the tailwater with a normal water elevation of 127.5’. The bypass reach is likewise influenced by backwater effect of the downstream Skelton Project impoundment.

3.1.8 Appurtenant Facilities and Equipment

3.1.8.1 Transmission Facilities

The Project related transmission facilities include the generator leads, generator breakers, a 2.4 kV bus, a 2.4 kV breaker, transformer bank No. 1, and high side switch T1H. The transformer bank is a three phase unit (rated 5,000 kVA, 34/2.4 kV). The line that transmits energy from the transformer bank to the local utility is not part of the licensed Project.

3.1.8.2 Downstream Fish Passage

The construction of a downstream fish passage facility at the Project was completed in 2000. It began operation in 2001. The fish passage facility consists of a seven-foot-wide gate leading to a metal flume which deposits downstream-migrating fish into a permanently watered pool. A conveyance/passage flow of 120 cfs is discharged through the sluice gate from May 1 (or at 10°C ambient river temperature – whichever occurs first) through June 15 (or at 18°C ambient river temperature – whichever occurs first) annually to pass downstream migrating fish.

Table 3-1 Bar Mills Project Facilities and Descriptions

Bar Mills Project – FERC No. 2194	
Description	Number or Fact
General Information	
FERC Number	2194
License Issued	August 26, 2008
License Expiration Date	August 26, 2048
License Type	Major License
Licensed Capacity	4.0 MW
Project Location	
	Buxton and Hollis (York County), Maine
River	Saco River, located at approximately river mile 19
Project Drainage Area	1,591 square miles
USGS Gages:	
Name	No. 01064500-Saco River near Conway, NH
Drainage Area at Gage	385 square miles
Period of Record	1929-Present
Maximum Flow at Gage	47,200 cfs – 03/27/53

Bar Mills Project – FERC No. 2194	
Minimum Flow at Gage	40 cfs – 03/10/32
Mean Annual Flow at Gage	946 cfs
Name	No. 01066000 – Saco River @ Cornish, ME
Drainage Area at Gage	1,293 square miles
Period of Record	1916-Present
Maximum Flow at Site	46,600 cfs – 03/21/36
Minimum Flow at Site	244 cfs – 10/07/64
Mean Annual Flow	2,719 cfs
Operation	Formerly daily cycling, with approximately 2.0 ft impoundment fluctuation – taken off line in 2017
Next Upstream Dam	West Buxton (FERC No. 2531) owned by FPL Energy
Next Downstream Dam	Skelton (FERC No. 2527) owned by FPL Energy
Impoundment	
Normal Full Pool Elevation	148.5’
Length	5.3 miles
Surface Area	263 acres
Volume Capacity	500 acre-feet useable
Tailwater	
Normal Elevation	127.5’
Dam	
Construction	Concrete founded on bedrock
Total Length	1,148 feet of water retaining structures include dam and canal sections, and a 14-foot-wide sluice at the center of the dam
Spillway Section:	
Length	306 ft (includes a 14-foot sluice and two 14-foot non-overflow abutments on either end of structure)
Height	Approximately 7 feet to sill
Flashboards	6.75 ft hinged steel
Permanent Crest Elevation	141.75’

Bar Mills Project – FERC No. 2194	
Canal Headworks:	
Construction	Concrete abutments and masonry piers with walkway
Length	94 feet
Canal	
Construction	Stone masonry and concrete with various overflow and non-overflow sections
Length	Approximately 735 feet
Powerhouse	
Construction	Reinforced concrete with wood plank roof supported on structural steel framing.
Length	80 feet
Width	40 feet
Turbines (Units 1 & 2 are identical)	
Type	Vertical shaft, fixed propeller
Manufacturer	James Leffel & Company
Hp rating	3000
Rated Gross Head (ft)	20
Speed (rpm)	120
Minimum Hydraulic Capacity (cfs)	950 one unit
Maximum Hydraulic Capacity (cfs)	3,120 combined
Generators (Units 1 & 2 are identical)	
Type	Vertical shaft, umbrella type
Manufacturer	Westinghouse Electric Corporation
KVA	2500
Phase	3
Cycles	60
Volts	2400
Power Factor	0.8
kW	2000
Total Installed Capacity	4000 kW
Turbine Governors	
Units 1 & 2	
Manufacturer	Woodward
Type	Motor driven
Output	30,000 ft lbs.
Powerhouse Crane	
	25-ton derrick with 90-foot boom

Bar Mills Project – FERC No. 2194	
Traveling Hoist	
	Used for operating flashboards on main spillway
Transmission Facilities	
Project-related transmission facilities	Generator leads, generator breakers
	2.4 kV bus, 2.4 kV breaker, Transformer Bank No. 1 high side switch T1H
Line from powerhouse	The transformer bank is a three phase unit (rated 5,000 kVA, 34/2.4 kV) and power from the Project is transmitted to the local utility system via a 34 kV three-phase non-project transmission line.

3.1.9 Land Ownership

Brookfield either owns or has flowage rights to all Project lands. There are no federal lands with the Projects' boundaries. BWPH will access the removal area from property owned by BWPH and from an area owned by the Town of Buxton, which includes deeded access for dam related activities.

3.1.10 Proposed Project Facilities

BWPH is proposing complete removal of the spillway to return the Saco River to free-flowing, unimpeded by the dam structure. Removal will include the spillway in its entirety, the timber crib dam that preceded the existing Bar Mills Dam, headwork structures, canal spillway, and former Rogers Fibre Mill Foundation.

The canal will remain mostly unchanged and will not be filled with soil materials. The powerhouse spillway at the downstream end of the canal will remain in its current configuration. The existing canal drain gate opening has timber stoplogs on the upstream face of the spillway. Those stoplogs will be removed to allow drainage of the canal. The powerhouse will remain in its current configuration with minor modifications. The derrick crane on the roof of the powerhouse will be removed along with its associated operating building. It is anticipated that the transformer on the powerhouse roof will be drained and removed.

The current conceptual layout would also include a new diversion weir (approximately two to three feet high) at the upstream end of the canal to direct flow and downstream

migrating fish away from the canal, and a drain gate opening at the downstream end of the canal to allow the canal to drain after high flow conditions.

BWPH will continue to maintain the remaining project features, including the powerhouse and surrounding lands and public recreational access, with the exception of the boat launch which will be reverted to a natural state with the concrete planks removed and bank stabilized.

4.0 PROJECT OPERATION

4.1 Existing Project Operation

FERC licensed operation of the Bar Mills Project is as a run of river facility. Units 1 and 2 are considered out-of-service indefinitely as of May and Dec. 2017, respectively as a result of concrete growth from AAR impeding the operation of the turbine/generator equipment. Prior to the station shutdown, the Bar Mills impoundment levels would generally fluctuate once or twice daily up to 2-feet below normal full pond elevation of 148.5 USGS datum to accommodate flow releases from the Bonny Eagle Project, located upstream of the Bar Mills Project. According to the Flow Agreement, the flow requirements at Bar Mills, which are determined by flow releases made at the upstream Bonny Eagle Project are: from April 1 through June 30, the impoundment will be maintained within 1 foot of the full pond elevation (run of river); from July 1 through September 30, minimum flows will be 400 cfs or inflow, whichever is less; from October 1 through November 15, minimum flows will be 600 cfs or inflow, whichever is less; and from November 16 through March 31, minimum flows will be 250 cfs or inflow, whichever is less. The Bar Mills Project will also maintain a continuous 100-cfs minimum flow in the bypass reach from April 1 to October 31, and a 50-cfs minimum flow from November 1 to March 31.

Because the powerhouse is no longer operational, all flows pass over the spillway and through the bypassed reach. The hinged flashboards continue to be manipulated to maintain impoundment water levels within license limits.

4.1.1 Estimated Average Annual Generation

The Bar Mills Project has significant operational challenges that have prevented the generating units from running for the last five years (non-operational since 2017). Prior to being taken offline, the average annual generation was 18,850 MWH

4.1.2 Estimated Average Head

The estimated average head at the Project is approximately 21 feet.

4.1.3 Reservoir Surface Area and Storage Capacity

The reservoir impounded by Bar Mills Dam, extending upstream from the top of the spillway at approximately elevation 148.5 NGVD, has an estimated surface area of 263 acres.

4.1.4 Plant Hydraulic Capacity and Stream Flow

The combined maximum hydraulic capacity of the two Project generating units is approximately 3,120 cfs. However, because the generating units are no longer in service, inflow to the project is passed over the spillway.

Daily average flow data for the Bar Mills Project were obtained from USGS Gage No. 01066000 Saco River at Cornish, Maine for January 1, 1996, through December 31, 2025; the gage is approximately 25 river miles upstream of the Bar Mills dam. The drainage area at the USGS Gage is 1,294 square miles. The drainage area at the Bar Mills dam is 1,591 square miles. The data from the USGS Gage were prorated to the Bar Mills Project based on the ratio of their drainage areas (1591 acres/1294 acres = 1.23). The mean and median flows over the 1996 to 2025 period were 3,744 cfs and 2,768 cfs, respectively. Flow duration curves are provided in Exhibit E.

5.0 CAPITAL AND OPERATION AND MAINTENANCE COSTS

The Project operated and produced power until 2017 when it was taken out of service indefinitely. Due to the overall cost to redevelop the project and meet migratory fish passage requirements, BWPH is electing to surrender the FERC license, remove certain components of the project features and continue to own and maintain other features (e.g., the powerhouse).

BWPH estimates that the total cost of the decommissioning of the Bar Mills Hydroelectric Project and planned removal of various dam and spillway features is between $7-12 million in present day costs. Delays in the construction timeline pose the risk of increasing these costs in future years.

5.1 Planning, Studies, and Outreach to Date

The Bar Mills Decommissioning project has required several years of sustained effort and significant financial investment before any physical dam removal activity has begun. To date, BWPH has spent approximately $1.0 million on engineering, environmental field studies, sediment sampling, community engagement, regulatory coordination, and preparation of the license surrender and draft decommissioning plan required by FERC. In addition to these early-phase efforts, additional consulting, engineering, and permitting support will continue into 2027 as part of the formal surrender process. This work reflects the complexity of responsibly evaluating dam removal at a site with shared infrastructure, historic industrial use, and close proximity to homes, public safety assets, and recreational resources.

5.2 Dam Removal and Site Restoration

BWPH estimates that dam removal and primary site restoration will cost between approximately $5.5 million and $7.5 million, depending on final scope, construction sequencing, and regulatory requirements. These estimates include mechanical contractor work, demolition activities, temporary facilities, engineering and construction oversight, project management, and contingency allowances. The upper end of the estimate reflects scenarios where additional structures are removed or where permitting and construction challenges increase complexity. These figures are planning-level estimates, not fixed prices, and will be refined as the decommissioning plan is finalized and reviewed by agencies.

5.3 Future Unknown Costs

In addition to the estimated dam removal costs, several potential future obligations remain unknown or difficult to quantify at this time. These include possible well mitigation measures for nearby private drinking water wells if impacts are identified; fire suppression alternatives for dry hydrants that would be affected once the dam is removed; recreational enhancements or public access improvements requested by the towns; and long-term fish passage and river restoration considerations following dam removal. Each of these items will require further study, agency review, and coordination with the Towns of Buxton and Hollis before costs can be defined.

As such, no reliable dollar estimates can yet be assigned, but BWPH is conservatively estimating that these measures may cost anywhere from $1-4 million. BWPH will carefully measure and evaluate all requests and prioritize those that have the greatest value to the public.

6.0 PURPOSE OF THE PROJECT

The Project operated and produced power until 2017 when it was taken out of service indefinitely. Due to the overall cost to redevelop the project and meet migratory fish passage requirements, BWPH is electing to surrender the FERC license, remove the spillway, and retain the powerhouse for other purposes that will be determined in the future.

7.0 DAM DECOMMISSIONING PLAN

The Bar Mills Dam Decommissioning Plan is included in Appendix A of Exhibit E.

8.0 LANDS OF THE UNITED STATES

In this proceeding involving the Bar Mills Project, the applicant believes that no issues regarding lands of the United States exist.

9.0 VALUE OF PROJECT POWER

The Project has not operated since 2017; therefore, there is no associated project power value. BHWP does not require the Project power to support its overall generation portfolio to meet existing and future customer demand.

10.0 ESTIMATED CHANGE IN PROJECT GENERATION

BHWP is proposing to surrender the license and decommission the Bar Mills Project; therefore, there is no change in Project generation compared to baseline, as the Project is not currently operational and is not generating electricity.

BAR MILLS HYDROELECTRIC PROJECT
FERC NO. 2194

APPLICATION FOR LICENSE SURRENDER

EXHIBIT E
ENVIRONNEMENTAL DOCUMENT

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DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

af	Acre-foot, the amount of water needed to cover one acre to a depth of one foot.
APE	Area of Potential Effect as pertaining to Section 106 of the National Historic Preservation Act.
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BOD	Biological Oxygen Demand
CFR	Code of Federal Regulations
cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DLA	Draft License Application
DO	dissolved oxygen
DOE	US Department of Energy
DOI	US Department of Interior
EA	Environmental Assessment
EAP	Emergency Action Plan
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EL	Elevation
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
FWCA	Fish and Wildlife Coordination Act
GIS	Geographic Information Systems
GWh	Gigawatt-hour (equals one million kilowatt-hours)
Hp	Horsepower
Hz	hertz (cycles per second)
HPMP	Historic Properties Management Plan
Installed Capacity	The nameplate MW rating of a generator or group of generators
Interested Parties	The broad group of individuals and entities that have an interest in a proceeding
kW	Kilowatt
kWh	kilowatt-hour
MBPL	Maine Bureau of Parks and Lands
MAS	Maine Audubon Society
MDEP	Maine Department of Environmental Protection

MDIFW	Maine Department of Fish and Wildlife, Agency of Natural Resources
MDMR	Maine Department of Marine Resources
MFS	Maine Forest Service
MGS	Maine Geologic Survey
MHPC	Maine Historic Preservation Commission
MNAP	Maine Natural Areas Program
MSPO	Maine State Planning Office
MW	Megawatt
MWh	megawatt-hour
NEPA	National Environmental Policy Act
NGO	Non-governmental organization
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Services, same as NOAA Fisheries
NOAA Fisheries	NOAA National Marine Fisheries Service, same as NMFS
NPS	National Park Service
NRCM	Natural Resources Council of Maine
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
PM&E	Protection, Mitigation and Enhancement Measures
PMF	Probable Maximum Flood
Project Boundary	The boundary line defined in the Project license issued by FERC that surrounds those areas needed for operation of the Project.
Project Vicinity	The general geographic area in which the Project is located
RM	River mile
SHPO	State Historic Preservation Officer
THPO	Tribal Historic Preservation Officer
TNC	The Nature Conservancy
TU	Trout Unlimited
USACE	US Army Corps of Engineers
USDA	US Department of Agriculture
USEPA	US Environmental Protection Agency
USFS	US Forest Service
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
WQC	Water Quality Certificate

1.0 INTRODUCTION

1.1 Background

Brookfield White Pine Hydro, LLC, (BWPH) owns and operates the Bar Mills Project (Project), between the Town of Buxton and the Town of Hollis, York County, Maine. The Project facilities are located on the Saco River at approximately river mile 19 (as measured from the river mouth at Camp Ellis, Maine) approximately 14.5 miles above head-of-tide. The project boundary extends upstream to the West Buxton Project (FERC No. 2531) boundary and downstream to the Skelton Project (FERC No. 2527) boundary at the Project tailwater (Figure 1-1). The project boundary, including the impoundment and upstream flowage easements, extends approximately 5.3 miles along the Saco River from RM 19, approximately 0.3 miles below Bar Mills Dam, to RM 24.3, the lower extent of the West Buxton Project tailrace.

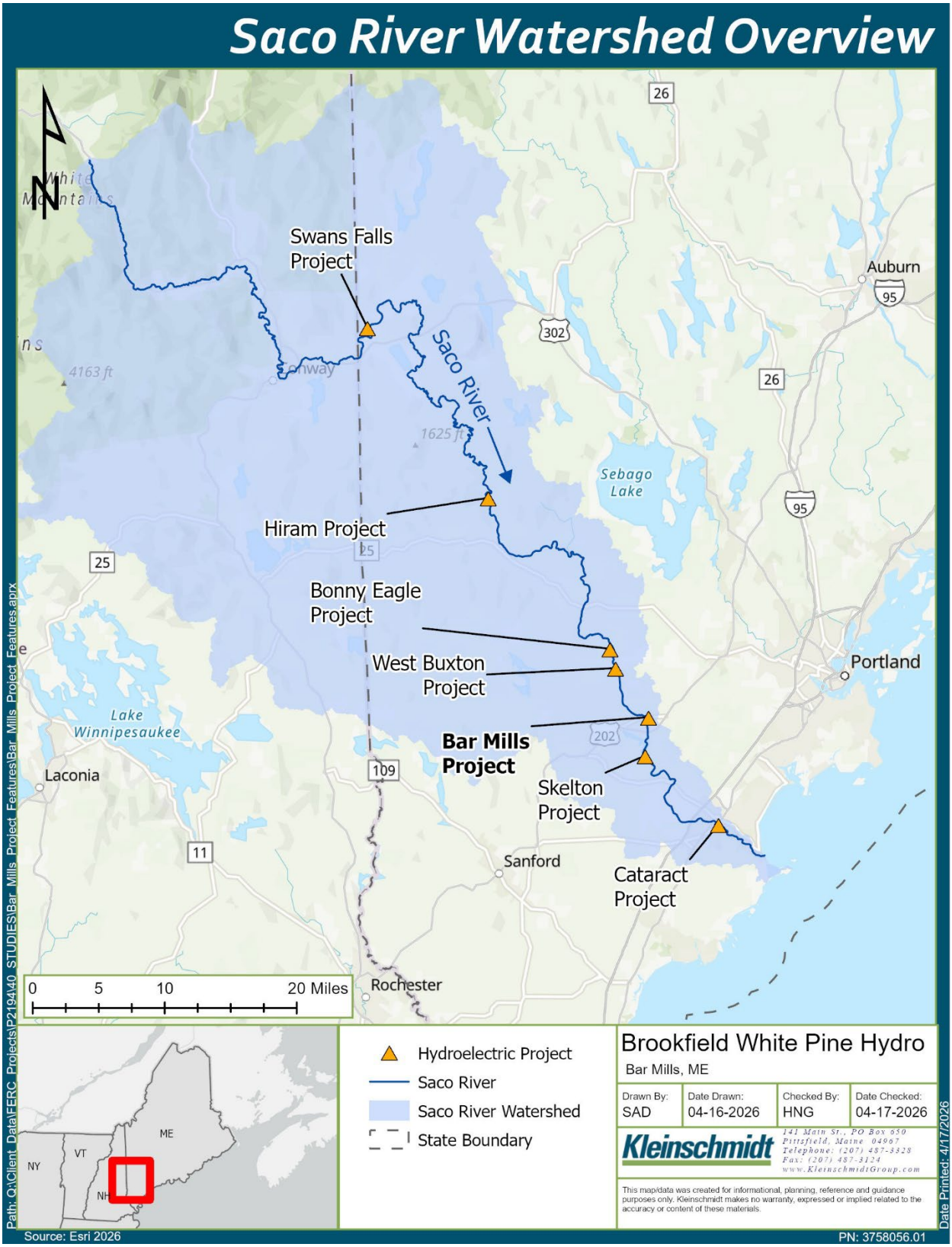

Figure 1-1 Saco River Watershed Overview

1.2 Saco River Settlement Agreement

BWPH filed an Offer of Settlement, known as the 2007 Saco River Fisheries Assessment Agreement (2007 Agreement)[1], with the Federal Energy Regulatory Commission on March 26, 2007. The 2007 Saco River Fisheries Assessment Agreement established the need, design, and schedule for future upstream anadromous fish passage facilities at the Bar Mills, West Buxton, Bonny Eagle, and Hiram Projects. FERC issued a License Order on August 26, 2008[2], upholding the 2007 Agreement. The 2007 Agreement and 2008 Project License require upstream fish passage to be operational at the Bar Mills Project by May 1, 2016. On November 1, 2017, BWPH filed an extension of time request to May 1, 2020[3], to install and commence operation of an upstream anadromous fish passage facility at the Bar Mills Project. Previous extensions of time (to May 1, 2018[4], and May 1, 2019[5]) had been granted to avoid interference with a Maine Department of Transportation (MDOT) bridge replacement project that was occurring within the project boundary. In the 2017 request, BWPH clarified that discussions with the US Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and Maine Department of Marine Resources (MDMR) had centered around alternative fish passage measures on the Saco River that may be more beneficial than a new fish passage facility at the Bar Mills Project. FERC approved the extension of time on January 18, 2018. By Order[6] dated July 17, 2019, FERC approved a 2019 Saco River Fisheries Agreement Amendment which revised the 2007 Fish Passage Assessment Agreement, and the fish installation schedule contained therein. The operational date for upstream fish passage facilities at the Project (or alternative developed in consultation with fisheries agencies), under the terms of the 2019 Saco River Fisheries Assessment Agreement Amendment is May 1, 2025.

On November 30, 2020[7], in accordance with the fish passage alternative specified in the 2019 Amendment, BWPH filed a letter with FERC indicating its intent to surrender the

[1] FERC 2007. Order Modifying and Approving Fish Passage Assessment Report and Recommendations for Fish Passage and Fisheries Management. 120 FERC ¶ 62,050

[2] FERC. 2008. Order Issuing New License. Issued August 26, 2008. Accession No.: 20080826-3019

[3] Bar Mills Project (FERC No. 2194-ME) Extension of Time Request for Upstream Fish Passage Facility Installation. Accession No.: 20171101-5188

[4] FERC 2015. Order Granting Extension of Time. Accession No.: 20150626-3027

[5] FERC 2017. Order Granting Extension of Time. Accession No.: 20170104-3020

[6] FERC. 2019. Order Approving Revised Fish Passage Assessment and Fish Passage Installation. Accession No.: 20190717-3068

[7] Bar Mills Project (FERC No. 2194-ME) Notification of Intent to Surrender License. Accession No. 20201130-5095

license for the Bar Mills Project. The Bar Mills Project has significant operational challenges that have prevented the generating units from running since 2017. These challenges are associated with an unavoidable condition called Alkali Aggregate Reactivity (AAR) which occurs when certain aggregates used in the concrete for the dam and/or powerhouse absorb water and cause expansion and cracking over a period of many years. There is no long-term remedy for AAR in the Bar Mills Powerhouse except full reconstruction.

BWPH determined that surrendering the FERC Project license and decommissioning the Project is the most viable solution in balancing operational, environmental, future dam safety need, and addressing fish passage requirements. BWPH proposes full removal of the spillway, log sluice, canal headworks structure on the west side of the river, and demolition of the former Rogers Fibre mill intake on the east side of the river.

1.3 Purpose of Exhibit E

This Exhibit E conforms with the content requirements of 18 CFR § 4.61(d). Exhibit E is the Environmental Report, structured in the format of an Environmental Assessment. The purpose of the Exhibit E is to describe the existing resources at the Bar Mills Project, and how the existing and proposed Project facilities or operations may affect those resources, including measures for protection, mitigation, and enhancement (PME) with respect to each resource affected. Exhibit E also assesses potential impacts of license surrender and decommissioning on environmental resources. This analysis is based on available information and on the results of studies conducted during the surrender application process.

2.0 CONSULTATION

2.1 Scoping

Following consultation with the resource agencies on dam breach and removal options[8], BWPH issued a Preliminary Scoping Document (PSD) on August 1, 2022, describing the Project, and the proposed action for decommissioning of the project structures and surrender of the project license, including e dam removal. Comments were requested to be submitted by September 1, 2022.

BWPH held a public informational meeting for the license surrender and decommissioning process, including presentation of plans for partial dam removal, for the Project at the Town of Buxton municipal office on August 2, 2022.

BWPH issued a Draft Study Plan on May 31, 2023 to provide the federal and state agencies, stakeholders and the general public with a description of studies and methodologies that BWPH intends to conduct in support of the Application for License Surrender and Decommissioning Plan for BWPH's proposed removal of the Bar Mills Dam. Studies were intended to inform analysis of potential project effects and mitigation measures and provide information necessary for state and federal permit applications [e.g., Maine Department of Environmental Projection's (MDEP) Maine Waterway Development and Conservation Act (MWDCA) and US Army Corps of Engineers (USACE) Section 401 permit applications].

BWPH compiled a list of resource issues and studies to be conducted in 2022 and 2023, partially informed through public outreach, which was posted to the project website and distributed to stakeholders on December 5, 2022. BWPH requested that comments and additional study requests be submitted by January 6, 2023.

BWPH issued the Draft Study plan for 30-day agency and public comment and requested any comments be submitted in writing by June 30, 2023.

BWPH had intended to conduct studies during the summer and fall of 2023, however, due to the abnormally high level of precipitation in Maine and New England during the

[8] Meetings were held with the US Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Maine Department of Marine Resources (MDMR), and Maine Department of Inland Fisheries and Wildlife (MDIFW) on December 17, 2021 and May 19, 2022 to discuss fish passage outcomes for various breach alternatives.

summer, most of the studies were delayed to 2024. A Draft Study Report focusing on the findings of these studies was published on October 22, 2025, with a public meeting held on October 30, 2025, and a public comment deadline of December 6, 2025.

2.2 Agency and Public Comments

Comments on the Draft Study Plans were received by August 15, 2023. A matrix of responses for the Draft Study Plans were appended to the Final Study Plan issued in August 2023. A Draft Study Report was issued in October 2025, Comments on the Draft Study Report were received in December 2025. A matrix of responses for the Draft Study Report is included in Appendix A of the Final Study Report. The Final Study Report will be filed with FERC concurrent with the Surrender Application and Decommissioning Plan in 2026.

2.3 Surrender Application and Decommissioning Plan

A draft Surrender Application and Decommissioning Plan are being distributed to agencies and the public for a 90-day review period. BWPH will hold a public meeting during the comment period to provide an overview of the Surrender Application and Decommissioning Plan. Comments received at the end of the comment period will be addressed, to the extent appropriate, in the final application and Decommissioning Plan prior to filing with FERC.

2.4 Decommissioning Committee

In response to feedback from the Towns of Hollis and Buxton during the study planning process, BWPH formed a Decommissioning Committee of ten representatives selected by the Towns to review a preliminary draft of the DSR, to identify primary issues of concern, and to form subcommittees to evaluate alternatives to address recreational access, water supply under lower water levels associated with groundwater wells and fire suppression, and other concerns identified by the committee members. A series of meetings of the Committee have been held over the course of 2025 and 2026.

3.0 PROPOSED ACTION AND ALTERNATIVES

3.1 No-Action Alternative

The no-action alternative is typically the baseline from which to compare the proposed action (i.e., license surrender and decommissioning of the Bar Mills Project) and the action alternatives that are assessed. The no-action alternative was not considered by BWPH due to migratory fish passage requirements. The 2007 SA and 2008 License require BWPH to install upstream fish passage. BWPH considered redevelopment of the powerhouse to enable operation of the two generating units in addition to establishing upstream fish passage at the Project. Redevelopment of the project coupled with construction of upstream fish passage facilities would be cost prohibitive, therefore the proposed alternative is to surrender the license and decommission the Project. BWPH proposes full removal of the spillway, log sluice, canal headworks structure on the west side of the river and demolition of the former Rogers Fibre mill intake on the east side of the river.

The no-action alternative is not considered further.

3.2 Existing Facilities

The Project dam extends from the east side of the Saco River adjacent to the site of the former Rogers Mill in Buxton to the Project canal headworks on the Hollis (west) shore of the river. The main dam is founded on bedrock, with a maximum height of approximately 21 feet and an average height of approximately 15 feet. An approximately 94-foot long headworks structure is located at the entrance to the canal. The headworks structure consists of four stone masonry piers and two concrete abutments which can be fitted with stoplogs to allow for the dewatering of the canal for maintenance. The canal extends approximately 735 feet from the headworks structure to the powerhouse. The minimum width of the canal is approximately 75 feet, near the headworks. The maximum width of the canal is approximately 180 feet, about mid-way in its length. The powerhouse spillway includes a 7-foot-wide surface gate and sluice for downstream fish passage immediately adjacent to the powerhouse. There is a 6-foot by 6-foot opening located at the base of the powerhouse spillway used for draining the canal with stoplogs that can be removed manually. The Project powerhouse substructure and a large part of the 40-foot-wide by 80-foot-long super-structure are constructed of reinforced concrete. The majority of the powerhouse is located below grade level and is not readily visible from the access road. The powerhouse roof is built of waterproof membrane overlaying wood planks and supported by structural steel framing. The powerhouse has two turbine units with an

installed capacity of 4.0 megawatts (MW). The tailrace consists of an excavated channel extending from the powerhouse to the river and is approximately 200 feet long with a normal water elevation of 127.5′.

Figure 3-1 provides an aerial depiction of primary project features. A full project description is contained in Exhibit A.

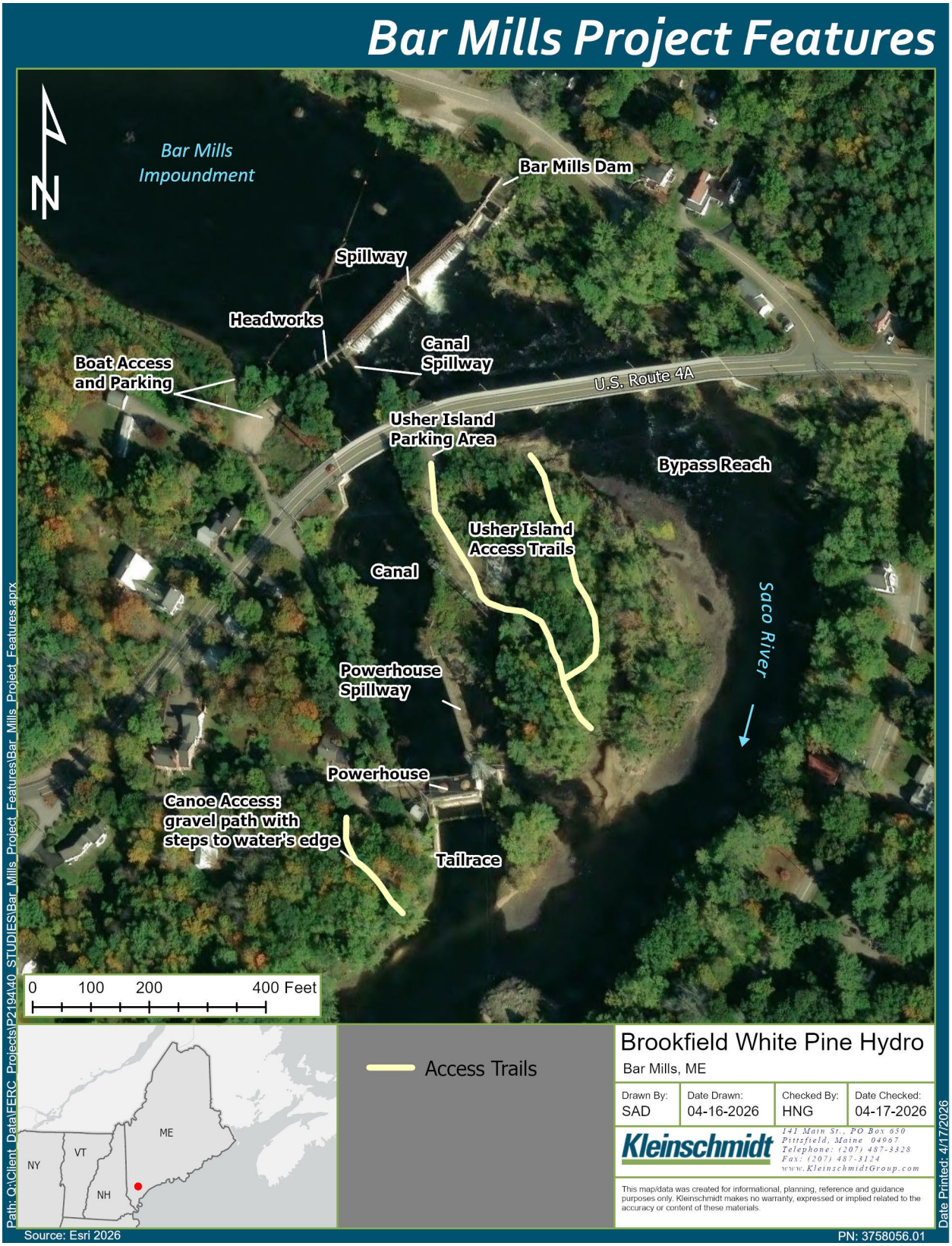

Figure 3-1 Bar Mills Project Features

3.3 Licensed Operations

Licensed operation of the Bar Mills Project is as a run of river facility. Units 1 and 2 are considered out-of-service indefinitely as of May and Dec. 2017, respectively, as a result of concrete growth from AAR impeding the operation of the turbine/generator equipment. Prior to the station shutdown, the FERC license authorized run-of-river operations. The Project operates consistent with the 1997 Flow Agreement[9], and the FERC approved Minimum Flow Monitoring Plan (2011)[10]. Also prior to shutting down the station, the Bar Mills impoundment level were fluctuated once or twice daily up to 2 feet below normal full pond elevation of 148.5 USGS datum to accommodate flow releases from the Bonny Eagle Project, located upstream of the West Buxton Project and Bar Mills Project. According to the FERC license and Minimum Flow Monitoring Plan[11], the flow requirements at the Project are:

- from April 1 through June 30, the impoundment will be maintained within 1 foot of the full pond elevation (run of river); outflow approximately equal to inflow (run-of-river operations) and a minimum bypass reach flow of 100 cfs, or inflow, whichever is less, will be maintained;
- from July 1 through September 30, the impoundment will be maintained within 2 feet of the full pond elevation; a Project minimum flow of 400 cfs or inflow, whichever is less and a minimum bypass reach flow of 100 cfs, or inflow, whichever is less, will be maintained;
- from October 1 through October 31, the impoundment will be maintained within 2 feet of the full pond elevation and a Project minimum flow of 600 cfs or inflow, whichever is less and a minimum bypass reach flow of 100 cfs, or inflow, whichever is less, will be maintained;
- from November 1 to November 15, the impoundment will be maintained within 2 feet of the full pond elevation; and a Project minimum flow of 600 cfs or inflow, whichever is less and a minimum bypass reach flow of 50 cfs, or inflow, whichever is less, will be maintained; and

[9] The April 30, 1997, Instream Flow Agreement for Hydroelectric Projects on the Saco River was incorporated as appropriate into the individual project licenses for the Hiram, Bonny Eagle, and Skelton projects.
[10] FERC, 2011. Order Amending Flow Monitoring Plan. Issued January 4, 2011. Accession No.: 20110104-3002.
[11] Order Amending Approved Flow Plan - 134 FERC ¶ 62,002.

- from November 16 through March 31, the impoundment will be maintained within 2 feet of the full pond elevation; and a Project minimum flow of 250 cfs or inflow, whichever is less and a minimum bypass reach flow of 50 cfs or inflow, whichever is less.

Minimum flows, other than those specifically required for the bypass reach are generally conveyed through the powerhouse via generation. During time of unit outage, or during times of inflows in excess of station capacity, flows are conveyed to the bypass reach via the spillway. Due to alkali-aggregate reaction (AAR) conditions observed in the powerhouse caused by construction materials utilized in the 1950s, Units 1 and 2 are considered out-of-service indefinitely as of May and Dec. 2017, respectively. Since that time, all flows at the Bar Mills Project have passed via the spillway and bypass reach and the headpond has been maintained at 148.5', unless flashboards are lowered during periods of high inflow conditions.

3.4 Existing Environmental Measures

Construction of a downstream fish passage facility at the Project was completed in 2000. It began operation in 2001. The fish passage facility consists of a seven-foot-wide gate leading to a metal flume which deposits downstream-migrating fish into a permanently watered pool. A conveyance/passage flow of 120 cfs is discharged through the sluice gate from May 1 (or at 10^{o}C ambient river temperature – whichever occurs first) through June 15 (or at 18^{o}C ambient river temperature – whichever occurs first) annually to pass downstream migrating fish.

3.5 Proposed Action

BWPH proposes license surrender and full removal of the spillway, log sluice, canal headworks structure on the west side of the river and demolition of the former Rogers Fibre mill intake on the east side of the river. The proposed action also includes removal of the canal spillway adjacent to the headgate structure and construction of a flow diversion weir to restrict flows from entering the canal except for high flow events that would likely occur once or twice a year. BWPH will maintain a 6-foot by 6-foot opening located at the base of the powerhouse spillway to keep the canal drained.

In summary, BWPH will remove the following project features:

- the entire main spillway and log sluice;
- remnant timber crib dam;

- canal headworks structure;
- crane, crane house, and transmission tower; and
- canal spillway.

Project features that may be modified but generally left in place include:

- canal and associated structures;
- powerhouse spillway;
- powerhouse and two generating units, and
- certain project recreation facilities.

In addition, BWPH will demolish the former Rogers Fibre Mill foundation, including fill and seeding to support river access from Buxton shoreline.

BWPH intends to remove the dam in three phases using two cofferdams. Details about sequencing, erosion control, and preliminary designs are contained in the Decommissioning Plan provided in Appendix A.

Once all decommissioning has been completed, BWPH intends to retain ownership of the powerhouse and surrounding lands (e.g., Usher Island). As a real estate investment entity, BWPH's parent company considers the powerhouse and surrounding land a valued asset that can potentially be repurposed for other future uses. The powerhouse and existing recreational access (canoe portage and trails on Usher Island) will continue to be maintained by BWPH. The impoundment boat launch will be reverted back to a natural state and the shoreline will be stabilized.

In summary, BWPH intends to implement the following protection, mitigation, and enhancement measures as part of its proposed action to surrender the license and decommission the project. Several of these measures are more fully discussed later in this application.

- Continue to maintain the powerhouse and existing recreational access (canoe portage and trails on Usher Island);
- Implement a slow drawdown of the reservoir to protect resident fish, catadromous American eels, and mussels;
- If directed by the Maine Historic Preservation Commission, document the Bar Mills Project using Maine Historic Building Record photography in compliance with

Historic American Buildings Survey/Historic American Engineering Record standards;

- Limit tree clearing to the USFWS restriction timeframe for protection of listed bat species; and
- Develop a planting plan to add vegetation in the immediate area of the powerhouse. The purpose of this plan is to improve the aesthetics of the powerhouse after all decommissioning work has been completed.

In addition, BWPH intends to implement three mitigation measures that are not part of its proposed action for license surrender but instead, will be implemented "off license." BWPH does not seek FERC approval for the following:

Town of Hollis Recreation Site

As described in Section 4.10.1.1, BWPH collaborated with the Town of Hollis to determine a new recreational access area upstream of the Bar Mills Dam on the Hollis side of the river. The new access area will be constructed on lands currently owned by the Town of Hollis, located on the same property as the municipal office building. The access area will be developed by BWPH and owned and operated by the Town of Hollis. It will permit river access to the area of the current Bar Mills impoundment, approximately midway between Bar Mills Dam and West Buxton Dam. BWPH is not seeking FERC approval because this site is located outside the Project boundary.

Private Groundwater Wells

As described in Section 4.4.2.2, BWPH is working with the Decommissioning Committee to coordinate a groundwater well survey for landowners abutting the river from approximately the intake canal to West Buxton dam. BWPH intends to identify, monitor, and mitigate any private groundwater wells that are adversely affected by the loss of the project's impoundment. BWPH is not seeking FERC approval because these wells are located outside the Project boundary.

Dry Hydrants

Also as described in Section 4.4.2.2, BWPH will continue to collaborate with the Hollis and Buxton Fire Chiefs to design and implement mitigative measures for fire suppression (e.g., dry hydrant alternatives). BWPH is not seeking FERC approval because these hydrants are located outside the Project boundary.

3.6 Alternatives Considered but Eliminated from Further Analysis

3.7 Federal Government Takeover of the Project

No party suggested that a federal takeover of the Bar Mills Project would be appropriate, and no federal agency has expressed an interest in operating the Project. There is no evidence that indicates a federal takeover should be recommended to Congress. A federal takeover of the Project is not a reasonable alternative and is not considered further.

3.7.1 Surrender and Decommissioning of the Project With Partial Removal

BWPH evaluated a partial spillway removal in addition to a full spillway removal. However, based on agency and stakeholder feedback on partial removal, BWPH is now proposing full removal of the spillway. Therefore, partial spillway removal is not considered further.

4.0 ENVIRONMENTAL ANALYSIS

4.1 General Description of the Project Vicinity

4.2 Saco River Basin

The Saco River has three principal headwaters in Maine and New Hampshire. The Swift River joins the Sace River in Conway, NH and the Ossipee and the Little Ossipee Rivers meet the Saco River in Cornish and East Limington, Maine, respectively. The Project area is located below the confluence of the Saco River and the three principal contributing headwaters, and approximately 19 miles above the mouth at the Atlantic Ocean.

The Saco River watershed has a drainage area of 1,703 square miles, rising in the White Mountains of New Hampshire and runs approximately 120 miles to the mouth located at Ferry Beach, Maine (Maine Rivers 2024). The project boundary extends 5.3 miles upstream of the dam to the tailwater of the West Buxton Project (FERC No. 2531). Downstream, the Project boundary extends approximately 250 feet to the upper end of the Skelton Project boundary (FERC No. 2527).

Approximately 85 percent of the Saco River Basin is forested, and 10 percent is under agricultural use (FERC 1996). Water in the Saco River is used for a variety of purposes including water supply, industrial uses, hydroelectric generation, and recreation. The Saco River is used as a source of drinking water after treatment for the cities of Saco and Biddeford (FPL Energy 2003).

4.3 Tributaries within Project Boundary

There are 22 intermittent and 3 perennial streams within the Bar Mills Project boundary. The three perennial streams entering the impoundment are Smith Brook, Crockett Brook, and Casper Brook.

4.4 Dams Within the Basin

The Bar Mills Project is the third of a series of six hydropower developments located on the Saco River which are owned and operated by BWPH. The projects, in order, are Cataract (river mile (RM) 6), Skelton (RM 17), Bar Mills (RM 19), West Buxton (RM 24), Bonny Eagle (RM 26) and Hiram (RM 48).

4.5 References

Federal Energy Regulatory Commission (FERC). 1996. Final Environmental Impact Statement for Saco River Projects. FERC/FEIS-0077.

FPL Energy Maine Hydro LLC (FPLE Maine). 2003. Bar Mills Hydroelectric Project, FERC No. 2194, Application for New License, Volume I – Application and Exhibits A, E, F, G and H and Appendix A.

Maine Rivers. 2024. Saco River Watershed. Accessed: April 24, 2026. Available at: Saco River Watershed - Maine Rivers

4.6 Geology, Soils, and Sediments

4.6.1 Affected Environment

Physiography/Topography

The Saco River Basin can be divided into four distinct physiographic regions. The uppermost northern portion of the basin is located in the White Mountain region of New Hampshire. This portion of the basin is characterized by high mountains of greater than 5,000 feet in elevation and rugged terrain which has been extensively eroded by glacial action. The uppermost reach of the river basin is very steep as the Saco River falls approximately 1,200 feet in the first 14 miles through narrow valleys of exposed bedrock. The terrain remains rough and steep as the river flows through Bartlett and North Conway, New Hampshire where it is joined by the Ellis River and the Swift River, respectively (CMP 1991).

In Maine, the Saco River moves into the New England Upland area and specifically into a physiographic region known as the Conway-Fryeburg Plain. This region is a broad, relatively flat valley that was once a glacial lake. Today, this valley contains some of the state's most significant agricultural and wetland areas. From Fryeburg to Hiram, the Saco River moves southeast through the Conway-Fryeburg Plain, where it intersects numerous ponds and wetlands formed in glacial depression. The river through this region is wide and shallow with a slope of less than one foot per mile (CMP 1991).

At Hiram, the Saco River passes into the Eastern Foothills physiographic region. The portion of the basin is characterized by steep hills and broad flat valleys, with elevations from 500 to 800 feet. This region contains many natural lakes and ponds, the result of significant glacial activity. The Ossipee and the Little Ossipee Rivers, both major tributaries to the Saco River, join the Saco River in this region at Cornish and Limington, respectively (CMP 1991).

At Limington, the Saco River moves into the lowermost portion of the basin and the final distinct physiographic region, the Seaboard Lowlands. The topography of this region is the result of glaciation and marine invasion and is characterized by low relief with rolling hills rising above the broad, flat plains. The Project is located within the Seaboard Lowlands physiographic region (CMP 1991).

Bedrock and Surficial Geology

The geology of the Project area is part of the Vassalboro Formation and consists of metamorphic rock derived from sedimentary rock and granite of Silurian-Ordovician age (Maine Geological Survey ((MGS)) 1985a). The bedrock is overlain by post-glacial alluvial deposits and glacial deposits (MGS 1985b).

The surficial deposits along the Project area are predominantly glacial deposits left behind during the last ice age. When this massive sheet of ice retreated, it left what is now the Project area submerged under water. The deposits that blanket the underlying bedrock are composed of the material that accumulated during this time, known as glaciomarine deposits. These consist of silt, clay, sand, and minor amounts of gravel. Small, isolated areas of heterogeneous mixtures of sand, silt, clay, and stones, known as glacial till, are located in the upland areas. Upstream from the dam, along the impoundment, are alluvial deposits which consist of sand, silt, and gravel (MGS 1985b). There is a sand and gravel aquifer located approximately 500-feet-east of the dam (MGS 1979).

Soils

Soils within the Project area predominately belong to the Scantic-Raynham-Buxton association. The Scantic and Raynham soils are poorly drained, nearly level, and have seasonal high-water tables. The Buxton soils are moderately well drained to somewhat poorly drained and are found on gently sloping to moderately steep and hilly terrain.

The Marlow-Brayton-Peru association may also occur adjacent to and on the lands northerly of the impoundment area between Bar Mills and West Buxton. These soils are deep, nearly level to moderately steep, well drained to poorly drained soils that were formed in the moderately coarse textured, compact glacial till. The Marlow soils are well drained, the Brayton soils are somewhat poorly drained to poorly drained, and the Peru soils are moderately well drained (USDA 1982).

Sediment Quality and Quantity

BWPH performed a risk assessment of properties and remaining structures within the Project boundary. This included a quantification and composition of sediment behind the Bar Mills Dam and the submerged timber crib dam immediately upstream. In addition, the assessment identified potential areas of shoreline bank erosion.

Sediment Quantity

In June of 2024, Ocean Surveys, Inc, conducted a sub-bottom profiling survey in the lower section of the impoundment (just upstream of Bar Mills dam to the remnant bridge piers, approximately 2,200 feet upstream of the dam). Results of the survey determined that the survey area investigated is underlain by surficial hardbottom (bedrock/glacial till) throughout the river, with the exception of small portions of sand/gravel and silt/clay along the western and eastern shorelines, respectively (OSI 2024). Results indicate that little sediment exists within the survey area and that preconstruction removal is unnecessary.

Sediment Quality

TRC observed that the sampled soil in the area of the former Rogers Fibre Mill foundation does exhibit some hazardous waste characteristics, but did not contain detectable amounts of asbestos (TRC 2025). However, cobble and boulder material used to stabilize the area prevented sampling below six inches. Due to the restriction in sampling below 6 inches TRC (2025) is uncertain whether potentially impacted soils are present below the stabilizing material.

In anticipation of future water levels being lowered following decommissioning of the Bar Mills Dam, BWPH conducted surveys in shoreline areas that would likely be exposed. TRC (2025) states that the sampling results, while limited in overall extent, suggest that human exposure is not likely to be a significant pathway of concern in the sampled areas.

Erosion

An erosion survey of the Project area was conducted in June 2002 associated with the FERC relicensing. The results of the survey indicated that shoreline erosion is not prevalent in the Project area (FPLE Maine 2003). A few small, concentrated areas of erosion were observed along the impoundment during the survey; however, the primary cause of these small areas of erosion was determined to be a result of human foot traffic to access the river near homes. Project operations were not considered to be a potential cause of erosion primarily because shoreline areas that are not subject to heavy human use did not have significant erosion except in localized areas where natural erosion would be expected (i.e., very steep shoreline areas with non-cohesive soils) (FPLE Maine 2003). Natural erosion in areas of steep banks with non-cohesive soils were observed in a few

small places but was limited to small areas at the upstream edge of the upper island and on exposed outer banks, which showed signs of minor slumping and tree toppling (FPLE Maine 2003).

Seismicity

Earthquakes in northeastern North America are assumed to occur during occasional releases of stress along zones of weakness within the earth's crust. There have been no significant movements along any of the faults in this region since the last ice age. However, earthquakes do occur in Maine. These occurrences have been small and no severe damage due to earthquake activity has ever been recorded at the facility. The regular occurrence of small earthquakes indicates that there may be some crustal deformation occurring in the northeastern United States. Modern and historical records indicate relatively higher activity in eastern, central, and southwestern parts of the state (MGS 2001). The largest recorded earthquake in Maine occurred in 1904 and had a Modified Mercalli Intensity of VII. In 1957 an earthquake occurred in Portland, approximately 15 miles from the Project area, with an intensity of VI and a magnitude of 4.2 (MGS 2015). Decommissioning dams in an earthquake-prone area reduces the risk of structural failure during seismic events, thereby minimizing the potential for downstream flooding and damage to critical infrastructure

4.6.2 Environment Effects

Temporary geomorphic adjustments are anticipated including bank erosion and sediment redistribution, as the river reestablishes a natural gradient and flow regime. Exposed soils and fine sediments in the former impoundment area may be subject to short-term erosion until stabilization and revegetation occur. Over time, sediment transport and channel morphology are expected to stabilize, supporting the restoration of natural riverine processes and habitats. The removal of the spillway is anticipated to restore natural geomorphic processes, support the development of a stable river channel, and enhance the geological integrity of the project area over time. Although soil/sediment testing indicated the presence of some unfavorable materials, only a very small amount are anticipated to be removed as part of the dam removal activities, if any. Removed materials will require disposal off-site at an approved landfill facility.

Due to the dated existing information from the prior relicensing, the potential for shoreline bank erosion along the impoundment was surveyed through field investigations conducted in September 2024. Bank Erosion Hazard Index (BEHI) ratings indicate that

much of the shoreline on the impoundment is at high risk of erosion. However, these conditions are expected to stabilize quickly once the spillway is removed, with many of the sandy banks adjusting to the new water elevation and rapidly becoming vegetated. Due to the newly exposed sandy banks, there will be some movement of the finer material in the system; however, historically, this reach was a cobble/boulder-dominated stream, and the general channel form, shape, and extent are not anticipated to change substantially following dam removal. The presence of a cobble and bedrock dominated riverbed in the upper reach and downstream of the Bar Mills Dam indicates that the channel bed is relatively stable and, once spillway removal occurs, the river will settle back into its historical, pre-dam channel form.

4.6.3 Unavoidable Adverse Effects

While the BEHI ratings indicate that much of the shoreline in the study area is at high risk of erosion, these conditions are expected to stabilize quickly once the spillway is removed, with many of the sandy banks adjusting to the new water elevation and rapidly becoming vegetated. The general channel form, shape, and extent are not anticipated to change substantially following the spillway removal.

4.6.4 References

Central Maine Power (CMP). 1991. Application for New License for Major Project Existing Dam Greater than 5.0MW, Skeleton Project, FERC No. 2527. Augusta, Maine.

Maine Geological Survey (MGS). 1985a. Bedrock Geologic Map of Maine.

Maine Geological Survey (MGS). 1985b. Surficial Geologic Map of Maine.

Maine Geological Survey (MGS). 1979. Open file No. 79-6. Sand and Gravel Aquifers Map 5, Cumberland and York Counties, Maine.

Maine Geological Survey (MGS). 2015. Earthquakes in Maine. Maine Department of Agriculture, Conservation & Forestry. Available at: https://www.maine.gov/dacf/mgs/hazards/earthquakes/quake.htm, Accessed: March 31, 2026.

OSI Inc. 2024. Survey Report (OSI Report No. 24ES011) Subbottom Profiling Survey.

United States Department of Agriculture (USDA). 1982. Soil Survey of York County, Maine.

4.7 Water Resources

4.7.1 Affected Environment

4.7.1.1 Water Withdrawals

There are no known withdrawals of water from the Project impoundment. The Saco River downstream of the Project is used as a source of drinking water for the cities of Saco and Biddeford but no water withdraw facilities are located in the impoundment.

4.7.1.2 Water Discharges

Potential non-point sources of discharge into the Saco River watershed include agricultural run-off, road salt, and sediment inputs due to silvicultural activities (FERC 1996). However, there are no observed significant areas of non-point discharge into Project waters. According to information obtained through the Maine Department of Environmental Protection (MDEP) and the US Environmental Protection Agency (USEPA), there are no permitted point source discharges to the Project impoundment (MDEP 2025). Direct discharges to the Saco River occur mainly downstream in the urban areas of Biddeford and Saco, Maine. Most of these sites occur at former mill complexes or municipal wastewater treatment facilities.

The former Rogers Fiber Mill, a previously remediated Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site located on the east bank beyond the Project spillway, has drainage discharge into a channel adjacent to the Project bypass reach area.

4.7.1.3 Water Quantity

The Project is operated as run-of-river. Within the powerhouse, Units 1 and 2 are considered out-of-service indefinitely as of May and December 2017, respectively. Since this time, all flows at the Bar Mills Project have passed via the spillway and bypass reach and the headpond has been maintained at 148.5'.

Prior to the closure of Units 1 and 2, the Project followed the below minimum flow schedule:

Bar Mills Project Minimum Flow	
April 1- June 30	the impoundment will be maintained within 1 foot of the full pond elevation (run of river); outflow approximately equal to inflow (run-of-river operations) and a minimum bypass reach flow of 100 cfs, or inflow, whichever is less, will be maintained;
July 1- September 30	the impoundment will be maintained within 2 feet of the full pond elevation; a Project minimum flow of 400 cfs or inflow, whichever is less and a minimum bypass reach flow of 100 cfs, or inflow, whichever is less, will be maintained;
October 1- October 31	the impoundment will be maintained within 2 feet of the full pond elevation and a Project minimum flow of 600 cfs or inflow, whichever is less and a minimum bypass reach flow of 100 cfs, or inflow, whichever is less, will be maintained;
November 1- November 15	the impoundment will be maintained within 2 feet of the full pond elevation; and a Project minimum flow of 600 cfs or inflow, whichever is less and a minimum bypass reach flow of 50 cfs, or inflow, whichever is less, will be maintained;
November 16- March 31	the impoundment will be maintained within 2 feet of the full pond elevation; and a Project minimum flow of 250 cfs or inflow, whichever is less and a minimum bypass reach flow of 50 cfs or inflow, whichever is less.

Daily average flow data for the Bar Mills Project were obtained from USGS Gage No. 01066000 Saco River at Cornish, Maine for January 1, 1996, through December 31, 2025; the gage is approximately 25 river miles upstream of the Bar Mills dam. The drainage area at the USGS Gage is 1,294 square miles. The drainage area at the Bar Mills dam is 1,591 square miles. The data from the USGS Gage were prorated to the Bar Mills Project based on the ratio of their drainage areas (= 1591/1294 = 1.23). The mean and median flows over the 1996 to 2025 period were 3,744 cfs and 2,768 cfs, respectively (Table 4-1). The monthly mean flow ranged from 1,497 cfs in September to 8,704 cfs in April. The lowest daily mean flow occurred on September 13, 2002 (305 cfs), and the highest daily mean flow occurred on June 18, 1988 (33,087 cfs). Flow duration curves are provided in Appendix B.

Table 4-1 Daily Average Flow Statistics for January 1, 1996, to December 31, 2025, at the Bar Mills Dam

Month	Minimum (cfs)	Median (cfs)	Mean (cfs)	Maximum (cfs)
January	726	2,940	3,438	13,776
February	892	2,189	2,620	11,722
March	1,023	3,690	4,358	18,573
April	1,402	7,423	8,704	25,092
May	1,316	5,172	5,927	25,215
June	566	2,583	3,336	33,087
July	530	1,599	2,434	12,300
August	309	1,091	1,678	11,587
September	305	946	1,497	12,054
October	310	1,796	2,658	17,589
November	613	3,235	3,818	17,835
December	913	3,702	4,456	24,723
All Data	305	2,768	3,744	33,087

4.7.1.4 Water Quality

The State water quality classification for Project waters, including the impoundment and tailwater, is Class A (Title 38 MRSA §467 (12)(A)(8)). Class A waters are the second highest classification given to Maine rivers. Waters immediately upstream of the Project are also Class A waters, whereas the Skelton impoundment just downstream of the Project is listed as Class GPA (Great Pond A). The Maine statutes which define the water quality classification include provisions that recognize that some changes to aquatic life and habitat have occurred due to existing hydropower impoundments. The provision states that within the influence of a pre-existing hydropower Project impoundment, habitat characteristics and aquatic life criteria of Class A waters are considered met if Class C criteria are met (Title 38 MRSA §464 (10)(A)). The standards for Class A waters and the standards for Class C aquatic life are:

> CLASS A WATER QUALITY STANDARDS FOR MAINE WATERS
>
> *Class A waters are included in the second highest classification of waters, only lower than the Class AA waters. Class A waters are designated as suitable for drinking water after disinfection treatments. Class A waters are also suitable for the following uses: fishing, recreation on and in the water, navigation, industrial process and cooling water supply, hydroelectric power generation (except as prohibited under Title 12, Section 403), and as habitat for fish and other aquatic wildlife. Class A waters do not contain less than seven parts per million or 75 percent saturation dissolved*

oxygen, whichever is higher. The aquatic life and bacteria content of Class A waters will be as naturally occurs.

CLASS C AQUATIC LIFE STANDARDS FOR MAINE WATERS

Discharges to Class C waters may cause some changes to aquatic life, provided that the receiving waters shall be of sufficient quality to support all species of fish indigenous to the receiving waters, and maintain the structure and function of the resident biological community.

BWPH conducted a desktop search, compilation, and summary of existing baseline water quality data, including prior relicensing studies and any recent and ongoing water quality monitoring and data reported by the state, the SRCC, and any other relevant sources.

Maine statute 38 MRSA (§464-470) establishes the basis for the State's classification system of surface waters (Table 4-2). The State has one standard for the classification of lakes and great ponds, GPA, which includes inland bodies of water artificially formed or increased that have a surface area greater than 10 acres. The State's riverine surface waters can be classified as Class AA, A, B, or C waters.

Table 4-2 State of Maine Standards for Classification of Surface Waterbodies

Standard	Description
GPA (lakes)	Suitable for drinking water after disinfection, recreation, fishing, agriculture, industrial process and cooling water supply, hydroelectric power generation, navigation, and as habitat for fish and other aquatic life.
Class AA	Managed for their outstanding natural ecological, recreational, social, and scenic qualities. Direct discharge of wastewater, dams, and other significant human disturbances are prohibited.
Class A	Managed for high quality with limited human disturbance allowed. Direct discharges are allowed but highly restricted.
Class B	General-purpose waters that are managed to attain good quality water. Well-treated discharges with ample dilution are allowed.
Class C	Managed to attain at least the swimmable-fishable goals of the federal Clean Water Act and to maintain the structure and function of the biological community.

Source: MDEP, 2024. Maine Legislature n.d.

MDEP reports on the condition of its streams, rivers, lakes, ponds, marine, and estuarine waters biennially through requirements associated with the federal Clean Water Act. MDEP bases its water quality assessments on five major listing categories as described below (MDEP, 2024):

- **Category 1:** Attaining all designated uses and water quality standards, and no use is threatened;
- **Category 2:** Attains some designated uses; no use is threatened; and insufficient data or no data and information is available to determine if the remaining uses are attained or threatened (with presumption that all uses are attained);
- **Category 3:** Insufficient data and information to determine if designated uses are attained (with presumption that one or more uses may be impaired);
- **Category 4:** Impaired or threatened for one or more designated uses, but does not require development of a TMDL (Total Maximum Daily Load) report;
- **Category 5:** Waters impaired or threatened for one or more designated uses by a pollutant(s), and a TMDL report is required.

The reach of the Saco River at the Bar Mills Project is designated in the draft 2024 Integrated Water Quality Report as Category 2: rivers and streams attaining some designated uses, no use is threatened, and insufficient data and no data and information is available to determine if the remaining uses are attained or threatened (MDEP 2024a).

Several water quality monitoring studies have been completed in the Bar Mills Project vicinity since 2000. The results from these studies are summarized below.

2001 Monitoring/Previous Relicensing

FPLE Maine collected ambient water quality data (temperature and DO) at four sites (upper impoundment, lower impoundment, tailrace, bypass reach) at the Bar Mills Project from August 26 to August 29, 2001, to support the FERC relicensing (Figure 4-1) (FPLE Maine 2003). Monitoring was completed in the morning (before 7 AM) and in the late afternoon (after 4 PM). Vertical profiles of the water temperature, DO concentration, and DO percent saturation at the upper and lower sites demonstrated that the impoundment did not stratify. In the impoundment, the water temperature ranged from 22.8°C to 24.4°C (73.0°F to 75.9°F), the DO concentration ranged from 8.0 mg/L to 8.8 mg/L, and the DO percent saturation ranged from 93.4 percent to 105.2 percent (Table 4-3, Table 4-4). In the bypass reach, the water temperature, DO concentration, and DO percent saturation ranged from 22.8°C to 24.9°C (73.0°F to 76.8°F), 8.1 mg/L to 9.1 mg/L, and 94.9 percent to 105.7 percent, respectively (Table 4-5). In the tailwater, the water temperature, DO concentration, and DO percent saturation ranged from 23.1°C to 24.3°C (73.6°F to 75.7°F), 8.3 mg/L to 8.5 mg/L, and 97.1 percent to 101.2 percent, respectively (Table 4-6). Results of the study and comments provided by the MDEP demonstrated that the Bar Mils Project waters met the designated Class A water quality standards (FPLE Maine 2003, MDEP 2008).

FPLE Maine collected benthic macroinvertebrate samples from the Bar Mills Project impoundment in August through September 2001 in support of the FERC relicensing (Figure 4-1) (MDEP 2024b). Benthic macroinvertebrate sampling was completed in the Bar Mills bypass reach from July to August 2002 (MDEP 2024c). The results of macroinvertebrate sampling in the Bar Mills impoundment and bypass reach and comments provided by the MDEP indicated that Bar Mills Project waters were attaining their designated aquatic life standards for Class A waters (FPLE Maine 2003, MDEP 2008).

Table 4-3 Water Quality Data, August 26-29, 2001, Bar Mills Upper Impoundment

Sample Dates:		8/26/2001			8/27/2001						8/28/2001						8/29/2001		
River Flow (CFS):		GENERATING, NO SPILL, 325 CFS			LEAKAGE, NOT GENERATING, 325 CFS						NO SPILL, SPILLING PM, NOT GENERATING, 350 CFS						LEAKAGE, GENERATING, 325 CFS		
Time:		6:30 PM			5:30 AM			6:00 PM			6:30 AM			5:30 PM			6:30 AM		
Weather/Temp:		PARTLY CLOUDY, 80'S			HUMID, HIGH 60'S			OVERCAST, HUMID			PARTLY CLOUDY			PARTLY CLOUDY			CLEAR COOL		
Depth (Meters) Location	**Sample**	**D.O. (mg/L)**	**Temp. (°C)**	**% Sat.**	**D.O. (mg/L)**	**Temp. (°C)**	**% Sat.**	**D.O. (mg/L)**	**Temp. (°C)**	**% Sat.**	**D.O. (mg/L)**	**Temp. (°C)**	**% Sat.**	**D.O. (mg/L)**	**Temp. (°C)**	**% Sat.**	**D.O. (mg/L)**	**Temp. (°C)**	**% Sat.**
	1/4	8.4	24.2	99.8	8.3	23.0	96.8	8.8	23.8	104.9	8.0	22.9	93.4	8.4	23.9	99.6	8.1	23.1	94.8
Surface	**1/2**	8.4	24.3	99.7	8.3	23.1	96.8	8.8	23.8	105.1	8.0	22.9	93.5	8.4	23.9	99.5	8.1	23.1	94.9
	3/4	8.3	24.2	99.8	8.2	23.1	95.9	8.8	23.8	105.2	8.0	22.8	93.6	8.4	23.9	99.6	8.1	23.1	94.5
	1/4	8.3	24.1	99.6	8.2	23.1	96.1	8.8	23.7	104.1	8.0	23.0	93.8	8.3	23.9	99.6	8.1	23.1	94.3
1	**1/2**	8.3	24.2	99.6	8.3	23.1	96.8	8.7	23.8	105.1	8.1	23.0	93.9	8.3	23.8	99.4	8.1	23.1	94.3
	3/4	8.3	24.2	99.8	8.2	23.1	95.6	8.8	23.7	104.7	8.1	23.0	93.9	8.3	23.8	99.6	8.1	23.1	94.4
	1/4	8.3	24.1	99.4	8.2	23.1	95.5	8.7	23.7	102.7	8.0	23.0	93.8	8.3	23.8	99.4	8.1	23.1	94.4
2	**1/2**	8.3	24.2	99.4	8.2	23.2	95.6	8.7	23.7	102.5	8.0	23.0	93.8	8.3	23.8	99.4	8.1	23.1	94.3
	3/4	8.3	24.1	99.6	8.2	23.1	95.5	8.8	23.7	104.1	8.0	22.9	93.8	8.3	23.8	99.4	8.1	23.1	94.2
	1/4	8.3	24.1	99.4	8.2	23.1	95.5	8.7	23.7	102.4	8.0	23.0	93.7	8.3	23.8	99.2	8.1	23.1	94.3
3	**1/2**	8.3	24.1	99.2	8.2	23.2	95.6	8.7	23.7	102.4	8.0	23.0	93.8	8.3	23.8	99.3	8.1	23.1	94.2
	3/4	8.3	24.1	99.4	8.1	23.1	95.1	8.8	23.7	103.0	8.0	22.9	93.8	8.3	23.8	99.4	8.1	23.1	94.1
	1/4	8.3	24.0	99.2	8.2	23.1	95.5	8.6	23.6	101.8	8.0	23.0	93.7	8.3	23.7	99.0	8.1	23.1	94.3
4	**1/2**	8.3	24.0	99.1	8.0	23.2	93.8	8.6	23.6	101.4	8.0	23.0	93.8	8.3	23.7	99.1	8.0	23.1	93.7
	3/4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/4	8.3	24.0	99.1	8.1	32.1	94.8	8.6	23.5	101.1	8.0	22.9	93.6	8.3	23.7	99.0	8.1	23.1	94.3
5	**1/2**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

	Transect Location	**Secchi Disk Depth (m)**	**Total Depth (m)**	**Secchi Disk Depth (m)**	**Total Depth (m)**	**Secchi Disk Depth (m)**	**Total Depth (m)**	**Secchi Disk Depth (m)**	**Total Depth (m)**	**Secchi Disk Depth (m)**	**Total Depth (m)**	**Secchi Disk Depth (m)**	**Total Depth (m)**
	1/4	4	5	4.5	5	5	5	5	5	5	5	4.8	4.8
	1/2	4	4	4	4	4	4	4	4	4	4	4	4
	3/4	3	3	2.8	2.8	3	3	3	3	3	3	3	3

Notes: NS - No sample due to water depth.
Transects sampled from east to west.

Table 4-4 Water Quality Data, August 26-29, 2001, Bar Mills Lower Impoundment

Sample Dates:		8/26/2001			8/27/2001						8/28/2001						8/29/2001		
River Flow (CFS):		GENERATING, NO SPILL, 325 CFS			LEAKAGE, NOT GENERATING, 325 CFS						NO SPILL, SPILLING PM, NOT GENERATING, 350 CFS						LEAKAGE, GENERATING, 325 CFS		
Time:		6:30 PM			5:30 AM			6:00 PM			6:30 AM			5:30 PM			6:30 AM		
Weather/Tem:		PARTLY CLOUDY, 80'S			HUMID, HIGH 60'S			OVERCAST, HUMID			PARTLY CLOUDY			PARTLY CLOUDY			CLEAR COOL		
Depth (Meters)	Sample Location	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.
	1/4	8.3	24.4	99.9	8.4	23.8	99.5	8.8	23.8	103.9	8.3	23.0	96.6	8.4	23.9	99.7	8.3	23.0	96.9
Surface	1/2	8.3	24.3	100.0	8.5	23.8	100.1	8.8	23.8	103.5	8.3	23.0	96.7	8.4	23.9	99.7	8.3	23.1	96.2
	3/4	8.3	23.3	99.9	8.4	23.8	99.8	8.7	23.7	103.1	8.3	23.0	96.7	8.4	23.9	99.8	8.3	23.1	96.8
	1/4	8.3	24.4	99.5	8.2	23.8	98.7	8.8	23.8	103.5	8.3	23.0	96.5	8.3	23.9	99.6	8.3	23.1	96.9
1	1/2	8.3	24.4	99.6	8.4	23.9	99.1	8.8	23.7	103.5	8.2	23.1	96.1	8.4	23.9	99.7	8.3	23.1	96.5
	3/4	8.3	24.4	99.1	8.3	23.9	99.4	8.7	23.7	103.0	8.3	23.1	96.2	8.4	23.9	99.7	8.3	23.1	96.6
	1/4	8.3	24.4	99.9	8.4	23.9	99.5	8.7	23.7	102.4	8.2	23.2	96.3	8.3	23.8	99.5	8.3	23.1	96.9
2	1/2	8.2	24.4	98.9	8.3	23.9	98.8	8.7	23.7	102.6	8.2	23.2	96.3	8.3	23.8	99.6	8.3	23.1	96.6
	3/4	8.3	24.4	99.5	8.4	23.9	99.3	8.7	23.7	102.8	8.3	23.2	96.4	8.3	23.8	99.7	8.2	23.1	96.2
	1/4	8.3	24.4	99.2	8.3	23.9	98.8	8.7	23.5	102.1	8.2	23.2	96.3	8.3	23.7	99.5	8.3	23.1	96.9
3	1/2	8.3	24.4	98.7	8.3	23.8	99.0	8.7	23.6	102.1	8.2	23.2	96.3	8.3	23.8	99.5	8.3	23.1	96.6
	3/4	8.2	24.4	98.5	8.4	23.8	99.4	8.7	23.6	102.1	8.2	23.2	96.3	8.3	23.8	99.5	8.2	23.1	96.2
	1/4	8.3	24.4	99.1	8.3	23.9	98.5	8.7	23.4	101.2	8.2	23.2	96.2	8.3	23.7	99.2	8.3	23.1	96.4
4	1/2	8.3	24.4	99.4	8.3	23.8	98.8	8.7	23.4	101.2	8.2	23.2	96.2	8.3	23.7	99.4	8.3	23.1	96.7
	3/4	8.3	24.4	99.0	8.3	23.8	99.3	8.7	23.5	101.5	8.2	23.2	96.1	8.3	23.7	99.4	8.2	23.1	96.3
	1/4	8.2	24.4	98.6	8.3	23.8	98.4	8.6	23.4	100.2	8.2	23.2	96.1	8.3	23.7	99.2	8.2	23.1	96.0
5	1/2	8.2	24.4	98.7	8.3	23.8	98.5	8.6	23.4	100.4	8.2	23.2	96.1	8.3	23.7	99.2	8.3	23.1	96.4
	3/4	8.2	24.4	98.7	8.3	23.8	99.1	8.6	23.4	100.5	8.2	23.2	96.1	8.3	23.7	99.4	8.3	23.1	96.4
	1/4	NS	NS	NS	8.3	23.8	98.2	NS	NS	NS	NS	NS	NS	8.3	23.7	99.1	8.2	23.1	95.5
6	1/2	8.1	24.4	97.2	8.3	23.8	98.5	8.6	23.3	100.3	8.2	23.2	96.1	8.3	23.6	99.1	8.2	23.1	96.4
	3/4	8.2	24.4	98.7	8.3	23.8	98.7	8.6	23.4	100.2	8.2	23.2	96.0	8.3	23.7	99.2	8.2	23.1	96.3
	1/4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	8.3	23.6	99.1	8.2	23.1	95.2
7	1/2	NS	NS	NS	8.3	23.8	98.2	8.5	23.3	99.8	8.2	23.2	96.1	8.3	23.6	99.1	8.2	23.1	96.3
	3/4	8.2	24.4	98.5	8.3	23.8	98.4	8.6	23.3	100.0	8.2	23.2	96.0	8.3	23.6	99.2	8.2	23.1	96.3
	1/4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
8	1/2	NS	NS	NS	8.2	23.8	97.7	8.4	23.2	99.6	8.2	23.2	96.0	8.3	23.6	99.0	8.2	23.1	96.1
	3/4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	8.3	23.6	99.0	8.2	23.1	96.1

Transect Location	Secchi Disk Depth (m)	Total Depth (m)	Secchi Disk Depth (m)	Total Depth (m)	Secchi Disk Depth (m)	Total Depth (m)	Secchi Disk Depth (m)	Total Depth (m)	Secchi Disk Depth (m)	Total Depth (m)	Secchi Disk Depth (m)	Total Depth (m)
1/4	5	5	5	5.2	5	5	5.2	5.3	5	6.4	5	6.5
1/2	5	5	5	7.5	5	7.4	5.2	7.4	5	7.5	5.5	7.4
3/4	5	6.6	5	6.6	5	6.3	5.2	6.7	5	7.4	5	7.3

Notes:

NS - No sample due to water depth.

Transects sampled from east to west.

Table 4-5 Water Quality Data, August 26-29, 2001, Bar Mills Bypass Reach

Sample Dates:	8/26/2001			8/27/2001						8/28/2001						8/29/2001		
River Flow (CFS):	NO SPILL, GENERATING, 325 CFS			LEAKAGE, NOT GENERATING, 325 CFS						NO SPILL, SPILLING PM, NOT GENERATING, 350 CFS						LEAKAGE, GENERATING, 325 CFS		
Time:	7:00 PM			5:20 AM			7:00 PM			6:50 AM			6:15 PM			6:50 AM		
Weather/Temp:	PARTLY CLOUDY, 80'S			HUMID, HIGH 60'S			OVERCAST, HUMID			PARTLY CLOUDY			PARTLY CLOUDY			CLEAR COOL		
Depth	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.
Mid	8.1	24.9	98.1	8.2	22.8	94.9	8.6	24.0	103.8	8.8	22.9	102.1	8.7	23.7	102.7	9.1	22.9	105.7
Transect Location	Secchi Disk Depth (m)	Total Depth (m)		Secchi Disk Depth (m)	Total Depth (m)		Secchi Disk Depth (m)	Total Depth (m)		Secchi Disk Depth (m)	Total Depth (m)		Secchi Disk Depth (m)	Total Depth (m)		Secchi Disk Depth (m)	Total Depth (m)	
Mid	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	

Table 4-6 Water Quality Data, August 26-29, 2001, Bar Mills Tailwater

Sample Dates:	8/26/2001			8/27/2001						8/28/2001						8/29/2001		
River Flow (CFS):	NO SPILL, GENERATING, 325 CFS			LEAKAGE, NOT GENERATING, 325 CFS						NO SPILL, SPILLING PM, NOT GENERATING, 350 CFS						LEAKAGE, GENERATING, 325 CFS		
Time:	5:45 PM			7:10 AM			7:00 PM			6:55 AM			6:25 PM			7:05 AM		
Weather/Temp:	PARTLY CLOUDY, 80'S			HUMID, HIGH 60'S			OVERCAST, HUMID			PARTLY CLOUDY			PARTLY CLOUDY			CLEAR COOL		
Depth	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.	D.O. (mg/L)	Temp. (°C)	% Sat.
Mid	8.3	24.3	99.5	8.3	23.6	97.1	8.4	23.8	100.1	8.4	23.1	97.6	8.5	24.1	101.2	8.5	23.2	99.3
Transect Location	Secchi Disk Depth (m)	Total Depth (m)		Secchi Disk Depth (m)	Total Depth (m)		Secchi Disk Depth (m)	Total Depth (m)		Secchi Disk Depth (m)	Total Depth (m)		Secchi Disk Depth (m)	Total Depth (m)		Secchi Disk Depth (m)	Total Depth (m)	
Mid	1	1		1	1		1	1		1	1		1	1		1	1	

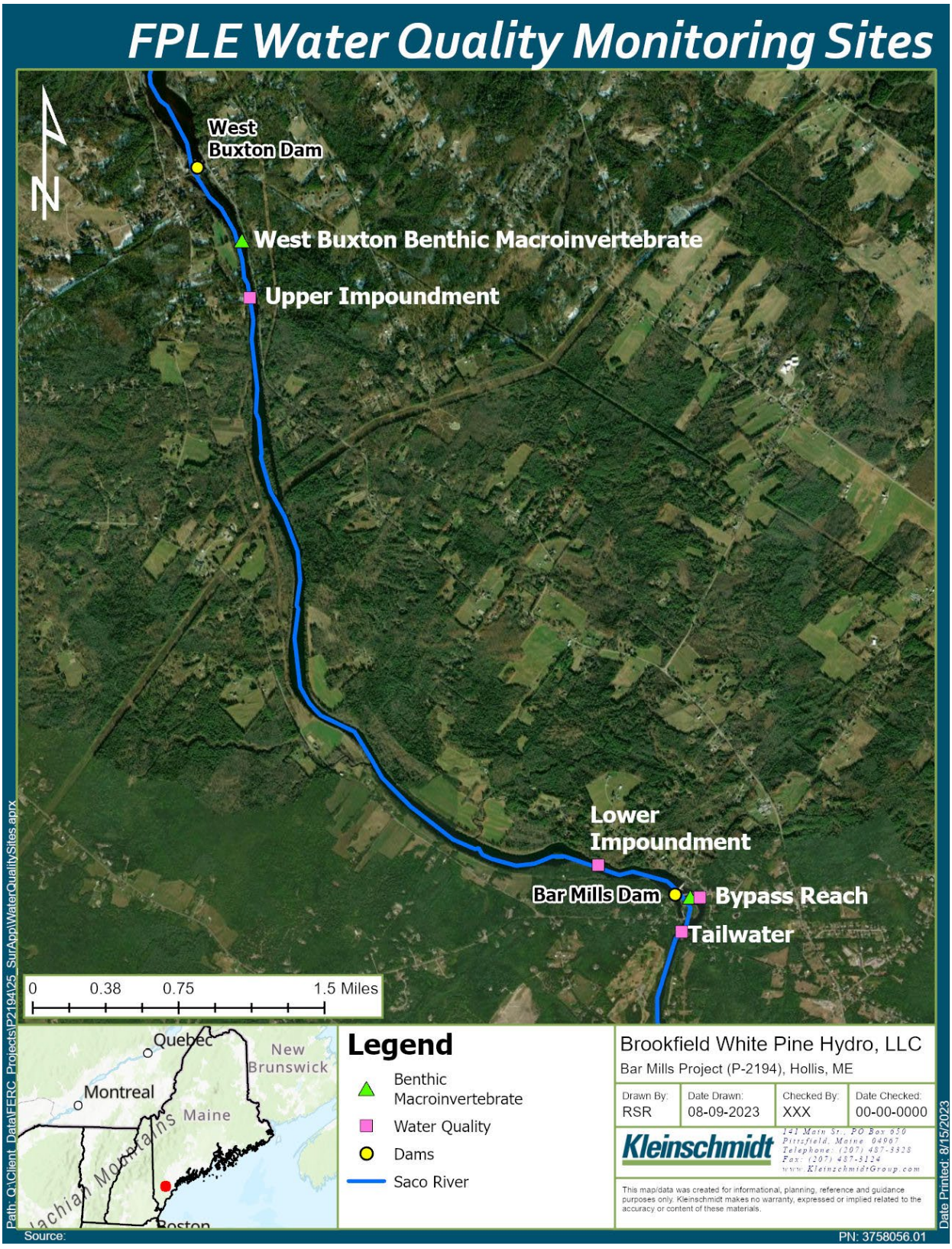

Figure 4-1 Water Quality Study Sampling Sites at the Bar Mills and West Buxton Projects

West Buxton Project Studies

The licensee of the West Buxton Project (FERC No. 2531) completed water quality monitoring in 2013 in the West Buxton impoundment and tailrace (BWHP 2015). The monitoring was conducted in support of the project relicensing and in accordance with MDEP sampling protocols. The Bar Mills Project impoundment extends upstream approximately 5 river miles to the downstream extent of the West Buxton Project.

Vertical profiles of water temperature and DO (concentration and percent saturation), a water transparency measurement, and water samples (analyzed for chlorophyll-a, total phosphorus, pH, color, total alkalinity) were collected two times per month from June to October 2013 at the deep spot in the impoundment. The vertical profiles demonstrated that the impoundment did not thermally stratify. The water temperature ranged from 12.7°C (54.9°F) to 25.9°C (78.6°F), the DO concentration ranged from 7.7 mg/L to 12.3 mg/L, and the DO percent saturation ranged from 93.8 percent to 115.6 percent demonstrating that DO was in attainment with the Class A standards. Chlorophyll-a (1.0 µg/L to 2.6 µg/L in 9 of 10 samples), total phosphorus (9 µg/L to 18 µg/L), pH (6.9 to 7.2), and the water transparency (2.1 m to 4.8 m) also met Class A standards and indicated low productivity.

In the West Buxton tailrace, sampling was conducted once per week in the morning and afternoon for 10 weeks between July 17 and September 18, 2013 (BWHP 2015). The water temperature ranged from 17.0°C (62.6°F) to 26.6°C (79.9°F), the DO concentration ranged from 8.2 mg/L to 10.2 mg/L, and the DO percent saturation ranged from 96.6 percent to 107.3 percent. Class A standards for DO were met on all sampling days.

Benthic macroinvertebrate community sampling was conducted downstream of the West Buxton tailrace from July 26 to August 23, 2013 (Figure 4-1). Results from this sampling indicated that the macroinvertebrate community was diverse, abundant, and rich in taxa and that sensitive organisms accounted for a large portion of the community. MDEP evaluated the results of the macroinvertebrate samples collected in the West Buxton tailwater area with their linear discriminant model and determined that the aquatic community in the Saco River downstream of the West Buxton Project attained Class A standards (BWHP 2015, MDEP 2024d).

Saco River Corridor Commission Water Quality Monitoring

Water quality monitoring has been conducted by the SRCC since 2001 at numerous (over 50) stations along the Saco River (SRCC 2020). The SRCC monitoring program collects surface water quality data once or twice per month from May to September or October at sites along the Saco River, the Ossipee River, the Little Ossipee River, and several smaller tributaries and ponds (SRCC 2020).

Turbidity, pH, conductivity, DO concentration, DO percent saturation, water temperature, and E-coli data from four sites at or near the Bar Mills Project are presented below (Figure 4-2, Table 4-7, Table 4-8, Table 4-9, Table 4-10). Site S18 is located just upstream (approximately 200 feet) of the Bar Mills dam and powerhouse on river left near the site of the old Rogers Fibre Mill. Site S17 is approximately 6.5 river miles upstream of the Bar Mills Dam and approximately 500 feet upstream of the Bonny Eagle Project powerhouse. Site S19-U is approximately 2.3 river miles downstream of the Bar Mills dam in the Skelton Project impoundment, and Site S19-J is approximately 3.2 river miles downstream and just above the Skelton Project dam.

At Site S18 just upstream of the Bar Mills dam, approximately 98 percent and 99 percent of the DO concentration and percent saturation measurements exceeded the standards of 7 mg/L and 75 percent saturation, respectively Table 4-7). The median DO concentration and percent saturation from 2001 through July 2023 were 8.7 mg/L and 96.8 percent, respectively. The median and average pH (6.9) met Class A standards (Table 4-7). Maximum water temperatures (approximately 24°C to 26°C) were observed in mid-July through August. Turbidity and conductivity levels were low.

At Site S17 at the Bonny Eagle Project, 99 percent of the DO data exceeded the Class A standards with median DO levels of 8.6 mg/L and 96.8 percent saturation (Table 4-8). The median and average pH (6.9) met standards and 89 percent of the data was between 6.5 and 9.0. At Site S19-U, over 90 percent of the DO data exceeded the standards; 86 percent of the pH data was between 6.5 to 9.0 (Table 4-9). TKN and total phosphorus were measured during some years at Site S19-U; the concentrations of both parameters were low. All of the available DO and pH data at Site S19-J (from 2022 and 2023) met Class A standards (Table 4-10).

Table 4-7 Water Quality Data Collected at Site S18 Upstream of the Bar Mills Dam off Depot Street by SRCC, 2001-2023

Date	pH	Turbidity (NTU)	Conductivity (µS/cm)	DO (mg/L)	DO (% saturation)	Water Temperature (°C)	E. coli (CFUs/100 mL)
Aug-Oct 2001	6.6 - 7	0.8 - 1.1		7.4 - 9.6	84.9 - 88.4	11.1 - 22.5	54 - 87
April-Nov 2002	6.5 - 7.4	0.6 - 6.9		6.6 - 12.3	72.1 - 114.2	6.1 - 26.1	
April-Oct 2003	6.6 - 7.5	0.9 - 5.3		6.3 - 13.9	75.7 - 127	6.8 - 24.8	
April-Oct 2004	5.9 - 7.4	1 - 11.5		7.1 - 12.3	79.9 - 96.1	4.9 - 23	
April-Oct 2005	6.7 - 8.7	1 - 9.3		6.9 - 12	77.2 - 102.1	6 - 23	
April-Oct 2006	6.9 - 8	0.7 - 3.5		7 - 11.5	73.3 - 105.8	11.2 - 25.8	
May-Oct 2007	6.9 - 7.7	0.8 - 2.5		7 - 10.9	79.7 - 110.6	14.9 - 26	
May-Oct 2008	6.5 - 6.9	1 - 5.6		6.5 - 10.6	78.7 - 100.3	13.1 - 25.4	
May-Sept 2009	6.5 - 7.4	1.8 - 3	11.3 - 16.7	8.4 - 9.8	96.6 - 102.1	15.5 - 22.9	
May-Sept 2010	6.4 - 6.9	1.2 - 3.1	20.1 - 29.9	8 - 10.5	90.7 - 113	15.3 - 26.2	
May-Oct 2011	6.7 - 7.6	1 - 38.4	16.8 - 30.7	7.5 - 9.7	88.3 - 101.9	14.5 - 27	
May-Oct 2012	6.6 - 7.8	1.3 - 3.1	17 - 27	8 - 9.8	96.1 - 98.8	15 - 25.6	
May-Sept 2013	6.6 - 7.6	1.2 - 2	19 - 25.1	8.2 - 10.1	93.4 - 100.2	15 - 23	
May-Sept 2014	6.7 - 7	1.2 - 2.9	19.7 - 28.4	8.1 - 10.3	95.5 - 101	14.2 - 23.9	
May-Sept 2015	6.5 - 6.9	0.8 - 1.7	19.4 - 31	7.9 - 10.2	96 - 100.4	14.6 - 25.6	
May-Sept 2016	6.5 - 6.8	0.8 - 1.8	23.1 - 33.4	7.6 - 10.2	94.3 - 100	14.5 - 26.3	
May-Sept 2017	5.9 - 6.6	1.2 - 3.5	19.3 - 30.3	8.3 - 9.9	95.4 - 102.2	15.4 - 23.3	
May-Sept 2018	6.1 - 8.3	0.9 - 3.7	24 - 35.7	8 - 9.8	93.8 - 101.6	16 - 26.4	
May-Sept 2019	6.2 - 8.7	1.2 - 2.8	48.8 - 75.6	6.7 - 11.3	75.2 - 102.4	10.8 - 24.6	
May-Sept 2020	6.2 - 7.3	0.7 - 2	45.4 - 81	7.9 - 9.9	95.3 - 102	15.6 - 26.8	
May-Sept 2021	6.1 - 9.1	1.2 - 2.3	47.7 - 72.1	7.9 - 10.2	94.6 - 98.4	13.9 - 25.3	
May-Sept 2022	6.6 - 7	1.1 - 3.6	54.6 - 82.1	7.7 - 10.5	95.6 - 99.4	12.8 - 26.1	4.1 - 59.8
May-July 2023	6.7 - 6.9	1.5 - 6.2	36.1 - 59.7	9 - 10.9	98.5 - 104	13.4 - 20.6	2 - 139.1
Median	**6.9**	**1.5**	**27.4**	**8.7**	**96.8**	**20.5**	**29.8**
Average	**6.9**	**2.1**	**35.8**	**8.8**	**95.3**	**19.5**	**41.8**

Table 4-8 Water Quality Data Collected at Site S17 near Bonny Eagle Island by SRCC, 2001-2023

Date	pH	Turbidity (NTU)	Conductivity (µS/cm)	DO (mg/L)	DO (% saturation	Water Temperature (°C)	E. coli (CFUs/100 mL)
Aug-Oct 2001	6.7 - 7	0.7 - 1.5		7.3 - 10	85.8 - 94.7	11.8 - 22.5	16 - 69
April-Oct 2002	6.6 - 7.6	0.6 - 1.8		7.2 - 11.3	83.6 - 103.9	8.2 - 24.9	
April-Oct 2003	6.5 - 7.2	0.8 - 4.8		7.1 - 12.6	85.0 - 111.9	6.8 - 25.8	
April-Oct 2004	5.9 - 7.1	0.8 - 1.5		7.1 - 12.1	84.3 - 118.9	4.5 - 24	
April-Oct 2005	6.6 - 7.2	1 - 4.3		7.6 - 11.6	88.6 - 98.8	5 - 23	
May-Oct 2006	6.8 - 8.7	0.7 - 3.1		6.9 - 10.7	73.1 - 102.5	13.3 - 25.7	
May-Oct 2007	6.9 - 7.9	0.7 - 2		7.5 - 11.3	83.9 - 111.5	15 - 25.7	
May-Oct 2008	6.5 - 7.9	1.1 - 2.6		6.5 - 10.8	79.7 - 102.9	13.1 - 25.5	
May-Sept 2009	6.4 - 7.6	1.1 - 4.2	9.5 - 17.1	8.2 - 9.8	96.8 - 100	15.9 - 22.9	
May-Sept 2010	6.5 - 7.7	1.2 - 2.7	19.7 - 29.4	8.2 - 10.2	98.8 - 104.3	15.5 - 25.2	
May-Oct 2011	6.9 - 7.6	1 - 35.8	16.6 - 31.2	7.9 - 9.6	94 - 100.5	14.4 - 26.2	
May-Oct 2012	6.7 - 7.3	1.6 - 3	16.8 - 26.9	7.8 - 9.7	93.4 - 99.3	15.4 - 25.6	
May-Sept 2013	6.8 - 8	1 - 2.2	10.3 - 23.7	8.2 - 10	94.5 - 100.3	15.2 - 23.4	
May-Sept 2014	6.9 - 7.4	1.3 - 2.5	19.9 - 26.3	8.4 - 10.2	98.4 - 101.5	14.5 - 23.6	
May-Sept 2015	6.5 - 7.1	0.9 - 1.9	19.3 - 29.3	8.1 - 10.5	98.1 - 101.4	14 - 25.7	9.8 - 34.5
May-Sept 2016	6.2 - 6.9	0.9 - 1.7	22 - 33.1	7.9 - 10.1	96.9 - 99.9	15 - 26.3	
May-Sept 2017	5.8 - 6.9	1.2 - 4.6	19 - 29.3	8 - 9.7	94 - 100.1	15.8 - 23.2	
May-Sept 2018	6.4 - 8.3	1 - 2.5	23.7 - 35.2	7.5 - 9.7	92.7 - 98.6	16.2 - 26.7	
May-Sept 2019	6.2 - 9.3	1.3 - 3	46 - 71	7.6 - 10.9	92.1 - 99.4	11.2 - 24.4	
May-Sept 2020	6.2 - 7.6	1 - 1.7	43.1 - 85.3	7.5 - 9.7	90.6 - 101.6	15.7 - 26.6	
May-Sept 2021	6.2 - 7.1	1.1 - 2.1	50.5 - 71.4	7.7 - 10.1	92.7 - 99.8	14.2 - 25.1	
May-Sept 2022	6.5 - 7	1.1 - 1.7	51.5 - 83.1	7.8 - 10.4	93.5 - 99.4	13.7 - 26.2	2 - 39.3
May-July 2023	6.5 - 7.4	1.9 - 5	35.1 - 58.6	8.6 - 10.4	96.5 - 99.7	13.3 - 20.7	3.1 - 151.5
Median	**6.9**	**1.4**	**28.0**	**8.6**	**96.8**	**20.5**	**16.5**
Average	**6.9**	**1.7**	**36.4**	**8.8**	**96.1**	**19.6**	**28.0**

Table 4-9 Water Quality Data Collected at Site S19-U in the Skelton Project Impoundment by SRCC, 2001-2023

Date	pH	Turbidity (NTU)	Conductivity (µS/cm)	DO (mg/L)	DO (% saturation)	Water Temperature (°C)	TKN (mg/L)	Total Phosphorus (mg/L)	E. coli (CFUs/100 mL)
Aug-Oct 2001	6.5 - 7.1	0.9 - 2.1		6.5 - 9.1	76.7 - 109.4	12 - 25.3			19 - 93
April-Nov 2002	6.5 - 7.5	1.3 - 6.7		6 - 11.2	73.4 - 105	8 - 25.2	0.2 - 3.2	0.01 - 0.85	0 - 0
April-Oct 2003	6.8 - 7.3	1.1 - 5.2		6.6 - 12	76.2 - 113.7	6.8 - 26.1	0.2 - 0.8	0.01 - 0.18	7.5 - 1000
April-Oct 2004	6.2 - 7.9	0.9 - 3.2		7.5 - 13.5	87.8 - 147.6	4.5 - 23.5	0.2 - 0.8	0.005 - 0.41	0 - 70.4
April-Oct 2005	6.6 - 7.4	1 - 10.3		6.7 - 13	79.9 - 107.2	4.5 - 28	0.3 - 0.3		0 - 68
May-Oct 2006	6.7 - 8.8	1 - 8.6		6.7 - 9.9	72 - 99.1	13.3 - 25.6	0.3 - 0.5	0.008 - 0.018	2 - 160
May-Oct 2007	6.6 - 9.1	1 - 2.4		6.9 - 11.4	75.7 - 112.4	14.2 - 27.2	0.3 - 0.6		2.1 - 129.6
May-Oct 2008	6.5 - 7	1.4 - 2.3		7 - 10.8	73.7 - 107.3	12.8 - 24.5	0.3 - 0.3	0.007 - 0.02	2 - 72.1
May-Sept 2009	6.4 - 6.9	1.6 - 4.8		7.1 - 10.7	83.3 - 116.5	18.1 - 23.6	0.3	0.011 - 0.017	1 - 72.7
May-Sept 2010	6.2 - 6.8	1.9 - 2.2		5.5 - 8.3	60.4 - 102.2	16.1 - 27	0.3 - 0.3	0.009 - 0.013	1 - 10.9
May-Oct 2011	6.5 - 7.4	1.1 - 51.2	25.4 - 62.4	5.8 - 9.3	52.1 - 98.3	10.9 - 27.7	0.3		5.2 - 121
May-Oct 2012	6.6 - 7.5	1.6 - 2.5	16.4 - 39	6.9 - 9.7	80.1 - 97.4	15.9 - 26.2	0.4	0.014 - 0.015	3.1 - 74.9
May-Sept 2013	6.5 - 7.6	1.3 - 1.8	19.9 - 23.9	7.4 - 8.6	73.7 - 96.8	15 - 24.2	0.3 - 0.4		4.1 - 51.2
May-Sept 2014	6.6 - 6.9	1.3 - 1.9	16.5 - 27.4	7.7 - 10.2	89.1 - 103.4	15.7 - 24.8	0.4 - 0.5		3.1 - 18.9
May-Sept 2015	6.4 - 6.8	1.3 - 2.3	22.7 - 31.6	6.3 - 8.9	62.3 - 102.1	15 - 26	0.4 - 0.7	0.022	1 - 25.6
May-Sept 2016	6.5 - 6.8	1.2 - 1.8	22.6 - 32.4	6.4 - 8.8	79.2 - 104	15.2 - 27.1	0.3 - 1.5	0.02 - 0.065	1 - 48.8
May-Sept 2017	6 - 6.6	1.5 - 2.9	19.8 - 29.9	7.5 - 10.4	89.9 - 106.5	15.8 - 24.2	0.7	0.013 - 0.018	9.7 - 42.6
May-Sept 2018	6 - 8.1	1 - 2.6	24.2 - 35.9	8 - 10.2	98 - 101.8	16 - 26.7	0.3 - 0.5	0.006 - 0.04	13.4 - 307.6
May-Sept 2019	6.3 - 8.3	1.1 - 2.7	47.9 - 73.5	8.1 - 11.4	97.7 - 103.4	10.8 - 24.7		0.007 - 0.012	5.2 - 73.3
May-Sept 2020	6.2 - 7.1	0.9 - 1.7	45.7 - 81.6	7.9 - 10.2	97 - 101.7	15.5 - 26.6		0.008 - 0.055	11 - 62
May-Sept 2021	6 - 8.8	1.1 - 2.3	48.2 - 71.9	8.1 - 10.6	96.6 - 101.8	13.8 - 25.3		0.001 - 0.044	9.8 - 325.5
May-Sept 2022	6.6 - 7.2	1.1 - 1.9	54.9 - 84.6	7.7 - 10.7	96.2 - 101.3	13.1 - 26.3			2 - 83.3
May-July 2023	6.7 - 7	1.5 - 7.9	35.9 - 59.8	9.3 - 11	100.4 - 105.2	13.4 - 20.6			3 - 285.1
Median	**6.8**	**1.6**	**30.4**	**8.3**	**94.8**	**21.2**	**0.3**	**0.01**	**17.2**
Average	**6.9**	**2.1**	**40.0**	**8.5**	**93.2**	**20.2**	**0.4**	**0.1**	**40.5**

Table 4-10 Water Quality Data Collected at Site S19-J at the Public Boat Launch Upstream of the Skelton Project Dam by SRCC, 2022-2023

Date	pH	Turbidity (NTU)	Conductivity (µS/cm)	DO (mg/L)	DO (% saturation)	Water Temperature (°C)
May-Sept 2022	6.5 - 7.0	1.4 - 5.3	54.0 - 80.7	7.2 - 10.9	87.8 - 103.3	12.8 - 27.5
May-July 2023	6.6 - 7.4	1.7 - 6.6	34.6 - 54.3	8.6 - 10.8	95.4 - 105.3	14.3 - 21.5
Median	**6.8**	**2.0**	**58.9**	**8.5**	**97.1**	**20.0**
Average	**6.8**	**2.8**	**59.4**	**8.9**	**98.0**	**20.2**

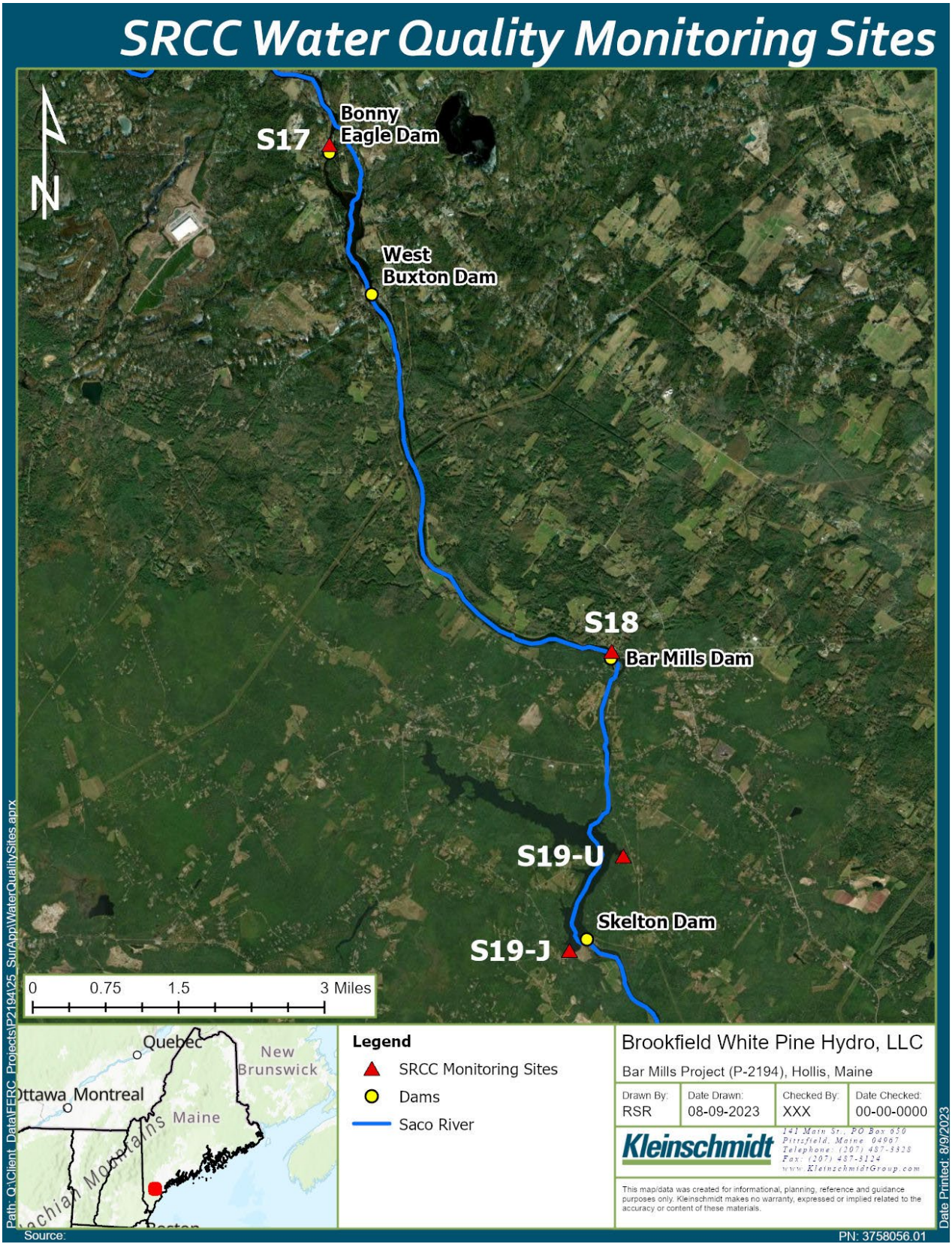

Figure 4-2 SRCC Monitoring Sites near the Bar Mills Project

Water quality monitoring was completed at 18 sites along the Saco River between North Conway, NH, and Biddeford, ME, by researchers from the University of New England between 2010 and 2012 (Zeeman and Spillane 2015). Overall, water quality was found to be good with low chlorophyll-a, nutrient, and E-coli levels. DO ranged between approximately 7 mg/L to 12 mg/L and 90 percent to 105 percent.

4.7.2 Environmental Effects

4.7.2.1 Water Quantity

BWPH completed a river elevation model of the reach from Bar Mills Dam to the upper limit of the existing impoundment just downstream of West Buxton. A 1-dimensional (1D) and 2-dimensional (2D) hydraulic model was developed using the state-of-the-art U.S. Army Corps of Engineers' HEC-RAS v6.1 software to simulate the water levels and depths for the existing conditions and full spillway removal conditions. Each condition modeled three flows: 300 cubic feet per second (cfs), 400 cfs, and the annual median flow of 2,476 cfs. The 300 cfs flow is intended to represent the lowest summer flow and 400 cfs represents the typical low summer flow.

In addition to using the model to characterize and compare pre- and post-spillway removal water level conditions, BWPH used the model output and historic hydrology data to evaluate potential impacts to water supply wells and dry hydrants resulting from lower impoundment levels.

Hydraulic modeling of water depths at 300 cfs, 400 cfs, and the annual median flow of 2,476 cfs determined the anticipated change in maximum and average water depths through the reach between Bar Mills dam and the remnant bridge piers (hydraulic control). The modeled reduction in normal water levels in this reach averages 7.8 feet across the three flow conditions and the average reduction in depth is 6.2 feet (Table 4-11, and Figure 4-3 through 4-5). Average and maximum water depths under 300, 400, and 2,476 cfs are presented in Table 4-11.

Table 4-11 Maximum and Average Water Depth for Average Mean, Lowest, and Typical Low Summer Flows Under Full Spillway Removal Conditions

Maximum Water Depth, Bar Mills Dam to Pier Remnants (ft)			
	300 cfs	400 cfs	2,476 cfs
Existing Conditions	17.5	18.1	19.2
Post Full Spillway Removal	9.9	10.0	11.6
Change in Maximum Depth	7.6	8.1	7.6

Average Water Depth, Bar Mills Dam to Pier Remnants (ft)			
	300 cfs	400 cfs	2,476 cfs
Existing Conditions	8.3	8.4	9.3
Post Full Spillway Removal	2.2	2.2	2.9
Change in Average Depth	6.1	6.1	6.4

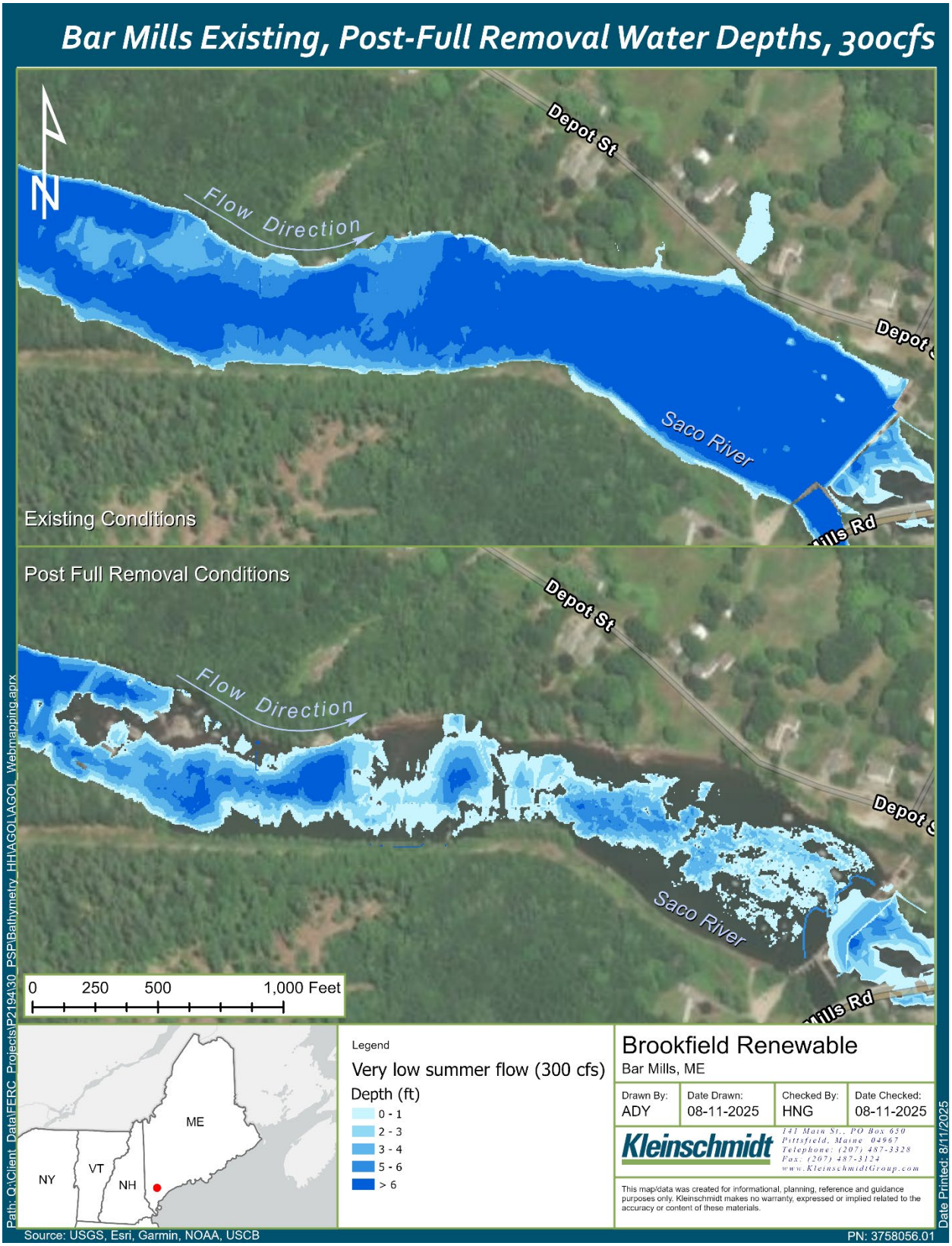

Figure 4-3 Hydraulic Modeling 300 cfs Existing and Full Spillway Removal

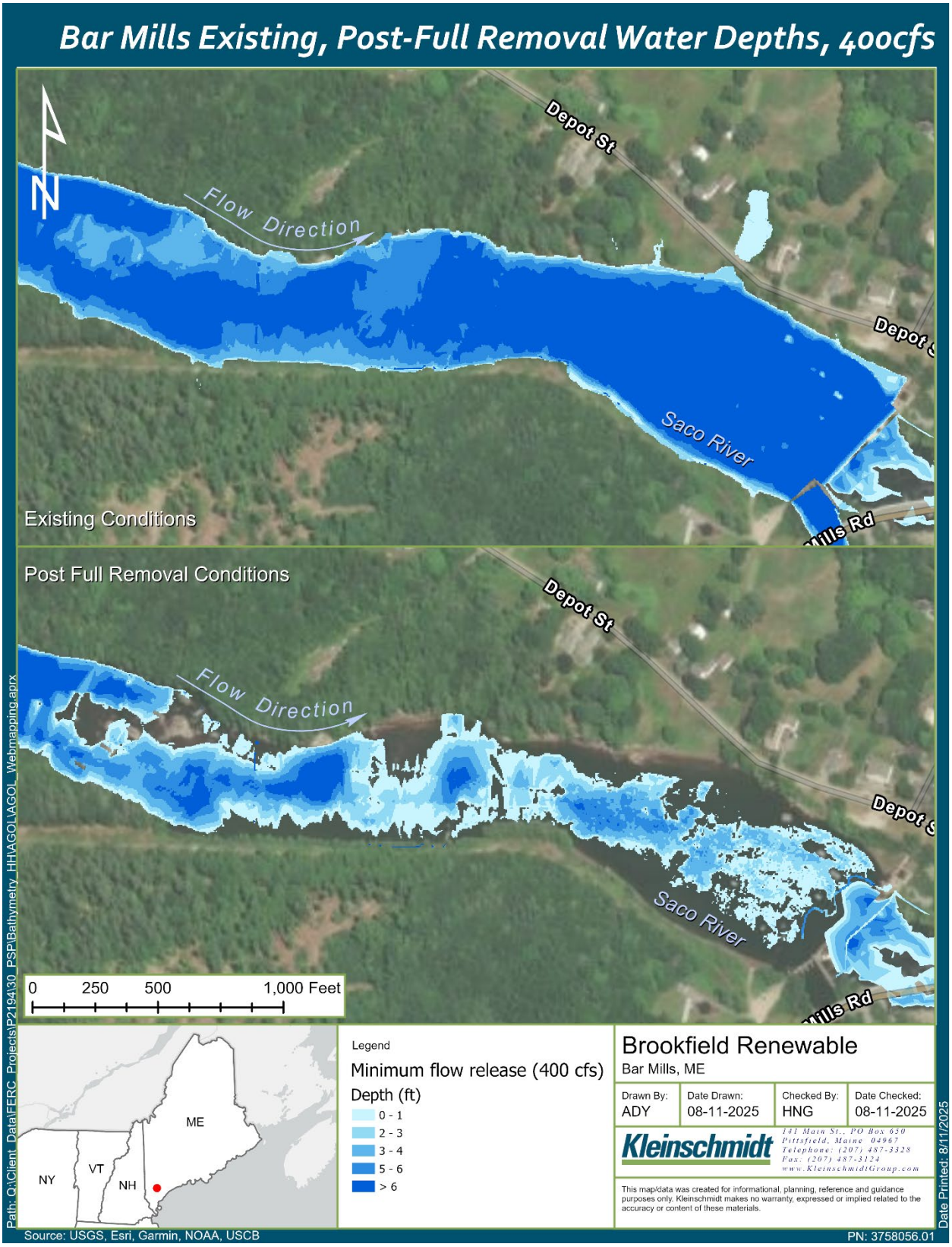

Figure 4-4 Hydraulic Modeling 400 cfs Existing and Full Spillway Removal

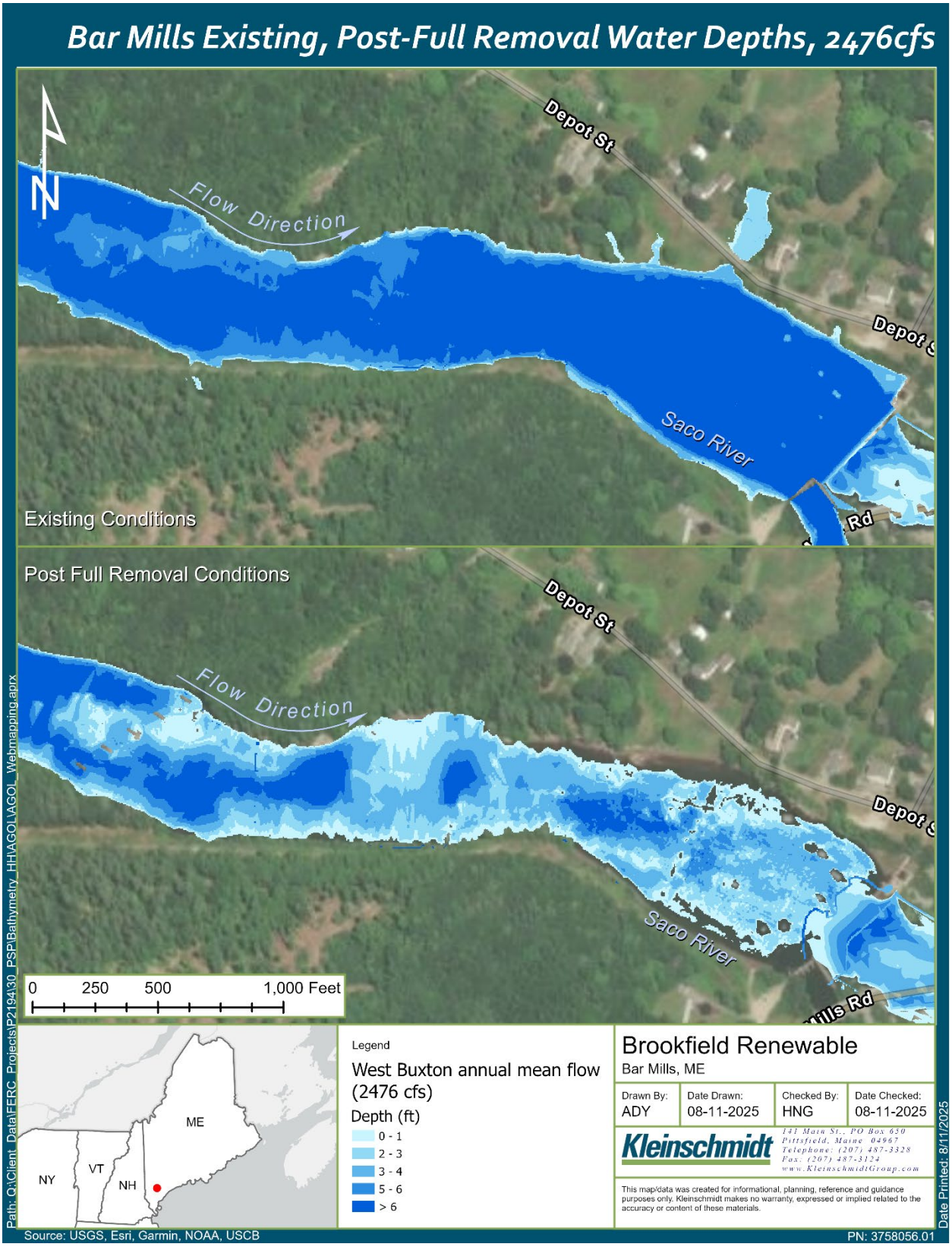

Figure 4-5 Hydraulic Modeling 2,476 cfs Existing and Full Spillway Removal

Removal of the Bar Mills Spillway will restore the pre-dam flow regime in this section of the Saco River, resulting in more natural seasonal fluctuations in water quantity. The elimination of the impoundment will reduce or eliminate artificial water level control, allowing the river to respond directly to precipitation and watershed hydrology. The spillway removal is anticipated to lower surface water elevations in the former impoundment and adjacent Saco River, returning both surface and groundwater levels near the former impoundment to pre-dam conditions.

4.7.2.2 Water Supply Wells and Dry Hydrants

Based upon stakeholder concerns during the scoping and study planning phase of the surrender process, BWPH has committed to survey, monitor, and mitigate private groundwater wells and dry hydrants that are adversely affected by license surrender and dam decommissioning. However, these measures are not part of BWPH's proposed action for license surrender and will be implemented "off license". Therefore, BWPH is not seeking FERC approve for these measures.

TRC conducted an evaluation of wells in the vicinity of Bar Mills Dam that may be affected by the dam's removal. TRC (2025) notes that because the surface water of the impoundment and Saco River is hydraulically connected to the adjacent and underlying groundwater flow system, lower water levels in the impoundment and river will result in lower groundwater elevations near the former mill pond. TRC (2025) found that the greatest change in surface water elevation will be just immediately upstream of the Bar Mills dam with normal surface elevation reduced by approximately 18 feet at the dam, from a normal impoundment elevation of 148.5 NGVD to a few feet above the proposed new elevation of the stream channel of approximately 127.5 feet NGVD (Figure 4-6). The change in surface elevation will be progressively less moving upstream from the dam and the hydraulic control in the area of the remnant bridge piers. Normal water levels (50% exceedance or 2,725 cfs) in the river upstream of the hydraulic control are anticipated to be reduced by approximately 2.5 feet following removal of the dam; however, these effects will be lessened due to the natural topography of the riverbed. Flow durations will not change as inflow to this segment of the river will not be affected by removal of the spillway.

TRC (2025) further states that the impact of dam removal on groundwater elevations will be attenuated with distance from the impoundment laterally and with distance upstream from the dam. TRC identified three ways in which a lower groundwater level could affect private wells:

- a drop in groundwater elevation could dewater a portion of the upper saturated thickness of the bedrock connected to the well;
- lowered groundwater elevations could require pumps to be set deeper within the well; and
- lowering the static head would require pumps to lift water higher and depending on the age and type of pump, this could lead to reduced flow.

The extent of effects will not be known until the spillway is removed, at which time BWPH would assess the need for mitigation measures. BWPH continues to collaborate with Decommissioning Committee members to coordinate a well survey for landowners abutting the river reach from approximately the intake canal to West Buxton dam. This information will aid BWPH in evaluating potential risk of impacts on wells based on technical data (e.g., type of well, depth, proximity to the river) and inform any potential mitigation plans. Rather than limiting the survey to the radius considered by TRC, the Decommissioning Committee determined it appropriate to survey landowners along the river corridor from Bar Mills dam to West Buxton dam.

Two dry hydrants currently draw water from the Bar Mills impoundment: one is located on Depot Street in Buxton, and the other is on Canal Road in Hollis. The Towns of Buxton and Hollis requested a study to determine whether the dry hydrants will remain operational and whether the proposed diversion weir at the upstream end of the canal will allow sufficient water to keep the hydrants operational. BWPH and the Hollis and Buxton Fire Chiefs evaluated alternatives to modify and/or relocate the dry hydrant intakes, but determined relocation is not viable. Therefore, BWPH will evaluate the feasibility of installing a water storage tank in the vicinity of the Rogers Fibre Mill site as an off-license measure. BWPH anticipates additional consultation with the Towns regarding groundwater wells, fire suppression, and recreational access as BWPH implements the Decommissioning Plan.

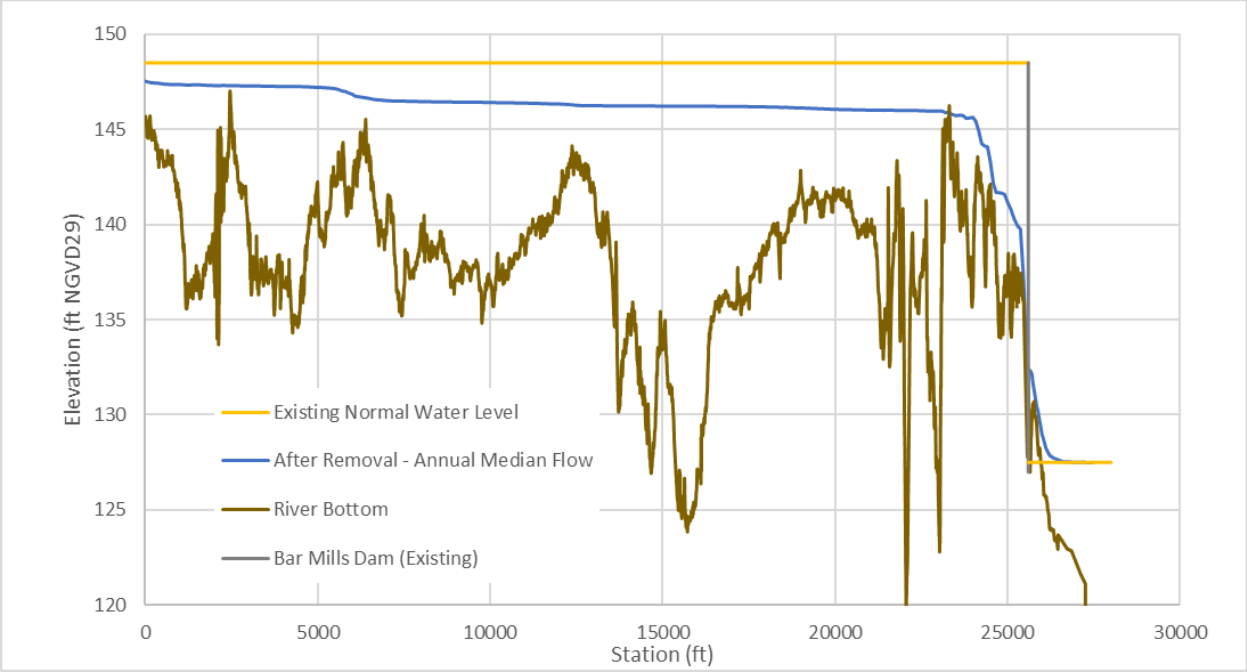

Figure 4-6 Upstream Water Levels[12]

4.7.2.3 Water Quality

BWPH anticipates the removal of the Bar Mills Project spillway to result in both short-term and long-term effects on water quality. In the short term, the release and downstream transport of limited accumulated sediments may temporarily increase turbidity and suspended solids, potentially affecting aquatic habitats and water clarity. There may also be a temporary release of nutrients or organic material previously trapped in the impoundment, which could lead to localized decreases in dissolved oxygen levels.

Over the long term, water quality is expected to improve as the river resumes natural flow and sediment transport processes. The restoration of free-flowing conditions typically reduces the potential for thermal stratification and stagnation, resulting in more stable dissolved oxygen levels and water temperatures. The reestablishment of natural riffle-run sequences and improved connectivity can further support the recovery of aquatic ecosystems and enhance overall water quality. These changes are generally considered beneficial for riverine health and habitat.

[12] Station 0 is the upstream extent of the Bar Mills Project boundary at the West Buxton tailwater.

4.7.3 Unavoidable Adverse Effects

4.7.3.1 Water Quantity

Lowered surface water levels will result in corresponding decreases in groundwater elevations near the former impoundment, with the impact attenuating with distance from the mill pond and upstream from the dam. Groundwater supply wells were identified along the impoundment that may be affected by reduced groundwater levels. Potential effects on these wells include partial dewatering of the upper saturated bedrock, the need to set pumps deeper within the wells, and possible reduced pump flow rates due to increased lift requirements. The full extent of these effects will not be known until after the spillway removal, at which point further assessment and potential mitigation may be necessary.

Based upon stakeholder concerns during the scoping and study planning phase of the surrender process, BWPH has committed to measures specific to water supply wells and dry hydrants. These measures are not part of the proposed action and are assumed to be handled off-license without a need for FERC approval. BWPH is coordinating a well survey for landowners along the river corridor to evaluate potential risks and inform mitigation planning. Additionally, alternatives for modifying or relocating dry hydrant intakes are under consideration in consultation with municipal fire departments as part of the ongoing decommissioning process.

4.7.3.2 Water Quality

Unavoidable effects may include a temporary increase in turbidity and suspended sediment concentrations as the limited accumulated sediments are mobilized and transported downstream. This may also result in the short-term release of nutrients or organic material previously trapped in the impoundment, potentially causing localized decreases in dissolved oxygen levels and temporary impacts to aquatic habitats. These effects are generally limited in duration and are most pronounced during and immediately following removal activities, diminishing as the river system stabilizes and resumes natural flow and sediment transport processes.

4.7.4 References

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4.8 Fisheries and Aquatic Resources

4.8.1 Affected Environment

4.8.1.1 Resident Fish

MDIFW manages the lower Saco River from head-of-tide upstream to East Limington, including the project waters, as a warm-water fishery (MDIFW 1982). Within this reach, MDIFW also manages tributaries and river bypass reaches below dams to support wild and stocked cold-water fish, including brook trout and brown trout (MDIFW letter dated May 30, 2003). The principal warm-water fisheries include self-sustaining populations of smallmouth bass, largemouth bass, chain pickerel, and white perch.

Fisheries Surveys

FPLE Maine conducted a fisheries study at the Project in October 2001 within the Project impoundment, bypass reach, and tailwater using multiple gear types. The study collected a total of 751 fish representing 17 species from the Project area; Table 4-12 summarizes catch by species and sampling location. Smallmouth bass were the most abundant species collected at the Project, representing 35 percent of the total catch. The relative abundance of smallmouth bass ranged from 28 percent in the tailwater to 55 percent in the upper bypass reach. Within the Project impoundment, smallmouth bass and largemouth bass comprised 44 percent and 15 percent of the total catch, respectively. Surveys of other impounded riverine areas in Maine found that large and smallmouth bass together accounted for between 4 percent and 58 percent of total catches (FPLE Maine 2003).

Table 4-12 Common and Scientific Names and Number of All Fish Species Collected at Sampling Areas during the October 2001 Fisheries Sampling

Common name	Scientific name	Impoundment	Crockett Brook (mouth)	Unnamed Tributary (mouth)	Bypass Reach (free flowing areas)	Bypass reach (backwater areas)	Tailwater	Total
American eel	*Anguilla rostrata*	8	0	0	9	1	0	18
Black crappie	*Pomoxis nigromaculatus*	7	3	1	0	0	2	13
Blacknose dace	*Rhinichthys atratulus*	12	0	0	0	0	0	12
Brown bullhead	*Ameiurus nebulosus*	2	0	3	2	0	0	7
Brown trout	*Salmo trutta*	1	0	0	0	0	0	1
Chain Pickerel	*Esox niger*	16	8	2	0	0	0	26
Common shiner	*Luxilus cornutus*	24	15	1	0	3	0	43
Cusk (Burbot)	*Lota lota*	3	0	0	1	0	0	4
Fallfish	*Semolitus corporalis*	10	0	0	4	0	0	14
Golden shiner	*Notemigonus crysoleucas*	1	7	0	0	0	0	8
Herring spp.	*Clupeid*	0	0	0	0	40	95	135
Largemouth bass	*Micropterus salmoides*	46	0	1	1	0	0	48
Pumpkinseed sunfish	*Lepomis gibbosus*	17	0	1	7	6	14	45
Smallmouth bass	*Micropterus dolomieu*	137	0	0	32	33	60	262
White perch	*Morone americana*	0	0	0	0	10	11	21
White sucker	*Catastomus commersoni*	14	15	10	2	5	19	65
Yellow perch	*Perca flavescens*	13	3	2	0	0	11	29

Resident Fish Impoundment Tributary Access

In consideration of the reduction in normal water surface elevation in the impoundment that would result from full spillway removal, BWPH conducted field studies to assess impacts to tributary access for resident fish species. The three perennial streams in the study area were Smith Brook, Crockett Brook, and Casper Brook.

During the 2024 field study, field staff observed that the three primary tributary streams contained either stagnant water (Crockett and Casper brooks) or flowing water (Smith Brook) within the thalweg at the drawn-down impoundment elevation. In Crockett Brook and Casper Brook, water remained stagnant for more than 150 feet upstream of their confluences with the Saco River. The drawn-down impoundment elevation reduced water depths and exposed shoreline banks at all three tributary confluences. During an approximately 5-foot impoundment drawdown to the approximate post-breach impoundment water level, the confluences of Crockett and Casper brooks with the Saco River maintained approximately one foot of water depth. The 2024 field study occurred during drought conditions thus there was little to no flow in the two streams. With no backwatering under dam removal conditions, water levels are reduced by 2-3 feet or so. Under current day normal impoundment levels, the backwater effect extends upstream within Crockett Brook about 1,000 feet.

Smith Brook maintained a continuous thalweg of flowing water, with depths ranging from 0.5 to 1 foot (Kleinschmidt 2025). Field staff noted that flow originating from Smith Brook was substantially colder than Saco River water under observed conditions, and that the confluence area consisted of a mixed substrate of sand, silt, and gravel.

Bass Spawning

FPLE Maine performed a bass spawning survey at the Project in June 2002 to document the number and location of smallmouth and largemouth bass nests in the Project area by snorkeling all shorelines in the Project waters (FPLE Maine 2003).

During the survey, FPLE Maine observed a total of 12 bass nests in the impoundment, all of which were observed in the middle portion of the impoundment in depths between 2.5 to 5 feet of water (FPLE Maine 2003). Six nests observed in the impoundment were in a water velocity refuge downstream of a small island and the remaining six nests were dispersed along the shoreline area of the mid-impoundment (FPLE Maine 2003).

FPLE Maine also observed 11 bass nests in the lower, backwatered area of the bypass reach, where nests were observed in 2.5 to 4 feet of water in large gravel and cobble substrates (FPLE Maine 2003). In the tailwater area, FPLE observed eight bass nests which were dispersed on both shorelines in three to six feet of water in large gravel and cobble substrates (FPLE Maine 2003).

Because smallmouth bass have been documented spawning in water depths ranging from 0.8 to 12 feet (VFWD 2017), tributary depths at the Saco River confluences are not anticipated to limit access for spawning bass. The minimum suitable zone of passage (ZOP) is defined as a water depth equivalent to two-thirds of the body thickness of the largest target fish expected to move through a reach, where body thickness represents the distance from the dorsal musculature to the underside of the fish (Bovee 1982). This criterion supports fish passage and movement in natural channels.

Using proportional measurements for bass presented in Smith (1985), a standard body length of 71.5 millimeters (mm) corresponds to a body depth of 29 mm, yielding a ratio of 0.41. The preferred adult lengths for smallmouth and largemouth bass identified by VFWD (2017) are 14 and 15 inches, respectively. An average bass length of 14.5 inches would therefore correspond to an estimated body depth of approximately 5.9 inches, requiring a ZOP of about 3.9 inches. Observed depths at tributary mouths exceed this minimum requirement and would not limit passage for smallmouth or largemouth bass.

4.8.1.2 Migratory Fish

Historically, six species of anadromous fish utilized the Saco River including Atlantic salmon (*Salmo salar*), alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), American shad (*Alosa sapidissima*), rainbow smelt (*Osmerus mordax*), and striped bass (*Morone saxatilis*). It is believed that all anadromous species except for Atlantic salmon were unable to pass the falls at the head tide in Saco/ Biddeford, which is now the site of the Cataract Project (FERC No. 2528), and utilized only the tidal reach of the river below the falls. There is no known historical documentation of shad or river herring occurring above the falls at Saco or Biddeford. One catadromous species, American eel migrates through and has been identified in the Project area and were documented in relatively low abundance in the 2001 FPLE Maine Fisheries Survey (FPLE Maine 2003).

In 2019, BWPH and the resource agencies executed a revised Saco River Fish Passage Assessment Agreement (SRFAA) for migratory fish species, superseding the 2007 SRFAA[13]. The 2019 Amendment replaced Section 5.3.b.1, including a provision for a "single permanent upstream anadromous fish passage facility at each of the Projects, or an alternative method agreed upon and approved by the Parties" with an implementation schedule of May 1, 2025, for the Bar Mills Project. Without an economically viable solution to return the generating units to an operable condition, BWPH determined that surrendering the FERC Project license and decommissioning the Project through a full spillway removal is the most viable solution for balancing operational, environmental, future dam safety needs, and meeting fish passage requirements under the SRFAA.

The Bar Mills Dam removal is intended to restore the impounded reach back to a free-flowing condition. A hydraulic model was developed using empirical river flow and bathymetry data collected within the reach and using the U.S. Army Corps of Engineers' HEC-RAS software. The model outputs include water velocity, depth and water surface elevation (WSEL) at 5, 50, and 95 percent exceedance flows during the fish passage season (May 1 – July 31). This information was used to evaluate the suitability of a zone-of-passage that would allow migratory fish species to access upstream habitats. The model was used to develop riverbed slope profile (Figure 4-7), water depth (Figure 4-8, Figure 4-11 and Figure 4-14), water velocity (Figure 4-9, Figure 4-12 and Figure 4-15) and riverbed elevation profile (Figure 4-10, Figure 4-13, and Figure 4-16) plots to estimate the post dam removal conditions of the area currently occupied by the Bar Mills Dam. The plots represent low (95% exceedance, 762 cfs), median (50% exceedance, 2,725 cfs) and high flow (5% exceedance, 9,930 cfs) scenarios.

Two channels are expected to occur within the existing dam footprint, a primary channel on river left, looking downstream, and a secondary channel on river right (Figure 4-9). The channel bathymetry in these areas consists of a steep bed slope of 4.8 percent and 7.6 percent, which drops 6.7 feet and 9.7 feet over a distance of 141 feet and 127 feet, at the primary and secondary channels, respectively. Flow is somewhat constricted through these channels resulting in shallow, fast-flowing hydrology. At low flow conditions (762 cfs) water depth is less than 0.5ft deep across most of the constriction with a thalweg in the middle of deeper water (1.0 -1.5ft) occupying about 20 percent of the wetted width of the river (Figure 4-7). Water velocity accelerates through the constriction reaching

[13] Saco River Fish Passage Assessment - Offer of Settlement and Explanatory Statement FPL Energy Maine Hydro LLC - Cataract Project (No. 2528), Skelton Project (No. 2527), Bar Mills Project (No. 2194), West Buxton Project (No. 2531), Bonny Eagle Project (No. 2529), Hiram Project (No. 2530).

speeds as high as 8-10 fps in the thalweg and slowing to 2-6 fps at the margins (Figure 4-9). The lowest water velocities occur in the shallowest areas.

Zone-of-Passage

Fish swimming speed and stamina, locomotion and the mechanics of fish swimming, are important considerations when evaluating potential hydraulic barriers to upstream migration. Swimming speeds and endurance vary with species and body morphology, fish length, water temperature and other variables (Katopodis, and Gervais 2016). Water depth is another key factor in a fish's ability to navigate an area and shallow water depth exacerbate challenges to navigation. Fish are capable of locomotion in very shallow water over short distances, in extreme cases fish have been observed moving through reaches so shallow that their backs are out of the water. However, these are unusual and short-lived circumstances and swim performance criteria assume full body submergence (NMFS 2022). In this analysis we assume that the minimum passage depth is 1.5 times the body depth.

The species of interest for this analysis include only those diadromous species that necessarily need access to upstream habitat to complete their life cycle and include American shad, river herring (alewife, blueback herring), American eel, and Atlantic salmon. Of these species only river herring and American eel regularly migrate upstream past Skelton Dam and therefore have the potential to migrate to the Bar Mills area of the Saco River. River herring (453,620 passed over a ten-year period between 2015 and 2025) are the focus of this analysis, but we have also included American eel, American shad and Atlantic salmon, which occasionally pass upstream of Skelton dam in low numbers, (eel passage unknown, 17 salmon, and 730 American shad between 2015 and 2025) (MDMR 2026).

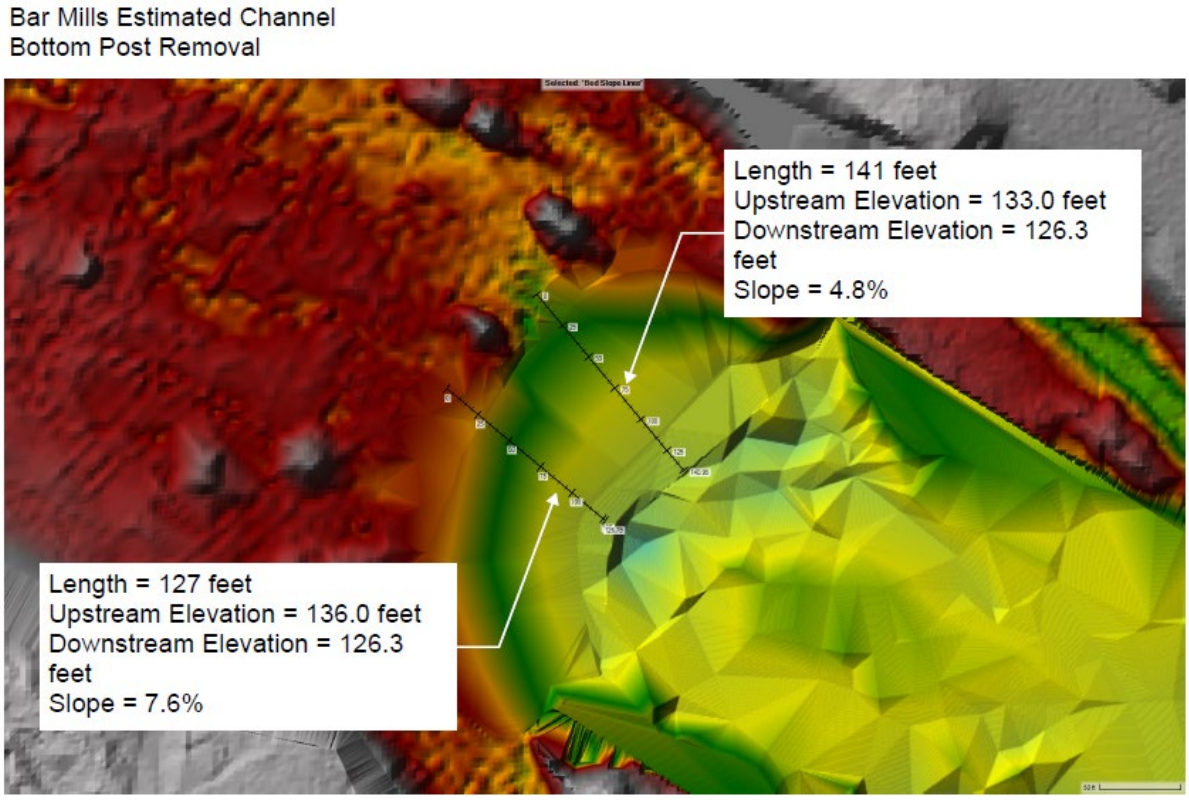

Figure 4-7 Bed Profiles at the Bar Mills Dam Site

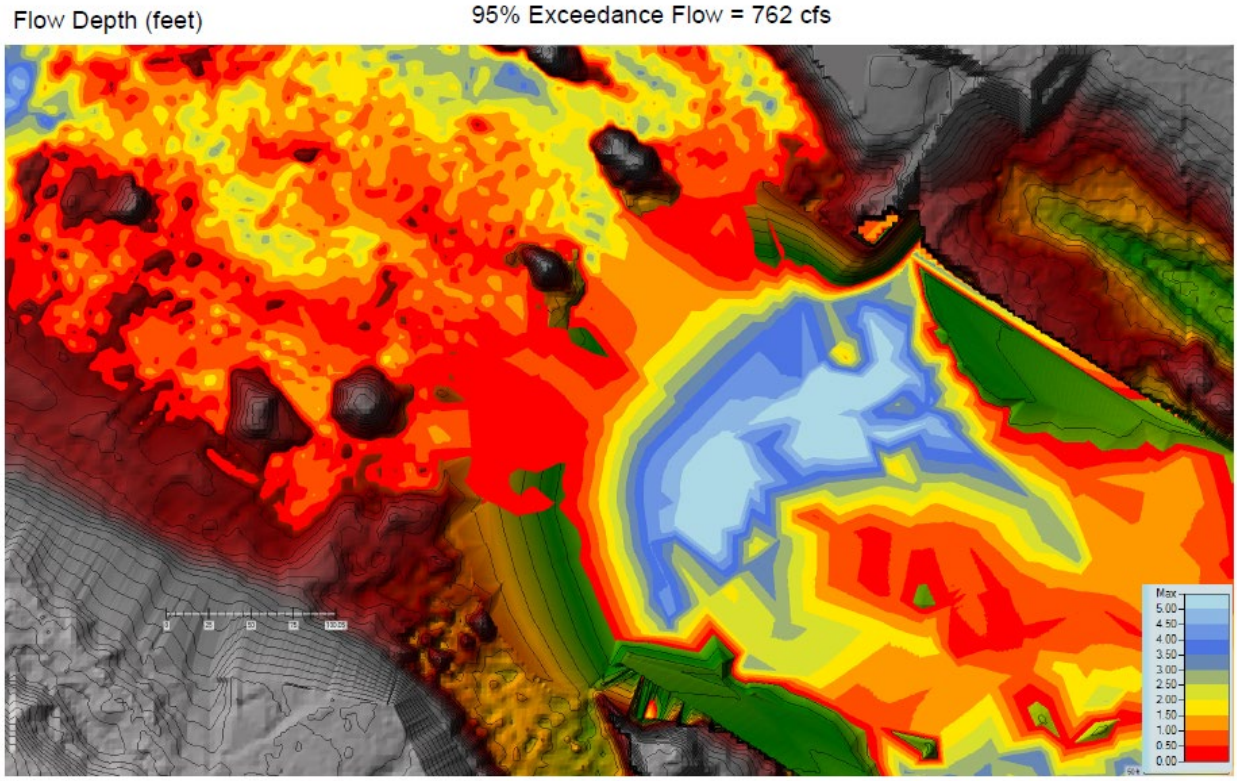

Figure 4-8 Water Depth (ft) at the Bar Mills Dam Site at Low Flow (95 percent exceedance)

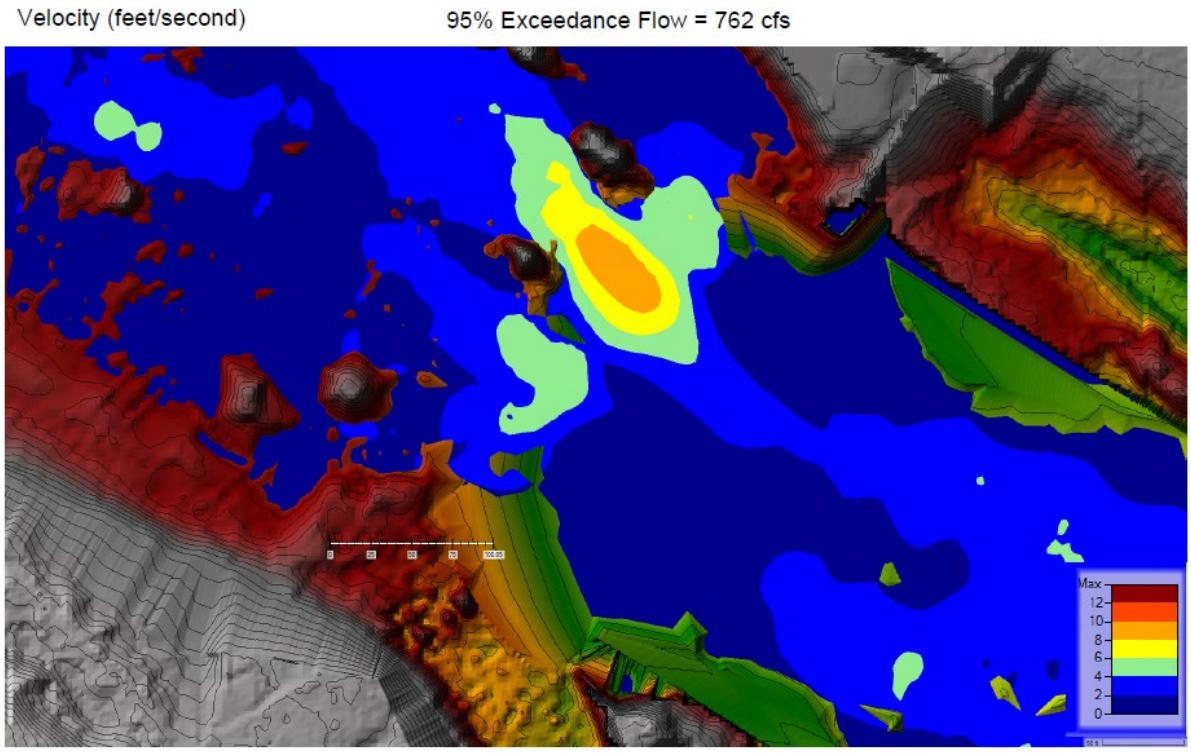

Figure 4-9 Water Velocity (fps) at the Bar Mills Dam Site at Low Flow (95 percent exceedance)

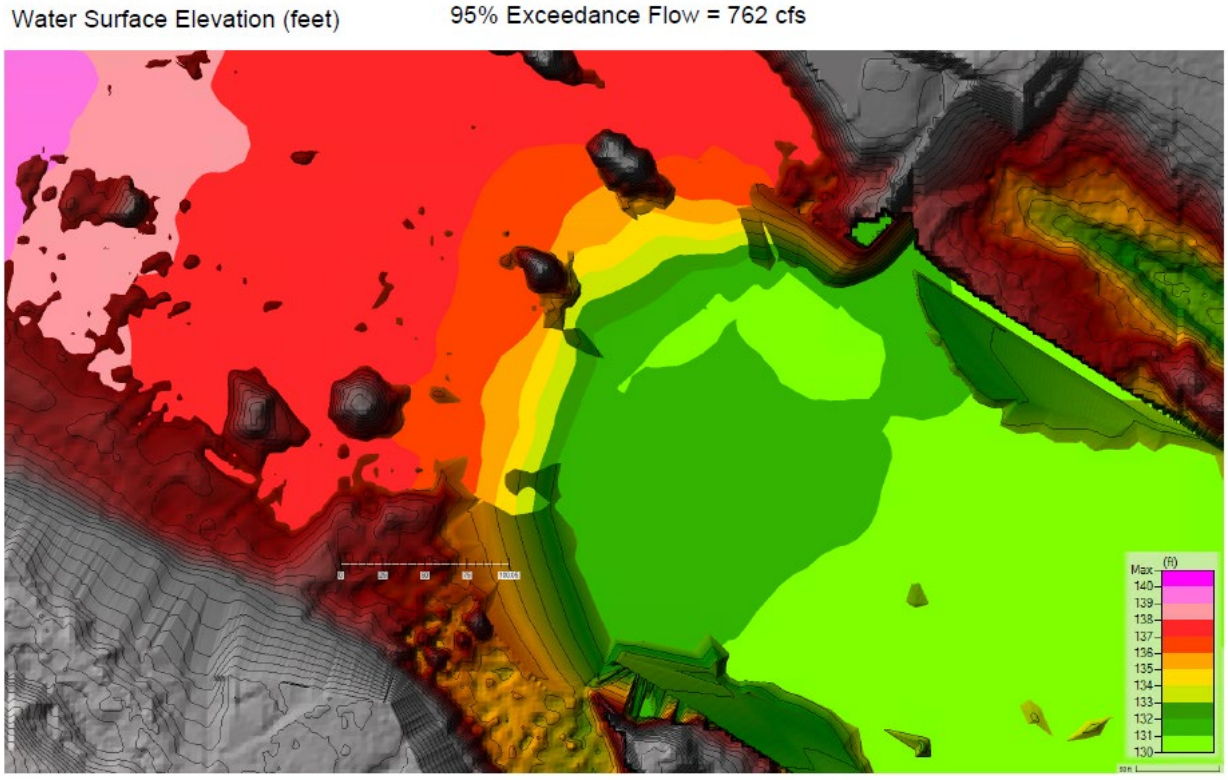

Figure 4-10 WSEL at the Bar Mills Dam Site at Low Flow (95 percent exceedance)

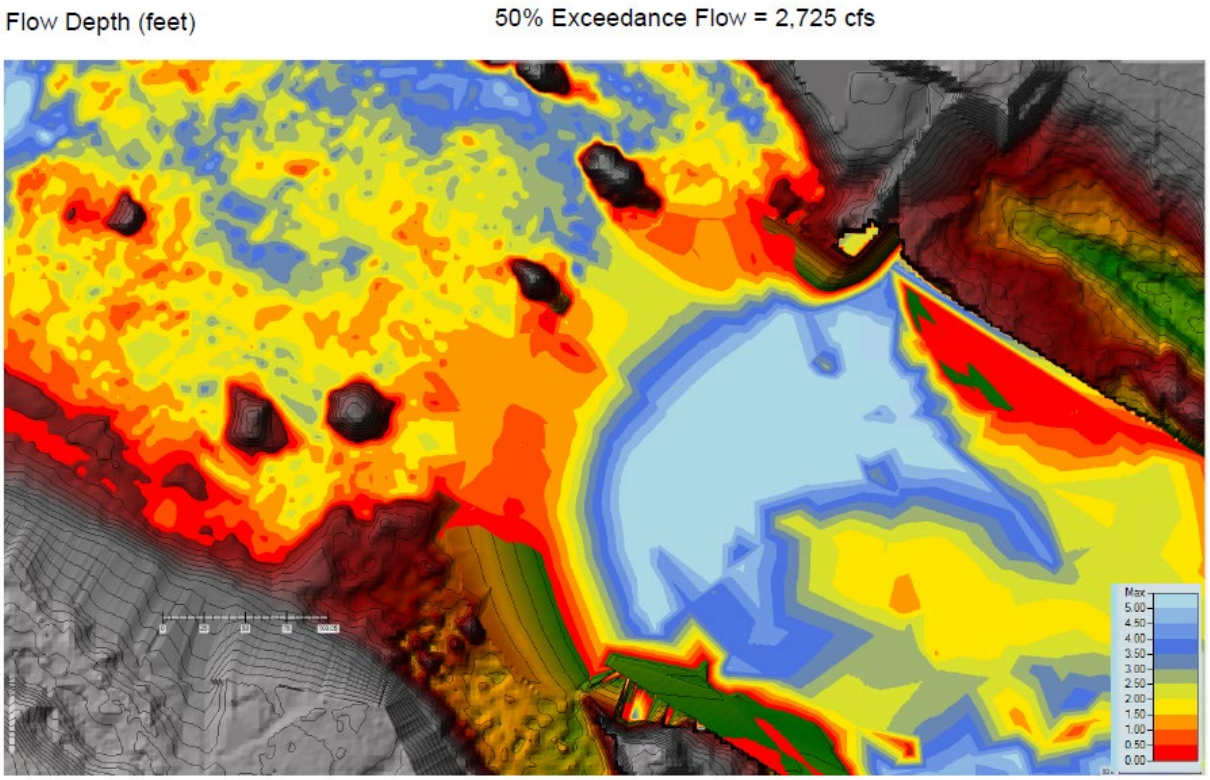

Figure 4-11 Water Depth (ft) at the Bar Mills Dam Site at Low Flow (50 percent exceedance)

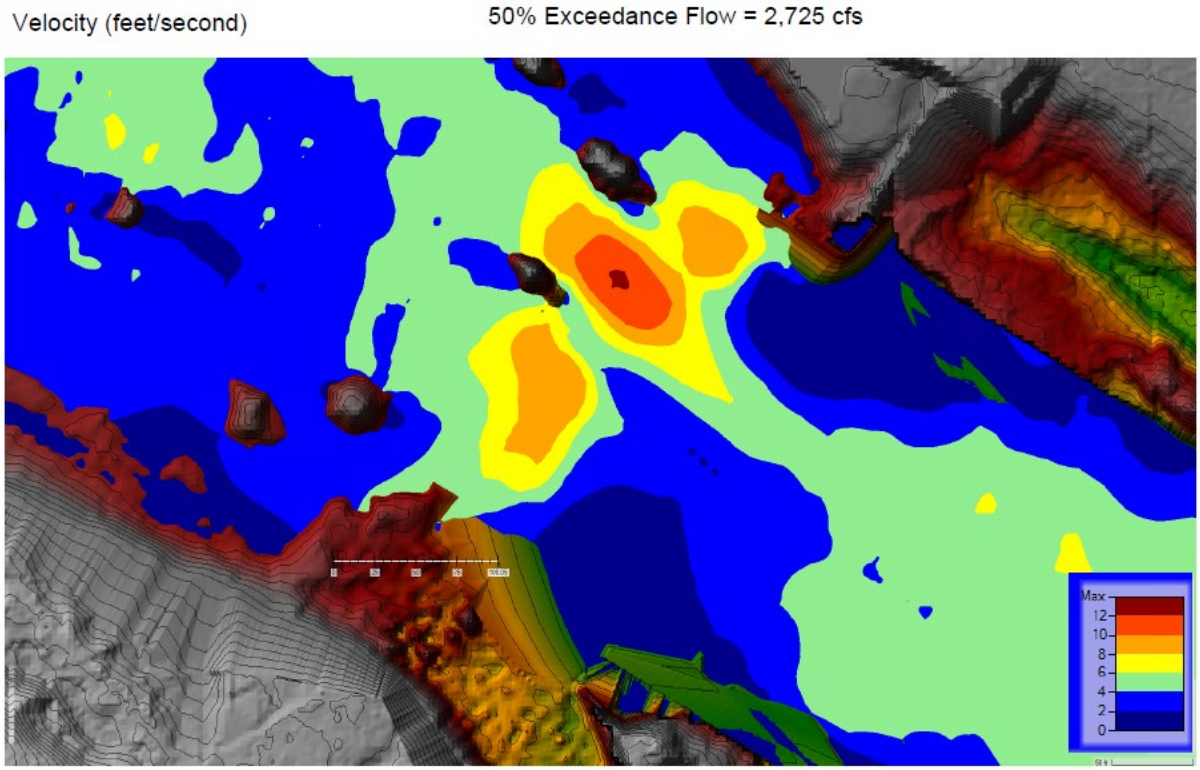

Figure 4-12 Water Velocity (fps) at the Bar Mills Dam Site at Low Flow (50 percent exceedance)

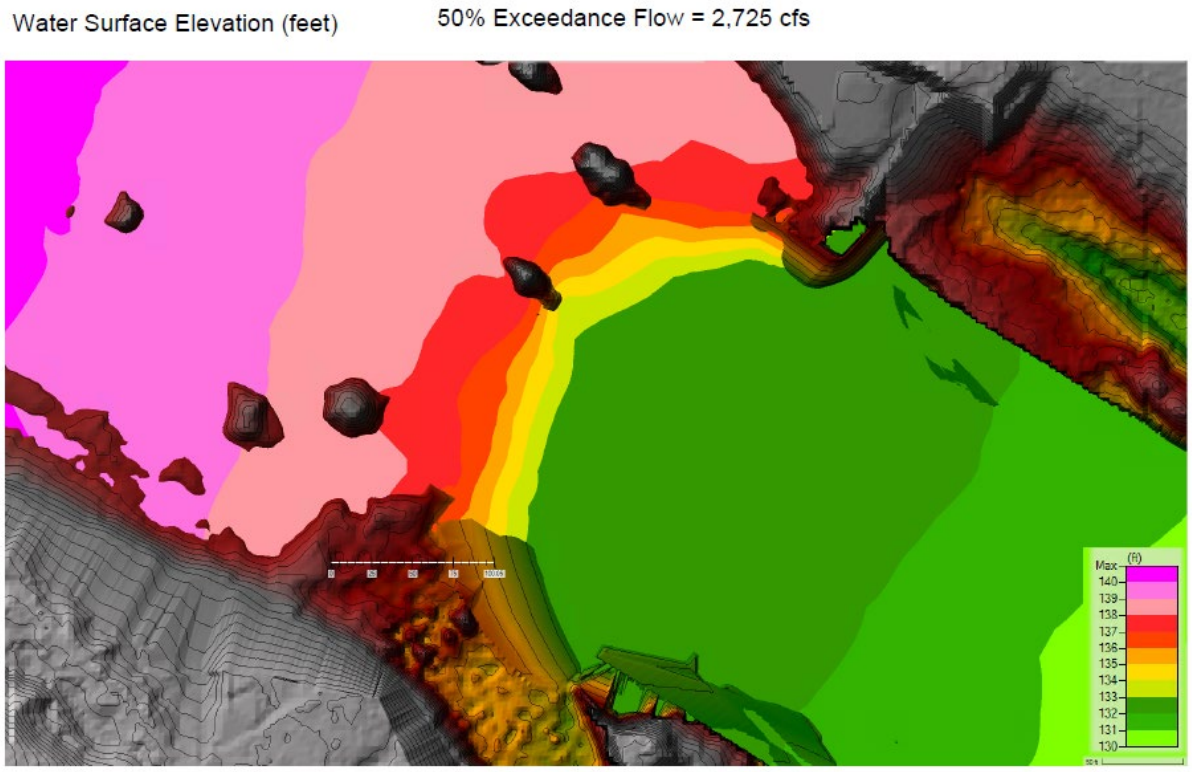

Figure 4-13 WSEL at the Bar Mills Dam Site at Low Flow (50 percent exceedance)

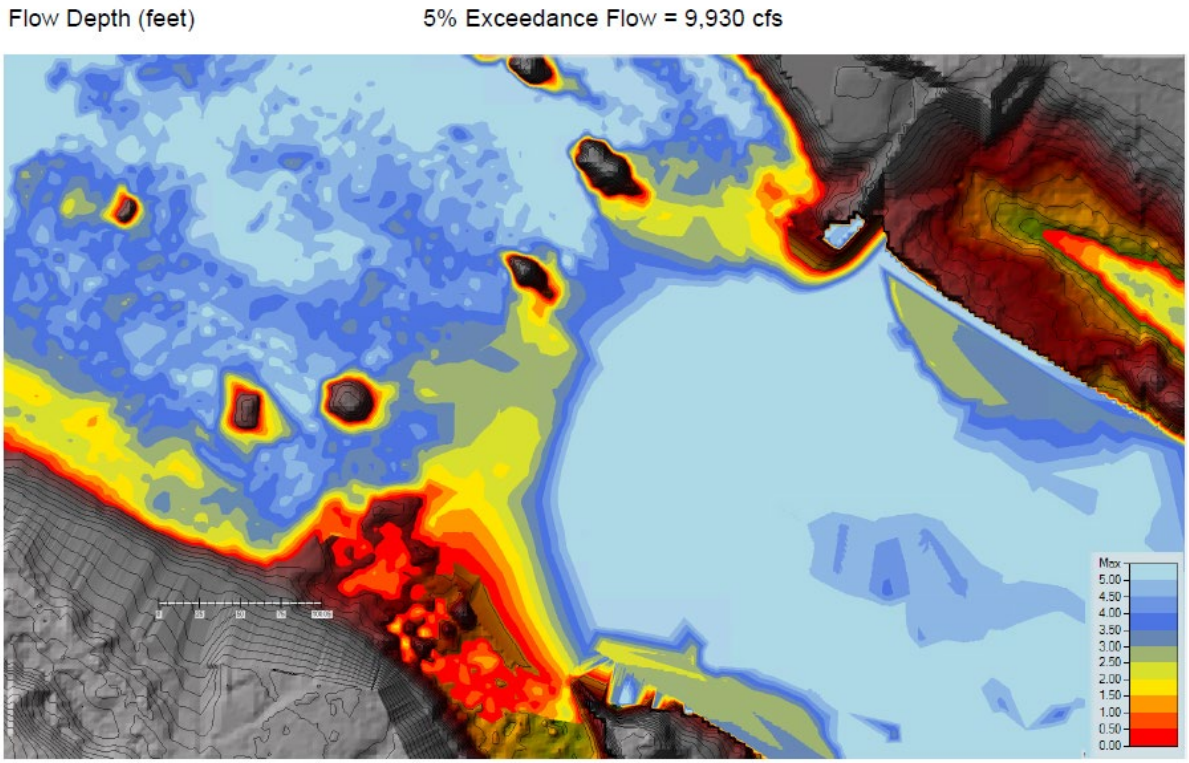

Figure 4-14 Water Depth (ft) at the Bar Mills Dam Site at Low Flow (5 percent exceedance)

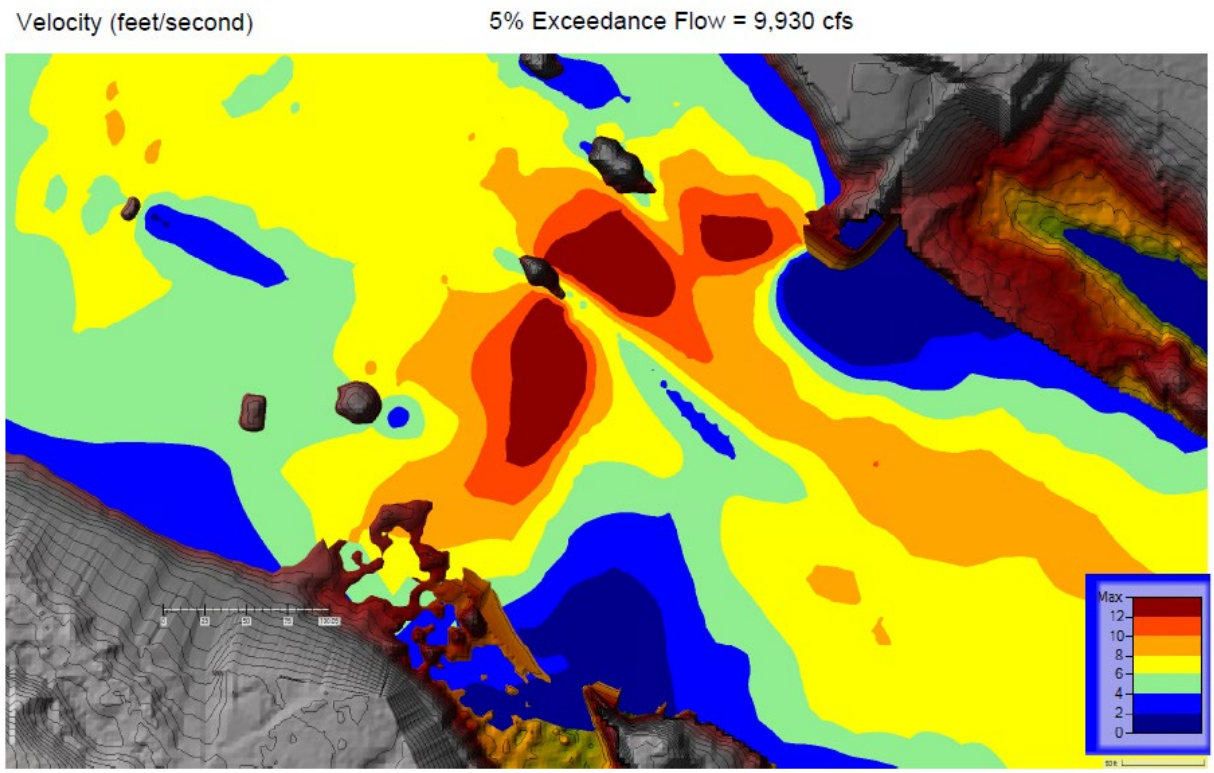

Figure 4-15 Water Velocity (fps) at the Bar Mills Dam Site at Low Flow (5 percent exceedance)

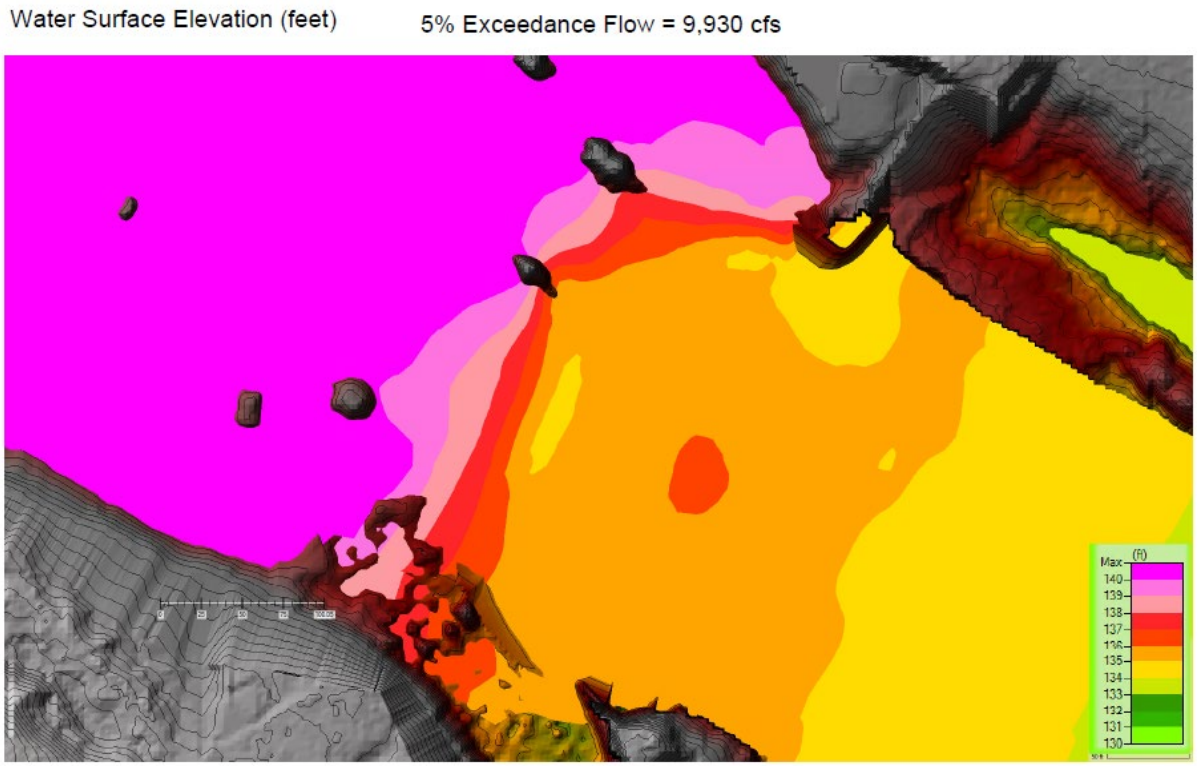

Figure 4-16 WSEL at the Bar Mills Dam Site at Low Flow (5 percent exceedance)

Swim Performance Online Tool

A tool developed by Di Rocco and Gervais (2025) named the Swim Performance Online Tools or SPOT https://fishprotectiontools.ca/index.html was used, in conjunction with the hydraulic model out puts to estimate if fish are expected to be able to traverse the post-removal constriction area.

Low Flow Scenarios (95 Percent Exceedance Flow = 762 cfs)

River Herring (alewife and blueback herring) Low Flow Scenario (762 cfs)

Fish Size Basis (MDMR 2026)

- Total Length Range – 25 – 30cm
- Body Depth Range – 6.5 – 9.5 cm

Minimum swim depth range (1.5x body depth) – 9.75 (0.32 ft) – 14.25 cm (0.47 ft)

Model Results – Total Length – 28 cm at a distance of 23m or 75 ft.
2.5% of 280 mm Herring can swim in 1.9 m/s (6.23 ft/s) current for at least 23 m
12.5% of 280 mm Herring can swim in 1.7 m/s (5.6 ft/s) (current for at least 23 m
50% of 280 mm Herring can swim in 1.3 m/s (4.3 ft/s) current for at least 23 m
87.5% of 280 mm Herring can swim in 1.1 m/s (3.6 ft/s) current for at least 23 m
97.5% of 280 mm Herring can swim in 0.92 m/s (3.0 ft/s) current for at least 23 m

With water velocities exceeding 8 fps over a distance of approximately 23 m (approximately 75ft) in all areas of suitable depth at the low flow scenario, few, if any river herring attempting to pass upstream through the constriction, are likely to be successful.

American Eel

Fish Size Basis - Yellow Phase Eel (MDMR 2026)

- Total Length Range – 15–35 cm
- Body Depth Range – 0.7 -1.0 cm

Minimum swim depth range (1.5x body depth) – 1.05cm (0.03 ft) – 1.5 cm (0.05 ft)

Model Results – Total Length – 25 cm at a distance of 23m or 75 ft.
2.5% of 250 mm Eel can swim in 0.74 m/s (2.4 ft/s) current for at least 23 m
12.5% of 250 mm Eel can swim in 0.52 m/s (1.7 ft/s) current for at least 23 m
50% of 250 mm Eel can swim in 0.32 m/s (1.0 ft/s) current for at least 23 m
87.5% of 250 mm Eel can swim in 0.2 m/s (0.7 ft/s) current for at least 23 m
97.5% of 250 mm Eel can swim in 0.14 m/s (0.5 ft/s) current for at least 23 m

With water velocities exceeding 2 fps over a distance of approximately 23 m (approximately 75ft) in all areas of suitable depth at the low flow scenario, approximately 2.5 percent of American eel attempting to pass upstream through the constriction are likely to be successful. However, this is likely a low estimate as eel are adept at moving through very shallow water and using wetted substrate opportunistically, often leaving the water altogether to ascend barriers, particularly when small in size.

American Shad

Fish Size Basis (USFWS 2026)

- Total Length Range – 51 -61cm
- Body Depth Range – 18 - 20cm

Minimum swim depth range (1.5x body depth) – 27 cm (0.89 ft) – 30 cm (0.98 ft)

Model Results – Total Length – 50 cm at a distance of 23m or 75 ft.

2.5% of 500 mm Herring can swim in 3.8 m/s (12.5ft/s) current for at least 23 m
12.5% of 500 mm Herring can swim in 3.3 m/s (10.8 ft/s) current for at least 23 m
50% of 500 mm Herring can swim in 2.6 m/s (8.5 ft/s) current for at least 23 m
87.5% of 500 mm Herring can swim in 2.1 m/s (6.9 ft/s) current for at least 23 m
97.5% of 500 mm Herring can swim in 1.8 m/s (5.9 ft/s) current for at least 23 m

With water velocities exceeding 8 fps over a distance of approximately 23 m (approximately 75ft) in all areas of suitable depth at the low flow scenario, as many as half of American shad attempting to pass upstream through the constriction are likely to be successful.

Atlantic salmon

Fish Size Basis (USFWS 2026)

- Total Length Range – 70-76 cm
- Body Depth Range – 15- 18 cm

Minimum swim depth range (1.5x body depth) – 22.5 cm (0.74 ft) – 30 cm (0.89 ft)

Model Results – Total Length – 75 cm at a distance of 23m or 75 ft.

2.5% of 750 mm Salmon & Walleye can swim in 6.3 m/s (20.7 ft/s) current for at least 23 m
12.5% of 750 mm Salmon & Walleye can swim in 4.4 m/s (14.4 ft/s) current for at least 23 m
50% of 750 mm Salmon & Walleye can swim in 2.6 m/s (8.5 ft/s) current for at least 23 m
87.5% of 750 mm Salmon & Walleye can swim in 1.5 m/s (4.9 ft/s) current for at least 23 m
97.5% of 750 mm Salmon & Walleye can swim in 1.1 m/s (3.6 ft/s) current for at least 23 m

With water velocities exceeding 8 fps over a distance of approximately 23 m (approximately 75ft) in all areas of suitable depth at the low flow scenario, as many as half of Atlantic salmon attempting to pass upstream through the constriction are likely to be successful.

Mid-Flow Scenarios (50 Percent Exceedance Flow = 2,725 cfs)

American shad

Fish Size Basis (USFWS 2026)

- Total Length Range – 51 - 61cm
- Body depth range – 18 - 20cm

Minimum swim depth range (1.5x body depth) – 27 cm (0.89 ft) – 30 cm (0.98 ft)

Thalweg Model Results – Total Length – 50 cm at a distance of 40 m or 130 ft.
2.5% of 500 mm Herring can swim in 2.6 m/s (8.5 ft/s) current for at least 40 m
12.5% of 500 mm Herring can swim in 2.3 m/s (7.5 ft/s) current for at least 40 m
50% of 500 mm Herring can swim in 1.8 m/s (5.9 ft/s) current for at least 40 m
87.5% of 500 mm Herring can swim in 1.5 m/s (4.9 ft/s) current for at least 40 m
97.5% of 500 mm Herring can swim in 1.3 m/s (4.3 ft/s) current for at least 40 m

With water velocities exceeding 8 fps over a distance of approximately 40 m (approximately 130 ft) in the thalweg during a mid-flow scenario, less than 2.5 percent American shad attempting to pass upstream through the thalweg constriction are likely to be successful. However, with the increase in flow, additional areas with suitable depth (1.0 - 1.5ft) for shad locomotion becomes available on the river left channel (looking upstream) (Figure 4-11).

River Left Channel Model Results – Total Length – 50 cm at a distance of 18 m or 60 ft.
2.5% of 500 mm Herring can swim in 4.5 m/s (14.8 ft/s) current for at least 18 m
12.5% of 500 mm Herring can swim in 3.8 m/s (12.5 ft/s) current for at least 18 m
50% of 500 mm Herring can swim in 3.1 m/s (10.2 ft/s) current for at least 18 m
87.5% of 500 mm Herring can swim in 2.5 m/s (8.2 ft/s) current for at least 18 m
97.5% of 500 mm Herring can swim in 2.1 m/s (6.9 ft/s) current for at least 18 m

With water velocities exceeding 8 fps over a distance of approximately 18 m (approximately 60ft) in all areas of suitable depth at the mid-flow scenario, as many as 87.5 percent of American shad attempting to pass upstream through the RL channel high velocity constriction are likely to be successful. However, the additional flow increased the

upstream extent of **moderate velocity (6 ft/s)** to approximately 61 meters or 200 ft (Figure 4-11), which greatly reduces the probability of success to less than 2.5 percent for shad attempting to migrate upstream through this reach. The cumulative effects of the moderate and high velocity areas further reduce the probability of shad passing through this area. Ultimately, very few shad are likely to ascend through the constriction reach at mid-flow.

River Left Channel Model Results – Total Length – 50 cm at a distance of 61 m or 200 ft.

2.5% of 500 mm Herring can swim in 2 m/s (6.6 ft/s) current for at least 61 m
12.5% of 500 mm Herring can swim in 1.7 m/s (5.6 ft/s) current for at least 61 m
50% of 500 mm Herring can swim in 1.4 m/s (4.6 ft/s) current for at least 61 m
87.5% of 500 mm Herring can swim in 1.1 m/s (3.6 ft/s) current for at least 61 m
97.5% of 500 mm Herring can swim in 0.94 m/s (3.1 ft/s) current for at least 61 m

Atlantic salmon

Fish Size Basis (USFWS 2026)

- TL range – 70-76 cm
- Body depth range – 15- 18 cm

Minimum swim depth range (1.5x body depth) – 22.5 cm (0.74 ft) – 30 cm (0.89 ft)

Model Results – Mid-flow scenario (2,725 cfs), TL – 75 cm at a distance of 40 m or 130 ft.
2.5% of 750 mm Salmon & Walleye can swim in 5.2 m/s (17.1 ft/s) current for at least 40 m
12.5% of 750 mm Salmon & Walleye can swim in 3.6 m/s (11.8 ft/s) current for at least 40 m
50% of 750 mm Salmon & Walleye can swim in 2.2 m/s (7.2 ft/s) current for at least 40 m
87.5% of 750 mm Salmon & Walleye can swim in 1.3 m/s (4.3 ft/s) current for at least 40 m
97.5% of 750 mm Salmon & Walleye can swim in 0.9 m/s (3.0 ft/s) current for at least 40 m

With water velocities exceeding 8 fps over a distance of approximately 40 m (approximately 130 ft) in all areas of suitable depth within the thalweg at the mid-flow scenario, approximately 12.5 percent of Atlantic salmon attempting to pass upstream through the thalweg constriction are likely to be successful. However, with the increase in flow, additional areas with suitable depth (1.0 - 1.5ft) for salmon locomotion is available on the river left channel (looking upstream) (Figure 4-11).

River Left Channel Model Results – Total Length – 75 cm at a distance of 18 m or 60 ft.
2.5% of 500 mm Salmon & Walleye can swim in 4.8 m/s (15.7 ft/s) current for at least 18 m
12.5% of 750 mm Salmon & Walleye can swim in 3.4 m/s (11.2 ft/s) current for at least 18 m
50% of 750 mm Salmon & Walleye can swim in 2 m/s (6.6 ft/s) current for at least 18 m
87.5% of 750 mm Salmon & Walleye can swim in 1.2 (3.9 ft/s) m/s current for at least 18 m
97.5% of 750 mm Salmon & Walleye can swim in 0.83 (2.7 ft/s) m/s current for at least 18 m

With water velocities exceeding 8 fps over a distance of approximately 18 m (approximately 60ft) in all areas of suitable depth at the mid-flow scenario, approximately 12.5 percent of salmon attempting to pass upstream through the river left channel of the constriction are likely to be successful. Further, the additional flow increased the upstream extent of **moderate velocity (6 ft/s)** to approximately 61 meters or 200 ft, which exhibits a similar probability of navigation through the reach, 12.5 percent, though the cumulative effects of both the high velocity area (>8ft/s) and the moderate velocity area are likely to exacerbate the challenge of migration through this area.

River Left Channel Model Results – Total Length – 75 cm at a distance of 61 m or 200 ft.
2.5% of 500 mm Salmon & Walleye can swim in 3.2 m/s (10.5 ft/s) current for at least 61 m
12.5% of 500 mm Salmon & Walleye can swim in 2.2 m/s (7.2 ft/s) current for at least 61 m
50% of 500 mm Salmon & Walleye can swim in 1.3 m/s (4.3 ft/s) current for at least 61 m
87.5% of 500 mm Salmon & Walleye can swim in 0.8 m/s (2.6 ft/s) current for at least 61 m
97.5% of 500 mm Salmon & Walleye can swim in 0.55 m/s (1.8 ft/s) current for at least 61 m

4.8.1.3 Freshwater Mussels

FPLE Maine conducted a mussel survey during the previous relicensing during the summer of 2001 in the Project impoundment, bypass reach, and tailrace. The survey determined that mussel populations at the Project consist primarily of Eastern elliptio (*Elliptio complanata*). Relics of Triangle Floater (*Alasmidonta undulata*) were found in the impoundment and bypass reach. Substrates along the impoundment perimeter consist of sand and mud which provide suitable habitat for Eastern elliptio (Nedeau et al. 2000). Most of the individuals observed in the impoundment were located in depths greater than three feet.

FPLE collected a subsample of 25 Eastern elliptio from the impoundment which ranged in length from 57 to 93mm. FPLE observed and collected one relic Triangle Floater along the impoundment shoreline which measured 34mm.

FPLE Maine collected relics of 15 triangle floaters from the lower portion of the bypass reach. FPLE Maine observed several hundred relics of Eastern elliptio along the shore of the lower bypass reach. Of the relics collected by FPLE along the lower bypass reach shoreline triangle floaters ranged in length from 31 to 44mm and eastern elliptio ranged in length from 39 to 100mm. One live Eastern elliptio was observed along the western shore of the bypass reach in an area of calm water approximately one foot deep in cobble and gravel substrate (FPLE, 2003).

4.8.2 Environmental Effects

4.8.2.1 Resident Fish

There may be short term effects to resident fish passage into and out of tributaries to the former impoundment. However, a slow drawdown will help reduce adverse impacts on resident fish species. The Proposed Action may also have direct, short-term impact on individual mussels located in the drawdown area. BWPH will attempt to reduce this impact by drawing down the impoundment gradually and in stages, allowing mussels to move to deeper water and facilitating relocation efforts.

4.8.2.2 Migratory Fish

The analysis utilizing the SPOT tool assumes migrating fish are subject to the reference water velocities continuously. An example of a real-world application in which this may be the situation includes fish swimming through a culvert, flume or raceway. In natural settings, such as the Saco River, velocity refuge areas (e.g., boulders, other bathymetric features and eddies) provide opportunity for fish to rest as they ascend challenging high velocity reaches, reducing fatigue impacts. As such, the estimates of probable passage reported herein are likely to be an under estimation. This analysis indicates that even after restoration to free-flowing conditions, the Bar Mills dam site may continue to impede migratory species under certain river flow conditions due to the steeply sloped bedrock riverbed immediately upstream. The former timber crib dam's location and design was intended to leverage natural geographic features that inherently create a potential impediment to migratory passage, the extent of which will be unknown until the structures are removed..

4.8.2.3 Freshwater Mussels

The Proposed Action may have direct, short-term impact on individual mussels located in the impoundment as it is drawn down during construction. BWPH will attempt to reduce

this impact by drawing down the impoundment gradually and in stages, allowing mussels to move to deeper water and facilitating relocation efforts.

4.8.3 Unavoidable Adverse Effects

Construction may cause short-term unavoidable effects on fisheries habitat, including sedimentation and increased turbidity. Due to the limited amount of sediment in the construction area, these effects are expected to be minor and transitory. Best Management Practices (BMPs), including erosion and sediment control measures, will be employed to limit the extent and duration of any such effects.

Results of the hydraulic and biological performance evaluation indicate that post-removal conditions at the Bar Mills Dam site are unlikely to consistently provide an effective zone of passage for upstream-migrating fishes across the range of flows evaluated during the fish passage season. Bathymetric data show that the former dam footprint corresponds to a naturally steep hydraulic control characterized by high bed slopes, shallow depths, and elevated water velocities concentrated through one primary and one secondary channel. These conditions persist under low (95 percent exceedance) and mid-range (50 percent exceedance) flows, producing extended reaches of fast water (>6–8 ft/s) over distances that exceed the sustained swimming capabilities of most individuals for river herring, American shad, and Atlantic salmon, even where minimum depth criteria are met. Passage opportunities are most limited at low flows due to shallow depths and high velocities, while mid-flow conditions modestly increase available depth but also extend the longitudinal distance over which biologically challenging velocities occur, resulting in similarly low cumulative passage probabilities.

Among the species evaluated, American eel are most likely to successfully negotiate the constriction, particularly given their documented ability to exploit shallow water, wetted substrates, and non-traditional passage routes that are not fully captured by hydraulic or swim performance modeling. By contrast, river herring—the predominant diadromous species currently accessing this reach of the Saco River—are expected to experience substantial passage limitation under both low- and mid-flow scenarios, with successful ascent likely restricted to a small proportion of the population and potentially limited to brief hydrologic windows. Although larger-bodied species such as American shad and Atlantic salmon exhibit greater swimming capacity, model results suggest that only a fraction of individuals would be able to traverse the high-velocity constriction zones, and cumulative fatigue across sequential moderate- and high-velocity reaches further reduces effective passage probability.

While the application of the SPOT tool likely underestimates true passage by assuming continuous exposure to reference velocities and not accounting for micro-scale velocity refugia, the overall findings consistently point to this reach functioning as a significant hydraulic bottleneck following dam removal. The analysis supports a conclusion that the Bar Mills Dam was constructed at a location that may historically represented a natural impediment to upstream migration. Consequently, dam removal may not provide longitudinal connectivity for diadromous fishes at this site.

4.8.4 References

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4.9 Botanical Resources

4.9.1 Affected Environment

FLPE completed a terrestrial resources study in September of 2001 that assessed wetland and upland habitats; rare, threatened and endangered species; and wildlife resources in the Project area. In July of 2024 BWPH conducted a shoreline survey to characterize existing wildlife, botanical, and wetland resources, including invasive botanical species along the immediate shoreline of the Project boundary.

Cover types along the impoundment and tailrace are primarily composed of mature mixed hardwood upland forest, agricultural lands, and utility rights-of-way. Additional, though less extensive, cover types include a variety of palustrine wetlands—forested, scrub-shrub, emergent, and unconsolidated bottom—as well as scattered areas of residential development. Two wooded upland islands are also present within the middle and lower sections of the impoundment.

Riparian Upland

The mixed hardwood forest cover type within the Project area is typically mature with a high degree of vertical and horizontal complexity, including well-developed shrub and sapling layers, snags, and down wood. Dominant tree species include shagbark hickory (*Carya ovata*), white oak (*Quercus alba*), and black birch (*Betula lenta*). Shagbark hickory is particularly common along the shoreline. Other common tree species present in the area include red oak (*Quercus rubra*), basswood (*Tilia americana*), white pine (*Pinus strobus*), white ash (*Fraxinus americana*), sugar maple (*Acer saccharum*), yellow birch (*Betula alleghaniensis*), white birch (*Betula papyrifera*), gray birch (*Betula populifolia*), black cherry (*Prunus serotina*), American beech (*Fagus grandifolia*), and trembling aspen (*Populus tremuloides*). The shrub and sapling layer is typically composed of saplings of the dominant overstory tree species, along with several invasive shrubs. These include two non-native honeysuckles (*Lonicera morrowi*i and *L. tatarica*), autumn olive (*Elaeagnus umbellata*), and glossy buckthorn (*Frangula alnus*). The shrub and understory layer is more fully developed along the riverbank and at habitat edges throughout the area. In contrast, within the interior portions of the mixed upland forest, the shrub layer is generally less diverse and forms a noticeably sparser understory. Dominant herb and vine layer species include false Solomon's seal (*Maianthemum racemosum*), poison ivy (*Toxicodendron radicans*), Canada mayflower (*Maianthemum canadense*), partridge-berry (*Mitchella repens*), and Virginia creeper (*Parthenocissus quinquefolia*).

The utility rights-of way, agricultural edges, and residential edges are characterized by more open cover types. Dominant species include forbs such as Queen Anne's lace (*Daucus carota*), Canada goldenrod (*Solidago canadensis*), bracken fern (*Pteridium aquilinum*), milkweeds (*Asclepias* spp.), wild strawberry *(Fragaria virginiana*), yarrow (*Achillea millefolium*), and cinquefoil (*Potentilla simplex*.), as well as grasses such as timothy (*Phleum pratense*), red fescue (*Festuca rubra*), little bluestem (*Schizachyrium scoparium*), and bluejoint grass (*Calamagrostis canadensis*). Common woody species include staghorn sumac (*Rhus typhina*), multiflora rose (*Rosa multiflora*), smooth sumac (*Rhus glabra*), highbush blackberry (*Rubus allegheniensis*), raspberry (Rubus spp.), sweet fern (*Comptonia peregrina*), and trembling aspen, white pine, and black cherry saplings. Scattered apple trees (*Malus* spp.) are also present within edge habitats throughout the Project area.

Wetlands

The study area contains approximately 76 acres of palustrine wetland habitat including palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested (PFO), and palustrine unconsolidated bottom (PUB) wetlands (Table 4-13):

Table 4-13 Field Verified Wetland

Wetland Type	Approximate Area (Acres)	Percent of Total Wetlands
Palustrine Emergent	15	20
Palustrine Scrub-Shrub	6	7
Palustrine Forested	54	72
Palustrine Unconsolidated Bottom	1	1
Total	**76**	**100**

The study area includes approximately 15 acres of emergent wetlands found along the shoreline of the river channel and perennial streams. They are also part of larger wetland complexes where woody vegetation is managed, such as in transmission rights-of-way. Common species include sensitive fern (*Onoclea sensibilis*), woolgrass (*Scirpus cyperinus*), fringed sedge (*Carex crinita*), and upright sedge (*Carex stricta*). The wetlands associated with streams showed signs of water marks and sediment staining related to seasonal high water. The PEM wetlands within the study area provide several functions including wildlife

habitat, flood flow alteration, sediment and shoreline stabilization, nutrient removal, and sediment and toxicant retention.

PSS wetlands comprise approximately 6 acres of the study area. This wetland type is found on a small island within the Saco River or associated with larger, forested, wetland complexes. Dominant shrub vegetation includes speckled alder (*Alnus incana*), common buttonbush (*Cephalanthus occidentalis*), red osier dogwood (*Cornus sericea*), and white meadowsweet (*Spiraea alba*). Herbaceous vegetation varies depending on light penetration, but often includes sensitive fern, royal fern (*Osmunda regalis*), and Joe Pye weed (*Eutrochium maculatum*). Common hydrologic indicators include surface water, saturation, and water-stained leaves. Functionally, these wetlands provide wildlife habitat, nutrient removal, and sediment and toxicant retention.

PFO wetlands are the most frequently occurring wetland type, covering approximately 54 acres of the study area. These wetlands occur along the shoreline, and as part of larger wetland complexes. The overstory is primarily dominated by deciduous hardwood species including silver maple, red maple (*Acer rubrum*), and yellow birch. The shrub layer in these wetlands is generally sparse, primarily composed of saplings from overstory species. White meadowsweet, winterberry (*Ilex verticillata*) and steeplebush (*Spiraea tomentosa*) occur occasionally. Herbaceous vegetation varies depending on canopy closure, but common species include sensitive fern, royal fern, and king of the meadow (*Thalictrum pubescens*). The swamp white oak (*Quercus bicolor*), which is a threatened species in the state of Maine (MNAP 2021), was observed in three forested wetlands along the eastern shore of the impoundment.

There were two freshwater ponds (i.e., PUB wetlands) comprising approximately 1 acre of the study area. These open water habitats are largely unvegetated; however, they provide several functions including wildlife habitat, flood flow alteration, and sediment and toxicant retention.

Invasive Botanical Species

Fifteen invasive botanical species were documented throughout the Project area (Table 4-14). Upstream of the Bar Mills Dam, most invasive species were found at trace amounts with low coverage. Downstream of the Bar Mills Dam, invasive species were found at moderate to high densities along the shore and on the island. The most common invasives were woody shrubs, including autumn olive, glossy buckthorn, and Morrow's honeysuckle, with lower densities of multiflora rose (*Rosa multiflora*) and Japanese

barberry (*Berberis thunbergia*). Oriental bittersweet (*Celastrus orbiculatus*), a woody vine species, was prevalent as well.

Japanese knotweed (*Fallopia japonica*) was also observed in the study area, appearing in trace amounts upstream of the Bar Mills Dam but forming dense thickets along the shoreline downstream of the dam. Although this species can be found in wetlands, it typically thrives in upland areas and at higher elevations along shorelines.

Curly pondweed (*Potamogeton crispus*), an aquatic invasive species, was observed in trace amounts at the lower end of the impoundment. This species was found as individual stems along the water's edge, with no other aquatic plant species found concurrently. The stems were hand-pulled by the field crew during the survey.

Table 4-14 Invasive Botanical Species Observed in the Project Area

Scientific Name	Common Name	Status[1,2]
Artemisia vulgaris	common mugwort	4
Berberis thunbergii	Japanese barberry	1
Celastrus orbiculatus	Oriental bittersweet	1
Centaurea stoebe	spotted knapweed	3
Cirsium arvense	Canada Thistle	1
Cynanchum louiseae	black swallowwort	1
Elaeagnus umbellata	autumn olive	2
Euonymus alatus	winged euonymous	1
Fallopia japonica	Japanese knotweed	1
Frangula alnus	glossy buckthorn	1
Lonicera morrowii	Morrow's honeysuckle	1
Lonicera tatarica	Tartarian honeysuckle	1
Phalaris arundinacea	reed canary grass	1
Potamogeton crispus	curly pondweed	1
Rosa multiflora	multiflora rose	2

[1] Source: Maine Department of Agriculture, Conservation and Forestry, 2019

[2] Status rankings from Maine Advisory List of Invasive Plants: 1 – Severely invasive; 2 – Very invasive; 3 – Invasive, habitat-specific threats; 4 – Potential to be invasive, monitor

4.9.2 Environmental Effects

BWPH anticipates the removal of the Bar Mills Project to have positive impacts on the botanical resources in the Project area. The restoration of natural hydrology and sediment transport processes is expected to facilitate the recovery of native botanical communities, enhance habitat quality, and support broader ecosystem functions within the project area.

Riparian Uplands

Post-removal conditions will expose previously inundated habitat, allowing for the natural colonization and succession of native riparian plant species. Over time, this process is expected to increase the diversity and structural complexity of plant communities along the restored channel and floodplain. Early successional species are likely to dominate initially, followed by the establishment of more mature riparian assemblages.

Wetlands

The removal of the Bar Mills Project is anticipated to benefit wetlands over the long term by restoring natural hydrologic regimes, increasing habitat diversity, and supporting the reestablishment of native wetland plant communities. Some existing wetlands may experience temporary disturbance during construction activities; however, these disturbances are expected to be localized and of limited duration. The drawdown of the impoundment will expose previously inundated soils, leading to a transition in wetland types and potential expansion of riverine and floodplain wetlands as the stream channel reestablishes.

One small freshwater pond adjacent to the lower impoundment is directly influenced by river water levels. Following the removal of the Bar Mills Project, the newly exposed soils are expected to quickly become vegetated with native herbaceous wetland species that currently occupy the emergent fringe. Consequently, the wetland is anticipated to transition from an open-water freshwater pond to an emergent wetland community.

The larger wetland complexes were found either at elevations several feet higher than the existing, normal Bar Mills impoundment level or in the floodplain. These wetlands are primarily fed by hydrologic inputs from the contributing watershed or are only affected by river water levels during seasonal flooding events. The removal of the Bar Mills project is not expected to affect these wetlands.

Emergent wetlands along shoreline primarily receive hydrologic input through periodic inundation from the river or stream. Water wicking through exposed alluvial sand and silt are expected to maintain saturation in the upper soil layers. The exposure of new substrate will likely enable emergent species to germinate from existing seed banks or to spread vegetatively. It is anticipated that these wetlands will reconfigure and shift towards the new water elevation. Wetlands formed as a result of artificial impoundments often exhibit poor water quality due to disruptions in physical, chemical, and biological processes caused by altered stream hydrology. With the restoration of more natural stream flows following the removal of the Bar Mills Project, it is expected that higher-quality wetlands will re-establish within the former impoundment footprint.

4.9.3 Unavoidable Adverse Effects

Construction activities and changes in hydrology may temporarily disturb wetland soils and vegetation. These effects are expected to be localized and of limited duration. The disturbance associated with the removal of the Bar Mills Project and sediment exposure may create opportunities for non-native invasive plant species to establish. Due to the prevalence of existing invasive species documented in 2024, BWPH is not specifically proposing invasive species management measures.

4.9.4 References

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4.10 Wildlife

4.10.1 Affected Environment

4.10.1.1 Habitat

Cover types along the Bar Mills impoundment and tailrace are predominantly mature mixed hardwood forest, agriculture, and utility right-of-way. Although not dominant, additional cover types include several types of wetlands and scattered areas of residential development. The habitat within and around the Project supports a diversity of wildlife species including mammals, reptiles, amphibians, waterfowl, and songbirds.

4.10.1.2 Wildlife Species

Wildlife species found in the Project vicinity in September 2001 included gray squirrel, red squirrel, eastern chipmunk, white-tailed deer, and striped skunk. Beaver dens were observed along the impoundment shorelines. Green-backed heron, great-blue heron, double-crested cormorant, and belted kingfisher were observed in emergent wetlands and open water sections. Painted turtle were observed along the river margins and snapping turtle were observed below the water surface. Wood duck were observed in forested wetlands and black duck were observed on the impoundment. Wild turkey were seen in the floodplain forests. A variety of songbirds, including chickadee, blue jay, and red-breasted nuthatch were also observed (FLA 2003).

4.10.2 Environmental Effects

BWPH anticipates the removal of the Bar Mills Project to have positive impacts on local wildlife as the removal of man-made river impediments often restores natural ecosystem processes, enhances connectivity within the river corridor and improves overall river health[14]. The restoration of more natural stream flows will facilitate the reestablishment of floodplain connectivity and riparian vegetation. These changes are anticipated to enhance habitat quality and diversity for a variety of wildlife species, including macroinvertebrates, birds and mammals. The removal of the project is also anticipated to restore longitudinal connectivity of the river. While the Bar Mills Dam was constructed at a location that may have historically represented a natural obstacle to upstream diadromous fish migration, removal of the spillway is still expected to benefit amphibians,

[14] https://www.americanrivers.org/2019/06/twenty-years-of-dam-removal-successes-and-whats-up-next/

reptiles, and mammals that rely on unimpeded river corridors for migration, dispersal, and access to habitat.

4.10.3 Unavoidable Adverse Effects

Construction activities associated with the Bar Mill Project removal may result in temporary disturbance to wildlife due to noise, increase in human presence, and habitat alteration. These effects are expected to be localized and short-term, with wildlife returning to resorted habitat as conditions stabilize. No significant changes are expected downstream of the Project; therefore, existing habitat would not be adversely affected downstream.

4.10.4 References

FPL Energy Maine Hydro LLC (FPLE Maine). 2003. Bar Mills Hydroelectric Project, FERC No. 2194, Application for New License, Volume I – Application and Exhibits A, E, F, G and H and Appendix A.

4.11 Rare, Threatened, and Endangered Species

The Endangered Species Act (ESA) was passed in 1973 to protect those animals and plants and associated habitats that are in danger of becoming extinct. The US Fish and Wildlife Service (USFW)S classifies animals and plants into two categories: "endangered species" are in danger of extinction throughout the area in which they are usually found, and "threatened species" are those that could become endangered in the near future. The bald eagle was removed from the ESA list on June 28, 2007. However, bald eagles remain federally protected under the Bald and Golden Eagle Protection Act of 1940 and the Migratory Bird Treaty Act.

Wildlife species in Maine may also be protected under the Maine Endangered Species Act (MESA). Depending on their level of vulnerability to extinction, species may be listed as Endangered or Threatened. Under MESA, a species may also be identified as Special Concern if it does not meet the criteria of endangered or threatened but is particularly vulnerable and could easily become threatened or is suspected to be endangered or threatened but for which insufficient data exists (MDIFW 2010).

MESA includes the designation and protection of Essential Habitats, which are defined as "areas currently or historically providing physical or biological features essential to the conservation of endangered or threatened species in Maine and which may require species management considerations" (MDIFW 2010). The Natural Resources Protection Act (NRPA) provides protection to certain natural resources including Significant Wildlife Habitats and is administered by the MDEP.

4.11.1 Affected Environment

4.11.1.1 Endangered Fish Species

Atlantic salmon are listed as endangered under the Endangered Species Act (ESA). While there is no known historical documentation of shad or river herring occurring in the Saco River upstream of the falls at the head of tide (site of the Cataract Project FERC No. 2528), Atlantic salmon historically passed over the falls and utilized a large portion of the Saco River and its major tributaries, including the Project area. Critical habitat is designated by the National Marine Fisheries Service (NMFS) or the USFWS for the survival and recovery of species listed as threatened or endangered under the Federal Endangered Species Act (ESA). Essential fish habitat (EFH) is identified for species managed in Fishery Management Plans under the Magnuson-Stevens Fishery Conservation and Management Act and is defined as the habitat necessary for managed fish to complete their life cycle such that

the fishery can be harvested sustainably. NMFS designated the Saco River as Essential Fish Habitat (EFH) for Atlantic salmon but there is no designated critical habitat for Atlantic salmon within the Saco River watershed.

Upstream migrating Atlantic salmon can reach the Project area by passing upstream through dedicated fish passage facilities at the Cataract Project and Skelton Project. However, in the previous five years (2021 through 2025) staff at Skelton captured only seven upstream migrating Atlantic salmon, and they trucked all of them upstream of the Project area to the Big Ossipee River (a major tributary to the Saco River).

4.11.1.2 Mussels

As previously discussed, the triangle floater was observed in the lower bypass reach during a mussel survey in 2001 (FPLE 2003). The triangle floater was listed as a species of Special Concern in Maine when the study was conducted in 2001; however, the species status was removed from the list of species of Special Concern following changes to the criteria in 2007 and is now considered secure (Swartz and Nedeau 2007). Therefore, no RTE freshwater mussel species are known to occur in the Project area.

4.11.1.3 Wildlife Species

A USFWS Planning and Consultation (IPaC) report obtained in April 2026 (Appendix C) identified Tricolored Bat and the Monarch Butterfly, proposed for listing as endangered and threatened species, respectively, as potentially being affected by activities in the Project area. Although not included in the IPaC results it is assumed that the northern long-eared bat (NLEB) may also be present in the Project area. The IPaC report did not identify any critical habitats in the Project area.

No study requests or comments were provided by MDIFW in response to the Draft or Final Study Plan. Relicensing documents for the Bar Mills Project from 2003 and the upstream West Buxton Project from 2015 indicate there were no State threatened or endangered wildlife species documented in the vicinity of either project. The State of Maine's Natural Heritage Database and the MDIFW online database were reviewed for the presence of habitat for state-listed species. The MDIFW habitat mapping[15] also indicates no significant wildlife habitat in the vicinity of the Bar Mills Project. In recent MDIFW comments and study requests for the FERC relicensing of the downstream

[15] https://www.maine.gov/ifw/fish-wildlife/wildlife/beginning-with-habitat/maps/map-viewer.html

Cataract Project (FERC No. 2528)[16], MDIFW identified several State-listed species that could potentially be in the vicinity of the Cataract Project. Considering the Cataract Project is 13 river miles downstream, the same species are likely considered to potentially occur in the Bar Mills project area including little brown bat, northern long-eared bat, eastern small-footed bat, big brown bat, red bat, hoary bat, silver-haired bat, tri-colored bat, wood turtle, and golden eagle.

NORTHERN LONG-EARED BAT (FEDERALLY AND STATE LISTED)

The northern long-eared bat (NLEB) is listed as Endangered at the federal and state level. The NLEB was federally listed as threatened on April 2, 2015, with a final rule published in the Federal Register on January 14, 2016. On November 29, 2022, the USFWS reclassified the NLEB as endangered under the Endangered Species Act (ESA) due largely to impacts of white-nose syndrome throughout the bats range (USFWS n.d.a). On April 27, 2016, the USFWS determined that the designation of critical habitat for the species was not prudent; therefore, no critical habitat is established for the NLEB (USFWS 2024b).

The NLEB winters in underground caves and cave-like structures known as hibernacula, but summers singly or in small colonies in cavities, under bark, or in hollows of live and dead trees typically greater than 3 inches in diameter (USFWS n.d.a). Suitable roosting trees also include exfoliating bark, cavities, or cracks (USFWS n.d.a). Forested areas are important for the NLEB not only for roosting, but also for foraging, and for commuting between habitats, such as summer roosting locations and winter hibernation habitat (USFWS n.d.a).

MONARCH BUTTERFLY (FEDERALLY AND STATE LISTED)

The monarch butterfly (*Danaus plexippus*) is federally listed as a candidate insect species that has the potential to occur within the vicinity of the Bar Mills Project. Monarch butterflies breed by laying eggs on milkweed plants and larvae emerge after two to five days. Larvae develop through five phases over nine to eighteen days feeding on milkweed. Larvae then pupate into a chrysalis before emerging into an adult butterfly. Adult butterflies live approximately two to five weeks, and overwintering adults will enter a reproductive diapause and live six to nine months. Many monarchs will undergo a long-distance generational migration of distances over 3,000 km (USFWS 2023b).

[16] Accession Number 20241218-5258.

BATS

There are eight species of bats found in Maine, all of which are protected at some level (MDIFW 2022b). Two are state classified as endangered: NLEB (see Section 4.6.1.1 for details), and the little brown bat; two are state classified as threatened: the eastern small-footed bat, and the tri-colored bat; and the remaining four species are state listed as species of special concern: big brown bat, eastern red bat, hoary bat, and the silver-haired bat (MDIFW 2023, 2022a). Like the NLEB, the remaining seven species of bat found in Maine feed on night-flying insects such as moths, beetles, and mosquitoes, and primarily use echolocation to identify prey (MDIFW n.d.a).

White-nose syndrome affects hibernating bats, and spreads through bat-to-bat contact or by coming in contact with the fungal spores and transporting them to other sites (MDIFW n.d.b). The bats in Maine that are susceptible to white-nose syndrome include: big brown bat, little brown bat, NLEB, eastern small-footed bat, and the tri-colored bat (MDIFW n.d.b).

WOOD TURTLE

The wood turtle can be present throughout the entire State of Maine but is uncommon. The wood turtle hibernates during the winter and is often found in forested streams near their hibernation locations (USFWS n.d.c). They are semi-terrestrial and are affected by both aquatic and terrestrial habitat loss (USFWS n.d.c). The wood turtle inhabits slow-moving streams or rivers with sandy or silty substrate, often in areas with deep pools and woody debris, and is omnivorous, consuming leaves, grasses, berries, insects, worms, and more (MDIFW n.d.c). The woods turtle is long-lived and does not reach sexual maturity until 11 to 12 years old (MDIFW n.d.c).

GOLDEN EAGLE AND BALD EAGLE

The protection of birds is regulated by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)).

Bald eagles are no longer listed under the ESA but maintain federal protection under the Bald and Golden Eagle Protection Act. Bald eagles typically nest within 0.25 to 1 mile of large bodies of open water, such as lakes and large rivers. Eagles nest in large, super-

canopy trees or snags often in late-successional forests. They prefer a nest site at the edge of the forest, near foraging areas, unobstructed views, and with little human disturbance. Most eagles forage primarily on fish, with lesser quantities of waterfowl, carrion, and small mammals. The bald eagle often winters along large interior or coastal bodies of water that remain free of ice.

The golden eagle is Maine's rarest breeding bird and has been listed as a state endangered species since 1986 (MDIFW 2003a). Golden eagles traditionally inhabit places with open country that includes rangeland, tundra, and alpine areas, and places with more rugged topography, nesting on cliffs, or in trees if found in heavily forested areas (MDIFW 2003a). In Maine, golden eagles have primarily been found in the western and northwestern mountainous regions (MDIFW 2003a).

4.11.1.4 Migratory Birds

The 2026 IPac report identifies 18 migratory bird species that may be present in the project area (Table 4-15). Of these species, 14 are identified as having breeding seasons ranging from mid-May to mid-October.

The bald eagle, while delisted federally on August 9, 2007, is still listed as endangered in the state of Maine and is also protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The bald eagle has a breeding season from mid-October through the end of August. There are no known bald eagle nests in the project area. USFWS bald eagle nest location data[17] identifies a nest location approximately five miles downstream of the Bar Mills dam. Bald eagles may transiently utilize the project area.

Table 4-15 Migratory bird species that may be present in the Project Area

Scientific Name	Common Name	Breeding Season
Haliaeetus leucocephalus	Bald Eagle	Oct 15 to Aug 31
Setophaga castanea	Bay-breasted Warbler	May 25 to Aug 1
Coccyzus erythropthalmus	Black-billed Cuckoo	May 15 to Oct 10
Vermivora cyanoptera	Blue-winged Warbler	May 1 to Jun 30
Dolichonyx oryzivorus	Bobolink	May 20 to Jul 31
Cardellina canadensis	Canada Warbler	May 20 to Aug 10
Setophaga tigrina	Cape May Warbler	Jun 1 to Jul 31

[17] https://fws.maps.arcgis.com/apps/webappviewer/index.html?id=796b7baa18de43b49f911fe82dc4a0f1

Scientific Name	Common Name	Breeding Season
Chaetura pelagica	Chimney Swift	Mar 15 to Aug 25
Coccothraustes vespertinus	Evening Grossbeak	May 15 to Aug 10
Contopus cooperi	Olive-sided Flycatcher	May 20 to Aug 31
Calidris melanotos	Pectoral Sandpiper	Breeds Elsewhere
Setophaga discolor	Prairie Warbler	May 1 to Jul 31
Pheucticus ludovicianus	Rose-breasted Grosbeak	May 15 to July 31
Euphagus carolinus	Rusty Blackbird	Breeds Elsewhere
Piranga olivacea	Scarlet Tanager	May 10 to Aug 10
Limnodromus griseus	Short-billed Dowitcher	Breeds Elsewhere
Catharus fuscescens fuscescens	Veery	May 15 to Jul 15
Hylocichla mustelina	Wood Thrush	May 10 to Aug 31

Source: USFWS IPaC Resource List, April 2026 (see Appendix C).

4.11.1.5 Botanical Species

No federally listed rare, threatened, or endangered (RTE) plant species were observed in the study area during the 2001 or 2024 terrestrial field surveys. One state-threatened species, swamp white oak (*Quercus bicolor*), was documented within the study area; however, it occurs outside of the Project's area of water level influence.

Several stands of swamp white oak were observed within the high-terrace hardwood floodplain wetlands located in the mid-impoundment area. Trees ranging in size for saplings to mature canopy-dominant individuals were observed in the wetlands. Associated species included red maple, silver maple, royal fern, sensitive fern, and cinnamon fern.

4.11.2 Environmental Effects

4.11.2.1 Endangered Fish Species

Upstream-migrating Atlantic salmon are currently trapped at the Skelton Project and trucked to the Big Ossipee River. Atlantic salmon runs in the Saco river are small and mainly consist of stray hatchery fish from other river systems and potentially some wild fish. In 2025, one Atlantic salmon was captured at the Cataract East Channel fishway and passed upstream, and no Atlantic salmon were captured at the Skelton fishway (BWPH 2026). It is unlikely that Atlantic salmon will encounter the Bar Mills Project area during

upstream migration for the foreseeable future. With the existing trap and truck program for Atlantic salmon and because removal of the spillway will eliminate a structural impediment to upstream and downstream migration, dam removal is not likely to adversely affect the species. Planned decommissioning and spillway removal will improve downstream passage for kelts by allowing downstream migration without obstruction.

4.11.2.2 Mussels

No threatened or endangered mussel species are known to occur in the project area, therefore no adverse effects are anticipated as a result of dam removal activities.

4.11.2.3 Wildlife

In the long term, the Bar Mills Project removal will restore natural riverine and riparian habitats. The reestablishment of native vegetation and the creation of more diverse riparian zones are anticipated to benefit RTE wildlife including bats, monarch butterfly, and wood turtle.

Bats

The reestablishment of native vegetation and the creation of more diverse riparian zones are anticipated to increase insect abundance and improve foraging opportunities for multiple bat species. Short-term impacts may include temporary disturbance from construction activities, such as increased noise, lighting, and human presence. These disturbances could cause bats to temporarily avoid the immediate project area during active construction periods. However, these effects are expected to be localized and of limited duration. For any activities requiring clearing of trees 3-inches-diameter or greater at base height, BWPH will abide by seasonal tree clearing restrictions and only clear trees between November 1 and March 31 for the protection of northern-long eared bat. Should tree clearing be required during the restricted time period (April 1 to October 31), BWPH will consult with the USFWS and MDIFW regarding removal needs for the protection of northern-long eared bat. Therefore, no adverse effects to bat species are anticipated.

Monarch Butterfly

Removal of the Bar Mills spillway is anticipated to have beneficial effects on monarch butterfly habitat by restoring native vegetation and potentially increasing the availability of milkweed and nectar plants within the project area. Short-term disturbance from construction activities may temporarily displace individual butterflies or reduce available

nectar sources. However, these effects are expected to be localized and of limited duration. As the impoundment is drawn down and natural river processes are restored, previously inundated areas will be exposed and subject to natural succession. This process is likely to support the establishment of native herbaceous vegetation, including milkweed, which serves as the primary larval host plant for monarch butterflies. Restoration of native plant communities in the former impoundment and along the river corridor is anticipated to enhance foraging and breeding habitat for monarch butterflies. Increased floral diversity and abundance will provide nectar resources for adult monarchs during migration and breeding periods. Therefore, no adverse effects to monarch butterfly are anticipated.

Wood Turtle

Wood turtle has not been documented in the project area. However, the restoration of natural hydrology and riparian vegetation is anticipated to improve habitat connectivity and support the long-term persistence of any wood turtle population that could exist within the project area. The restoration of natural stream flow, channel morphology and connectivity, which are beneficial for wood turtle movement, foraging and nesting, are anticipated to enhance the quality and availability of suitable habitat. Construction activities could temporarily disturb or displace wood turtles if present. Changes in water levels and the release and redistribution of impoundment sediments, which are limited, may temporarily alter the streambed conditions; however, as the river system stabilize and natural substrates develop, it is anticipated that any potential wood turtle habitat will be enhanced, including basking and nesting sites.

4.11.2.4 Migratory Birds

The conversion of the impounded area to a free-flowing river system will alter the composition and structure of available habitats. While open water habitats used by some waterfowl and wading birds may decrease, the restoration of riparian zones and floodplain forests is expected to benefit a broader diversity of migratory songbirds and other avian species. It is anticipated that the reestablishment of native vegetation and natural channel features will increase the availability of foraging and nesting sites for migratory birds. Enhanced riparian plant communities will provide food resources, cover, and nesting substrates, supporting a greater abundance and diversity of bird species over time. Construction activities associated with the Bar Mills Project removal may temporarily disturb migratory birds through increased noise, human presence, and habitat alteration. These effects are expected to be localized and of limited duration, with birds returning to

the area as habitats recover and stabilize. As noted above, BWPH anticipates that any tree removal activities will be limited to the restricted time period associated with protective measures for bats. This timeframe, November 1 and March 31 is outside the breeding season for all migratory bird species that have potential to inhabit the project area and therefore are unlikely to be adversely affected by the Proposed Action.

4.11.2.5 Botanical Species

Swamp white oak, listed as a threatened species in Maine, was identified during the terrestrial surveys. All observed individuals and populations of swamp white oak are located in a larger wetland complex fed by hydrologic inputs from the contributing watershed or is only affected by river water levels during seasonal flooding events. Therefore, the swamp white oak is outside the area of direct and indirect influence of the Project and no adverse effects to swamp white oak are anticipated from removal of Bar Mills dam.

4.11.3 Unavoidable Adverse Effects

No unavoidable adverse effects on state or federal listed or species of special concern are anticipated.

4.11.4 References

Brookfield White Pine Hydro LLC. 2026. 2025 Saco River Diadromous Fish Passage Report. March 2026.

FPL Energy Maine Hydro, LLC. 2003. Final License Application (FLA). 2007. FPL Energy Maine Hydro, LLC. Bar Mills Project, FERC No. 2194-020. Volume 1 of 3.

Maine Natural Areas Program (MNAP). 2021. *Quercus bicolor* Willd.: Swamp White Oak. https://www.maine.gov/dacf/mnap/features/quebic.htm

Maine Department of Inland Fisheries and Wildlife (MDIFW). 2003a. Golden eagle. [Online] URL: https://www.maine.gov/ifw/docs/endangered/goldeneagle_58_59.pdf.

Maine Department of Inland Fisheries and Wildlife (MDIFW). 2010. Maine Endangered Species Act. [Online] URL: http://www.mainelegislature.org/legis/statutes/12/title12sec12801.html.

Maine Department of Inland Fisheries and Wildlife (MDIFW). 2022a. Species of Special Concern. [Online] URL: https://www.maine.gov/ifw/fish-wildlife/wildlife/endangered-threatened-species/special-concern.html.

Maine Department of Inland Fisheries and Wildlife (MDIFW). N.d.a. Bats. [Online] URL: https://www.maine.gov/ifw/fish-wildlife/wildlife/species-information/mammals/bats.html#:~:text=A%20fungal%20disease%20that%20spread,North%20America%2C%20including%20in%20Maine.

Maine Department of Inland Fisheries and Wildlife (MDIFW). N.d.b. White nose syndrome. [Online] URL: https://www.maine.gov/ifw/fish-wildlife/wildlife/living-with-wildlife/diseases/white-nose-syndrome.html.

Maine Department of Inland Fisheries and Wildlife (MDIFW). N.d.c. Wood turtle | *glyptemys insculpta*. [Online] URL: https://www.maine.gov/ifw/fish-wildlife/wildlife/species-information/reptiles-amphibians/wood-turtle.html.

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U.S. Fish and Wildlife Service (USFWS). 2020. Monarch (*Danaus Plexippus*) species status assessment report, version 2.1, September 2020. [Online] URL: https://ecos.fws.gov/ServCat/DownloadFile/191345.

United States Fish and Wildlife Service (USFWS). N.d.a. Northern Long-eared Bat. [Online] URL: https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis. Accessed March 12, 2024.

United States Fish and Wildlife Service (USFWS). N.d.b. Listed animals. [Online] URL: https://ecos.fws.gov/ecp0/reports/ad-hoc-species-report?kingdom=V&kingdom=I&status=E&status=T&status=EmE&status=EmT&status=EXPE&status=EXPN&status=SAE&status=SAT&mapstatus=3&fcrithab=on&fstatus=on&fspecrule=on&finvpop=on&fgroup=on&header=Listed+Animals. Access March 14, 2024.

United States Fish and Wildlife Service (USFWS). N.d.c. Wood turtle. [Online] URL: https://www.fws.gov/species/wood-turtle-glyptemys-insculpta. Accessed March 14, 2024.

4.12 Cultural Resources

4.12.1 Affected Environment

Three archaeological sites were identified during the prior FERC relicensing as eligible for listing in the National Register of Historic Places (NRHP). As reported by then licensee NextEra Energy on February 13, 2013, all data recovery field work, analysis, and reporting were completed at the sites between 2011 and 2012, completing all archaeology mitigation under the Programmatic Agreement and Historic Properties Management Plan. No new measures are anticipated relative to significant historic archeological resources.

As part of the study phase for the surrender and decommissioning, BWPH contracted TRC to conduct an evaluation of historic structures associated with the Bar Mills Project. TRC confirmed the previously determined eligibility of the Bar Mills Hydroelectric Plant and Bar Mills Dam. Survey documentation was provided to the Maine Historic Preservation Commission (MHPC) for approval and concurrence. MHPC concurred with the determination that all the primary project structures are eligible for listing on the NRHP and recommended seeking ways to avoid, minimize, or mitigate any adverse effects on these structures.

4.12.2 Environmental Effects

As noted above, recovery efforts for previously identified archaeological resources have been completed. BWPH does not anticipate any adverse effects to archaeological resources.

However, removing the Bar Mills Dam and other structures will adversely affect historic resources that are eligible for listing on the NRHP. As mitigation for dam removal, BWPH intends to document the Bar Mills Project using Maine Historic Building Record photography in compliance with the Historic American Buildings Survey/Historic American Engineering Record standards (HABS/HAER). BWPH is in the process of developing a formal mitigation plan in consultation with the MHPC and anticipates development of a Memorandum of Agreement (MOA) with the State Historic Preservation Officer (SHPO) and FERC to define necessary mitigation measures.

4.12.3 Unavoidable Adverse Effects

License surrender and dam removal will adversely affect historic resources that are eligible for listing in the NRHP which is anticipated to be mitigated through HABS/HAER documentation.

4.12.4 References

NextEra Energy. 2013. NextEra Energy Programmatic Agreement Compliance Actions for 2012 and Proposals for 2013 FERC Projects: Gulf Island-Deer Rips (FERC No. 2283), Weston (FERC No. 2325), Wyman (FERC No. 2329), North Gorham (FERC No. 2519), Bonny Eagle (FERC No. 2529), Skelton (FERC No. 2527), Fort Halifax (FERC No. 2552 (Surrendered)), Moosehead (FERC No. 2671), Upper and Middle Dam Storage Projects (FERC No. 11834), Bar Mills (FERC No. 2194) and Brassua (FERC No. 2615). February 12, 2013. FERC Accession Number: 20130213-0011

4.13 Recreation Resources

4.13.1 Affected Environment

The Saco River is used extensively for outdoor recreation and is recognized as an important recreational and natural resource (FERC 1996). The upstream reaches of the Saco River is Maine's most heavily used canoe-touring river due to easy navigation, clean water, variety of scenery, and easy access (Maine State Planning Office (MSPO) 1987; Hardy 1985). Between Fryeburg and Brownfield (approximately 40-60 river miles upstream of the Project) it is common to see rafts of canoes lashed together floating down the river and multiple parties camping along the shoreline.

In contrast, the river section in which the Bar Mills Project lies provides a vastly different recreation opportunity, supporting a quieter atmosphere with a substantially lower likelihood of encountering others while recreating. While canoe touring is not prominent in the lower section of the river, occasionally groups travel from the Saco headwaters in New Hampshire all the way down to the Atlantic Ocean. Other recreation opportunities along the river in general include swimming, camping, picnicking, power boating, and sightseeing (FERC 1996).

4.13.1.1 Bar Mills Project Recreation Resources

BWPH currently provides the following recreation sites at the Bar Mills Project: impoundment boat launch and parking area, canoe portage, tailwater canoe access, and Usher Island parking area and trails (Figure 4-17). At the impoundment boat launch, there is parking available for 4 single vehicles, 2 trailered vehicles, and one ADA space for a trailered vehicle (NextEra Energy 2010). At Usher Island, there is parking available for 2 single vehicles. Although formal recreational access is not provided at the Route 4A bridge, the area is frequently used for river access for inner tubing.

Although outside of the Project boundary, BWPH intends to develop a new recreational access area that will be constructed on lands currently owned by the Town of Hollis, located on the same property as the municipal office building. The access area will be developed by BWPH and owned and operated by the Town of Hollis. It will permit river access to the area of the current Bar Mills impoundment, approximately mid-way between Bar Mills Dam and West Buxton Dam. The new recreational area for the Town of Hollis is not included in BWPH's proposed action for license surrender and FERC approval but instead, will be implemented "off license."

Upstream of the Bar Mills Project, at the West Buxton Project, BWPH provides an impoundment boat launch with parking for 2 single vehicles, 2 trailered vehicles, and 1 ADA space (Figure 4-18). There is an angler access trail with parking for 3 single vehicles. On the east side of the river, there is a canoe portage and tailrace access site with parking for 2 single vehicles (BWPH 2018).

4.13.1.2 Recreation Use

4.13.1.3 Current Recreation Use Levels

BWPH conducted recreation use monitoring through use counts and visitor surveys in 2023 and 2024.

4.13.1.4 2023

Between July 1 and September 3, 2023, BWPH collected spot counts and visitor surveys at the Bar Mills impoundment boat launch on a mix of weekdays, weekends, and holidays between 8 AM and 7 PM. During each spot count, the field clerk recorded the date, time, weather, number of vehicles with and without trailers parked in the parking lot, and the number of individuals that could be seen boating, fishing, walking/hiking/running, picnicking, sightseeing or other activity from the parking area. Although significant levels of tubing occur downstream of the Bar Mills dam, this type of use was not monitored because this area would not be affected by partial or full spillway removal because minimum flow releases from upstream facilities would continue to provide existing flow conditions in the reach.

The visitor survey collected information on group size, length of stay on site, recreation activities, ratings of crowdedness and site condition, site recommendations, and visits during the non-recreation season (September through May).

A total of 13 vehicles were observed during the spot counts conducted between July 1 and September 3, 2023, at the Bar Mills impoundment boat launch; none of the vehicles had a boat trailer. A total of 9 people were observed during the spot counts; 2 people were walking/hiking/running, 2 people were swimming, and 5 people were doing other activities. Zero people were seen boating, fishing, picnicking, or sightseeing (BWPH 2025).

The average number of vehicles ranged from 0.25 vehicles on weekdays to 0.63 vehicles on holidays. Based on the 4 single parking spaces available, the parking was under-utilized ranging from 6 percent occupied on weekdays to 16 percent on holidays (BWPH 2025).

Members of the Decommissioning Committee indicated that the high river flows experienced in 2023 likely affected recreational activity, particularly boating. As a result, the recreational use data recorded during the spot surveys are likely not representative of typical use levels.

Throughout the 2023 study season, 18 visitor surveys were completed. The group sizes of the 18 survey respondents ranged from 1 to 3 people with an average of 1.8 people (BWPH 2025). The recreation activities participated in by the respondents are shown in Table 9-4 of the Draft Study Report[18]. Swimming was the most common activity with 11 respondents (61 percent) stating they participated in that activity. Other popular activities were canoeing/kayaking and sightseeing. Other reported activities were boating, fishing, relaxing, tubing, wading, and walking (BWPH 2025).

All survey respondents rated the crowdedness at the impoundment boat launch between light and moderate; 15 of the respondents (83 percent) gave a rating of light (Table 9-5 Draft Study Report). The average rating was 1.2. All respondents rated the condition of the site between good and excellent with an average rating of 3.9 (BWPH 2025).

4.13.1.5 2024 Spot Counts

During the spot counts completed during the 2024 recreation season, a total of 21 vehicles were observed at the Bar Mills impoundment boat launch parking area and 12 vehicles were observed at the Usher Island parking area. Of the 33 total vehicles, 25 did not have trailers and 8 did have trailers. Most vehicles at both recreation sites were seen on weekends. Parking at the Bar Mills impoundment boat launch and at Usher Island was underutilized with ample parking available (BWPH 2025).

During the spot counts, a total of 8 vehicles were seen at the West Buxton recreation sites; 6 were at the impoundment boat launch, 2 at the canoe portage/tailrace access, and 0 were at the angler access trail. Parking was well under capacity at the West Buxton recreation sites. A total of 28 people were observed at the Bar Mills recreation sites participating in boating, fishing, walking/running, picnicking, sightseeing, and swimming (BWPH 2025).

Recreation use monitoring completed in 2023 at the Bar Mills impoundment boat launch and in 2024 at Bar Mills recreation sites demonstrated that use levels were low and under capacity. The spot counts and survey results did not indicate that motor boating was a common activity.

[18] Issued for agency and public comment in October 2025.

Figure 4-17 Bar Mills Project Recreation Sites

Figure 4-18 West Buxton Project Recreation Sites

4.13.2 Environmental Effects

BWPH will maintain current recreation sites at the Bar Mills Project including the canoe portage take-out and canoe portage put-in and the trails on Usher Island. The impoundment boat launch will be reverted back to a natural state and the shoreline will be stabilized. Access to the other Bar Mills recreation sites and the West Buxton recreation sites will remain unchanged after license surrender and dam decommissioning.

Due to the reduction in water level at the Bar Mills boat launch, BWPH anticipates a loss of this access point to the Saco River. This loss of access is expected to be offset by development of the new access area behind the Hollis municipal facilities.

4.13.3 Unavoidable Adverse Effects

After the dam is removed and the project impoundment no longer exists, the existing trailered boat launch will be unusable and therefore closed. This site will reverted to a natural state and the shoreline will be stabilized.

4.13.4 References

Brookfield White Pine Hydro LLC (BWPH). 2018. Final Recreation Management Plan. Accession number 20181116-5219. Available online: https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20181116-5219&optimized=false.

Hardy, Joseph. 1985. Maine Rivers Access and Easement Plan. Prepared for the Maine Bureau of Parks and Lands.

Maine State Planning Office (MSPO). 1987. State of Maine Comprehensive River Management Plan, Volume 2, Maine Rivers Study. Augusta, Maine.

NextEra Energy. 2010. Bar Mill Project Recreation Plan Facility Enhancements (FERC 2194). Accession number 20100105-5029. Available online: https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20100105-5029&optimized=false.

4.14 Land Use and Aesthetics

4.14.1 Affected Environment

The Project boundary encompasses lands and water necessary for the operation of the hydro facility, this includes lands and flowage rights up to elevation 148.5 feet NGVD around the impoundment that may or may not be owned in fee by BWPH, as well as several BWPH-owned parcels containing the powerhouse, recreation sites, and appurtenant facilities. Under the proposed action, the impoundment will be lost, extending the shoreland toward the original historic river channel creating additional lands between the current Project boundary and the reestablished river.

4.14.1.1 Land Use

Land use in any area is influenced by various combinations of topography, soil characteristics, historic demographics, and ownership patterns. Other factors affecting land use are prior use patterns, access, proximity to population centers or significant resources, and zoning regulations. In the Project area, current land use is most influenced by a long history of agriculture and by the Project's vicinity to Portland, Maine, the state's largest population center.

The Project is in the southern portion of the Saco River Basin. The Saco River meanders 120 miles from its headwaters in New Hampshire through southern Maine to the City of Saco, where it empties into the Atlantic Ocean. The foothills and flat plains region of southern Maine are relatively undeveloped, with most of the water frontage being privately owned and the dominant land uses being forestry and agriculture (FERC 1996). Eighty-five percent of the Saco River Basin is forested and another ten percent used for agriculture (FERC 1996) (Figure 4-19). Figure 4-20 focuses on land use within the Project vicinity, between the Bar Mills Project and the West Buxton Project.

The Project area lies within the flat plain region of York County, one of Maine's fastest growing areas. According to the 2020 census, the Town of Buxton had a population of 8,376 and the Town of Hollis had a population of 4,745 (U.S. Census Bureau 2020).

Residential development along the Project shoreline is limited. The existing light residential development is concentrated at either end of the impoundment, in the village of Bar Mills, at the downstream end where the Project structures are located, and in West Buxton at the upstream end of the impoundment. Land use in the vicinity of the Project

consists primarily of small private woodlots, agricultural, and light residential development. The immediate shoreline is primarily forested.

Land use around the Project is governed by local zoning ordinances, Maine's Shoreland Protection Act, the National Flood Insurance Program, and the Saco River Corridor Act. In June of 2025, the Town of Hollis amended its Shoreland Zone and Rural Residential Three-Acre zoning ordinances.

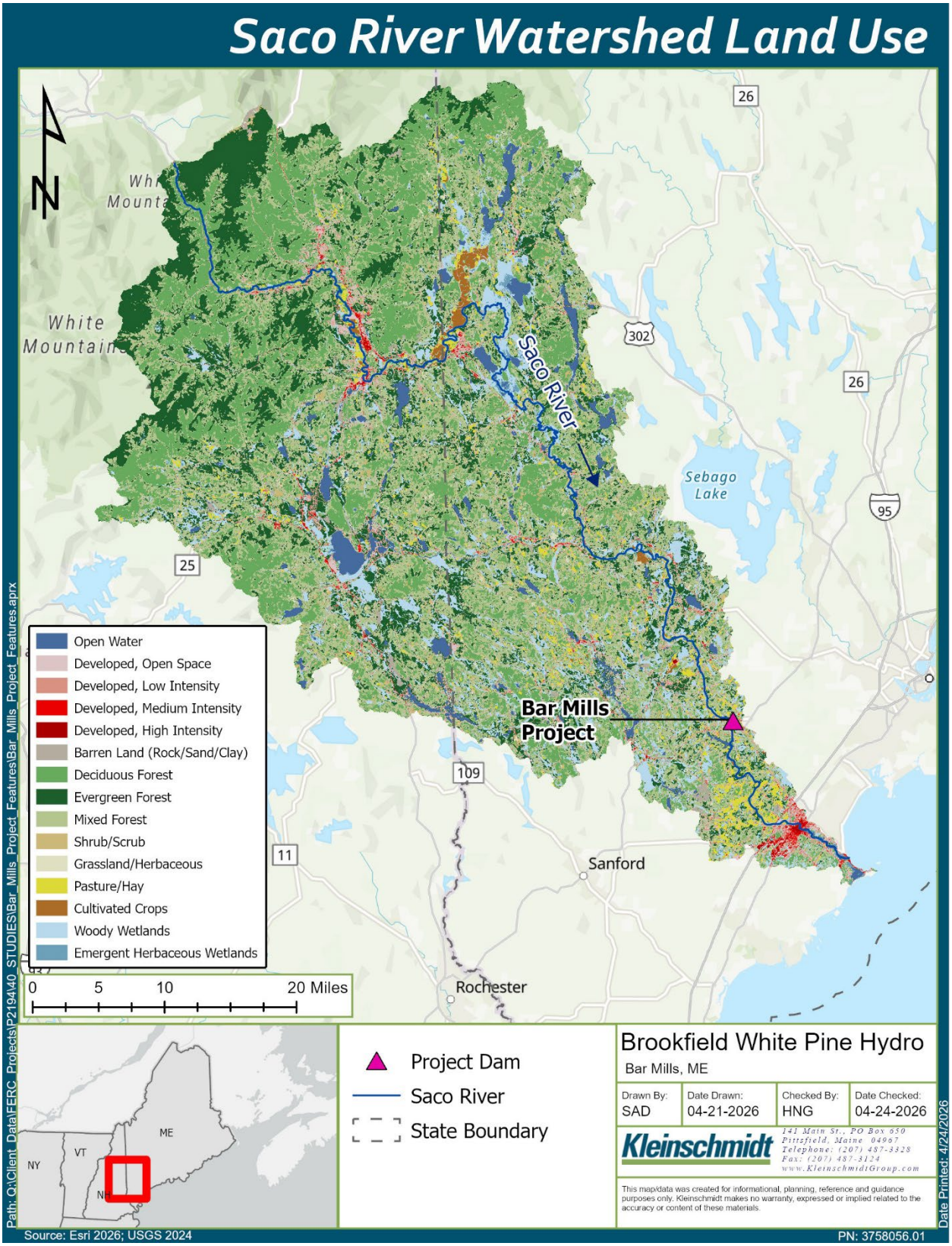

Figure 4-19 Saco River Watershed Land Use

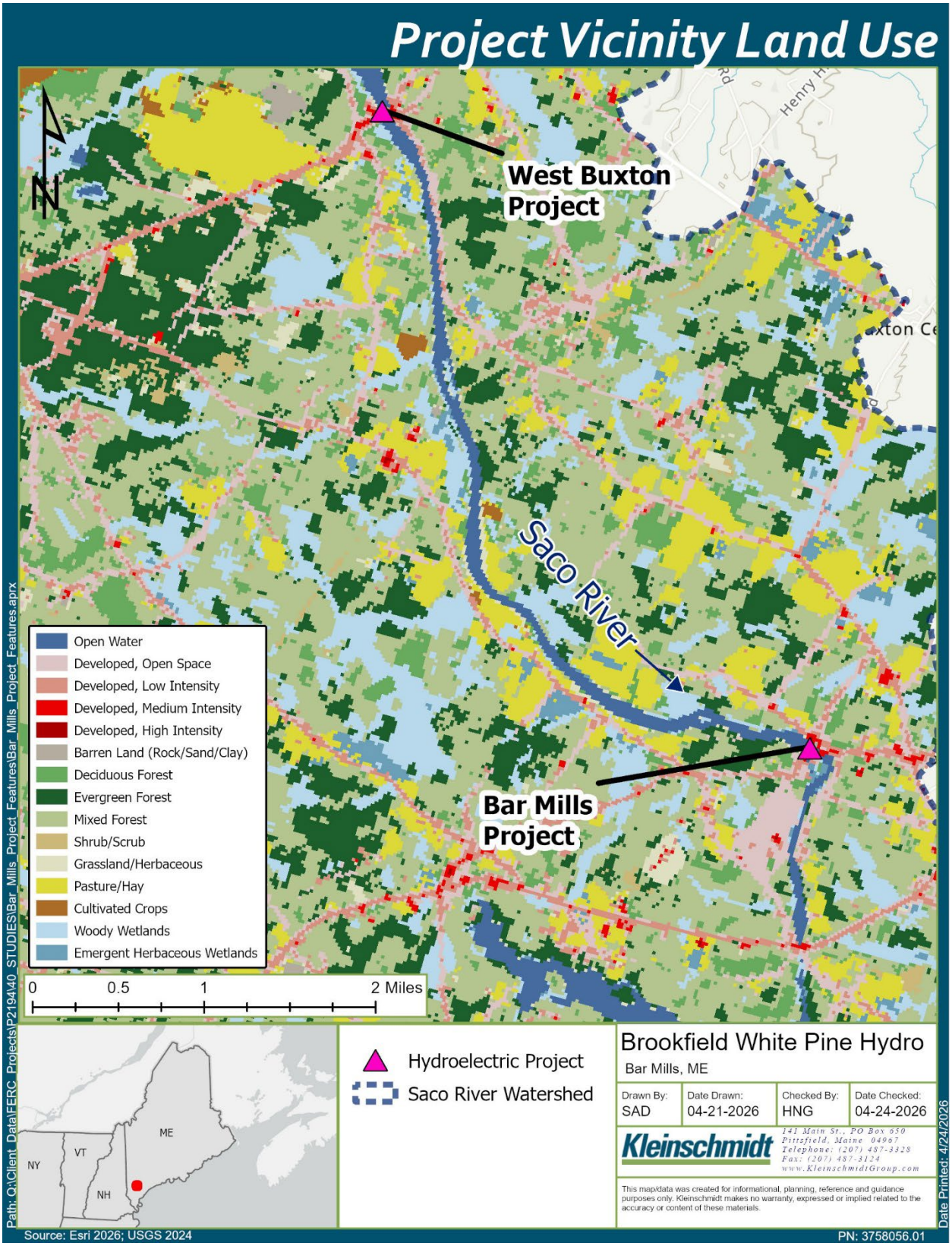

Figure 4-20 Land Use within Project Vicinity

4.14.1.2 Aesthetic Resources

The upper Saco River is well known regionally as a canoeing river and is heavily used by boaters on both single- and multiple-day camping trips. Within Maine, in its upstream reaches between Fryeburg and Hiram, the river is wide and slow moving, with large stretches of sandy beaches on which boaters camp. The scenic nature of the upper reaches of the Saco and easy paddling attracts thousands of boaters each summer, many of whom travel in large parties.

The lower portion of the Saco River, south of Hiram and through the Project area, is narrower and less attractive to boaters, though the downstream reach is popular for tubing. In the Project area, the shoreline is relatively steep, and the impoundment is narrow, relatively shallow, and riverine in character. Two small, wooded islands are located in the Project impoundment.

Within the Project area, few structures are visible from the river and there are limited areas where the impoundment is visible from roadways. Views of the Saco River are provided from State Route 4 in Hollis and Buxton, and from Route 112 in Buxton. Existing state and local regulations and the oversight of the SRCC serve to maintain visual buffers and guide development along the shorelines to maintain the character of the Saco River for the entire Saco River Basin, including the Project area.

4.14.2 Environmental Effects

Land use in the Project area is not expected to change significantly, and BWPH is not proposing any specific measures related to land use. Land within the existing Project that is currently impounded would become exposed following dam removal and over time would return to a free-flowing floodplain and riparian condition.

The powerhouse was not specifically evaluated relative to aesthetics because FERC considers the existence of the powerhouse as the baseline condition in conducting an environmental assessment. The powerhouse will remain in its current configuration with minor modifications. Turbine generator equipment and other mechanical and electric equipment will remain in-place. The derrick crane on the roof of the powerhouse will be removed along with its associated operating building. The material will all be disposed of offsite at an approved landfill. The existing headgate slots will be closed off and the trashracks removed. The trashracks will be disposed of offsite. The headgate slots will receive a concrete bulkhead to retain the small amount of fill in the canal needed to regrade the downstream end of the canal for proper drainage. The existing headgates will

be utilized to further cover the headgate openings. An old steel transmission tower to the west of the powerhouse will be removed and disposed of offsite.

BWPH intends to develop a planting plan to add vegetation in the immediate area of the powerhouse. The purpose of this plan is to improve the aesthetics of the powerhouse after all decommissioning work has been completed. This plan will improve the aesthetics of the powerhouse post-license surrender.

Removing the Bar Mills spillway, the submerged timber crib dam upstream of the Bar Mills dam, and the canal spillway and headworks, and demolition of the Rogers Fibre Mill foundation will return this section of the Saco River to a more natural, aesthetic condition.

4.14.3 Unavoidable Adverse Effects

Certain project features including the canal and powerhouse will remain after all decommissioning work is completed and the license surrender is effective. However, keeping these facilities in place will not adversely affect the project's aesthetics compared to existing conditions, which FERC considers the baseline in developing an environmental assessment.

4.14.4 References

Federal Energy Regulatory Commission (FERC). 1996. Final Environmental Impact Statement for Saco River Projects. FERC/FEIS-0077.

United States Census Bureau. 2020. P1: Race, Total Population. Available Online: population - Census Bureau Tables. Accessed March 29, 2026.

4.15 Socioeconomics

4.15.1 Affected Environment

4.15.1.1 Town of Buxton

The population of the Town of Buxton, based on 2024 census data, is 8,512. The average age is 45.5 years, the average income is $46,000, and the average person per household is 2.5 (Census Report 2024a). The Town of Buxton population in 2020 was 8,376, equaling a 2.5 percent increase in population in 4 years. The percentage of civilian labor force over 16 years of age was 70.4% (QuickFacts 2024a). The four largest employers are manufacturing, retail trade, health care, and social assistance (City-Data 2023).

4.15.1.2 Town of Hollis

The population of the Town of Hollis, based on 2024 census data, is 4,872. The average age is 43.8 years, the average income is $41,000, and the average person per household is 2.7. The Town of Hollis population in 2020 was 4,745, equaling a 2.5 percent increase in population in 4 years (Census Report 2024b).

Table 4-16 Population by Age: York County, Maine, and United States

	York County	Maine	U.S.
Total	220,143	1,405,012	340,110,990
5-17	28,379	186,110	54,564,265
18-29	28,810	191,268	53,594,910
30-39	28,551	179,032	23,279,730
40-49	25,987	167,105	43,049,230
50-59	28,698	108,591	40,433,480
60-69	35,293	213,995	41,085,348
70+	35,262	228,342	41,979,400

Source: U.S. Census 2024c

4.15.1.3 Employment and Income

The median household income for the Town of Buxton and the Town of Hollis was $100,144 and $95,950 in 2024, respectively (Census Report 2024a, 2024b). The median household income for York County was $88,333 in 2024, while the median income for Maine was $74,733 in 2024 (QuickFacts 2024b).

Table 4-17 2024 Poverty Rates

Location	Poverty Percentage (%)
Town of Buxton	2.3%
Town of Hollis	5.7%
York County	7.5%
State of Maine	10.6%
U.S.	10.6%

Source: QuickFacts 2024c

Poverty rates among the Town of Buxton are lower in comparison to the Town of Hollis, York County, and the State of Maine. Maine and the U.S. poverty rate are the same at 10.6 percent.

4.15.2 Environmental Effects

The Project was taken offline in 2017 and has not generated any power since that year. Today, the Project remains permanently disabled due to AAR conditions. Surrendering the license and removing the spillway is not expected to have any significant socioeconomic impacts. BWPH expects a temporary increase in employment via its contractors needed to decommission and remove project facilities. However, this additional employment is not expected to be significant.

4.15.3 Unavoidable Adverse Effects

No unavoidable adverse effects have been identified.

4.15.4 References

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APPENDIX A

DECOMMISSIONING PLAN

Decommissioning Plan

Bar Mills Hydroelectric Project

FERC No. 2194

Prepared for:

Brookfield White Pine Hydro LLC

Prepared by:

Kleinschmidt Associates

June 2026

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GLOSSARY OF TERMS

Abutment – The portion of a dam which is in direct contact with and supported by foundation rock, designed to resist structural forces generated by the dam and the impounded water.

Bypassed Reach – The stretch of river between a hydropower intake and tailrace where flow is reduced because water is diverted for power generation.

Dam – A structure built to store, divert, or control water flow.

Derrick Crane – A crane with a vertical mast and pivoting boom, supported by guys or struts, used for lifting and positioning heavy loads in construction and industrial applications.

Draft Tube – A conduit that carries water from the turbine runner to the tailrace while recovering pressure.

Fish Passage – Facilities that allow fish to migrate upstream or downstream past a dam.

Generator – Device that converts mechanical energy from the turbine into electrical energy.

Flashboard – A removable panel installed on a dam or spillway crest to temporarily raise the upstream water level and increase storage or head.

Head – Vertical distance between water intake and turbine outlet.

Headgate – A gate installed at the intake of a hydropower system to control or stop water flow into the power conveyance and turbine units.

Headworks – The intake and associated control and protection structures at the upstream end of a hydropower project that regulate and divert water into the conveyance system.

Hydropower – Electricity generated from the energy of flowing or falling water.

Impoundment – Water stored behind a dam in a reservoir.

Installed Capacity – Maximum rated electrical output of a plant, expressed in MW.

Intake – Structure where water enters the hydropower system.

Log Sluice – A controlled opening in a dam or intake used to pass logs and floating debris downstream, preventing accumulation and protecting hydropower facilities.

Minimum Flow – Minimum flow released downstream to maintain ecological health.

Pier – A vertical structural support between openings in a dam or spillway that carries loads and separates water passages.

Power Canal – An open channel that conveys water from a river, reservoir, or diversion structure to a hydropower plant intake, using gravity flow.

Powerhouse – Building housing turbines, generators, and electrical equipment.

Reservoir – Artificial or natural lake used to store water for power generation.

Run-of-River – Hydropower system using natural river flow with little or no storage.

Sedimentation – Deposition of sediments in reservoirs.

Spillway – A structure built into or adjacent to a dam that releases excess water from a reservoir to the river downstream when reservoir levels exceed the normal operating range.

Substation – Facility that transforms voltage levels for power transmission.

Tailrace – Channel carrying water from the turbine back to the river.

Trashrack – A bar screen to prevent debris from entering the turbine and water conveyance system.

Turbine – Rotating machine that converts water energy into mechanical energy.

Water Rights – Legal rights governing the use of water resources.

1.0 INTRODUCTION

The Bar Mills Project has significant operational challenges that have prevented the Project's two generating units (Units 1 and 2) from running for the last five years. These challenges are associated with an unavoidable condition called Alkali Aggregate Reactivity (AAR) which occurs when certain aggregates used in the concrete for the dam and/or powerhouse absorb water and cause expansion and cracking over a period of many years. There is no long-term remedy for AAR at the Bar Mills Project except full reconstruction.

Without an economically viable solution to return the generating units to an operable condition, Bar Mills is uniquely suited for the surrender of its license and a pathway to decommissioning. Brookfield White Pine Hydro (BWPH) determined that surrendering the Federal Energy Regulatory Commission (FERC) Project license and decommissioning the Project through a full removal of the Project headworks, and spillway is the most viable solution in balancing operational, environmental, and future dam safety needs. Although the dam may be constructed on ledge outcropping that could have been an impediment to upstream fish migration under certain river flow conditions, removal of the spillway structure will return this segment of the river to a free-flowing condition, providing migratory fish passage. As discussed in more detail below, BWPH will remove the spillway and former timber crib dam, eliminating the structures from being a barrier to migratory fish. Other features of the project will be removed or modified.

BWPH conducted an evaluation of removal alternatives in consultation with state and federal agencies and the public, including formation of a Decommissioning Committee consisting of representatives from BWPH and the towns of Buxton and Hollis. The Decommissioning Plan is intended to identify components of the surrender and dam removal[1] and how issues raised by stakeholders will be addressed through the license surrender and decommissioning process. The Decommissioning Plan also identifies commitments by BWPH to address issues raised by stakeholders, although certain commitments associated with the decommissioning would likely be outside FERC's authority to enforce and are not formally part of the surrender proposal. This includes monitoring and potential mitigation of effects on groundwater wells, fire suppression

[1] Design drawings are considered Critical Energy Infrastructure Information (CEII) and are therefore not being publicly distributed.

facilities, and new recreational access upstream of the current dam location, all located outside of the existing FERC Project Boundary. BWPH is also voluntarily proposing to demolish the former Rogers Fibre Mill foundation, even though this action appears unlikely to be required by FERC due to the lack of direct nexus to the proposed action.

A draft of the Decommissioning Plan and Surrender Application is being distributed for agency and public review in June 2026. Written comments (Appendix A) specific to the Decommissioning Plan will be addressed in the final Decommissioning Plan and Surrender Application, as appropriate.

1.1 Project Description

The Bar Mills Project, owned and operated by BWPH, is located on the Saco River and consists of a dam structure, an impoundment, a powerhouse, and appurtenant features. The entire project, including the impoundment and upstream flowage easements, extends approximately 5.3 miles along the Saco River from river mile 19 to river mile 24.3 where the West Buxton Project tailrace flows. A project location map is provided in Exhibit E of the Surrender Application.

1.2 Overview of Project Features

The Project structures include a concrete dam that spans the river, a granite headwork structure located at the entrance to the intake canal, a canal that conveys flow to the powerhouse, a downstream fish passage facility, a powerhouse, and appurtenant equipment. An aerial view of these Project structures is included below. A graphical representation of project features is provided in Exhibit E of the Surrender Application.

1.2.1 Dam

The Project dam extends from the east side of the Saco River adjacent to the site of the former Rogers Mill in Buxton to the Project canal headworks on the Hollis (west) shore of the river. The main dam is founded on bedrock, with a maximum height of approximately 21 feet and an average height of approximately 15 feet. The permanent spillway crest is at Elevation 141.75 feet and is topped with 6.75-foot-high hinged steel flashboard panels. The project includes the remnants of the Rogers Fibre Mill foundation, consisting of an approximately 100-foot long concrete structure on the east side connected to a 14-foot wide spillway abutment. The concrete spillway is approximately 264 feet long including a 14-foot wide low flow gate structure located in the center of the spillway. An

approximately 14-foot wide concrete abutment is located on the western end of the spillway and joins the spillway to the canal headworks structure and canal wall/auxiliary spillway. An operating bridge spans the entire length of the spillway with an electric hoist located on the bridge used for operating the hinged flashboard panels. Beyond the canal headworks (discussed below) the dam includes an earthen embankment containing a buried concrete cut-off wall, approximately 50 feet in length. The Project dam develops a head of 21 feet between the normal full headpond elevation (148.5') and normal tailwater elevation (127.5').

Photo 1-1 Downstream View of Spillway

1.2.2 Intake Canal

An approximately 94-foot long headworks structure is located at the entrance to the canal. The headworks structure consists of four stone masonry piers and two concrete abutments which can be fitted with stoplogs to allow for the dewatering of the canal for maintenance. There are no gates at the headworks structure, and the structure is not used to control flow into the canal. A steel walkway extends across the headworks structure to

provide access from the west end of the dam to the spillway abutment and operating bridge.

Photo 1-2 Headworks Structure

Photo 1-3 Canal Spillway

The canal extends approximately 735 feet from the headworks structure to the powerhouse. The minimum width of the canal is approximately 75 feet, near the headworks. The maximum width of the canal is approximately 180 feet, about mid-way in its length. The canal was excavated into soil and bedrock and includes concrete saddle dikes to maintain the normal operating levels. The west side of the canal is primarily and earth slope. At the top of the slope is the powerhouse access road. The east side of the canal is formed by the canal spillway composed of a 90-foot long masonry/concrete overflow section adjacent to the spillway, excavated bedrock slopes and various masonry and concrete non-overflow saddle dams approximately 311 feet long, and a 175-foot long concrete overflow section near the powerhouse, referred to as the powerhouse spillway. The overflow portions of the canal wall have a crest elevation of 148.5', matching the normal full impoundment elevation. Non-overflow sections have crest elevations ranging from 149.5' to greater than 155.0'.

Photo 1-4 Canal Looking from Bridge Towards Powerhouse Under Drawdown

The powerhouse spillway includes a 7-foot-wide surface gate and sluice for downstream fish passage immediately adjacent to the powerhouse. There is a 6-foot by 6-foot opening located at the base of the powerhouse spillway used for draining the canal with stoplogs that can be removed manually.

Photo 1-5 Downstream Side of Powerhouse Spillway and Canal Drain Gate

1.2.3 Powerhouse

The Project powerhouse substructure and a large part of the 40-foot-wide by 80-foot-long super-structure are constructed of reinforced concrete. The majority of the powerhouse is located below grade level and is not readily visible from the access road. The powerhouse roof is built of waterproof membrane overlaying wood planks and supported by structural steel framing. Roof hatches are provided over each of the two units. A stiff leg 25-ton outdoor derrick crane is provided at the west end of the powerhouse. The crane house is mounted on concrete piers and is steel framed and covered with corrugated aluminum siding. Equipment contained within the powerhouse is discussed in Section 2.3. The powerhouse substructure includes the two turbine water intakes and draft tubes, two headgates, and trashracks. The powerhouse has two turbine units with an installed capacity of 4.0 MW.

Photo 1-6 Aerial Image of Powerhouse

1.2.4 Tailrace

The tailrace consists of an excavated channel extending from the powerhouse to the river and is approximately 200 feet long, with a normal water elevation of 127.5’. The Project tailwater is influenced by the downstream Skelton Project headpond which, at a full pond of 127.5', backwaters into the Bar Mills tailrace.

Photo 1-7 View of Powerhouse from Downstream

1.2.5 Appurtenant Facilities and Equipment

Transmission Facilities

The Project related transmission facilities include the generator leads, generator breakers, a 2.4 kV bus, a 2.4 kV breaker, transformer bank No. 1, and high side switch T1H. The transformer bank is a three phase unit (rated 5,000 kVA, 34/2.4 kV). The line that transmits energy from the transformer bank to the local utility is not part of the licensed Project.

1.3 Existing Project Operations Description

Licensed operation of the Bar Mills Project is as a run of river facility. Units 1 and 2 are considered out-of-service indefinitely as of May and Dec. 2017, respectively, as a result of concrete growth from AAR impeding the operation of the turbine/generator equipment. Prior to the station shutdown, the Bar Mills impoundment levels would generally fluctuate once or twice daily up to 2-feet below normal full pond elevation of 148.5 USGS datum to accommodate flow releases from the Bonny Eagle Project, located upstream of the Bar Mills Project.

Because the powerhouse is no longer operational, all flows pass over the spillway and through the bypass channel. The hinged flashboards are manipulated to maintain impoundment water levels.

1.4 Land Ownership

Brookfield either owns or has flowage rights to all Project lands. There are no federal lands with the Projects' boundaries. BWPH will access the removal area from property owned

by BWPH and from an area owned by the Town of Buxton, which includes deeded access for dam related activities.

1.5 Existing FERC License Requirements

Under Article 401(A) of the August 2008 FERC license (which references Conditions 3A, 3B, and 3E of the Maine WQC), the following minimum flow conditions must be met at all times:

Except as temporarily modified by (1) approved maintenance activities, (2) extreme hydrologic conditions, as defined below, (3) emergency electrical system conditions, as defined below, (4) flashboard failure or maintenance, or (5) agreement between the applicant, the Department, and appropriate state and/or federal agencies, and in accordance with the 1997 Instream Flow Agreement[2] for Hydroelectric Projects on the Saco River, the following minimum flows shall be released from the project:

- *From April 1 through June 30 annually, outflow approximately equal to inflow (run-of-river operations);*
- *From July 1 through September 30 annually, an instantaneous minimum flow of 400 cfs or inflow, whichever is less;*
- *From October 1 through November 15 annually, or for such alternative six week period as may be mutually agreed to by BWPH and state and federal fisheries agencies, an instantaneous minimum flow of 600 cfs or inflow, whichever is less; and*
- *From November 16 through March 31 annually, an instantaneous minimum flow of 250 cfs or inflow, whichever is less.*

Except as temporarily modified by (1) approved maintenance activities, (2) extreme hydrologic conditions, (3) emergency electrical system conditions, (4) flashboard failure or maintenance, or (5) agreement between the applicant, the Department, and appropriate state and/or federal agencies, instantaneous minimum flows of 100 cfs from April 1 to October 31 and 50 cfs from November 1 to March 31 shall be released to the bypassed river reach below the project dam. This bypassed river reach flow shall be counted as part of the overall project minimum flow releases specified in Part A of this condition.

[2] Instream Flow Agreement for Hydroelectric Projects on the Saco River (April 30, 1997)

1.6 Fish Passage Requirements

By Order dated July 17, 2019[3], FERC approved a Revised Fish Passage Assessment and Fish Passage Installation Schedule which sets the operational date for upstream fish passage facilities at the Project, under the terms of the 2007 Saco River Fisheries Assessment Agreement, to be May 1, 2025. Downstream fish passage occurs via spill due to the powerhouse units being permanently offline.

1.7 Other Relevant License Requirements

Currently BWPH maintains recreational access, consisting of a boat launch, canoe take-out, portage, and put-in, and trails on Usher Island. BWPH is currently proposing to continue to maintain recreational access, although the facilities will no longer be under FERC jurisdiction.

1.8 Project Removal Description

The Bar Mills Project has significant operational challenges that have prevented the generating units from running. Units 1 and 2 are considered out-of-service indefinitely as of May and December 2017, respectively. These challenges are associated with AAR as previously described. The only long-term remedy for AAR at the Bar Mills Project is full reconstruction, which when combined with fish passage requirements is not an economically viable alternative.

BWPH determined that surrendering the FERC Project license and decommissioning the Project through a full spillway removal is the best adapted alternative for balancing operational, environmental, and future dam safety needs. This action will return the Saco River at this location to a free-flowing condition.

In order to address fish passage requirements as part of the decommissioning, BWPH has consulted with state and federal agencies to evaluate removal alternatives. BWPH proposes full removal of the spillway to include the canal headworks structure on the west side of the river and former Rogers Fibre mill intake on the east side of the river. This includes removal of the canal spillway adjacent to the headgate structure and construction of a flow diversion weir to restrict flows from entering the canal with the exception of high flow events that would likely occur one to two times per year. Restoring a free-flowing

[3] 168 FERC ¶ 62,035

condition will allow upstream and downstream fish passage, unimpeded by the presence of the dam.

BWPH will also demolish and cap the remains of the mill foundation structure in a manner to prevent erosion of existing shoreline materials and cover with loam and seed. A study was performed to quantify sediment in the impoundment within approximately one-half mile upstream of the dam. It was found that the channel bottom is primarily hard materials and not comprised of significant deposits of soft sediment. There was some soft sediment observed immediately adjacent to the impoundment shoreline that will become exposed post dam removal. This material is expected to revegetate rapidly. Because of the conditions found as part of this study, BWPH is not anticipating any dredging of materials from the river.

Under the proposed action, BWPH intends to remove the following project features:

- Spillway and log sluice;
- remanent timber crib dam;
- canal headworks structure;
- crane, crane house, transmission tower; and
- canal spillway

The following project structures may be modified but will generally be left in place:

- canal and associated structures;
- powerhouse spillway;
- powerhouse and two generating units; and
- certain project recreation facilities.

BWPH intends to remove the dam in three phases using two cofferdams/work pads, one in Phase II and one in Phase III. The cofferdams will consist of shotrock and earthen fill.

Once all decommissioning work has been completed, BWPH intends to continue to own lands within the current project boundary and maintain remaining structures, including periodic safety inspections. These lands and structures will no longer be under FERC jurisdiction.

BWPH intends to implement the following protection, mitigation, and enhancement measures as part of its proposed action to surrender the license and decommission the project. Several of these measures are more fully discussed later in this application.

- Continue to maintain the powerhouse and existing recreational access (canoe portage and trails on Usher Island);
- Implement a slow drawdown of the reservoir to protect resident fish, catadromous American eels, and mussels;
- If directed by the Maine Historic Preservation Commission, document the Bar Mills Project using Maine Historic Building Record photography in compliance with Historic American Buildings Survey/Historic American Engineering Record standards;
- Limit tree clearing to the USFWS restriction timeframe for protection of listed bat species; and
- Develop a planting plan to add vegetation in the immediate area of the powerhouse. The purpose of this plan is to improve the aesthetics of the powerhouse after all decommissioning work has been completed.

1.9 Additional Measures Proposed Outside of the Surrender Proposal

Though anticipated to be outside of FERC's jurisdiction under the license surrender process, BWPH also proposes and is committed to additional measures based upon issues raised by stakeholders and discussed with the Decommissioning Committee, during the pre-application filing process including:

- development of new hand-carry boat and recreational access behind the Hollis administrative building;
- remove concrete planking at the existing hand-carry boat and recreational access and revert back to natural state and shoreline stabilized;
- identification of and monitoring groundwater wells that may be adversely affected by permanent reduction of water levels along the impoundment;
- mitigation measures as determined necessary to address adverse effects on groundwater wells;
- construct new fire suppression facilities to mitigate effects on existing dry hydrants in Buxton and Hollis; and

- continue to operate and maintain existing recreational access on Usher Island and parking adjacent to the existing boat launch.

Additional details for these measures are provided in Section 2.

Figure 1-1 Project Features to be Removed

2.0 DECOMMISSIONING PLAN

2.1 Pre-Removal Phase

2.1.1 Preconstruction Permitting

In addition to FERC approval of the surrender and associated construction plans, BWPH will also be required to submit state and federal permit applications [e.g., Maine Department of Environmental Projection's (MDEP) Maine Waterway Development and Conservation Act (MWDCA), US Army Corps of Engineers (USACE) Section 401, and Sacor River Corridor Commission (SRCC) permit applications]. FERC also requires licensees that surrender the license to obtain water quality certification (WQC) under Section 401 on the Clean Water Act (CWA).

2.1.2 Mitigation Measures

2.1.2.1 Historic Resources

No new measures are anticipated relative to significant historic archeological resources. Three archaeological sites were identified during the prior FERC relicensing as eligible for listing in the National Register of Historic Places (NRHP). As reported by then licensee NextEra Energy on February 13, 2013[4], all data recovery field work, analysis, and reporting was completed at the sites between 2011 and 2012, completing all archaeology mitigation under the Programmatic Agreement (PA) and Historic Properties Management Plan (HPMP).

As part of the study phase for the surrender and decommissioning, BWPH contracted TRC Companies (TRC) to conduct an evaluation of historic structures associated with the Bar Mills Project. TRC confirmed the previously determined eligibility of Bar Mills Hydroelectric Plan and Bar Mills Dam. Survey documentation was provided to Maine Historic Preservation Commission (MHPC) for approval and concurrence. MHPC concurred with eligibility of the facilities for listing on the National Register of Historic Places and recommended seeking ways to avoid, minimize, or mitigate any adverse effects on these structures. TRC anticipates that mitigation will include a documentation submittal of Bar Mills for the Maine Historic Building Record photography in compliance with the Historic American Buildings Survey/Historic American Engineering Record

[4] https://elibrary.ferc.gov/eLibrary/filedownload?fileid=01ABF89B-66E2-5005-8110-C31FAFC91712

(HABS/HAER) standards. TRC is in the process of developing a formal mitigation plan in consultation with the SHPO. Due to FERC and Advisory Council on Historic Preservation consultation requirements, BWPH assumes any mitigative measures will be reviewed and approved by FERC in a surrender approval order.

2.1.2.2 Groundwater Wells

BWPH recognizes the potential that a limited number of local private wells may be affected by permanently lowered water levels upstream of the Bar Mills dam. Because local groundwater wells that could be affected by lower water levels are outside of the FERC boundary, BWPH assumes that any associated mitigation program will not specifically be approved by FERC.

BWPH is in the process of gathering well data that will be used to develop a monitoring and mitigation process, which may include enhancement of existing wells or drilling new wells, depending on the extent of effects. BWPH has developed a baseline GIS dataset consisting of existing well data (e.g., type and depth) from Maine Geological Survey (MGS). In order to supplement the MGS data, BWPH has consulted with representatives from Buxton and Hollis to identify an approach to survey landowners. The Committee determined that it would be appropriate to survey landowners with properties adjacent to the river. BWPH gathered landowner information from the Towns' tax maps and tax commitment data to develop and distribute a survey enabling landowners to provide responses through an online survey or by hardcopy. Responses received to date have been added to the GIS dataset. BWPH will utilize the data to develop a post-removal monitoring program and mitigation process. The details of well mitigation is undetermined at this time and will likely not be fully known until the dam is removed and potential changes in local groundwater levels have stabilized. BWPH understands that there is potential for a post-removal monitoring plan is a result of the active data collection efforts. BWPH is committed to mitigating adverse impacts to wells affected by the dam removal.

2.1.2.3 Dry Hydrants

In comments received from the Towns during initial phases of the surrender process, two dry hydrants, located on Canal Street in Hollis and Depot Street in Buxton, were identified as likely to be adversely affected by permanently lowered water levels upstream of Bar

Mills dam. Because the dry hydrants are outside of the FERC boundary, BWPH assumes that any associated mitigation program will not specifically be approved by FERC.

BWPH has consulted with the town Fire Chiefs to review potential alternatives, and at the recommendation of the Chiefs, has hired a specialty consultant to assist in developing plans to mitigate effects on the existing hydrants. It is anticipated that the mitigation plan will be developed over the course of 2026 and will be implemented prior to dam removal construction. BWPH is committed to mitigating adverse impacts to the towns from changes in fire suppression water supplies.

2.1.3 Pre-Removal Site Preparation

Construction Contractor Mobilization

Within approximately one month prior to commencing dam removal activities, the construction contractor will begin mobilizing to site. Mobilization activities will include setup of a primary laydown area at the location of the existing boat launch parking area on the west end of the dam. Development of this laydown area will include vegetation removal and minor site grading and material placement to facilitate use of the site by construction crews. Because there are no major construction materials necessary to remove the dam, with the exception of cofferdam materials, there will not be significant material laydown occurring prior to dam removal activities. Most of the mobilization activities will include equipment mobilization and setup of contractor administration facilities. The cofferdam materials will be transported to site and directly put into place without the need for substantial stockpiles.

A secondary laydown area will be prepared on the east end of the dam at the location of the former Rogers Fibre Mill site. Most of the area to be used as laydown will occur on an existing concrete slab and gravel parking area that exists at that location. There are no significant ground disturbing activities planned at the secondary laydown area in order to avoid further disturbance of the environmentally sensitive location.

Sediment Testing

A study was performed to quantify sediment in the impoundment within approximately one-half mile upstream of the dam. It was found that the channel bottom is primarily hard materials and not comprised of significant deposits of soft sediment. There was some soft sediment observed immediately adjacent to the impoundment shoreline that will become

exposed post dam removal. Sampling and testing of sediment was conducted for material exposed along the shoreline during an approximately 6-foot drawdown of the impoundment as well as testing of sediment in the existing power canal. Although testing indicated the presence of some unfavorable materials, only a very small amount are anticipated to be removed as part of the dam removal activities, if any. Removed materials will require disposal off-site at an approved landfill facility. Maine Department of Environmental Protection (MEDEP) regulations require that the material be tested within a short duration prior to disposal. Therefore, these materials will require testing prior to removal from the site.

Traffic Management

The dam removal activities will be performed within the river channel and away from public access roadways. During mobilization and demobilization, and occasionally over the duration of the project, heavy equipment will be moved to and from the site. This will be an occasional activity and is not anticipated to require special traffic management. During cofferdam construction and removal, there will be increased traffic in the immediate vicinity of the site, in the form of over-the-road dump trucks entering and leaving the site. If required as part of MEDEP permit approvals, occasional traffic control, in the form of flaggers, will be utilized to assist in managing traffic on the public roads. On the east end of the dam, during Removal Phase II, traffic entering and exiting the dam site for cofferdam construction and removal will do so via Depot Street. Depot Street is a public way in the Town of Buxton and is lightly traveled. There is good visibility in both directions and will not likely require traffic management. On the west end of the dam, traffic entering and exiting the dam site will do so via State Route 4A in the Town of Hollis. This public roadway has significantly more traffic and has limited site distance to the south with a hill present that somewhat limits visibility. During times of heavy truck traffic entering or exiting the laydown yard, there may need to be periodic flagging operations to safely manage traffic. The final determination of this requirement will occur as part of MEDEP permitting.

Public Safety Signage

There is existing signage adjacent to the Bar Mills Hydroelectric facility warning the public about the hazards of recreating adjacent to the dam. Construction entrance signs will be placed adjacent to the entrance of the construction laydown areas. The facility boat barrier and signage will be installed upstream of the dam, as typical, for the duration of

construction activities. Public access to the impoundment boat launch will be prohibited during construction as a public safety precaution. It is anticipated that downstream access will remain open during construction.

Minimum Flows During Construction

Because there will be no means to stop or otherwise impound inflows, minimum flow requirements will always be met. Currently, all flows pass over the spillway and into the bypass reach downstream of the dam. During dam removal activities, the flow over the spillway will be constricted to one side of the river or the other; however, minimum flows will continue to be passed over the spillway. There are three primary dam removal phases, further described in Section 2.2.

During Removal Phase I, flashboards on the west side of the spillway will be lowered and inflow will pass over the entire spillway length while removal work takes place within the canal, downstream of the headworks structure.

During Removal Phase II, a cofferdam will be installed to dewater the eastern portion of the spillway and inflow will be passed through the canal headworks and removed canal spillway as well as over the western portion of the spillway.

During Removal Phase III, the Removal Phase II cofferdam will be removed and a cofferdam will be constructed to dewater the western portion of the spillway while flows are passed through the eastern portion of the channel where the spillway was removed in Removal Phase II. After removal of the eastern portion of the spillway, the Removal Phase III cofferdam will be removed and flow will spread across the entire river channel.

During each phase, including during transitions between phases, inflow will be passed into the bypass reach, thereby always meeting minimum flow requirements. In the unexpected event that minimum flows are anticipated to not be met, BWPH will notify resource agencies and make provisions to protect resources, as necessary.

2.2 Dam Removal Phase

The Bar Mills Dam removal will include a complete removal of the spillway to return the Saco River to a free-flowing condition, unimpeded by the dam structure. Other features of the hydroelectric project will be removed or modified to complete the

decommissioning of the hydroelectric facility. The final configuration of each primary project feature is described below.

- *Spillway –* The concrete spillway will be removed in its entirety to the bedrock channel bottom. Removal of the spillway will include removal of the steel trestle operating bridge, flashboards and low flow gate at the center of the spillway. Both east and west spillway abutments will also be removed to bedrock. The concrete material will be disposed of at either the east end of the dam in the area of the former Rogers Fibre Mill foundation or in a designated area in the canal. Rubble will be capped with a layer of filter material to cover the large concrete debris and then covered with loam and seed on the Buxton shoreline and rip-rap in the canal. It will be demolished into pieces that are manageable by the contractor's equipment with exposed rebar removed and disposed of offsite. The steel trestle operating bridge has a lead paint coating that will require it to be disposed of at an appropriate landfill site. The steel flashboards and low flow crest gate will be either salvaged or disposed of offsite. The small building on the center pier of the spillway between the two trestle bridge sections has an asbestos siding material. The small building will be appropriately disposed of at an approved landfill.

- *Remnant Timber Crib Dam –* The timber crib dam that preceded the existing Bar Mills Dam was previously demolished to an elevation just below the permanent concrete crest of the current concrete dam. The timber crib extends from the east side of the river upstream of the current concrete dam and joins the current dam at the west spillway abutment at the interface of the spillway and headworks structure. The remnants of the timber crib dam will be removed to the bottom of the remaining structure. It is not known if the timber crib dam is founded on bedrock or alluvial material; however, the extent of removal is to the bottom of the crib structure, as can be best determined at the time of removal. The timber material will be removed from site and disposed of at an approved landfill facility. Stone ballast or other infill material may be disposed of onsite depending on the viability of separating the materials.

- *Headworks Structure –* The headworks structure will be removed to bedrock. The concrete and stone materials will be disposed of in the canal. Steel components will be disposed of off site.

- *Canal Spillway –* The canal spillway will be demolished to bedrock. The material will be disposed of at designated areas within the canal.

- *Canal and Associated Structures –* The canal will remain mostly unchanged and will not be filled with soil materials. It will normally remain dry except for occasional high flows. The canal will have a designated area for disposal of concrete and stone materials. There are several small concrete saddle dams and short walls and former bridge abutments that will remain in their current condition. The bottom of the canal at the downstream end drops in elevation as it enters the powerhouse intake. This area will receive fill to allow appropriate drainage and avoid ponding of water. Water entering the canal, either from normal runoff or high flows will exist the canal through an existing gate opening within the powerhouse spillway at the left side on the downstream end of the canal. The slope of the canal provides natural drainage to the downstream end of the canal which will facilitate drainage within the canal. Minor grading of soft sediment within the canal may be necessary to avoid small areas of ponding. The soil covered areas within the canal will be allowed to naturally revegetate. Areas of exposed rock will remain exposed.

Photo 2-1 Typical Saddle Dam in Canal to Remain

- *Powerhouse Spillway* – The powerhouse spillway at the downstream end of the canal will remain in its current configuration. The existing canal drain gate opening has timber stoplogs on the upstream face of the spillway. Those stoplogs will be removed to allow drainage of the canal.

- *Powerhouse* – The powerhouse will remain in its current configuration with minor modifications. Turbine generator equipment and other mechanical and electric equipment will remain in-place. The derrick crane on the roof of the powerhouse will be removed along with its associated operating building. The material will all be disposed of offsite at an approved landfill. The existing headgate slots will be closed off and the trashracks removed. The trashracks will be disposed of offsite. The headgate slots will receive a concrete bulkhead to retain the small amount of fill in the canal needed to regrade the downstream end of the canal for proper drainage. The existing headgates will be utilized to further cover the headgate openings. An old steel transmission tower to the west of the powerhouse will be removed and disposed of offsite. It is anticipated that the transformer on the powerhouse roof will be drained and removed.

- *Former Rogers Fibre Mill Foundation* – The foundation of the former mill building serves as a water retaining structure that spans between the east spillway abutment and east bank of the channel. The superstructure was removed in the 1990's and the concrete foundation remains. The foundation is believed to be founded on bedrock. BWPH intends to demolish the concrete foundation in a manner similar to the concrete spillway and dispose of the concrete material within the footprint of the foundation. This disposal area would also receive the concrete debris from the east end of the spillway. The disposal area will be capped with a layer of filter material to cover the large concrete debris and then covered with loam and seed. The area will be graded to match into the surrounding area on the river bank to extend the park area owned by the Town of Buxton.

Photo 2-2 Former Roger Fibre Mill Foundation

- *Recreation Facilities –* The recreation facilities associated with the hydropower project include a canoe portage from the tailrace to the boat launch at the end of the dam, a trailered boat launch and parking area and trails on Usher Island which separates the canal from the bypass reach. The canoe portage and Usher Island trails are intended to remain in place for future public access. The boat launch concrete planking will be removed and the boat launch will revert back to natural state and shoreline stabilized. The boat launch parking area will remain available for public use and provide a location for river access. BWPH will continue to collaborate with the Town of Hollis to develop new boater access behind the municipal facility (See Section 3.1).

Photo 2-3 Existing Boat Launch

- *Fire Protection* – There are currently two dry hydrants on the Bar Mills impoundment that allow the local fire departments to draw water from the impoundment in the event of a fire. One hydrant is in the canal and owned by the Town of Hollis. The second hydrant, owned by the Town of Buxton on Depot Street, is immediately upstream of the dam. Both hydrants will no longer be serviceable because of lower water levels after removal of the dam. BWPH has been working with both towns to reach a solution for continued provisions of fire protection water supply. Potential solutions include new dry hydrants located to be operable with the lower water levels and a new fire protection storage tank that would be shared between the two towns. BWPH is committed to reaching a solution that works for both towns to be implemented as part of the dam removal.

Photo 2-4 Existing Dry Hydrant on Depot Street in Buxton

3.0 DAM REMOVAL SEQUENCING

The removal of Bar Mills Dam will be completed in three removal phases, preceded by a mobilization phase and followed by a site restoration/demobilization phase. The intended dam removal sequencing is described below.

Mobilization Phase

1. Install upland erosion and sediment controls necessary for the pre-removal phase.
2. Install upland temporary facilities (e.g., construction access roads, laydown areas, and work trailer(s).

Phase I

1. Install bulkhead panels in canal headworks slots.
2. Remove gate in powerhouse spillway and dewater canal. Spillway drain gate will not allow all water to be removed from canal in the area adjacent to the powerhouse. Pumping will be required to remove the water adjacent the powerhouse intake.
3. Install haybales at powerhouse spillway gate for sediment control.
4. Place temporary fill in canal to provide access to canal spillway from west laydown area. Access fill in canal shall include material to buttress headworks piers for stability in the dewatered condition.
5. Place temporary fill and provide any necessary improvements in canal for access to fill placement areas south of Route 4a (Main Street). Confirm clearance under low chord of bridge.
6. Install turbidity curtain to contain the canal spillway work area. Demolish canal spillway. Place acceptable rubble in the fill placement areas at the powerhouse and along canal and cap with rip-rap such that large chunks of concrete will not be visible. Remove turbidity curtain once demolition is complete.
7. Remove temporary fill for access to the canal spillway demolition. Stabilize any other temporary fill in the canal. Remove turbidity.

Phase II

1. Remove headworks bulkhead panels.

2. Contractor will need to coordinate with owner to manipulate existing hinged flashboards on spillway to divert flow away from immediate work area. Flashboards on east spillway will be in raised position for phase II cofferdam installation.
3. Construct temporary access routes from the east staging area to the Phase II downstream work area and to the Phase II upstream work area. Contractor may opt to prepare staging area as part of Phase I.
4. Install turbidity curtain to contain Phase II upstream work area. Install Phase II upstream earthen cofferdam and work pad from east bank.
5. Install turbidity curtain to contain Phase II downstream work area. Install Phase II downstream earthen cofferdam and work pad from east bank to center of spillway.
6. Demolish east steel walkway, timber crib and concrete spillway down to bedrock/design grade. Demolish east abutment and former mill foundations. Place concrete rubble in the east fill placement area. Top with a layer of filter material to cover the large concrete debris and cover with loam and seed. Dispose of all other material offsite.
7. Remove Phase II downstream earthen cofferdam and work pad. Remove turbidity curtain once cofferdam has been removed.
8. Remove Phase II upstream earthen cofferdam and work pad. Remove turbidity curtain once cofferdam has been removed.
9. Remove temporary access routes from the east staging area to the Phase II downstream work area and east staging area to the Phase II upstream work area.
10. Stabilize east fill placement area.

Phase III

1. Install bulkhead panels in canal headworks slots.
2. Install turbidity curtain to contain Phase III upstream work area. Install Phase III upstream earthen cofferdam and work pad from west bank to center of spillway.
3. Install turbidity curtain to contain Phase III downstream work area. Install Phase III downstream earthen cofferdam.
4. Remove west steel walkway, spillway section, and headworks structure. Dispose of concrete rubble in disposal areas within the canal which will be capped with rip-rap such that large chunks of concrete will not be visible.

5. Construct diversion weir at canal entrance.
6. Install riprap on the canal fill placement area side slopes.
7. Grade the bottom to canal to provide positive drainage to the outlet sluice invert.
8. Remove Phase III downstream earthen cofferdam. Remove turbidity curtain once cofferdam has been removed.
9. Remove Phase III upstream earthen cofferdam and work pad. Remove turbidity curtain once cofferdam has been removed.

Site Restoration/Demobilization Phase

1. Remove temporary facilities and then seed and mulch all disturbed areas as final grades are achieved and per erosion and sediment control plan.
2. Restore site to owner's approval and permit conditions.

3.1 Post Removal Phase

BWPH is currently working with the Town of Hollis to consider the construction of a new recreation site upstream of the Bar Mills Dam on the Hollis side of the river. A location has been found that is currently owned by the Town of Hollis, located on the same property as the municipal office building. The access facility would be developed by BWPH upon completion of dam removal activities and the facility will be owned, operated, and maintained by the Town of Hollis. It would allow for river access to the area of the current Bar Mills impoundment, approximately mid-way between Bar Mills Dam and West Buxton Dam. BWPH notes that this area is outside of the FERC Project Boundary.

After decommissioning of the Bar Mills Hydroelectric Project, BWPH will continue to maintain the powerhouse structure.

After decommissioning the canal will normally be dry except for high flow events which will enter the canal as river levels rise and drain after river levels recede. The existing canal drain gate will be completely removed to allow for continuous drainage of the canal. BWPH will perform occasional monitoring of the canal to observe if debris is impeding the ability of the gate to drain the canal. BWPH will maintain the opening in the powerhouse spillway to facilitate drainage of the canal to avoid impounding water within the canal.

Should permitting agencies (i.e., MDEP or USACE) require any post-removal monitoring plans (e.g., revegetation or shoreline erosion), BWPH will develop such plans in consultation with the appropriate agencies and implement those plans as directed by those agencies.

3.1.1 Site Restoration

Removal of the Bar Mills Dam will restore the section of the Saco River to a free-flowing stretch of river. Areas of upland disturbed as part of the construction activities will be restored and stabilized to prevent erosion. BWPH does not propose any river restoration activities above and beyond dam removal.

3.1.2 Anticipated Post-Removal Monitoring

Post-removal monitoring will include monitoring of potential impacts to private groundwater wells surrounding the impoundment. Data on the surrounding wells continues to be collected from adjacent landowners and will be used to develop a post-removal monitoring plan. Because a monitoring plan has not yet been developed and would be developed outside of the surrender process, BWPH assumes that a surrender approval will not be contingent upon any well monitoring being completed.

No other post-removal monitoring is currently planned.

3.2 Construction Management Plans

Prior to construction activities, BWPH will prepare multiple plans specific to state and location permitting, as well as those required by FERC in the license surrender order. BWPH will prepare all plans and specifications required by FERC's New York Regional Office (NYRO) and will not begin construction until NYRO has formally approved design plans and specifications. Once FERC approves the proposed decommissioning and removal, BWPH will prepare, in consultation with appropriate agencies, the plans required by the license surrender order which may include but not be limited to the following construction related plans.

- Plans and Specifications for Dam Removal
- Quality Control and Inspection Plan
- Temporary Construction Emergency Action Plan
- Cofferdam Plan

- Spill Prevention Control and Countermeasure Plan
- Material Disposal Plan

3.2.1 Erosion and Sediment Control Plan

Introduction

As part of the proposed license surrender and dam removal, BWPH will implement erosion and sediment control (ESC) measures designed to avoid, minimize, and mitigate erosion, sedimentation, and turbidity impacts to the Saco River and adjacent resources during dam removal activities. Approximate locations of ESC measures will be identified on construction design plans.

ESC measures will be implemented in accordance with:

- Maine Department of Environmental Protection (DEP) *Erosion and Sediment Control Best Management Practices*
- Conditions of the Clean Water Act Section 401 Water Quality Certification
- Natural Resources Protection Act (NRPA)
- Any applicable U.S. Army Corps of Engineers authorizations

The measures described below will be implemented during all phases of dam removal.

Overview of Dam Removal Phasing

Dam removal will be conducted in three sequential phases to maintain river continuity while minimizing sediment mobilization and downstream water quality impacts:

- **Phase I:** Canal Spillway Removal (No Cofferdams)
- **Phase II:** East Spillway Removal (Upstream and Downstream Cofferdams)
- **Phase III:** West Spillway Removal (Upstream and Downstream Cofferdams)

Construction sequencing will be adjusted as necessary to respond to river flows and site conditions.

General Erosion and Sediment Control Commitments

During all phases of dam removal, BWPH will:

- Minimize the extent and duration of exposed soils
- Implement ESC measures prior to the initiation of ground-disturbing activities
- Limit in-water work to approved seasonal work windows
- Take measures to minimize visibly turbid discharges from entering the Saco River
- Stabilize disturbed areas as soon as practicable following construction
- Inspect ESC measures regularly and maintain them until final stabilization is achieved

Phase-Specific Environmental Protection Measures

Phase I: Canal Spillway Removal (No Cofferdam)

The canal spillway will be removed without isolating the river channel.

Environmental Commitments:

- Canal spillway removal will be conducted incrementally to avoid sudden sediment release.
- Work will be performed during periods of low to moderate river flow, consistent with state and federal in-water work timing restrictions.
- Turbidity will be monitored visually downstream of the work area.
- Turbidity curtains will be installed downstream of active work areas as warranted by site conditions.
- Demolition debris and exposed sediment will be removed from the river channel immediately upon generation.
- Disturbed banks will be temporarily stabilized following spillway removal to reduce erosion.

Phase II: East Spillway Removal

(Upstream and Downstream Cofferdams)

The east spillway will be removed under isolated conditions using cofferdams.

Environmental Commitments:

- Upstream and downstream cofferdams will be installed to isolate the east spillway from active river flows.

- Cofferdams will be constructed of erosion resistant materials and constructed to prevent underseepage and scour.
- River flows will be maintained around the isolated work area to protect downstream resources.
- The isolated area will be dewatered in a controlled manner.
- All dewatering discharges will be filtered prior to entering surface waters and managed to prevent erosion at discharge points.
- Secondary turbidity control measures will be maintained downstream of the cofferdams.
- Excavated materials will be stored in upland areas protected by perimeter erosion and sediment controls.

Phase III: West Spillway Removal

(Upstream and Downstream Cofferdams)

The west spillway will be removed following completion of the east spillway.

Environmental Commitments:

- Cofferdams will be installed and maintained consistent with Phase II commitments.
- Removal activities will be sequenced to minimize sediment mobilization.
- Cofferdams will be removed gradually to allow controlled reintroduction of flow.
- Banks disturbed during construction will be stabilized using biodegradable erosion control materials and native vegetation.

Dewatering and Water Quality Protection

For all phases requiring dewatering:

- Pumps will be equipped with intake screens to protect aquatic organisms.
- Discharges will be filtered or settled prior to entering the Saco River.
- Discharge locations will be stabilized to prevent erosion.
- Construction activities will be modified or suspended if unacceptable turbidity is observed downstream.

Inspection, Maintenance, and Adaptive Management

BWPH will implement the following:

- Daily inspections of ESC measures during active construction.
- Additional inspections following rainfall events.
- Prompt repair or replacement of deficient ESC measures.
- Adaptive management in coordination with Maine DEP, FERC staff, and other agencies if unforeseen sediment or turbidity issues arise.

Final Stabilization and Site Restoration

Following dam removal:

- All disturbed areas will be permanently stabilized as soon as practicable.
- Native riparian vegetation will be established consistent with regional conditions.
- Temporary ESC measures will remain in place until stabilization is achieved.
- Final site conditions of the construction area will promote long-term bank stability and river function.

Summary of Environmental Commitments

Implementation of this ESC Plan will ensure that dam removal activities conducted as part of the license surrender:

- Protect water quality
- Minimize sediment transport
- Prevent erosion
- Support successful return of the river to a free-flowing state.

4.0 SCHEDULE

BWPH will remove the Bar Mills Dam in the sequence discussed in Section 2.2 above during one summer/fall construction season. Table 4-1 below includes the anticipated schedule leading up to the dam removal construction. Should approvals not be received in time to allow for a 2027 construction season, dam removal activities will be completed in 2028.

Table 4-1 Bar Mills Estimated Decommissioning Schedule

Responsible Party	Pre-Filing Milestone	Date/Time Frame
BWPH	Release of Draft Study Report	October 2025
All Stakeholders	Informational Meeting (6pm, Hollis Town Hall Meeting Room)	October 30, 2025
All Stakeholders	Draft Study Reports Comments Due	December 6, 2025
BWPH	Issue Draft License Surrender Application	June 2026
All Stakeholders	Draft Surrender App Comments Due	August 2026
BWPH	File Final License Surrender App w/ FERC	September 2026
BWPH	File Federal, State and Local Permit Apps.	September 2026
State and Federal Agencies	Anticipate Federal, State and Local Permits and Water Quality Certification – Dependent on Timing of Agency Issuances	September 2027
FERC	Anticipate Surrender Order	November 2027
BWPH	Begin Mobilization	Spring 2028
BWPH	Commence Removal Activities	July 2028
BWPH	Complete Removal	December 2028
BWPH	Site Restoration	May 2029

5.0 TOTAL COST FOR PROJECT DECOMMISSIONING AND SITE IMPROVEMENTS

BWPH estimates that the total cost of the decommissioning of the Bar Mills Hydroelectric Project and planned removal of various dam and spillway features is between $7-12 million in present day costs. Delays in the construction timeline pose the risk of increasing these costs in future years.

Planning, Studies, and Outreach to Date

The Bar Mills Decommissioning project has required several years of sustained effort and significant financial investment before any physical dam removal activity has begun. To date, BWPH has spent approximately $1 million on engineering, environmental field studies, sediment sampling, community engagement, regulatory coordination, and preparation of the license surrender and draft decommissioning plan required by FERC. In addition to these early-phase efforts, additional consulting, engineering, and permitting support will continue into 2026 as part of the formal surrender process. This work reflects the complexity of responsibly evaluating dam removal at a site with shared infrastructure, historic industrial use, and close proximity to homes, public safety assets, and recreational resources.

Dam Removal and Site Restoration

BWPH estimates that dam removal and primary site restoration will cost between approximately $5.5 million and $7.5 million, depending on final scope, construction sequencing, and regulatory requirements. These estimates include mechanical contractor work, demolition activities, temporary facilities, engineering and construction oversight, project management, and contingency allowances. The upper end of the estimate reflects scenarios where additional structures are removed or where permitting and construction challenges increase complexity. These figures are planning-level estimates, not fixed prices, and will be refined as the decommissioning plan is finalized and reviewed by agencies.

Future Unknown Costs

In addition to the estimated dam removal costs, several potential future obligations remain unknown or difficult to quantify at this time. These include possible well mitigation

measures for nearby private drinking water wells if impacts are identified; fire suppression alternatives for dry hydrants that will be affected once the dam is removed; recreational enhancements or public access improvements; and long-term fish passage and river restoration considerations following dam removal. Each of these items will require further evaluation, agency review, and coordination with the Towns of Buxton and Hollis before costs can be defined.

As such, no reliable dollar estimates can yet be assigned, but BWPH is conservatively estimating that these measures may cost anywhere from $1-4 million.

APPENDIX A

AGENCY AND PUBLIC COMMENTS AND RESPONSES

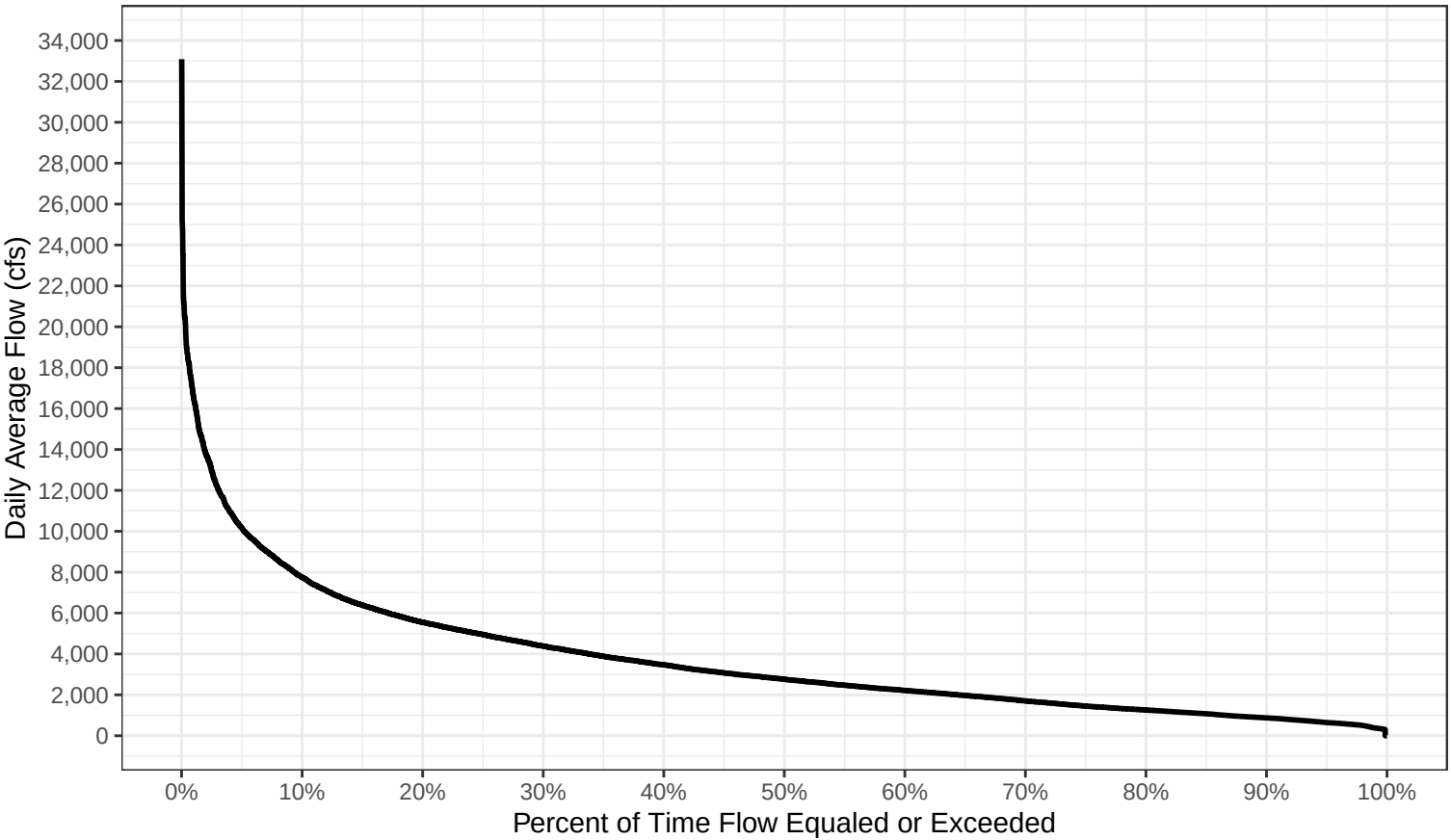
[TO BE PROVIDED IN FINAL DECOMMISSIONING PLAN]

APPENDIX B

FLOW DURATION CURVES

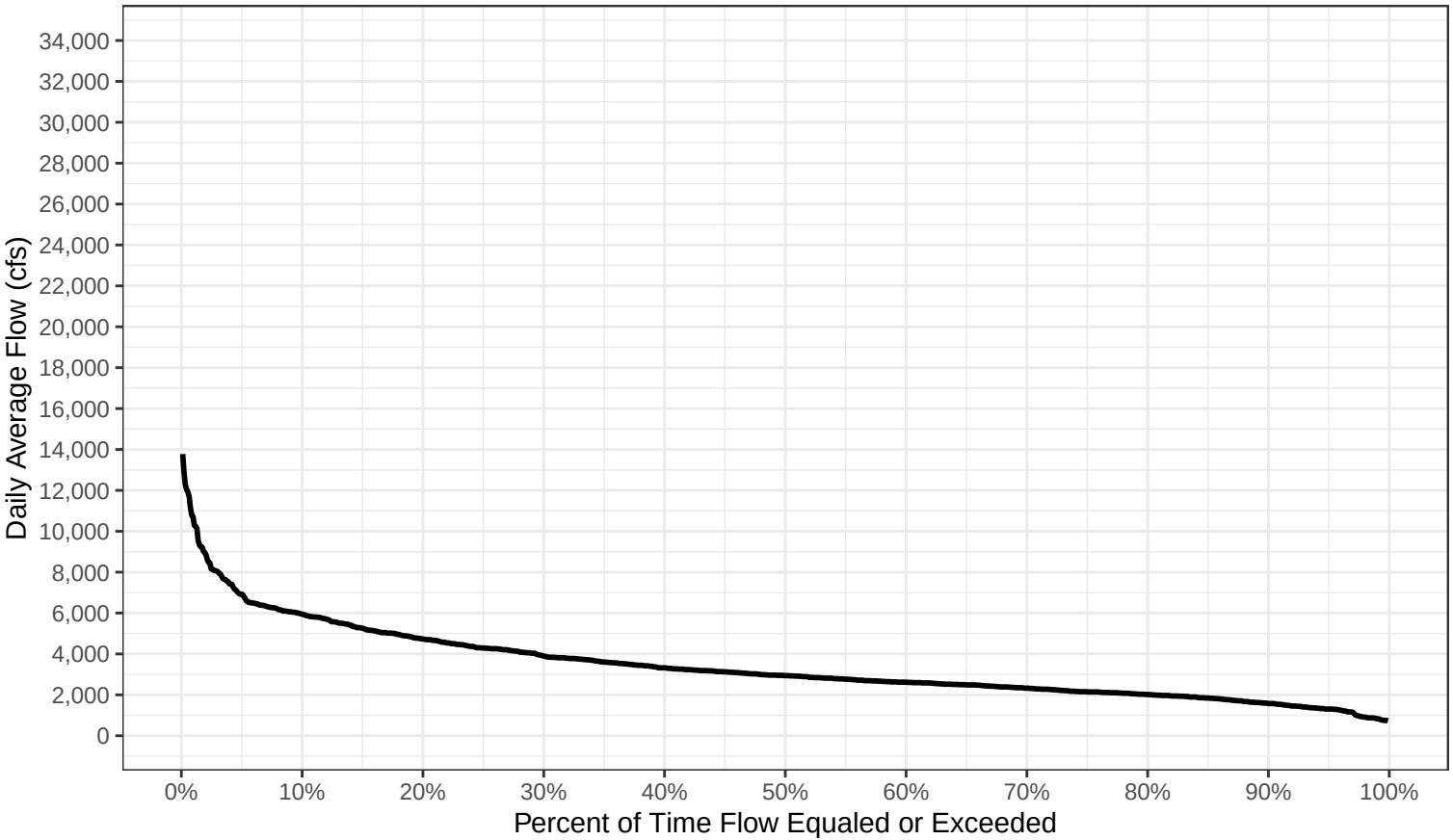
Bar Mills Project Annual Flow Duration Curve

Prorated from USGS Gage No. 01066000 Saco River at Cornish, ME
Period of Record: January 1996 to December 2025



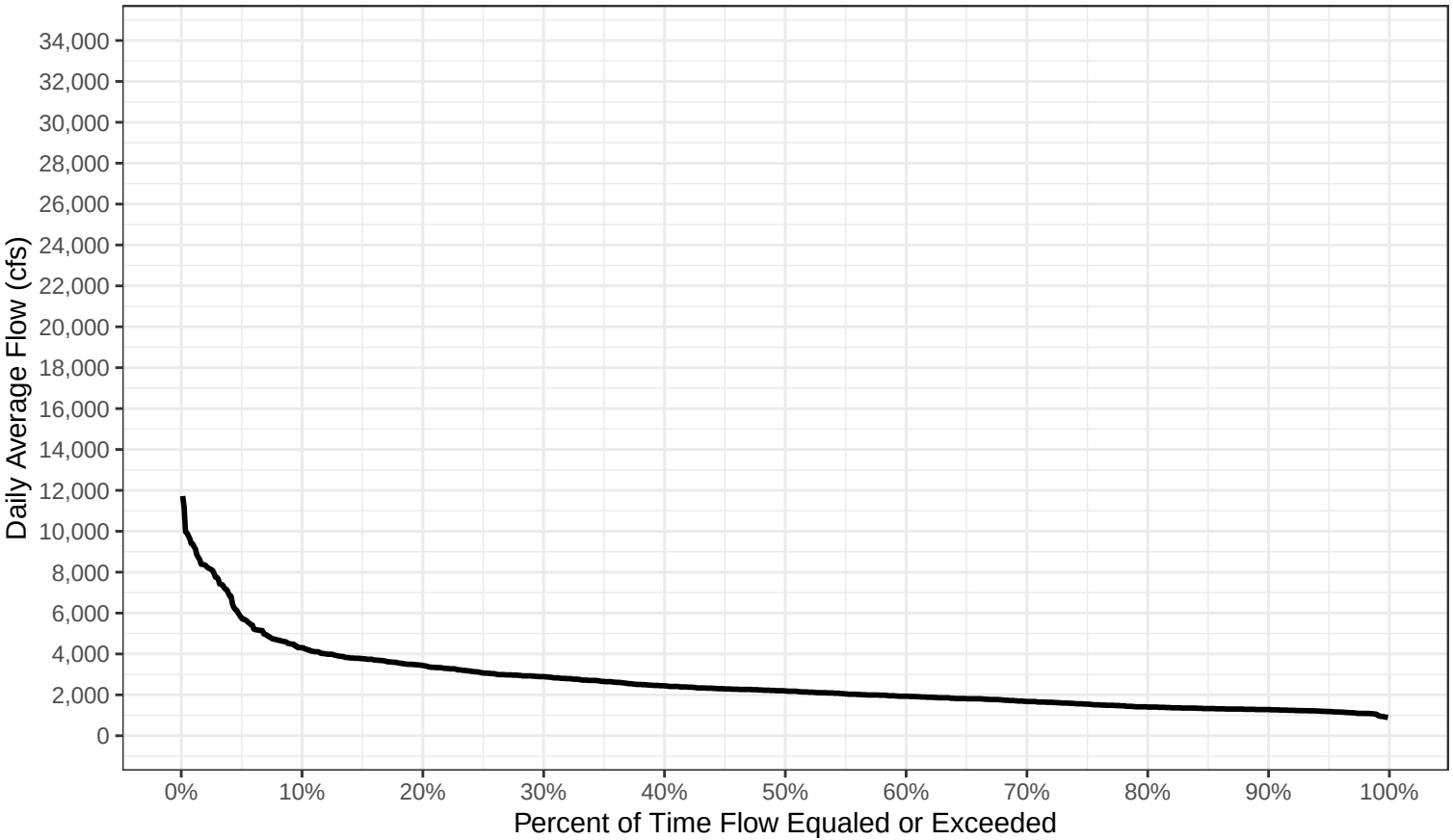
Bar Mills Project January Flow Duration Curve

Prorated from USGS Gage No. 01066000 Saco River at Cornish, ME
Period of Record: January 1996 to December 2025



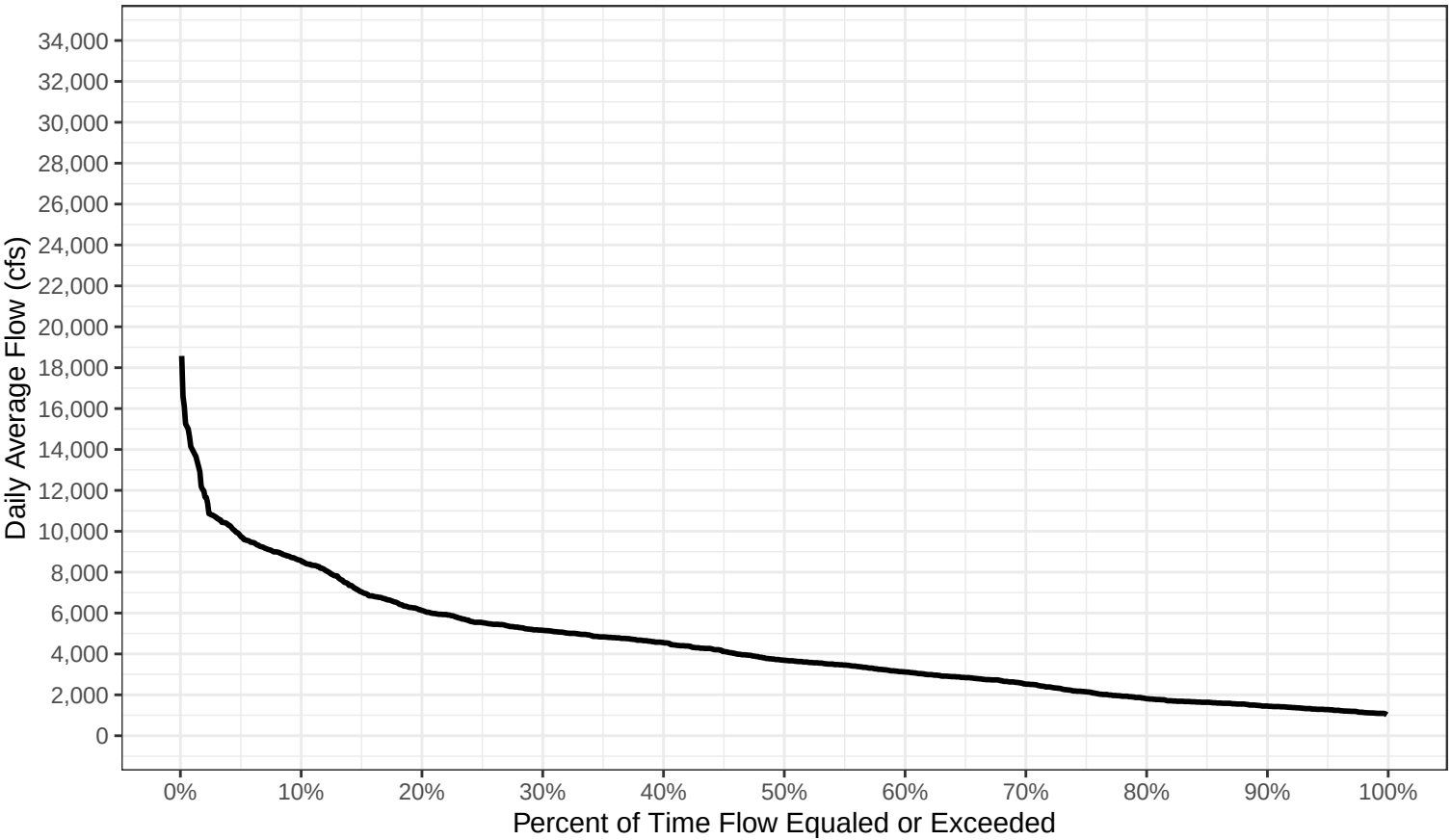
Bar Mills Project February Flow Duration Curve

Prorated from USGS Gage No. 01066000 Saco River at Cornish, ME
Period of Record: January 1996 to December 2025



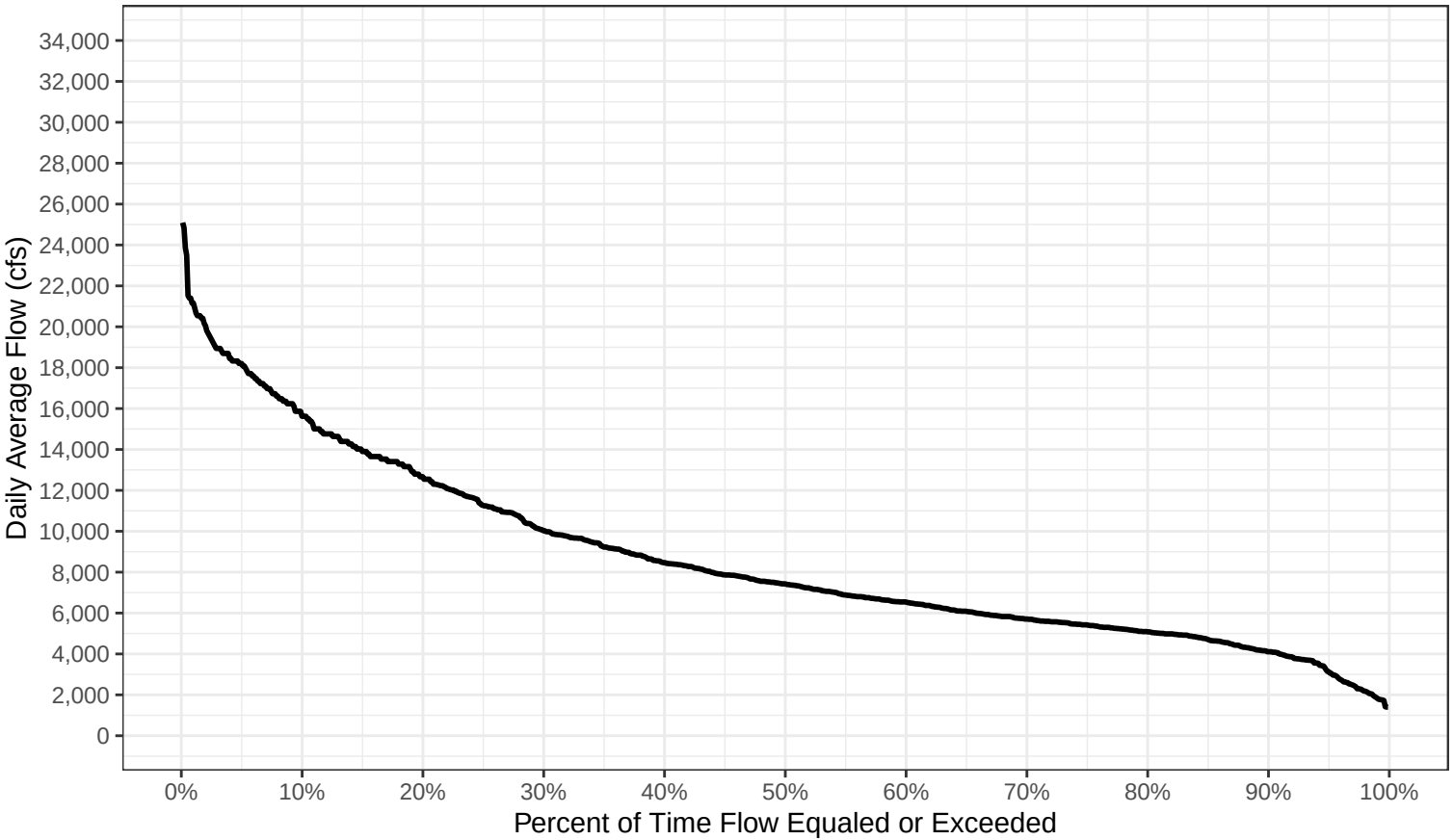
Bar Mills Project March Flow Duration Curve

Prorated from USGS Gage No. 01066000 Saco River at Cornish, ME
Period of Record: January 1996 to December 2025



Bar Mills Project April Flow Duration Curve

Prorated from USGS Gage No. 01066000 Saco River at Cornish, ME
Period of Record: January 1996 to December 2025



Bar Mills Project May Flow Duration Curve

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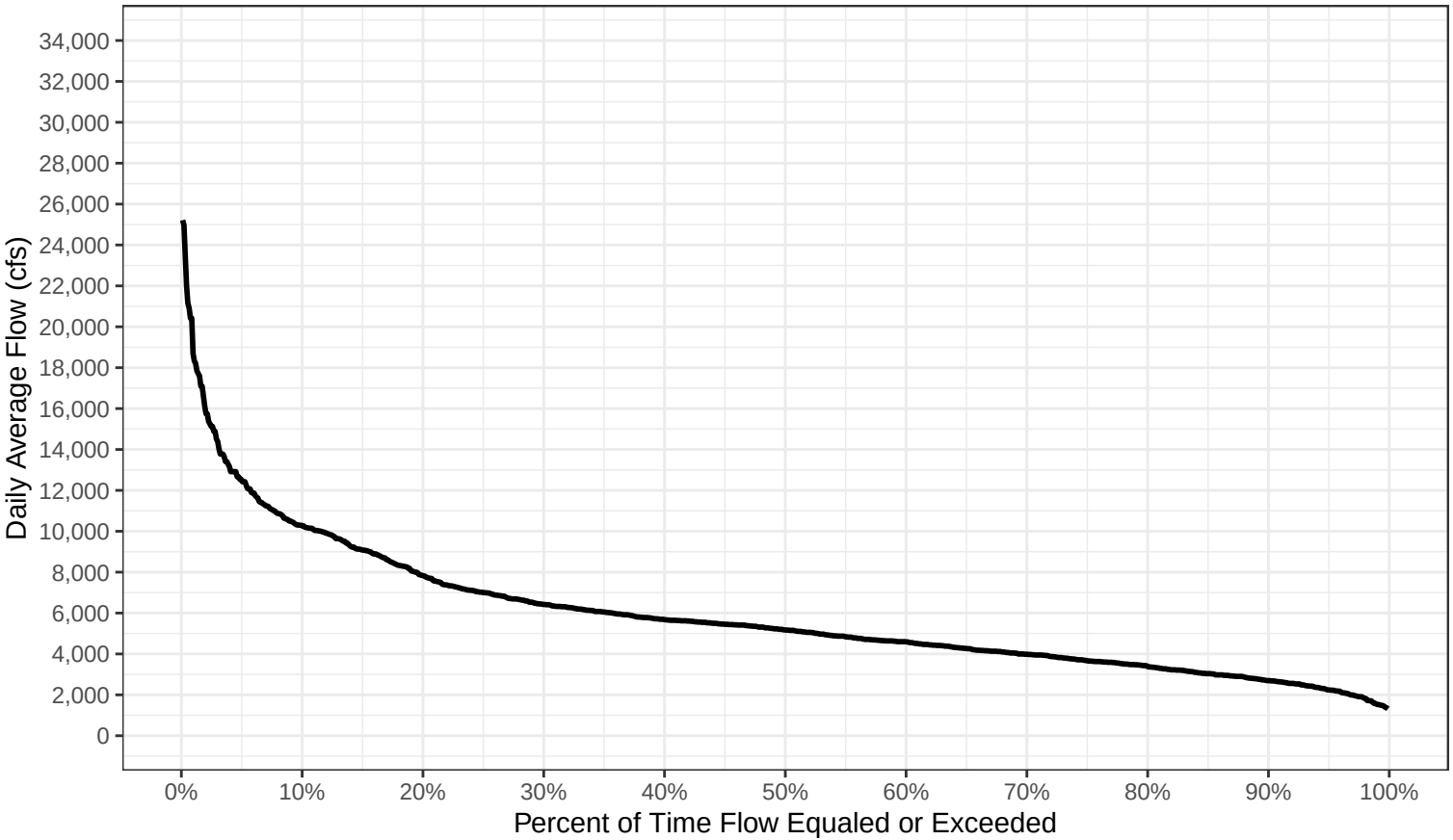
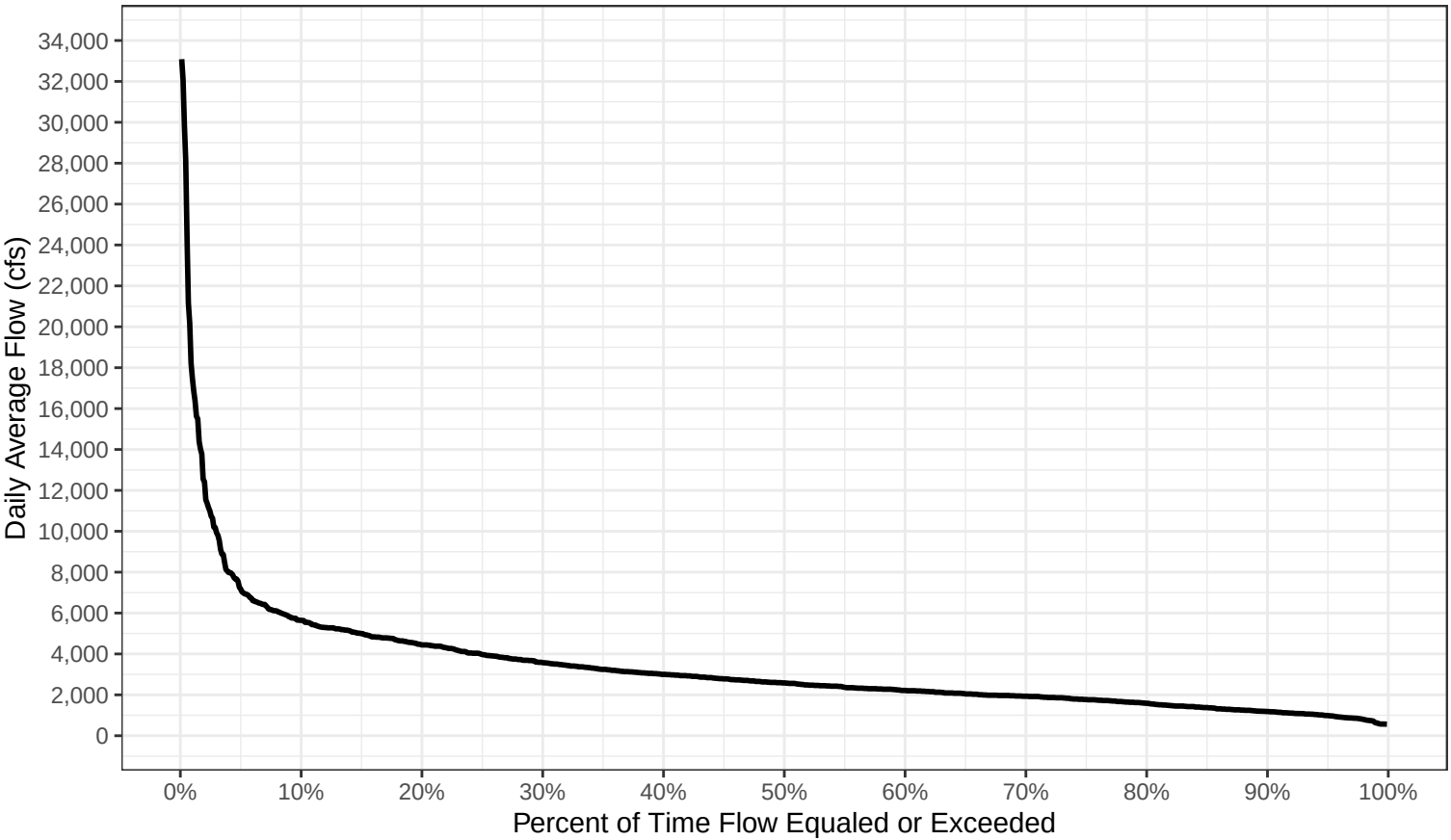
Period of Record: January 1996 to December 2025



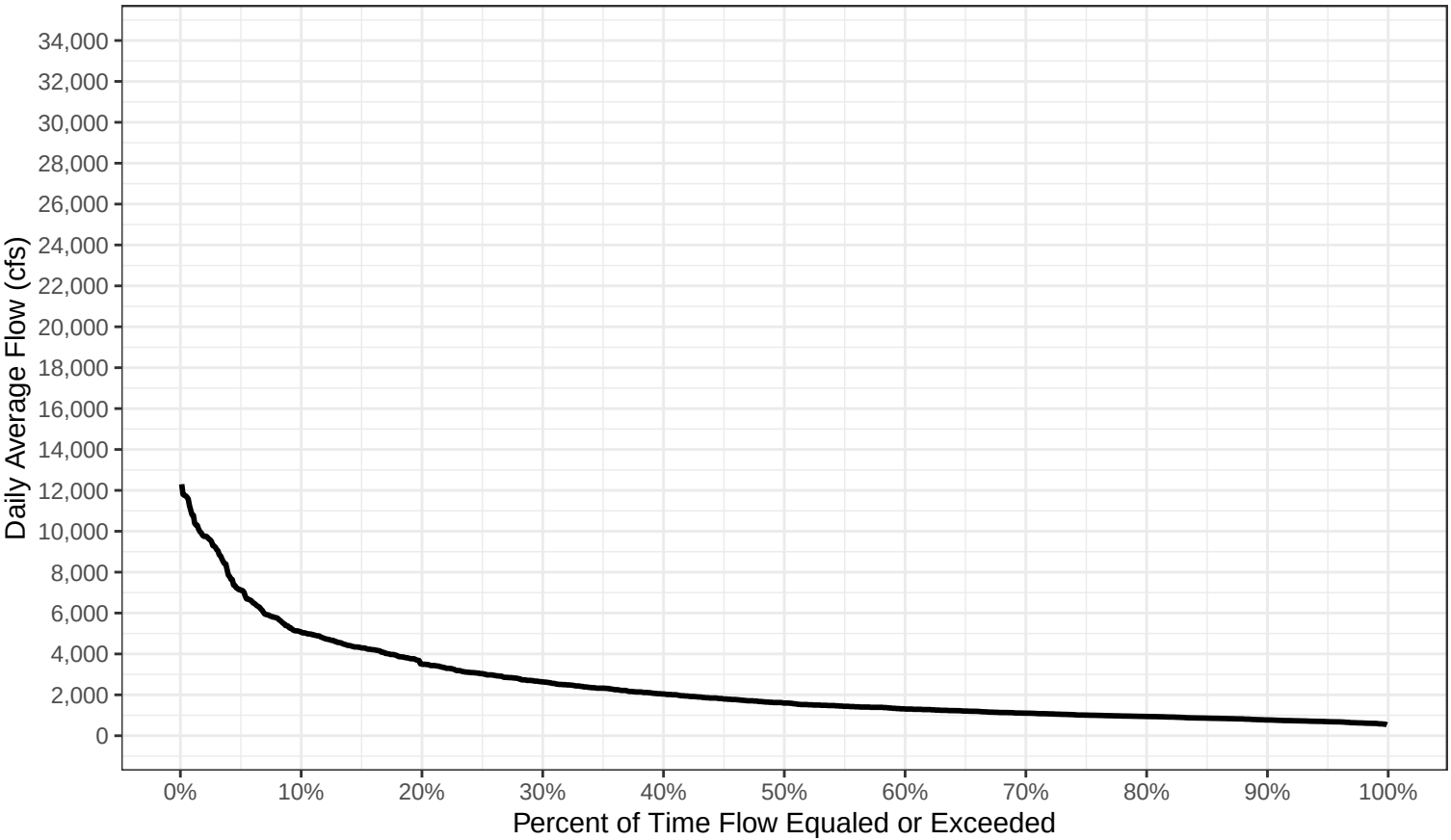
Bar Mills Project June Flow Duration Curve

Prorated from USGS Gage No. 01066000 Saco River at Cornish, ME
Period of Record: January 1996 to December 2025



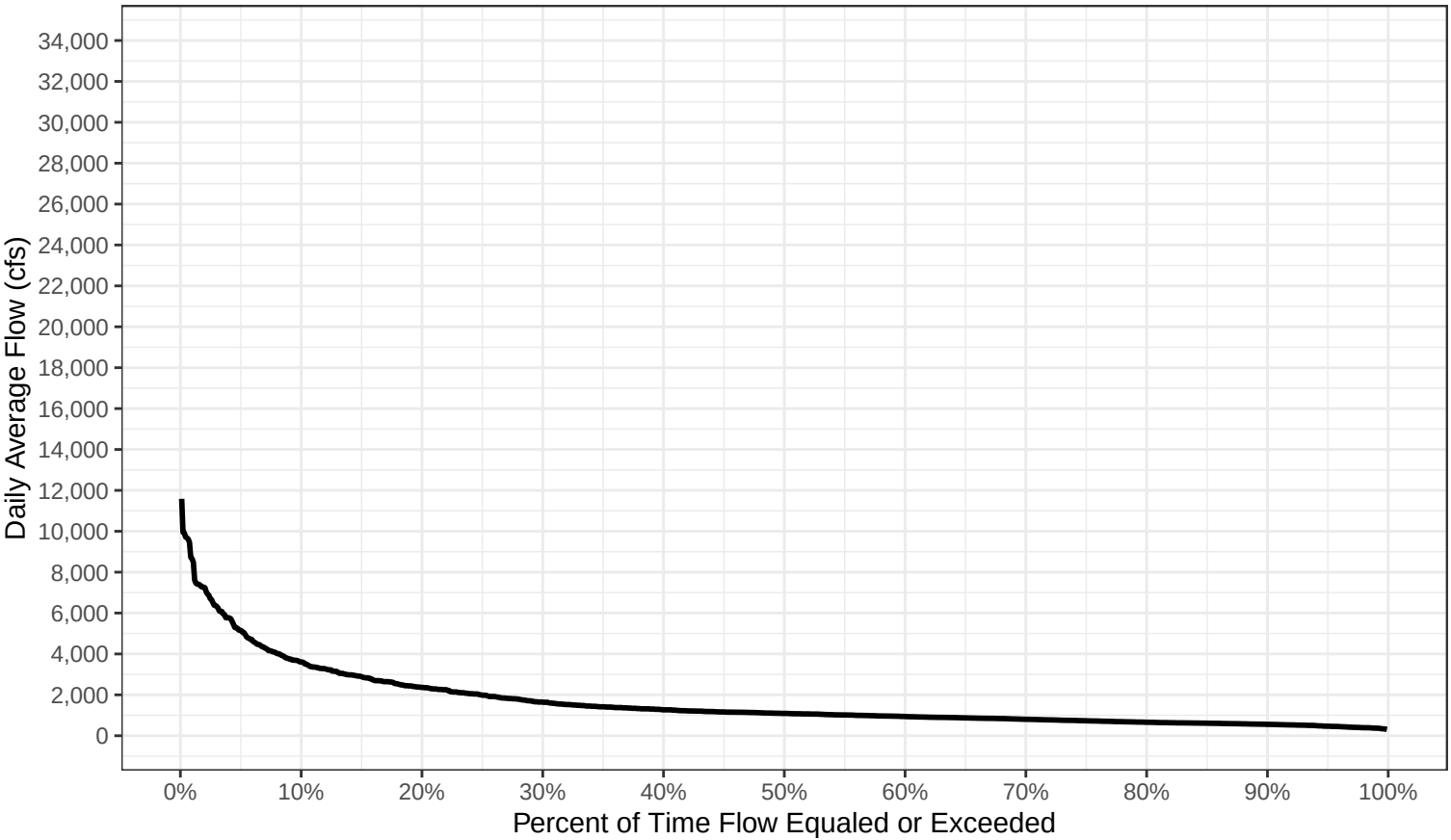
Bar Mills Project July Flow Duration Curve

Prorated from USGS Gage No. 01066000 Saco River at Cornish, ME
Period of Record: January 1996 to December 2025



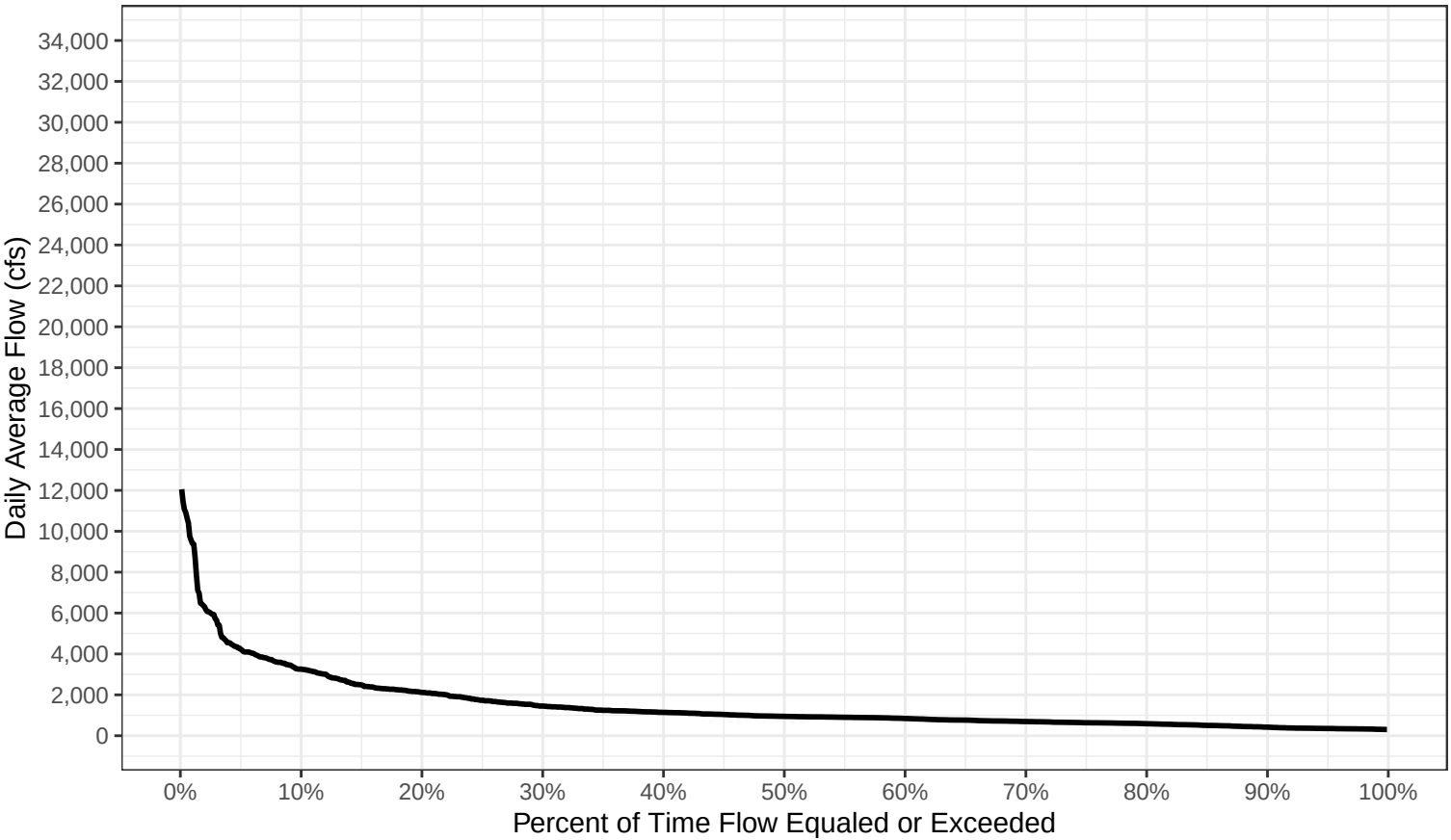
Bar Mills Project August Flow Duration Curve

Prorated from USGS Gage No. 01066000 Saco River at Cornish, ME
Period of Record: January 1996 to December 2025



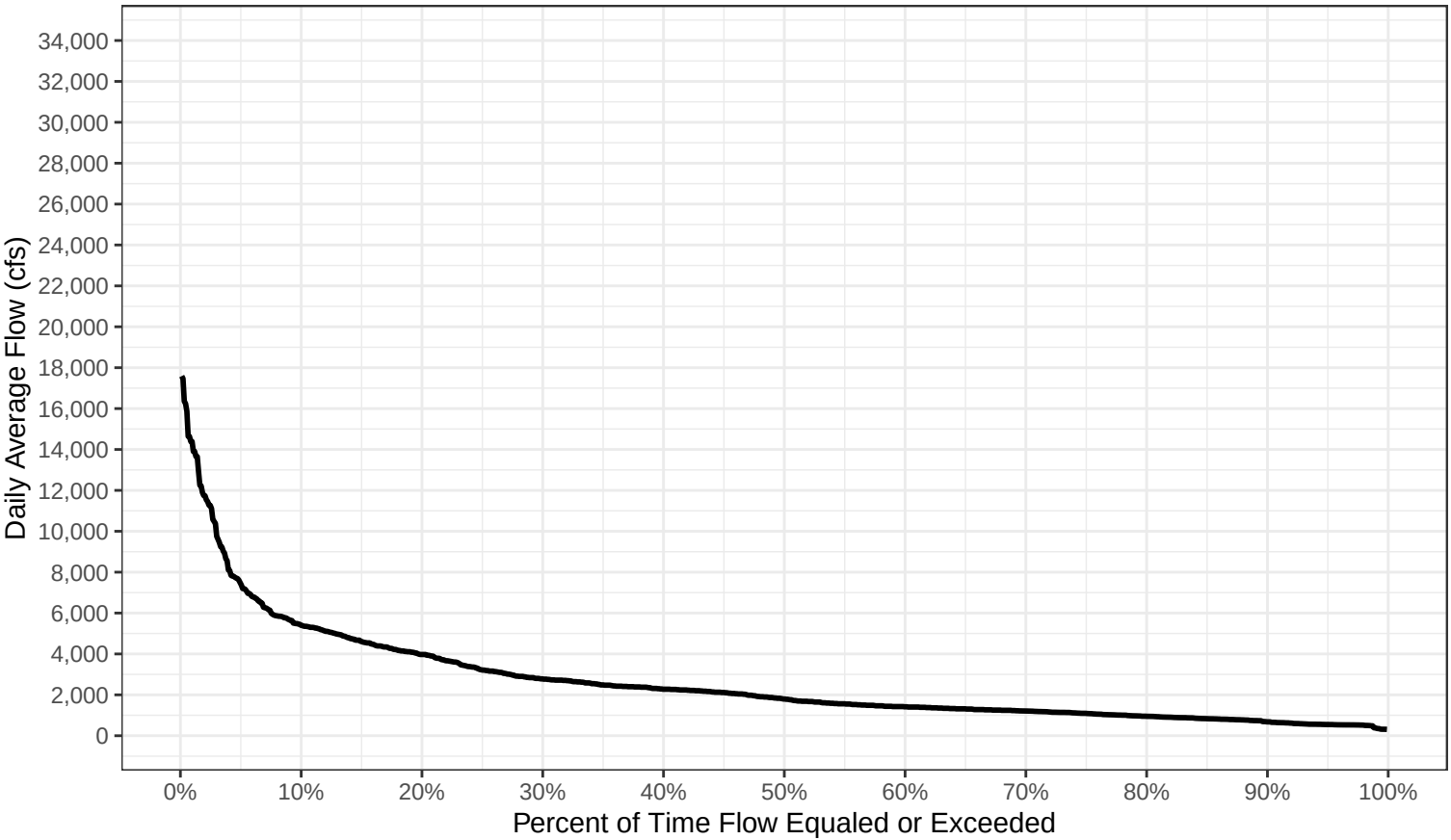
Bar Mills Project September Flow Duration Curve

Prorated from USGS Gage No. 01066000 Saco River at Cornish, ME
Period of Record: January 1996 to December 2025



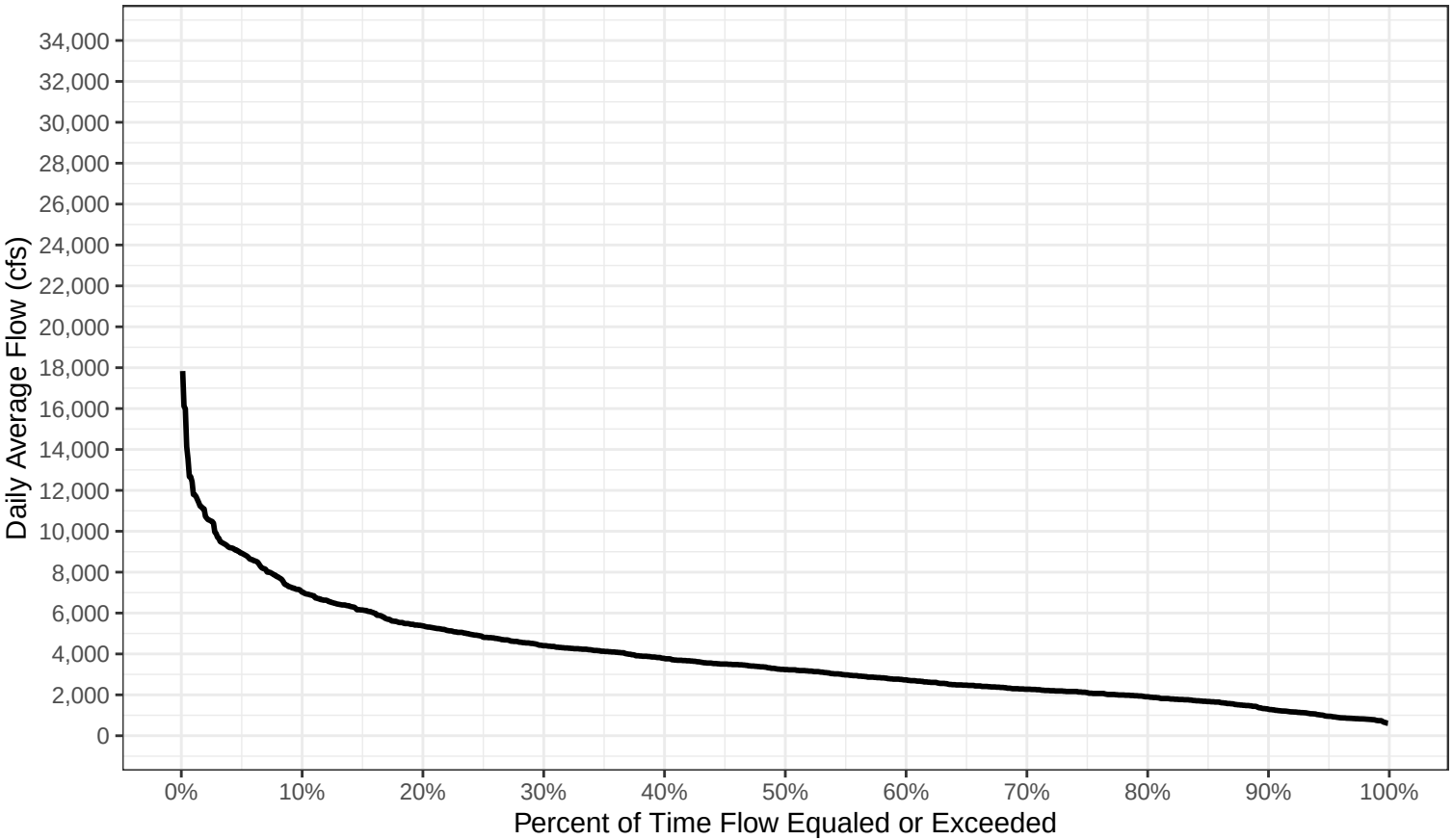
Bar Mills Project October Flow Duration Curve

Prorated from USGS Gage No. 01066000 Saco River at Cornish, ME
Period of Record: January 1996 to December 2025



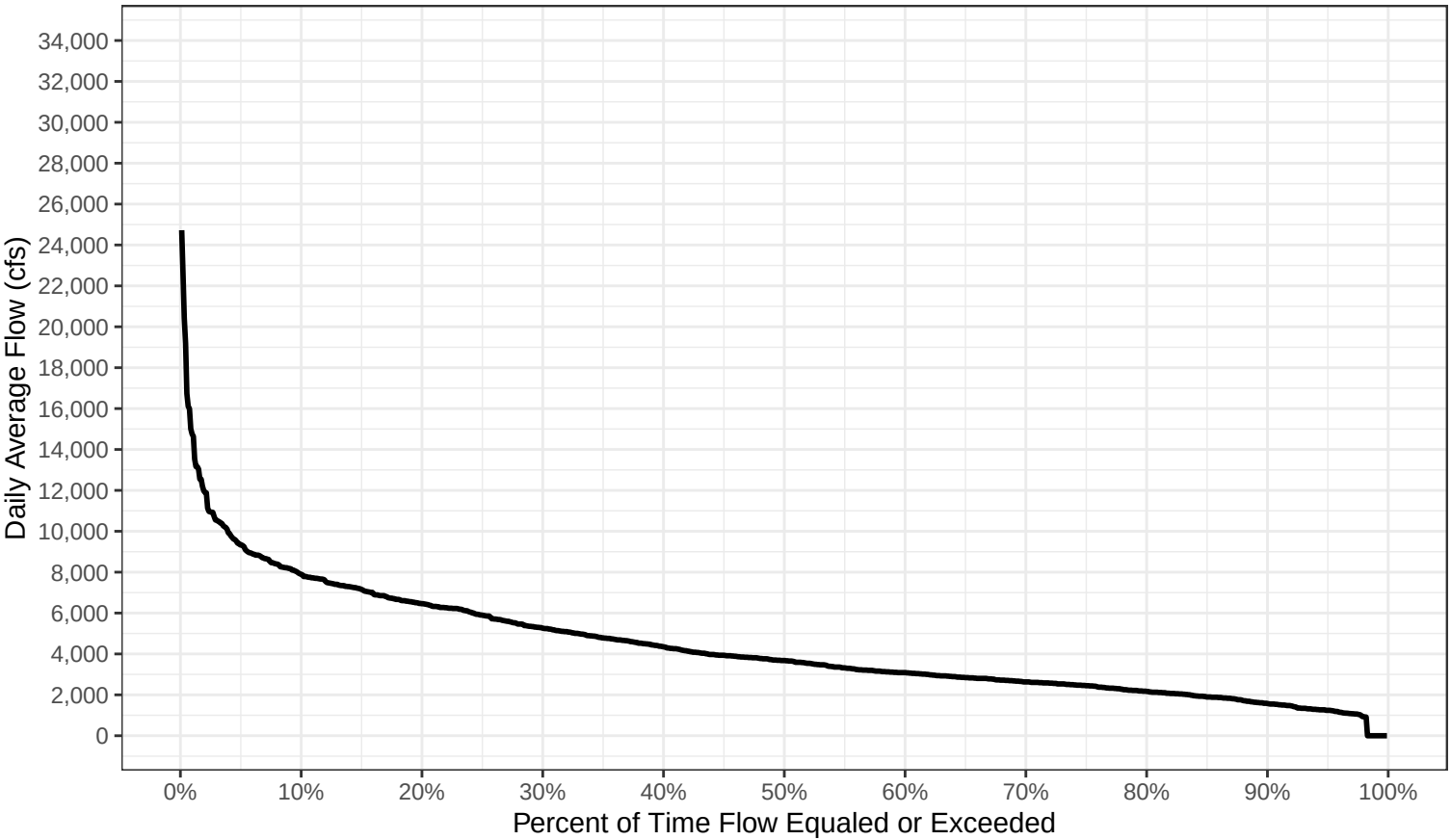
Bar Mills Project November Flow Duration Curve

Prorated from USGS Gage No. 01066000 Saco River at Cornish, ME
Period of Record: January 1996 to December 2025



Bar Mills Project December Flow Duration Curve

Prorated from USGS Gage No. 01066000 Saco River at Cornish, ME
Period of Record: January 1996 to December 2025



APPENDIX C

IPAC REPORT

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

York County, Maine

Local office

Maine Ecological Services Field Office

(207) 469-7300
(207) 902-1588

MAILING ADDRESS
P. O. Box A
East Orland, ME 4431

PHYSICAL ADDRESS
306 Hatchery Road
East Orland, ME 4431

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Tricolored Bat Perimyotis subflavus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts
For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

Review the FAQs
The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Oct 15 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted

Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

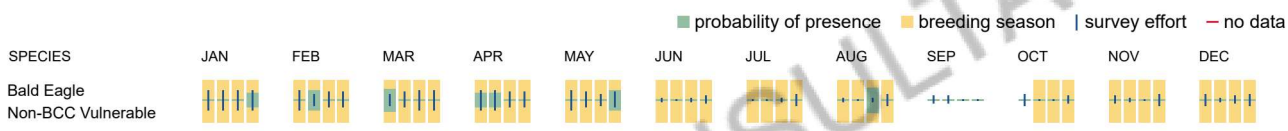
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Bald & Golden Eagles FAQs

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are an eagle (Bald and Golden Eagle Protection Act requirements may apply).

Proper interpretation and use of your eagle report
On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort line or no data line (red horizontal) means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your "IPaC PROBABILITY OF PRESENCE SUMMARY" at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Migratory birds

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Measures for Proactively Minimizing Migratory Bird Impacts

Your IPaC Migratory Bird list showcases birds of concern, including Birds of Conservation Concern (BCC), in your project location. This is not a comprehensive list of all birds found in your project area. However, you can help proactively minimize significant impacts to all birds at your project location by implementing the measures in the Nationwide avoidance and minimization measures for birds document, and any other project-specific avoidance and minimization measures suggested at the link Measures for avoiding and minimizing impacts to birds for the birds of concern on your list below.

Ensure Your Migratory Bird List is Accurate and Complete

If your project area is in a poorly surveyed area, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles document, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

Review the FAQs
The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Oct 15 to Aug 31
Bay-breasted Warbler Setophaga castanea This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 25 to Aug 1
Black-billed Cuckoo Coccyzus erythropthalmus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10

Blue-winged Warbler Vermivora cyanoptera — Breeds May 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Cape May Warbler Setophaga tigrina — Breeds Jun 1 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Evening Grosbeak Coccothraustes vespertinus — Breeds May 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Pectoral Sandpiper Calidris melanotos — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prairie Warbler Setophaga discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Rose-breasted Grosbeak Pheucticus ludovicianus — Breeds May 15 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Scarlet Tanager Piranga olivacea — Breeds May 10 to Aug 10
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Veery Catharus fuscescens fuscescens — Breeds May 15 to Jul 15
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

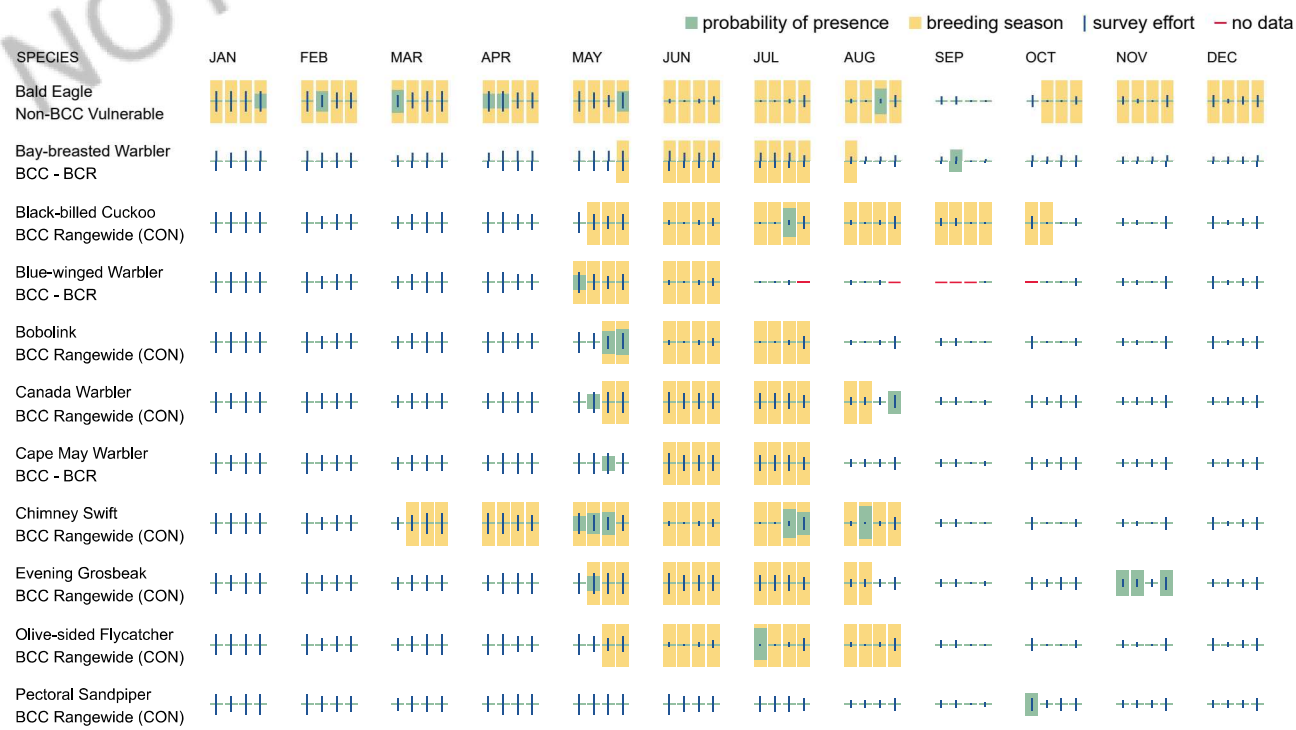
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

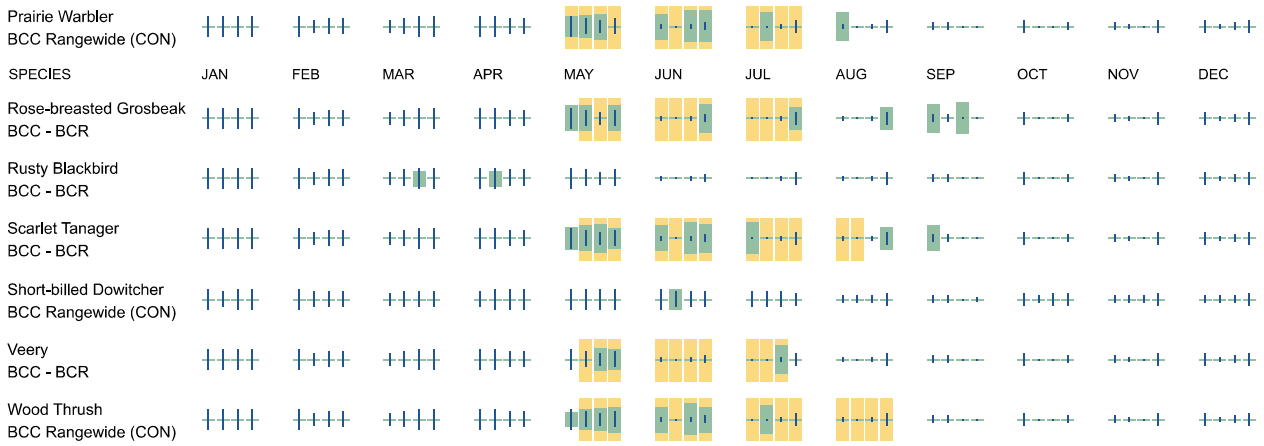
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Migratory Bird FAQs

Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Avoidance & Minimization Measures for Birds describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the Bald and Golden Eagle Protection Act and those species marked as "Vulnerable". See the FAQ "What are the levels of concern for migratory birds?" for more information on the levels of concern covered in the IPaC migratory bird species list.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) with which your project intersects. These species have been identified as warranting special attention because they are BCC species in that area, an eagle (Bald and Golden Eagle Protection Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, and to verify survey effort when no results present, please visit the Rapid Avian Information Locator (RAIL) Tool.

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for **the species** are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your "IPaC PROBABILITY OF PRESENCE SUMMARY" at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Bald and Golden Eagle Protection Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially BCC species. For more information on avoidance and minimization measures you can implement to help avoid and minimize migratory bird impacts, please see the FAQ “Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds”.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Proper interpretation and use of your migratory bird report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list does not represent all birds present in your project area. It is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide implementation of avoidance and minimization measures to eliminate or reduce potential impacts from your project activities, should presence be confirmed. To learn more about avoidance and minimization measures, visit the FAQ "Tell me about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Interpreting the Probability of Presence Graphs
Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.