FINAL LICENSE APPLICATION

GORHAM HYDROELECTRIC PROJECT
FERC NO. 2288

Submitted by:

Central Rivers Power NH Gorham, LLC
Manchester, New Hampshire

Prepared by:

Kleinschmidt

July 2022

GORHAM HYDROELECTRIC PROJECT

PROJECT NO. 2288

INITIAL STATEMENT

Before The
United States of America
Federal Energy Regulatory Commission

CRP NH Gorham, LLC **Gorham Hydroelectric Project (P-2288)**

Application For New License
For Major Project less than 5 MW
Initial Statement
(Pursuant to 18 CFR 4.51)

1. CRP NH Gorham, LLC ("CRP" or "Licensee"), licensee for the Gorham Hydroelectric Project (FERC No. 2288) (Project), applies to the Federal Energy Regulatory Commission (hereinafter FERC or Commission) for a new license for the Gorham Hydroelectric Project, as described in the attached exhibits. The Project is currently licensed by Order with an effective date of August 1, 1994 and expires on July 31, 2024. CRP NH Gorham, LLC is a wholly-owned, indirect subsidiary of Central Rivers Power, LLC.

2. The location of the Project is:
   State or territory: New Hampshire
   County: Coos
   Township or nearby towns: Towns of Gorham and Shelburne
   Stream or other body of water: Androscoggin River

3. The exact name, business address, and telephone number of the applicant are:
   CRP NH Gorham, LLC
   670 N. Commercial Street, Suite 204
   Manchester, NH 03101
   (603) 623-8222

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

   Kevin Webb
   Manager, Licensing
   CRP NH Gorham, LLC
   670 N. Commercial Street, Suite 204
   Manchester, NH 03101
   (978) 935-6039

Curt Mooney
Manager, Regulatory Affairs
CRP NH Gorham, LLC
59 Ayers Island Road
Bristol, New Hampshire 03222
(603) 744-0846

4. CRP NH Gorham, LLC is a domestic corporation and is not claiming preference under section 7(a) of the Federal Power Act. See 16 U.S.C. 796.

5. (i) The statutory or regulatory requirements of the State of New Hampshire, 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:

   a. Water Quality Certification (WQC) from the State of New Hampshire pursuant Section 401 (a)(1) of Public Law 92-500 as amended by Public Law 95-217 (Clean Water Act of 1977), 33 U.S.C. Section 1341.

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

   a. The Licensee will apply to the New Hampshire Department of Environmental Services (NHDES) for a Water Quality Certification no later than 60 days after FERC issues the notice of acceptance and ready for environmental analysis.

6. All existing Project facilities are owned by CRP NH Gorham, LLC. The Project consists of a timber crib, L-shaped dam, an impoundment with a surface area of 32 acres, a spillway, a canal gatehouse and power canal, a powerhouse containing four generating units. The hydroelectric turbine/generators feed through a step-up transformer into the adjacent distribution substation.

7. The Project does not occupy any lands of the United States.

8. The Project is an existing constructed project; no additional construction is proposed.

THE FOLLOWING INFORMATION IS PROVIDED PURSUANT TO 18 CFR §5.18(A) AND §4.32(A) OF THE COMMISSION'S REGULATIONS:

1. CRP NH Gorham, LLC possesses all proprietary rights necessary to construct, operate or maintain the Project.

2. The name and mailing address of:

   a. Every county in which any part of the Project and any federal facilities that would be used by the project are located:

   Coos County, New Hampshire
   P.O. Box 10
   West Stewartstown, NH 03597

   There are no federal facilities used by the Gorham Project.

   b. Every city, town, or similar local political subdivision in which any part of the project and any federal facilities that would be used by the project are located, or that is within 15 miles of the project dam and has a population of 5,000 or more people.

   The Gorham Project is located in the towns of Gorham and Shelburne in Coos County, New Hampshire. The City of Berlin, NH is within 15 miles of the Project and has a population greater than 5,000.

   City of Berlin
   164 Main Street
   Berlin, NH 03570

   Town of Gorham
   20 Park Street
   Gorham, NH 03581

   Town of Shelburne
   74 Village Road
   Shelburne, NH 03581

c. Every irrigation district, drainage district, or similar special purpose political subdivision in which any part of the project is located and in which any federal facility that is used by the project is located or that owns, operates, and maintains or uses any project facility.

The Coos County Conservation District is a special purpose political subdivision, which may be interested in the notification.

Coos County Conservation District
4 Mayberry Lane
Lancaster, NH 03584

d. Every other political subdivision in the general area of the Project that there is reason to believe would likely be interested in, or affected by, this notification:

There are no other political districts or subdivisions that are likely to be interested in or affected by the notification. The following economic development and planning organizations that may be interested in the notification.

Coos Economic Development Corporation
149 Main Street
P.O. Box 205
Lancaster, New Hampshire, 03584

North Country Council
Regional Planning Commission and Economic Development District
161 Main Street,
Littleton NH 03561

Berlin Industrial Development & Park Authority
City Hall
168 Main Street
Berlin, NH 03570

e. All Indian tribes that may be affected by the Project

There are no federally recognized Native American tribes in New Hampshire. CRP NH Gorham, LLC is not aware that the Project affects any Native American tribe.

SUBSCRIPTION

This Application for New License for the Gorham Hydroelectric Project, FERC No. 2288, is executed in the State of New Hampshire, County of Hillsborough, by

Matthew E. Stanley
Vice President and General Manager
CRP NH Gorham, LLC
670 N Commercial Street, Suite 204
Manchester, NH 03101

who, being duly sworn, deposes and says that the contents of this application are true to the best of their knowledge or belief. The undersigned has signed this application this 27th day of July, 2022.

CRP NH Gorham, LLC

By _____

VERIFICATION

Subscribed and sworn to before me, a Notary Public of the State of New Hampshire this 27 day of July, 2022.

_____
(Notary Public)

STACEY BLAIR NOTARY PUBLIC MY COMMISSION EXPIRES 10/27/2026 STATE OF NEW HAMPSHIRE

(My Commission Expires) seal

GORHAM HYDROELECTRIC PROJECT

PROJECT NO. 2288

EXHIBIT A

PROJECT DESCRIPTION

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1.0 INTRODUCTION

CRP NH Gorham, LLC ("CRP" or "Licensee") is proposing to relicense with the Federal Energy Regulatory Commission (FERC or the Commission) the 2.15 MW Gorham Hydroelectric Project (Project) (FERC Project No. 2288). The Project is located on the Androscoggin River in northern New Hampshire within the Town of Gorham, Coos County. Figure 1.1 provides the general location of the Project facilities. The Gorham Project is one of seven hydroelectric projects within an 11-mile reach of the Androscoggin River between Berlin and Shelburne, New Hampshire (FERC 1993). There are five hydroelectric projects within 8 miles upstream of the Gorham Project; the Shelburne Project is approximately 2.8 miles downstream of the Gorham Project.

The Project consists of a timber crib, L-shaped dam, an impoundment, a spillway, a canal gatehouse and power canal, a powerhouse containing four generating units. The hydroelectric turbine/generators feed through a step-up transformer into the adjacent distribution substation. A map of the Project boundary is provided in Exhibit G. There are no federal lands or facilities within the Project boundary. CRP is not proposing to add capacity or make any physical modifications to the Project under the new license.

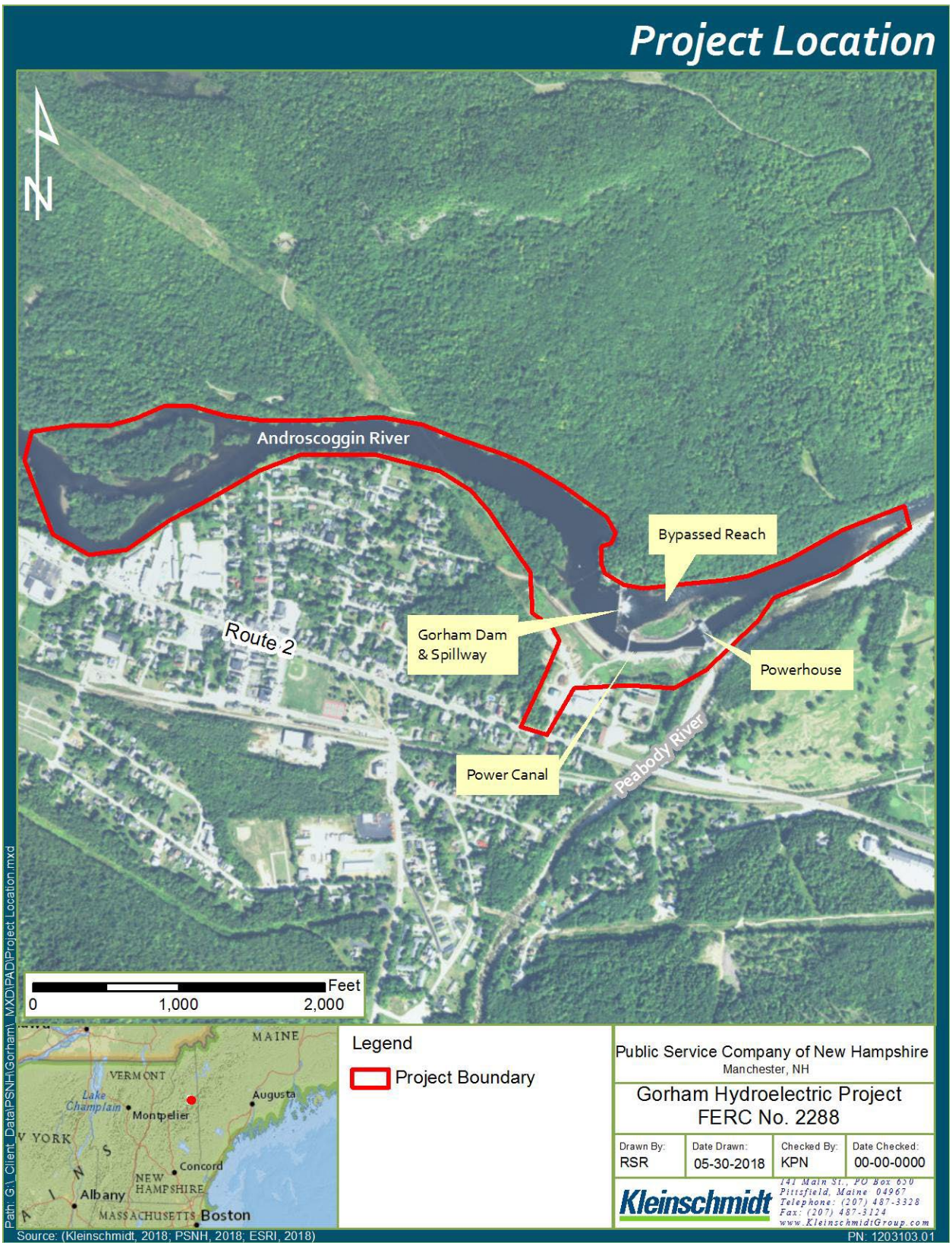


Figure 1.1 Gorham Project Location

2.0 DESCRIPTION OF PROJECT

The single-development Project consists of an impoundment, dam, canal gatehouse and power canal, powerhouse with four turbine/generator units, transmission line appurtenant facilities. Table 2.1 provides a detailed description of the Gorham Project facilities.

2.1 Project Facilities

2.1.1 Project Impoundment

The Project impoundment has a surface area of 32 acres, at normal maximum water surface elevation of 772.53 feet (NGVD29).[1] The water depth in the impoundment is approximately 10 to 15 feet. The Project impoundment extends approximately 4,700 feet upstream of the Project dam. As the Project is operated as run-of-river, the Project impoundment has no useable storage capacity. Due to the absence of useable storage associated with no impoundment fluctuation, the Project is entirely dependent upon Androscoggin River inflows for generation.

2.1.2 Project Dam

The Project dam is a timber crib, L-shaped dam about 14 feet high, with three sections: (1) an 89-foot, 6-inch-long spillway section, with a steel sheet pile facing, having a crest elevation of 772.23 feet (NGVD29), topped with 1.85-foot wooden timbers, (2) a 252-foot, 7 and 1/2-inch-long spillway section, with one layer of 3-inch wooden plank facing, having a crest elevation of 768.19 feet, topped with hinged wooden flashboards, about 4.6-feet-high, and (3) a 75-foot-long reinforced-concrete sluiceway section, with a crest elevation of 768.20 feet, topped with 4.88-foot-high hinged wooden flashboards, having one 15-foot-wide sluice gate (Photo 2.1)). Slight differences in dimensions compared to current license descriptions are likely associated with dam repairs that have occurred over the past 10 years.

[1] Unless otherwise specified, all elevations in this Application for License refer to the National Geodetic Vertical Datum of 1929 (NGVD 29).

Photo 2.1 Gorham Project Dam

2.1.3 Canal Gatehouse and Power Canal

The canal gatehouse, adjacent to the western dam section, is a wooden structure approximately 80-feet-long and 15-feet-wide. Gatehouse has five water passage openings separated by concrete piers. The primary purpose of the gatehouse is to dewater the power canal for inspection and maintenance.

The Project has an earthen power canal which is approximately 415-feet-long by 60-feet-wide by 20-feet-deep (Photo 2.2). The westerly 45 feet of the north and south walls of the canal are lined with reinforced concrete and the remaining 375 feet is earthen dike.

Photo 2.2 Gorham Power Canal

2.1.4 Powerhouse and Generators

The powerhouse is located on the south end of the power canal. The powerhouse is constructed in three sections. The middle section was constructed in 1909 and is 33 feet by 38 feet; the north section was constructed in 1917 and is 26 feet by 38 feet; and the south section was constructed in 1923 and is 70 feet by 33 feet. The substructure is constructed from reinforced concrete and concrete blocks. The north section of the powerhouse contains two 400-kW Allis-Chalmers generators) driven by two 583-horsepower (hp) S. Morgan Smith vertical, Francis-type turbines. The south section contains two 675-kW Allis-Chalmers generators driven by two 1,000-hp Allis-Chalmers vertical, propeller-type turbines, totaling a maximum hydraulic capacity of 2,800 cfs, at an operating head of approximately 18 feet (Photo 2.3).

Photo 2.3 View of powerhouse interior and generating units.

2.1.5 Project Bypass Reach and Tailrace

Operation of the Gorham Project results in the diversion of water from an approximately 850-foot-long bypassed reach. In accordance with Article 402 of the existing FERC license, the Licensee provides a minimum flow of 200 cfs or inflow, whichever is less, into the bypassed reach for the protection of water quality and fish and wildlife resources. The 200 cfs minimum flow is maintained through a lowered spillway flashboard (5-foot-wide by 6-foot high) in the middle of the spillway.

2.1.6 Project Appurtenant Facilities and Equipment

The Project has a 33 kV, 200-foot-long transmission line, and appurtenant facilities. Figure 2.2 provides a single-line diagram for the Project.

2.1.7 Project Lands

The Project is located within the Androscoggin River Valley in the Town of Gorham, Coos County, New Hampshire. A map of the Project boundary is provided in Exhibit G. There are no federal lands or facilities within the Project boundary.

2.1.7.1 Lands of the United States

The Project does not occupy any facilities or lands of the United States.

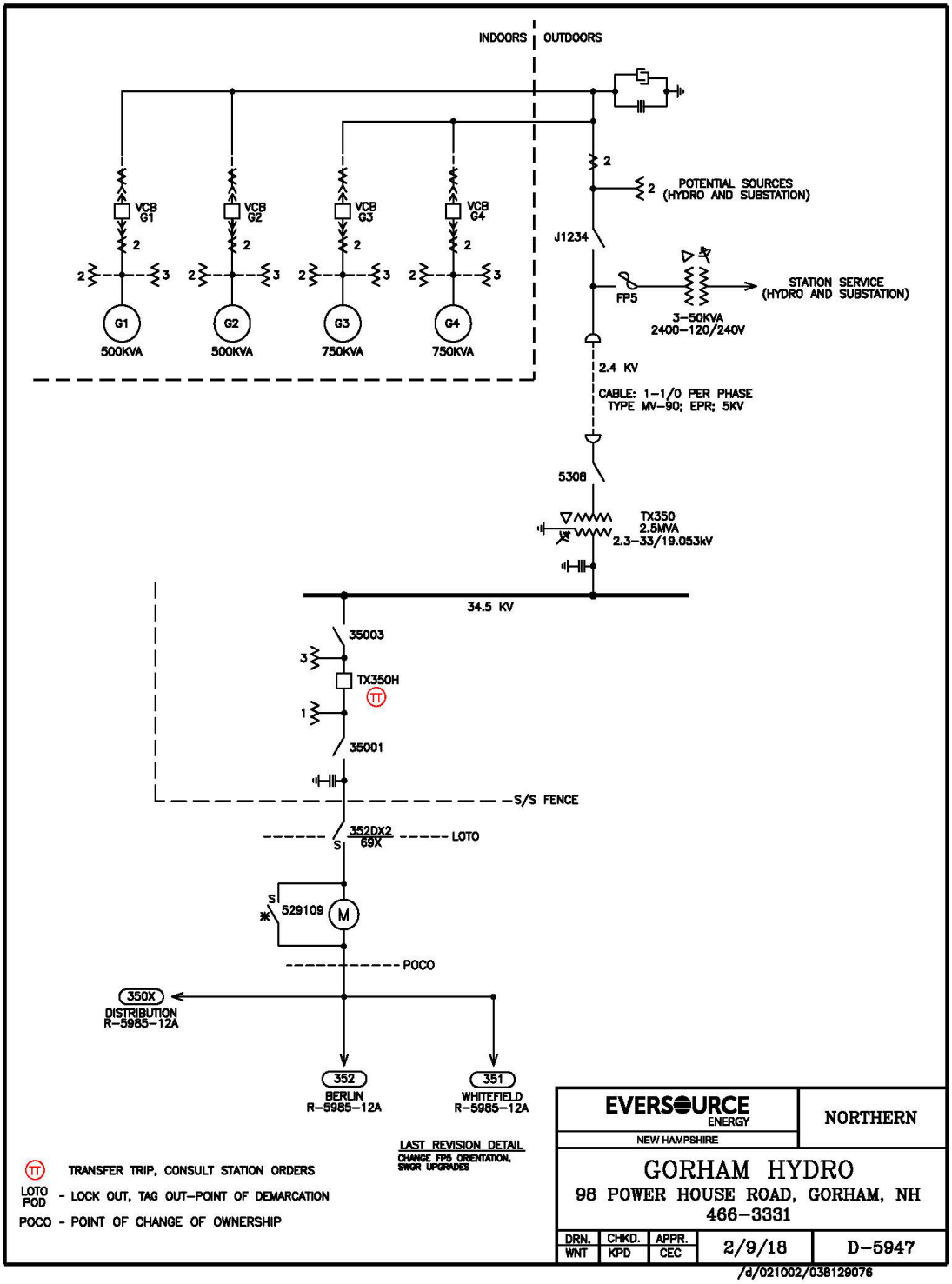


Figure 2.1 Single-Line Diagram

Table 2.1 Gorham Project Facilities and Descriptions

Gorham Project – FERC No. 2288	
Description	Number or Fact
General Information	
FERC Number	P-2288
License Issued	August 1, 1994
License Expiration Date	July 31, 2024
Licensed Capacity	2,150 kW
Project Location	On Androscoggin River in Coos County, New Hampshire.
Impoundment and Dam	
Surface Area of Impoundment	32 acres
Length and Elevations	• 89-foot, 6-inch-long spillway section, with top elevation of 772.23 feet (NGVD 29), topped with 1.85-foot wooden timbers • 252-foot, 7 and 1/2-inch-long spillway section, with crest elevation of 768.19 feet, topped with 4.6-feet-high hinged wooden flashboards • 75-foot-long reinforced-concrete sluiceway section, with a crest elevation of 768.20 feet, topped with 4.88-foot-high hinged wooden flashboards, having one 15-foot-wide sluice gate
Height	20 feet
Power Canal	
Length	415 feet
Width	60 feet
Depth	20 feet
Powerhouse	
Middle Section (1909)	33 feet by 38 feet
North Section (1917)	26 feet by 38 feet

South Section (1923)	70 feet by 33 feet
Turbines/Generators	
Number of units	4 units (2 S. Morgan Smith vertical Francis-type) with generating capacity of 400 kW each (2 Allis-Chalmers vertical, propeller-type) with generating capacity of 675 kW each
Rated Net Head	18 feet
Hydraulic Capacity	2,800
Units 1 & 2 (each)	Minimum approximately 100 cfs; Maximum approximately 450 - 500 cfs
Units 3 & 4 (each)	Minimum approximately 250 -300 cfs; Maximum approximately 900 – 1,000 cfs
Average Annual Generation	10,368 MWh
Transmission Lines	
Type	33-kV
Length	200 feet

2.1.8 Proposed Facilities

The Licensee is proposing no additions or modifications to the existing Project facilities, and no changes to Project generating capacity.

2.1.9 Provisions for Future Units

There are no plans for additions or modifications to the Project facilities and therefore, no provisions for future units.

2.2 Project Operation

2.2.1 Current Project Operation

Article 401 of the existing license requires run-of-river operation with minimum impoundment fluctuations including maintaining the pond level within +/- 2 inches of the normal pond level. Article 402 of the existing license requires a minimum flow of 200 cfs or inflow, whichever is less, into the bypassed reach. The minimum flow is released through a lowered flashboard (5-foot-wide by 6-foot high)near the middle of the dam.

Per Article 401 and 402, run-of-river operation and minimum flow releases may be temporarily modified if required by operating emergencies beyond the control of the Licensee, or for short periods upon agreement between the Licensee, the New Hampshire Fish and Game Department, and the U.S. Fish and Wildlife Service. If the flow is so modified, the Licensee must notify the Commission as soon as possible, but no later than 10 days after each such incident.

The generating units are normally operated remotely from Central Rivers Power's (CRP) Control Center, managed by Customized Energy Solutions (CES) located in Philadelphia, Pennsylvania, although the units are also capable of local operation. Manual operations and maintenance of the Gorham Project are performed by the Upper Hydro Group, which is also responsible for the J. Brodie Smith Project (FERC No. 2287), upstream, and Canaan Project (FERC No. 7528) located in northern New Hampshire on the Connecticut River. Daily logs of pond level, flow, and outages are maintained electronically for the Project. Minimum bypass flows are assured by maintaining a lowered section of the flashboards. Unit sequencing is typically unit 1, 2, 3 and 4 from June through October and unit 4, 3, 2, and 1 from November through May, but varies depending on weather conditions/temperatures, precipitation, and ice retention.

2.2.2 Proposed Project Operation

No modifications to operations are proposed, either to the run-of-river mode or to the minimum bypass flows.

2.2.3 Proposed Environmental Measures

CRP proposes the following PMEs to benefit resources in the Gorham Project area:

- Continue to provide minimum flows to the bypass reaches of the Androscoggin River for the protection and enhancement of aquatic resources.
- Continue to operate the Project as a run-of-river facility, which is protective of environmental resources.
- Implement an updated Operations Compliance Plan for the project.
- Continue providing recreational use of the existing Gorham hand carry boat access and canoe portage; Details of future recreation management will be developed following completion of the Recreation Use and Facility Assessment in 2022.

- Continue implementation of the existing Cultural Resources Management Plan (CRMP) for continued protection of historic resources.

2.3 Average Annual Generation And Plant Factor

The Project's generation capacity is 2,150 kWh, with an average annual generation from 2017-2021 as shown in Table 2.2.

$$\frac{10{,}368 \text{ MWh/year}}{2.15 \text{ MW} \times 8{,}760 \text{ hrs/yr}} = 55.0\%$$

The Project has an average annual energy production of approximately 10,368 megawatt-hours (MWh) per year and an annual plant factor of approximately 55.0 percent based on its current capacity of 2.15 megawatts (MW). Table 2.2 provides monthly generation for 2019 through 2021.

Table 2.2 Monthly and Annual Generation (MWH) for the Gorham Project (January 2017 – December 2021)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
2019	1,285	1,082	963	1,006	1,138	1,212	974	518	309	640	929	571	10,626
2020	825	1,236	1,347	1,227	1,265	911	1,314	756	442	979	1,002	1,237	12,542
2021	1,145	1,109	936	1,222	842	452	426	306	308	293	585	896	8,522
Average	1,085	1,142	1,082	1,152	1,082	858	905	527	353	637	839	901	10,563

Dependable capacity is generally defined as the amount of load a hydroelectric plant can carry under adverse hydrologic conditions during a period of peak demand, for example during low flow conditions typical of August. The dependable capacity ratings as identified in the ISO New England 2021 Capacity, Energy, Loads, and Transmission (CELT) Report are 1.7 MW for the winter and 1.1 MW for the summer.

2.4 Estimated Average Head

The Project is operated as run-of-river. The normal operating head for the Project is 18 feet.

2.5 Flow Data

2.5.1 Hydraulic Capacity of the Project

The total maximum hydraulic capacity of the Gorham Project generating units is 2,800 cfs, at an operating head of approximately 18 feet.

2.5.2 River Flow Data

River flow data for the Gorham Project was generated from USGS gage No. 01054000 (Androscoggin River near Gorham, New Hampshire) for the period January 1991 through December 2020; the USGS gage is approximately 4.5 river miles upstream of the Gorham Project. Data from the USGS gage were pro-rated by a factor of 1.03 to account for the additional drainage area at the Gorham Project.

The minimum, maximum and average annual river flows of the Androscoggin River at the Gorham Project are estimated to be 807 cfs; 20,597 cfs and 2,903 cfs, respectively (Table 2.3). The maximum monthly flow typically occurs in April, and the minimum monthly flow is typically in September (Table 2.3). The peak flow (22,667 cfs) occurred on April 30, 1923, and the minimum flow (807 cfs) occurred September 4, 2015. Annual and monthly flow duration curves for the Gorham Project are presented in Appendix A.

Table 2.3 Pro-rated Daily Mean, Median, Minimum, and Maximum river flows by Month for the Gorham Project (January 1991 through December 2020).

Month	Minimum flow (cfs)	Maximum flow (cfs)	Average flow (cfs)
January	1,294	6,521	2,734
February	1,314	7,193	2,866
March	1,304	14,697	3,172
April	1,314	20,597	4,917
May	1,428	16,767	4,262
June	1,180	13,248	2,962
July	977	10,661	2,390
August	1,128	10,350	2,026
September	807	10,071	1,904
October	1,056	15,525	2,370
November	1,180	10,350	2,641
December	1,201	10,133	2,617

3.0 ORIGINAL COST OF EXISTING UNLICENSED FACILITIES

This section is not applicable to the Gorham Hydroelectric Project because CRP NH Gorham LLC is not applying for an initial (original) license.

4.0 ESTIMATED AMOUNT PAYABLE UPON TAKEOVER PURSUANT TO SECTION 14 OF THE FEDERAL POWER ACT

Under Section 14(a) of the Federal Power Act (FPA), the federal government may take over any project licensed by the Federal Energy Regulatory Commission (FERC or Commission) upon the expiration of the original license. The Commission may also issue a new license in accordance with Section 15(a) of the FPA. If such a takeover were to occur upon expiration of the current license, the Licensee would have to be reimbursed for the net investment, not to exceed fair value, of the property taken, plus severance damages. To date, no agency or interested party has recommended a federal takeover of the Gorham Project pursuant to Section 14 of the FPA.

4.1 Fair Value

The fair value of the Project depends on prevailing power values and license conditions, both of which are currently subject to change. The best approximation of fair value is likely to be the cost to construct and operate a comparable power generating facility. Because of the high capital costs involved with constructing new facilities and the increase in fuel costs associated with operating such new facilities (assuming a fossil-fueled replacement), the fair value would be considerably higher than the net investment amount. If a takeover of the Gorham Project were to be proposed, the Licensee would calculate fair value based on then-current conditions.

4.2 Net Investment

The net book investment for the Gorham Project is approximately $3,678,076[2] as of the end of 2021.

[2] The Gorham Hydroelectric Project was purchased as part of the Public Service of New Hampshire (PSNH) portfolio of assets; individual assets were not assigned individual costs at the time of purchase. The costs herein are prorated from the total portfolio costs and are approximations.

4.3 Severance Damages

Severance damages are determined either by the cost of replacing (retiring) equipment that is "dependent for its usefulness upon the continuance of the License" (Section 14, FPA), or the cost of obtaining an amount of power equivalent to that generated by the Project from the least expensive alternative source, plus the capital cost of constructing any facilities that would be needed to transmit the power to the grid, minus the cost savings that would be realized by not operating the Project. These values would be calculated based on power values and license conditions at the time of Project takeover.

5.0 ESTIMATED ANNUAL COSTS OF THE PROJECT

This section describes the approximate annual costs of the Project. The estimated average annual operation and maintenance cost of the Project over the period 2019 through 2021 is $354,878. This estimate includes costs associated with existing project operations and maintenance[3], as well as local property and real estate taxes, but excludes income taxes, depreciation, and costs of financing.

5.1 Land and Water Rights

The Licensee is proposing no expansion of its land or water rights as a consequence of this license application.

5.2 Cost of New Facilities

The Licensee is not proposing any capacity-related developments at the Gorham Project at this time.

5.2.1 Capital Costs

Actual capital costs are based on a combination of funding mechanisms that includes stock issues, debt issues, revolving credit lines, and cash from operations.

5.3 Taxes

Property taxes for 2021 were approximately $137,860. Income taxes for the Project are incorporated into costs of the CRP's consolidated business and are not separated out for the Project.

5.4 Depreciation and Amortization

The annualized composite rate of depreciation for the Project is approximately 5%.

5.5 Operation and Maintenance Expenses

The estimated annual operation and maintenance expense at the Project for 2021 was approximately $326,425 including corporate support costs.

[3] Including major maintenance costs

5.6 Costs to Develop the License Application

The total estimated cost of relicensing the Project is costs to date are approximately $300,000.

5.6.1 Costs of Proposed Environmental Measures

CRP is proposing no modifications of the existing Project facilities. CRP proposes to continue the existing licensed mode of project operations. CRP proposes the following PMEs to benefit resources in the Gorham Project area:

- Continue to provide a minimum flow of 200 cfs or inflow, whichever is less, to the bypassed reach of the Androscoggin River for the protection and enhancement of aquatic resources.
- Continue to operate the Project as a run-of-river facility, which is protective of environmental resources.
- Implement an updated Operations Compliance Plan for the Project.
- Continue providing recreational use of the existing Gorham hand carry boat access and canoe portage; Details of future recreation management will be developed following completion of the Recreation Use and Facility Assessment in 2022.
- Continue implementation of the existing Cultural Resources Management Plan (CRMP) for continued protection of historic resources.

6.0 ESTIMATED ANNUAL VALUE OF PROJECT POWER

Power generated by the Gorham Project is sold to the regional grid at prevailing market rates. The Licensee estimates gross annual energy production of approximately 10,368 megawatt-hours (MWh). The average market clearing price for energy can be estimated based on the ISO New England website.

7.0 SOURCES AND EXTENT OF FINANCING

The Licensee's current financing needs are generated from internal funds. The Licensee is likely to finance major enhancements through earnings retention, equity contributions, and loans made by the corporate parent or some combination of those mechanisms.

8.0 MEASURES TAKEN OR PLANNED TO ENSURE SAFE MANAGEMENT, OPERATION, AND MAINTENANCE OF THE PROJECT

CRP NH Gorham, LLC has developed, according to FERC's Guidelines for Public Safety at Hydropower Projects, Public Safety Plans for the Gorham Project, which are revised on a regular basis as conditions warrant. These plans (and revisions) are reviewed and accepted by the FERC New York Regional Office. CRP NH Gorham, LLC operates the Project consistent with its commitment to public and employee safety. Additional details of Licensee safety programs are provided in Exhibit H.

9.0 INCREASE OR DECREASE IN PROJECT GENERATION

No changes to Project operations are proposed. Therefore, there are no anticipated changes to the Project's average annual generation.

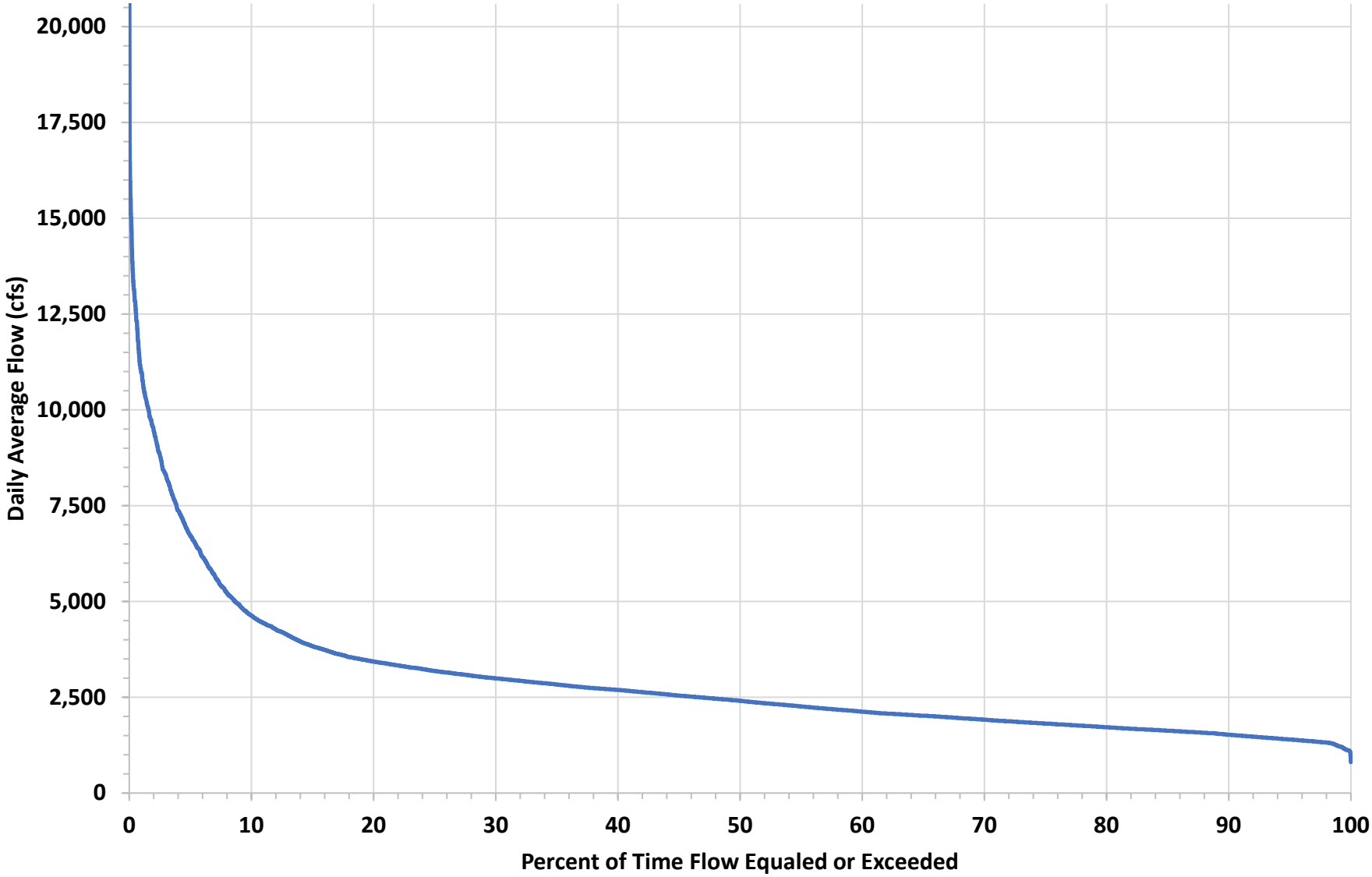
APPENDIX A

FLOW CURATION CURVES

Gorham Hydroelectric Project - Annual Flow Duration Curve

Prorated (x1.0354) from USGS Gage # 01054000 Androscoggin River near Gorham, NH

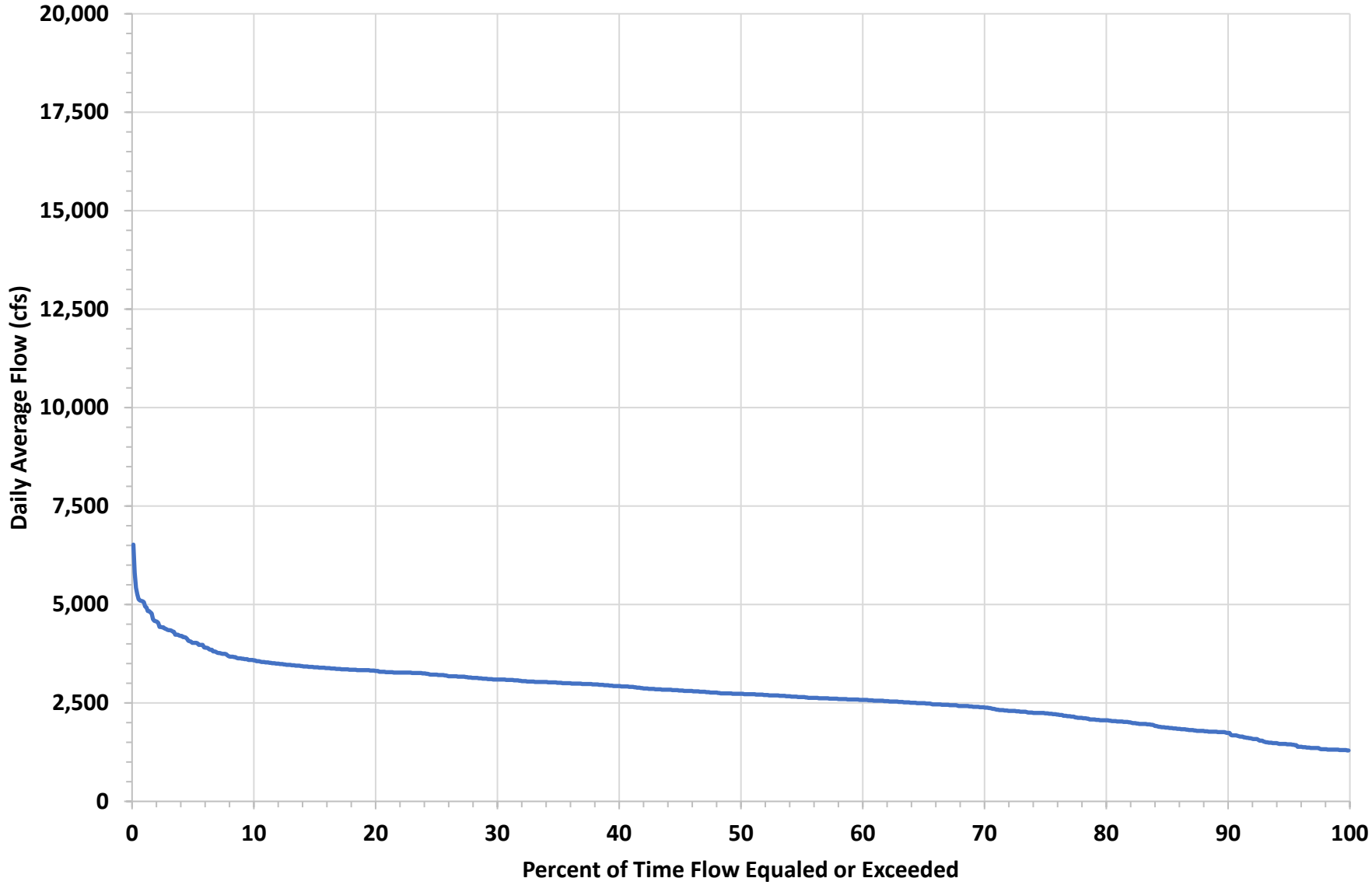
Period of Record January 1, 1991 to December 31, 2020

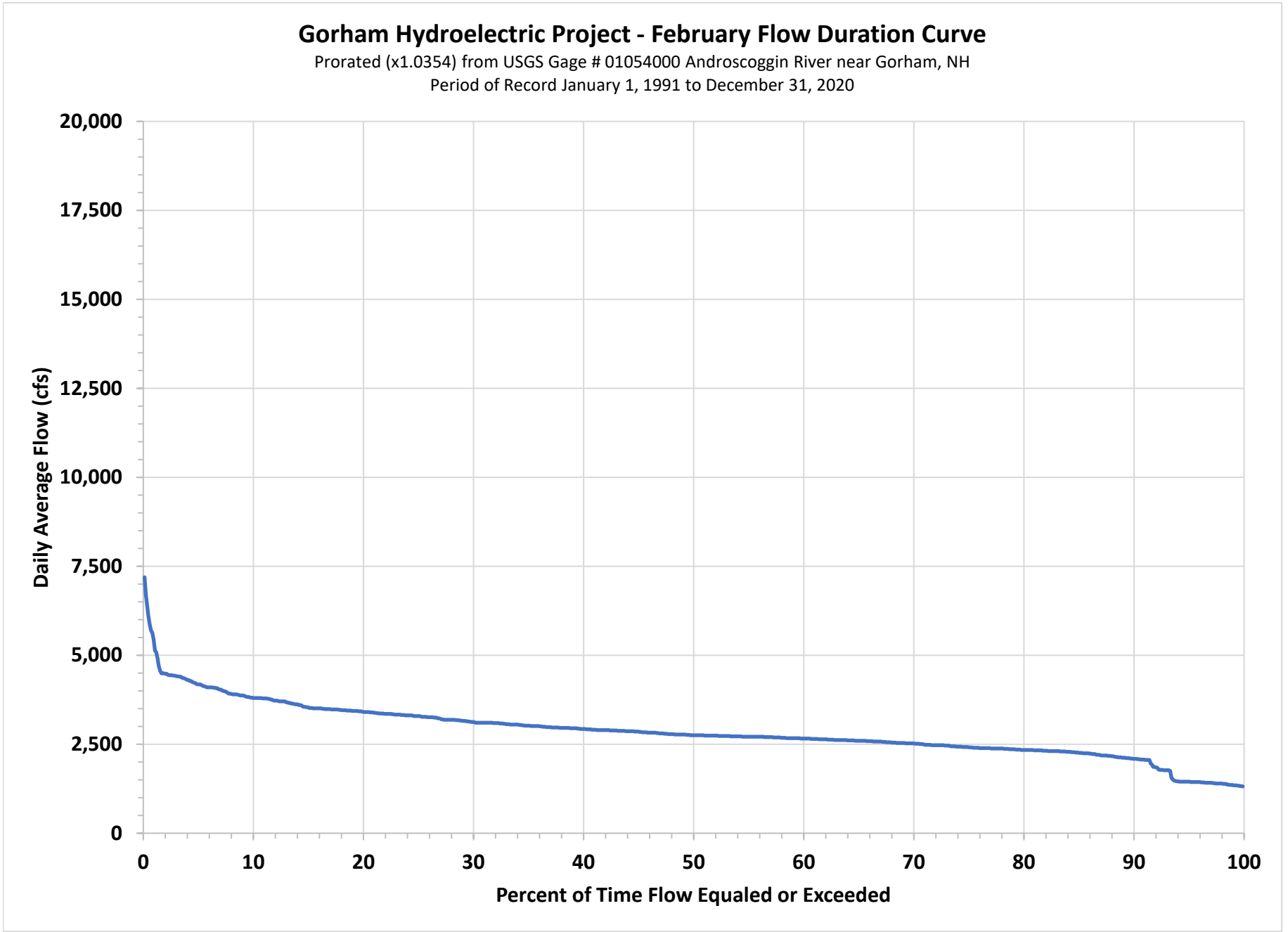


Gorham Hydroelectric Project - January Flow Duration Curve

Prorated (x1.0354) from USGS Gage # 01054000 Androscoggin River near Gorham, NH

Period of Record January 1, 1991 to December 31, 2020

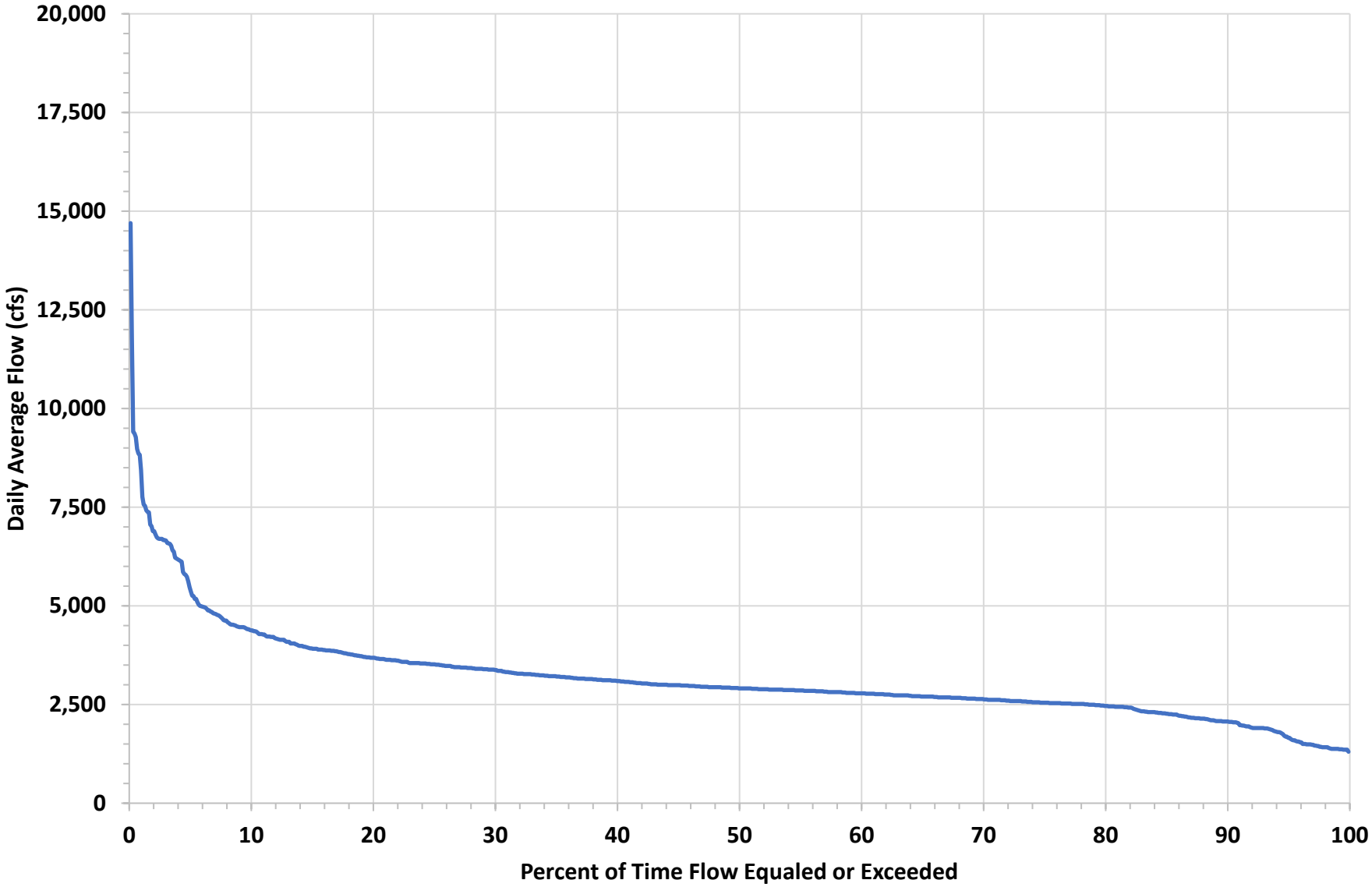


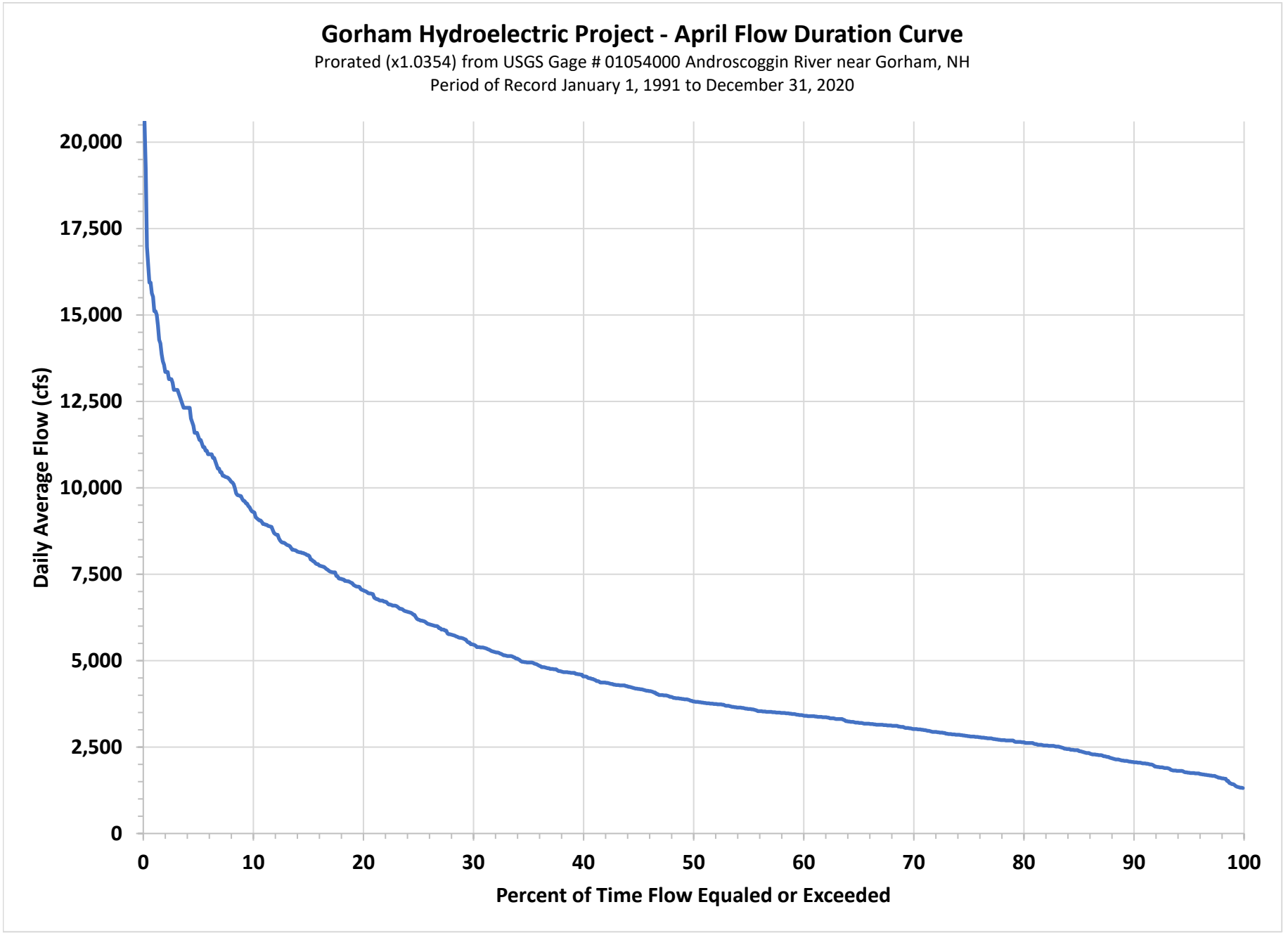

Gorham Hydroelectric Project - February Flow Duration Curve
Prorated (x1.0354) from USGS Gage # 01054000 Androscoggin River near Gorham, NH
Period of Record January 1, 1991 to December 31, 2020
Daily Average Flow (cfs)
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

Gorham Hydroelectric Project - March Flow Duration Curve

Prorated (x1.0354) from USGS Gage # 01054000 Androscoggin River near Gorham, NH

Period of Record January 1, 1991 to December 31, 2020

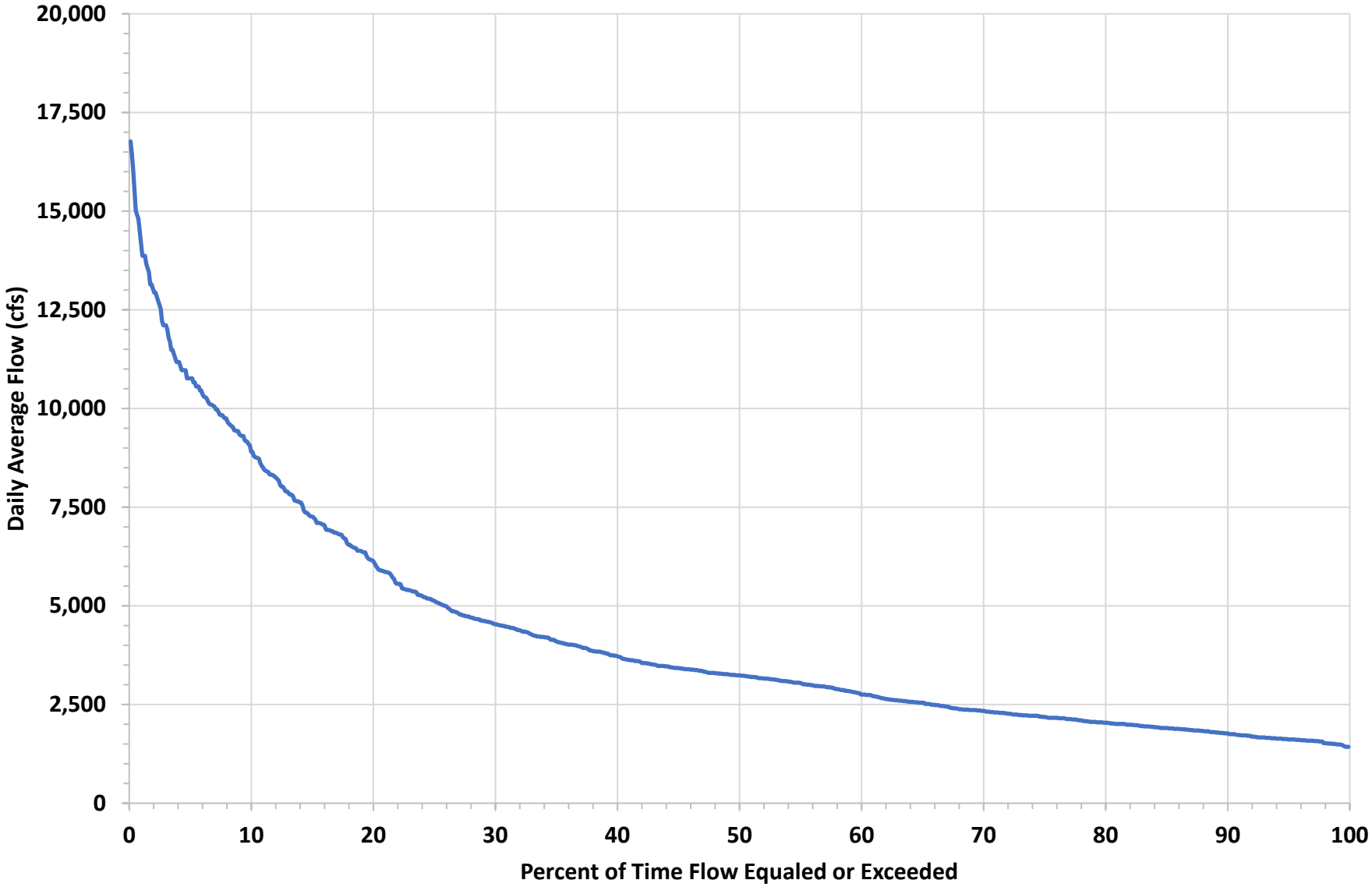


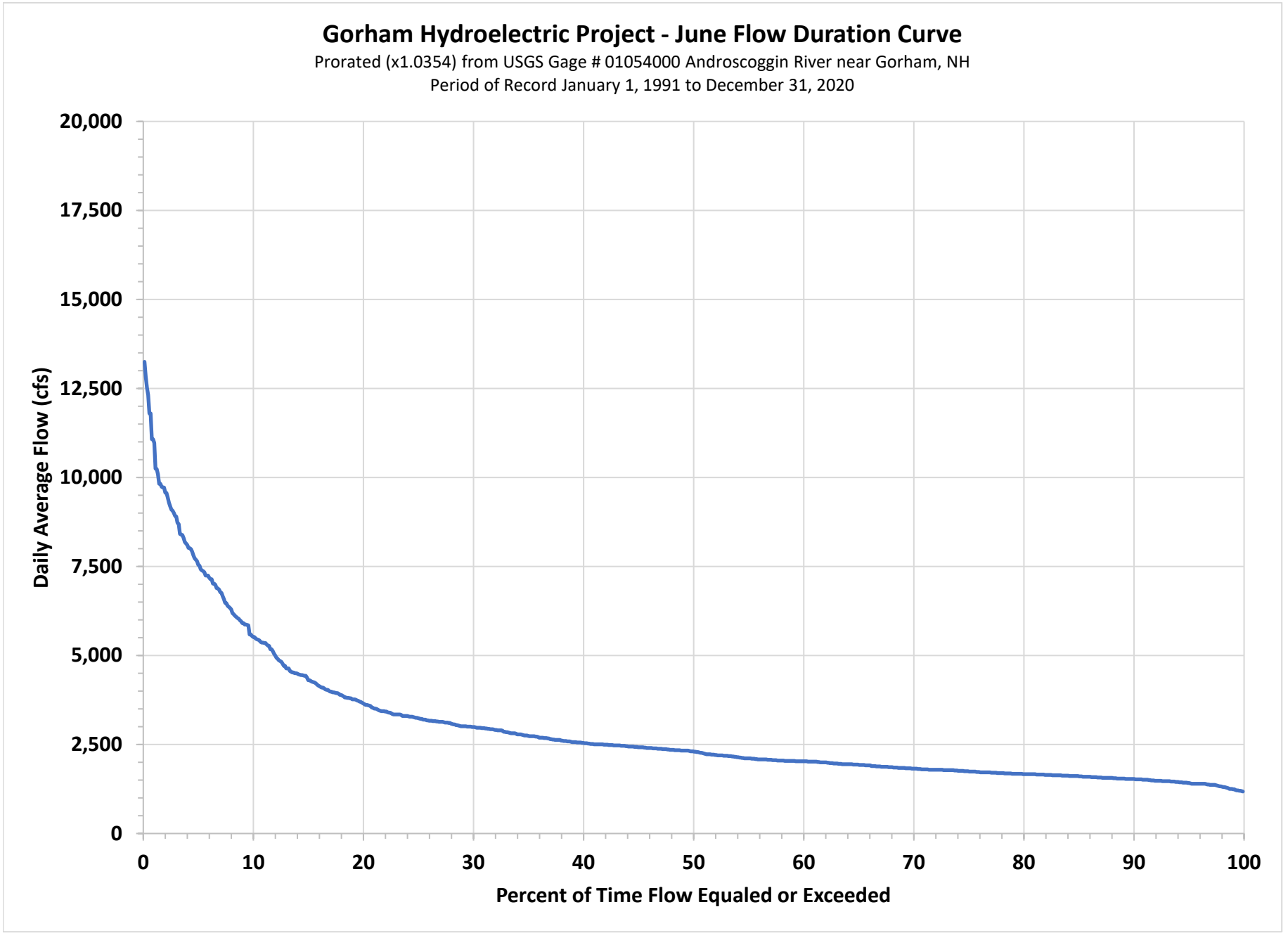

Gorham Hydroelectric Project - April Flow Duration Curve
Prorated (x1.0354) from USGS Gage # 01054000 Androscoggin River near Gorham, NH
Period of Record January 1, 1991 to December 31, 2020
Daily Average Flow (cfs)
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

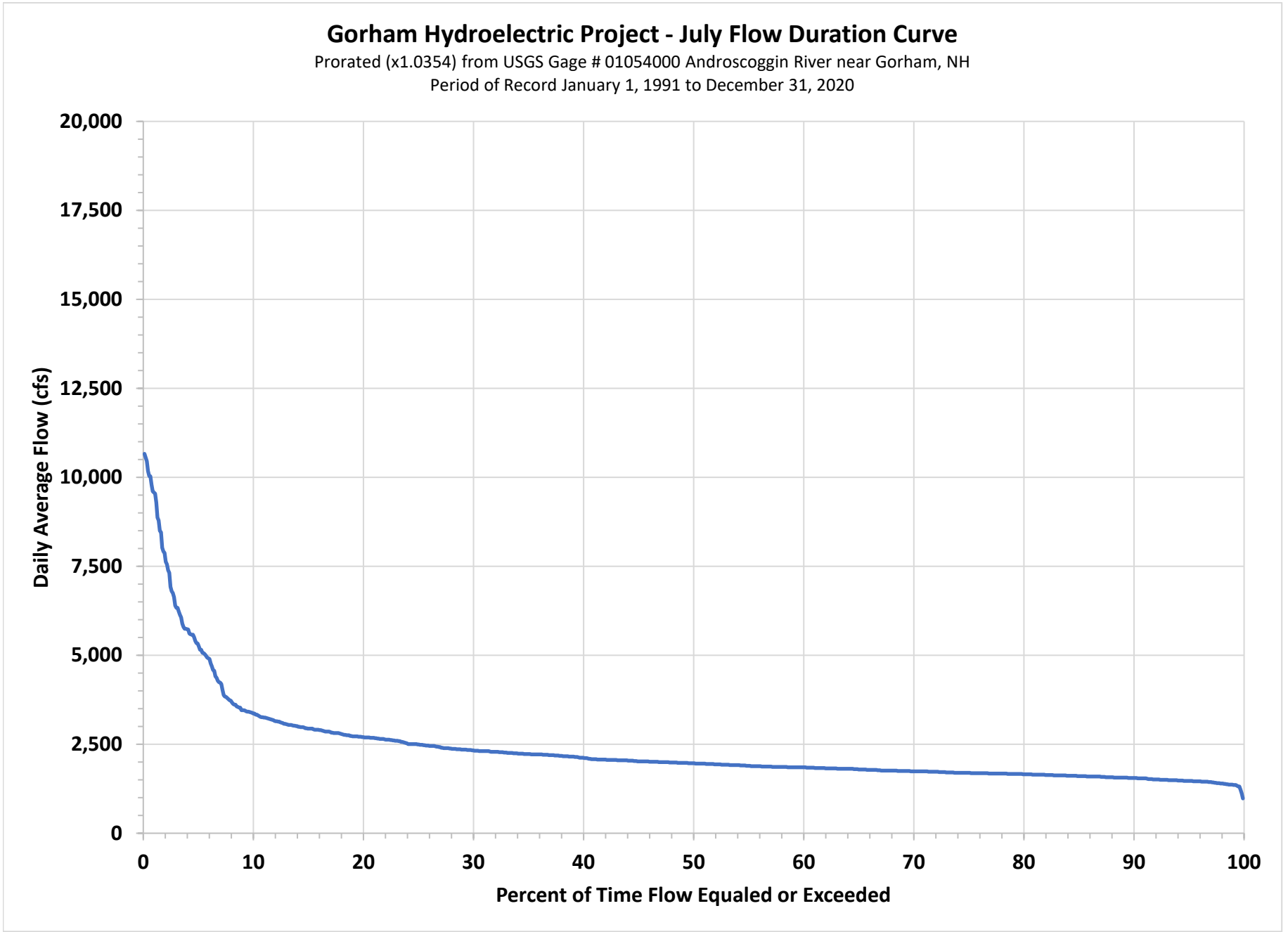
Gorham Hydroelectric Project - May Flow Duration Curve

Prorated (x1.0354) from USGS Gage # 01054000 Androscoggin River near Gorham, NH

Period of Record January 1, 1991 to December 31, 2020



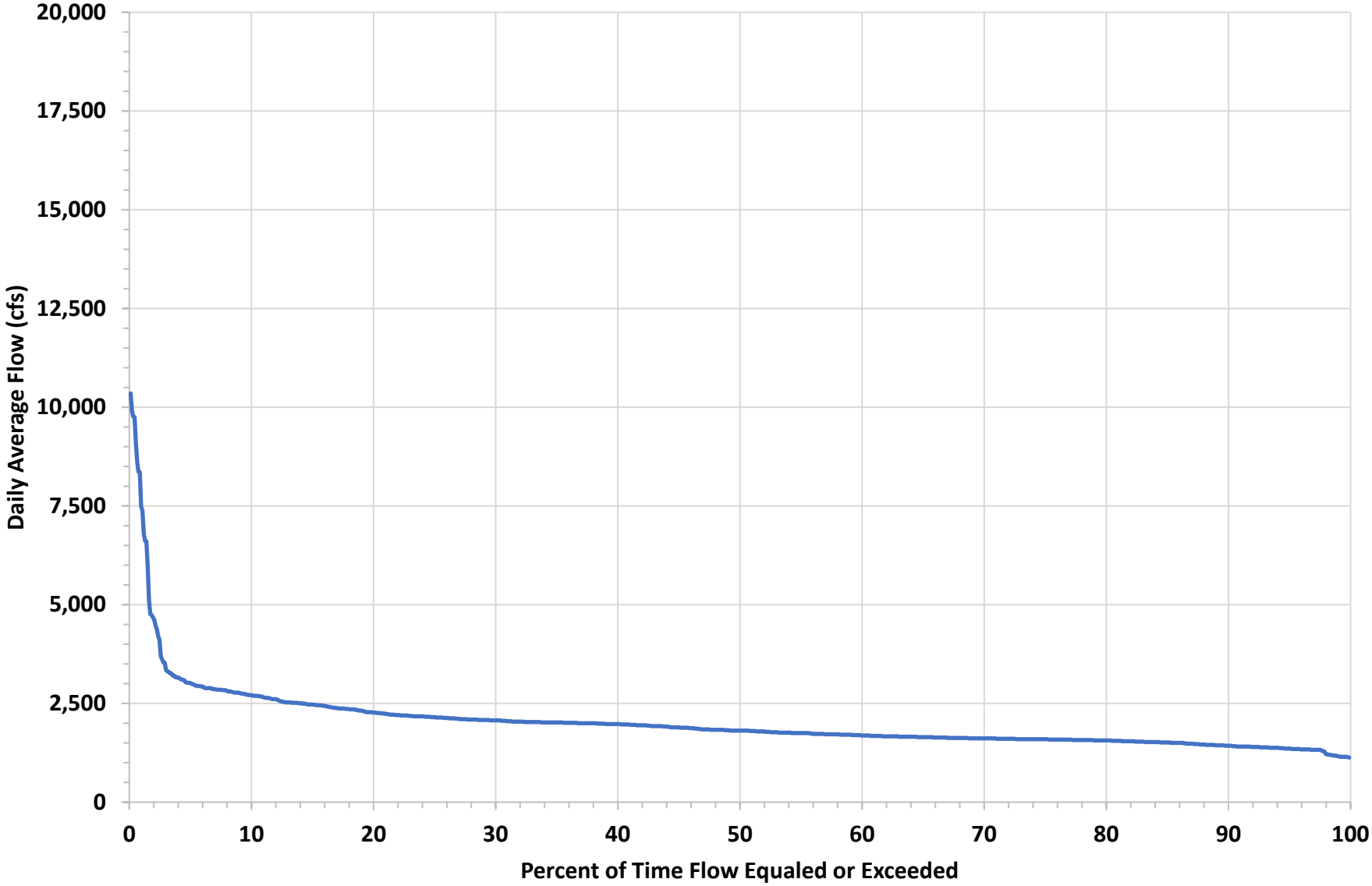

Gorham Hydroelectric Project - June Flow Duration Curve
Prorated (x1.0354) from USGS Gage # 01054000 Androscoggin River near Gorham, NH
Period of Record January 1, 1991 to December 31, 2020
Daily Average Flow (cfs)
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

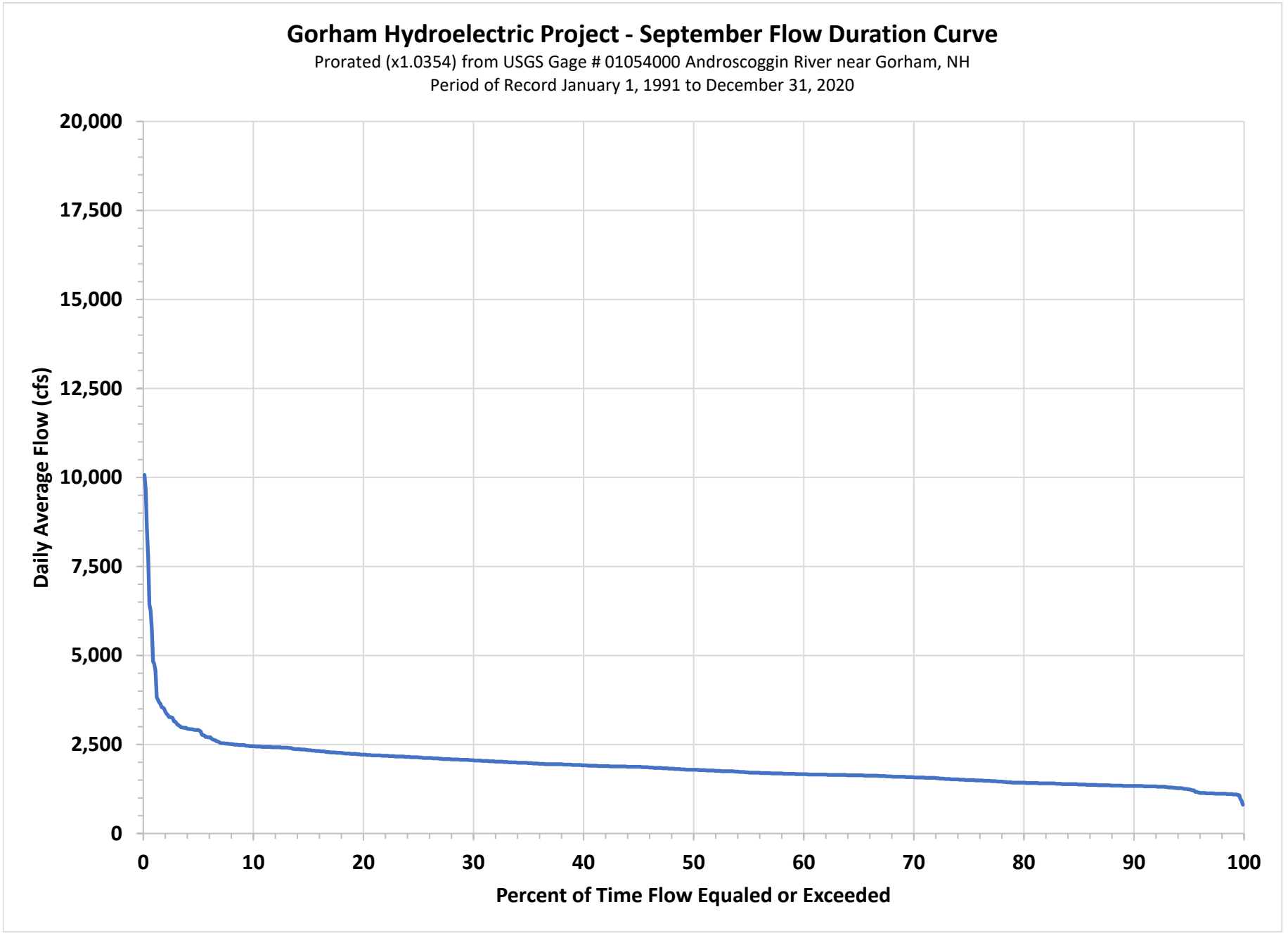

Gorham Hydroelectric Project - July Flow Duration Curve
Prorated (x1.0354) from USGS Gage # 01054000 Androscoggin River near Gorham, NH
Period of Record January 1, 1991 to December 31, 2020
Daily Average Flow (cfs)
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

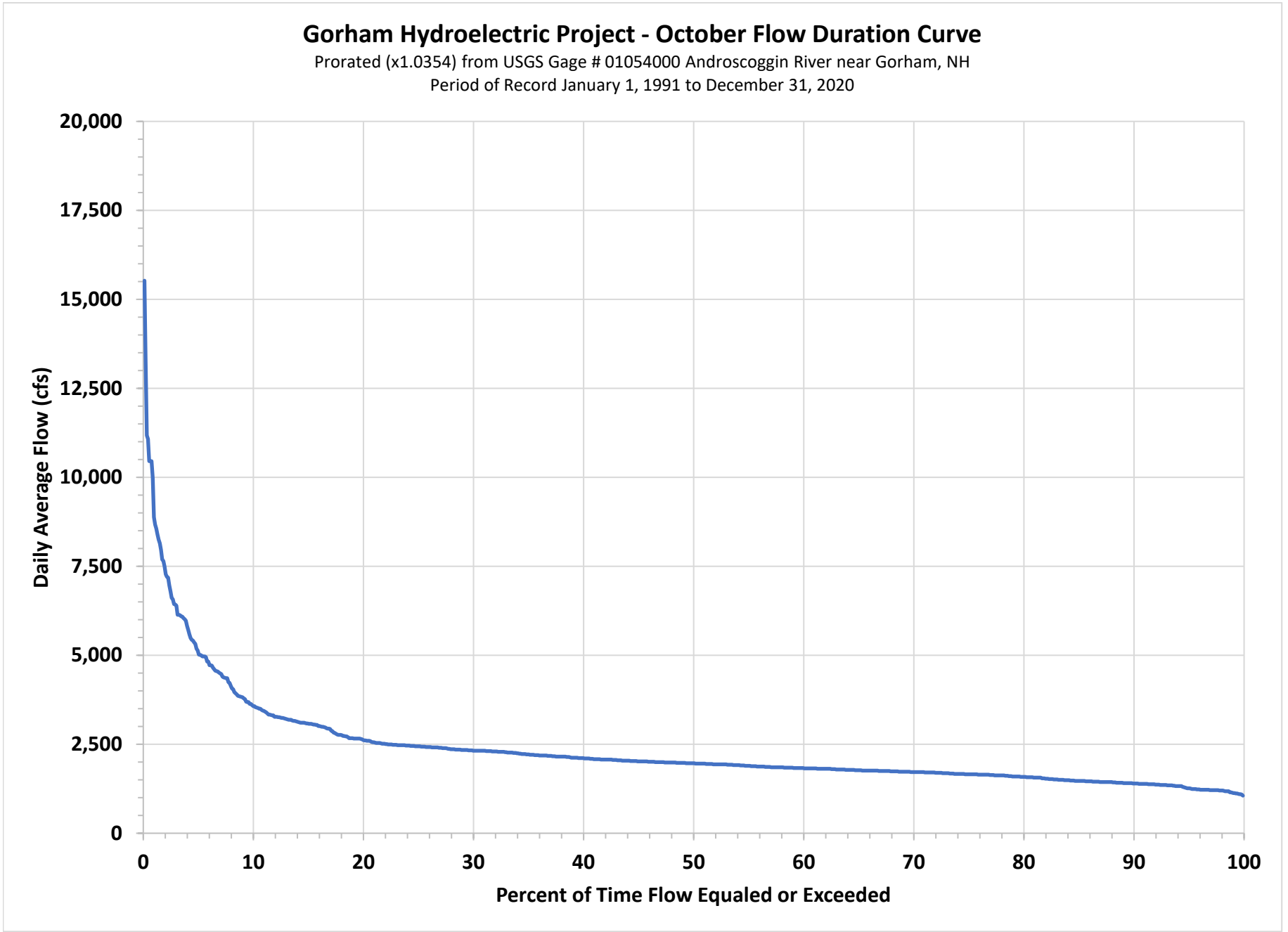
Gorham Hydroelectric Project - August Flow Duration Curve

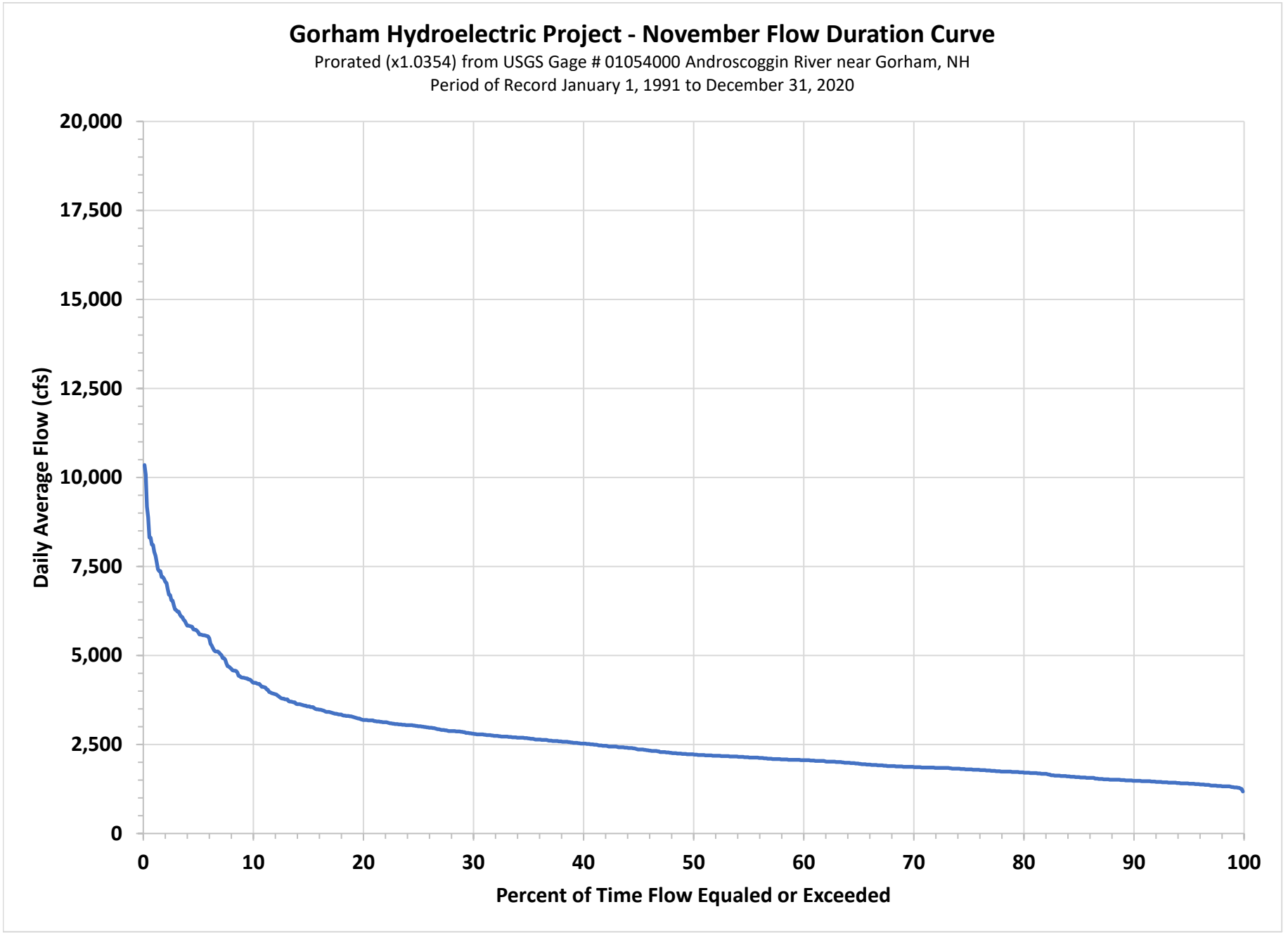
Prorated (x1.0354) from USGS Gage # 01054000 Androscoggin River near Gorham, NH

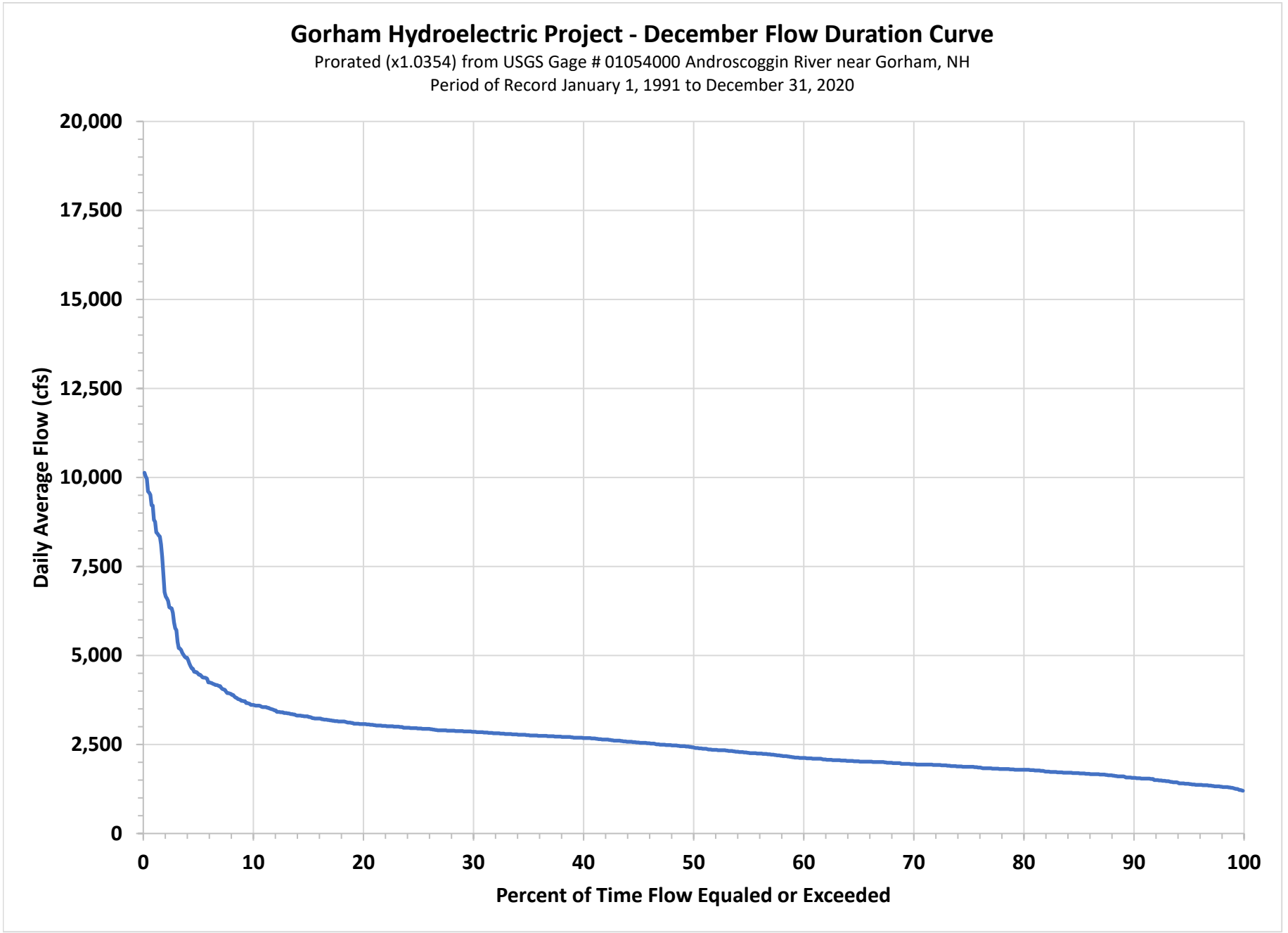
Period of Record January 1, 1991 to December 31, 2020




Gorham Hydroelectric Project - September Flow Duration Curve
Prorated (x1.0354) from USGS Gage # 01054000 Androscoggin River near Gorham, NH
Period of Record January 1, 1991 to December 31, 2020
Daily Average Flow (cfs)
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


Gorham Hydroelectric Project - October Flow Duration Curve
Prorated (x1.0354) from USGS Gage # 01054000 Androscoggin River near Gorham, NH
Period of Record January 1, 1991 to December 31, 2020
Daily Average Flow (cfs)
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


Gorham Hydroelectric Project - November Flow Duration Curve
Prorated (x1.0354) from USGS Gage # 01054000 Androscoggin River near Gorham, NH
Period of Record January 1, 1991 to December 31, 2020
Daily Average Flow (cfs)
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


Gorham Hydroelectric Project - December Flow Duration Curve
Prorated (x1.0354) from USGS Gage # 01054000 Androscoggin River near Gorham, NH
Period of Record January 1, 1991 to December 31, 2020
Daily Average Flow (cfs)
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

GORHAM HYDROELECTRIC PROJECT

PROJECT NO. 2288

EXHIBIT E

ENVIRONMENTAL REPORT

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LIST OF ACRONYMS

APE	Area of potential effect
°C	Degrees Celsius
Commission	Federal Energy Regulatory Commission
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CZMA	Coastal Zone Management Act
DLA	Draft. License Application
DO	Dissolved Oxygen
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FLA	Final License Application
FPA	Federal Power Act
ft/s	Feet per second
IPaC	Information for Planning and Conservation
Licensee	CRP NH Gorham, LLC
Magnuson-Stevens Act	Magnuson Fishery Conservation and Management Act
mg/L	Milligrams per liter
MW	Megawatt
NHB	New Hampshire Natural Heritage Bureau
NGOs	Non-governmental organizations
NHPA	National Historic Preservation Act
NOAA Fisheries	National Oceanographic and Atmospheric Administration
NOI	Notice of Intent
NRHP	National Register of Historic Places
PAD	Pre-Application Document
PME	Protection, mitigation and enhancement
Project	Gorham Hydroelectric Project
RTE	Rare, Threatened and Endangered
USDA	U.S. Department of Agriculture
USFWS	U.S. Department of the Interior Fish and Wildlife Service
USGS	U.S. Geological Survey
WQC	Water Quality Certification

1.0 INTRODUCTION

1.1 Application

Central Rivers Power NH, LLC (or "Licensee") is the licensee for the 2.15 megawatt (MW) Gorham Hydroelectric Project (Project) (FERC Project No. 2288). The Project is located on the Androscoggin River in northern New Hampshire within the Town of Gorham, Coos County (Figure 2.1). There are no lands of the United States within the GLHA NH Project boundary. The Smith Project is one of eight hydroelectric projects within an 11-mile reach of the Androscoggin River between Berlin and Shelburne, New Hampshire (FERC 1993). There are five hydroelectric projects within 8 miles upstream of the Gorham Project; GLHA's Shelburne Project is approximately 2.8 miles downstream of the Gorham Project.

The Federal Energy Regulatory Commission (FERC) issued a license under the Federal Power Act (FPA) for the Project in 1994. The license for the Project expires on July 31, 2024. CRP NH Gorham, LLC is pursuing a new license for the Project under FERC's Integrated Licensing Process (ILP).

The purpose of this Environmental Exhibit is to: (1) describe the existing and proposed project facilities, lands, and waters; (2) describe existing and proposed project operations and maintenance; and (3) provide an analysis of the effects of the proposed relicensing on environmental resources identified during scoping, potentially affected by the relicensing, including the effects of any proposed protection, mitigation, and enhancement (PME) measures for each resource area.

1.2 Purpose of Action and Need for Power

FERC must decide to issue a license for the continued operation of the Gorham Project and what conditions, if any, should be included. In addition to power and developmental purposes, FERC must give equal consideration to energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Issuing a license for the Project would allow CRP NH Gorham, LLC to generate electricity for the term of a new license. The Project is operated to produce hydroelectric power which is sold to the ISO New England administered market.

1.3 Statutory and Regulatory Requirements

1.3.1 Federal Power Act

Issuance of a new license for the Gorham Project is subject to requirements under the FPA and other federal statutes. Requirements applicable to this Final License Application (FLA) are summarized below.

1.3.1.1 Section 18 Fishway Prescriptions

Under Section 18 of the FPA, the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) have the authority to prescribe fishways at federally regulated hydropower projects. As described in Section 3.4, Fish and Aquatic Resources, the Gorham Project area is a considerable distance upstream of the natural range of migratory fish species. No upstream or downstream fish passage facilities exist at the Project or at any other hydroelectric project in the upper Androscoggin River.

1.3.1.2 Section 4(e) Conditions

Section 4€ of the FPA requires that any license issued by FERC for a hydroelectric project within a federal reservation shall be subject to and contain such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation. The Gorham Project does not occupy any federal lands; therefore, these conditions do not apply.

1.3.1.3 Section 10(j) Recommendations

Under Section 10(j) of the FPA, FERC must consider recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the Gorham Project prior to issuing a new license. FERC will include these conditions in any new license unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law.

1.3.2 Section 401 of the Clean Water Act

Section 401 of the Clean Water Act (CWA) requires CRP NH Gorham, LLC to obtain certification from the appropriate state pollution control agency verifying compliance with the CWA or to obtain a waiver of certification. The New Hampshire Department of Environmental Services (NHDES) is the agency responsible for water quality certifications for the Gorham Project. CRP NH Gorham, LLC will request water quality certification

(WQC) from the NHDES in accordance with 18 Code of Federal Regulations (CFR) §5.23(b) within 60 days of FERC's issuance of notice of acceptance of the Final License Application (FLA) and REA.

1.3.3 Endangered Species Act

The Endangered Species Act (ESA) (19 United States Code [USC] § 1536(c)), as amended, provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The lead federal agencies for implementing ESA are the USFWS and the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service. Section 7 of the ESA requires federal agencies, in consultation with the USFWS or NOAA to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. On September 19, 2019, FERC granted CRP NH Gorham, LLC designation as the FERC's non-federal representative for carrying out consultation pursuant to Section 7 of the ESA. No federally listed species are known to occur within the Gorham Project area. See additional discussion in Section 3.7, Threatened, Endangered, and Special Status Species.

1.3.4 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires the NMFS to describe and identify essential fish habitat (EFH) in federal fishery management plans for commercial species. The Magnuson-Stevens Act requires federal agencies to consult with NMFS when any activity is proposed to be permitted, funded, or undertaken by a federal agency may have adverse effects on designated EFH. The upper Androscoggin River does not have any commercially-managed fish species; therefore, EFH is not designated.

1.3.5 Coastal Zone Management Act

Under Section 307 (c)(3)(A) of the Coastal Zone Management Act (CZMA), FERC cannot issue a license for a hydroelectric project within or affecting a states' coastal zone unless the state's CZMA agency concurs with the applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification. On January 18, 2022,

CRP NH Gorham, LLC requested confirmation from the New Hampshire Coastal Program (NHCP) that the Gorham Project is not included within the jurisdiction of the NHCP. NHCP confirmed that the Project is outside the New Hampshire coastal zone and the relicensing of the Gorham Project by FERC is not subject to CZMA Federal consistency review by the New Hampshire Coastal Program (Appendix A).

1.3.6 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA), as amended, requires FERC to consider the effect of its undertakings on historic properties. Historic properties are any prehistoric or historic districts, sites, buildings, structures, Traditional Cultural Properties (TCPs), and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the National Register of Historic Places (NRHP). Section 106 of the NHPA is implemented through the Advisory Council on Historic Preservation (Council regulations "Protection of Historic Properties" (36 CFR Part 800). On September 19, 2019, FERC granted CRP NH Gorham, LLC designation as the FERC's non-federal representative for carrying out consultation with the State Historic Preservation Officer, as required by section 106, National Historic Preservation Act, and the implementing regulations of the Advisory Council on Historic Preservation at 36 CFR 800.2.

1.3.7 Wild and Scenic Rivers and Wilderness Acts

Section 7(a) of the Wild and Scenic Rivers Act requires federal agencies to decide whether the operation of a hydroelectric project under a new license would unreasonably diminish the scenic, recreational, or fish and wildlife values present in the designated area. The Wilderness Act of 1964 established a National Wilderness Preservation System. The Androscoggin River within the Gorham vicinity is not a nationally designated wild and scenic river or wilderness area.

1.4 Public Review and Consultation

The Commission requires that applicants consult with appropriate resource agencies, tribes, and other entities before filing an application for a new license. Pursuant to 18 CFR § 5.18(b)(5)(G), a distribution list of names and addresses of every federal, state, and interstate resource agency, Native American tribe, and member of the public with which the Licensee consulted in preparation of this Environmental Document is provided in

Appendix A. The following subsections summarize the key relicensing consultation conducted as part of the ILP for the Gorham Project

1.4.1 Scoping

On July 26, 2019, CRP NH Gorham, LLC filed Notice of Intent (NOI) and a Pre-application Document (PAD) with FERC to initiate the ILP and consultation with federal and state agencies, tribes, non-governmental organizations (NGOs) and other interested parties (i.e., those on the distribution list, Appendix A). On September 18, 2019, FERC issued notice that the PAD and NOI had been filed, the commencement of the pre-filing process, and requested comments and study requests. FERC issued Scoping Document 1 (SD1) on September 18, 2019, and Scoping Document 2 (SD2) on January 20, 2020. On October 22 and 23, 2019, FERC held agency and public scoping meetings for the Gorham Project. Comments on the PAD and study requests were due on November 23, 2019

1.4.2 Relicensing Studies

On January 7, 2020, CRP NH Gorham, LLC filed a Proposed Study Plan (PSP) with FERC and provided notification of the filing to agencies and stakeholders. On February 6, 2020, pursuant to 18 CFR 5.11(e), the Licensees held a PSP meeting to clarify the intent and contents of the PSP and identify any outstanding issues with respect to the PSP. Comments on the PSP were due to FERC within 90 days of filing the PSP, on or before April 6, 2020.

On May 6, 2020, CRP NH Gorham, LLC filed a Revised Study Plan (RSP), and provided notification of the filing to agencies and stakeholders. On May 29, 2020, FERC issued the Study Plan Determination (SPD) approving six studies RSP. CRP successfully completed five studies, and one study – the recreation study – is ongoing. The results of these studies were provided in the Initial Study Report (ISR) (Table 1.1). Follow-up bypass flow gaging and habitat suitability data collection occurred in November 2021, where was reported in the USR, and summarized herein.

Table 1.1 List of Studies and Study Status

Study Report	Status
Water Quality and Bypass Reach Aquatic Habitat Study	Complete, water quality results in ISR, bypass reach aquatic habitat results were provided in USR
Botanical Resources Study	Complete, results in ISR
Historic Architectural Survey	Complete, results in ISR
Freshwater Mussel Survey	Complete, results in ISR
Desktop Impingement and Entrainment Study	Complete, results in ISR
Recreation Use and Facility Assessment Study	Ongoing through 2022

In accordance with 18 CFR § 5.15(c), CRP NH Gorham, LLC filed the ISR on June 7, 2021, and provided notification to agencies and stakeholders. CRP NH Gorham, LLC held the ISR meeting on June 22, 2021, and filed an ISR meeting summary with the FERC on July 7, 2021. Comments on the ISR were filed by FERC, the USFWS, and NHDES.

The USR was filed with FERC on June 6, 2022, followed by the USR meeting held on June 17, 2022. CRP NH Gorham, LLC filed as summary of the USR meeting on July 1, 2022. No comments or requests for new or modified studies were filed.

1.4.3 Draft License Application

The DLA was distributed on March 3, 2022. Comments were received from FERC (May 26, 2022) and NHDES (June 1, 2022), are summarized in Appendix A and addressed within the FLA Exhibits, as appropriate.

1.5 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act was originally enacted in 1940 (16 U.S.C 668-668d) to protect eagles from human-induced alterations and human interactions. As defined in 50 C.F.R, Part 22, permits are required for the "taking" (meaning to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb), possession, and transportation with the United States of bald eagles and golden eagles and their parts, nests, and eggs. Although bald eagles have been observed at the Project, the Licensee knows of no eagle nests within the Project boundary, and eagles were not raised as a resource issue of concern during consultation.

1.6 Federal Lands

There are no federal lands within the Project boundary.

1.7 References

Federal Energy Regulatory Commission (FERC). 1993. Final Environmental Impact Statement. Relicensing Seven Existing Projects in the Upper Androscoggin River Basin (FERC 2422-004, 2287-003, 2326-002, 2327-002, 2322-001, 2288-004, 2300-002).

USEPA 2021. United States Environmental Protection Agency (USEPA). 2021. 2020 Clean Water Act Section 401 Certification Rule. [Online] https://www.epa.gov/cwa-401/2020-clean-water-act-section-401-certification-rule-0. Accessed February 15, 2022.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 No Action Alternative

The No-Action Alternative is to continue to operate and maintain the Gorham Project under the terms and conditions of the current license. No new PME measures would be implemented and the current facilities, Project boundary, and operations would be maintained. The No-Action Alternative represents the baseline to which energy production and environmental conditions are compared to other alternatives. Because the Licensee is proposing no changes to the operation of the Project and facilities, the effects of the No-Action alternative are essentially identical to the effects of the proposed relicensing for each individual resource issue described in the Section 4.0, with the exception of proposed PME measures.

2.1.1 Existing Project Facilities

The Gorham Project consists of an impoundment with a surface area of 32 acres, dam, powerhouse, intake and conveyance system, tailrace, transmission line, and appurtenant facilities.

Exhibit A, Project Description, provides additional details about the existing Gorham Project facilities.

2.1.2 Project Safety

Exhibit H provides additional details regarding CRP NH Gorham, LLC's safety programs.

2.1.3 Existing Project Operations

The Project is operated as run-of-river (Article 401) with minimum impoundment fluctuations including maintaining the pond level within +/- 2 inches of the normal pond level setpoint of 97.1 feet (local datum[1]). Article 402 of the existing license requires a minimum flow of 200 Cubic feet per second (cfs) or inflow, whichever is less, into the project reservoir. The minimum flow is released through a lowered flashboard near the middle of the dam. The generating units are normally operated remotely by Customized Energy Solutions (CES) located in Philadelphia, Pennsylvania, although the units are also

[1] Equivalent to 772.53 NGVD 29 datum.

capable of local operation. Manual operations and maintenance of the J. Brodie Smith Project are performed by the Central Rivers Power NH, LLC Upper Hydro Group, which is also responsible for the Smit Project (FERC No. 228), upstream on the Androscoggin River and the Canaan Project (FERC No. 7528) located in northern New Hampshire on the Connecticut River. Daily logs of pond level, flow, and outages are maintained electronically for the Project

2.1.4 Existing Environmental Measures

Under the current license, CRP NH Gorham, LLC provides the following PME measures:

- Operates the project as run-of-river mode for the protection of fish and wildlife resources and water quality in the Androscoggin River.
- Continue to provide a minimum flow of 200 cfs or inflow to the project reservoir, whichever is less, for the protection and enhancement of fish and wildlife resources and water quality in the bypassed reach of the Androscoggin River.
- Implement the Shoreland Protection Plan at the project.
- Continued to provide public access to project lands, consistent with the existing public safety plan.
- Continued to operate and maintain all project recreational facilities.
- Continue to implement the provisions of the existing Cultural Resources Management Plan (CRMP).

2.2 Applicants Proposed Action

2.2.1 Proposed Project Facilities and Operations

CRP NH Gorham, LLC is proposing no modifications of the existing Project facilities or operations. No changes of these facilities that are outside normal maintenance practices or FERC's safety requirements are proposed. CRP NH Gorham, LLC proposes to continue the existing licensed mode of project operations. CRP NH Gorham, LLC is not proposing any changes to facilities or operations that would affect resources, and as such, for the purposes of the FLA, the No-Action Alternative is the same as the Proposed Action. See additional description of proposed measures in Section 2.2.2, Proposed Environmental Measures.

2.2.2 Proposed Environmental Measures

CRP NH Gorham, LLC proposes the following PMEs to benefit resources in the Gorham Project area:

- Continue to provide a minimum flow of 200 cfs or inflow to the project reservoir, whichever is less, to the bypassed reach, for the protection and enhancement of aquatic resources.
- Continue to operate the Project as a run-of-river facility, which is protective of environmental resources.
- Implement an updated Operations Compliance Plan for each of the project.
- Continue to maintain and provide recreational use of the existing recreation facilities; Details of future recreation management will be developed following completion of the Recreation Use and Facility Assessment in 2022.
- Continue implementation of the existing CRMP for continued protection of historic resources.

2.3 Alternatives Considered but Eliminated from Further Analysis

2.3.1 Federal Government Takeover of the Project

No party has suggested that federal takeover of the Project would be appropriate, and no federal agency has expressed an interest in operating the Project. Federal takeover of the Project would require congressional approval. Moreover, there is no evidence that indicates a federal takeover should be recommended to Congress. Thus, the federal takeover of the Project is not a reasonable alternative and has not been considered in this analysis.

2.3.2 Issuing a Non-Power License

A non-power license is not a reasonable alternative to a new license with continuing PME measures and has not been considered in this analysis. A non-power license has not been sought by any party. As such, there is no basis for concluding that the Gorham Project should no longer be used to produce power.

2.3.3 Decommissioning the Gorham Project

The Gorham Project provides a viable, safe, and clean renewable source of power to the region, and it provides recreational opportunities to the public. If the Gorham Project were

decommissioned, its contribution to renewable energy and recreation would cease. Decommissioning or license denial is not a reasonable alternative and has not been considered in this analysis

2.4 Existing Project Boundary

The existing FERC project boundary for the Gorham Project is in Figure 2.1. CRP NH Gorham, LLC is proposing to remove 1.84 acres from the project boundary adjacent to the Route 2 access road and recreational parking area (which will be retained and remain open to the public). This parcel serves no project purpose and is informally utilized and periodically mowed by the Gorham Public Works Department.

Figure 2.1 Gorham Project Boundary

3.0 ENVIRONMENTAL ANALYSIS

3.1 General Description of the River Basin

3.1.1 River Basin Overview

The Androscoggin River begins in northwestern Maine at Umbagog Lake, crosses into northern New Hampshire, then re-enters Maine near Bethel, eventually joining the Kennebec River at Merrymeeting Bay in coastal Maine (Figure 3.1). The Androscoggin River drops 1000-feet from its headwaters to the Atlantic Ocean, with an average descent of 8-feet per mile. The watershed has a total drainage area of 3,450-square-miles, with 720-square-miles of drainage in New Hampshire (Maine Rivers 2022). The watershed can be broken into two sections, the upper and lower Androscoggin River watersheds. The Project is within the upper Androscoggin River watershed (Figure 3.1). The Gorham Project is one of eight hydroelectric projects within an 11-mile-long, high gradient reach of the river between Berlin and Shelburne, New Hampshire, with concentrated hydropower development. The river gradient from the most upstream project, Great Lakes Hydro America's (GLHA) Sawmill to the most downstream project, GLHA's Shelburne is approximately 30 feet per mile, which provides excellent conditions for hydroelectric power generation. The drainage area at the Gorham Project is approximately 1,402-square-miles. Important tributaries in the Project area include the Dead River, which joins the Androscoggin River approximately 1,500 feet downstream of the dam in the bypassed reach of the Gorham Project, and Stearns Brook which enters the Androscoggin River approximately six miles upstream of the project in Milan, NH.

3.1.2 Major Land and Water Uses

The area to the north of the project is primarily forest with pockets of shrub/scrub and agricultural land; the area is zoned for timber and agriculture. The land bordering the southern edge of the project boundary is developed and zoned for residential and commercial uses.

The Androscoggin River near the Project is used for hydropower generation, recreation, wildlife and aquatic habitat, and flood control.

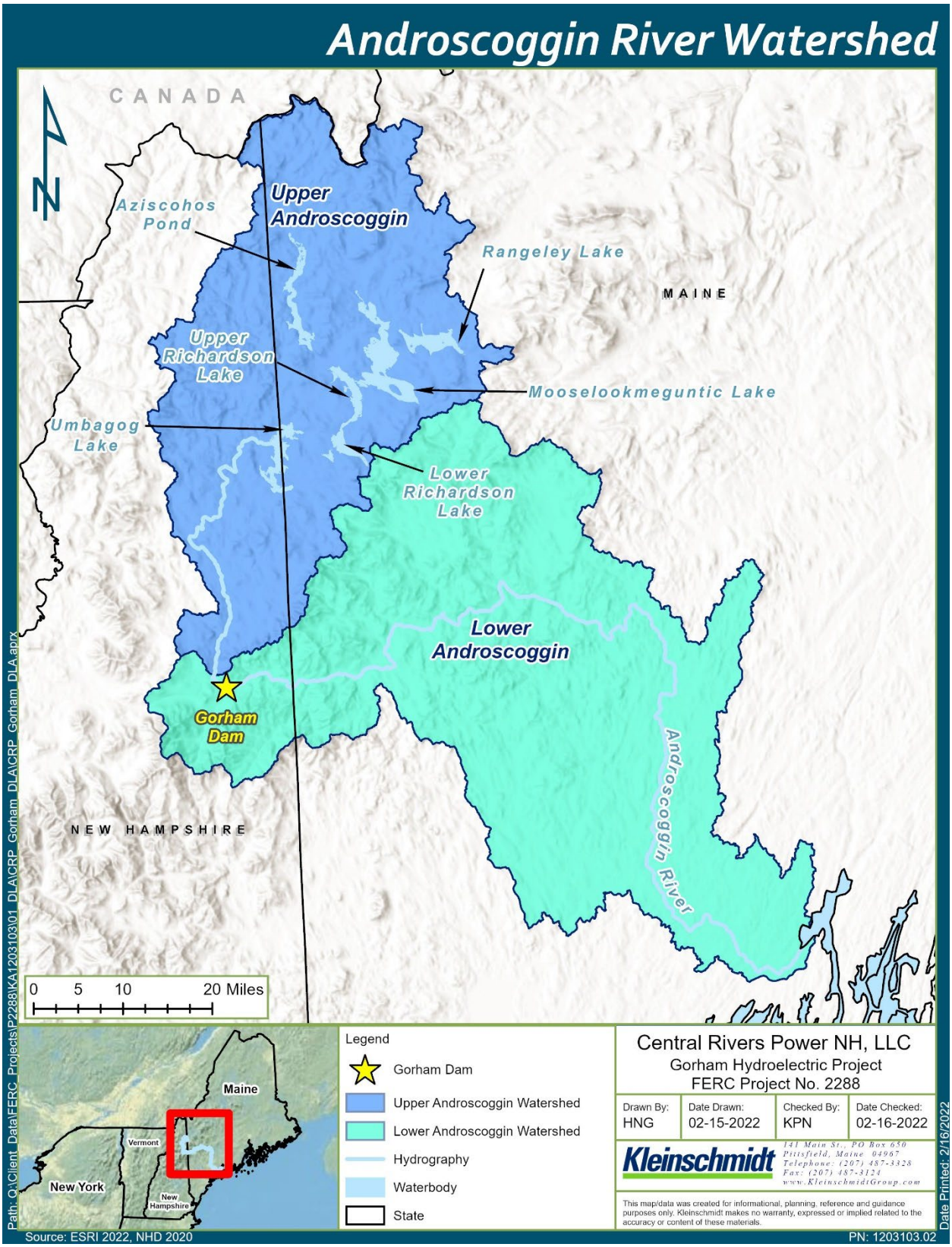

Figure 3.1 Upper Androscoggin River Watershed

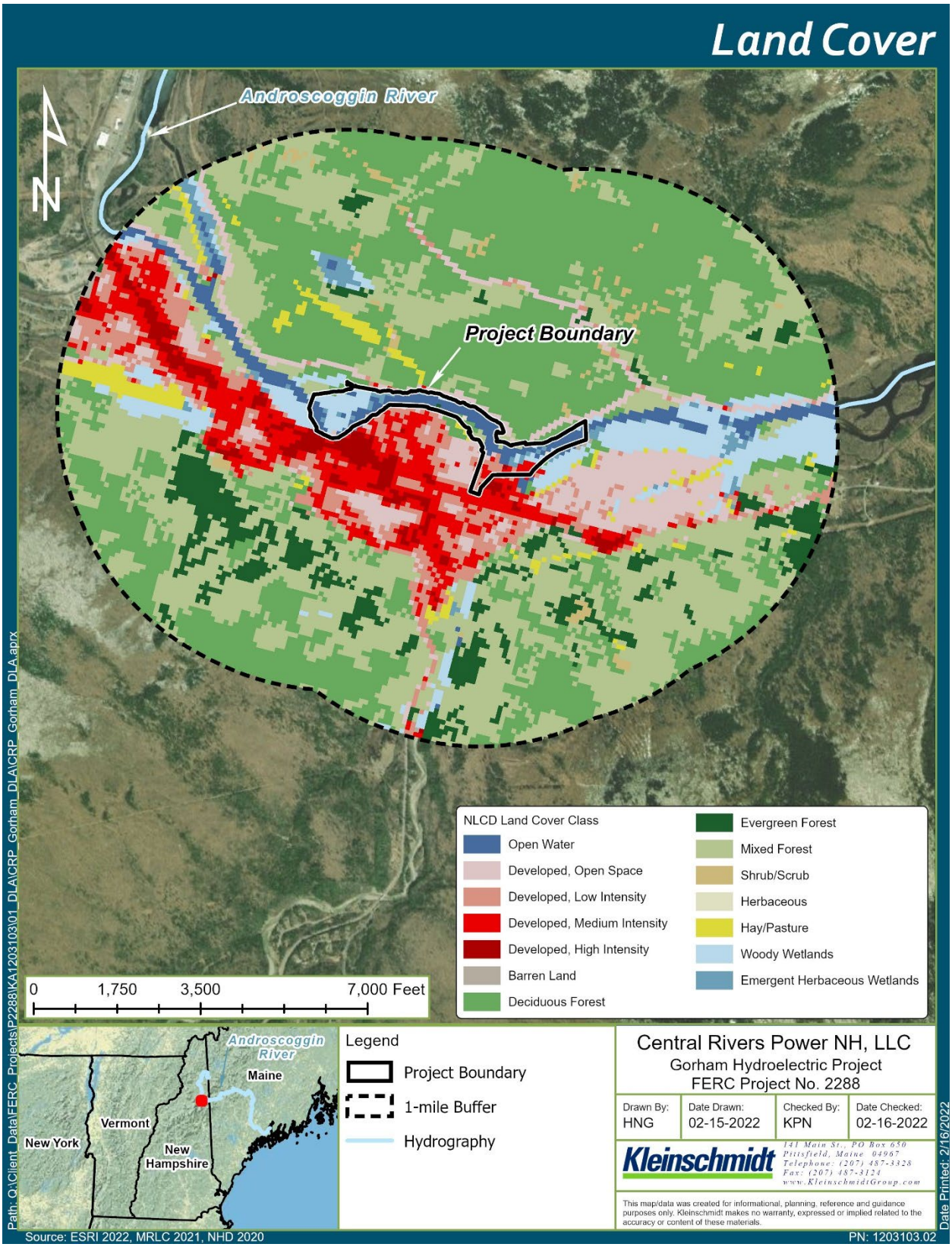

Figure 3.2 Land Cover Types

3.1.3 Dams Within the Basin

The Androscoggin River Basin contains over 200 dams, most of which are on various tributaries to the mainstem. Figure 3.3 provides a list of dams on the mainstem from Errol, New Hampshire, to Brunswick, Maine. Additional storage reservoirs and dams exist upstream of Errol, including Mahaney, Kennebago Falls, Rangeley, Upper Dam, Middle Dam, and Aziscohos.

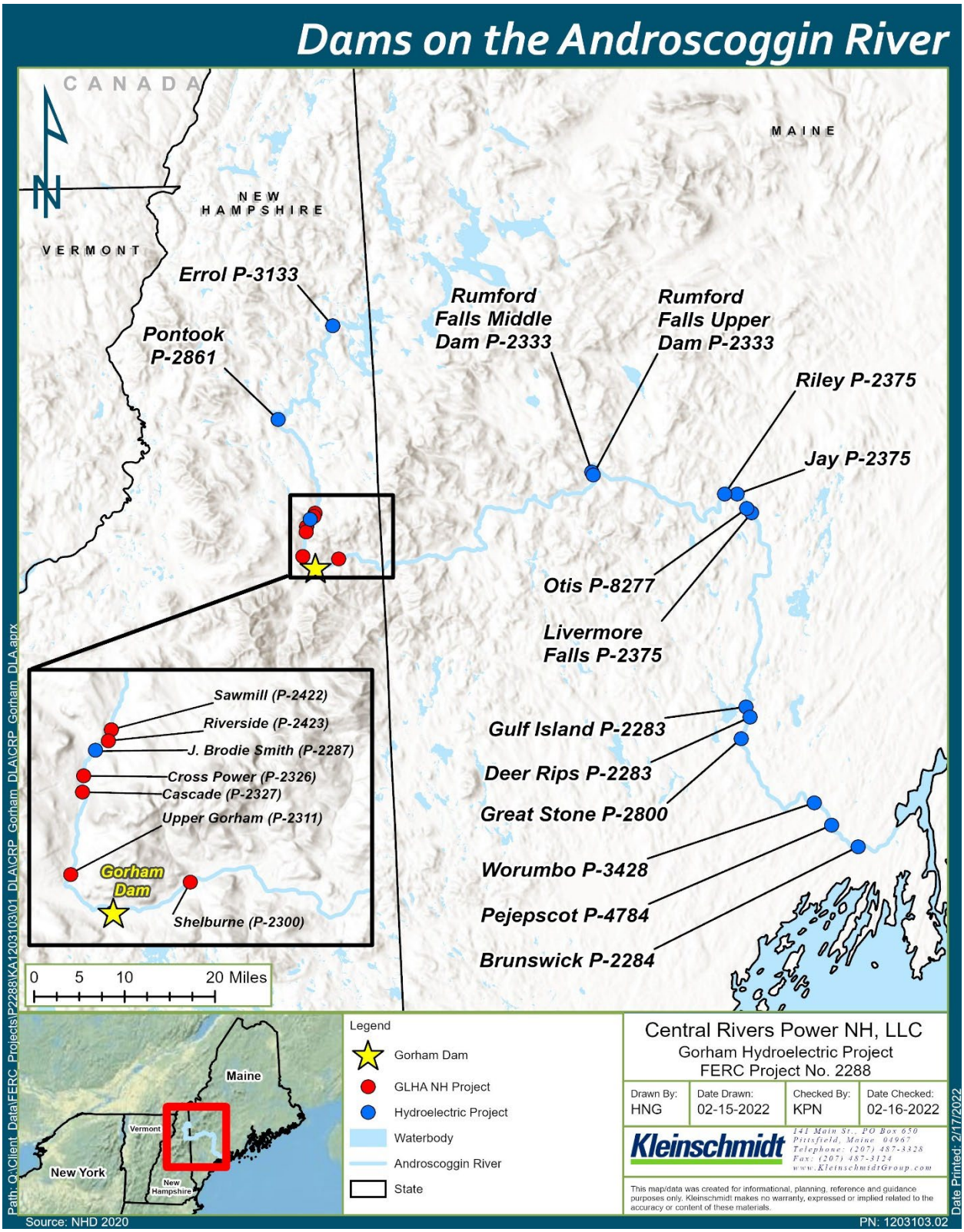

Figure 3.3 Dams in the Androscoggin River Basin

3.1.4 Tributary Rivers and Streams

Principal tributaries to the Androscoggin River include: Dead River, which joins the Androscoggin River in Berlin, New Hampshire; the Moose River, which enters the Androscoggin River approximately 1.3-river-miles upstream of the Gorham Project; and the Peabody River, which enters the Androscoggin River approximately 1,000 feet downstream of the Gorham Project powerhouse (FERC No. 2288).

3.1.5 Climate

The Project region experiences mild, relatively humid summers and cold winters with moderate snowfall in the lower elevations. Average July air temperatures in the Project vicinity range from a daily average maximum of 78°F to a daily average minimum of 55°F. The daily average maximum air temperature for January is approximately 26°F while the daily average minimum air temperature for January is 5°F. The average annual total precipitation is 41.57 inches with an average annual snowfall of 78 inches (US Climate Data 2022).

3.1.6 References

Maine Rivers. 2022. Androscoggin Watershed. [Online] https://mainerivers.org/watershed-profiles/androscoggin-watershed/. Accessed January 27, 2022.

U.S. Climate Data. 2022. Climate Data, Berlin, Maine. [Online] https://www.usclimatedata.com/climate/berlin/new-hampshire/united-states/usnh0020. Accessed January 27, 2022.

3.2 Geology and Soil Resources

3.2.1 Affected Environment

New Hampshire is located in the New England physiographic province. This province is mountainous and contains highly deformed metamorphic rocks from the Precambrian and Paleozoic eras; the Project area is in the part of the province made up of Paleozoic sedimentary and metasedimentary rocks (NPS 2018). The Gorham Project is located in the White Mountains section of the New England physiographic province in northeast New Hampshire. The Androscoggin River valley was formed during the end of the last ice age, approximately 12,000 to- 15,000 years ago. The landscape was carved out by the melting and retreat of great massive glaciers that once covered the area. During this process the Androscoggin River channel formed leaving behind broad areas of rich alluvial soil along the riverbanks. The Androscoggin River valley is known for its rich, productive farmlands (Bethel Historical Society 2022).

The White Mountain section of the New England physiographic province is mainly comprised of Silurian and Devonian phyllite and schist, as well as Ordovician, Silurian, and Devonian intrusive igneous rocks. Most of the Project boundary occurs in the Littleton Formation, which is part of the Central Maine Composite Terrane and consists of sedimentary and volcanic rocks. It is the most widespread geologic formation in New Hampshire, and it extends from Massachusetts to Maine in a north-northeasterly direction. The primary rock type in this geological unit is metasedimentary rock, and the secondary rock type is metavolcanic rock. This geologic unit is fossiliferous in the western part of New Hampshire; the Gorham Project occurs in the eastern part of the state, making it less likely for fossils to be found there (Billings 1980; USGS 2018).

The lithology of the Littleton Formation is particularly complex. The formation was originally composed primarily of argillaceous and arenaceous sediments but also contained beds of other rocks, including volcanics, quartzites, and impure dolomites. The formation possesses a large range in grade of metamorphism. Even locally within the formation there is wide variation between metamorphosed sedimentary rocks and plutonic rocks (Billings 1980).

Soils

The soil in the Project area is generally loamy (Figure 3.4). The most commonly found soils in the Project area are Sheepscot cobbly very fine sandy loam (15 percent), Monadnock fine sandy loam (11 percent), Abenaki very fine sandy loam (10 percent), and Colton gravelly fine sandy loam (8 percent) (USDA 2018) (Table 3.1, Figure 3.4).

Table 3.1 Soil types in and 1,000 feet around the Gorham project boundary.

Map Unit Name	Soil Type	Area (acres)	Percent (%)
102A	Sunday loamy fine sand, 0 to 3 percent slopes	25	5%
143C	Monadnock fine sandy loam, 8 to 15 percent slopes	19	4%
143D	Monadnock fine sandy loam, 15 to 25 percent slopes	11	2%
143E	Monadnock fine sandy loam, 25 to 50 percent slopes	23	5%
145C	Monadnock fine sandy loam, 0 to 15 percent slopes	2	0%
14B	Sheepscot cobbly very fine sandy loam, 1 to 8 percent slopes	75	15%
169C	Sunapee fine sandy loam, 8 to 15 percent slopes	6	1%
208A	Fryeburg very fine sandy loam, 0 to 3 percent slopes	19	4%
22A	Colton gravelly fine sandy loam, 0 to 3 percent slopes	18	4%
22B	Colton gravelly fine sandy loam, 3 to 8 percent slopes	10	2%
22C	Colton gravelly fine sandy loam, 8 to 15 percent slopes	6	1%
22E	Colton gravelly fine sandy loam, 15 to 60 percent slopes	8	2%
273E	Berkshire, Monadnock	15	3%
28B	Madawaska very fine sandy loam, 3 to 8 percent slopes	4	1%
307A	Lovewell very fine sandy loam, 0 to 3 percent slopes	1	0.2%
433A	Grange silt loam, 0 to 5 percent slopes	20	4%
501A	Abenaki very fine sandy loam, 0 to 3 percent slopes	49	10%
504A	Metallak very fine sandy loam, 0 to 3 percent slopes	30	6%
505A	Cohas loam, 0 to 2 percent slopes	17	3%
55C	Hermon sandy loam, 8 to 15 percent slopes	14	3%
59C	Waumbek sandy loam, 8 to 15 percent slopes	24	5%
59D	Waumbek sandy loam, 15 to 25 percent slopes	10	2%

Map Unit Name	Soil Type	Area (acres)	Percent (%)
61C	Tunbridge-Lyman-Rock outcrop complex, 8 to 15 percent slopes	5	1%
61D	Tunbridge-Lyman-Rock outcrop complex, 15 to 25 percent slopes	6	1%
61E	Tunbridge-Lyman-Rock outcrop complex, 25 to 60 percent slopes	9	2%
670C	Tunbridge-Berkshire-Lyman complex, 8 to 15 percent slopes	7	1%
W	Water	72	14%
	Total	506	

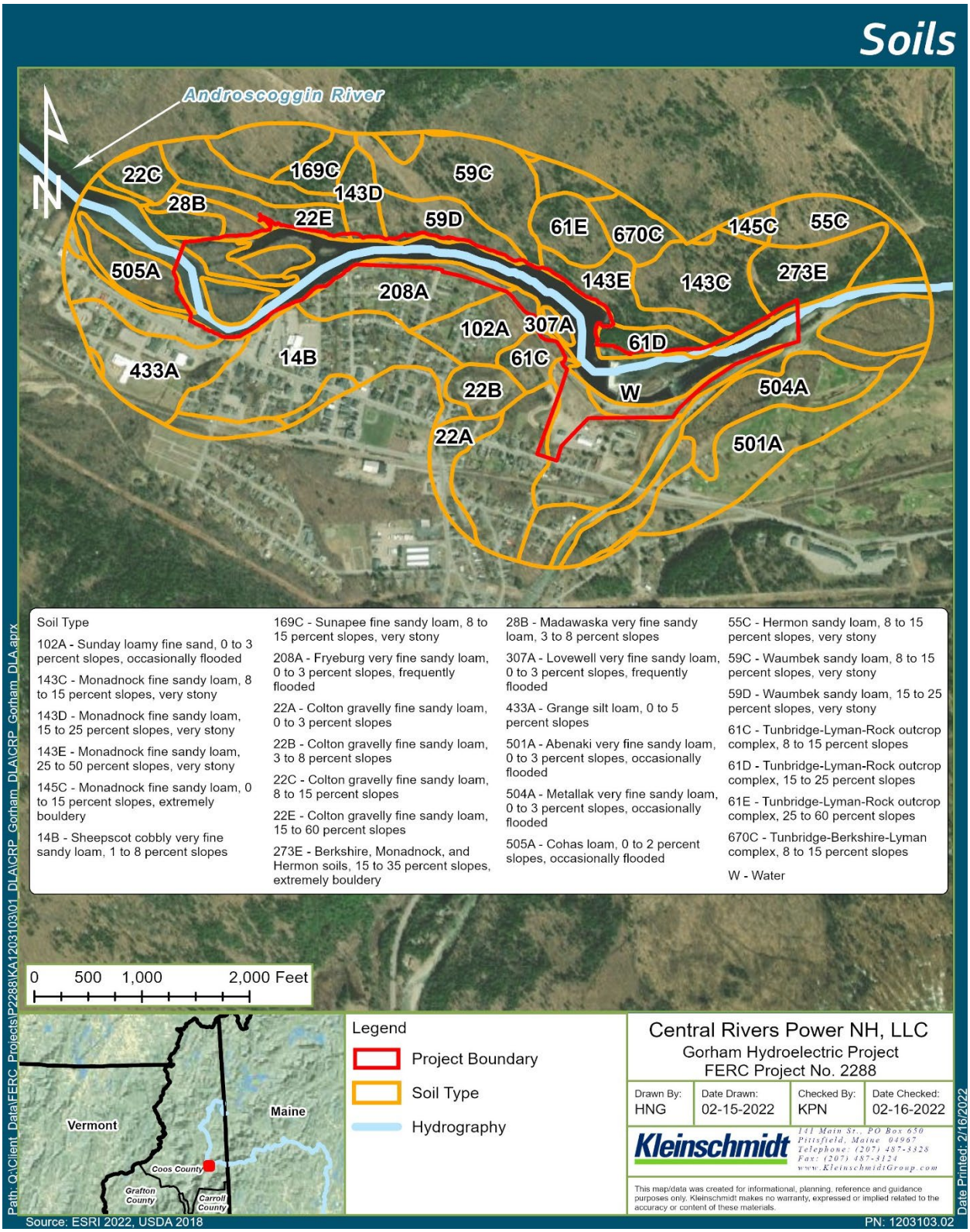

Figure 3.4 Soil Types in and around the Gorham Project Area

Reservoir Shoreline and Stream Banks and Erosion

The major soil types along the northern shoreline of the Gorham project boundary are Monadnock fine sandy loam, Sheepscot cobbly very fine sandy loam, Colton gravelly fine sandy loam, Berkshire/Monadnock, Madawaska very fine sandy loam, Hermon sandy loam, Waumbek sandy loam, and Tunbridge-Lyman-Rock outcrop complex (Table 3.1, Figure 3.4). These soils range from being moderately well drained to excessively drained.

The southern shoreline along the project boundary consists of Sunday loamy fine sand, Sheepscot cobbly very fine sandy loam, Fryeburg very fine sandy loam, Colton gravelly fine sandy loam, Grange silt loam, Abenaki very fine sandy loam, and Tunbridge-Lyman-Rock outcrop complex (Table 3.1, Figure 3.4). These soils range from being poorly drained to excessively drained.

Article 408 of the project license requires the licensee to file a shoreland protection plan to protect the aesthetics of and public access to the project's shoreland. The article requires the plan to include maps delineating the shoreland protective buffer zone area; a description of vegetative management; and measures for maintaining the aesthetics of the transmission line right-of-way. The article also requires the licensee to prepare the plan after consultation with the Town of Gotham, City of Berlin, New Hampshire Fish and Game Department (NHFGD), and the National Park Service (NPS).

On August 1, 1995, PSNH (previous Project owner) filed a Shoreland Protection Plan for the Gorham Project and supplemented the filling on September 22, 1998 by letter. FERC modified and approved the plan on April 19, 1999 (87 FERC ¶ 62,076).

The south shore of the Androscoggin River in Gorham is highly developed in contrast to the north shore which is mainly timber. The project reservoir has a normal elevation of 772.53 NGVD 29[2] Datum and the project boundary lies at contour elevation 773.6 along the impoundment. The licensee owns approximately 35 percent of the area within the project boundary and retains flowage easements for the rest of the area within the project boundary.

Due to the unlikelihood of the north shore property being bought and commercialized, a 150 feet buffer was not adopted in the plan. The Licensee files annually a shoreline

[2] Unless otherwise stated, elevations are in NGVD 29 datum.

inspection report for the upstream and downstream shoreline areas of the Project boundary. To date, no changes have occurred nor violations to the Shoreland Protection Plan have occurred.

The majority of the shoreline within the Project boundary is forested, limiting the degree of potential erosion. Soils within the Project range from moderately low to moderate erodibility. There may be limited amounts of localized erosion, but if present, the extent of such shoreline erosion is unknown.

The Natural Resources Conservation Service has assessed the susceptibility of the soils surrounding the Project to erosion (i.e., the K Factor) caused by water including rainfall and stormwater run-off. K Factor estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity with values ranging from 0.02 to 0.69; larger values indicate greater susceptibility to sheet and rill erosion by water (USDA 2018). The K Factor values for the soils surrounding the Gorham Project range from 0.05 (Colton gravelly fine sandy loam) to 0.37 (Fryeburg very fine sandy loam, Grange silt loam, Abenaki very fine sandy loam, and Metallak very fine sandy loam) indicating a low to moderate susceptibility to erosion from water (USDA 2018).

3.2.2 Environmental Effects

In SD 2, FERC identified no geologic and soils resource issues. CRP NH Gorham, LLC is not proposing any changes to project operations or existing facilities that would affect geology, soils, erosion, or cause sedimentation. CRP NH Gorham, LLC is also proposing no construction or dredging activities that could disturb sediments, affect soils, or affect geologic resources.

3.2.3 Proposed Environmental Measures

CRP NH Gorham, LLC is not proposing any new environmental measures related to geology and soils at the Gorham Project.

3.2.4 Unavoidable Adverse Effects

Continued operation and relicensing of the Gorham Project as proposed is not expected to have unavoidable adverse effects on soils because all facilities are operated as run-of-river.

3.2.5 References

Bethel Historical Society. 2022. "The Great River and its Valley." Available online: https://bethelhistorical.org/catalog/exhibits/show/rivers-journey/the-great-river-and-its-valley. (Accessed 1/25/2022).

Billings, Marland P. (1980.) The Geology of New Hampshire: Part II, Bedrock Geology. Concord, New Hampshire: Division of Forests and Lands, Department of Resources and Economic Development. Available at https://www.des.nh.gov/organization/commissioner/pip/publications/geologic/documents/geologyofnh2.pdf.

United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). (2018.) "Custom Soil Resource Report for Coos County Area, New Hampshire. (Accessed 1/25/2022).

3.3 Water Resources

3.3.1 Affected Environment

3.3.1.1 Water Quantity and Use

Five large water storage reservoirs (Rangeley, Aziscohos, Upper and Lower Richardson Lakes, Mooselookmeguntic, and Umbagog) in the Upper Androscoggin watershed are operated to maintain a target flow of 1,550 cfs at Berlin, NH, year-round (FERC 1993). The system has a combined storage capacity of approximately 644,000 acre-feet (ARC 2020). Flow regulation occurs at the Errol Hydroelectric Project (FERC No. 3133), which impounds Lake Umbagog, approximately 38 river miles upstream of the Gorham Project.

River flow data for the Gorham Project was obtained from USGS gage No. 01054000 (Androscoggin River near Gorham, New Hampshire) (USGS 2021). The drainage area at the USGS gage is approximately 1,361 square miles. The USGS gage is located approximately 4.2 river miles upstream of the Gorham Project dam. The data from the USGS gage was prorated (x1.035) to the Gorham Project dam.

Annual and monthly river flows of the Androscoggin River at the Gorham Project from January 1, 1991, to December 31, 2020, are provided in Table 3.2. Annual average, minimum, and maximum flows are estimated to be 2,903 cfs; 807 cfs; and 20,597 cfs, respectively. The maximum monthly average flow (4,917 cfs) was observed in April, and the minimum monthly average flow occurred in September (1,904 cfs). The maximum recorded daily average flow (20,597 cfs) occurred on April 1, 1998, and the minimum daily average flow (807 cfs) occurred on September 4, 2015. Flow duration statistics are provided in Table 3.3 and flow duration curves are appended to Exhibit A.

Table 3.2 Monthly minimum, maximum, and average flow at the Gorham Project, (January 1, 1991 to December 31, 2020)

Month	Minimum (cfs)	Maximum (cfs)	Average (cfs)
January	1,294	6,521	2,734
February	1,314	7,193	2,866
March	1,304	14,697	3,172
April	1,314	20,597	4,917
May	1,428	16,767	4,262
June	1,180	13,248	2,962
July	977	10,661	2,390

Month	Minimum (cfs)	Maximum (cfs)	Average (cfs)
August	1,128	10,350	2,026
September	807	10,071	1,904
October	1,056	15,525	2,370
November	1,180	10,350	2,641
December	1,201	10,133	2,617
Annual	**807**	**20,597**	**2,903**

Source: USGS 2021

Table 3.3 Flow duration statistics for the Gorham Project (January 1, 1991 to December 31, 2020)

Percent of Time Flow Equaled or Exceeded	Annual	January	February	March	April	May	June	July	August	September	October	November	December
0.1	15,529	6,521	7,193	14,697	20,597	16,767	13,248	10,661	10,350	10,071	15,525	10,350	10,133
0.5	12,752	5,176	6,030	9,306	16,195	15,186	12,055	10,086	9,323	7,093	10,668	8,593	9,584
1.0	10,971	5,026	5,287	8,227	15,111	14,083	10,964	9,564	7,451	4,759	8,816	7,906	8,792
5.0	6,707	4,026	4,181	5,413	11,483	10,764	7,544	5,285	3,011	2,907	5,071	5,648	4,479
10.0	4,626	3,581	3,799	4,378	9,303	8,901	5,517	3,364	2,701	2,453	3,571	4,233	3,611
15.0	3,831	3,405	3,532	3,916	8,048	7,259	4,306	2,939	2,474	2,339	3,078	3,571	3,278
20.0	3,436	3,312	3,407	3,685	7,034	6,127	3,649	2,699	2,267	2,215	2,616	3,188	3,074
30.0	2,991	3,095	3,126	3,374	5,462	4,533	2,991	2,326	2,070	2,057	2,318	2,802	2,857
40.0	2,691	2,929	2,929	3,095	4,544	3,722	2,542	2,118	1,977	1,915	2,107	2,525	2,681
50.0	2,412	2,732	2,753	2,908	3,819	3,240	2,303	1,967	1,811	1,791	1,967	2,220	2,417
60.0	2,122	2,577	2,660	2,784	3,409	2,753	2,029	1,853	1,687	1,666	1,826	2,060	2,122
70.0	1,915	2,384	2,522	2,632	3,022	2,339	1,822	1,739	1,615	1,576	1,718	1,866	1,946
80.0	1,718	2,060	2,339	2,463	2,639	2,039	1,666	1,656	1,563	1,428	1,584	1,710	1,791
85.0	1,625	1,873	2,260	2,267	2,385	1,904	1,606	1,604	1,511	1,377	1,470	1,584	1,694
90.0	1,521	1,739	2,091	2,070	2,061	1,770	1,532	1,553	1,428	1,335	1,397	1,480	1,563
95.0	1,397	1,449	1,449	1,656	1,760	1,615	1,418	1,470	1,356	1,242	1,263	1,398	1,393
99.0	1,221	1,314	1,351	1,377	1,428	1,490	1,242	1,359	1,162	1,097	1,131	1,304	1,276
99.5	1,149	1,304	1,335	1,356	1,340	1,452	1,206	1,314	1,149	1,076	1,104	1,283	1,235
99.9	1,097	1,294	1,314	1,304	1,314	1,428	1,180	977	1,128	807	1,056	1,180	1,201

The Androscoggin River in the Gorham Project area is used for hydroelectric power generation, recreation, wastewater assimilation, and aquatic and wildlife habitat. There are seven other hydropower projects within the 11-mile reach of the Androscoggin River containing the Gorham Project. The GLHA Sawmill (FERC No. 2422), Riverside (FERC No. 2423), Cross (FERC No. 2326), Cascade (FERC No. 2327), and Upper Gorham (FERC No. 2311) Projects and the CRP NH Smith, LLC's J. Brodie Smith Project (FERC No. 2287) are upstream of the Gorham Project. The GLHA Shelburne Project (FERC No. 2300) is approximately three river miles downstream of the Gorham Project.

CRP NH Gorham, LLC is authorized to discharge wastewater from the Gorham Project to the Androscoggin River under the New Hampshire General Permit for Hydroelectric Generating Facilities (Permit #NHG360000) (USEPA 2022). The Town of Gorham Wastewater Treatment Facility is authorized to discharge to the Androscoggin River within the Gorham project boundary under the New Hampshire General Permit for Publicly Owned Treatment Works and Other Treatment Works Treating Domestic Sewage with Dilution Factors Greater than Fifty (Permit #NHG580000, NHG580927) (USEPA 2010). There are no current or proposed water withdrawals or consumptive uses of water at the Gorham Project.

The Androscoggin River is used for a wide variety of water-based recreation activities. Additional information about recreation opportunities near the Gorham Project is provided in Section 3.8 Recreation.

CRP NH Gorham, LLC operates the Gorham Project in run-of-river mode where outflow from the powerhouse is approximately equal to inflow. Run-of-river operations minimize water level fluctuations in the impoundment; protect water quality, fishery, wildlife, and visual resources; and provide stable river flows downstream. Operation of the Gorham Project results in the diversion of water from an approximately 850-foot-long bypassed reach. CRP NH Gorham, LLC provides a minimum flow of 200 cfs or inflow, whichever is less, into the project impoundment for the protection of water quality and fish and wildlife resources (FERC 1994). This minimum flow was based on results from an IFIM study which found that 200 cfs optimized habitat for the studied fish species (e.g., fallfish, brook trout, and rainbow trout) (FERC 1993).

3.3.1.2 Water Quality

Water Quality Standards

The Androscoggin River in Berlin and Gorham, New Hampshire, is classified by the state of New Hampshire as Class B. The designated uses of Class B surface waters in New Hampshire are aquatic life, fish consumption, potential drinking water supply, swimming and other recreation in and on the water, and wildlife. Class B waters are "*considered acceptable for fishing, swimming and other recreational purposes, and, after adequate treatment, for use as water supplies*" (NHDES 2020a). Water quality criteria for Class B waters in New Hampshire are provided in Table 3.4.

Table 3.4 Water Quality Criteria for Class B Waters in New Hampshire[3]

Parameter	Criteria
Dissolved Oxygen (DO)	Instantaneous minimum concentration of 5 mg/L At least 75% saturation (daily average)
Nutrients	Shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring.
Total Phosphorus	For the protection of aquatic life: < 8 µg/L in oligotrophic waters ≤ 12 µg/L in mesotrophic waters ≤ 28 µg/L in eutrophic waters (median based on a least 5 independent samples collected between May 24 and September 15).
Chlorophyll-a	≤ 15 µg/L for protection of recreational uses in freshwater. For the protection of aquatic life: < 3 µg/L in oligotrophic waters ≤ 5 µg/L in mesotrophic waters ≤ 11 µg/L in eutrophic waters

[3] Unless naturally occurring or subject to (a), above, surface waters within the top 25 percent of depth of thermally unstratified lakes, ponds, impoundments, and reservoirs or within the epilimnion shall contain a dissolved oxygen content of at least 75 percent saturation, based on a daily average and an instantaneous minimum dissolved oxygen content of at least 5 mg/l. Unless naturally occurring, the dissolved oxygen content below those depths shall be consistent with that necessary to maintain and protect existing and designated uses (NHDES 2016).

Parameter	Criteria
	(median based on a least 5 independent samples collected between May 24 and September 15).
pH	6.5 to 8.0
Temperature	Any stream temperature increase associated with the discharge of treated sewage, waste or cooling water, water diversions, or releases shall not be such as to appreciably interfere with the uses assigned to this class.

Source: NHDES 2016, 2020a

2020 Water Quality Study

In accordance with the FERC SPD, CRP NH Gorham, LLC completed a comprehensive water quality study throughout the Gorham Project area during late June to September 2020. The goals of the study were to collect contemporary data to evaluate the spatial and temporal effects of operation of the Gorham Project on water quality in the Androscoggin River and to assess compliance with New Hampshire water quality standards. The objectives of the study were to:

- Collect dissolved oxygen (DO), water temperature, pH, nutrients, chlorophyll-a, and Secchi disk data at the deep spot in the Gorham impoundment; and,
- Collect DO, water temperature, and pH in a riverine reach upstream of the impoundment, in the bypass reach, in the tailrace, and downstream of the tailrace and bypass reach confluence.

CRP NH Gorham, LLC monitored water quality at 5 sites throughout the Gorham Project area (Table 3.5, Figure 3.5); a complete description of all monitoring sites and methods is provided in the ISR. The monitoring sites were installed on June 29 or July 1, 2020; data loggers were retrieved September 23 or 24, 2020. Concurrent water quality studies were completed at the J. Brodie Smith Project and the six GLHA hydropower projects for a total of 31 monitoring sites in the 11-mile reach of the Upper Androscoggin River in Berlin, Gorham, and Shelburne, NH.

Table 3.5 Water quality monitoring sites at the Gorham Project, June 29-September 24, 2020.

Site Number and Name
Site 22 Gorham Above Impoundment
Site 23 Gorham Impoundment
Site 24 Gorham Bypass Reach
Site 25 Gorham Tailrace
Site 26 Gorham Downstream Confluence

* The monitoring sites were numbered sequentially beginning at the GLHA Sawmill Project (e.g., Site 1 Above Sawmill Impoundment) and continuing downstream.

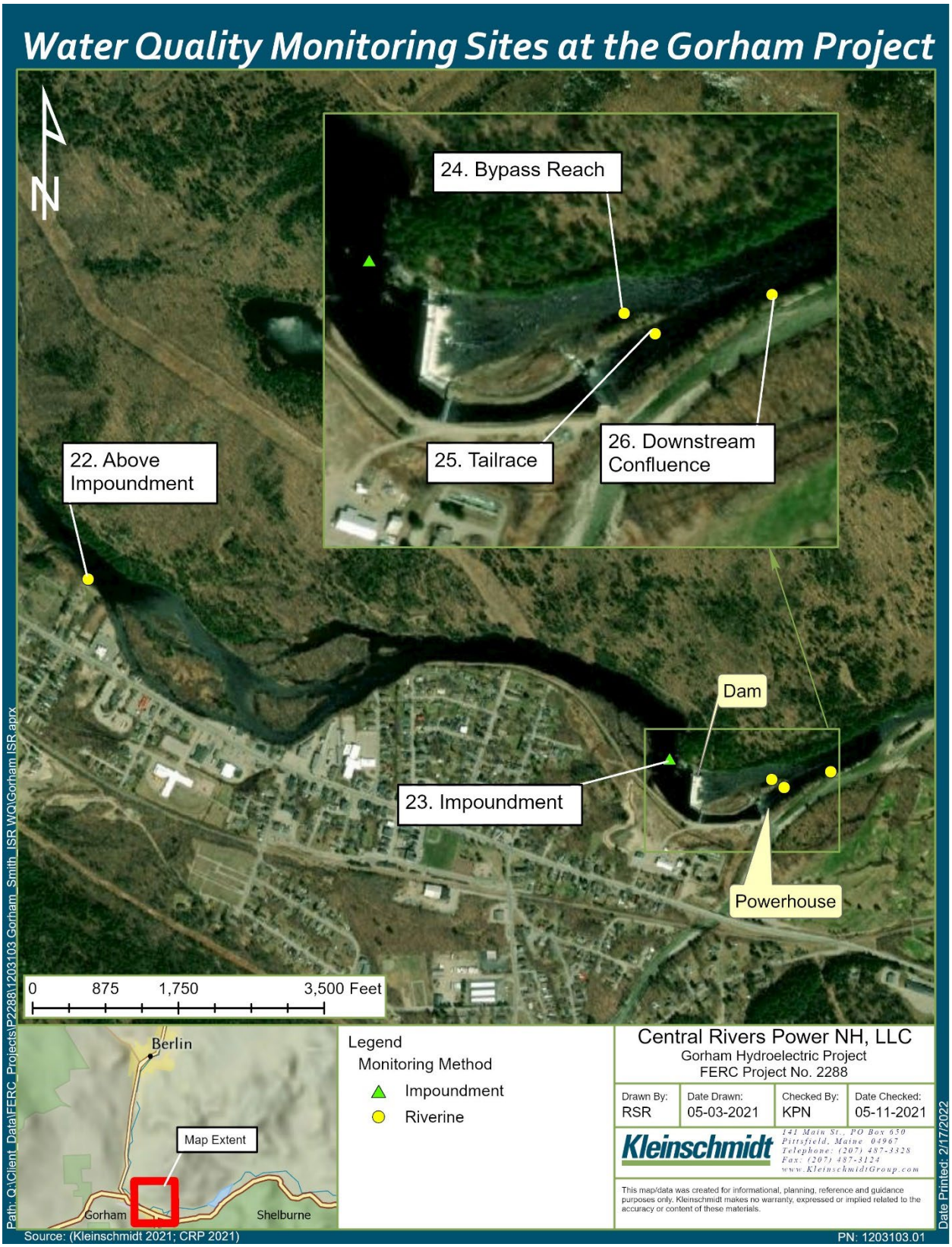

Figure 3.5 Location of Water Quality Monitoring Sites at the Gorham Project.

Two types of monitoring were completed in 2020 at the Gorham Project: impoundment and riverine.

- Impoundment: Once per week, CRP NH Gorham, LLC collected a vertical profile (1-meter increments) of water temperature and DO using a calibrated YSI ProODO, YSI 550A, or YSI ProSolo handheld meter. In addition, each week, CRP NH Gorham, LLC performed a Secchi disk transparency measurement and collected water samples for analysis of chlorophyll-a, total phosphorus, total Kjeldahl nitrogen (TKN), and nitrite + nitrate nitrogen. In accordance with the sampling guidelines for a non-stratified impoundment described in NHDES (2020b), CRP NH Gorham, LLC collected a grab sample from a depth equal to 25 percent of the total depth for analysis of TKN, nitrite + nitrate nitrogen, and total phosphorus. A composite sample to two thirds of the total depth was collected using an epilimnetic core tube for analysis of chlorophyll-a. CRP NH Gorham, LLC continuously monitored the DO concentration, water temperature, and pH with Onset HOBO U-26 and MX-2501 data loggers at 15-minute intervals.
- Riverine: CRP NH Gorham, LLC performed continuous monitoring of DO, water temperature and pH using Onset HOBO U-26 and MX-2501 data loggers at 15-minute intervals. DO percent saturation for each site was calculated using the DO concentration and atmospheric pressure data in the HOBOware software. The atmospheric pressure was recorded every 15 minutes with an Onset HOBO U-20 water level data sonde that was installed adjacent to the GLHA Shelburne Project powerhouse.

River flow data for the study period (June 29 to September 24, 2020) were obtained from USGS Gage #01054000 Androscoggin River near Gorham, NH. Impoundment elevation and generation data were recorded through CRP NH Gorham, LLC's supervisory control and data acquisition (SCADA) system in 15-minute intervals.

The river flow was highest following rain events on June 29 through July 2 (4 inches) immediately after data logger installation at some sites, and on July 15 (2.4 inches) (Figure 3.6). Inflow to the project area increased from approximately 1,200 cfs on June 29 to 6,100 cfs on June 30 and from 2,600 cfs on July 14 to 4,600 cfs on July 15 (Figure 3.6). River flow ranged from approximately 1,400 cfs to 2,000 cfs from July 30 to August 20 and then stabilized at approximately 1,000 cfs to 1,150 cfs through the end of the study.

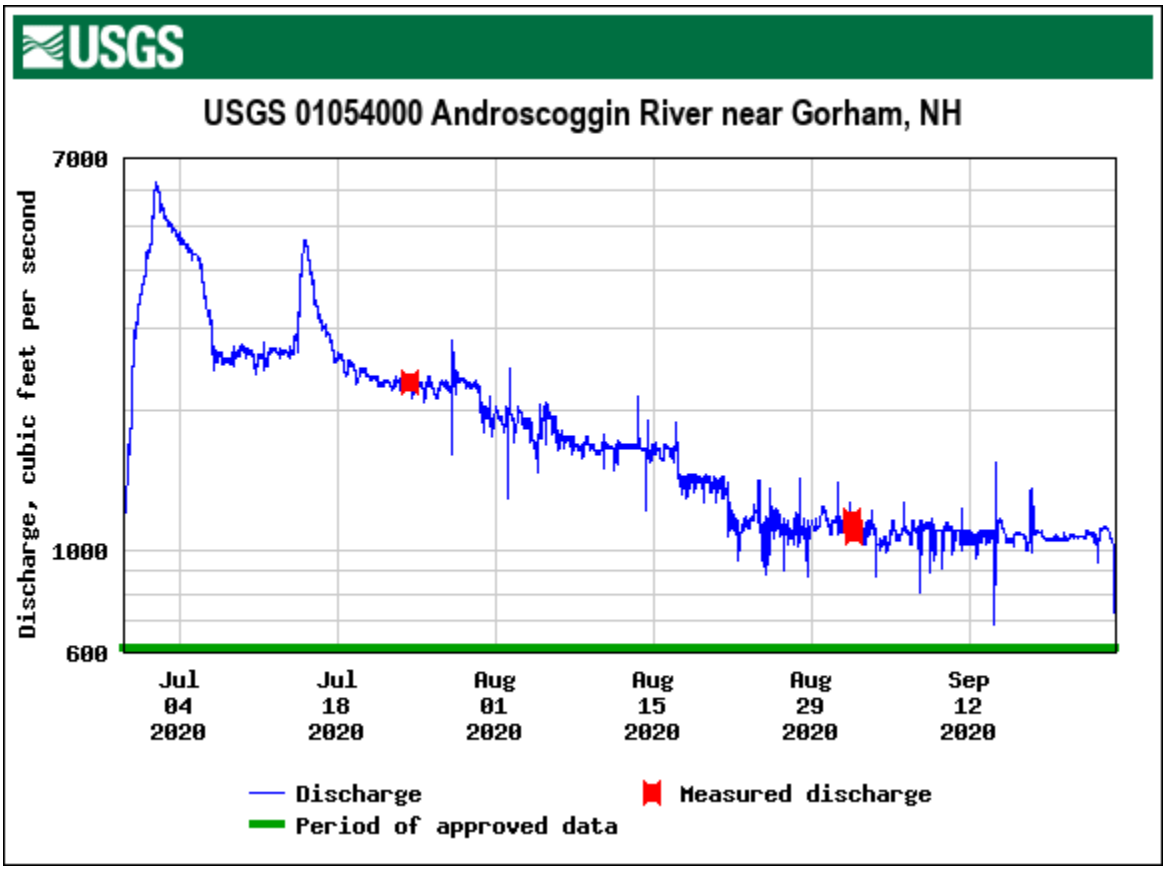

Figure 3.6 River flow (cfs) at USGS Gage #01054000, June 29 – September 24, 2020.

The Gorham Project generated for the entire study period except for 45 minutes on the morning of September 14. The impoundment elevation was generally stable except for some variations during the high flow events in July and short-term changes throughout the study. Spill to the bypass reach occurred from June 29 to July 6 and July 14-16 when inflow exceeded the maximum hydraulic capacity of the project (2,800).

Time series graphs of the DO concentration, DO percent saturation, daily average DO percent saturation, water temperature, and pH at the five monitoring sites at the Gorham Project are shown in Figure 3.7 through Figure 3.11. The average water temperature (20.0 Degrees Celsius (°C) to 21.3°C), DO concentration (8.5 Milligrams per liter (mg/L) to 8.9 mg/L), DO percent saturation (97.1 percent to 102.8 percent), and pH (6.6 to 6.9) were similar at the five monitoring sites at the Gorham Project (Table 3.6). A diurnal variation in the DO concentration, DO percent saturation, water temperature, and pH was observed

throughout the Gorham Project area. DO, pH, and water temperature had higher levels during the day and minimum levels overnight to early morning. This trend indicates the influence of biological processes (e.g., photosynthesis, respiration) on water quality.

The DO concentration and daily average DO percent saturation exceeded the state standards (5.0 mg/L and 75 percent saturation) throughout the study period. In July, DO ranged between 7 mg/L and 9 mg/L except during the time periods with cooler water temperatures and high flows when it increased to over 9 mg/L (e.g., July 1-3, July 14-18). DO primarily varied between 6 mg/L and 9.5 mg/L through the end of August. In early to mid-September, DO was between 8 mg/L and 10 mg/L. During the last several days of the study (September 19-24), DO was between 9.5 mg/L and 11 mg/L. The date of the minimum DO concentration varied with site; the maximum DO levels at all sites were observed on September 21 and 22. The instantaneous DO percent saturation ranged from 62.3 percent to 110.3 percent, and the daily average DO percent saturation ranged from 84.5 percent to 108.0 percent.

DO data from the bypass reach during the July 29 to August 6 and August 7 to 12 periods was removed from the final data set presented in the ISR because of human and/or instrument error or sedimentation/biofouling and because it was not representative of actual environmental conditions. DO data from the tailrace from July 31 to August 7 and August 30 to September 2 and DO data from the downstream confluence from August 4 to 7 were also removed for similar reasons. Further review of the raw data indicated that a combination of factors likely influenced the DO measurements during those periods. For example, Figure 3.12 shows the DO concentration in the bypass reach and downstream confluence, Unit 1 generation, and the DO spot check results (to indicate the times field crew downloaded data) from July 28 to August 9, 2020. The rapid decrease in DO in the bypass reach on July 29 (from 8 mg/L to less than 1 mg/L in less than four hours) is characteristic of sedimentation over the logger probe. This drop occurred right after a data download suggesting a human influence or instrument malfunction. Further, there were several periods between July 30 and August 5 when Unit 1 generation decreased and DO increased and vice versa. This suggests that changing the generation level may have altered the water level or flow at the bypass reach data logger which subsequently influenced the DO measurements. Overall, the cause of the variability in DO during this period is inconclusive and was likely influenced by human, environmental, or operational factors.

Similar variable trends in DO were observed at the downstream confluence from August 4 to 7 suggesting that water with lower and variable DO levels from the tailrace or bypass reach was measured (Figure 3.12). DO returned to over 7 mg/L and resembled the trends observed before August 4 after the data download and equipment check on August 7 suggesting that cleaning the logger or repositioning it at redeployment contributed to the DO measurements. This also suggests that the data from August 4 to 7 was not representative of actual conditions.

Figure 3.13 shows the DO concentration in the tailrace, Unit 1 and Unit 4 generation, and spot check results for July 28 to September 5, 2020, and illustrates that the changing Unit 1 generation levels may have contributed to the DO variability between July 30 and August 7. The decrease in the tailrace DO on September 1 coincided with generation starting at Unit 4. Immediately following the data download and equipment check and cleaning on September 2, DO levels returned to over 9 mg/L. Two hours later, Unit 4 stopped generating. While the cause of the decrease in DO on September 1 appears related to Unit 4 operation, the fact that DO was over 9 mg/L after the logger was downloaded and cleaned suggests that biofouling or sedimentation also influenced the prior DO measurements. Again, the cause of the decrease in DO concentrations on September 1-2 is inconclusive and likely reflected environmental and operational factors.

The minimum water temperature (11.9ºC to 13.4ºC) was observed on September 21, 22, or 23 depending on site; the maximum water temperature (24.8ºC to 26.2ºC) was observed on August 12 at all sites. At the beginning of monitoring, the water temperature was approximately 21ºC and ranged between 22ºC and 26ºC through mid-August (excluding the high flow events). The water temperature decreased to around 18ºC at the end of August and increased to 20ºC to 22ºC on September 9-10. At the end of the monitoring period, the water temperature was near 13ºC. The water temperature at the above impoundment site was typically 0.5ºC to 1.5ºC lower than at the other monitoring sites at the Gorham Project particularly during the high flow events. The cooler temperatures likely reflect inflow from the Moose River which enters the Androscoggin River approximately 350 feet upstream of the above impoundment monitoring site. The monitoring location was in close proximity to a the Moose River which is a tributary fed by small, flashy, high elevation mountain brooks and streams from the Crescent Range and North side of the Presidential Range, where temperatures are likely cooler than at lower elevations where sampling occurred.

pH was within the range of the state standard (6.5 to 8.0) for 90.6 percent of the study period in the tailrace and ranged from 6.0 to 7.1 pH exhibited different trends at the tailrace than the other sites, the cause of which is unknown. pH met the standard for 98.1 percent to 99.9 percent of the study period at the other four monitoring sites at the Gorham Project. pH was lowest at all sites (5.8 to 6.3) on July 14 (also on August 16 in the tailrace) with maximum values of 6.9 or 7.1 on several days. pH was below the standard (6.5) for short periods at the above impoundment, impoundment, bypass reach, and downstream confluence sites on July 1, 2, 14, or 15 during the high flow events with cooler water temperatures.

Water temperature and DO were uniform throughout the water column demonstrating that the impoundment did not thermally stratify (Table 3.7). The average water temperature throughout the water column ranged from 18.3ºC on September 3 to 24.3ºC on July 30. The water temperature varied by 0.2ºC or less in each profile. The average DO throughout the water column ranged from 7.9 mg/L on August 13 to 9.3 mg/L on July 16. The average DO percent saturation ranged from 92.4 percent on August 13 to 102.9 percent on July 16. The DO concentration and percent saturation varied by 0.6 mg/L or less and 3.3 percent or less, respectively, throughout the water column in each profile. The DO concentration was above the 5.0 mg/L standard in all profiles.

Chlorophyll-a ranged from 1.1 µg/L to 2.6 µg/L; the median of 1.6 µg/L met the state of New Hampshire's thresholds for the protection of recreational and aquatic life uses (Table 3.8). Total phosphorus ranged from 5.9 µg/L to 52 µg/L with an average of 15.8 µg/L. The median of 9.0 µg/L was below the 12 µg/L threshold for the protection of aquatic life in mesotrophic water. Nitrite+Nitrate N ranged from 0.058 mg/L to 0.090 mg/L. TKN ranged from 0.21 mg/L to 0.34 mg/L with an average of 0.29 mg/L; these values are considered average (NHDES 2011). The Secchi disk measurements ranged from 2.9 m to 5.0 m with an average of 4.1 m. Secchi disk depths of 1.8 m to 4 m are generally characteristic of mesotrophic waterbodies while depths greater than 4 m are typical of oligotrophic waterbodies (NHDES 2020c).

Table 3.6 DO (mg/L and percent saturation), daily average DO percent saturation, water temperature, and pH statistics at the Gorham Project.

	Site 22 Gorham Above Impoundment				
	DO (mg/L)	DO % saturation	Daily Average DO % Saturation	Water Temperature (ºC)	pH
Avg	8.9	99.9	99.9	20.0	6.7
Min	7.7	93.4	96.1	11.9	5.8
Max	11.0	107.9	103.4	24.8	6.9
	Site 23 Gorham Impoundment				
	DO (mg/L)	DO % saturation	Daily Average DO % Saturation	Water Temperature (ºC)	pH
Avg	8.9	102.8	102.8	21.3	6.8
Min	8.1	94.3	99.2	13.4	6.3
Max	10.4	110.3	107.5	25.5	7.1
	Site 24 Gorham Bypass Reach				
	DO (mg/L)	DO % saturation	Daily Average DO % Saturation	Water Temperature (ºC)	pH
Avg	8.7	98.7	98.4	21.1	6.7
Min	5.5	63.9	84.5	12.1	6.2
Max	10.8	107.0	101.9	26.2	7.1
	Site 25 Gorham Tailrace				
	DO (mg/L)	DO % saturation	Daily Average DO % Saturation	Water Temperature (ºC)	pH
Avg	8.8	101.4	101.4	21.2	6.6
Min	6.4	71.4	91.8	13.2	6.0
Max	10.3	108.6	105.9	25.5	7.1
	Site 26 Gorham Downstream Confluence				
	DO (mg/L)	DO % saturation	Daily Average DO % Saturation	Water Temperature (ºC)	pH
Avg	8.5	97.1	97.3	21.2	6.9
Min	5.1	62.3	85.1	13.3	6.3
Max	10.1	109.4	108.0	25.4	7.1

Table 3.7 Water temperature (ºC), DO concentration (mg/L), and DO percent saturation (%) profiles at Site 23 Gorham Impoundment.

Water Temperature (ºC)										
Depth (m)	7/8/20 11:30	7/16/20 10:00	7/23/20 10:15	7/30/20 11:15	8/6/20 10:10	8/13/20 09:45	8/20/20 0:00	8/27/20 11:00	9/3/20 8:30	9/10/20 9:10
0.1	23.3	20.7	22.4	24.3	21.7	23.3	20.8	19.6	18.3	20.4
1	23.2	20.7	22.4	24.3	21.7	23.3	20.8	19.6	18.3	20.4
2	23.2	20.8	22.4	24.3	21.8	23.3	20.8	19.6	18.3	20.4
3	23.1	20.6	22.5	24.3	21.8	23.3	20.9	19.6	18.3	20.4
4	23.1	20.7	22.5	24.3	21.8	23.3	20.9	19.6	18.3	20.4
5	23.1	20.8	22.5	24.3	21.8	23.3	21.0	19.6	18.3	20.4
6	23.2	20.8	22.5	24.3	21.8	23.3	20.9	19.6	18.3	20.4
7	-	20.8	22.5	24.3	21.8	23.3	-	-	-	-
Avg	*23.2*	*20.7*	*22.5*	*24.3*	*21.8*	*23.3*	*20.9*	*19.6*	*18.3*	*20.4*
Min	*23.1*	*20.6*	*22.4*	*24.3*	*21.7*	*23.3*	*20.8*	*19.6*	*18.3*	*20.4*
Max	*23.3*	*20.8*	*22.5*	*24.3*	*21.8*	*23.3*	*21.0*	*19.6*	*18.3*	*20.4*
DO Concentration (mg/L)										
Depth (m)	7/8/20 11:30	7/16/20 10:00	7/23/20 10:15	7/30/20 11:15	8/6/20 10:10	8/13/20 09:45	8/20/20 10:00	8/27/20 11:00	9/3/20 8:30	9/10/20 9:10
0.1	8.6	9.3	8.9	8.6	8.9	8.1	8.6	8.7	9.0	8.6
1	8.6	9.3	8.8	8.6	8.9	7.9	8.8	8.7	9.0	8.4
2	8.6	9.3	8.8	8.6	8.9	7.9	8.5	8.7	8.9	8.4
3	8.6	9.3	8.8	8.6	8.9	7.9	8.4	8.7	9.0	8.4
4	8.6	9.3	8.8	8.6	8.9	7.8	8.4	8.7	8.9	8.4
5	8.6	9.3	8.8	8.6	8.9	7.9	8.4	8.7	8.9	8.3
6	8.6	9.2	8.8	8.6	8.8	7.8	8.3	8.7	8.9	8.3
7	-	9.2	8.8	8.6	8.8	7.9	-	-	-	-
Avg	*8.6*	*9.3*	*8.8*	*8.6*	*8.9*	*7.9*	*8.5*	*8.7*	*8.9*	*8.4*
Min	*8.6*	*9.2*	*8.8*	*8.6*	*8.8*	*7.8*	*8.3*	*8.7*	*8.9*	*8.3*

Max	*8.6*	*9.3*	*8.9*	*8.6*	*8.9*	*8.1*	*8.8*	*8.7*	*9.0*	*8.6*
DO Percent Saturation (%)										
Depth (m)	7/8/20 11:30	7/16/20 10:00	7/23/20 10:15	7/30/20 11:15	8/6/20 10:10	8/13/20 09:45	8/20/20 10:00	8/27/20 11:00	9/3/20 8:30	9/10/20 9:10
0.1	100.7	100.7	102.0	103.1	101.6	94.4	95.8	98.3	98.6	93.5
1	100.8	103.6	102.0	103.0	101.5	93.2	94.1	98.2	98.7	93.7
2	100.8	103.4	102.0	102.8	101.2	93.0	95.1	98.4	98.3	93.3
3	100.8	103.4	101.8	102.8	101.0	92.6	94.1	97.7	98.5	92.7
4	100.6	103.3	101.7	102.6	100.9	91.2	93.7	98.0	98.0	92.7
5	100.6	103.1	101.5	102.6	100.6	92.0	93.3	97.6	98.0	92.6
6	100.5	103.0	101.6	102.5	100.5	91.1	93.4	97.7	97.7	92.3
7	-	103.0	101.4	102.3	100.4	91.7	-	-	-	-
Avg	*100.7*	*102.9*	*101.8*	*102.7*	*101.0*	*92.4*	*94.2*	*98.0*	*98.2*	*93.0*
Min	*100.5*	*100.7*	*101.4*	*102.3*	*100.4*	*91.1*	*93.3*	*97.6*	*97.6*	*92.3*
Max	*100.8*	*103.6*	*102.0*	*103.1*	*101.6*	*94.4*	*95.8*	*98.4*	*98.7*	*93.7*

Table 3.8 Chlorophyll-a, nutrient, and Secchi Disk results from Site 23 Gorham Impoundment.

Statistic	Chlorophyll-a (µg/L)[a]	Total Phosphorus (µg/L)[b]	Nitrite+Nitrate N (mg/L)[c]	TKN (mg/L)[d]	Secchi Disk (m)
Average	1.7	15.8	0.072	0.29	4.1
Median	1.6	9.0	0.071	0.31	4.4
Minimum	1.1	5.9	0.058	0.21	2.9
Maximum	2.6	52	0.090	0.34	5.0

[a]Below detection limit in 2 samples
[b]Below detection limit in 1 sample
[c]Below detection limit in 2 samples
[d]Below detection limit in 4 samples

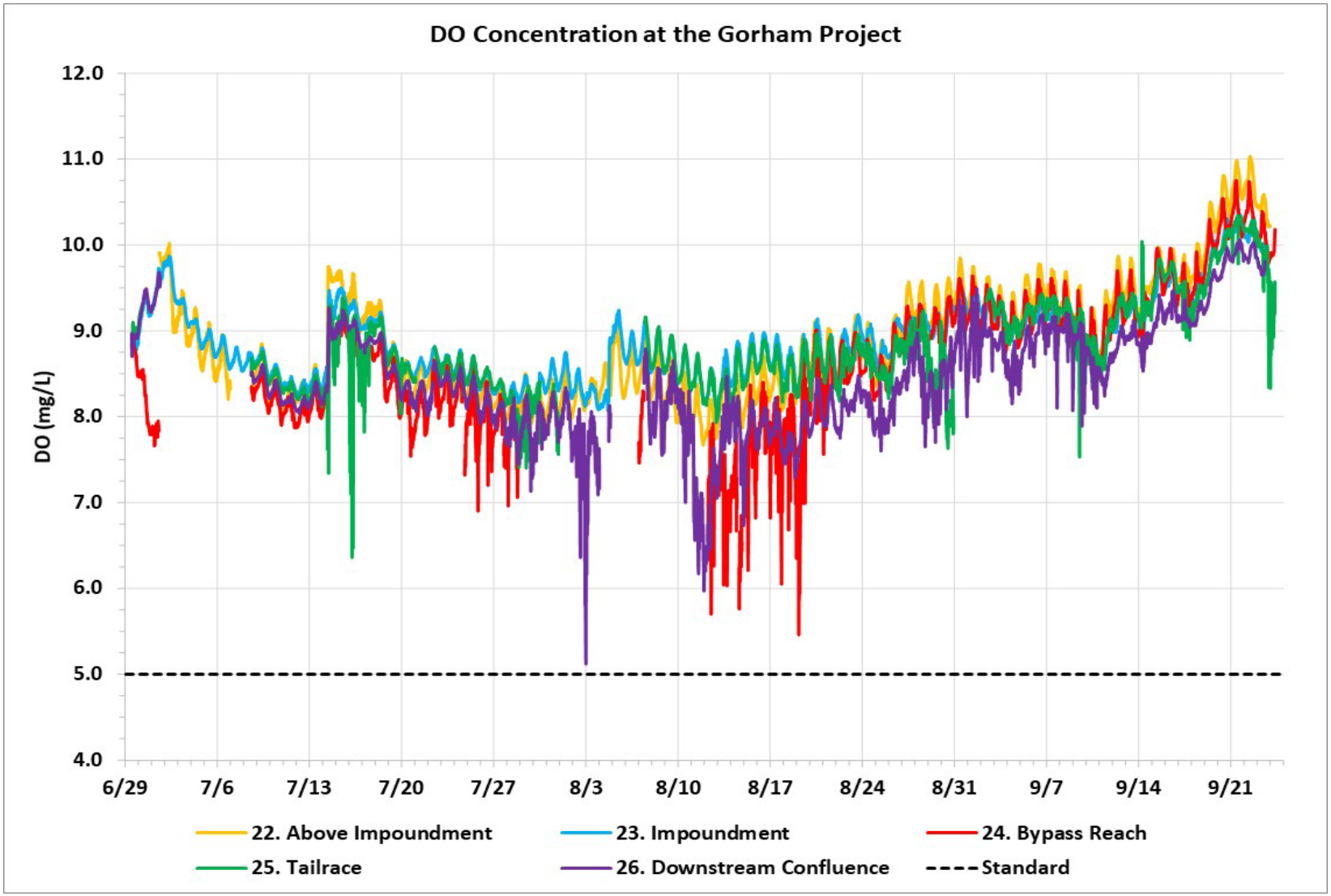

Figure 3.7 DO concentration (mg/L) and the Class B standard at the Gorham Project, June 29-September 24, 2020.

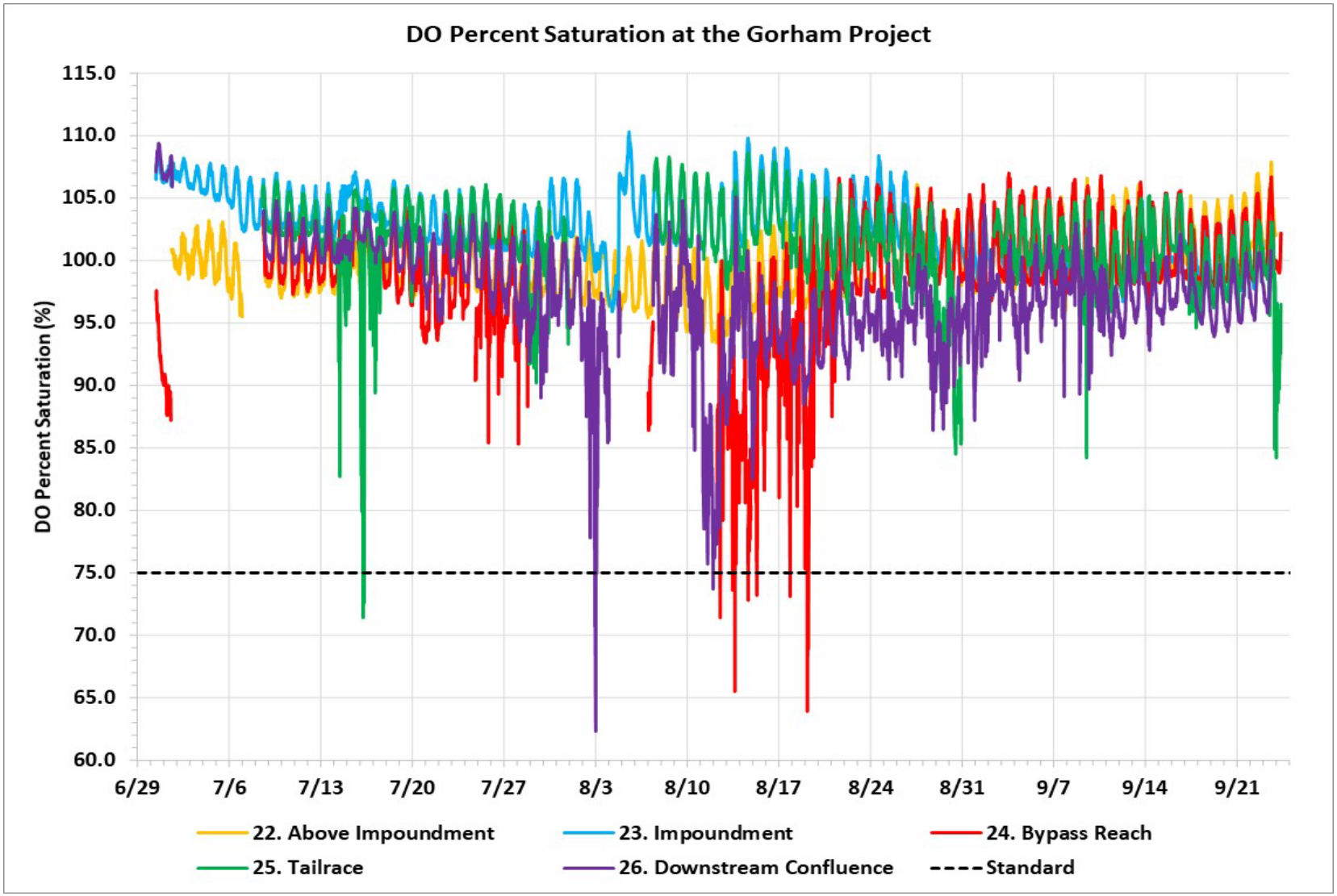

Figure 3.8 DO percent saturation and the Class B standard at the Gorham Project, June 29-September 24, 2020.

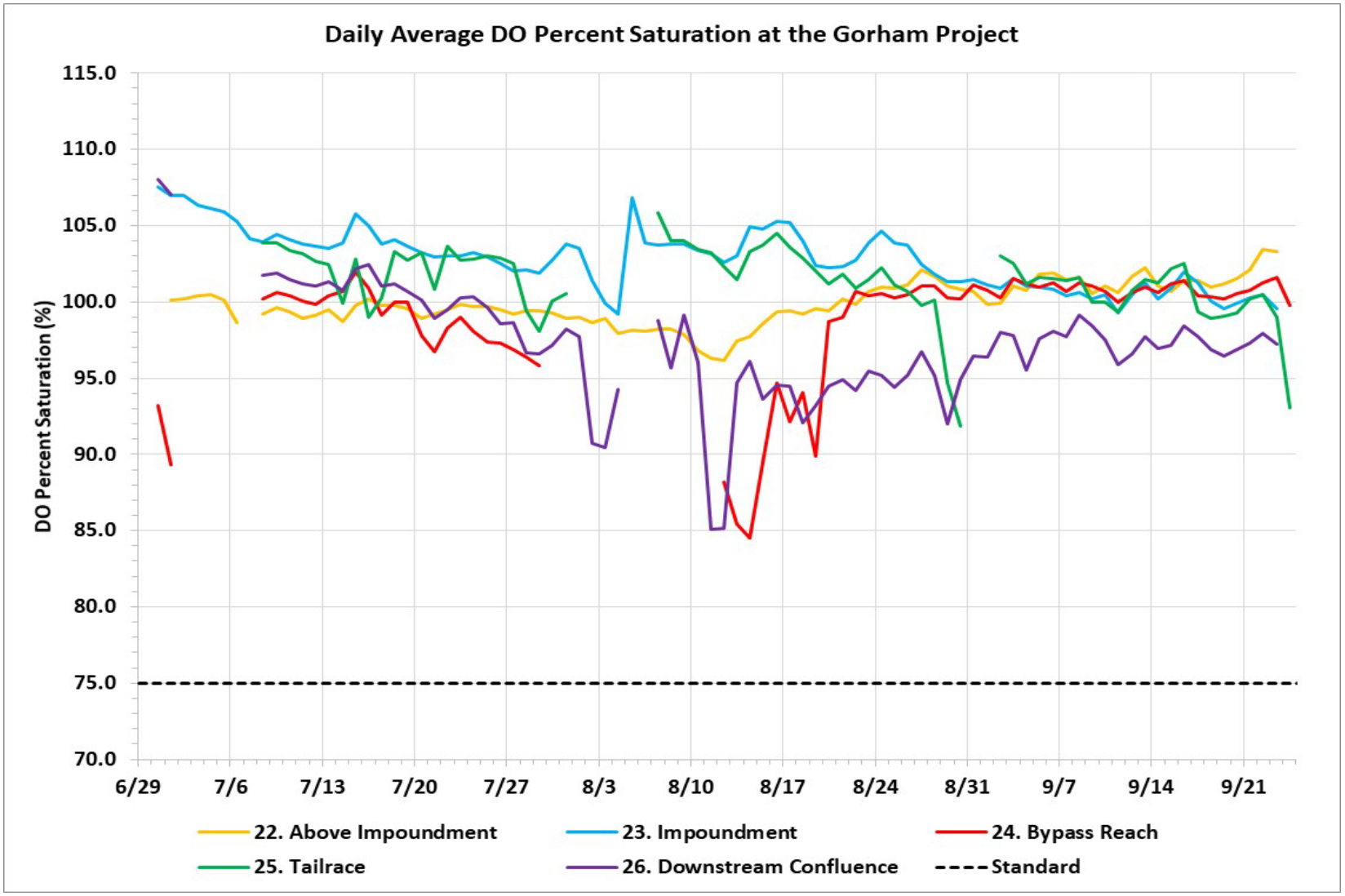

Figure 3.9 Daily average DO percent saturation and the Class B standard at the Gorham Project, June 29-September 24, 2020.

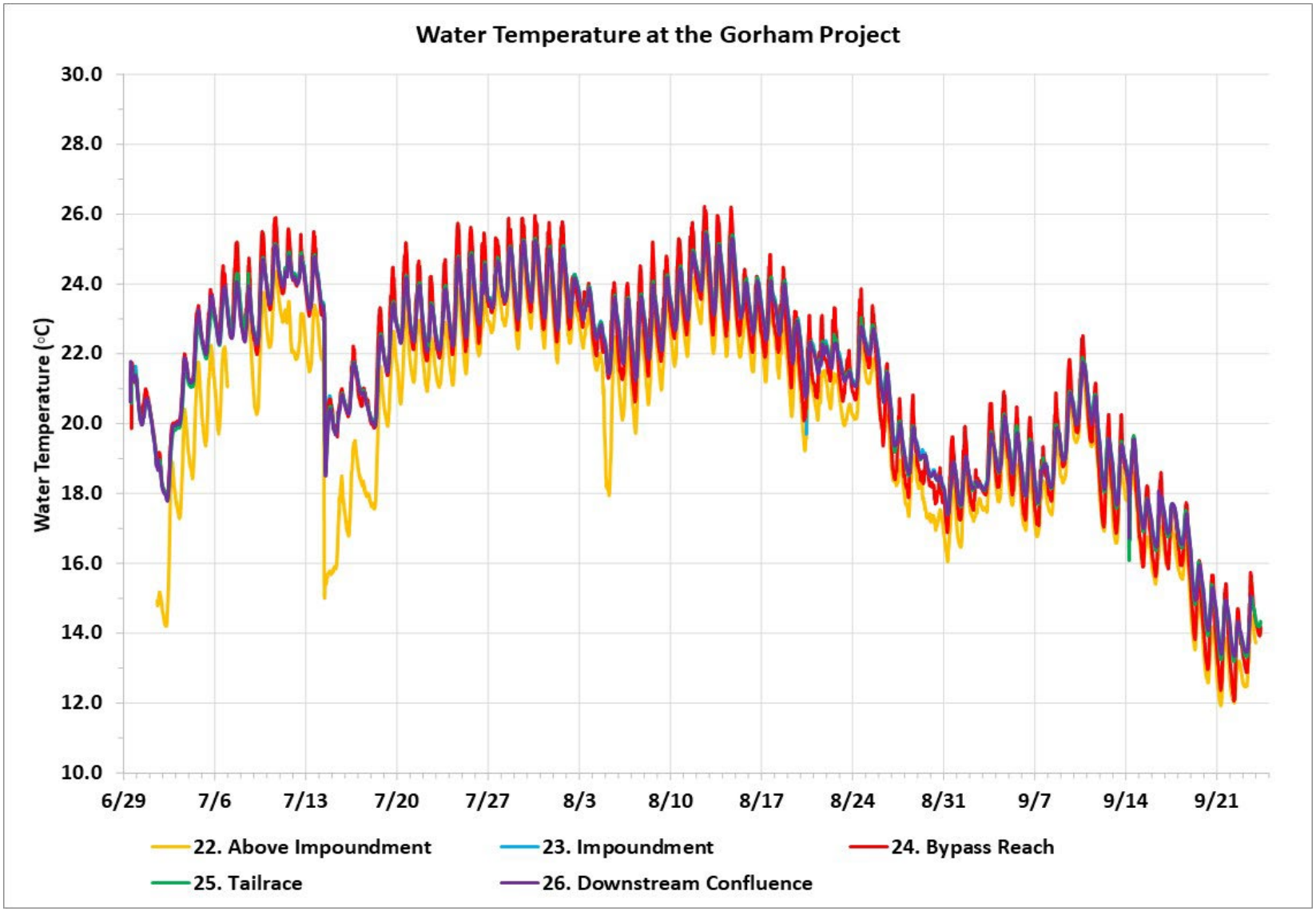

Figure 3.10 Water temperature (°C) at the Gorham Project, June 29-September 24, 2020.

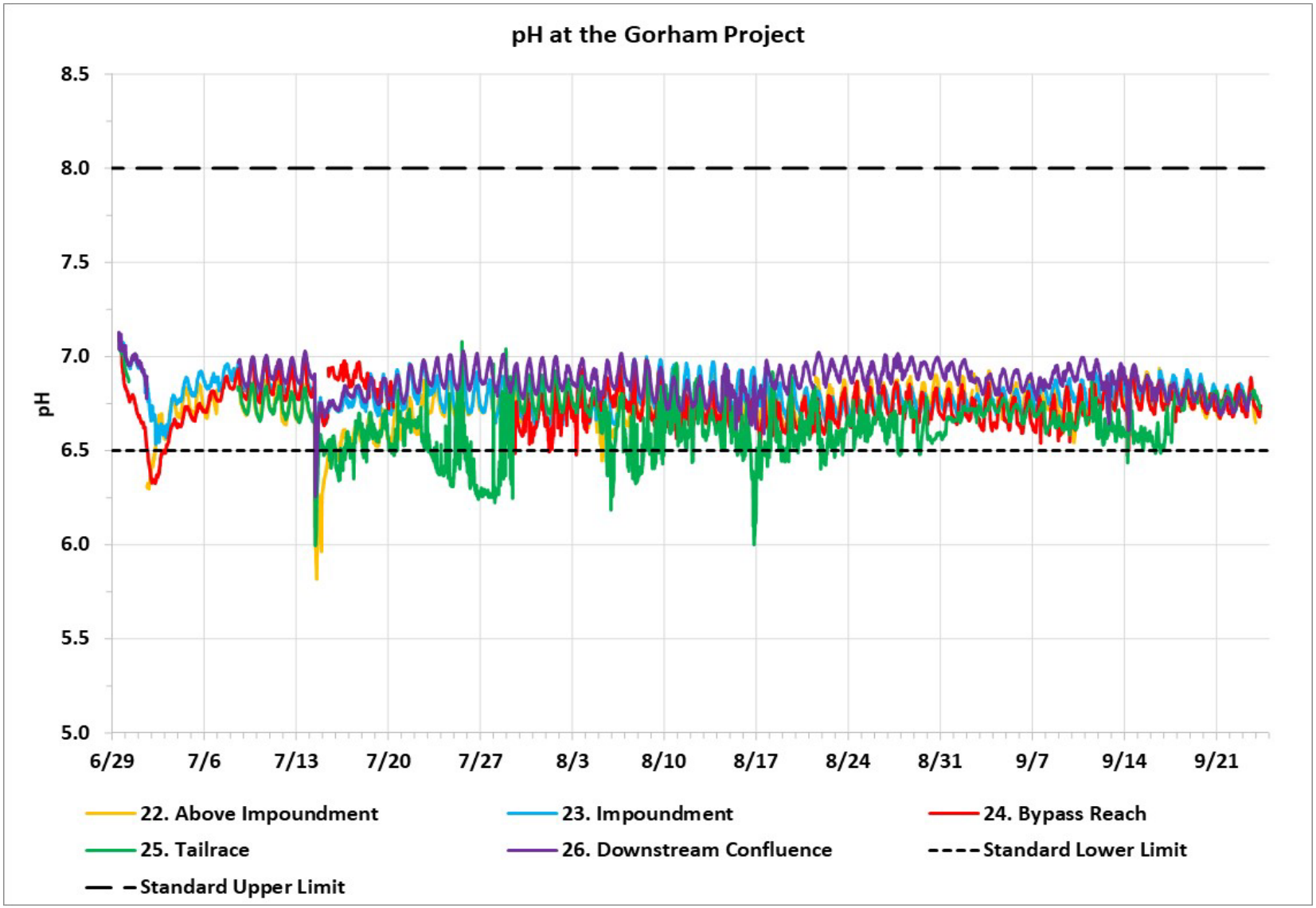

Figure 3.11 pH and the Class B standard at the Gorham Project, June 29-September 24, 2020.

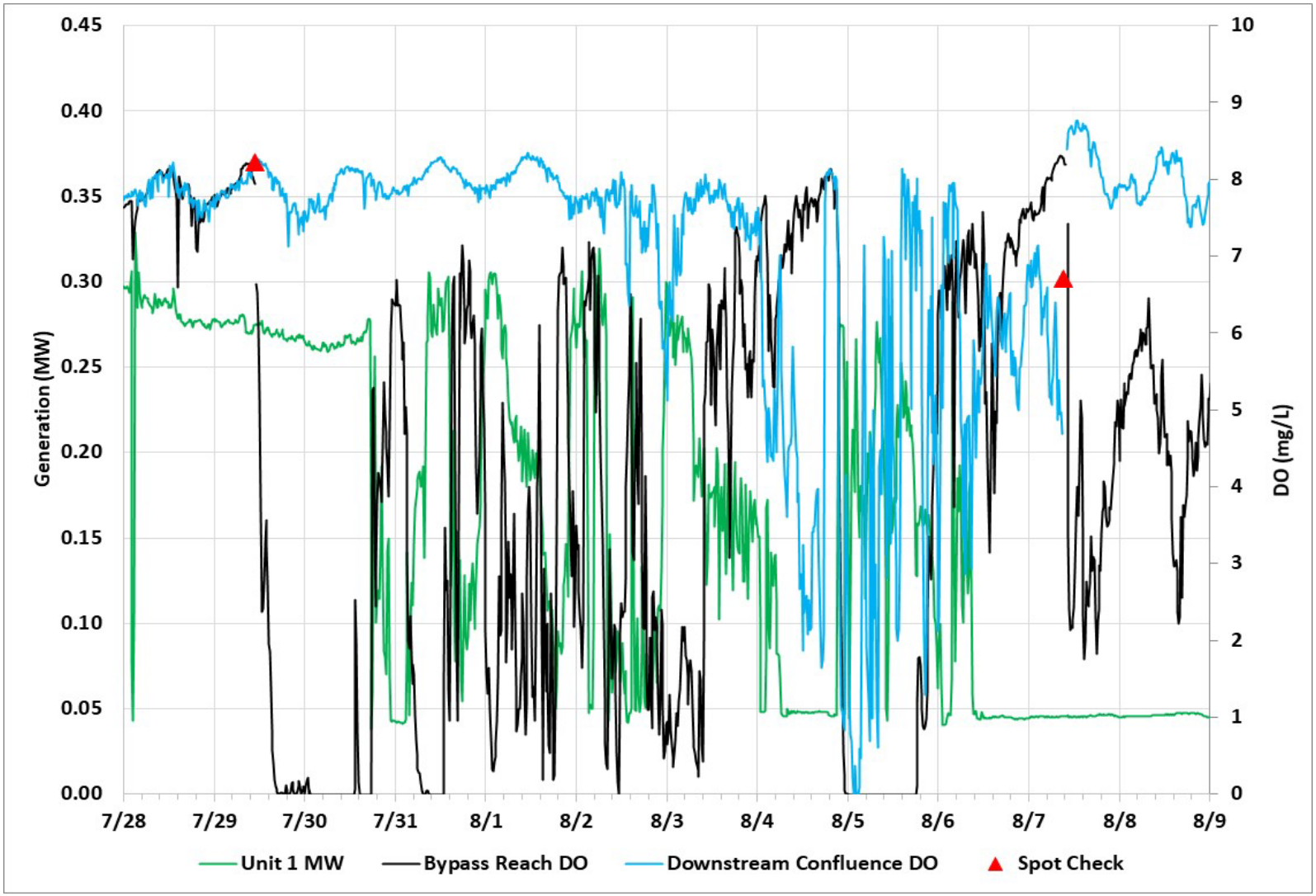

Figure 3.12 DO concentration in the bypass reach and downstream confluence, Unit 1 generation, and the bypass reach DO spot check during July 28 to August 9, 2020.

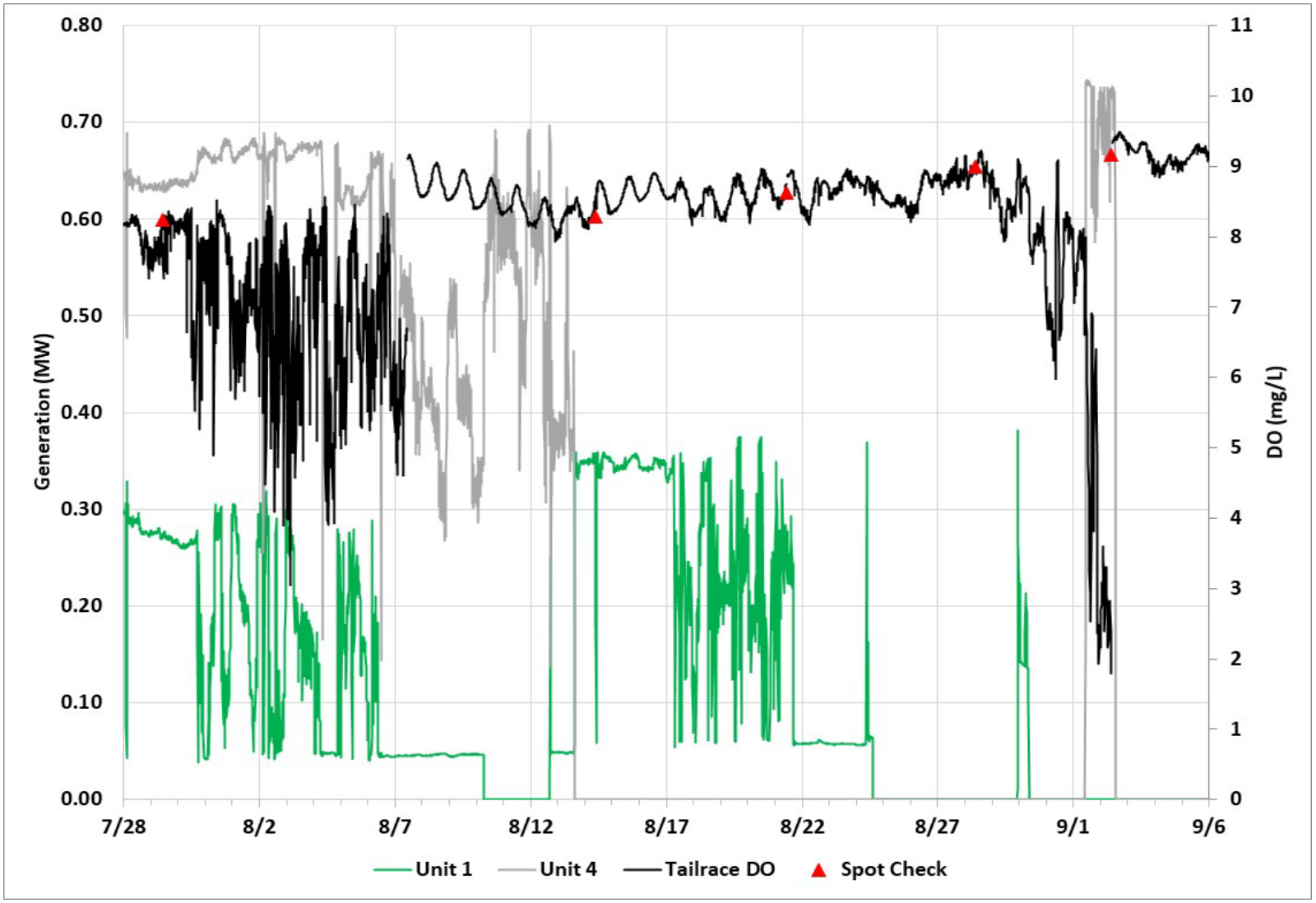

Figure 3.13 DO concentration in the tailrace, Unit 1 and Unit 4 generation, and the DO spot check during July 28 to September 5, 2020.

3.3.2 Environmental Effects

3.3.2.1 Water Quantity

CRP NH Gorham, LLC is not proposing any modifications to existing project facilities and is proposing to continue to operate the Gorham Project as run-of-river where natural inflow to the dam is equal to the outflow with no water storage in the impoundment for generation. CRP NH Gorham, LLC will continue to provide a minimum flow of 200 cfs to the bypass reach. CRP NH Gorham, LLC is proposing to develop an Operations and Maintenance Plan as a new license compliance measure which describes the current operations and maintenance practices. As such, there are no anticipated adverse effects on water quantity in the Gorham Project area.

3.3.2.2 Water Quality

The comprehensive water quality study completed at the Gorham Project in late June through mid-September 2020 documented that state Class B water quality standards were met. The DO concentration, daily average DO percent saturation, chlorophyll-a, and total phosphorus measurements collected throughout the Gorham Project were generally in attainment with standards. pH met the standard for 98.1 percent to 99.9 percent of the study period at the above impoundment, impoundment, bypass reach, and downstream confluence sites. pH was below 6.5 for short periods on July 1, 2, 14, or 15 during the high flow events with cooler water temperatures. pH was within the range of the state standard (6.5 to 8.0) for 90.6 percent of the study period in the tailrace and ranged from 6.0 to 7.1.

The Gorham impoundment did not thermally stratify and was well mixed. The DO concentration exceeded the state standard in all vertical profiles. Chlorophyll-a and total phosphorus were in attainment with standards for the protection of aquatic life and recreational designated uses. The low chlorophyll-a and nutrient concentrations and good water clarity indicate that the Androscoggin River in the Gorham Project area has low productivity and is not influenced by algal blooms.

Erroneous DO data from the bypass reach (July 29 to August 6, August 7 to 12), tailrace July 31 to August 7, August 30 to September 2), and downstream confluence (August 4 to 7) were removed from the final data set analyzed and presented in the ISR because it was not representative of the environmental conditions and demonstrated evidence of sedimentation or biofouling. Further review of the raw data suggested that operational changes may have also contributed to the unusual trends in the DO data but DO

concentrations and daily average percent saturations were above state standards. Overall, the cause of the variable and low DO levels is inconclusive and likely was influenced by a combination of factors including operations, human factors, and sedimentation or biofouling. It is worth noting that the short term lower DO concentrations and percent saturation observed at the Gorham Project were not transported far downstream; all DO data measured at the downstream GLHA Shelburne Project during the same time period was above the state standards.

Water quality monitoring studies were completed at the eight hydropower projects demonstrating good water quality throughout this 11-mile reach of the Upper Androscoggin River. The DO concentration, daily average DO percent saturation, chlorophyll-a, and total phosphorus measurements collected throughout the Upper Androscoggin River were all in attainment with standards. pH was within the limit of the standard throughout the entire study period at 15 of the 31 total monitoring sites. A limited amount of pH data was below the 6.5 standard for short periods at the remaining sites; the majority of these periods coincided with high flow events and cooler water temperatures or were observed during the daily early morning pH minimum. None of the eight project impoundments were thermally stratified. The 2020 monitoring results demonstrate that operation of the eight hydroelectric projects, including the Gorham Project, throughout the Upper Androscoggin River in Berlin, Gorham, and Shelburne, NH, does not have adverse impacts on water quality.

CRP NH Gorham, LLC is not proposing any changes to existing project facilities or operations. The Licensee proposes to develop an Operations and Maintenance Plan as a new license implementation requirement to describe the current operations and maintenance practices and to continue providing the existing minimum flow to the bypass reach. CRP NH Gorham, LLC does not anticipate that continued operation of the Gorham Project will have an adverse effect on water quality in the Androscoggin River.

3.3.3 Unavoidable Adverse Effects

The proposed action (i.e., continued operation and relicensing of the Project) as proposed is not expected to result in any unavoidable adverse effects on water quantity and water quality resources in the Androscoggin River.

3.3.4 References

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3.4 Fish and Aquatic Resources

3.4.1 Affected Environment

3.4.1.1 Aquatic Habitat

The Gorham Project is within an 11-mile-long, high gradient reach of the upper Androscoggin River with concentrated hydropower development, industrial development, towns, and residential areas. There are long reaches of free-flowing river and tributaries upstream and downstream of these concentrated hydroelectric facilities, including a 32-mile-long reach upstream interrupted only by the Pontook Project (FERC No. 2861), and a 40-mile-long reach downstream of Shelburne, New Hampshire. Dam owners farther upstream in the watershed manage the Androscoggin River for industrial purposes, recreation, instream flow uses, and for protecting aquatic species, with regulated outlets at Rangeley Lake, Mooselookmeguntic Lake, Richardson Lake, Aziscohos Lake and Lake Umbagog. The final re-regulating point is at the Errol dam in Errol, New Hampshire. The Errol Project is not operated as a peaking facility, but provides relatively steady discharges, striving to meet the target flow of 1,550 cfs on the Androscoggin River in Berlin, NH on a year-round basis (Brookfield, et. al. 2021); the Errol dam is approximately 35 river miles upstream of the Gorham Project. The licensee operates the Gorham Project as a run-of-river facility, which minimizes the effects of operations on fish and aquatic resources by maintaining stable river flow conditions and impoundment levels.

Aquatic habitat in the Gorham project area includes a small, riverine impoundment with a surface area of 32 acres (Photo 3.1), an 800-foot-long riverine bypassed reach between the dam and powerhouse, and the tailwater area. CRP NH Gorham, LLC provides a year-round minimum flow of 200 cfs or inflow to the Project impoundment, whichever is less, from the dam into the bypass reach for the protection of water quality, aquatic habitat, and fishery resources; the minimum flow was based on the results of an instream flow study conducted in consultation with the resource agencies during the prior relicensing. The minimum flow is provided through an opening in the flashboards at the dam (Photo 3.2). The bypassed reach is primarily low to moderate gradient riffle, with mostly cobble and boulder substrates. Both banks have defined, moderate slopes and surrounding land use includes forest, commercial, and residential development.

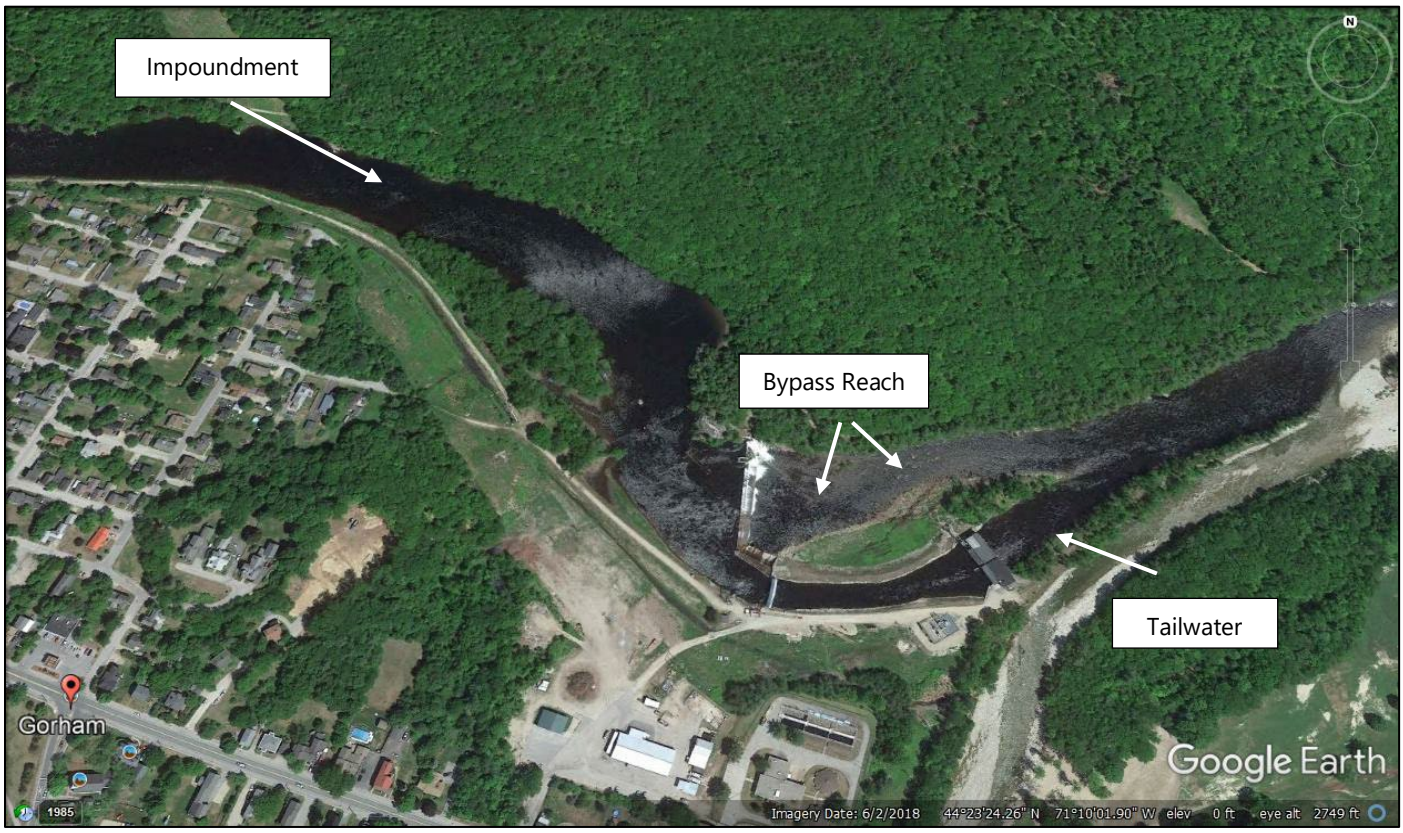

Photo 3.1 Gorham Impoundment, Bypass Reach, and Tailwater

Photo 3.2 Gorham Dam and Minimum Flow Release into Upper Section of Bypass Reach

The Licensee collected habitat data within the Gorham bypass reach in 2020 to document hydrologic conditions and aquatic habitat at the existing minimum flow release. The study was completed pursuant to the RSP and requests from the NHDES and NHDFG. The Licensee originally proposed to set up transects in the bypass reach and collect instream data, measure discharge, collect detailed photography and video, and perform drone flyovers to capture high resolution photographs and video. In 2020, the Licensee focused on drone aerial photography combined with analyses of applicable existing data from previous studies in the bypass reach.

The drone was flown in a continuous direction to the limit of visibility 30 to 60 feet above the river bed, after which it was returned to the launch site and transported to the next launch location. Researchers captured images of substrate and instream cover, river transect areas from previous instream flow studies, mesohabitat type (e.g., riffle, run, pool), wetted width, overall hydrologic conditions (flow patterns, areas of turbulence, and reoxygenation), substrates for macroinvertebrate colonization, and conditions related to zone of passage for fish movements, such as water depth and large elevation gradients. The pilot and biologist noted mesohabitat types, dominant substrates, cover types, and cover quality based on direct observation and professional judgement. Mesohabitat substrate types were classified after Dunn and Leopold (1998). Dominant substrates were classified as: bedrock, boulder (small, medium, or large), cobble, gravels, and sand (Bovee 1982). The following activities were performed to analyze the data for the study:

- Classified mesohabitats using the collected drone imagery as follows:
    - **Riffle**: shallow, with moderate velocity, turbulent, high gradient (usually > 1 percent), moderate to large substrates (cobbles or gravels).
    - **Rapid**: shallow, with moderate to high velocity, turbulent, with chutes and eddies, high gradient (usually > 2 percent), large substrates, or bedrock.
    - **Run**: moderately deep to deep, well-defined non-turbulent laminar flow, low-moderate velocity, well-defined thalweg, typically concave stream geometry, varying substrates, gentle slope (< 1 percent).
    - **Glide**: shallow, well-defined non-turbulent laminar flow, low velocity, well-defined thalweg, flat stream geometry, finer substrates, transitional from pool.
    - **Pool***:* deep, low velocity, well-defined hydraulic control at outlet.
- Obtained and reviewed quantitative information collected at the study sites during previous relicensing studies (Normandeau 1991). This included habitat

transects (e.g., water depth/velocity/substrate/wetted width), as well as Physical Habitat Suitability Model (PHABSIM) data.

- Summarized information about how CRP NH Gorham, LLC provides and maintains minimum flows.
- Evaluated DO, pH, and water temperature data collected in 2020 in each bypass reach.
- Viewed aerial photos to determine the distribution of mesohabitats and dominant substrates and cover and used with past study data (when available) to locate former study sites within the Gorham Project bypass. Transect profile data were not available; however; the discharge versus wetted area relationship at each transect was reviewed to assess the adequacy of the existing flow requirement.

Substrate in the reach is predominantly medium and large sized boulder although there are bedrock outcrops and occasional gravel patches. Object cover is limited to scattered boulders, and deeper sections of pools. Mesohabitats include a large pool at the toe of the spillway, and a boulder riffle that terminates in a riverine pool backwatered by the from the tailrace at the confluence with the Peabody River (Photo 3.3 and Photo 3.4).

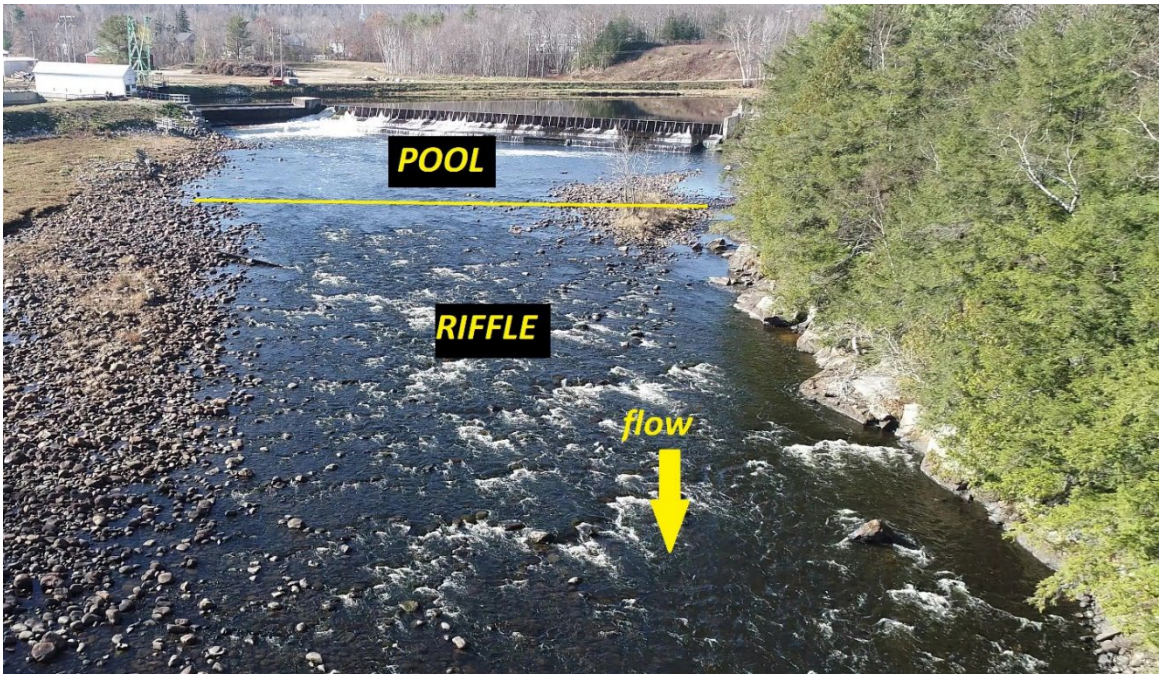

Photo 3.3 Gorham Project Bypass Reach Looking Upstream at Riffle and Pool Mesohabitat at the Existing Minimum Flow of 200 cfs.

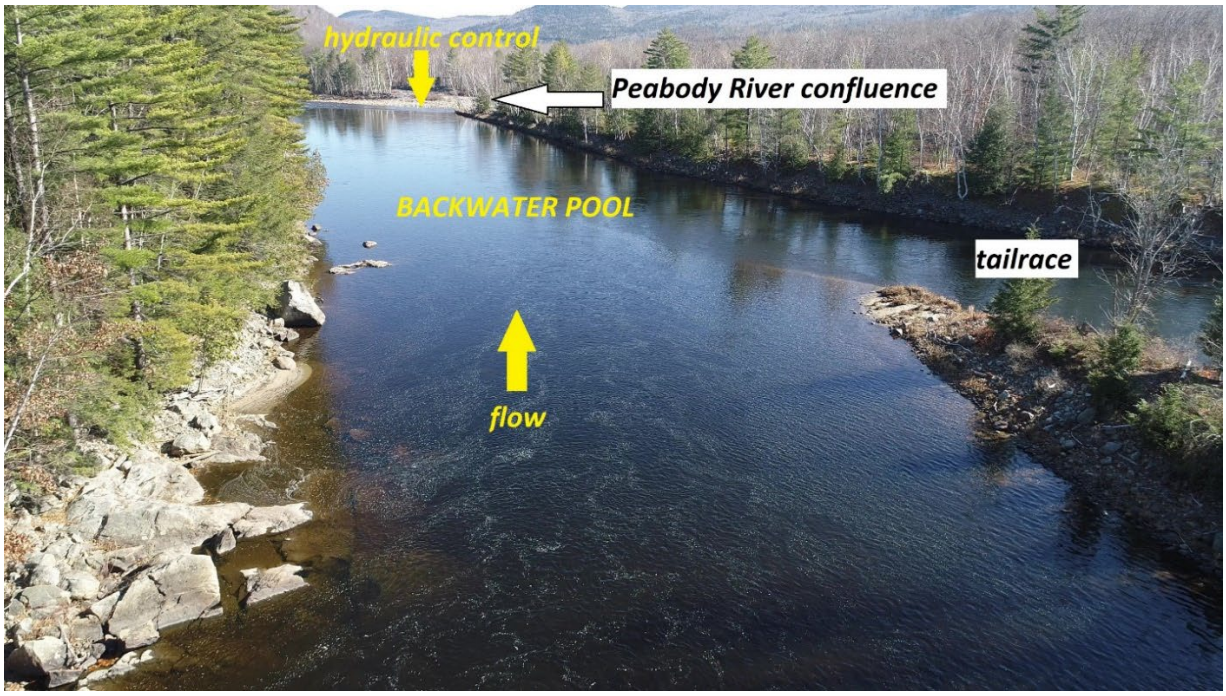

Photo 3.4 **Gorham Project Bypass Reach Looking Downstream at Backwatered Pool Habitat at the Existing Minimum Flow of 200 cfs.**

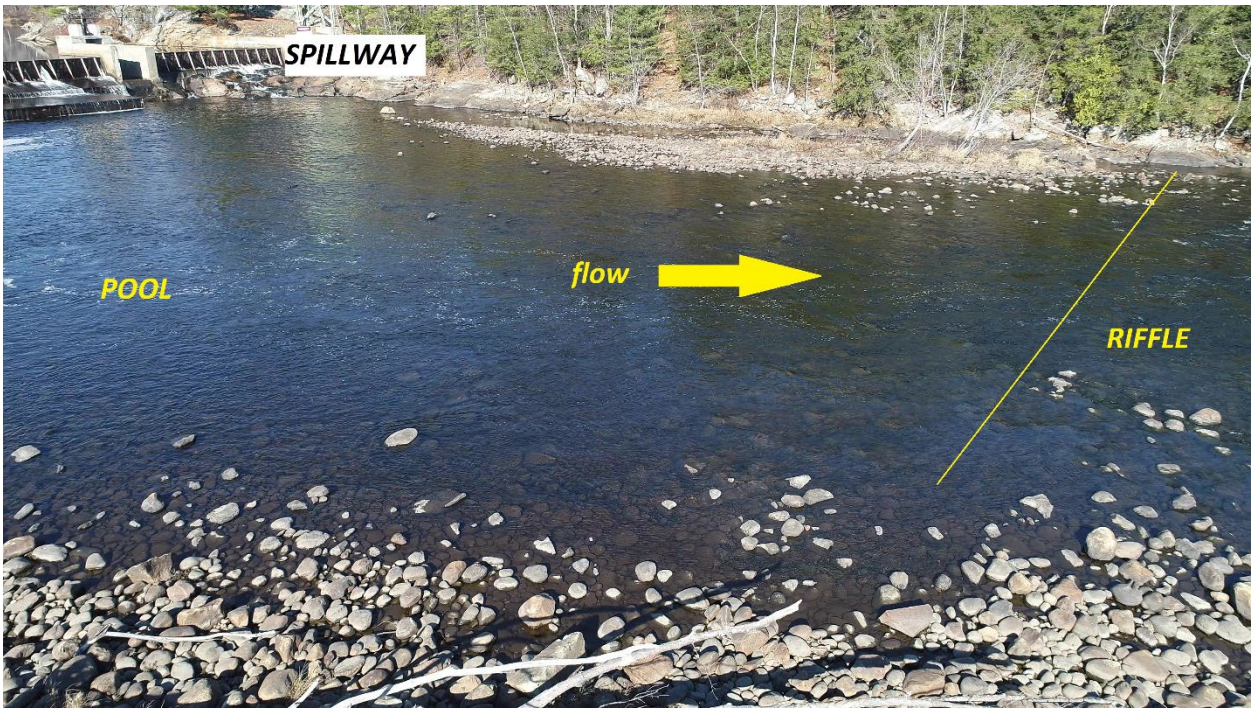

Photo 3.5 **Gorham Project Bypass Reach Pool Mesohabitat at the Existing Minimum Flow of 200 cfs**

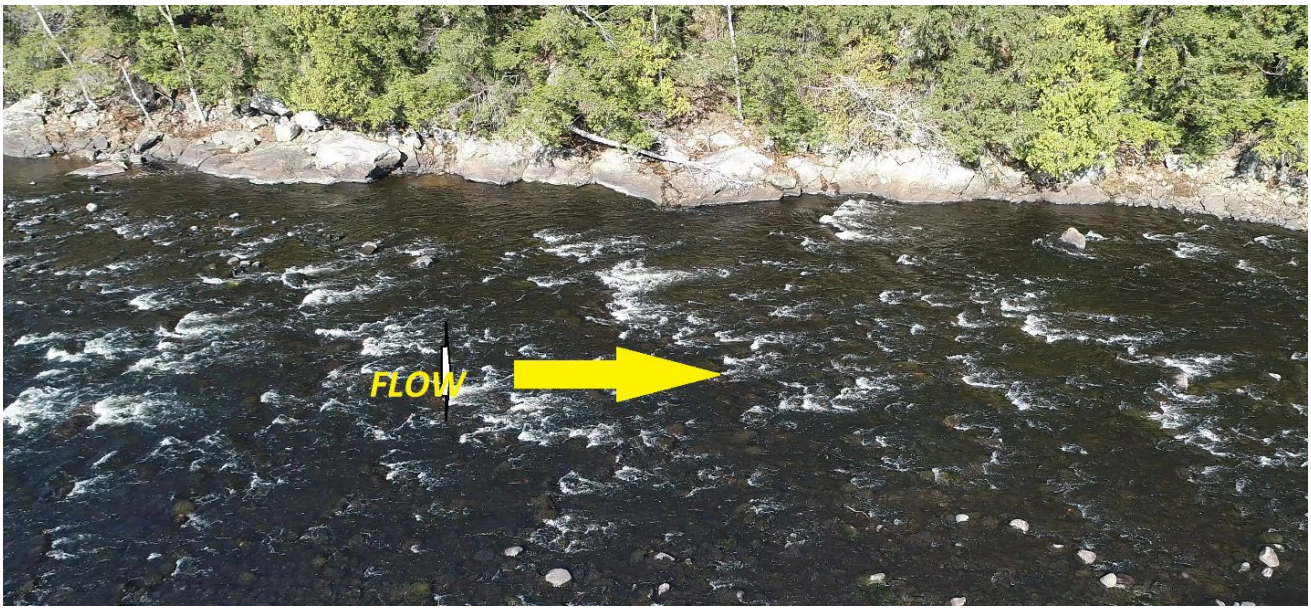

Photo 3.6 Gorham Project Bypass Reach Riffle Mesohabitat at the Existing Minimum Flow of 200 cfs

The former Licensee performed an Instream Flow Incremental Methodology (IFIM) study in 1991 using a PHABSIM model to quantify habitat suitability for brown trout and rainbow trout (Normandeau 1991). A single study site was employed with five transects distributed throughout all mesohabitats in the reach. The study analyzed discharge and habitat suitability between 50 and 800 cfs. Table 3.9 and Figure 3.14 summarize the wetted area relationship for various flow increments across the modeled range. According to the results, the percentage of wetted area at any given flow varied slightly among the transects; however, there is generally an inflection point at around 200 cfs for most transects, which provides 88 to 99.8 percent of the wetted area relative to that achieved at 800 cfs at all transects, except transect 4 which achieved 64 percent of maximum wetted area at 200 cfs.

Normandeau (1991) also reported that 350 cfs "*would be the optimal minimum flow…for juvenile brook trout*" but that a flow of 150 cfs could be biologically justified as it "*would provide 92% of the WUA*[4] *for juvenile brook trout that would be found at a discharge of 300 cfs and also provides 81-85% of WUA that would occur at 300 cfs for the remaining salmonid life stages.*"

[4] WUA (Weighted Usable Area) is a quantitative index of habitat suitability computed in PHABSIM models.

Table 3.9 Total Wetted Area (Square Feet per 1,000 Feet of Stream Length) at Study Transects in the Gorham Project Bypass Reach Between 50 and 800 cfs.

Flow (cfs)	Transect 1	Percent Channel Wetted	Transect 2	Percent Channel Wetted	Transect 3	Percent Channel Wetted	Transect 4	Percent Channel Wetted	Transect 5*	Percent Channel Wetted
50	244,767	***88%***	117,300	***63%***	31,834	***19%***	37,502	***26%***	-	**-**
100	258,085	***93%***	132,343	***71%***	67,436	***41%***	67,711	***47%***	-	**-**
200**	270,420	***98%***	163,153	***88%***	149,344	***90%***	92,658	***64%***	145,392	***99.8%***
300	272,213	***98%***	169,522	***91%***	151,943	***91%***	98,666	***68%***	-	**-**
400	273,586	***99%***	173,559	***93%***	157,752	***95%***	109,776	***76%***	145,675	***100%***
600	275,705	***99%***	180,241	***97%***	159,493	***96%***	136,639	***95%***	145,109	***99.6%***
800	277,332	***100%***	185,666	***100%***	166,332	***100%***	144,539	***100%***	-	-

Source: Normandeau 1991.

*** Data not available at this transect for flows other than 200, 400 and 800 cfs.**

**** Existing minimum flow.**

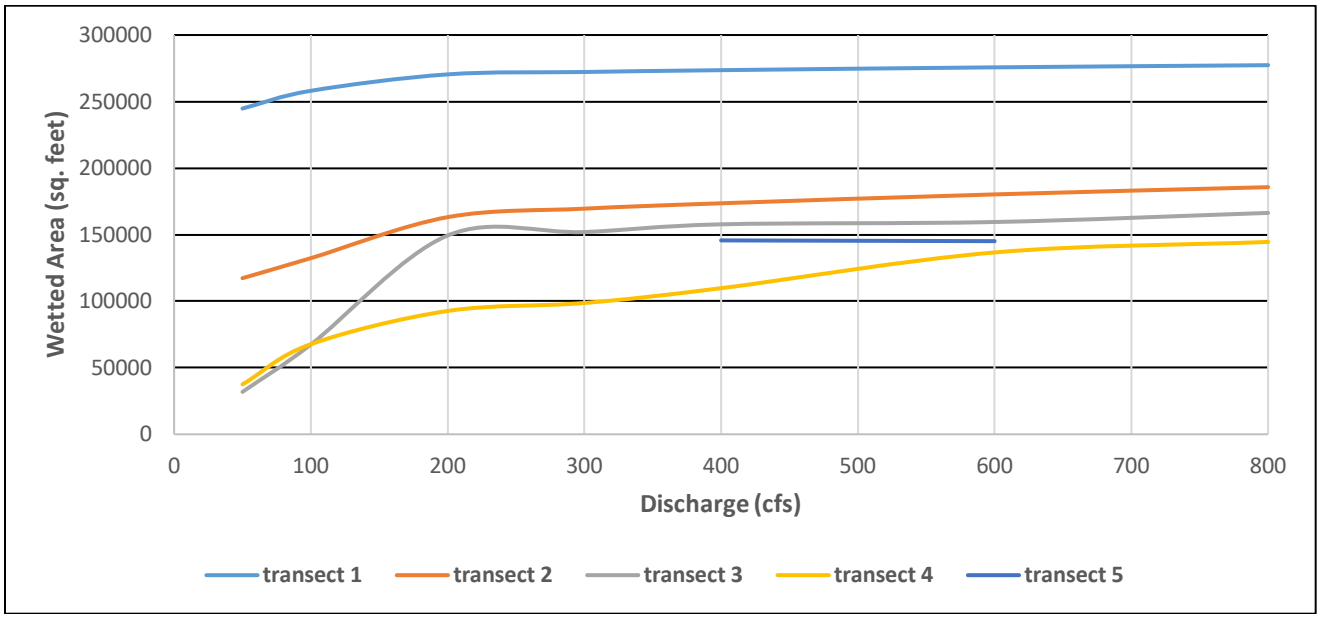

Figure 3.14 Relationship between Flow and Wetted Area in the Gorham Bypass Reach (from Normandeau 1991)

During the 2020 water quality monitoring study, the Licensee monitored DO and water temperature at 15-minute increments from the end of June into late-September in the Gorham bypass reach. The 2020 data demonstrated average DO levels of 8.7 mg/L and 98.7 percent saturation. The DO standard for the Androscoggin River is 5 mg/L with a daily average of 75 percent saturation. Average water temperature and pH were 21.1 °C and 6.7 pH units. Water quality monitoring in 2020 demonstrated that the existing minimum flow requirements in the bypass reaches maintain New Hampshire's surface water quality standards. Section 3.3, Water Resources, and the ISR provide additional detail on the 2020 water quality monitoring.

In their August 6, 2021, letter providing comments on the ISR, NHDES requested several clarifications regarding the study methodology and additional data collection in the Gorham bypass reach. In the fall of 2021, CRP NH Gorham, LLC completed additional habitat data collection and analysis. Detailed study methods and results were provided in the USR and summarized below.

A total of eight gaging passes were conducted with the ADCP (Photo 3.7), and data were analyzed in the field for compliance with the gaging standard (variability less than 5% of

the mean). There was less than 5% variability among the three best gaging measurements selected (Table 3.10). The mean discharge measured during the minimum flow release at the gaging site was 290.1 cfs. The standard deviation across the three measurements was 8.9 cfs. The mean wetted width of the gaging transect was 206.8 feet (Table 3.10).

Photo 3.7 Gaging below the Gorham dam using the ADCP drone boat

Table 3.10 Gaging Data Summary at Gorham on November 9, 2021

File ID	Width (ft)	Total Flow (cfs)
20211109145040	214.05	300.663
20211109132722	207.41	278.86
20211109134402	199.056	290.629
Mean	206.839	290.051
Standard Deviation	6.135	8.911

Distribution of Depths and Velocities

Because the bypass flow present during the survey was close to 300 cfs, comparisons of depth and velocity were made with the 300 cfs modeling results reported by NAI (1991). Transect 1 (CRP) represents a wetted area of 137,350 square feet per thousand feet of stream length at a 290 cfs discharge. Although this is less than that of NAI (1991) Transect 2 (169,522), Transect 1 (CRP) was not located exactly at the NAI transect locations.

Therefore, width and related wetted area are affected by the difference in specific transect location.

Hydraulics are generally similar between Transect 1 (CRP) and the previous study transects modeled for 300 cfs, with minor shifts in depths and velocities. Transect 1 (CRP) has a similar distribution of velocities as (NAI 1991) Transect 2 with most velocities ranging between 0.5 to 2 feet per second (fps) (Table 3.11). Transect 1 (CRP) displays a slight shift in overall depths compared to Transect 2 (NAI 1991) but overall, most depths range between 1 to 3 feet. However, no depths between 3 to 4 feet were found in Transect 2 (NAI 1991), and a small percentage of depths between 3 to 4 feet exist at Transect 1 (CRP) (Table 3.12).

Table 3.11 Comparison of total wetted area and distribution of mean column velocities at the Gorham Project bypass reach study site

Location (Year - Site)	Total Wetted Area (ft^2) per 1000 feet of Stream	Velocity Ranges (ft/s) by Percent				
		0 - 0.5	0.5 - 1.0	1.0 - 2.0	2.0 - 3.0	3.0 - 4.0
2021 – Transect 1 (CRP) 290 cfs	137,350	21	25	35	16	3
1991 - Transect 2(NAI 1991) 300 cfs	169,522	11	26	46	17	0
1991 - Transect 2(NAI 1991) 200 cfs	163,153	28	23	46	5	0

Table 3.12 Total wetted area and distribution of depths at the Gorham study site

Location (Year - Site)	Total Wetted Area (ft^2) per 1000 feet of Stream	Depth Ranges (feet) by Percent			
		0 - 1	1 - 2	2 - 3	3 - 4
2021 – Transect 1 (CRP) 290 cfs	137,350	7	53	35	4
1991 - Transect 2 (NAI 1991) 300 cfs	169,522	41	50	9	0
1991 - Transect 2 (NAI 1991) 200 cfs	163153	42	58	0	0

Habitat Suitability Criteria

Due to field conditions, it was not possible to collect micro velocities and depths to support habitat suitability analysis at the targeted discharge of 200 cfs. Discharge measured during the gaging below Gorham dam was 290 cfs. Therefore, the 2021 habitat suitability data collected at 290 cfs cannot be directly compared to the NAI 1991 suitability results. However, while a direct comparison cannot be made between the current minimum flow requirement of 200 cfs, based upon the depth and velocity criteria ranges that provide suitable hydraulic conditions, 200 cfs would largely provide optimal or near optimal depth and velocity conditions for target species of rainbow trout. NHDES requested a comparison of previous relicensing vs. present substrates. NAI (1991) describes boulder and rubble as the predominant bed material, which appears to be consistent with present conditions.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act requires the NMFS to describe and identify EFH in federal fishery management plans for commercial species. The Magnuson-Stevens Act requires federal agencies to consult with NMFS when any activity is proposed to be permitted, funded, or undertaken by a federal agency may have adverse effects on designated EFH. The upper Androscoggin River does not have any commercially-managed fish species; therefore, EFH is not designated.

3.4.1.2 Fish Assemblage and Management

Resident Fish Community

Historically, the upper Androscoggin River near Berlin, New Hampshire, was heavily polluted due to point source discharges from municipal, paper mill, and textile effluents (Inglis et al. 2014, Yoder et al. 2006a, Boucher 1997). Pollution from point source discharges, dams, timber drives, land use practices, non-native fish species, and over-fishing all contributed to a decline in the quality of the fishery (AMC 2003, Boucher 1997). Improvements to water quality since the 1970s resulting from regulations, new municipal and industrial treatment facilities, and the establishment of more stringent water quality standards have allowed the reach of the river between Berlin and Shelburne (i.e., near the Gorham Project) to improve as a recreational and ecological resource (Inglis et al. 2014). However, NHDES continues to recommend that fish caught from Berlin, New Hampshire,

to the Maine border do not get consumed because of elevated dioxin and mercury levels resulting from past industrial discharges (NHDES 2021).

The upper Androscoggin River supports approximately 30 species of fish, a quarter of which are non-native (AMC 2003). Angling for salmonids is bolstered by trout stocking and wild reproduction in the upper watershed and within tributaries. Cold water inflow from tributaries and regulated water releases from upper storage reservoirs[5] enhances coldwater fisheries habitat in the main stem of the Androscoggin River. The Midwest Biodiversity Institute (MBI) sampled 51 sites in the Androscoggin River in 2003 to document the spatial distribution and relative abundance of fish in large, non-wadeable river systems of the northeastern United States (Yoder et al. 2006a). MBI electrofished nine 0.6-mile-long reaches within or near the Gorham Project (Figure 3.15), collecting 3,378 fish representing 18 species (Table 3.13). MBI's overall catch was dominated by common fish species from the northeastern United States, including fallfish (30.6 percent), smallmouth bass (26.3 percent), white sucker (14.9 percent), and longnose dace (10.7 percent); common shiner (6.4 percent) and spottail shiner (4.2 percent) were also relatively abundant (Table 3.13).

CRP NH Gorham, LLC provides access to the Gorham Project for angling and other water-based recreation by maintaining an informal boat launch at the downstream end of the impoundment, boat barrier for safety, and pedestrian access to the tailwater area. CRP NH Gorham, LLC proposed in the Revised Study Plan to conduct a recreation use and facility assessment study to determine existing use and condition of recreation water access sites at or near the project, and whether those sites are adequate to meet existing and future recreation demand in the project areas. Due to postponement of the recreation studies at the J. Brodie Smith, Gorham, and GLHA projects, the results of the 2022 study will be filed as a supplement to the Final License Application in early 2023.

[5] Umbagog, Aziscohos, and Richardson lakes.

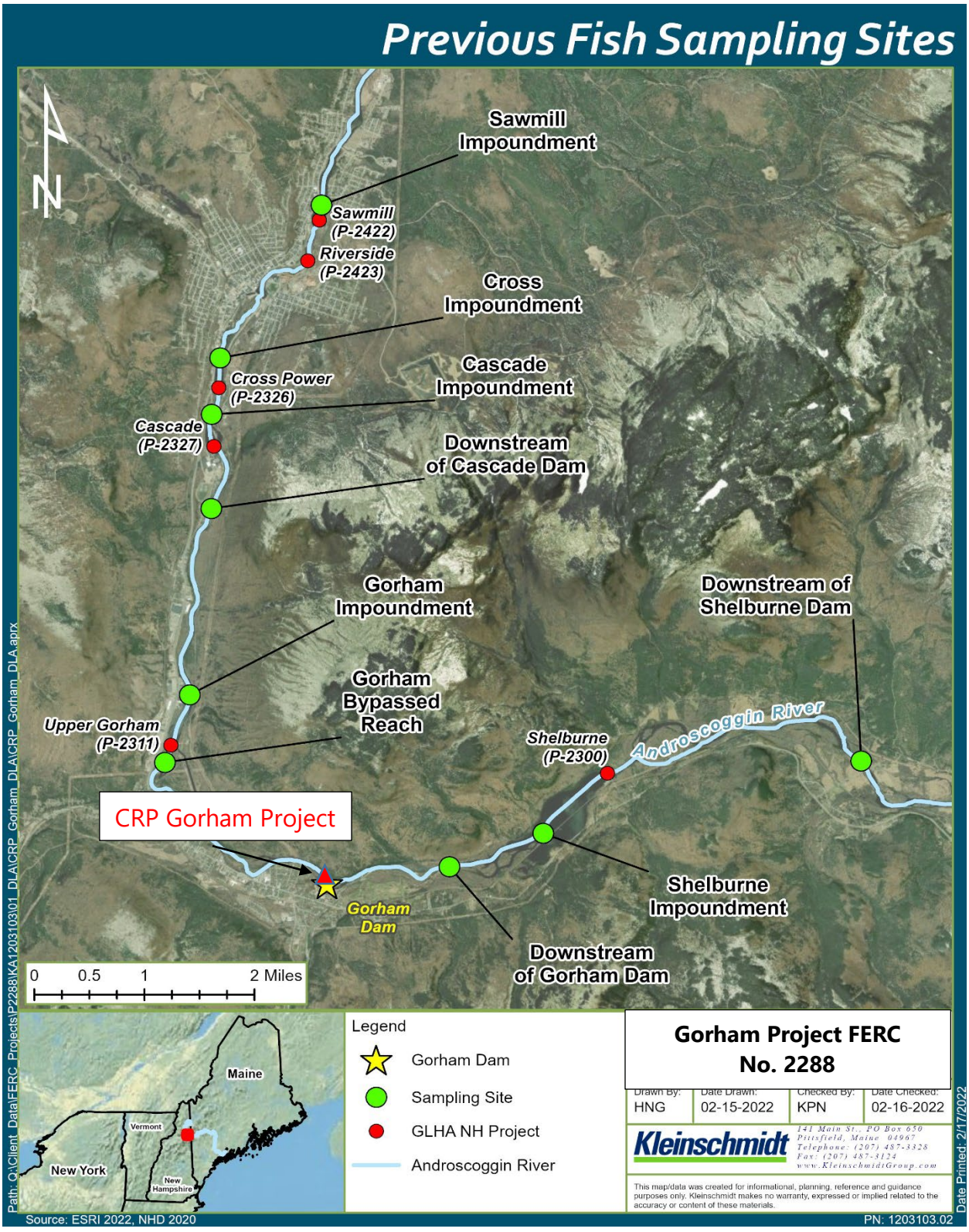

Figure 3.15 Midwest Biodiversity Institute's 2003 Fish Sampling Locations

Other species, such as rainbow trout, bullhead, and yellow perch were less common (i.e., less than or equal to 2 percent of the total catch). Smallmouth bass and white sucker were the most common species in riverine segments; smallmouth bass and fallfish were the most common species in the impounded segments (Yoder et al. 2006a). Rainbow trout and brown trout were present but not predominant. Species richness ranged from 5 to 12 in sampled reaches. Maine Department of Inland Fisheries and Wildlife (MDIFW) reports that burbot and chain pickerel also occur in the upper Androscoggin River (Brautigam and Pellerin 2014).

James River New Hampshire Electric (JRNHE, former Licensee of several hydropower projects in the upper Androscoggin River) completed baseline fisheries surveys in the near the Gorham Project in the late 1980s using boat and backpack electrofishing, fyke nets, gill nets, and experimental angling. Like what was documented by MBI in 2003, the fish assemblage in lacustrine (i.e., lake or impounded) waters was composed primarily of common fish species from the northeastern United States, including fallfish, white sucker, common shiner, and lesser numbers of smallmouth bass, yellow perch, longnose dace, lake chub, rainbow trout, and brown trout (Table 3.14); the fish assemblage in riverine sections were composed of white sucker, longnose sucker, longnose dace, landlocked salmon, rainbow trout, lake chub, common shiner, golden shiner, brown bull head blacknose dace, slimy sculpin, fallfish, pumpkinseed sunfish, and brown trout (Table 3.14).

Table 3.13 Fisheries Assemblage Documented near the Gorham Hydroelectric Project in 2003

Species	Sawmill impound.	Cross Power impound.	Cascade impound.	Downstream Cascade dam	Gorham impound.	Gorham bypass	Downstream of Gorham	Shelburne impound.	Total by Species	Relative Percent
Fallfish	22	16	8	200	314	149	279	44	1,032	30.54
Smallmouth bass	65	132	189	125	160	32	91	95	889	26.31
White sucker	-	-	4	89	102	214	88	7	504	14.92
Longnose dace	-	-	-	124	-	203	36	-	363	10.74
Common shiner	1	-	1	3	183	1	12	14	215	6.36
Spottail shiner	-	-	-	-	61	1	3	78	143	4.23
Yellow perch	-	3	-	4	1		38	23	69	2.04
Largemouth bass	12	11	14	4	3	-	-	-	44	1.30
Rainbow trout	1	-	-	1	-	21	11	-	34	1.01
Lake chub	-	-	-	-		22	2	-	24	0.71
Golden shiner	3	-	-	-	2		-	14	19	0.56
Brown bullhead	-	-	-	-	2	-	-	10	12	0.36
Rock bass	3	1	1	-	6	-	-	-	11	0.33
Blacknose dace	-	-	-	-	-	6	1	-	7	0.21
Brown trout	2	-	1	1	-	-	1	-	5	0.15
Longnose sucker	-	-	-	1	-	2	1	-	4	0.12
Creek chub	-	-	-	1	-	2	-	-	3	0.09
Landlocked salmon	-	-	-	1	-	-	-	-	1	0.03
Total Catch	**109**	**163**	**218**	**554**	**834**	**653**	**563**	**285**	**3,379**	**100.00**
No. of Species	**8**	**5**	**7**	**12**	**10**	**11**	**12**	**8**	**18**	**-**

Source: Yoder et al. 2006a; 2006b.

Table 3.14 Fisheries Assemblage Documented near the Gorham Project in 1988

Waterbody	No. Fish Collected	Percent Abundance Fish Species Collected
Sawmill impoundment	44	Fallfish (57%); common shiner (25%); white sucker (11%); rainbow trout (2.3%); yellow perch (2.3%); blacknose dace (2.3%)
Sawmill bypassed reach	67	White sucker (36%); landlocked salmon (24%); rainbow trout (24%); common shiner (13%); longnose sucker (3%); lake chub, blacknose dace, longnose dace, and slimy sculpin were common but not quantified
Riverside bypassed reach	21	Longnose sucker (28%); common shiner (19%); fallfish (14%); rainbow trout (14%); landlocked salmon (10%); blacknose dace (10%); white sucker (5%)
Cross Power impoundment	19	Common shiner (47%); white sucker (37%); fallfish (16%)
Cross Power tailwater	64	White sucker (64%); fallfish (14%); smallmouth bass (8%); common shiner (8%); brown trout (1.5%); yellow perch (1.5%); blacknose dace (1.5%); lake chub (1.5%)
Cascade impoundment	60	White sucker (68%); fallfish (13%); smallmouth bass (8%); common shiner (6.5%); brown trout (1.5%); yellow perch (1.5%)
Upper Gorham impoundment	44	White sucker (70%); longnose dace (18%); fallfish (7%); unidentified minnows (5%)
Upper Gorham bypassed reach	149	White sucker (27%); blacknose dace (20%); longnose dace (17%); longnose sucker (13%); rainbow trout (9%); slimy sculpin (abundant, but not quantified); brook trout (9%); lake chub (abundant, but not quantified); brown bullhead (1%); fallfish (1%); pumpkinseed sunfish (1%)
Shelburne impoundment	40	White sucker (60%); rainbow trout (20%); fallfish (18%); yellow perch (2%)
Shelburne bypassed reach	19	Golden shiner (42.5%); yellow perch (32%); white sucker (10.5%); brook trout (5%); brown bullhead (5%); burbot (5%)

Source: JRNHE 1991, JRNHE 1989.

Fisheries Management

Fishing between Berlin, New Hampshire, and the Maine-New Hampshire border is catch-and-release only with no seasonal closures and no limits on the number and size of fish taken (NHDFG 2021). There is no formal, published fisheries management plan for the

upper Androscoggin River near the Gorham Project; however, NHDFG stocks brown trout, rainbow trout, and brook trout upstream of Berlin annually to support a put and take fishery (Table 3.15). In 2020, NHDFG stocked just over 53,500 brook trout, brown trout, and rainbow trout in the main stem of the Androscoggin River (Table 3.15). Most stocking locations are more than 10 miles upriver from the Berlin area (e.g., Errol, Cambridge, Milan, and Dummer; Table 3.15). NHDFG also stocks the Moose, Wild, and Peabody rivers with brown and rainbow trout to bolster the trout fishery in the main stem Androscoggin River in New Hampshire and Maine (Brautigam and Pellerin 2014); the Moose and Peabody rivers discharge to the mainstem Androscoggin below the Gorham Project, and the Wild River confluence is well downstream from the Shelburne Project (Figure 3.16). Stocking and fishing regulations are the main drivers controlling game fish populations in the upper Androscoggin River (AMC 2003). NHDFG has not stocked trout in the main stem of the Androscoggin River between Berlin and Shelburne since 2003 because of fish consumption advisories (personal communication, Jesse Wechsler, Kleinschmidt, with Diane Timmons, NHDFG June 28, 2019).

Table 3.15 2020 Trout Stocking Data for the Androscoggin River in New Hampshire

Town	Species	Age	Number
Berlin	Brown trout	1+YR	2,000
Berlin	Brook trout	1+YR	8,654
Berlin	Brook trout	2+YR	500
Berlin	Rainbow trout	1+YR	2,500
Cambridge	Brown trout	1+YR	1,000
Cambridge	Brook trout	1+YR	4,254
Cambridge	Brook trout	2+YR	200
Cambridge	Rainbow trout	1+YR	1,500
Dummer	Brown trout	1+YR	1,000
Dummer	Brook trout	1+YR	4,254
Dummer	Brook trout	2+YR	1,185
Dummer	Rainbow trout	1+YR	2,000
Errol	Brown trout	1+YR	1,184
Errol	Brook trout	1+YR	5,254

Town	Species	Age	Number
Errol	Brook trout	2+YR	300
Errol	Brook trout	3+YR	200
Errol	Rainbow trout	1+YR	6,500
Milan	Brown trout	1+YR	3,023
Milan	Brook trout	1+YR	5,054
Milan	Brook trout	2+YR	500
Milan	Rainbow trout	1+YR	2,500
Total Rainbow Trout			15,000
Total Brown Trout			8,207
Total Brook Trout			30,355
Total Stocked			**53,562**

Source: NHDFG, 2021

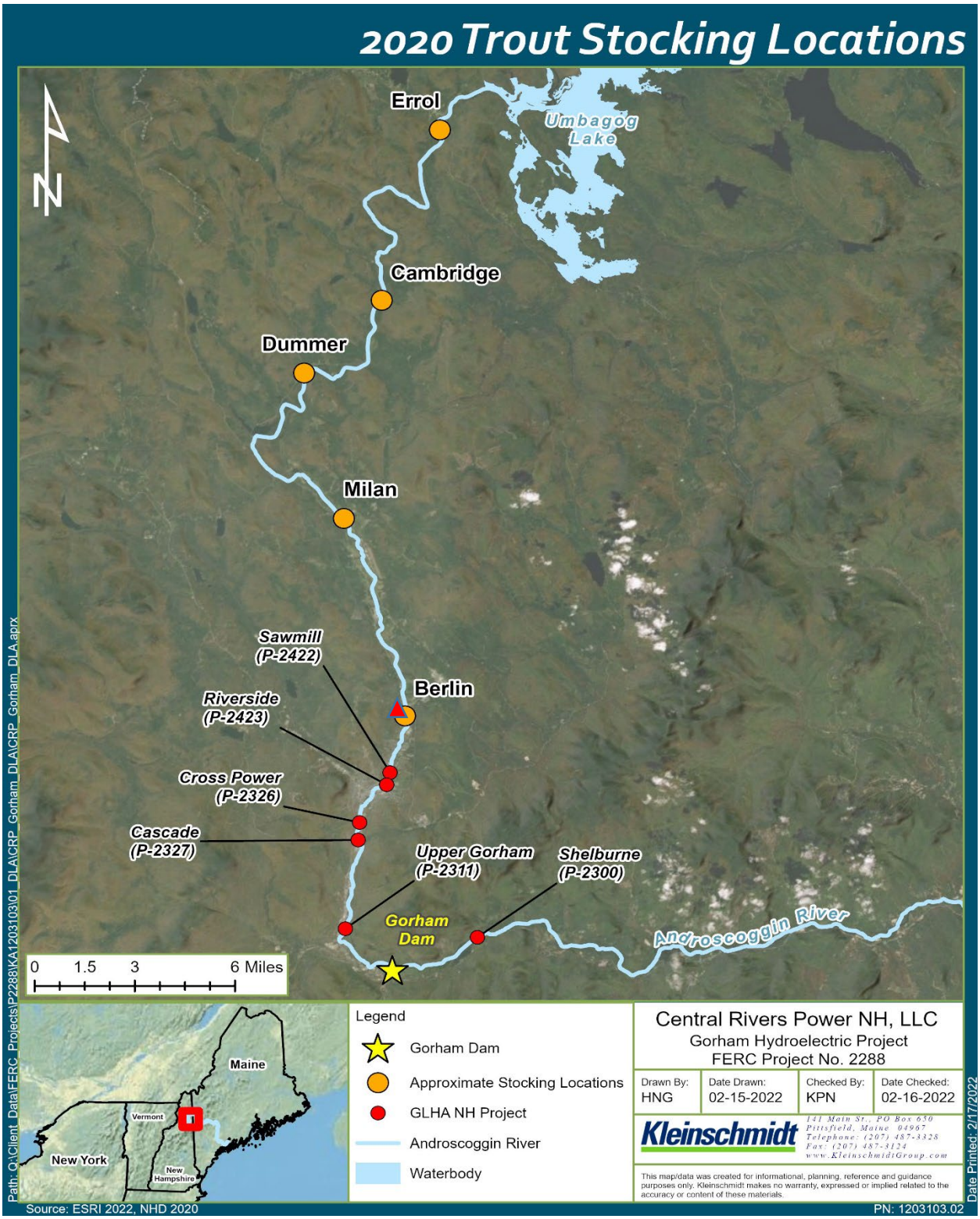

Figure 3.16 Trout Stocking Locations on the Main Stem Androscoggin River and Major Tributaries

According to MDIFW, native brook trout are well established in tributaries and inhabit the main stem of the Androscoggin River seasonally between Gilead and Bethel, Maine (approximately 12 RM and 24 RM downstream of the Shelburne Project, respectively) (Brautigam and Pellerin 2014). Wild tributary populations in conjunction with annual stocking of hatchery brook trout, rainbow trout, and brown trout contribute to the local coldwater fishery (Brautigam and Pellerin 2014).

Diadromous Fish Species

The natural range of migratory, anadromous fish does not extend to the upper Androscoggin River. Two major cascades in the lower Androscoggin River drainage (Lewiston Falls and Rumford Falls) are natural barriers for anadromous fishes (Wippelhauser et al. 2017). Atlantic sturgeon, shortnose sturgeon, and rainbow smelt likely did not pass beyond Pejepscot Falls (Wippelhauser et al. 2017) in Brunswick, Maine. Lewiston Falls prevented the upstream migration of sea-run alewives, American shad, blueback herring, striped bass, and sea lamprey, while Rumford Falls was a barrier to Atlantic salmon (Wippelhauser et al. 2017). The Gorham Project is approximately 63 RMs upstream of Lewiston Falls and 43 RMs upstream of Rumford Falls. American eel, a catadromous fish species, are present in the lower Androscoggin River (i.e., downstream of Lewiston Falls) in relatively low numbers as compared to other watersheds in Maine (Yoder et al. 2006a). MBI collected no American eels in the upper Androscoggin River in 2003 (Yoder et al. 2006a).

Fish Entrainment and Impingement

As proposed in the RSP, the Licensee completed a desktop study in 2021 to assess the potential risk of entrainment and impingement of resident fish species at the Gorham Project. A final report was provided in the ISR. The objectives of the study were to:

- Describe the configuration of the intake areas, including forebay characteristics, size of the intakes, trash rack spacing, approach velocities, and trash rack debris and cleaning protocols.
- Assess entrainment risk and impingement risk of stocked salmonids (e.g., brown trout and rainbow trout) and the four most abundant resident fish species known to occur in the study area.

CRP NH Gorham, LLC evaluated entrainment and impingement risk of juvenile and adult lifestages of stocked trout, fallfish, smallmouth bass, white sucker, and longnose dace (four most common species known to occur in the project area). In addition, CRP NH Gorham, LLC estimated turbine passage survival for juvenile species that have weaker swimming speeds that may be entrained. This combination of species and lifestages represented a range of game species, nongame species, and native species that may be affected by project operations. CRP NH Gorham, LLC reviewed features of the Gorham Project that were applicable to fish entrainment and impingement including:

- Trash rack configuration (e.g., surface area of rack system and clear spacing of trash rack bars).
- Water use through the turbines (e.g., cfs used for generation).
- Calculated approach velocity (feet per second (fps)) in front of the trash racks.
- Debris accumulation and handling.
- Turbine characteristics (e.g., power output, turbine type and orientation, revolutions per minute, and head).

Biological characteristics of the target species that influence their susceptibility to entrainment and impingement and aquatic habitat in the project area were also reviewed, including:

- Applicable life history information for each species (e.g., length, body width, and burst swim speed for juvenile and adult lifestages).
- Habitat preferences and an assessment of aquatic habitats near the project intakes.
- Propensity to migrate (i.e., requirements for obligatory downstream migration).
- Applicable species- or family-specific turbine survival data.

Entrainment and impingement risk for juveniles and adults of each target species was ranked as high, moderately high, moderate, moderately low, or low according to swim speed (i.e., ability to avoid or resist intake velocities that could result in involuntary entrainment or impingement), body size (likelihood of passing through trash racks), habitat preference or availability of habitat near the intake area, and the proclivity to move (i.e., migratory requirements).

Burst fish swim speed information was collected from a literature review of published and unpublished information. In instances where information on swim speeds was not readily available, burst swim speed estimates were derived using the following equation developed by the USFWS:

Burst Swimming Speed (ft/s) = (Fish length (ft) x 3 body lengths per second (ft/s)*(2)[6]

Turbine passage survival estimates were made for those species and lifestages that were found to be at risk (i.e., could physically fit through the trash racks and with swim speeds less that calculated approach velocities). Turbine passage survival estimates were derived from past studies described in the Electric Power Research Institute's (EPRI 1997) database for hydropower projects using sites similar to the Gorham hydroelectric facility. In addition, the USFWS' Turbine Blade Strike Analysis model (Towler and Pica 2020) was used to assess turbine passage survival for those species or lifestages classified as at risk (i.e., in instances where swim speeds were less than calculated approach velocities).

The Gorham Project has four Allis Chalmers vertical Francis turbines. The total hydraulic capacity of the station is 2,800 cfs with a maximum generation of 7.9 MW. The turbine trash racks have surface areas ranging from 360 square feet at unit 1 and unit 2; 24-ft X 15-ft) to 435 square feet (unit 3 and unit 4; 21.2-ft X 20.5-ft) for a total rack area of 1,590 square feet. Full depth, vertical trash rack bars are spaced at 2 and 3.5 inches. Relevant turbine and site characteristics are provided in Table 3.16.

[6] USFWS 1989.

Table 3.16 Characteristics of the Gorham Project

Characteristic	Gorham Unit 1	Gorham Unit 2	Gorham Unit 3	Gorham Unit 4
Turbine Orientation	Vertical	Vertical	Vertical	Vertical
Turbine Type (e.g., Kaplan/Francis)	Francis	Francis	Francis	Francis
Rated Power (MW)	0.4	0.4	0.675	0.675
Turbine Rated Max Flow (cfs)	500	500	900	900
Head (feet)	18			
Turbine RPM	120	120	180	180
Description of Debris Management/Removal	Hydraulic Rake			
Gross Dimensions of Trash Rack (square feet)	360	360	435	435
Calculated Approach Velocity (fps)	1.4	1.4	2.06	2.06
Clear (Open) Spacing Between Trash Rack Bars	2.0	2.0	3.5	3.5

The Gorham Project is characterized by a large power canal with no habitat in the intake area other than open water. Trash rack spacing is wide enough for adult smallmouth bass, white sucker, and fallfish to become entrained. Maximum intake velocities range from 1.4 to 2.0 fps when operating at the full hydraulic capacity of 2,800 cfs. Burst speeds of juvenile and adult fallfish, smallmouth bass, and white sucker are greater than the maximum approach velocity of 1.4 to 2.0 fps, which means fish can actively swim away from the intake area to avoid entrainment.

The risk of impingement and entrainment of fish was found to be low at Gorham Project because of several factors:

- The lack of quality aquatic habitat in the power canals, which minimizes the likelihood that fish will encounter the intake areas.
- The industrial nature and developmental history of the Project area, which has resulted in limited fisheries management in the 11-mile-long reach of the Androscoggin River between the Sawmill Project and the Shelburne Project.
- Low water velocities in front of the intake racks (e.g., 2 fps or less) and the ability of fish to swim away from the racks.
- The absence of migratory fish that require downstream passage which would be more at risk of entrainment as compared to resident fish species; the natural range of migratory, anadromous fish does not extend to the upper Androscoggin River.

CRP NH Gorham, LLC is proposing no changes to operations or facilities; therefore, the risk of entrainment or impingement is expected to remain low during the term of any new license.

Benthic Macroinvertebrates and Freshwater Mussels

Maine Department of Environmental Protection (MDEP) has monitored benthic macroinvertebrate communities on the upper Androscoggin River every 5 years at Bethel, Maine, which is approximately 23 RM downstream of the Shelburne Project. MDEP uses benthic macroinvertebrate data to assess attainment of established water quality class designation. The Androscoggin River at Bethel, Maine, is a Class B water. Benthic macroinvertebrate data collected since 1998 demonstrate that the Androscoggin River attains Class A or Class B designation based on benthic macroinvertebrate community metrics (MDEP 2019); Class B waters are the second highest designation in Maine. Attainment of Class is based on 30 benthic macroinvertebrate community metrics, including abundance, taxa richness, species diversity, and the characteristics of the Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) Orders, which are sensitive to pollution and provide forage opportunities for fish communities.

Ten freshwater mussel species are known to occur in New Hampshire, six of which are species of concern or protected species. Four species are reported to occur in the upper Androscoggin River near Berlin, New Hampshire (NHDFG 2021b) (Table 3.17). None of the four is listed by NHDFG as a rare species and three are commonly-occurring with secure population levels (Table 3.17).

Table 3.17 Status and Distribution of Freshwater Mussel Species in the Upper Androscoggin River

Common Name	Status
Creeper	Not listed, vulnerable; known to occur downstream of Shelburne Project and upstream of Berlin, New Hampshire.
Eastern elliptio	Not listed, population secure; occurs upstream of Berlin and within all major watersheds in New Hampshire.
Eastern floater	Not listed, population secure; occurs upstream of Berlin, NH.
Triangle floater	Not listed, population secure; known to occur downstream of Shelburne Project and upstream of Berlin, New Hampshire.

Source: NHDFG 2021b

The NHDFG requested that the Licensee complete freshwater mussel surveys throughout the Gorham project area as part of the relicensing study effort. CRP NH Gorham, LLC contracted Biodrawversity, Inc. to perform freshwater mussel surveys in 2020. A summary of the study results is provided below; the full study report was provided in the ISR. The objective of the study was to characterize species composition, distribution, abundance, demographics (inferred from shell length distribution), and habitat use of the mussel community.

An initial site visit to confirm access and identify potential survey sites was completed on July 27, 2020. A list and map of 7 proposed survey sites was developed based on the initial site assessment and submitted to NHDFG for review. After approval from the NHDFG, 7 survey locations were established in the tailwater (1), bypass reach (1), and impoundment (5). The surveys were completed from September 1 through September 4, 2020. Water was clear, water temperature was in the low to mid 60s, and visibility was excellent even in deep water. Three biologists worked together at each site; two people conducted the snorkel surveys, and the third person provided support, recorded all data, and checked shorelines for shells. At each survey site, biologists recorded mussel species present, counts for all species, habitat descriptions, photographs of mussels and habitat, survey method and duration, and location.

Eastern elliptio and triangle floater were found during the survey. Two live triangle floater were found in the impoundment (plus one shell), and none (live or dead) were found in the bypass reach or tailrace. One of the triangle floater was in a side channel in the impoundment. Researchers documented 83 Eastern elliptio, mostly in the side or farther downstream in the impoundment). None were found in the bypass reach, and 12 were found in the tailrace.

Biodrawversity noted that most of the impoundment appears to contain suitable habitat for these two species, with the exception of the uppermost site of the impoundment that had strong flows and coarse rocky substrates. The bypass reach is poor habitat for any mussel species due to a combination of shallow depth, coarse rocky substrates, and very strong scouring flows. Deeper areas of the tailrace, with fairly stable flows and fine substrates (gravel and small cobble) also provide suitable mussel habitat.

3.4.1.3 Invasive Aquatic Species

The NHDES reports no invasive aquatic species infestations in the upper Androscoggin River (NHDES 2019).

3.4.2 Environmental Effects

CRP NH Gorham, LLC is proposing no changes to operations or construction activities at the Gorham Project. As such, there will be no land or surface water disturbances, no changes in short term or long term river flow management, and no changes in reservoir elevations resulting from the proposed relicensing of the Project, except during infrequent maintenance activities throughout the term of any new license. CRP NH Gorham, LLC is proposing to develop and implement an OCP for the duration of a new license term to reliably maintain run-of-river operations at the Gorham Project, which is protective of fish and aquatic resources.

3.4.2.1 Aquatic Habitat

The bypass each was the subject of an IFIM model specifically designed to assess flows that promote a self-sustaining trout fishery. The current minimum flow in that reach targets trout habitat requirements, from agency recommendations based on study results. Fish occupying these reaches can also be recruited from contiguous downstream river reaches and nearby tributaries such as the Peabody River. As demonstrated by the 2020 follow up work, the river channel is fully wetted and mesohabitats are interconnected at the existing minimum flow. The impoundment will be maintained at a stable elevation as a result of run-of-river operations, which is protective of fish and aquatic organisms. Monitoring of DO and pH in 2020 also demonstrated that the existing minimum flow requirement meets New Hampshire's surface water quality standards.

3.4.2.2 Fish and Aquatic Species

The fish assemblage is representative of cool and warmwater fisheries in New England. The proposed action (continued operation) is not expected to have an adverse effect on existing fish communities. The proposed action will maintain riverine and lacustrine habitats throughout the Gorham project area. Run-of-river operations will maintain and provide aquatic habitats for fish and other aquatic organisms. As part of the proposed action, CRP NH Gorham, LLC will continue to provide access to the impoundment and tailwater area for angling and other water-based recreation.

3.4.2.3 Fish Entrainment

CRP NH Gorham, LLC is proposing no changes to operations; therefore, the risk of entrainment or impingement is expected to remain low.

3.4.2.4 Benthic Macroinvertebrates and Freshwater Mussels

CRP NH Gorham, LLC is proposing no changes to operations of facilities; therefore, invertebrate species and freshwater mussels are not expected to be affected by the proposed action.

3.4.3 Proposed Environmental Measures

The Licensee is proposing to operate the Gorham Project in a run-of-river mode and provide a 200 cfs minimum flow or inflow to the impoundment, if less, to the bypass reach to maintain and support aquatic communities. These measures will help protect aquatic communities and maintain habitats throughout the term of a new license. These operational conditions would be implemented under the proposed OCP.

3.4.4 Unavoidable Adverse Effects

Some unavoidable effects such as short-term erosion or infrequent entrainment of small fishes will occur over the term of a new license. The Licensee will implement erosion control measures in the event that construction activities are required for maintenance. Infrequent, short-term drawdown for maintenance (e.g., canal repairs, flashboard replacement) will likely occur during the term of a new license. Any permits needed at the time for these operational activities would be acquired by the Licensee at their onset.

3.4.5 References

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3.5 Wildlife and Botanical Resources

3.5.1 Affected Environment

The Gorham Project located in the Northern Appalachians and Atlantic Maritime Highlands Ecoregion. This region covers most of the northern and mountainous regions of New England. Vegetation is generally mixed hardwood and spruce-fir forests. Forest vegetation is somewhat transitional between the boreal regions to the north and the broadleaf deciduous forests to the south (Wiken, 2011). Habitats at the Gorham Project is primarily the impoundment and riparian zone. Terrestrial habitats are limited to islands and shoreline wetlands within the Project boundaries.

3.5.1.1 Wildlife Resources

Characteristic wildlife in this region includes moose, black bear, white-tailed deer, red fox, bobcat, lynx, snowshoe hare, porcupine, fisher, marten, racoon, beaver, rabbit, northern flying squirrel, osprey, red-tailed hawk, wild turkey, ruffed grouse, black-backed woodpecker, gray jay, common loon, and red-back salamander. Diverse types of birds and shorebirds are also abundant (Wiken, 2011).

Mammals

Area Habitat within the Projects boundaries are dominated primarily by aquatic habitat with limited terrestrial habitat. Mammalian present and most large wildlife species present are likely transient, and using the riparian corridor for movement and occasional foraging. Large species such as moose may occur, as they use a wide variety of habitats including second-growth boreal forests interspersed with semi-open areas, and swamps, to mature stands of balsam fir or white birch, and young aspen stands (DeGraaf and Yamasaki, 2001). These larger mammal species, such as moose, deer, and bear are do not likely reside year round resident within the Project. Species Other mammals such as the raccoon are also likely common, especially along the riparian corridors associated with the Project Boundaries. Other mammals present in the vicinity of the Projects include furbearers, small game species, rodents, and bats are also likely present in the Project area. These wildlife species reside in many different habitat types such as woodland, scrub-shrub or early successional areas, and grassland areas; use of these areas may shift during different life stages and/or times or year (DeGraaf and Yamasaki, 2001). Mammals that likely inhabit the forest and shrub communities near these Projects include moose, white-tailed deer,

black bear, eastern coyote, beaver, mink, gray squirrel, red squirrel, raccoon, opossum, muskrat, fisher, and porcupine (DeGraaf and Yamasaki, 2001; NHFGD, 2022).

Appendix C provides a list of the mammalian species that may exist or may use habitat near the six of the Projects, as well as their habitat preferences. It is likely that many of these species in Table 1 may occur near or within the Project area but they are likely limited rather than within the Project boundaries because terrestrial habitat is limited.

Mammals typically found in woodland and riparian areas such as the riparian habitat along the impoundment, include raccoon, long-tailed weasel, striped skunk, white-footed mouse and common bat species such as the little brown bat and big brown bat. These mammals are normally found in woodland or riparian areas due to food requirements, predator or prey relationships, and a preference by several species for trees as den or nest sites (DeGraaf and Yamasaki, 2001).

Scrub-shrub habitat is common along the impoundment shoreline and generally occurs in narrow bands along the fringe of emergent wetland areas or forested riparian habitats. Early successional areas generally include upland areas that are in transitional from cleared areas back to forest. Mammals typically found in scrub-shrub or early successional areas include coyote and red fox. These mammals are normally found in scrub-shrub areas due to food requirements, predator or prey relationships, and cover (DeGraaf and Yamasaki, 2001).

Grassland and agricultural areas are generally uncommon in most of the Project; within the Sawmill and Gorham Project, grassland areas and manicured lawns are relatively common. Mammals typically found in grassland areas include the meadow vole, house mouse, and the deer mouse. Several species of bats may also use these areas or manmade structures within these areas. Additionally, several species can be found in multiple habitat types due to their generalized requirements. Coyotes, for example, use woodlands, wetlands, and grasslands in addition to scrub-shrub areas for foraging, dens, and travel corridors (DeGraaf and Yamasaki, 2001).

Amphibians and Reptiles

Reptile and amphibian species inhabit many different habitat types such as woodland, riparian, scrub-shrub or early successional areas, and grasslands. Use of these areas may shift during different life stages and/or times of year.

Reptile and amphibian habitat preferences are primarily influenced by food and reproductive requirements. Species typically found in wetland and open water areas and in aquatic habitats such as the impoundments and tributaries may include the northern leopard frog, green frog, bullfrog, pickerel frog, northern spring peeper, and the snapping turtle (DeGraaf and Yamasaki 2001; NHFGD 2022). These species use aquatic habitats for foraging, loafing (i.e., resting), protection, reproduction, and hibernation (DeGraaf and Yamasaki, 2001; NHFGD, 2022). Species typically found in woodland areas, including riparian areas, include the spotted salamander, American toad, gray treefrog, wood frog, and the northern red-backed salamander. Many species utilize riparian zones for shelter, venturing into more aquatic and/or terrestrial habitats to forage and reproduce (DeGraaf and Yamasaki, 2001; NHFGD, 2022).

Appendix C lists amphibians and reptiles that may occur within the Project area or nearby their habitat preferences. Because terrestrial habitats are limited within the Project, many of the species in Appendix C may occur within the Project vicinity rather than within the Project boundaries.

Birds

Habitats associated with the Project includes the Project impoundment, tributaries, wetlands, and riparian areas. These areas provide breeding habitat, migratory stopovers, and wintering habitat for a high diversity of avifauna including neotropical songbirds, resident species, water birds, and waterfowl. Avian species typically found in wetland habitats and along the shoreline of the impoundment include or lakes in the area include red-winged blackbird, song sparrow, and waterfowl such as the mallard duck (DeGraaf and Yamasaki, 2001). Species of ducks may nest within vegetated shallows and wetlands and forage in open water (DeGraaf and Yamasaki, 2001; NHFGD, 2022).

Appendix C lists bird species that may occur or may use habitat near the Project and their preferred habitat. Appendix C represents the assemblages of birds likely to use Habitat in the Project area, but it is not a complete list of all the bird species known from the region.

The Androscoggin River corridor and adjacent wetlands attract a wide variety of waterfowl. Waterfowl species that may occur within the vicinity include common species such as the wood duck, redhead, American black duck, mallard, and common merganser. Water birds are found primarily in wetland and riparian habitat areas in the vicinity of the Project, including the impoundment. Some of the water birds known to use wetland and riparian habitats in the vicinity of the Project include the belted kingfisher, and American bittern.

The Gorham Project may include several species of birds of prey, and many of these species may use habitat in the boundaries on a seasonal basis. Some of these species include the bald eagle, osprey, red-tailed hawk, and barred owl. These species utilize many different habitat types throughout the year including woodland, scrub-shrub or early successional areas, and wetland and open water areas.

3.5.1.2 Botanical Resources

The Gorham Project occurs within the Boreal region of New Hampshire. The boreal region encompasses the great northern conifer forest in New Hampshire, boreal region species occur from the White Mountains northward. Boreal region plants include balsam fir, black spruce, paper birch, larch, and quaking aspen. Numerous plant species in New Hampshire are restricted to the southeastern portion of the North American boreal forests or occupy the transition zone between boreal and eastern deciduous forests, including red spruce, red pine, northern white cedar, sheep laurel, and rhodora (Sperduto, 2012).

In 2020, CRP NH Gorham, LLC conducted reconnaissance level field surveys of botanical species (including Rare, Threatened and Endangered (RTE) plant species) within the Project area and used aerial photo interpretation and publicly available National Wetland Inventory (NWI) mapping to identify cover types as well as desktop reviews. The goal of this study was to document the botanical resources within the Project boundaries and to note any RTE species. The reconnaissance level surveys were also designed to document invasive vegetation in the Project area. Researchers identified 18 habitat types, and

documentation of 167 botanical species. Seven invasive botanical species were identified in the Project area. No RTE species plant were identified.

Table 3.18 lists the botanical communities along with dominant species and calculated acreage present within the study area. Table 3.19 lists the botanical invasive species identified in the study area.

The New Hampshire Heritage Bureau identified the Sugar Maple-Silver Maple-White Ash Floodplain Forest as one of only two documented floodplain forests of this type in New Hampshire. This community is found in low-lying plains directly adjacent to the Shelburne impoundment and is influenced by seasonal flooding (Photo 3.8). Trees are widely spaced, and many may have multiple trunks due to the fluctuation of flood waters. The dominant overstory tree is Silver Maple (*Acer saccharinum*), which comprises more than 60 percent of the canopy cover. Other canopy trees include Sugar Maple, White Ash (*Fraxinus americana*), and American Elm (*Ulmus americana*). The shrub layer is essentially absent except for edge habitat and canopy gaps. Shrubs observed in these areas include Speckled Alder (*Alnus incana*), Redosier Dogwood (*Cornus sericea*), and White Meadowsweet (*Spiraea alba* var. *latifolia*). Several vine species were observed in this community and were mainly associated with the shrub layer. These species include Devil's Darning Needles (*Clematis virginiana*), Virginia Creeper (*Parthenocissus quinquefolia*), Groundnut (*Apios americana*) and the invasive Oriental Bittersweet (*Celastrus orbiculatus*). The herb layer is well-developed and variable with many areas of dominate Sensitive Fern (*Onoclea sensibilis*). Other common herbs include Ostrich Fern (*Matteuccia struthiopteris*), Poison Ivy (*Toxicodendron radicans*), and Bristly Dewberry (*Rubus hispidus*).

Photo 3.8 View of Sugar Maple-Silver Maple-White Ash Floodplain Forest

Table 3.18 Botanical Communities

Habitat Type	Dominant Overstory	Dominant Shrub	Dominant Herbaceous	Acres	Percent of Area
Ruderal Forest	Bigtooth Aspen (*Populus grandidentata*), Paper Birch (*Betula papyrifera*), and Quaking Aspen (*Populus tremuloides*)	Bigtooth Aspen (*Populus grandidentata*), Paper Birch (*Betula papyrifera*), and quaking Aspen (*Populus tremuloides*), Striped Maple (*Acer pensylvanicum*)	Common Tansy (*Tanacetum vulgare*), Red Clover (*Trifolium pretense*), Winter Vetch (Vicia villosa), Goldenrod (*Solidago* spp.) Lowbush Blueberry (*Vaccinium angustifolium*)	19.12	11.76%
Sugar Maple-Beech-Yellow Birch Forest	American Beech (*Fagus gradifolia*), Sugar Maple (*Acer saccharum*), and Paper Birch (*Betula papyrifera*)	American Beech (*Fagus gradifolia*), Sugar Maple (*Acer saccharum*), and Paper Birch (*Betula papyrifera*), Hobblebush (*Viburnum lantanoides*), Smooth Shadbush (*Amelanchier laevis*), Withe-rod (*Viburnum nudum*)	Shining Clubmoss (*Huperzia lucidula*), Trillium (*Trillium* spp.), Canada Mayflower (*Maianthemum canadense*), Starflower (*Trientalis borealis*), Wild Sarsaparilla (*Aralia nudicaulis*), Lance-leaved Twistedstalk (*Streptopus lanceolatus*), Indian Cucumber (*Medeola virginiana*)	20.01	12.30%
Hemlock-Oak-Northern Hardwood Forest	Eastern Hemlock (*Tsuga canadensis*), Northern Red Oak (*Quercus rubra*), Red Maple (*Acer rubrum*), American Beech (*Fagus gradifolia*), Red Spruce (*Picea rubens*)	Striped Maple (*Acer pensylvanicum*), Hobblebush (*Viburnum lantanoides*)	Woodferns (*Dryopteris* spp.), Shining Clubmoss (*Huperzia lucidula*), Western Bracken fern (*Pteridium aquilinum*) Lowbush Blueberry (*Vaccinium angustifolium*)	7.89	4.86%

Habitat Type	Dominant Overstory	Dominant Shrub	Dominant Herbaceous	Acres	Percent of Area
Hemlock-Beech-Oak-Pine Forest	Eastern White Pine (*Pinus strobus*), Red Maple (*Acer rubrum*), Northern Red Oak (*Quercus rubra*), American Beech *(Fagus gradifolia*),Paper Birch (*Betula papyrifera*)	Eastern White Pine (*Pinus strobus*), Red Maple (*Acer rubrum*), Northern Red Oak (*Quercus rubra*), American Beech (*Fagus gradifolia*),Paper Birch (*Betula papyrifera*), Striped Maple (*Acer pensylvanicum*)	Eastern Teaberry (*Gaultheria procumbens*), Wild Sarsaparilla (*Aralia nudicaulis*), Canada Mayflower (*Maianthemum canadense*) Indian Cucumber (*Medeola virginiana*)	8.54	5.25%
Hemlock-White Pine Forest	Eastern Hemlock (*Tsuga canadensis*), White Pine *(Pinus strobus*)	Striped Maple (Acer pensylvanicum)	Lowbush Blueberry (*Vaccinium angustifolium*), Fan Clubmoss (*Lycopodium digitatum*)	7.22	4.44%
Sugar Maple-Silver Maple-White Ash Floodplain Forest	Silver Maple (*Acer saccharinum*), Sugar Maple (*Acer saccharum*), white ash (*Fraxinus americana*), American Elm (*Ulmus americana*)	Speckled Alder (*Alnus incana*), Redosier Dogwood (*Cornus sericea*), White Meadowsweet *(Spiraea alba var. latifolia*), Devil's Darning Needles (*Clematis virginiana*), Virginia Creeper (*Parthenocissus quinquefolia*), Groundnut (*Apios americana*), Oriental Bittersweet (*Celastrus orbiculatus*)	Sensitive Fern (*Onoclea sensibilis*), Ostrich Fern (*Matteuccia struthiopteris*), Poison Ivy (*Toxicodendron radicans*), Bristly Dewberry (*Rubus hispidus*)	12.61	7.76%
Mesic Herbaceous River Channel	N/A	N/A	Goldenrods (*Solidago* spp.), Sedges (*Carex* spp.), Asters (*Symphyotrichum* spp.), spotted Joe Pye Weed (*Eutrochium*	3.91	2.41%

Habitat Type	Dominant Overstory	Dominant Shrub	Dominant Herbaceous	Acres	Percent of Area
			maculatum), Woolgrass (*Scirpus cyperinus*), Hedge False Bindweed (*Calystegia sepium*), Jewelweed (*Impatiens capensis*), Common Boneset (*Eupatorium perfoliatum*), Japanese Knotweed (*Polygonum cuspidatum*), Purple Loosestrife (*Lythrum salicaria*)		
Short Graminoid-Forb Meadow Marsh/Mudflat	N/A	N/A	Woolgrass (*Scirpus cyperinus*), Mannagrass (*glyceria* spp.), Soft Rush (*Juncus effusus*), and Three-way Sedge (*Dulichium arundinaceum*).		
Cattail Marsh	N/A	N/A	Broad-leaved Cattail (*Typha latifolia*), White Water Lily (*Nymphaea odorata*),	0.49	0.30%

Habitat Type	Dominant Overstory	Dominant Shrub	Dominant Herbaceous	Acres	Percent of Area
Developed	N/A	N/A	Annual Ragweed (*Ambrosia artemisiifolia*) Common Tansy (*Tanacetum vulgare*), Common Plantain (*Plantago major*), Asters (*Symphyotrichum* spp.), Common Evening Primrose (*Oenothera biennis*), Goldenrod (*Solidago* spp.), Butter and Eggs *(Linaria vulgaris*), Bird's-foot Trefoil (*Lotus corniculatus*).	50.30	30.93%
Open Space	Japanese Maples (*Acer s*pp.), Apple and Crabapple (*Malus* spp.)	Honeysuckle (*Lonicera* spp.), Common Juniper (*Juniperus communis*)	Bluegrass (*Poa* spp.) Goldenrods (*Solidago* spp.), Hedge False Bindweed (*Calystegia sepium*), Winter Vetch (*Vicia villosa*), and Asters (*Symphyotrichum* spp)	30.60	18.82%
Transmission Right-of-Way	N/A	Allegheny Blackberry (*Rubus allegheniensis*), Staghorn Sumac (*Rhus typhina*), Steeplebush (*Spiraea tomentosa*), Northern Bush Honeysuckle (*Diervilla lonicera*)	Sensitive Fern (*Onoclea sensibilis*), Indian Hemp (*Apocynum cannabinum*), Common Cinquefoil (*Potentilla simplex*), Goldenrod (*Solidago* spp.), Asters (*Symphyotrichum* spp.) and Oriental Bittersweet (*Celastrus orbiculatus*)	1.22	0.75%
Total				161.91	100%

Invasive Species

A total of seven invasive botanical species were documented in the or adjacent to the study area (Table 3.19) for both the Smith and Gorham Projects. Invasive species densities were low to moderate in the study area. The most common invasive botanical species include Oriental Bittersweet (*Celastrus orbiculatus*), Multiflora Rose (*Rosa multiflora*), and Japanese Barberry (*Berberis thunbergia*) which grow in the understory of several forest communities as well as in open and developed areas.

Table 3.19 Invasive Plants within the Study Area

Scientific Name	Common Name	Lifeform Type	Notes
Acer platanoides	Norway maple	Tree	One tree found just outside the Study Area near a Ruderal Forest community.
Berberis thunbergii	Japanese Barberry	Shrub	Found in the understory of several forested communities.
Celastrus orbiculatus	Oriental Bittersweet	Vine	Found in trace to relatively dense patches along the shoreline and in the understory of forested communities of the Gorham Study Area.
Euonymus alatus	Burning Bush	Shrub	Only one individual plant was observed in a Developed area associated with the town of Berlin.
Polygonum cuspidatum	Japanese Knotweed	Perennial herb-subshrub	One relatively dense area was observed in an Open Space in the Smith Study Area.
Lonicera morrowii	Morrow's Honeysuckle	Perennial Shrub	Only a few small stands were observed in the Ruderal Forest and an Open Space in the Smith Study Area.
Rosa multiflora	Multiflora Rose	Shrub	Found in relatively disturbed areas in the Ruderal Forest, Open Area, and ROW communities.

3.5.2 Environmental Effects

In SD2, FERC identified the potential effects of continued project operation and maintenance on riparian, littoral, and wetland habitats and associated wildlife, including nesting bald eagles as a potential resources issues. CRP NH Gorham, LLC is not proposing any changes to project operations or existing facilities that would affect wildlife or botanical species, including bald eagles. CRP NH Gorham, LLC is also proposing no construction activities that could affect terrestrial resources or nesting species. CRP NH Gorham, LLC is proposing to continue operating the Gorham Project as a run-of-river

facility which will maintain impoundment levels and river flows, thereby protecting aquatic shoreline habitats and the aquatic or terrestrial biota that uses them during their lifecycles.

CRP NH Gorham, LLC proposes removal of the 1.84 acre parcel from the project boundary adjacent to the Route 2 access road and recreational access parking which is used by Gorham Public Works for material storage and is not necessary for project operations or maintenance. Therefore, removal of this upland areas from the project boundary will not adversely affect terrestrial resources.

3.5.3 Proposed Environmental Measures

CRP NH Gorham, LLC is not proposing any new environmental measures related to wildlife or botanical resources at the Gorham Project because the proposed action is not expected to adversely affect wildlife or botanical resources at this time.

3.5.4 Unavoidable Adverse Effects

Continued operation and relicensing of the Gorham Project as proposed are not expected to have unavoidable adverse effects on wildlife and botanical resources.

3.5.5 References

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3.6 Wetland, Riparian and Littoral Habitats

3.6.1 Affected Environment

The Gorham Project is located within the boreal region of New Hampshire. The boreal region species occur from the White Mountains northward, and in peatlands throughout the state. Specifically, the Berlin Projects occur within the White Mountains section which includes all of the White Mountains as well as the hilly country in Northern New Hampshire (Sperduto and Nichols 2012). The Project is within the Upper Androscoggin watershed on the Androscoggin River and includes several wetlands. The shoreline and much of the impoundment supports the littoral zone, and nearly all the upland areas provide riparian habitat.

3.6.2 Wetlands

In 2020, CRP NH Gorham, LLC conducted a Botanical Resources study in the Gorham Project vicinity. The study area included a 200-foot buffer of the Project boundary. In addition to the riverine wetlands identified by the NWI, the reconnaissance survey identified two wetland botanical communities and a forested floodplain community (CRP 2021).

Riverine Wetlands

The most common wetland type within the Project boundary are riverine wetlands associated with the Androscoggin River. The results of the 2020 survey work demonstrated that wetlands in the Project boundary contain primarily deep-water habitats. These results were generally consistent with riverine wetlands mapped by the USACE and recorded in the National Wetland Inventory (USFWS 2022) (Figure 3.17). The primary wetland type is riverine wetlands (R2UBH) in the Androscoggin River channel. Riverine wetlands are classified as having unconsolidated bottom which are characterized by the "lack of large stable surfaces for plant and animal attachment" (USGS 1992). Substrate of riverine wetlands likely consist of cobble, gravel, sand, mud, or organic material.

Botanical Communities Identified

Mesic Herbaceous River Channel

The mesic herbaceous river cannel community occurs on shores and islands in the Gorham Impoundment and downstream of the Gorham Dam within the Androscoggin River channel (riverine) (Photo 3.9). This community is subjected to ice scour and flooding and the substrate consists of sand and small to medium sized cobble deposited in the active river channel. The lower areas may be wet throughout the growing season while the upper areas are more mesic. Sparse vegetation is variable and occurs below ordinary high water. Common plants include goldenrods, sedges, asters, spotted Joe Pye weed, woolgrass, hedge false bindweed, jewelweed, and common boneset.

Photo 3.9 Representative Mesic Herbaceous River Cannel. Photo was taken downstream of the Gorham Dam outside of the study area.

Short Graminoid-Forb Meadow Marsh/Mudflat

This community is found exclusively upstream of the Gorham Dam (Photo 3.10). This herbaceous wetland appears to be semi-permanently flooded and, in a typical year, is inundated by shallow to somewhat deep water during the growing season. Soils may range from silt to medium grain sand with some muck or sporadic patches of fibric organic material (Sperduto and Nichols 2012). Vegetation is dominated by graminoids and includes woolgrass, mannagrass, soft rush, and three-way sedge.

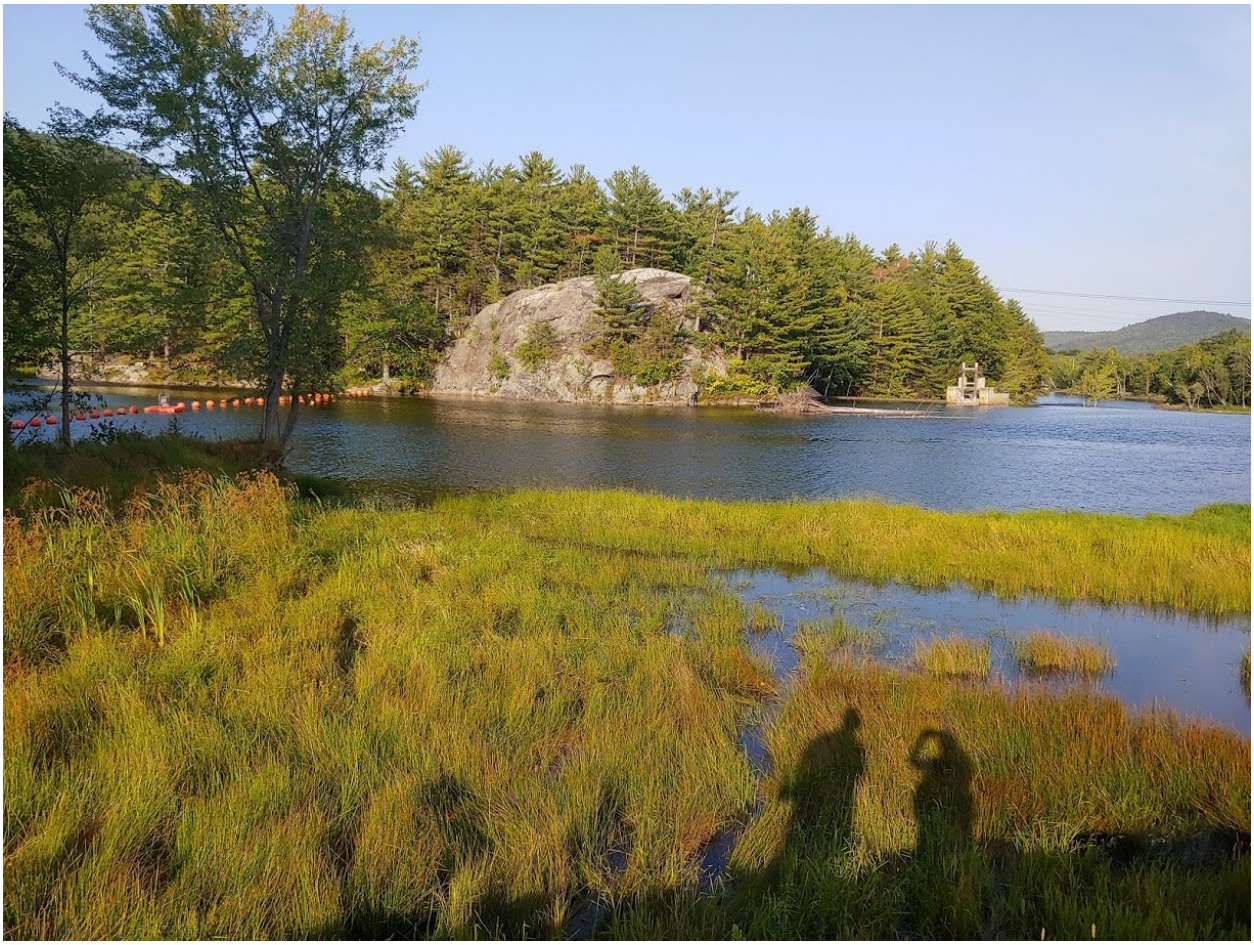

Photo 3.10 View of Emergent Marsh

Sugar Maple-Silver maple-White Ash Floodplain Forest

The sugar maple-silver maple-white ash floodplain forest is a unique and rare natural community in New Hampshire (Photo 3.11). This community is found in low-lying plains directly adjacent to the Androscoggin River; it is one of two documented floodplain

forests of this type in New Hampshire (See Section 3.7, Rare, Threatened, and Endangered Species). The community is influenced by seasonal flooding and soils may vary from well to moderately well drained sandy loams to poorly drained silty loams (Sperduto and Nichols 2012). Trees are widely spaced, and many have multiple trunks due to the fluctuation of flood waters. The dominant overstory tree is silver maple, which comprises more than 60 percent of the canopy cover. Other canopy trees include sugar maple, white ash, and American elm. The shrub layer is essentially absent except for edge habitat and canopy gaps. Shrubs observed in these areas include speckled alder, red-osier dogwood, and white meadowsweet. Several vine species were observed in this community and were mainly associated with the shrub layer. These species include devil's darning needles, Virginia creeper, groundnut, and the invasive oriental bittersweet. The herb layer is well-developed and variable with many areas of dominate sensitive fern. Other common herbs include ostrich fern, poison ivy, and bristly dewberry.

Photo 3.11 Representative Sugar Maple-Silver Maple-White Ash Floodplain Forest. Photo was taken downstream of the Gorham Dam outside of the study area.

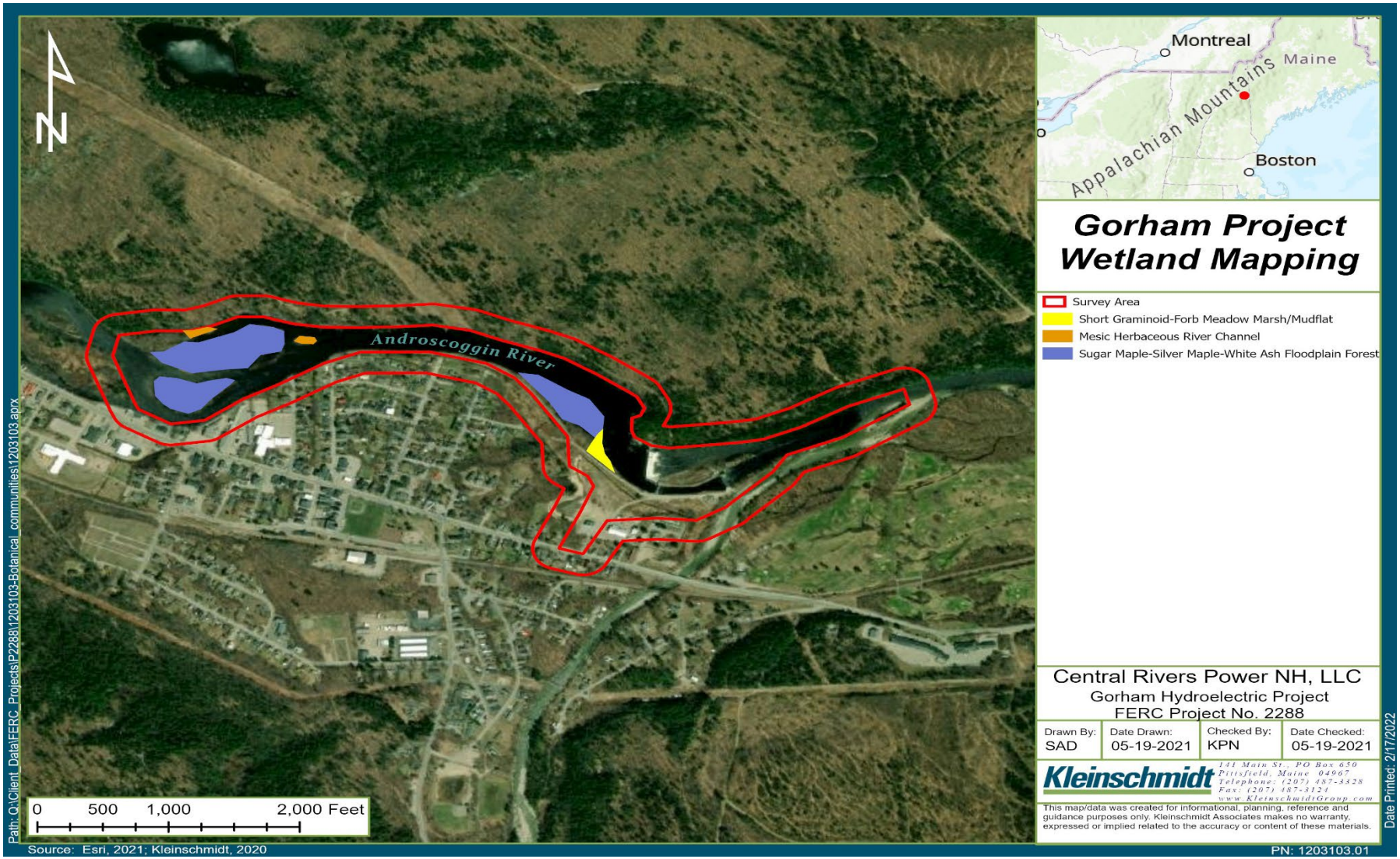

Figure 3.17 Project Wetlands

Riparian and Littoral Habitat

Riparian habitat within the Gorham Project vicinity is a mix of deciduous, coniferous, and mixed forest, and commercial and residential development as discussed in section 3.5.1.2, Botanical Resources. Dominant forest community types include sugar maple-beech-yellow birch forest, hemlock-oak-northern hardwood forest, and hemlock-white -pine forest. On the northern side of the Gorham Project much of the riparian zone is intact, with an area of transmission right-of-way. These areas are commonly dominated by weedy or manicured herbaceous species and an underdeveloped shrub and tree canopy due to vegetation management. The southern side of the Project contains more concentrated residential and commercial development associated with the town of Gorham.

The littoral zone is the transitional area between deep-water, aquatic habitat and terrestrial wetlands or uplands. Littoral habitats include those areas of a water body through which light penetrates resulting in primary productivity. Within the Project boundary, this zone is often unvegetated with a cobble-gravel, sand, mud, or organic bottom. In some areas, this zone is vegetated with species that grow on or below the water surface and form an aquatic bed wetland. Deeper portions of the open water will likely support submerged aquatic vegetation such as coontail or wild celery. Shallower waters are commonly dominated by floating leaved vegetation such as various pondweeds, yellow water-lily, white water-lily, floating heart, or watershield. Shallow water aquatic habitat is dominated by a mixture of emergent plants, floating plants, and submerged plants suspended in the water column. Pickerelweed, yellow water-lily, and bladderworts are almost always present, and one or more is typically dominant. A variety of pondweed species, bulrushes, bur-reed species, and other aquatics may also be present (Sperduto and Nichols 2012).

While no aquatic invasive species are identified in Gorham, NH (NHDES 2017) there are several known occurrences of aquatic invaders that pose a potential risk of infestation. Species known to occur within New Hampshire, as of 2017 include curly-leaf pondweed (*Potamogeton crispus*), Eurasian watermilfoil (*Myriophyllum spicatum*), European naiad (*Najas minor*), fanwort (*Cabomba caroliniana*), variable milfoil (*Myriophyllum heterophyllum*), water chestnut (*Trapa natans*) (NHDES 2017).

3.6.3 Environmental Effects

In SD2, FERC identified potential effects of continued project operation and maintenance on riparian, littoral, and wetland habitats and associated wildlife. CRP NH Gorham, LLC is not proposing any changes to project operation or existing facilities that would affect the riparian, littoral, or wetland habitats. CRP NH Gorham, LLC is proposing to continue operate the Project as a run-of-river facility which will maintain impoundment levels and river flows, thereby protecting the littoral, riparian, and adjacent wetland habitats and the aquatic or terrestrial biota that uses them during their lifecycles.

CRP NH Gorham, LLC proposes removal of the 1.84 acre parcel from the project boundary adjacent to the Route 2 access road and recreational access parking which is used by Gorham Public Works for material storage and is not necessary for project operations or maintenance. Therefore, removal of this upland area from the project boundary will not adversely affect riparian, littoral, and wetland.

3.6.4 Proposed Environmental Measures

CRP NH Gorham, LLC is not proposing any new environmental measures related to riparian, littoral, and wetland resources at the Project because the proposed action is not expected to adversely affect wildlife or botanical resources.

3.6.5 Unavoidable Adverse Effects

Continued operation and relicensing of the Project as proposed is not expected to have unavoidable adverse effects on wetlands because they are operated as run-of-river. Although drawdowns are occasionally conducted for maintenance or in advance of flooding flows at the Project, these drawdown events are not expected to have lasting effects on the riparian, littoral, or wetland habitats as evidenced by the persistence of these habitats in the Project boundary.

3.6.6 References

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3.7 Threatened, Endangered and Special Status Species

3.7.1 Affected Environment

3.7.1.1 Federally Listed Species

The USFWS's Information for Planning and Consultation (IPaC) project planning tool identifies the Canada lynx (*Lynx canadensis*) and the northern long-eared bat (NLEB, *Myotis septentrionalis*) as potentially occurring in the Gorham Project area (USFWS 2022) (Appendix B). Both species are listed as threatened under the ESA. The bald eagle (*Haliaeetus leucocephalus*), which was removed from the ESA list on June 28, 2007, is federally protected by the Bald and Golden Eagle Protection Act of 1940; bald eagles may occur in the Project area. The IPaC also identified monarch butterfly (*Danaus plexippus*) as a candidate species for listing. Section 7 ESA consultation is not required for candidate species (USFWS 2022b). There are no critical habitats for recovery of federally protected species in the Project area.

3.7.1.2 State Listed Species

Rare wildlife species are protected under the New Hampshire Endangered Species Conservation Act (NHDFG 2022). Depending on their level of vulnerability to extinction, species may be listed as endangered or threatened, or identified as a species of special concern if it does not meet criteria for listing but is particularly vulnerable, could easily become threatened, or is suspected to be endangered or threatened but for which insufficient data exists (NHDFG 2018a). On January 21, 2022, CRP NH Gorham, LLC requested a review from the New Hampshire Natural Heritage Bureau (NHB) for the Project to identify species protected by New Hampshire's endangered species law. NHB reported there is a natural community, endangered plant species, and three RTE birds may occur near the Gorham Project (Table 3.20) (NHB 2022) (Appendix B).

Table 3.20 RTE Species Identified by the New Hampshire Natural Heritage Bureau That May Occur in the Gorham Project Area

Project	Natural Community	Plant Species Common Name	Plant Species Scientific Name	Vertebrate Species Common Name	Vertebrate Species Scientific Name
Gorham	Sugar maple – silver maple – white ash floodplain forest	Ovoid spikesedge (E)*****	*Eleocharis ovata*	Bald eagle (SC)	*Haliaeetus leucocephalus*
		Pink shinleaf (E)**	*Pyrola asarifolia ssp. asarifolia*	Peregrine falcon (T)	*Falco peregrinus anatum*

Key: * two unidentified sensitive species were reported by the NHB near the Gorham Project; however, their location is approximately 1-mile-away from the Androscoggin River.
** indicates that the most recent report for that occurrence was more than 20 years ago
E – Endangered; T – Threatened; SC – Special Concern

Based on available habitat and range, four state endangered bat species, including the federally threatened northern long-eared bat, have the potential to occur in or near the Project area (Table 3.21).

Table 3.21 Potential State and Federally Listed Species that May Occur in the Gorham Project Area.

Common Name	Scientific Name	Status
Eastern small-footed bat	*Myotis leibii*	SE
Little brown bat	*Myotis lucifugus*	SE
Northern long-eared bat	*Myotis septentrionalis*	SE, FT
Tri-colored bat	*Perimyotis subflavus*	SE
Canada lynx	*Lynx canadensis*	SE, FT

Source: USFWS 2022; NHB 2019
Key; SE – state endangered
FT – Federally threatened

3.7.1.3 Description of Threatened and Endangered Wildlife Species

Northern Long-Eared Bat

The NLEB was listed as threatened on April 2, 2015, with a final rule published in the Federal Register on January 14, 2016. 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 2020). The NLEB feeds on invertebrates and is known to glean prey from vegetation and water surfaces. The NLEB winters in underground caves and cave-like structures, but summers alone or in small colonies in cavities, under bark, or in hollows of live and dead trees typically greater than 3-inches in diameter. Suitable roosting trees also include exfoliating bark, cavities, or cracks (USFWS 2020). While the Gorham Project is within the range of the NLEB, there are no known overwintering or summer roosting sites, although feeding may occur over the impoundments and tailraces.

Canada Lynx

Canada lynx occupy various habitats in boreal forests and their southern extensions. In eastern forests, dominant vegetation includes spruce and balsam fir. Snowshoe hare are important prey for lynx, and young or subalpine stands may be preferred because they contain more hare than do mature stands. Though data on competition and predation are equivocal, lynx may avoid bobcat and coyote by seeking deep snow, to which lynx are morphologically adapted (long legs and large feet) (NHDFG 2015c). Although critical habitat has been designated in Maine, northern New Hampshire is only considered supporting landscape for the species. Given its developed state, proximity to towns and cities, and predominantly aquatic habitats (e.g., river reaches and impoundments), it is unlikely that Canada lynx are present in the Project area.

Eastern small-footed bat

The eastern small-footed bat is known to occur in Coos and Rockingham counties in New Hampshire. Summer records are known from seven localities: the White Mountain National Forest, Bartlett, New Boston, Piermont, Surry, Hinsdale, and Newington (NHDFG 2015b). In winter, this species requires cave or mine habitat that provides adequate characteristics for successful hibernation. Such characteristics include low levels of human disturbance and a stable microclimate (NHDFG 2015b). Summer habitat for the species includes caves and mines, hollow trees and under bark. This suggests that forested areas

with caves, mines, rock outcrops or talus provide key summer habitat, but few small-footed bats are captured during mist-netting surveys on potential summer foraging habitat, so little is known about the species' reproduction or summer behavior (PGC 2014).

Due to the narrow project boundaries with little wooded area, it is unlikely that lands include wintering and summering habitat. However, the species may use nearby areas and feed over impoundments and tailraces.

Little Brown Bat

The little brown bat is a migratory species found throughout New England, whose habitat depends on the season and setting. This species lives in colonies that can range from hundreds to thousands of individuals (National Wildlife Federation 2015). During the winter, they hibernate in caves, abandoned mines, or other caverns. Summer habitat includes both day and night roosts, which include but are not limited to buildings, trees, under rocks, and in piles of wood. Day and night roosts are typically spaced away from each other, day roosts have very little or no light, provide good shelter, and typically have southwestern exposures to provide heat for arousal from daily torpor. Night roosts are typically in confined spaces with temperatures below 15 degrees Celsius (Havens 2006). The mating season usually starts in August and pups are born approximately two months later. Little brown bats feed strictly on insects and will typically live to six or seven years (National Wildlife Federation 2015).

Due to the narrow project boundaries with little wooded area, it is unlikely that lands include wintering and summering habitat. However, the species may use nearby areas and feed over impoundments and tailraces.

Tri-colored bat

The tri-colored bat is listed as a listed as endangered at the state level. This species winters in caves and mines, and occasionally use other structures to hibernate with low levels of human disturbance and temperature stability. No available data describe the summer habitat requirements of tricolored bats in New Hampshire. After leaving hibernacula, females from maternity colonies in live or dead foliage of deciduous trees (NHDFG 2015a).

Currently the majority of the project boundary is surrounded by hardwood riparian forest and by urban development. While the Gorham Project fall within the species' range, due

to the narrow project boundaries with little wooded area, it is unlikely that lands in include wintering and summering habitat. However, the species may use nearby areas and feed in the project impoundments and tailraces.

Peregrine Falcon

The peregrine falcon is listed in New Hampshire as a threatened species. Peregrine falcons perch or nest in tall structures at high elevations, although they will nest along rivers and coastlines as well as in cities. The peregrine falcon was first reported in 2015 near the Gorham Project and in 2018, two nests were recorded, however no chicks fledged (NHB 2022).

Monarch Butterfly

The monarch butterfly (*Danaus plexippus*) is the only federally listed (candidate) insect that has the potential to occur within the vicinity of the West Enfield Project. The monarch is a large butterfly with bright orange wings surrounded by a black border with black veins. Monarch butterflies breed by laying eggs on milkweed plants and larvae emerge after two to five days. Larvae develop through 5 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 2022b).

Migratory Birds

The protection of migratory 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 USFWS (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. They are legally protected in New Hampshire as a species of concern. Bald eagles typically nest near large bodies of open water, such as lakes and large rivers. Eagles nest in large, super-canopy trees or snags often in late-successional forest. 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 (NHDFG 2018b). One bald eagle was observed near the Project in 2012 (NHB 2022).

Table 3.22 Birds of Conservation Concern That May Occur Within or in the Gorham Project Area.

Common Name	Scientific Name	Level of Concern	Breeding Period
Bald eagle	*Haliaeetus leucocephalus*	Non-BCC	Breeds Dec 1 to Aug 31
Cape May Warbler	*Setophaga tigrina*	BCC Rangewide	Breeds Jun 1 to July 31
Evening Grosbeak	*Coccothraustes vespertinus*	BCC Rangewide	Breeds May 15 to Aug 10
Eastern Whip-poor-will	*Antrostomus vociferus*	BCC Rangewide	*Breeds* *May 1 to August 20*

Source: USFWS 2022

Mussels

Based on the IPaC and NHB reviews, no state or federally listed freshwater mussel species were identified in the Project area. As described in Section 3.4, *Fish and Aquatic Resources,* at the request of the NHDFG, the Licensee completed RTE freshwater mussel surveys throughout the Project area in 2020; no RTE mussel species were encountered. The complete freshwater mussel report was provided as part of the ISR and is available on FERC's e-Library.

3.7.1.4 Rare, Threatened, and Endangered Botanical Resources and Habitats

The Project area includes a variety of upland and wetland habitat along the shoreline of the Androscoggin River. Based on the NHB review, ovoid spikeweed and pink shinleaf, are state-endangered plant species, that were both documented near the Gorham Project over 20 years ago.

The ovoid spikeweed prefers wet sandy or peaty soils and can be found in ditches, swales, shores, wet meadows, floating mats, and bogs (Minnesota Wildflowers 2019).

The pink shinleaf prefers moist sandy woodland soil and shady cool areas. The species has been found in forested peatlands, including cedar swamps as well as more acidic areas like black spruce and red maple forests (NYNHP 2022).

The NHB review identified an exemplary sugar maple-silver maple-white ash floodplain natural community between the Gorham and Shelburne hydroelectric projects, one of only two documented floodplain forests of this type in the state. Portions of this natural community are described as having evident and patchy distribution of invasive species while records indicate that to the east "was a typical, non-disturbed patch of high terrace floodplain forest" (personal communication with Amy Lamb, New Hampshire Heritage Bureau 2019).

As discussed in Section 3.5, *Wildlife and Botanical Resources,* the Licensee performed surveys in the Project area in 2020 to identify whether RTE plant species occur. No RTE species were documented. The distribution and location of the Sugar Maple-Silver Maple-White Ash Floodplain natural community was verified during the survey to occupy approximately 18.5 acres near the Shelburne and Gorham projects.

3.7.2 Environmental Effects

In SD2, FERC identified potential effects of continued project operation and maintenance on threatened or endangered species or their habitat in the vicinity of the proposed projects, including the federally threatened Canada lynx and northern long-eared bat. CRP NH Gorham, LLC is not proposing any changes to project operations or existing facilities that would affect RTE species. CRP NH Gorham, LLC is proposing no construction activities that could temporarily affect any listed species. Limited impoundment fluctuations associated with infrequent maintenance operations would not be expected to produce long-term impacts to the Sugar Maple-Silver Maple-White Ash Floodplain natural communities.

CRP NH Gorham, LLC proposes removal of the 1.84 acre parcel from the project boundary adjacent to the Route 2 access road and recreational access parking which is used by Gorham Public Works for material storage and is not necessary for project operations or maintenance. No threatened or endangered species habitat exists on the parcel as it consists of roadways and mowed grass. Therefore, removal of this upland areas from the project boundary is not likely to will not adversely affect RTE species.

3.7.3 Proposed Environmental Measures

CRP NH Gorham, LLC is not proposing any new environmental measures related to RTE species or their habitats at the Gorham Project. Continued run-of-river operations will

provide stable headpond and river flows, which is beneficial to RTE species or plant communities that use or are associated with the Gorham Project area.

3.7.4 Unavoidable Adverse Effects

Continued operation and relicensing of the Project as proposed is not expected to have unavoidable adverse effects on identified rare, threatened, endangered, or special status species.

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3.8 Recreational Resources

3.8.1 Affected Environment

3.8.1.1 Existing Recreation Facilities in the Project Boundary

CRP NH Gorham, LLC provides recreation facilities along the south shore of the Gorham project including a walking trail/gravel road from the existing parking area near Route 2 to the river (approximately 750 feet), a picnic area, a canoe portage (approximately 2,250-foot-long gravel footpath/road), a fishing area downstream of the powerhouse, parking, and an information kiosk; a second information kiosk is located on the north shore of the project (Table 3.23) (FERC 1995; PSNH 2005, 2010, 2015; CRP 2020). Access to the Androscoggin River within the Gorham project boundary is also available from Hogan Road which runs along the northern shore (Figure 3.18). Hogan Road is an informal road primarily used by all-terrain vehicles (ATV) and mountain bikers.

CRP NH Gorham, LLC provides regular maintenance of public recreation and access facilities such as repair and grading of gravel walking paths/roadways and parking areas, mowing/weed whacking of grass areas, and disposal of litter.

The Town of Gorham is in the process of improving the existing hand-carry boat access associated with the existing canoe portage and to develop a new parking area adjacent to the existing hand-carry boat access to supplement the existing parking area located outside security fencing adjacent to Route 2 (Figure 3.18). Because the new parking area will be adjacent to the improved hand-carry access, the public will have improved access to the river because parking access will no longer be subject to closure of the security gate[7] at the Route 2 location. The existing parking area is estimated to accommodate 3-4 vehicles. The new parking area, accessed from Howland Avenue, will accommodate approximately 10 vehicles. It is anticipated that these improvements will be completed in 2022.

CRP proposes to remove 1.84 acres from the project boundary adjacent to the Route 2 access road and recreational parking area. This parcel serves no project purpose and is informally utilized and periodically mowed by the Gorham Public Works Department.

[7] Gorham Public Works Department closes the gate at 3:00 PM on weekdays, with limited access on weekends.

3.8.1.2 Project Recreation Use and Capacities

The previous Licensee filed a recreation use report with FERC every five years for the Gorham Project (FERC 1995). Annual recreation use information is obtained from observations made by project operators who record the number of people recreating at the project during each visit to the facility and from self-reporting surveys available at the two information kiosks (FERC 1995). As defined in the January 30, 1995 Recreation Plan for the Gorham Project, the operators record counts of all persons utilizing facilities for recreational purposes. The observations are recorded in the station diary maintained at the powerhouse. FERC approved and modified the 1995 Recreation Plan by Order dated May 1, 1995, requiring a self-registration survey system to supplement operator observation data that would only be collected during weekdays. The self-registration monitoring component was approved by FERC on November 14, 1995, which includes providing a Recreation Survey sheet at two kiosks, which tracks the visitor's date and time of arrival, residence, estimated monetary spending this visit, recreation activities in which the visitor took part, and questions adequacy of the facilities for use by the physically challenged. The total number of visitors to the Gorham Project were 160 from 1996-1999, 314 from 2000 to 2004, 596 from 2005 to 2009, 469 from 2010 to 2014, and 381 from 2015 to 2019 (Table 3.24). The most popular activities at the Gorham Project were walking and hiking followed by fishing and biking (PSNH 2000, 2005, 2010, 2015, CRP 2020).

Table 3.23 Number of recreation visits from the 5-year recreation usage reports for the Gorham Project.

Recording Method	1996-1999	2000-2004	2005-2009	2010-2014	2015-2019
Operator Reports	-	251	503	401	341
Surveys	-	63	93	68	40
Total	160	314	596	469	381

In comments on the DLA, FERC requested an explanation of survey methods (see above) and why such different levels of use have been documented. The Licensee believes that variability is primarily a factor of frequency of operator visits to the project and variability in public participation in the self-registration survey, which is outside of the Licensee's control.

Figure 3.18 Recreation facilities at the Gorham Hydroelectric Project.

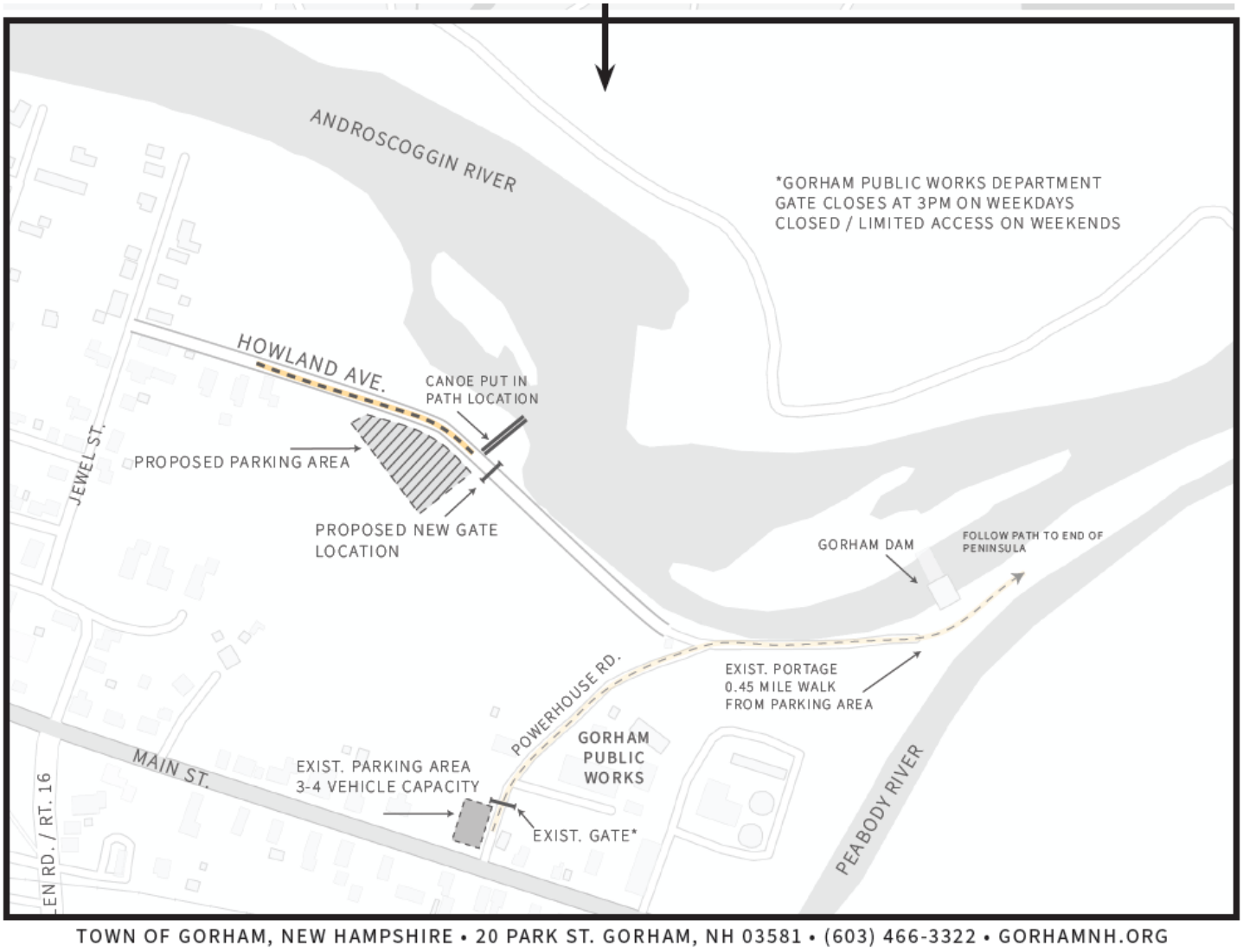

Figure 3.19 Plan for Canoe Access and Parking Improvements

CRP reports the number of recreation days at the Gorham project every six years in the FERC Form 80 Licensed Hydropower Development Recreation Report. The annual total recreation days were 977, 47, and 870 in 2003, 2009, and 2015, respectively (Table 3.24). Capacity utilization ranged from 15 percent to 25 percent (PSNH 2003, 2009; Eversource 2015). (Note: the numbers reported in Table 3.23 and Table 3.24 are not the same because they reflect different time periods and are estimated using different methods, although CRP NH Gorham, LLC does not have record of methods utilized for Form 80 monitoring.) It is anticipated that the results of the 2022 recreation monitoring effort will provide sufficient, contemporary information regarding recreational use and facility adequacy.

Table 3.24 Recreation days* and capacity utilization from the 2003, 2009, and 2015 FERC Form 80 reports for the Gorham Project.

	2003	2009	2015
Annual Total Recreation Days	977	47	870
Peak Weekend Average Recreation Days	20	125	8
Capacity Utilization (%)	25	20	15

*A recreation day is defined as each visit by a person to a development for recreational purposes during any portion of a 24-hour period.

FERC and the Town of Shelburne requested a recreation study as part of relicensing. FERC requested a recreation use and facility assessment to determine the existing use and condition of access sites and whether those sites are adequate to meet recreation demand. The components of the study should include an access site inventory, user spot counts, and a recreation user survey to determine visitor perceptions of the adequacy of access sites and any need for improvements. The Town of Shelburne requested a study on recreational access and use of the Androscoggin River. The town of Gorham requested the development of a Unified Recreation Plan of all eight hydroelectric projects (including the six projects owned and operated by GLHA) for recreational development or recreational opportunities. In addition, the town of Berlin, residents of Shelburne, New Hampshire, the National Park Service, and the Appalachian Mountain Club provided comments discussing recreation water access and trails throughout the project vicinity.

The Revised Study Plan proposed a recreation use and facility assessment study to determine existing use and condition of recreation water access sites at or near the

Project, and whether those sites are adequate to meet existing and future recreation demand in the project areas.

On May 29, 2020, FERC issued their Study Plan Determination (SPD). However, due to anticipated anomalous usage due to the COVID-19 pandemic, the revised study plan states that CRP plans to complete the recreation use study from May to September 2021. As part of FERC's SPD, the proposed 2021 recreation schedule was accepted.

After reviewing the given state of affairs in 2021, on March 29, 2021, the Licensee notified the Commission that they would be postponing the recreation study due to continued COVID-19 outbreak once again. The Licensee did not anticipate that 2021 will reflect typical recreation conditions or use at the J. Brodie Smith and Gorham Projects. Like observed in 2020, some FERC-approved recreation sites could see a significant increase in use as individuals look for ways in which to exercise and recreate while maintaining social distancing recommendations, while other recreation sites could see a significant decrease in use from closures, whether in response to public safety concerns, or from individuals choosing to shelter in place and not participate in their normal recreation activities.

In either case, the Licensee did not believe that a recreation use and facility assessment study conducted during the 2021 recreation season will reflect an accurate depiction of typical recreation facility use and adequacy, nor would it be particularly informative regarding site specific capacity and needs. Additionally, given the scope of the recreation study, requiring Licensee staff or consultants to frequently gather information from recreational users at the recreation sites potentially exposes both them and the public to the COVID-19 virus. As such, the Licensee is expecting to conduct the recreation use study during the 2022 study season. The results of the 2022 survey will be incorporated in a supplemental filing to the Final License Application.

3.8.1.3 Regional Recreation Opportunities

The Gorham Project is in the Great North Woods region of New Hampshire. This region is known for its open wilderness, hiking trails, mountain peaks, and scenic views. The town of Gorham often serves as a center point for accessing the many recreational opportunities throughout the region, including the Mount Washington Auto Road which begins in Gorham. The White Mountain National Forest and the Presidential Range of the

White Mountains are located just south of Gorham, New Hampshire. State parks within the White Mountain National Forest include Mount Washington State Park, Crawford Notch State Park, and Franconia Notch State Park. Over 100 miles of the Appalachian Trail pass through the White Mountains (ATC 2022).

Popular destinations within approximately 30 miles of the Gorham Project include the New Hampshire towns of Littleton, Bethlehem, Jefferson, Lancaster, Conway, and Berlin, as well as Bethel, Maine. The 87-acre Moose Brook State Park is approximately 3 miles northwest of the Gorham Project; the park provides amenities for camping, swimming, fishing, hiking, biking, picnicking, scenic viewing, and snowshoeing (NH DNCR 2021a). Jericho Mountain State Park is approximately 9 miles northwest of the Gorham Project and provides opportunities for camping, hiking, boating, swimming, canoeing, fishing, horseback riding, picnicking, snowshoeing, snowmobiling, and ATV riding (NH DNCR 2021b). In addition, several downhill skiing facilities are within a half-hour drive of Gorham including Wildcat Mountain, Attitash Mountain, Bretton Woods Mountain, and Sunday River (Recreation in Gorham, NH 2022a).

3.8.1.4 Recreation Opportunities in the Project Vicinity

A variety of recreation opportunities are available within the vicinity of the Gorham Project. Municipal recreation amenities are provided at the Gorham Common approximately 0.5 miles southwest of the Gorham Project which provides recreation fields for softball, baseball, soccer, and tennis; a playground; a picnic area; and summer concerts. The Libby pool and recreation field are less than 1 mile south. The Medallion Opera House provides concerts and theatrical performances (Recreation in Gorham, NH 2022b). The Androscoggin Valley Country Club, which has an 18-hole golf course, is just south-southeast of the Gorham Project. The White Birches Camping Park is 1.3 miles south-southeast in Shelburne, New Hampshire, and provides swimming, playground, trails, cabins, and RV and tent camping (White Birches 2022). Also, the Great Glen Trails Outdoor Center is 8 miles south in the White Mountain National Forest and provides cross country skiing, rafting, kayaking, and mountain biking (GGT 2022).

Access to the Androscoggin River downstream of the Gorham Project is provided at a gravel boat launch approximately 2.5 river miles downstream in the Lead Mine State Forest off of Hogan Road (NHFG 2022). A hand-carry access area off of Route 2 provides access to the Reflection Pond upstream of the Shelburne dam. Access to the

Androscoggin River is also available from a gravel hand carry boat access site approximately 2 river miles upstream of the Gorham Project (NHFG 2022). NHFG information is limited but identifies the access, outside the Gorham Project boundary and not associated with the Project, as being shoreline fishing/cartop, with limited access.

3.8.1.5 Regional Needs Identified in Management Plans

The 2019-2023 New Hampshire Statewide Comprehensive Outdoor Recreation Plan (NH SCORP) serves to qualify New Hampshire for funding from the federal Land and Water Conservation Fund (LWCF) and provides guidance on prioritizing the allocation of LWCF grants. Goals of the NH SCORP include identifying outdoor recreation trends, needs, and issues; evaluating the supply and demand of recreation resources; and providing a strategic plan for addressing recreation issues in the state (NH DNCR 2019). The strategic priorities for the state of New Hampshire from the 2019-2023 SCORP are connecting people to the outdoors to promote healthy lifestyles, consistent and wise stewardship and conservation of natural resources, economic vitality through the promotion of outdoor recreation and tourism, and education of recreation users, partners and agencies (NH DNCR 2019)

3.8.1.6 Existing Shoreline Management Policies

The previous Licensee adopted provisions from the New Hampshire Shoreland Water Quality Protection Act (SWQPA) to serve as the Shoreland Protection Plan for the Gorham Project (PSNH 1995; FERC 1999; NHDES 2022). Specifically, all land within 250-feet of the ordinary high water mark will be defined as protected shoreland with restrictions on the uses of that land, and land within a 150-foot buffer of the ordinary high water mark will be maintained as a natural woodland buffer (FERC 1999; NHDES 2022). CRP manages vegetation growth along the transmission line right-of-way to minimize adverse impacts to facilities and aesthetics (FERC 1999; PSNH 1999). Furthermore, CRP NH Gorham, LLC conducts annual inspections of the shoreland to assess compliance with the SWQPA and whether any changes to the SWQPA impact the Gorham Project. The annual shoreland inspections have not identified any violations of the SWQPA (e.g., Eversource Energy 2017).

3.8.1.7 National and State Designations

The Peabody River is listed on the Nationwide Rivers Inventory because of hydrologic values (i.e., located in a high mountain area and flows through Mount Washington) (NPS 2016); the Peabody River joins the Androscoggin River approximately 1,000 feet downstream of the Gorham powerhouse. The Appalachian Trail is designated a National Scenic Trail (NPS 2021); sections of the trail in the White Mountain National Forest are within 5 miles of the Gorham Project. There are no project lands being considered for inclusion in the National Trail System or as a Wilderness Area.

3.8.2 Environmental Effects

In SD2, FERC identified potential effects of continued project operation on recreational use in the Gorham Project area, including the adequacy and condition of existing recreational access and facilities, as well as on aesthetic resources and public access within shoreline protection zones. CRP is currently conducting the recreation study in 2022 that will collect data that will identify any potential adequacy or conditions effects of existing facilities.

CRP NH Gorham, LLC is proposing to continue to operate and maintain all recreation access and facilities and coordinate maintenance of the new parking and take-out with the Town of Gorham. Improvements to the portage take-out and new parking being developed in cooperation with the Town of Gorham will provide increased parking capacity and over the existing lot. The take-out is anticipated to provide upgraded access, making it easier for recreators to enter and exit the river.

Removal of the small parcel from the project boundary adjacent to the existing walking path/access road will not affect recreation at the project as those lands are currently utilized by the Public Works Department for materials storage and the existing access road and recreational parking area will be retained in the boundary and continue to be maintained.

3.8.3 Proposed Environmental Measures

CRP NH Gorham, LLC is not proposing any additional measures related to recreation at this time, but will work with FERC, resource agencies, and local governments to develop a Recreation Management Plan, if needed based upon the results of the 2022 Recreation Use Survey. CRP NH Gorham, LLC will otherwise continue to maintain existing recreational

access and coordinate maintenance of the improved portage take-out and new parking area with the Town of Gorham.

3.8.4 Unavoidable Adverse Effects

Continued operation and relicensing of the Gorham Project as proposed are not expected to have unavoidable adverse effects on recreational resources.

3.8.5 References

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3.9 Aesthetic Resources

3.9.1 Affected Environment

3.9.1.1 Visual Character of the Project Lands and Waters

The Gorham Project is located within the Androscoggin River Valley in the town of Gorham, Coos County, New Hampshire. The Androscoggin River Valley is relatively narrow with steep adjacent upland areas (FERC 1993); within the reach between Berlin and Shelburne, New Hampshire, the width of the valley floor ranges from approximately 0.2 miles to 0.6 miles (FERC 1993). The western and southern edge of the river corridor between Berlin and Gorham is developed with industrial, commercial, and residential buildings; the northern and eastern shore of the river is forested.

The Gorham Project is several hundred feet from Route 2 and is generally not visible to passersby. The area between the project structures and Route 2 contains buildings for the Town of Gorham highway and water and sewer departments.

The Gorham Project consists of a 32-acre impoundment; a timber crib L-shaped dam with two spillway sections; a concrete sluiceway with a sluice gate; an earthen power canal; transmission lines; and a powerhouse. The shoreline of the impoundment consists of steep banks with bedrock outcrops and boulders (FERC 1993). The southern shoreline of the impoundment consists of riprap and has been filled for floodplain protection (FERC 1993). The northern portion of the impoundment splits around Buck Island and contains freshwater forested/shrub wetlands. Hogan Road parallels most of the northern side of the Gorham Project but provides limited views. In addition to views of the Androscoggin River, the Gorham Project provides scenic views of the Peabody River, mountains, forests, and a mature white birch stand downstream of the powerhouse (FERC 1993).

3.9.1.2 Other Scenic Attractions

The Gorham Project is situated in the Androscoggin River Valley between two of the most scenic regions of New Hampshire: The Great North Woods and the White Mountains. Scenic attractions near the Gorham Project include mountains, national and state forests, and national and state scenic byways. The following is a list of some scenic attractions near the Gorham Project:

- The Appalachian Trail is a National Scenic Trail (NPS 2021. Over 100 miles of the Appalachian Trail passes through the White Mountain National Forest and continues through Shelburne, New Hampshire, less than 5 miles from the Gorham Project (ATC 2022).
- The 100-mile White Mountain Trail is a designated National Scenic Byway and includes views of covered bridges, scenic overlooks, waterfalls, mountains, and historic sites (NHDOT 2021a; USDOT FHA 2022).
- The 115-mile Presidential Range Trail passes through Gorham, New Hampshire, and is designated a New Hampshire Scenic and Cultural Byway. This trail provides views of the White Mountains and wildlife and provides access to state parks, state forests, and historic villages (NHDOT 2021b).
- The 100-mile Woodland Heritage Trail travels through Gorham, New Hampshire, and the northern section of the White Mountain National Forest; the trail is designated a New Hampshire Scenic and Cultural Byway (NHDOT 2021c). The trail provides access to state parks, state forests, historic sites, and covered bridges.
- The 98-mile Moose Path Trail is a designated New Hampshire Scenic and Cultural Byway and provides access to historic sites, hiking, campgrounds, and state parks (NHDOT 2021d). This is the path used by the Gorham Moose Tours which begin in Gorham, New Hampshire, and provide wildlife viewing tours throughout northern New Hampshire.

3.9.2 Environmental Effects

In SD2, FERC identified the effects of continued Gorham Project operation on aesthetic resources as a potential issue.

No changes are proposed to the operation and maintenance of Gorham Project lands. Continued operation and maintenance of the Gorham Project will maintain the existing aesthetics of the area.

3.9.3 Proposed Environmental Measures

CRP NH Gorham, LLC is not proposing any enhancement measures related to land use or aesthetics at this time and is proposing no modifications of the existing Gorham Project facilities.

3.9.4 Unavoidable Adverse Effects

Continued operation and relicensing of the Gorham Project as proposed are not expected to have unavoidable adverse effects on aesthetic resources.

3.9.5 References

Appalachian Trail Conservancy (ATC). 2022. Explore by State. http://appalachiantrail.org/home/explore-the-trail/explore-by-state/new-hampshire. Accessed February 4, 2022.

Federal Energy Regulatory Commission (FERC). 1993. Final Environmental Impact Statement. Upper Androscoggin River Basin Hydroelectric Projects (FERC 2422-004, 2287-003, 2326-002, 2327-002, 2311-001, 2288-004, 2300-002). November 1993.

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3.10 Cultural and Tribal Resources

3.10.1 Affected Environment

Long before the first Europeans explored the area the ancestors of today's Abenaki Indians, Paleo-Indians, inhabited the river basin. Humans first came to the region during the Paleoindian period, ca 9000- 7000 B.C., although there are few remains in the area. Evidence of successive hunter-gather Archaic populations, ca 7000 -1000 B.C., are more common. The Androscoggin River was likely a travel route from these early periods through the Woodland period (1,000 to 1,500 AD). There are several landforms in the area that are likely to have a potential for cultural resources given that flat areas with easy access to water were conducive for encampments and activities like tool making, and for canoe portage around rapids (FERC 1993). Early Native Americans survived by primarily hunting large game. Based on an engraving dated to the late 1500s the Abenaki Indians of the area had developed some agricultural skills, growing corn, and boiling sap. They had also developed a series of trails and portages along the river (Bethel Historical Society 2007).

3.10.1.1 Historic Properties

Gorham Project

The first part of the existing Gorham powerhouse was built in 1909. Additional parts of the Gorham Project were built from 1917 to 1923 in stages by the Twin State Gas and Electric Company. In addition, the dam was enlarged several times, in 1903, 1927-1928, and 1958-1959. The Gorham Project was acquired by PSNH in 1943 (PSNH 1996).

In 1991, Justine Gengras and Dr. Charles Bolian conducted a Phase 1 archeological study of the Gorham Project vicinity. While they did not identify any prehistoric resources, they did identify two historic sites in the Gorham Project boundary. The Eddy Bridge site is comprised of abutments for an 1877-1921 suspension bridge and the Logging Boom site contains logging cribs and boom. Both sites are continuously inundated and not affected by normal Gorham Project operations. In addition, to the Eddy Bridge and Logging Boom site, Gengras and Bolian noted that some terrace areas and Buck Island near the Gorham Project may have a potential for prehistoric resource sensitivity (PSNH 1996).

In 1992, Ronald Tetu evaluated the Gorham Project for the potential eligibility to be listed on the National Register of Historic Places (NRHP). While the facility was greater than 50

years of age, it does not retain the integrity needed for listing due to the extensive redevelopment of the Gorham Project. The New Hampshire State Historic Preservation Office (SHPO) noted in a letter dated August 3, 1992 that the Gorham Project is "of historic interest" (PSNH 1996).

As set forth in the 1993 Programmatic Agreement for Managing Historic Properties, CRP NH Gorham, LLC has a Cultural Resources Management Plan (FERC 1994) for the Project and is required to submit an annual report for managing historic properties. This Agreement states that the Licensee is required to submit an annual report regarding any alterations, or future planned alterations to the structures listed above.

FERC requested in its November 25, 2019, study request, the CRP NH Gorham, LLC conduct a historic architectural survey of the Gorham Dam. Therefore, Harvey Research and Consulting reviewed all components of the project that are 50 years or older and evaluated them for eligibility on the National Register and, if eligible, assessed them for project-related effects so that the nature and extent of potential project effects and measures to avoid, lessen, or mitigate adverse effects can be properly determined. CRP NH Gorham, LLC surveyed the structures in the area of potential effect (APE) of the Project, in consultation with the New Hampshire State Historic Preservation Office (New Hampshire SHPO).

In accordance with the RSP, Harvey Research and Consulting completed a desktop review in 2020 to document the presence of historical structures and completed the historic architectural survey in September 2020 (CRP 2021) concluding that the Project not be recommended for eligibility for the National Register.

3.10.1.2 Area of Potential Effect

FERC requested in its comments on the PAD, that the Gorham Project be evaluated for eligibility for listing on the National Register.

It is Harvey Research and Consulting's professional opinion that there are no eligible structures for the National Register of Historic Places (NRHP) within the Project APE (CRP 2021 filed as Privileged).

NHDHR individual inventory forms were submitted to the NH Division of Historical Resources (DHR) on June 10, 2021, for review of eligibility.

3.10.1.3 Tribal Resources

There are no Native American lands, known Native American TCPs or religious properties, or NRHP-eligible or -listed sites associated with Native American Nations within the Project boundary or which would likely be affected by the proposed relicensing.

3.10.2 Environmental Effects

In SD2, FERC identified the effects of continued project operation and maintenance activities on properties that are included in or eligible for inclusion in the National Register of Historic Places as a potential resource that could be affected by the proposed action. CRP NH Gorham, LLC proposes to continue existing operations and implementing the existing PME measures as described in Section 2.2, *Applicant's Proposed Action*.

CRP NH Gorham, LLC will continue to implement the existing CRMP for continued protection of historic resources.

CRP NH Gorham, LLC is not proposing any changes to the Project or operations. CRP NH Gorham, LLC is not proposing the construction of any new facilities or ground disturbing activities that have the potential to affect eligible cultural resources.

3.10.3 Unavoidable Adverse Effects

Continued operation and relicensing of the Project as proposed is not expected to have unavoidable adverse effects on cultural and tribal resources.

3.10.4 References

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3.11 Land Use and Socioeconomic Resources

3.11.1 Affected Environment

3.11.1.1 Land Uses and Management Within the Vicinity of the Project

The dominant land cover class within a 1-mile buffer around the Gorham Project boundary is deciduous forest (36.2 percent) followed by mixed forest (27.9 percent), developed open space (6.4 percent), medium (5.8 percent) and low (5.4 percent) intensity development, evergreen forest (5.2 percent), and woody wetlands (4.9 percent) (Figure 3.19, Table 3.25). The area to the north of the project is primarily forest with pockets of shrub/scrub and agricultural land; the area is zoned for timber and agriculture (Figure 3.20). The land bordering the southern edge of the project boundary is developed and zoned for residential and commercial uses.

Table 3.25 Land Cover in a 1-mile Buffer Around the Gorham Project Boundary.

Land Cover	Area (square miles)	Percent
Open Water	0.15	2.5%
Developed, Open Space	0.38	6.4%
Developed, Low Intensity	0.32	5.4%
Developed, Medium Intensity	0.34	5.8%
Developed, High Intensity	0.11	1.9%
Barren Land	0.01	0.1%
Deciduous Forest	2.14	36.2%
Evergreen Forest	0.31	5.2%
Mixed Forest	1.65	27.9%
Shrub/Scrub	0.04	0.8%
Herbaceous	0.001	0.0%
Hay/Pasture	0.11	1.8%
Woody Wetlands	0.29	4.9%
Emergent Herbaceous Wetlands	0.06	1.0%
Total	5.9	1

Source: MRLC 2021

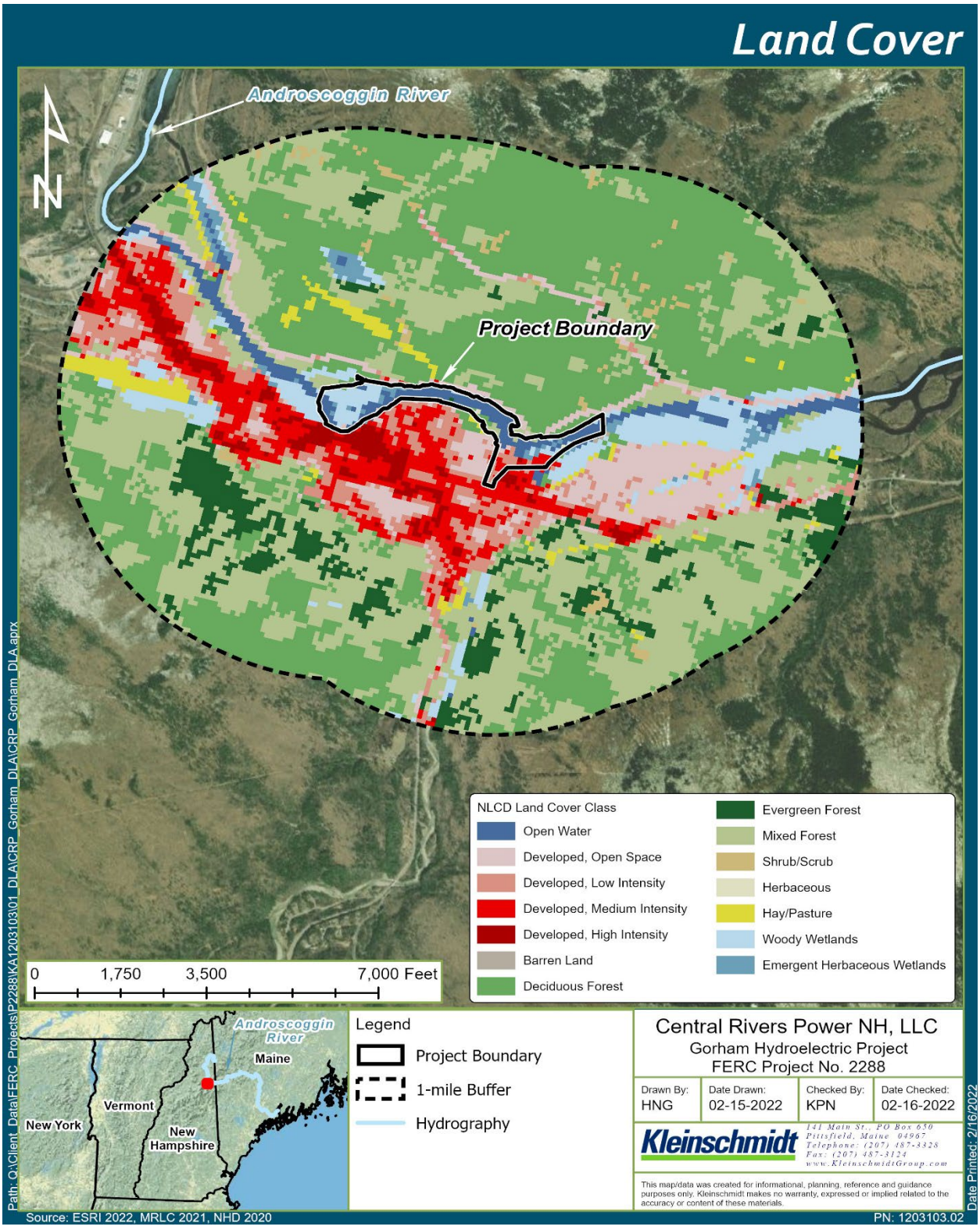


Figure 3.20 Land Cover Types Around the Gorham Project.

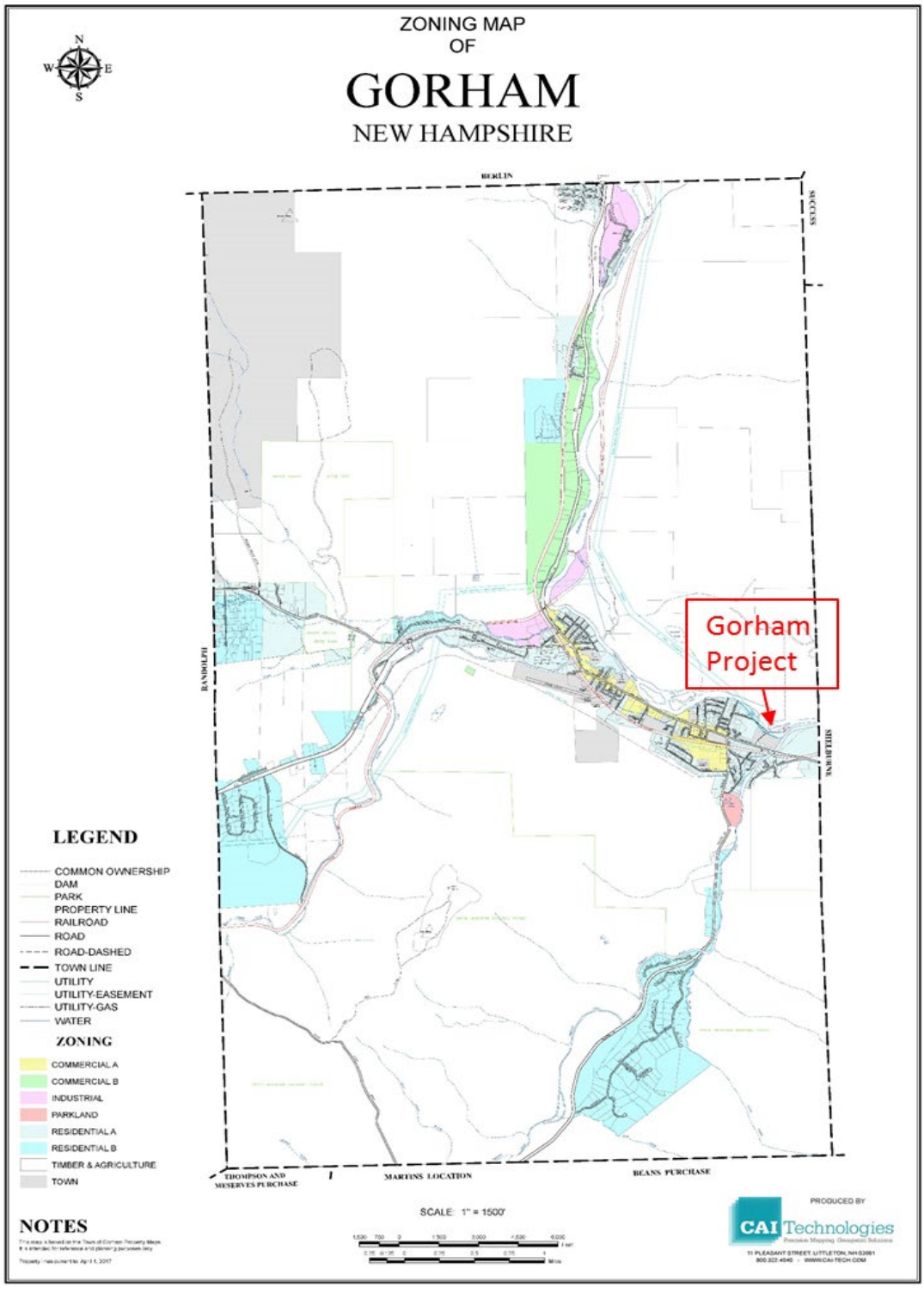


Figure 3.21 Zoning map for the Town of Gorham, New Hampshire (Town of Gorham, New Hampshire 2018).

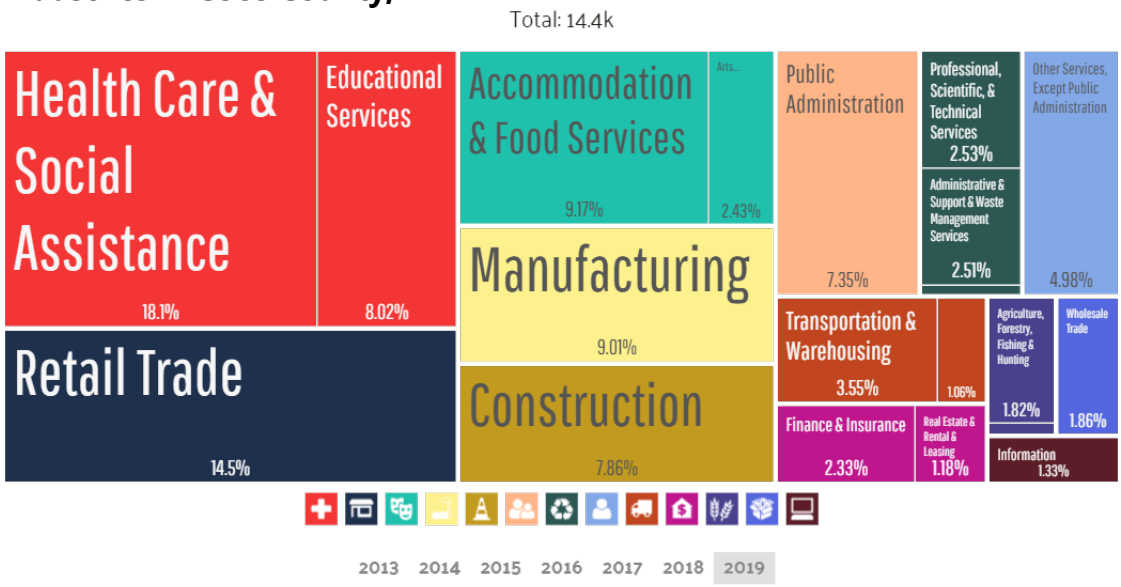
3.11.1.2 Land Use and Management of Project Lands

Operations and maintenance are the primary activities that occur on Gorham Project lands.

3.11.1.3 Land Use Patterns

The Gorham project is located in Coos County NH, and is located just outside the town of Gorham. Coos County NH is the most northeast county in New Hampshire. Coos county is made up of an estimated 31,563 people according to the 2019 census (U.S. Census 2018a). In 2010 Coos County consisted of 18.4 people per square mile (U.S Census 2019a). Coos County is quite rural, with the White Mountain National Forest to the West and is heavily wooded to the north. The largest industries in the area are health care and social assistance, retail and trade, and accommodations and food services. These industries employ 2,602, 2,084, and 1,317 people respectively (DataUSA).

Industries in Coos County, NH



Source: (DataUSA).

3.11.1.4 Population Patterns

The town of Gorham had a population of 2,698 in 2020, a slight decrease from their 2010 census numbers (U.S. Census 2019b). Coos County has shown a similar pattern, showing 31,563 people in the 2019 census, which is down from the 2010 census showing 33,055 people (U.S. Census 2019a). These decreases in population in the area is partially

accredited to the loss of mills that were the predominant employer in the county. A report by New Hampshire Employment Security in 2007 projected that the closure of the mill would equate to a loss of about 300 people in the County by 2018 (NHES 2007). In Gorham 3.9 percent of the population is under 5 years old, 15.5 percent are under the age of 18, and 18.7 percent are over the age of 65 (U.S. Census 2019b). Coos County has similar numbers with 4 percent of people being under the age of 5, 16.1 percent of people are under the age of 18, and 24.2 percent of people are over the age of 65. 47.4 percent of the population in Coos County is female (U.S. Census 2019)

Household/Family Distribution and Income

Presently, education services and health care are the top industries in Gorham, followed by arts, entertainment, recreation, and accommodation and food services, manufacturing, and retail. The median household income in Coos county is $47,117, while the Town of Gorham has median household incomes of $58,789. The percentage of the population in poverty in Coos county and Town of Gorham are 13.9 percent and 2.4 percent respectively (U.S. Census 2019a, U.S. Census 2019b). The closures of paper mills in the County has had major impacts on the area. In a 2007 report from New Hampshire Employment Security it is stated that the closure of the Wausau paper mill caused a reduction of 72.36 million in the gross regional product. Based on a REMI model this report also states that by 2018 average annual compensation will drop by more than $1,000 than if the mill had stayed open (NHES 2007).

Coos county has 21,723 housing units in 2019, and between 2015 and 2019 had a 70.7 percent owner occupied housing rate. Between 2015 and 2019 there was 13,768 households, with 2.14 persons per household (US Census 2019a). The Town of Gorham had 719 households with a 77.2 percent home ownership rate in 2019 with an average size of 1.97 people.

3.11.1.5 Health and Safety

In Coos County 8.7 percent of people under the age of 65 do not have health insurance (U.S Census 2019a). In Gorham, 97.6 percent of the population has health coverage (Data USA)

3.11.1.6 Diversity

In Coos County, 96.4 percent of people are White, 0.9 percent of people are Black or African American, 1.9 percent are Hispanic or Latino, and 1.5 percent of people are two or more races. There are less than 1 percent of Asian people, and American Indian and Alaskan Natives (U.S. Census 2019a).

3.11.1.7 Education

From 2015 to 2019 in Coos County, 87.8 percent of people over the age of 25 graduated high school or had a higher level of education, while 18.2 percent of people had a bachelor's degree or higher (U.S. Census 2019a). Gorham had 31.9 percent of people over the age of 25 with a high school diploma or higher, while 29.7 percent of people had a bachelor's degree or higher (U.S. Census 2019b).

3.11.2 Environmental Effects

There is no redevelopment potential identified for the Project that would contribute to project operations or boundary changes, and CRP NH Gorham, LLC proposes continued run-of-river operations. CRP NH Gorham, LLC has not identified any issues relative to socioeconomic resources.

3.11.3 Proposed Environmental Measures

There are no existing PM&E measures in place regarding socioeconomic resources, and none are proposed.

3.11.4 Unavoidable Adverse Effects

Continued operation and relicensing of the Gorham Project as proposed is not expected to have unavoidable adverse effects on socioeconomic resources.

3.11.5 References

Appalachian Trail Conservancy (ATC). 2022. Explore by State. http://appalachiantrail.org/home/explore-the-trail/explore-by-state/new-hampshire. Accessed February 4, 2022.

Eversource Energy. 2015. FERC Form 80 Submittal. March 16, 2015.

Eversource Energy. 2017. Annual Shoreland Water Quality Protection Act (SWQPA) Review and Inspection. FERC Project No. 2287-NH, J. Brodie Smith and No. 2288-NH, Gorham. Filed December 8, 2017.

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New Hampshire Department of Natural and Cultural Resources (NH DNCR). 2021a. New Hampshire State Parks Moose Brook State Park. https://www.nhstateparks.org/visit/state-parks/moose-brook-state-park.aspx. Accessed February 8, 2022.

New Hampshire Department of Natural and Cultural Resources (NH DNCR). 2021b. New Hampshire State Parks. Jericho Mountain State Park. https://www.nhstateparks.org/visit/state-parks/jericho-mountain-state-park.aspx. Accessed February 8, 2022.

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National Park Service (NPS). 2021. National Scenic Trails. https://www.nps.gov/subjects/nationaltrailssystem/national-scenic-trails.htm. Accessed February 4, 2022.

Public Service of New Hampshire (PSNH). 1995. Final Shoreland Projection Plan Gorham Project. Project No. 2288. Filed July 31, 1995.

Public Service of New Hampshire (PSNH). 1999. Addendum to Shoreland Protection Plan FERC Project No. 2288. July 1, 1999.

Public Service of New Hampshire (PSNH). 2000. Recreation Usage Report. Gorham Hydroelectric Project. Project No. 2288-NH. Submitted August 15, 2000.

Public Service of New Hampshire (PSNH). 2003. FERC Form 80 Submittal. March 27, 2003.

Public Service of New Hampshire (PSNH). 2005. Recreation Usage Report. Gorham Hydroelectric Project. Project No. 2288-NH. Submitted May 2, 2005.

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Town of Gorham, New Hampshire. 2018. Maps. https://www.gorhamnh.org/assessing/pages/maps. Accessed February .

White Birches Camping Park (White Birches). 2022. http://www.whitebirchescamping.com/. Accessed February 8, 2022.

3.12 Environmental Justice

Pursuant to Executive Orders 12898[8] and 14008[9] the Federal Energy Regulatory Commission (FERC or Commission) is required to complete an analysis of potential impacts from project operations on the local community in the vicinity of the project to understand the impacts to human health and the environment as they relate to environmental justice communities, or communities that stand to be disproportionately impacted by construction of a new facility or the continued operation of an existing facility, including socioeconomic and/or sociocultural impacts.

Additionally, the FERC understands that it plays an integral role in regulating large parts of the United States energy industry, having far-reaching impacts to the nation, especially regarding the move toward cleaner energy (FERC 2022). Although the FERC is not required to comply with Executive Order 13985[10] the Commission has voluntarily elected to participate in the process, in an effort to ensure everyone can benefit from the clean energy transition (FERC 2022). Pursuant to Executive Order 13985, the FERC has developed an Equity Action Plan (EAP) based on five focus areas, that discusses barriers traditionally experienced by underserved and environmental justice communities regarding FERC practices, and outlines actions to remove those barriers and foster a commitment to equity (FERC 2022).

The FERC recognizes that many of the licensed hydropower projects were constructed prior to implementation of the National Environmental Policy Act (NEPA), or the issuance of executive orders related to equity or environmental justice (FERC 2022). The steps taken by FERC related to the three executive orders will include equity considerations when making decisions regarding hydropower relicensing and consider environmental justice communities as they relate to the relicensing process.

[8] Exec. Order No. 12898, 59 Fed. Reg. 7629 (Feb. 16, 1994). Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.
[9] Exec. Order No. 14008, 86 Fed. Reg. 7619-7633 (Jan. 27, 2021) Tackling the Climate Change Crisis at Home and Abroad.
[10] Exec. Order No. 13985 (June 2021). Advancing Racial Equity and Support for Underserved Communities Through the Federal Government.

Identification of Environmental Justice Communities

The thresholds used for populations meeting environmental justice status are as follows:

- For minority populations, the meaningfully greater analysis method was used, where the minority population in a block group is at least 10 percent greater than that of the same population for the county:

  (County population) x (1.10) = threshold above which a minority population must be for inclusion as an environmental justice community
- The "low-income threshold criteria" was used to identify environmental justice communities based on income level, where the block group must have a higher percentage of low-income households than the county.

3.12.1 Affected Environment

The Gorham Hydroelectric Project is located on the Androscoggin River in the Town of Gorham, Coos County, New Hampshire. Within one mile of the Project there are five census block groups that could potentially be impacted by relicensing. Of the five census block groups within the Project area two include environmental justice communities. As of the 2020 United States Census the environmental justice communities based on race within the Gorham Project area include:

- Asian
- Hispanic
- Individuals identifying as two or more races

Each environmental justice community is represented by one group within the Project area (Table 3.26).

In addition to race, environmental justice communities include groups of individuals with income levels below poverty level, measured by household. Within the Gorham Project area there are no communities meeting environmental justice status related to household income level (Table 3.26).

Table 3.26 Environmental Justice Community

Current Community Data											
Geographic Area	**Total Population**	**White Alone, not Hispanic (%)[a]**	**African American/ Black (%)[a]**	**American Indian/ Alaska Native (%)[a]**	**Asian (%)[a]**	**Native HI & Other Pacific Islander (%)[a]**	**Some Other Race (%)[a]**	**Two or More Races (%)[a]**	**Hispanic Origin (any race) (%)[a]**	**Total Minority Population (%)**	**Households in Poverty (%)[b]**
New Hampshire	1377529	87.16%	1.46%	0.22%	2.60%	0.03%	1.75%	5.64%	4.32%	16.03%	7.4%
Coos County	31268	91.56%	1.68%	0.30%	0.65%	0.01%	0.50%	4.30%	2.15%	9.58%	12.50%
Census Tract 9509, Block Group 1	976	90.16%	0.31%	0.00%	**2.97%**	0.00%	0.00%	**4.82%**	1.74%	9.84%	2.13%
Census Tract 9509, Block Group 2	785	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.12%
Census Tract 9509, Block Group 3	694	94.24%	0.43%	0.00%	0.00%	0.00%	0.00%	0.29%	**5.04%**	5.76%	5.34%
Census Tract 9509, Block Group 4	735	97.96%	0.00%	0.00%	0.00%	0.00%	0.00%	1.63%	0.41%	2.04%	2.15%
Census Tract 9510, Block Group 2	1157	98.96%	0.00%	0.09%	0.00%	0.00%	0.09%	0.35%	0.52%	1.04%	3.07%

a Percent of total population (Table B03002 - Hispanic or Latino Origin by Race American Community Survey. 2020 ACS 5-Year Estimates Detailed Tables. U.S. Census Bureau retrieved from https://data.census.gov/cedsci/table?t=Race%20and%20Ethnicity&g=1500000US330079509001,330079509002,330079509003,330079509004,330079510002&tid=ACSDT5Y2020.B03002&moe=false on July 11, 2022.

b Percent of Households (Table B17017 - Poverty Status in the Past 12 Months by Household Type by Age of Householder. 2020 ACS 5-Year Estimated Detailed Tables. U.S. Census Bureau retrieved from https://data.census.gov/cedsci/table?t=Income%20and%20Poverty&g=1500000US330079509001,330079509002,330079509003,330079509004,330079510002&tid=ACSDT5Y2020.B17017&moe=false on July 11, 2020. * Grey shaded cells indicate EJ community

3.12.2 Environmental Analysis and Effects

The FERC currently lacks formal licensing guidance for analyzing and addressing environmental justice issues (FERC 2022). The United States Environmental Protection Agency (USEPA) issued a 2016 guidance document for assessing environmental justice within a regulatory context, and although the environmental stressors are different, the following three questions posed by the USEPA document are transferable:

- Are there potential environmental justice concerns associated with environmental stressors affected by the regulatory action for the population groups of concern in the baseline?
- Are there potential environmental justice concerns associated with environmental stressors affected by the regulatory action for population groups of concern for the regulatory option(s) under consideration?
- For the regulatory option(s) under consideration, are potential environmental justice concerns created or mitigated compared to the baseline?

Baseline Conditions

The Gorham Project has been in place since 1909, providing safe and renewable power to the region, as well as recreational opportunities to the public. The Project is operated in a run-of-river mode, resulting in minimal impoundment fluctuations. The primary uses of the Androscoggin River within the Project area include hydroelectric power generation, wastewater assimilation, recreation, aquatic and wildlife habitat, and flood control. Please see section 3 of this exhibit for additional baseline conditions for the region.

Proposed Action Considerations

CRP NH Gorham, LLC is not proposing changes to run-of-river operations as part of this relicensing process, and as a result of this type of operation, impacts to shoreline property or archeological or tribal sites within the Project area are not anticipated. No significant changes or construction at the Project are proposed.

3.12.3 Unavoidable Adverse Effects

No infrastructure or operational changes are proposed; therefore, relicensing, and continued operation of the Gorham Hydroelectric Project is not expected to have any new unavoidable adverse effects on environmental justice communities.

3.12.4 References

Federal Energy Regulatory Commission (FERC). 2022. Equity Action Plan. Retrieved from file:///J:/012/217/Docs/FLA/Exhibit%20E/Environmental%20Justice/Equity%20Action%20Plan%20for%20FERC%20EO13985.pdf on July 7, 2022.

United States Environmental Protection Agency (USEPA). 2016. Technical Guidance for Assessing Environmental Justice in Regulatory Analysis. Retrieved from https://www.epa.gov/sites/default/files/2016-06/documents/ejtg_5_6_16_v5.1.pdf on July 8, 2022.

4.0 ECONOMIC ANALYSIS

4.1 Cost and Value of Operating and Maintaining the License

CRP NH Gorham, LLC is proposing no changes to the project facilities. The overall cost and value of the licensed Gorham Project is presented in Exhibit A to this DLA.

4.1.1 Costs of Proposed Protection, Mitigation and Enhancement Measures

CRP NH Gorham, LLC proposes to continue to implement the Shoreland Protection as adopted from the New Hampshire Shoreland Water Quality Protection Act (SWQPA) to serve as the shoreland protection for the Gorham Project (PSNH 1995; FERC 1999; NHDES 2022).

CRP NH Gorham, LLC proposes to continue implementation of the existing CRMP for continued protection of potential cultural resources.

CRP NH Gorham, LLC proposes to continue maintenance and recreational access and existing recreational facilities.

CRP NH Gorham, LLC proposes to implement an updated Operations Compliance Plan to be developed as a new license implementation measure, which is not expected to add to the annual cost of operating the project.

4.1.2 References

Public Service of New Hampshire (PSNH). 1995. Final Shoreland Projection Plan Gorham Project. Project No. 2288. Filed July 31, 1995.

Federal Energy Regulatory Commission (FERC). 1999 Order Modifying and Approving Shoreland Protection Plan. Project No. 2288-015. 87 FERC ¶ 62,076. Issued· April 19, 1999.

New Hampshire Department of Environmental Services (NHDES). 2022. Shoreland Program. https://www.des.nh.gov/land/waterfront-development/protected-shoreland. Accessed February 8, 2022.

5.0 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the Federal Power Act (FPA), 16 U.S.C. section 803 (a)(2)(A), requires FERC to consider the extent to which a project is consistent with Federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. On April 27, 1988, the Commission issued Order No. 481-A, revising Order No. 481, issued October 26, 1987, establishing that the Commission will accord FPA section 10(a)(2)(A) comprehensive plan status to any Federal or state plan that: (1) is a comprehensive study of one or more of the beneficial uses of a waterway or waterways; (2) specifies the standards, the data, and the methodology used; and (3) is filed with the Secretary of the Commission. FERC currently lists 43 comprehensive plans for the State of New Hampshire. Within the Scoping Document 2, FERC identified 20 relevant plans for the Androscoggin River. Exhibit H provides a review of the plans that CRP NH Gorham, LLC has determined that current and proposed operations of Project facilities are consistent with Commission approved comprehensive management plans.

APPENDIX A

CONSULTATION DOCUMENTATION

From	Date	To	Description
Notice of Intention and Pre-Application Document			
CRP	7/26/2019	FERC, Distribution List	Notice of Intention, Use of ILP, and Pre-Application Document
CRP	11/13/2019	FERC, Distribution List	Previous Licensing Studies
Comments Received on PAD and Scoping Document 1			
FERC	9/18/2019	Service List	Scoping Document 1
FERC	9/18/2019	Service List	NOI, request for comments on PADs and Scoping Document
Raymond Danforth (resident of Shelburne)	11/18/19	GLHA	Comments on PAD
Appalachian Mountain Club	11/19/19	GLHA	Comments on SD 1
Katherine Stuart (resident of Shelburne)	11/19/19	GLHA	Comments on PAD
Hildreth Danforth (resident)	11/21/19	CRP	Comments on PAD
New Hampshire Fish and Game Department	11/22/19	CRP	Comments and study requests
New Hampshire Department of Environmental Services	11/22/19	CRP	Comments and study requests
National Park Service	11/22/19	CRP	Comments and study requests
Town of Gorham	11/22/19	CRP	Comments on PAD
Pamela Laflamme (City of Berlin)	11/22/19	CRP	Comments on PAD

From	Date	To	Description
Edith Tucker (Representative of Coos County)	11/22/19	CRP	Comments on PAD
FERC	11/25/2019	GLHA, CRP, Service List	Staff Study Requests
Public Scoping Meeting			
CRP, GLHA	10/22/2019	FERC, Distribution List	Transcripts of 10/22/2019 public scoping meeting held at 2:00 pm and 6:00 pm
Scoping Document 2			
FERC	01/02/2020	GLHA, CRP, Service List	SD 2
Proposed Study Plan			
CRP	01/07/2020	FERC, Distribution List	Proposed Study Plan
CRP	1/24/2020	FERC, Distribution List	1991 Phase 1 Archaeological Survey filed
Proposed Study Plan Comments			
New Hampshire Fish and Game Department	4/3/20	FERC	Proposed study plan comments
New Hampshire Department of Environmental Services	4/5/20	FERC	Proposed study plan comments
FERC	2/21/2020	Service List	Memo dated 02/20/2020 providing record of communication with the Kleinschmidt Group re the recreation methodology in the proposed study plan

From	Date	To	Description
CRP	3/16/2020	FERC, Distribution List	Clarification memo to FERC regarding recreation study
FERC	3/19/20	GLHA, CRP, Service List	Comments on proposed study plan
Revised Study Plan			
CRP	5/6/2020	FERC, Distribution List	Revised Study plan
FERC Study Plan Determination			
FERC	5/29/2020	GHLA and CRP	discussing the study plan determination
Progress Reports			
CRP	12/22/2020	FERC, Distribution List	Study progress report for 2020
CRP	3/29/2021	FERC, Distribution List	Recreation Use and Facility Assessment Study postponement due to COVID-19
Initial Study Report			
CRP	6/7/2021	FERC, Distribution List	ILP Relicensing Initial Study Report
CRP	6/22/2021	FERC and stakeholders	Initial Study Report Meeting
CRP	7/7/2021	FERC and stakeholders	Initial Study Reporting Meeting Summary
Initial Study Report Comments			
NHDES	8/9/2021	FERC, GLHA	Written comments on the ISR and requested that GLHA submit additional data and/or data analysis details as it pertains to the water quality study

From	Date	To	Description
CRP	9/7/2021	Stakeholders	Response to NHDES comments on the ISR and additional information data and data analysis requests for the water quality study.
CRP	10/19/2021	NHDES	Plan for collecting additional bypass flow data at the Upper Androscoggin projects
NHDES	10/28/2021	GLHA	Comments on the 2021 Plan, which were shared with the New Hampshire Fish and Game Department
GLHA/CRP	11/3/2021	NHDES	Edits to the flow gaging plan
NHDES	11/5/2021	GLHA, CRP	Edits to revised plan
Study Request Determination			
FERC	9/22/2021	CRP and CRP	Determination on Requests for Study Modifications for the J. Brodie Smith (P-2287-053), Gorham (P-2288-057), Shelburne (P-2300-052), Upper Gorham (P-2311-067), Cross Power (P-2326-054), Cascade (P-2327-047), Sawmill (P-2422-058), and Riverside (P-2423-031) Hydroelectric Projects
Draft License Application			
CRP	3/3/2022	FERC and distribution list	Filed Draft License Application
Draft License Application Comments			
Town of Shelburne	5/24/3022	FERC, GLHA	Comment on DLA and study requests

From	Date	To	Description
FERC	5/26/2022	GLHA, CRP, Service List	Comments on DLA
NHDES	6/1/2022	FERC	Comments on DLA
Updated Study Report			
CRP	6/6/2022	FERC, Distribution List	Files Instream Flows Report
CRP	6/17/2022	FERC, NHDES, NHFG, CRP	USR meeting held via virtual conference call
CRP	7/1/2022	FERC, Distribution List	USR meeting summary
Coastal Zone Management Act			
Kleinschmidt	1/18/2022	NHDES – Coastal Program	Consultation whether the Project relicensing is within the jurisdiction of the New Hampshire State Coastal Management Program
NHDES – Coastal Program	1/18/2022	Kleinschmidt	The relicensing of J. Brodie Smith and Gorham Projects by FERC is not subject to CZMA federal consistency review by the New Hampshire Coastal Program.

CRP - J. Brodie Smith and Gorham Draft License Application Comments and Responses			
Commenting Entity	**Section/Topic**	**Comment**	**Response**
FERC	Smith Penstock Ex A 2.1.9	Request description of penstock be updated to match in Exhibit A. The description does match table 4.1	Exhibit A has been revised to reflect that the penstock changes size from upstream to downstream.
FERC	Smith Exhibit E - Recreation	Application should include existing amenities and current management of Smith Peninsula Park	CRP is completeing the Recreation Use and Facility Assessment in the field season of 2022. The Study will be submitted post FLA filing. CRP acknowledges FERC's comment.
FERC	Gorham Exhibit A	A required statement of measures taken or planned to ensure safe management, operation, and maintenance of the project	This information was included in Exhibit H. A brief summary has been incorporated into Exhibit A and Exhibit H referenced for more detailed information.
FERC	Gorham Exhibit A Table 2.1	Missing an explanation of sequence of turbine operations. Need to include how the units are operated across the range of flow condition between min and max capacities	Exhibit A has been revised to provide this additional information.
FERC	Gorham Exhibit E 3.8.1.1	Requests more information needed about existing amenities provided at park and current management. Such details requested: parking spaces, times available, location of walking trail, etc.	Exhibit E has been revised to provide this additional information.
FERC	Gorham Ex E	Requests CRP describe improvements to hand-carry boat access agreed upon between the licensee and Town of Gorham, New Hampshire	Exhibit E has been revised to provide this additional information.
FERC	Gorham Ex E 3.8.1.4	Requests CRP provide more details about gravel hand-carry boat access site approximately 2 miles upstream of Gorham Project	Exhibit E has been revised to provide this additional information.
FERC	Gorham Ex E 3.8.1.2	Requests CRP provide more information about how project operators are collecting recreation usage data. Daily, Hourly, weekdays, weekends, etc.	Exhibit E has been revised to provide this additional information.
FERC	Gorham Ex E Table 3.20 Table 3.21	Requests CRP explain data collection methods used for the information presented in table 3.21 and explain why these tables provide such different data for recreation visitor use at the same project.	Exhibit E has been revised to provide this additional information.
FERC	Exhibit E Environmental Justice	Recommend a table of racial, ethnic, and poverty statistics for within a mile of the proposed project boundary. A map showing the project boundary and locations of any project related construction in relation to any identified environmental justice communities within the geographic scope. A discussion of anticipated project related impacts on any environmental justice communities. If environmental justice communities are present, please provide a description of public outreach efforts. A description of any mitigation measures proposed to avoid and/or minimize project effects on environmental justice communities. Identify any non-english speaking groups. Include any documentation of consultation with entities that expressed interest with environmental justice.	See Exhibit E for recommended information on Environmental Justic.
New Hampshire Department of Environmental Services (NHDES)	General Comments	Missing comments from GLHA and/or CRP nos. 6 through 13 on the NHDES ISRs comments in fall 2021	CRP will respond to NHDES study comments in a separate transmittal.
NHDES	GLHA & CRP (Smith & Gorham) Ex E Water Quality	Request to include a summary of the following provision on Env-Wq 1703.07 d to account for DO water quality standards for impoundments because the water quality study includes six impoundments	Comment acknowledged and language included.
		Request to include DO% saturation in impoundment monitoring study.	Exhibit E documents for Smith and Gorham includes DO% Saturation.

		NHDES requests that CRP also provide narrative summaries and hydrographs that describe flows to the bypass reaches during the water quality studies for CRP's Androscoggin River Projects so that NHDES and others can more easily understand how flows to the bypass reaches may have been related to water quality standards and criteria measured or calculated for the monitoring sites during the water quality studies.	Bypass flows are provided at the Smith Project via a 15" by 15" cutout in one of the two waste gates. Gorham bypass flows are provided via a lowered flashboard section (5' wide by 6' high). A summary of river flows, bypass flows, and station operations for the Smith and Gorham Projects was provided in Appendix D and Appendix F, respectively, of the 2020 water quality report.
		NHDES recommends that CRP acknowledge that the water quality study showed that operation, which includes temporary cessation of power generation, of CRP's Androscoggin River Projects may adversely impact water quality and discuss how the projects can contribute to changes in water quality by slowing river flow, making surface waters more stagnant, which can result in changes to water quality in the project's impoundments and downstream of those impoundments.	The 2020 monitoring results demonstrate that operation of the eight hydroelectric projects, including the Smith Project, throughout the Upper Androscoggin River in Berlin, Gorham, and Shelburne, NH, does not have adverse impacts on water quality.
NHDES	CRP Water Quality Study	Figure 3.7, 3.8, 3.9. CRP felt it necessary to remove some of the DO data from the final data set, could not determine the cause in variability of some of the DO data, and speculated that that the some of the variability in DO data was influenced by human, environmental, or operational factors. CRP explained that it could not make conclusions about the causes of DO variability in some of the DO data. Considering these issues, CRP should describe in the FLA whether it believes it met the objectives of the water quality study and if it plans to conduct another water quality study or additional water quality monitoring for the Gorham Hydroelectric Project to determine if the DO variability is a result of the project or some other factor.	See previous response. CRP believes the study objectives were met and does not proposed to conducte additional water quality monitoring.
		Figure 3.7 does not show Unit 1 generation and the DO spot checks that CRP referenced. NHDES believes that CRP intended to reference Figure 3.12 and requests that CRP correct that reference in the FLA so that NHDES and others can more easily understand CRP's summary of the water quality study.	Comment acknowledged and corrected in FLA.
		Figure 3.8 does not show DO concentration in the tailrace, Unit 1 and Unit 4 generation, and spot check results for July 28 to September 5, 2020. NHDES believes that CRP meant to reference Figure 3.13 and requests that CRP correct that reference in FLA so that NHDES and others can more easily understand CRP's summary of the water quality study.	
		NHDES requests that CRP discuss how it determined that an upstream tributary, the Moose River, likely caused lower water temperature measurements at the above impoundment monitoring site of the Gorham Hydroelectric Project compared to other monitoring sites of the project so that NHDES and others can understand how CRP made this determination.	Comment addressed in Exhibit E of the FLA.
NHDES	CRP Ex E Water Resources Environmental Effects	NHDES requests that CRP clarify its introductory statement of the referenced section about meeting water quality standards so that it does not imply that all water quality standards were always met during the study.	Comment addressed in Exhibit E of the FLA.
		NHDES requests that CRP clarify its introductory statement of the referenced section about meeting water quality standards so that it does not imply that all water quality standards were always met during the study. CRP should describe in the FLA whether it believes it met the objectives of the water quality study for project and if it plans to conduct another water quality study or additional water quality monitoring for the project to determine if the DO variability and low DO is a result of the project or some other factor.	See previous response. CRP believes the study objectives were met and does not proposed to conducte additional water quality monitoring.
NHDES	CRP Ex E 3.4.1	In addition to results from 2021 Bypass Reach, NHDES requests CRP includes data and analysis as well	2021 bypass reach results have been incorporated in Exhibit E of the FLA.
NHDES	General Comments	NHDES recommends that CRP reference NHDES' final version of the 2020/2022 305(b) and 303(d) CALM, dated February 18, 2022, because the draft version is no longer published by NHDES	Exhibit E has been revised to address this comment.

APPENDIX B

INFORMATION FOR PLANNING AND CONSULTATION (IPAC)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: January 20, 2022
Consultation Code: 05E1NE00-2022-SLI-1268
Event Code: 05E1NE00-2022-E-04475
Project Name: Gorham Hydroelectric Project (FERC No. 2288)

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2022-SLI-1268
Event Code: Some(05E1NE00-2022-E-04475)
Project Name: Gorham Hydroelectric Project (FERC No. 2288)
Project Type: DAM
Project Description: This is a re-review of the 2018 Consultation Code: 05E1NE00-2018-SLI-2073. The Gorham Hydroelectric Project is going through the relicensing process with the Federal Energy Regulatory Commission (FERC or the Commission) The 2.25 MW Gorham Hydroelectric Project consists of a 20-foot-high timber crib dam, a spillway, a power canal, a powerhouse containing four generating units, located on the Androscoggin River in Coos County, New Hampshire. PSNH is not proposing to add capacity or make any physical modifications to the Project under the new license. The current license will expire on July 31, 2024.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@44.39015005,-71.16189279809669,14z

Counties: Coos County, New Hampshire

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Wherever Found in Contiguous U.S. There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

APPENDIX C

LIST OF SPECIES POTENTIALLY OCCURRING IN THE PROJECT AREA

Table C-1 List of Mammals Potentially Occurring in the Vicinity of the Gorham Project

Species	Scientific Name	Habitat
Moose	Alces alces	Emergent wetlands, waterbodies edges, forest
Short-tailed shrew	Blarina brevicauda	Variety of open wooded habitats
Coyote	Canis latrans	Forest edge, existing ROW
Beaver	Castor canadensis	Slow moving waterbodies, wetlands
Star-nosed mole	Condylura cristata	Moist, open areas
Big brown bat	Eptesicus fuscus	Wooded areas, tree cavities
Lynx	Felis lynx	Extensive forest
Northern flying squirrel	Glaucomys sabrinus	Deciduous and mixed forest above 1,000 feet
Porcupine	Hystricomorph hystricidae	Mixed or coniferous forest
Silver-haired bat	Lasionycteris noctivagans	Wooded areas with loose bark near watercourses
Red bat	Lasiurus borealis	Edge of wooded areas
Hoary bat	Lasiurus cinereus	Wooded coniferous areas
Snowshoe hare	Lepus americanus	Woodlands with dense cover, clear cuts, regeneration
River otter	Lontra canadensis	Riparian areas and wetlands
Bobcat	Lynx rufus	Mixed and deciduous forest, brushy fields, swamps
Woodchuck	Marmota monax	Woodland edges, open areas
Pine marten	Martes americana	Deciduous and coniferous forest
Fisher	Martes pennanti	Mixed and coniferous forest
Striped skunk	Mephitis	Open woodlands, meadows
Meadow vole	Microtus pennsylvanicus	Open areas such as fields, marshes and clear cuts
House mouse	Mus musculus	Buildings, fields, corncribs
Ermine	Mustela erminea	Variety of brushy, wooded habitats, close to waterbodies
Long-tailed weasel	Mustela frenata	Open areas, forest edge, existing ROW
Southern red-backed Vole	Myodes gapperi	Cool, moist forest with mossy rocks, clear cuts
Eastern small-footed bat	Myotis leibii	Caves and mines, tree cavities
Little brown bat	Myotis lucifugus	Near waterbodies and wetlands, tree cavities
Northern long-eared bat	Myotis septentrionalis	Mixed forested landscapes

Species	Scientific Name	Habitat
Woodland jumping mouse	Napaeozapus insignis	Meadows, marshes, clear cuts and wooded areas
Mink	Neovison vison	Riparian and wetland areas
White-tailed deer	Odocoileus virginianus	Forest edge, coniferous swamps
Muskrat	Ondatra zibethicus	Marshes and slow waterbodies with cattail
Hairy-tailed mole	Parascalops breweri	Open wooded areas, fields
Tri-colored bat	Perimyotis subflavus	Wooded areas, caves and mines, tree cavities
Deer mouse	Peromyscus maniculatus	Coniferous or mixed forests, edges and clear cuts
Raccoon	Procyon lotor	Wooded areas along waterbodies
Norway rat	Rattus norvegicus	Industrial, farm and residential areas
Gray squirrel	Sciurus carolinensis	Deciduous and mixed forest
Red squirrel	Sciurus vulgaris	Coniferous forests
Masked shrew	Sorex cinereus	Damp woodlands with structures
Long-tailed shrew	Sorex dispar	Deep coniferous/mixed forests, with moss covered rocks
Smoky shrew	Sorex fumeus	Moist, bouldery upland areas with moss, clear cuts
Pygmy shrew	Sorex minutus	Variety of wooded habitats
Water shrew	Sorex palustris	Riparian and wetland areas in coniferous areas
Eastern chipmunk	Tamias striatus	Deciduous woodlands, ROW edge
Black bear	Ursus americanus	Mixed Forest and swamps
Red fox	Vulpes	Forest edge, existing ROW, meadows
Meadow jumping mouse	Zapus hudsonius	Moist, open meadows, shrub swamps and wooded uplands

Table C-2 List of Reptiles and Amphibians Potentially Occurring in the Vicinity of the Gorham Project

Species	Scientific Name	Habitat
Blue-spotted salamander	Ambystoma laterale	Moist areas such as vernal pools and forested wetlands
Spotted salamander	Ambystoma macultaum	Moist forested areas, vernal pools, marshy areas, mixed woods
Fowler's toad	Anaxyrus fowleri	Sandy areas such as river valleys, floodplains, lakeshores, and agricultural

Species	Scientific Name	Habitat
		areas. Also, in pine forests, fields, and lawns
Eastern/red-spotted newt	Notophthalmus viridescens	Juveniles (red efts) in moist forested areas, adults in slow moving waters
Northern dusky salamander	Desmognathys fuscus	Cool running waters at forest margin
Ring-necked snake	Diadophis punctatus	Warm, exposed areas, often near water with abundant bark, log, or rock cover
Northern redback salamander	Plethodon cinereus	Mixed deciduous woodlands; under decaying logs, rocks and litter
Four-toed salamander	Hemidactylium scutatum	Wet forested areas with sphagnum moss, bogs
Northern two-lined salamander	Eurycea bislineata	Floodplains, moist forests near seeps
Eastern American toad	Bufo a. americanus	Forested habitats, existing ROW
Spring peeper	Pseudacris crucifer	Wetlands such emergent and scrub-shrub, edges of waterbodies
Gray tree frog	Hyla versicolor	Forested areas, scrub-shrub swamps
Bullfrog	Rana catesbeiana	Shorelines of large waterbodies
Green frog	Rana clamitans melanota	Riparian areas along waterbodies and shallow pools
Mink frog	Rana septentrionalis	Margins of ponds, waterbodies
Wood frog	Rana sylvatica	Forested areas, vernal pools
Northern leopard frog	Rana pipiens	Wet open fields, emergent wetlands
Pickerel frog	Rana palustris	Wet open areas, waterbodies and pond margins
Snapping turtle	Chleydra serpentina	Permanent waterbodies
Wood turtle	Glyptemys insculpta	Slow-moving sandy/gravel bottom waterbodies, fields and woods
Eastern painted turtle	Chrysemys picta	Slow, quiet waterbodies
Northern water snake	Nerodia sipedon	Permanently flooded wetlands, waterbodies
Northern redbelly snake	Storeria occipitomaculata	Moist woodlands, bogs with sphagnum
Eastern garter snake	Thamnophis sirtalis	Variety of terrestrial habitats
Northern ringneck snake	Diadophis punctatus edwardsii	Shady woodlands and under logs, rocks
Eastern smooth green snake	Opheodrys vernalis	Upland areas, scrublands, existing ROW

Species	Scientific Name	Habitat
Eastern milk snake	Lampropeltis tiangulum	Variety of habitats such as scrublands, woodlands and ROW edge
Eastern Newt	Notophthalmus viridescens	Forests but requires large mosaics of interconnected hardwoods and wetlands

Table C-3 List of Birds Potentially Occurring in the Vicinity of the Gorham Project

Species	Scientific Name	Habitat
Cooper's hawk	Accipiter cooperii	Extensive forests
Northern goshawk	Accipiter gentilis	Extensive forests
Sharp-shinned hawk	Accipiter striatus	Isolated forested areas, edges
Spotted sandpiper	Actitis macularius	Edges of lakes and rivers
Northern Saw-whet owl	Aegolius acadicus	Woodlands, edges
Boreal owl	Aegolius funereus	Dense coniferous and mixed hardwood forests
Red-winged blackbird	Agelaius phoeniceus	Marshes, sloughs, dry fields, woodlands
Wood duck	Aix sponsa	Shallow water ponds, lakes and wetlands near wooded areas
Green-winged teal	Anas carolinensis	Ponds, lakes and marshes
Mallard	Anas platyrhynchos	Emergent and shrub wetlands, rivers and lakes
American black duck	Anas rubripes	Emergent and shrub wetlands, flowages, rivers and lakes
Ruby-throated hummingbird	Archilochus colubris	Woodlands, edges, swamps
Great blue heron	Ardea Herodias	Shallow shores of marshes and waterbodies
Long-eared owl	Asio otus	Dense (usually coniferous) forests or groves
Redhead	Aythya americana	Marshes, ponds, lakes
Ring-necked duck	Aythya collaris	Marshes, bogs, and flowages
Cedar waxwing	Bombycilla cedrorum	Open woodlands, open orchards, towns
Ruffed grouse	Bonasa umbellus	Forested areas with herbaceous openings, ROW edges
American bittern	Botaurus lentiginosus	Marshes, bogs, and waterbodies
Canada goose	Branta canadensis	Wetlands and waterbodies
Great horned owl	Bubo virginianus	Interior woodlands, forest edges, wetlands

Species	Scientific Name	Habitat
Common goldeneye	Bucephala clangula	Ponds, lakes and rivers near wooded areas
Red-tailed hawk	Buteo jamaicensis	Woodlands, ROW corridors, old fields
Rough-legged hawk	Buteo lagopus	Open fields, marshes
Red-shouldered hawk	Buteo lineatus	Woodlands, forested wetlands
Broad-winged hawk	Buteo platypterus	Woodlands, forested wetlands
Green heron	Butorides virescens	Waterbodies and shrub wetlands
Northern cardinal	Cardinalis cardinalis	Woodland edges, swamps, streamside thickets, gardens
American goldfinch	Carduelis tristis	Weedy fields, open second-growth woodlands, roadsides
Veery	Catharus fuscescens	Moist deciduous woodlands
Hermit thrush	Catharus guttatus	Wooded swamps, coniferous edges
Swainson's thrush	Catharus ustulatus	Coniferous forest, near water
Brown creeper	Certhia Americana	Dense woodlands
Killdeer	Charadrius vociferous	Barren areas, pastures, gravel pits
Common nighthawk	Chordeiles minor	Open woodlands, railroad beds, clearings
Northern harrier	Circus cyaneus	Meadows, emergent wetlands, bogs
Marsh wren	Cistothorus palustris	Marshes
Black-billed cuckoo	Coccyzus erythropthalmus	Brushy areas, open woodlands
Northern flicker	Colaptes auratus	Open woodlands, edges, clear cuts
Rock dove	Columba livia	Near human dwellings
Olive-sided flycatcher	Contopus cooperi	Spruce forests, bog edges
Eastern wood pewee	Contopus virens	Forest interior
American crow	Corvus brachyrhynchos	Woodlands, ROW corridors
Common raven	Corvus corax	Open woodlands, clear cuts
Blue jay	Cyanocitta cristata	Woodlands, towns
Black-throated blue warbler	Dendroica caerulescens	Mixed or deciduous forests with dense undergrowth
Bay-breasted warbler	Dendroica castanea	Coniferous forest, coniferous shrub areas
Yellow-rumped warbler	Dendroica coronate	Coniferous forest, edges
Palm warbler	Dendroica palmarum	Bogs and bog edges
Chestnut-sided warbler	Dendroica pensylvanica	Regeneration areas, clear cuts, ROW corridors
Yellow warbler	Dendroica petechial	Shrub and emergent wetlands, brushy areas along waterbodies
Pine warbler	Dendroica pinus	Pine forests, mixed woodlands

Species	Scientific Name	Habitat
Black-throated green warbler	Dendroica virens	Mixed forest, forested wetlands
Pileated woodpecker	Dryocopus pileatus	Interior second growth forest, forested wetlands
Gray catbird	Dumetella carolinensis	Brushy edges, shrub wetlands, clear cuts
Alder flycatcher	Empidonax alnorum	Shrub wetlands with openings
Least flycatcher	Empidonax minimus	Deciduous woodlands, edges, forested wetlands
Horned lark	Eremophila alpestris	Open areas, fields, pastures
Spruce grouse	Falcipennis Canadensis	Dense interior coniferous forest, cedar bogs
Merlin	Falco columbarius	Open forests adjacent to open areas for foraging
Peregrine falcon	Falco peregrinus	Rocky cliffs with ledges overlooking waterbodies, lakes, with a abundance of birds
American kestrel	Falco sparverius	ROW edges, old fields near tree cavities
Common snipe	Gallinago gallinago	Marshes, emergent bogs
Common loon	Gavia immer	Large waterbodies
Common yellowthroat	Geothlypis trichas	Grassy fields, shrubs, marshes
Bald eagle	Haliaeetus leucocephalus	Near large waterbodies
Barn swallow	Hirundo rustica	Near farms, pastures
Wood thrush	Hylocichla mustelina	Swamps and moist deciduous or mixed forest
Dark-eyed junco	Junco hyemalis	Forest, clearings, ROW edges
Northern shrike	Lanius excubitor	Open woodlands, brushy areas
Herring gull	Larus argentatus	Large waterbodies
Hooded merganser	Lophodytes cucullatus	Wooded ponds, lakes and rivers
Belted kingfisher	Megaceryle alcyon	Waterbodies, banks of waterbodies
Swamp sparrow	Melospiza georgiana	Shrub and emergent wetlands, waterbodies edges
Song sparrow	Melospiza melodia	Brushy fields, shrub wetlands, towns
Common merganser	Mergus merganser	Rivers and lakes
Red-breasted merganser	Mergus serrator	Rivers and lakes
Northern mockingbird	Mimus polyglottos	Near towns in brush
Black-white warbler	Mniotilta varia	Forest and second growth
Great crested flycatcher	Myiarchus crinitus	Woodlands, forested swamps
Mourning warbler	Oporornis Philadelphia	ROW corridors, clear-cuts
Tennessee warbler	Oreothlypis peregrine	ROW edges, open woodlands, dense shrubs

Species	Scientific Name	Habitat
Osprey	Pandion haliaetus	Near large waterbodies
Northern waterthrush	Parkesia noveboracensis	Forested wetlands near waterbodies
Savannah sparrow	Passerculus sandwichensis	Meadows, fields
Indigo bunting	Passerina cyanea	Forest edges and openings, ROW corridors
Gray jay	Perisoreus Canadensis	Coniferous forest, cedar bogs
Rose-breasted grosbeak	Pheucticus ludovicianus	Deciduous forest
Black-backed woodpecker	Picoides arcticus	Coniferous forest, clear cuts with dead timber
Three-toed woodpecker	Picoides dorsalis	Coniferous forest, clear cuts with dead timber
Downy woodpecker	Picoides pubescens	Forests
Hairy woodpecker	Picoides villosus	Forests
Rufous-sided Towhee	Pipilo erythrophthalmus	Forest edges and openings, ROW corridors
Pied-billed grebe	Podilymbus podiceps	Ponds, marshes with heavy emergent vegetation
Black-capped chickadee	Poecile atricapillus	Woodlands, towns
Boreal chickadee	Poecile hudsonicus	Coniferous forest, spruce bogs
Common grackle	Quiscalus quiscula	Open fields, marshes, parks
Ruby-crowned kinglet	Regulus calendula	Coniferous forest, edges
Golden-crowned kinglet	Regulus satrapa	Coniferous forest
Bank swallow	Riparia	Riverbanks, gravel pits
Eastern phoebe	Sayornis phoebe	Wooded or shrub areas near waterbodies
American woodcock	Scolopax minor	Moist woodlands, alder thickets
Ovenbird	Seiurus aurocapillus	Mature deciduous forest, no undergrowth
Northern parula warbler	Setophaga Americana	Mix forest with old man's beard, forested wetlands
American redstart	Setophaga ruticilla	Deciduous woodlands, forested wetlands
Eastern bluebird	Sialia sialis	Open woodlands, clearings, edges
Red-breasted nuthatch	Sitta Canadensis	Coniferous Forest
White-breasted nuthatch	Sitta carolinensis	Deciduous woodlands
Yellow-bellied sapsucker	Sphyrapicus varius	Woodlands, edges
Chipping sparrow	Spizella passerine	Towns, farms, fields
Barred owl	Strix varia	Forested wetlands, bottomlands

Species	Scientific Name	Habitat
European starling	Sturnus vulgaris	Towns, farms and fields
Tree swallow	Tachycineta bicolor	Open areas near water, beaver flowages
House wren	Troglodytes aedon	Near human dwellings, brushy clearings
Winter wren	Troglodytes hiemalis	Dense coniferous undergrowth, bog edges
American robin	Turdus migratorius	Open woodlands, clearings pastures
Eastern kingbird	Tyrannus tyrannus	Open woodlands, shrub wetlands
Nashville warbler	Vermivora ruficapilla	Moist deciduous forest, edges
Warbling vireo	Vireo gilvus	Open woodlands
Red-eyed vireo	Vireo olivaceus	Open deciduous forest
Philadelphia vireo	Vireo philadelphicus	Forests, edges, ROW corridors
Solitary vireo	Vireo solitaries	Mixed woodlands with dense understory
Canada warbler	Wilsonia Canadensis	Moist forest with undergrowth, forested wetlands
Wilson's warbler	Wilsonia pusilla	Bogs, shrub wetlands
Mourning dove	Zenaida macroura	ROW corridors, open woodlands, backyards
White-throated sparrow	Zonotrichia albicollis	Brushy areas, clear-cuts, bogs

GORHAM HYDROELECTRIC PROJECT

FERC NO. 2288

EXHIBIT F

GENERAL DESIGN DRAWINGS

This Material is Critical Energy/Electric Infrastructure Information (CEII).
Members of the Public may Obtain Nonpublic or Privileged Information
by Submitting a Freedom of Information Act (FOIA) Request.

GORHAM HYDROELECTRIC PROJECT

FERC NO. 2288

EXHIBIT G

PROJECT MAPS

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LIST OF APPENDICES

1.0 PROJECT MAP

The attached (Appendix A) Exhibit G map denotes the J. Brodie Smith Hydroelectric Project boundary. Table 1.1 provides a summary of the drawing number and title for the Exhibit G map. The Project Boundary Map shows the Project vicinity, location, and boundary in sufficient detail to provide a full understanding of the Project. The Exhibit G map was prepared in accordance with the requirements of 18 C.F.R. § 4.41(h).

Table 1.1 Gorham Project Boundary Maps

Exhibit	FERC Drawing No.	Title
G-1	P-2288, G-1	Project Boundary Map

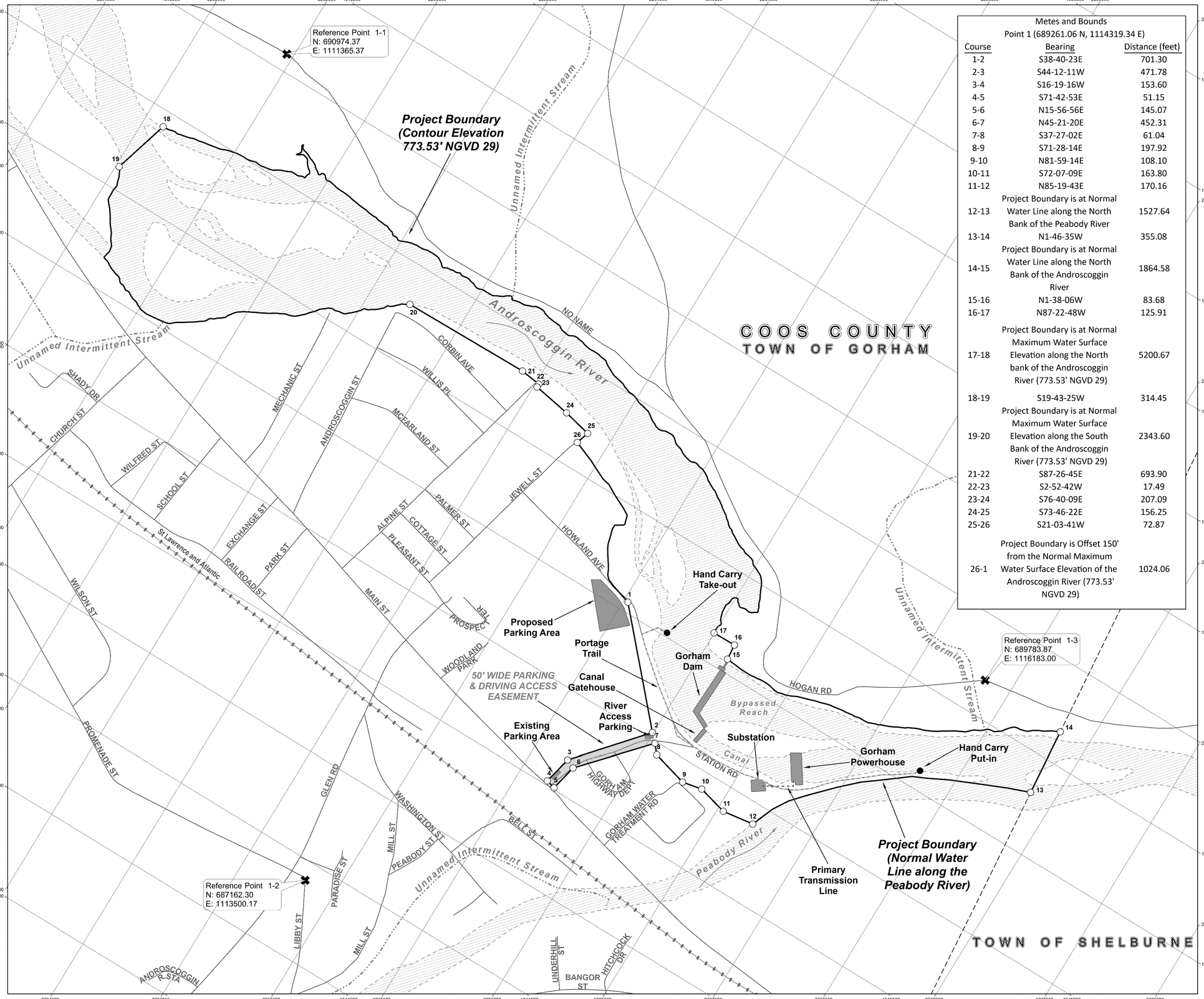
CRP is proposing to reduce the project boundary by 1.84 acres to remove a small portion of land that is not necessary for project purposes. Associated electronic files (e.g., GIS shapefiles) are provided with this Final License Application.

2.0 FEDERAL LANDS

There are no public lands or reservations of the United States within the Gorham Project boundary.

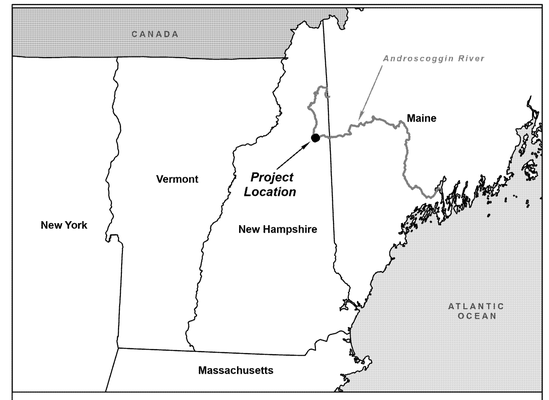
APPENDIX A

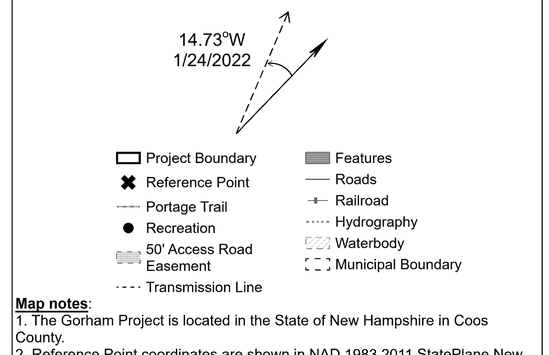
EXHIBIT G DRAWINGS



Metes and Bounds
Point 1 (689261.06 N, 1114319.34 E)

Course	Bearing	Distance (feet)
1-2	S38-40-23E	701.30
2-3	S44-12-11W	471.78
3-4	S16-19-16W	153.60
4-5	S71-42-53E	51.15
5-6	N15-56-56E	145.07
6-7	N45-21-20E	452.31
7-8	S37-27-02E	61.04
8-9	S71-28-14E	197.92
9-10	N81-59-14E	108.10
10-11	S72-07-09E	163.80
11-12	N85-19-43E	170.16
12-13	Project Boundary is at Normal Water Line along the North Bank of the Peabody River	1527.64
13-14	N1-46-35W	355.08
14-15	Project Boundary is at Normal Water Line along the North Bank of the Androscoggin River	1864.58
15-16	N1-38-06W	83.68
16-17	N87-22-48W	125.91
17-18	Project Boundary is at Normal Maximum Water Surface Elevation along the North bank of the Androscoggin River (773.53' NGVD 29)	5200.67
18-19	S19-43-25W	314.45
19-20	Project Boundary is at Normal Maximum Water Surface Elevation along the South Bank of the Androscoggin River (773.53' NGVD 29)	2343.60
21-22	S87-26-45E	693.90
22-23	S2-52-42W	17.49
23-24	S76-40-09E	207.09
24-25	S73-46-22E	156.25
25-26	S21-03-41W	72.87
26-1	Project Boundary is Offset 150' from the Normal Maximum Water Surface Elevation of the Androscoggin River (773.53' NGVD 29)	1024.06





Map notes:

1. The Gorham Project is located in the State of New Hampshire in Coos County.
2. Reference Point coordinates are shown in NAD 1983 2011 StatePlane New Hampshire FIPS 2800 Ft US.
3. Elevations shown are referenced to NGVD 29, where NAVD 88 = NGVD 29 - 0.410 ft. Conversion factor was determined using the NGS Coordinate Conversion and Transformation Tool (https://www.ngs.noaa.gov/NCAT/), accessed 7/19/2022.
4. Licensee has acquired all flowage rights and title in fee or the right to use in perpetuity all lands necessary or appropriate for the construction, maintenance, and operation of the Project. All property records are kept on file with the licensee.
5. There are no federal lands within the Project boundary.
6. The Project boundary description, as required by 18 CFR 4.41, is represented here by a grid of Northings and Eastings around, and graticules within, the map frame. Any position in Northings and Eastings along the Project boundary can be determined using these references.
7. The Project boundary, in part, was digitized from contour elevations derived from USGS NH Umbagog LiDAR data (USGS 2016).

SURVEYORS STATEMENT

I HEREBY CERTIFY TO THE FEDERAL ENERGY REGULATORY COMMISSION (FERC) THAT THIS PLAN MEETS THE CONDITIONS SET FORTH BY FERC FOR ITS EXPRESSED PURPOSE. THE PURPOSE OF THIS MAP IS TO PROVIDE A GEOREFERENCED VISUAL DEPICTION OF THE LOCATION OF PROJECT FEATURES AND BOUNDARIES BASED ON THE BEST AVAILABLE HISTORICAL DRAWINGS AND DIGITAL REFERENCE SOURCES INCORPORATED INTO THE GEOGRAPHIC INFORMATION SYSTEM (GIS). LOCATIONS HAVE NOT BEEN VERIFIED BY PHYSICAL FIELD SURVEYS AND THIS DRAWING SHOULD NOT BE USED FOR PURPOSES OF DEVELOPING PROPERTY BOUNDARY DESCRIPTIONS.

STATE OF MAINE
STEPHEN W. EVERETT
2161
PROFESSIONAL LAND SURVEYOR

CRP NH GORHAM, LLC

GORHAM HYDROELECTRIC PROJECT
FERC NO. 2288

PROJECT BOUNDARY MAP

EXHIBIT G | SCALE: 1" = 250' | SHEET NO. 1 OF 1

0 175 350 700 1,050 1,400 Feet

FERC DWG. NO. 2288-

GORHAM HYDROELECTRIC PROJECT

PROJECT NO. 2288

EXHIBIT H

DESCRIPTION OF PROJECT MANAGEMENT AND NEED FOR PROJECT POWER

TABLE OF CONTENTS

LIST OF TABLES

1.0 INTRODUCTION

The Gorham Hydroelectric Project (Project) (FERC Project No. 2288) is an existing generating facility licensed to CRP NH Gorham, LLC, a subsidiary to Central Rivers Power NH, LLC. For the purposes of this exhibit, Central Rivers Power NH, LLC and its subsidiary hydroelectric owners/licensee are referred to as "CRP" collectively. Exhibit H provides information pursuant to 18 CFR § 5.18(c), including CRP NH Gorham, LLC's ability to operate and maintain the project, any plans to modify the project, CRP NH Gorham, LLC's safety management, operation and maintenance of the Project, and other applicable information to be provided by existing applicants pursuant to 18 CFR § 5.18(c)(1)(ii).

2.0 INFORMATION TO BE SUPPLIED BY ALL LICENSEES

2.1 Plans and Ability of the Applicant to Operate and Maintain the Project

2.1.1 Plans to Increase Capacity or Generation

The Licensee has no current plans to increase the capacity or generation of the Project. However, as economic conditions change, CRP routinely performs periodic evaluations of generating facilities regarding potential upgrades and will continue to do so into the future. Normal routine maintenance will be performed as needed during the remainder of the license term and during any new license term.

2.1.2 Plans to Coordinate the Operation of the Project with Other Water Resource Projects

The Licensee proposes to maintain existing project operations as described in Exhibit A. The project is operated as run-of-river, and therefore the projects operate independently of other facilities.

2.1.3 Plans to Coordinate the Operation of the Project with Other Electrical Systems

Power generated by the Gorham Project is sold to the regional grid.

2.2 Need for Project Electricity

2.2.1 The Reasonable Costs and Availability of Alternative Sources of Power

The Project provides renewable power without the emissions of air pollutants or greenhouse gases that marginal fossil fuel plants produce. This is an increasingly important fact in New England, where all six New England states have enacted legislation to reduce the dependence on fossil-fired generation through the introduction of Renewable Portfolio Standards (RPS), or similar legislation, that encourages and requires the use of renewable power sources in each individual state's total resource output. Many of these RPS programs include an annual escalating supply requirement to further encourage reliance on renewable power sources. These enacted legislations are designed to increase the amount of renewable power supply in the region's mix of generation resources or, alternatively, reduce the amount of fossil-fired generation as a percentage

of the total resource output. If the Project would not provide this variable output generation, replacement energy would be replaced by other sources within the ISO New England. Alternative sources are likely to be generating units powered by fossil fuels, whose fuel and other variable costs may be significantly higher than those of the Project.

2.2.2 Increase in Costs if the Licensee is not Granted a License

If the Licensee is not granted a license, this Project would cease to provide affordable, clean electricity to the watershed. Consequently, an unquantified increase in costs would likely occur to New England electric consumers if a license for continued operation of the Project was not granted.

2.3 Effects of Alternative Sources of Power

2.3.1 Effects on Customers

This section is not applicable because CRP NH Gorham, LLC is a wholesale supplier.

2.3.2 Effects on the Licensee's Operating and Load Characteristics

The Licensee is an independent power producer and, as such, does not maintain a separate transmission system which could be affected by replacement or alternative power sources.

2.3.3 Effects on Communities Served

See the discussion above in *Section 2.2, Need for Electricity Generated by the Project*, regarding the loss of the Project's generation. Because the Licensee cannot predict with any certainty the actual type or location of a potential alternative facility providing replacement power, it cannot specifically discuss potential effects of an alternative source of power on any particular community.

2.4 Need for Project Power, Reasonable Cost and Availability of Alternative Sources of Power

The Licensee is an independent power producer and, as such, does not have an obligation or need to prepare load and capability forecasts in reference to any particular group or class of customers.

2.5 Effect of Power on Applicant's Industrial Facility

This section is not applicable as the Licensee does not use the power generated for its own industrial operations.

2.6 Need of the Tribe for Electricity Generated by the Project

The Licensee is not an Indian Tribe; therefore, this section is not applicable.

2.7 Impacts on the Operations and Planning of the Licensee's Transmission System of Receiving or Not Receiving the License

Because the Licensee is an independent power producer and does not own the local transmission system, this section is not applicable to the Licensee. Power generated by the Gorham Project is sold to the regional grid. The Single Line Diagrams for the Project can be found in Exhibit A of this Draft License Application.

2.8 State of Need for Modification to Existing Project Facility Operations

CRP NH Gorham, LLC has no plans to construct new facilities or to alter operations of the Project. CRP NH Gorham, LLC is seeking authorization to continue operating the Project in its current configuration and as it is currently licensed to operate.

2.9 Consistency with Comprehensive Plans

Section 10(a)(2)(A) of the Federal Power Act (FPA), 16 U.S.C. section 803 (a)(2)(A), requires FERC to consider the extent to which a project is consistent with Federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. On April 27, 1988, the Commission issued Order No. 481-A, revising Order No. 481, issued October 26, 1987, establishing that the Commission will accord FPA section 10(a)(2)(A) comprehensive plan status to any Federal or state plan that: (1) is a comprehensive study of one or more of the beneficial uses of a waterway or waterways; (2) specifies the standards, the data, and the methodology used; and (3) is filed with the Secretary of the Commission. FERC currently lists 43 comprehensive plans for the State of New Hampshire. Within the Scoping Document 2, FERC identified 20 relevant plans for the Androscoggin River. The following is a review of the plans that may be applicable to the Project. Based on a review of these plans, CRP NH Gorham, LLC has

determined that current and proposed operations of Project facilities are consistent with these Commission approved comprehensive management plans.

Interstate Fishery Management Plan for American eel (Anguilla rostrata) (Report No. 36). – April 2000. Atlantic States Marine Fisheries Commission. Addendum I-IV

The natural range of migratory, anadromous fish does not extend to the upper Androscoggin River. Three major cascades in the lower Androscoggin River drainage (Great Falls, Lewiston Falls, and Rumford Falls) are natural barriers for anadromous fishes (MDMR and MDIFW 2017). Exhibit E describes the existing fishery resource and recreational opportunities the Project provides.

Atlantic States Marine Fisheries Commission. 1999. Amendment 1 to the Interstate Fishery Management Plan for shad and river herring (Report No. 35). April 1999 and Amendments 2-4 (2000, 2009, 2010)

The natural range of migratory, anadromous fish does not extend to the upper Androscoggin River. Three major cascades in the lower Androscoggin River drainage (Great Fall, Lewiston Falls, and Rumford Falls) are natural barriers for anadromous fishes (MDMR and MDIFW 2017). Atlantic sturgeon, shortnose sturgeon, and rainbow smelt likely did not pass beyond Great Falls (MDMR and MDIFW 2017) in Brunswick, Maine. Lewiston Falls prevented the upstream migration of sea-run alewives, American shad, blueback herring, striped bass, and sea lamprey, while Rumford Falls was a barrier to Atlantic salmon (MDMR and MDIFW 2017). The Gorham Project is approximately 63 RMs upstream of Lewiston Falls and 43 RMs upstream of Rumford Falls, which are historic barriers to migratory species.

Exhibit E further discusses anadromous fishes and native species assemblage in the project vicinity.

National Park Service. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993.

The Nationwide Rivers Inventory (NRI) is a listing of more than 3,200 free-flowing river segments in the United States that are believed to possess one or more "outstandingly remarkable" natural or cultural values judged to be at least regionally significant (NPS

2021). As required under the Wild and Scenic Rivers Act section 5(d)(1) and related guidance, federal agencies are required to avoid or mitigate actions that would adversely affect NRI river segments.

The Peabody River is listed under the NRI and Peabody River joins the Androscoggin River downstream of Project, outside of the project boundary.

The Licensee is proposing to continue to operate Gorham Project as run-of-river with no new impacts to water quality or fisheries. Exhibit E describes the existing fishery resource and recreational opportunities the Project provides.

New Hampshire Office of State Planning. 1977. Wild, scenic, and recreational rivers for New Hampshire. Concord, New Hampshire. June 1977.

The five rivers listed as wild, scenic, and recreational in New Hampshire are the Lamprey, Nashua, Squannacook, Nissitisssit, and Wildcat.

The Gorham Project is located on the Androscoggin River; therefore, this plan does not apply to the Project.

New Hampshire Office of State Planning. 1989. New Hampshire Wetlands Priority Conservation Plan. Concord, New Hampshire.

The Plan is an addendum to the NH State Comprehensive Outdoor Recreation Plan. The plan documents other existing regulations and programs protecting wetlands in New Hampshire and provides additional recommendations to protect wetlands.

Pursuant to the revised study plan, CRP NH Gorham, LLC conducted a reconnaissance level survey to document botanical communities and rare, threatened, and endangered (RTE) botanical species in the Project study area during the fall of 2020. Wetlands are rare within the Project boundary and account for less than one percent of the overall study area.

The Project is operated in a run-of-river mode with no new impacts to water quality or wetlands and vegetation communities. Exhibit E describes the wetlands and riparian and littoral habitat represented in the Project vicinity.

New Hampshire Office of Energy and Planning. New Hampshire Statewide Comprehensive Outdoor Recreation Plan (SCORP): 2013-2018. Concord, New Hampshire. December 2013.

The 2013-2018 New Hampshire Statewide Comprehensive Outdoor Recreation Plan[1] (NH SCORP) serves to qualify New Hampshire for funding from the federal Land and Water Conservation Fund (LWCF) and provides guidance on prioritizing the allocation of LWCF grants. Goals of the NH SCORP include identifying outdoor recreation trends, needs, and issues; evaluating the supply and demand of recreation resources; and providing a strategic plan for addressing recreation issues in the state (NH DNCR 2013). The strategic priorities for the state of New Hampshire from the 2013-2018 SCORP are connecting people to the outdoors to promote healthy lifestyles, consistent and wise stewardship and conservation of natural resources, economic vitality through the promotion of outdoor recreation and tourism, and education of recreation users, partners, and agencies (NH DNCR 2013).

Exhibit E of the FLA further explains how CRP NH Gorham, LLC is complying with this plan.

New Hampshire Office of State Planning. 1991. Public Access Plan for New Hampshire's Lakes, Ponds, and Rivers. Concord, New Hampshire. November 1991.

Exhibit E of the FLA provides in detail the existing public access provided at the Gorham Project and CRP NH Gorham, LLC's effort in surveying the existing facilities and reviewing the potential use and need of public access in the Project boundary.

U.S. Fish and Wildlife Service. 1989. Atlantic salmon restoration in New England: Final environmental impact statement 1989-2021. Department of the Interior, Newton Corner, Massachusetts. May 1989.

The USFWS, in participation with the fishery agencies of the New England states and other Federal agencies, proposes to restore self-sustaining populations of Atlantic salmon by the year 2021 to the species' historical range in New England. The historical range of Atlantic salmon includes the Penobscot River among others. To accomplish the goal, USFWS will:

[1] In comments on the draft license application, FERC noted that the Commission approved SCORP is for 2008-2013, however recommendations from the 2018 SCORP can be considered.

- Utilize USFWS hatcheries and Fisheries Assistance field stations to reestablish and evaluate salmon populations;
- Consider the needs of salmon restoration in the process of reviewing Federal projects, permits, and licenses;
- Provide funding to state agencies for salmon restoration through the administration of the Federal Aid programs; and
- Conduct research on the biology of the Atlantic salmon.

USFWS states that effective upstream and downstream fish passage is a fundamental requirement of the goal of restoring self-sustaining populations of Atlantic salmon by the year 2021. No anadromous or catadromous fish are known to occur in the Project Boundary. Exhibit E further explains the aquatic species present at the Gorham Project.

U.S. Fish and Wildlife Service. n.d. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C.

This policy, under the auspices of the 1988 National Recreational Fisheries Policy (National Policy), encompasses the guiding principles, goals, and objectives set forth by the National Policy. The Policy defines the USFWS's stewardship role in management of the Nation's recreational fishery resources, which include not only angling, but fish watching and photographing. With the Fisheries USA policy, USFWS committed to accomplish three goals:

- Usability – to optimize the opportunities for people to enjoy the Nation's recreational fisheries.
- Sustainability – to ensure the future of quality and quantity of the Nation's recreational fisheries; and
- Action – to work in partnership with other Federal governmental agencies, states, tribes, conservation organizations, and the public to effectively manage the Nation's recreational fisheries.

The Licensee is proposing to operate as run-of-river with no new impacts to water quality or fisheries. Exhibit E describes the existing fishery resource and recreational opportunities the Project provides.

2.10 Financial and Personnel Resources

CRP has considerable experience operating not only the Project but other licensed hydroelectric and water storage projects in the region as well. As a corporation with multiple hydroelectric plants located throughout the region and in the State of New Hampshire, CRP either has or can acquire the necessary resources to continue the operation and maintenance of the Gorham Project.

CRP has a complete staff of engineers, biologists, operators, mechanics, and electricians that are trained and experienced in the operation of hydroelectric projects. Additionally, staff can also be utilized from other nearby CRP facilities, or contractors can be retained to undertake larger scale maintenance or upgrade projects. In addition, the Licensee has available the administrative, licensing, and support personnel that are needed to maintain compliance with the terms of the license.

Information regarding the Project's expected annual costs and value is provided in Exhibit D of this Final License Application.

2.11 Notification of Affected Landowners

18 CFR §16.10 (a) 10 requires that "*If an applicant proposes to expand the project to encompass additional lands, a statement that the applicant has notified, by certified mail, property owners on the additional lands to be encompassed by the project and governmental agencies and subdivisions likely to be interested in or affected by the proposed expansion.*" CRP NH Gorham, LLC is not proposing to expand the Project boundary to encompass additional lands of others. Therefore, notification of adjacent landowners is not applicable.

2.12 Applicant's Electricity Consumption Efficiency Improvement Program

Because the Licensee is an independent power producer, this section is not applicable to the Project.

2.13 Tribes Affected By the Project

There are no Native American lands, known Native American TCPs or religious properties, or NRHP-eligible or -listed sites associated with Native American Nations within the Project boundary or which would likely be affected by the Project relicensing.

3.0 INFORMATION TO BE PROVIDED BY AN APPLICANT WHO IS AN EXISTING LICENSEE

3.1 Measures Planned to Ensure Safe Management, Operation, and Maintenance of the Project

3.1.1 Safe Management, Operation and Maintenance

CRP NH Gorham, LLC has developed, according to FERC's Guidelines for Public Safety at Hydropower Projects, Public Safety Plans for the Gorham Project, which are revised on a regular basis as conditions warrant. These plans (and revisions) are reviewed and accepted by the FERC New York Regional Office. CRP NH Gorham, LLC operates the Project consistent with its commitment to public and employee safety. CRP NH Gorham, LLC attains its safety goals by:

- Providing an in-depth management and technical support organization;
- Establishing and implementing specific operating procedures including standard bulletins;
- Training operations and maintenance personnel;
- Inspecting all Project facilities regularly and monitoring indicators of Project condition and safety;
- Implementing a rigorous inspection and maintenance program for operating equipment and facilities vital to safety;
- Limiting public access and providing warning signs and other public safety devices where Project operations or Project features could endanger the public consistent with FERC's Guidelines for Public Safety at Hydropower Projects (FERC 2011[2]), and Security Program for Hydropower Projects (FERC 2016[3]); and
- Complying with all applicable local, state, and federal laws and regulations regarding the safe operation of industrial and electric facilities.

The Gorham Project is remotely monitored and operated 24 hours a day, 7 days a week. In addition, plant staff visit the site daily (Monday – Friday). A telephone paging system

[2] FERC. 2011. Guidelines for Public Safety at Hydropower Projects. updated November 29, 2011.
[3] FERC. 2016. Division of Dam Safety and Inspections FERC Security Program for Hydropower Projects Revision 3A.

notifies project personnel of operational problems via cellular telephones. Plant staff are generally within 30 minutes of the Project at all times. Gorham is classified as a low hazard dam. Section 10(c) of the Federal Power Act (FPA) authorizes FERC to establish regulations requiring licensees to operate and properly maintain their Projects for the protection of life, health, and property. FERC Part 12 regulations include such safety measures as signage and exclusion devices. Dam Safety and Surveillance Monitoring Reports are filed with FERC on an annual basis.

CRP NH Gorham, LLC was required by FERC to file a public safety plan for the Project, which depicts the public safety devices installed at the Project and their location. The Commission approved the Public Safety Plan on August 1, 1994 and July 17, 2006. CRP NH Gorham, LLC maintains fences, handrails, a locked entrance gate and warning signs to protect the public from the hazards of project operations. CRP NH Gorham, LLC also seasonally installs a boat barrier before Memorial Day Weekend and removes the barrier after Columbus Day annually. According to the most recent FERC Environmental Inspection Report (issued June 6, 2006).

These measures have been consistently applied and expanded as appropriate to ensure the safe, continued operation and maintenance of the Project. As described in the Project Public Safety Plan, CRP NH Gorham, LLC implements public safety and security measures, such as signage, fencing, alert/warning devices, and boat barriers to protect public safety and for Project security purposes.

FERC's New York Regional Office conducts an environmental inspection every few years. CRP NH Gorham, LLC completes all necessary corrective actions to address comments and recommendations arising from FERC inspections in a timely manner. The Project's dam is inspected annually by CRP NH Gorham, LLC's Engineering and Operations staff, as well as after floods in the Project vicinity. In addition, routine repairs are performed as needed.

3.1.2 Description of Operation During Flood Conditions

A description of operations during flood conditions is provided in Exhibit A of this Final License Application.

3.1.3 Description of Warning Devices Used to Ensure Downstream Public Safety

CRP NH Gorham, LLC has developed a Public Safety Plan for the Project that illustrates the location of safety signs, sirens, barriers, and other safety devices; the Public Safety Plan also includes measures required by FERC, or installed by CRP NH Gorham, LLC on its own initiative, to warn and/or protect the public in its use of Project lands and waters.

CRP NH Gorham, LLC's Public Safety Plans for the Gorham Project is considered CEII in accordance with the Commission's regulations; thus, it is not being distributed with this FLA.

All safety-related devices and features are inspected and tested annually. During inspections, signs are checked for damage, fences are inspected for stability, and other warning devices are tested to ensure they are audible and in working order.

3.1.4 Discussion of Any Proposed Changes to the Operation of the Project or Downstream Development Affecting the Emergency Action Plan

Gorham is classified as a low hazard dam. Due to the low hazard classification of this dam there is no requirement for an EAP.

CRP NH Gorham, LLC is not proposing any changes to the operation of the Project that would affect public safety. CRP NH Gorham, LLC is not aware of any proposed downstream development that would be affected by the Project.

3.1.5 Description of Monitoring Devices and Description of Maintenance and Monitoring Programs

Headpond and tailwater elevations are monitored by electronic instrumentation and visual staff gages. Additional information regarding dam safety and monitoring is provided in the individual Safety and Surveillance Monitoring Plan (DSSMP), filed as Critical Energy Infrastructure Information (CEII) with the Commission last filed on December 21, 2021.

3.1.6 Project's Employee Safety and Public Safety Record

No lost-time accidents have occurred at the Project within the period of recordkeeping for the facility. There have been no project-related deaths or serious injuries to members

of the public within the Project Boundary during the past 10 years. No accidents attributable to Project operations have occurred within the period of recordkeeping for the facility.

3.2 Current Project Operation

A description of Project operations is provided in Exhibit A of this Final License Application.

3.3 Project History

The first part of the existing Gorham powerhouse was built in 1909. Additional parts of the Gorham Project were built from 1917 to 1923 in stages by the Twin State Gas and Electric Company. In addition, the dam was enlarged several times, in 1903, 1927-1928, and 1958-1959. The Gorham Project was acquired by PSNH in 1943 and by CRP NH Gorham, LLC in 2018. The project spillway underwent a significant repairs in 2018.

3.4 Lost Generation Due to Unscheduled Outages

Table 3.1 summarizes available unscheduled outage and lost generation data during previous years (2016-2021). This table does not include periodic brief unit outages.

Table 3.1 Project Unscheduled Outages and Lost Generation, 2016-2021

Unit	Outage Start Time	Outage End Time	Duration (Hours)	Reason for Unit Unavailability
1	3/15/2016 6:48:00 PM	3/15/2016 10:27:00 PM	3.65	Rectify circuit Breaker Failure
1	4/29/2016 2:57:00 PM	5/1/2016 6:50:00 PM	51.88	Unit stopped by dispatcher – low flow issues
2	4/30/2016 10:29:00 PM	5/1/2016 6:50:00 PM	20.35	Unit stopped by dispatcher – low flow issues
Station	8/15/2016 8:00:00 AM	8/29/2016 8:00:00 AM	14.0	Annual Inspection and relined canal with new rip rap
Station	10/11/2016 8:00:00 AM	12/23/2016 8:00:00 AM	73.0	Scheduled Electrical Upgrade
1	1/19/17 9:59	1/19/17 11:01	1.03	Made setpoint change in PLC, caused unit to trip.

Unit	Outage Start Time	Outage End Time	Duration (Hours)	Reason for Unit Unavailability
1	5/20/17 2:34	5/22/17 12:08	57.57	34 boards down on dam, river flows dropped, pond control shut down unit.
2	5/20/17 8:41	5/22/17 11:10	50.48	34 boards down on dam, river flows dropped, pond control shut down unit.
3	5/20/17 20:59	5/22/17 10:25	37.43	34 boards down on dam, river flows dropped, pond control shut down unit.
4	5/20/17 20:59	5/22/17 10:35	37.60	34 boards down on dam, river flows dropped, pond control shut down unit.
4	6/12/17 15:46	6/13/17 13:27	21.68	HPU filter housing cracked, HPU low oil pressure.
2	7/4/17 20:15	7/5/17 7:27	11.20	Loose nitrogen fitting at stilling pipe.
1	7/4/17 20:19	7/5/17 7:20	11.02	Loose nitrogen fitting at stilling pipe.
3	7/4/17 20:21	7/4/17 22:06	1.75	Loose nitrogen fitting at stilling pipe.
4	7/4/17 20:23	7/4/17 22:22	1.98	Loose nitrogen fitting at stilling pipe.
Station	7/17/17 7:30	9/20/17 16:00	1568.50	AI and GSU replacement
2	10/25/17 7:16	10/25/17 8:45	1.48	Thrust oil switch out of adjustment.
1	10/30/17 3:49	11/1/17 13:03	57.23	351 & 352 line operation.
2	10/30/17 3:49	11/1/17 12:52	57.05	351 & 352 line operation.
3	10/30/17 3:49	10/31/17 10:20	30.52	351 & 352 line operation.
4	10/30/17 3:49	10/31/17 10:33	30.73	351 & 352 line operation.
1	6/4/2021 4:32:00 PM	6/4/2021 5:15:00 PM	0.71	External grid – line outage
1 & 4	12/4/2021 1:23:00 AM	12/4/2021 9:09:00 AM	7.75	Ice buildup
1 & 2	12/9/2021 11:23:00 AM	12/11/2021 3:43:00 PM	4.3	Ice buildup

3.5 Record of Compliance

A review of the Licensee's records indicates no violations of the terms and conditions of the license. In addition, CRP NH Gorham, LLC has not received any communication from the Commission indicating possible noncompliance.

3.6 Actions Affecting the Public

CRP has strong ties with the communities in the region, as a generator of electric power and as a major employer and taxpayer in the region. The Project is important locally as a clean and reliable energy source.

CRP NH Gorham, LLC provides public access to the Project lands and waters, as discussed in Exhibit E. CRP is currently collaborating with the Town of Gorham to improve the hand-carry boat launch and associated parking area, which is further discussed in Exhibit E.

3.7 Ownership and Operating Expenses that would be Reduced if the license were transferred

This section is not applicable because there is no competing application to take over the Project and no proposal to transfer the license.

3.8 Annual fees for use of federal or Native American lands

This does not apply to the Project because there are no federal or native American lands in the Project boundaries.

4.0 REFERENCES

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