

UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Great Lakes Hydro America, LLC

Project No. 2520-076

ORDER ISSUING NEW LICENSE

(Issued February 26, 2021)

**INTRODUCTION**

1. On August 31, 2016, Great Lakes Hydro America, LLC (GLHA) filed, pursuant to sections 4(e) and 15 of the Federal Power Act (FPA),<sup>1</sup> an application for a new license to continue operating and maintaining the Mattaceunk Hydroelectric Project No. 2520 (Mattaceunk Project). The 19.2-megawatt (MW) project is located on the Penobscot River in Aroostook and Penobscot Counties, Maine.<sup>2</sup> The project does not occupy federal land.

2. As discussed below, this order issues a new license for the project.

**BACKGROUND**

3. The Federal Power Commission, predecessor to the Federal Energy Regulatory Commission, issued the original license for the Mattaceunk Project to Great Northern Paper Company on January 9, 1967, with an effective date of January 1, 1938.<sup>3</sup> The Commission issued Great Northern Paper a new license for the project on September 30, 1988, with an effective date of September 1, 1988, that expired on August 31, 2018.<sup>4</sup>

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<sup>1</sup> 16 U.S.C. §§ 797(e) and 808.

<sup>2</sup> The Penobscot River is a navigable waterway of the United States. *See Bangor Hydro-Electric Company*, 33 F.P.C. 278 (1965). Therefore, section 23(b)(1) of the FPA, 16 U.S.C. § 817(1), requires the project to be licensed.

<sup>3</sup> *Great Northern Paper Co.*, 37 F.P.C. 75 (1967).

<sup>4</sup> *Great Northern Paper Co.*, 44 FERC ¶ 62,368 (1988). The license has been transferred several times and the licensee has also changed names. In 1990, the

Since then, GLHA has operated the project under an annual license pending disposition of its application for a new license.

4. On March 24, 2017, the Commission issued a public notice that was published in the *Federal Register*, accepting the application for filing, indicating the application was ready for environmental analysis, and setting May 23, 2017, as the deadline for filing motions to intervene, protests, comments, recommendations, preliminary terms and conditions, and preliminary fishway prescriptions.<sup>5</sup> The U.S. Department of the Interior (Interior), the National Marine Fisheries Service (NMFS), the Maine Department of Environmental Protection (Maine DEP), and the Maine Department of Inland Fisheries and Wildlife (Maine DIFW) each filed a timely notice of intervention.<sup>6</sup> The Penobscot Indian Nation, Maine Rivers, and Atlantic Salmon Federation filed timely motions to intervene.<sup>7</sup> None of the intervenors oppose the project. Interior and NMFS filed comments, recommendations, and preliminary terms and conditions. Maine DMR, Maine DEP, the Maine Historical Preservation Commission, the Penobscot Indian Nation, the U.S. Bureau of Indian Affairs (BIA), Atlantic Salmon Federation, and Bruce Haines filed comments and recommendations. Maine Rivers filed comments. GLHA filed reply comments.

5. On March 15, 2018, Commission staff issued a draft environmental assessment (EA), analyzing the effects of the proposed project and alternatives to it, and setting a deadline for comments of April 30, 2018.<sup>8</sup> Interior, NMFS, Maine DMR, BIA,

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Commission approved a name change to Great Northern Nekoosa Corporation. *Great Northern Paper Co.*, 52 FERC ¶ 62,237 (1990). In 1992, the license was transferred from Great Northern Nekoosa Corporation to Great Northern Paper, Inc. *Great Northern Nekoosa Corp.*, 59 FERC ¶ 62,137 (1992). In 2000, the license was transferred from Great Northern Paper, Inc. to GNE, LLC. *Great Northern Paper, Inc.*, 91 FERC ¶ 62,123 (2000). In 2002, GNE, LLC changed its name to Great Lakes Hydro America, LLC. *GNE, LLC*, 100 FERC ¶ 62,142 (2002).

<sup>5</sup> 82 Fed. Reg. 16,189-16,190 (Apr. 3, 2017).

<sup>6</sup> Under Rule 214(a)(2) of the Commission's Rules of Practice and Procedure, Interior, NMFS, Maine DEP, and Maine DIFW became parties to the proceeding upon timely filing of their notices of intervention. 18 C.F.R. § 385.214(a)(2) (2020).

<sup>7</sup> Timely, unopposed motions to intervene are granted by operation of Rule 214(c)(1) of the Commission's Rules of Practice and Procedure. 18 C.F.R. § 385.214(c)(1).

<sup>8</sup> The Commission's Rules of Practice and Procedure provide that if a filing

Penobscot Indian Nation, and GLHA filed comments on the draft EA. Staff issued a final EA on September 25, 2018.

6. The motions to intervene, comments, recommendations, and conditions have been fully considered in determining whether, and under what conditions, to issue the license.

## **PROJECT DESCRIPTION**

### **A. Project Area**

7. The Penobscot River is formed by two major tributaries, the West Branch Penobscot River (West Branch) and the East Branch Penobscot River (East Branch), that join to form the main stem of the Penobscot River near the town of Medway, Maine. The Mattaceunk Project dam (Weldon Dam) and powerhouse are located about 7 miles downstream of the confluence of the East and West Branches. From Weldon Dam, the river then flows southeasterly for about 87 miles to the Atlantic Ocean in Penobscot Bay near Bucksport, Maine, about 20 miles south of Bangor, Maine. The Penobscot River Basin has a total drainage area of 8,525 square miles.

8. The Mattaceunk Project is located about 67 miles upstream of the head of tide in Bangor, Maine, where it is the third of six existing FERC-licensed hydroelectric projects on the West Branch and mainstem of the Penobscot River.<sup>9</sup>

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deadline falls on a Saturday, Sunday, holiday, or other day when the Commission is closed for business, the filing deadline does not end until the close of business on the next business day. 18 C.F.R. § 385.2007(a)(2) (2020). Because the 45-day filing deadline fell on a Sunday (i.e., April 29, 2018), the filing deadline was extended until the close of business on Monday, April 30, 2018.

<sup>9</sup> The six hydroelectric projects include, from downstream to upstream, Milford (FERC Project No. 2534), West Enfield (FERC Project No. 2600), and Mattaceunk, which are all on the mainstem of the Penobscot River, and Medway (FERC Project No. 3440), Penobscot Mills (FERC Project No. 2458), and Ripogenus (FERC Project No. 2572), which are all on the West Branch. No FERC-licensed hydroelectric projects are located on the East Branch.

## **B. Project Facilities**

9. The Mattaceunk impoundment is about 8.5 miles long, with a surface area of 1,664-acres and a total storage capacity of 20,981 acre-feet at a normal pool elevation of 240.0 feet United States Geological Survey (USGS) datum.<sup>10</sup>

10. Weldon Dam includes: (1) an earthen embankment at the north shoreline; (2) an intake with trash racks that have 1-inch clear bar spacing covering the top 16 feet of the water column (at normal pool) and 2.63-inch bar spacing at depths greater than 16 feet; (3) a powerhouse structure (described in more detail below); (4) an upstream pool and weir fishway (described in more detail below); (5) a log sluice; (6) a roller gate spillway; (7) an ungated overflow spillway with 4-foot-high, wooden flashboards; and (8) the right abutment. These structures have a combined length of approximately 1,060 feet and a maximum height above the riverbed of about 45 feet.

11. The powerhouse contains two Kaplan turbines (units 1 and 2) each rated at 5,479 kilowatts (kW) and two fixed-blade propeller turbines (units 3 and 4) each rated at 5,489 kW, each driving a 6,000-kilovolt-ampere (kVA), 4,800-kW vertical synchronous generator for an authorized installed capacity of 19.2 MW. Water from the powerhouse discharges directly to the river downstream. Project generators connect to a substation located adjacent to the powerhouse, then to a 9-mile-long, 34.5-kilovolt (kV) transmission line to a point of interconnection with the local utility.

12. The current upstream pool and weir fishway has 36 pools and provides a 7 cfs auxiliary attraction flow. The downstream fishway (i.e., surface bypass) consists of single surface inlets integral with the trash racks in two of the four turbine forebays (intakes for units 3 and 4), and provides a maximum flow capacity of 140 cfs for passing fish to the tailrace area.

13. Project recreation facilities include a canoe portage on the west side of the dam and a fishing access area located downstream of the dam on the east bank of the river that includes a small picnic shelter, stairs to access the tailrace for fishing, and parking.

14. A more detailed project description is contained in Ordering Paragraph (B)(2).

## **C. Project Boundary**

15. The current project boundary encloses the impoundment up to contour elevation 240.0 feet (normal pool elevation) and lands associated with the dam, generator leads, powerhouse, recreational facilities, and transmission line.

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<sup>10</sup> Unless otherwise stated, all elevations in this order are referenced to USGS datum.

#### **D. Current Project Operation**

16. The Mattaceunk Project is operated in a run-of-river mode maintaining the fluctuation of the impoundment surface elevation within 1.0 foot of the flashboard crest elevation of 240.0 feet when the flashboards are in place.<sup>11</sup> The current license requires GLHA to maintain an impoundment surface elevation no lower than 1.0 foot below the dam crest elevation of 236.0 feet when the 4-foot-high flashboards are down (for flashboard repairs). The license also requires GLHA to maintain the impoundment surface elevation no lower than 2.0 feet below the top of flashboard crest elevation of 240.0 feet when the 4-foot-high flashboards are in place to allow an adequate margin for debris loads, ice loads, or sudden pool increases that might cause flashboard failure.<sup>12</sup>

17. The project operates when inflow is between 471 cfs (minimum hydraulic capacity) and 7,438 cfs (maximum hydraulic capacity). When inflow exceeds 7,438 cfs, excess water is released through the roller gate. However, when the downstream fishway is in operation, the log sluice is opened first when releasing excess flows.

18. The current license, as amended on June 21, 1991,<sup>13</sup> also requires a year-round continuous minimum flow of 1,674 cfs or inflow, whichever is less, and a daily average minimum flow of 2,392 cfs or inflow, if less, from July 1 through September 30, and 2,000 cfs or inflow, if less, from October 1 through June 30. The minimum flows are released through the turbines and fish passage structures when in operation. When inflow is less than the minimum hydraulic capacity of the turbines, the minimum flows are released through the log sluice, roller gate, fish passages, and/or the overflow spillway.

19. GLHA operates the upstream pool and weir fishway annually from May 1 to November 10 for adult Atlantic salmon. GLHA operates the downstream surface bypass fishway from April 1 to June 15 for smolts and kelts and from October 17 to December 1 for kelts only. Turbines 3 and 4 are the first units on and the last units off whenever the downstream bypass is operating in order to reduce entrainment of smolts and kelts through turbine intakes 1 and 2, where there is no surface bypass.

20. The project's average annual generation is approximately 123,334 megawatt-hours (MWh).

#### **E. Proposed Operation and Environmental Measures**

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<sup>11</sup> The limited fluctuation within 1.0 foot of the flashboard crest elevation is not a requirement of the current license.

<sup>12</sup> See *Great Northern Paper Co.*, 50 FERC ¶ 61,163 (1990).

<sup>13</sup> See *Great Northern Nekoosa Corp.*, 55 FERC ¶ 61,472 (1991).

21. To protect aquatic resources in the impoundment and downstream, GLHA proposes to continue to operate the project in run-of-river mode with year-round use of 4-foot-high flashboards, and maintain the impoundment surface elevation: (1) within 1.0 foot of the flashboard crest elevation (240.0 feet) when the flashboards are in place; (2) no lower than 2.0 feet below the flashboard crest elevation when needed for maintenance and to allow an adequate margin for wave action, debris loads, ice loads, or sudden pool increases that might cause flashboard failure when the flashboards are in place; and (3) no lower than 1.0 foot below the dam crest elevation of 236.0 feet when the flashboards are not in place.

22. To protect aquatic habitat downstream, GLHA proposes to continue to provide a year-round continuous minimum flow of 1,674 cfs, or inflow, whichever is less, downstream from the project, and continue to provide a daily average minimum flow of 2,392 cfs from July 1 through September 30 and 2,000 cfs from October 1 through June 30, or average inflow, whichever is less.

23. To monitor compliance with the operating requirements in any license issued, GLHA proposes to implement an Operations Monitoring Plan that includes provisions for: (1) monitoring impoundment water levels and minimum flows using the project's existing monitoring and operation system;<sup>14</sup> (2) documenting compliance with project operation by recording impoundment water level and project outflow data at least every 15 minutes, archiving the data, and providing the data to the Commission, and resource agencies upon request; (3) using "water-to-wire" efficiency testing to verify the accuracy of the existing curves used to estimate outflow from turbine units 2 and 3;<sup>15</sup> (4) conducting verification testing within 2 years of installing the proposed full-depth trash racks with 1-inch clear bar spacing, and again within 25 years of the effective date of any new license issued; and (5) reporting deviations from proposed impoundment

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<sup>14</sup> The existing system includes a pressure-sensitive water level sensor at the dam that provides real-time monitoring of impoundment water levels. Outflow from the turbines is calculated automatically from generation readings using conversion curves (i.e., kilowatts of generation versus flow). Outflow through the other project components (i.e., log sluice, roller gate, spillway, fish passages) is determined by reading and recording gate settings and impoundment water level and calculating flow based on engineering curves for each component. Project outflow and impoundment water level is recorded electronically at least every 15 minutes and is archived. *See* GLHA's September 14, 2018 proposed Operations Monitoring Plan.

<sup>15</sup> "Water-to-wire" refers to the relationship between turbine input and generator output. The existing curves are based on water-to-wire efficiency testing conducted in 1984 (turbine unit 2) and 2005 (turbine unit 3). GLHA proposes efficiency testing on units 2 and 3, because units 1 and 2 are identical Kaplan turbines and units 3 and 4 are identical fixed-blade propeller turbines.

water levels and minimum flows to the resource agencies within 24 hours and to the Commission within 10 days.

24. To provide upstream passage for American eels, GLHA proposes to install and maintain, on a seasonal basis, an upstream eel fishway within 2 years of the effective date of the new license.
25. To determine whether the proposed upstream eel fishway is effective, GLHA proposes to monitor it for use and effectiveness for one passage season.
26. To provide downstream passage for eels, GLHA proposes to implement an interim downstream passage schedule whereby GLHA would provide annual nighttime turbine shutdowns (8:00 p.m. to 4:00 a.m.), for up to a 6-week period between August 15 and October 31,<sup>16</sup> in combination with opening the project's roller gate beginning the first passage season following license issuance, and would install full-depth trash racks with 1-inch clear bar spacing within 2 years of license issuance.<sup>17</sup> GLHA also proposes to develop a permanent annual schedule based on a predictive model for eel movement.
27. To determine whether the proposed downstream passage measures for eels are effective, GLHA proposes to monitor, for two passage seasons, the effectiveness of the downstream eel passage measures.<sup>18</sup>
28. To provide upstream passage for American shad, blueback herring, and alewife (collectively, alosines), GLHA proposes to install, in year 15 of a new license, a new upstream fishway to be operational in year 16 of a new license.
29. To determine whether the proposed upstream fishway for alosines is effective, GLHA proposes to monitor the use and effectiveness of the upstream fishway for alosines for 2 years following its completion.

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<sup>16</sup> The interim night-time shutdown would be implemented as early as the first significant rain event (defined as greater than 1 inch of precipitation) occurring on, or after, August 15. The nighttime shutdown period would start no later than September 15 in years that a significant rain event does not occur during the August 15 to September 15 time period. *See* GLHA's July 7, 2017 filing, Attachment 1 at 40.

<sup>17</sup> *See* Species Protection Plan for Atlantic salmon in the August 31, 2016 Final License Application at Volume V.

<sup>18</sup> GLHA's proposal to monitor the downstream eel passage measures for 2 years constitutes the monitoring effort that would be undertaken to support development of a predictive model for establishing the aforementioned nighttime turbine shutdown period. *See* Final EA at 18.

30. To provide downstream passage for alosines after the upstream fishway for alosines is operational, GLHA proposes to operate the existing downstream fish bypass and release from the log sluice between 3 percent (225 cfs) and 9 percent (690 cfs) of the project's hydraulic capacity from June 1 to November 30, based on monitoring results.
31. To verify that the proposed downstream passage measures for alosines are effective, GLHA proposes to conduct effectiveness monitoring for 2 years once the upstream fishway for alosines is operational.
32. If the proposed passage measures described above are ineffective, GLHA proposes to implement additional operational and structural modifications and/or habitat enhancement measures.
33. To ensure that fish passage facilities are operating effectively, GLHA proposes to continue to implement the Fish Passage Operations and Maintenance Plan (Fish Passage O&M Plan), which defines the: (1) operational period for the existing upstream and downstream fishways; (2) annual start-up procedures; (3) debris management; and (4) safety procedures.
34. To provide upstream passage for adult Atlantic salmon, GLHA proposes to continue to operate the existing upstream fishway annually from May 1 to November 10, including the 7-cfs attraction flow at the fishway entrance.<sup>19</sup>
35. To provide an estimate of the number of adult Atlantic salmon that return to spawn upstream of the project, GLHA proposes to count the number of adult Atlantic salmon using a methodology developed in consultation with resource agencies.
36. To provide downstream passage for Atlantic salmon smolts and kelts, GLHA proposes to operate the downstream surface bypass from April 1 to June 15 for smolts and kelts, and from October 17 to December 1 for kelts only.
37. To protect the federally endangered Atlantic salmon, GLHA proposes to implement a Species Protection Plan that includes the following measures: (1) stocking marked smolts upstream of Weldon Dam in the first 3 years after relicensing to serve as a source of upper-Penobscot imprinted<sup>20</sup> adult salmon used for studying upstream passage

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<sup>19</sup> GLHA proposes to continue operating the existing upstream fishway throughout the duration of any new license, including after construction and operation of the proposed upstream fishway for alosines.

<sup>20</sup> Salmon are able to locate their natal habitat (and future spawning habitat), because they learn as juveniles and remember as adults the chemical cues (e.g., odors) of the habitat they experienced as juveniles. This learning at specific stages in development

of adults and downstream passage of kelts; (2) conducting up to 3 years of upstream fishway effectiveness monitoring for adults and up to 3 years of downstream monitoring for kelts, using the returning, imprinted, adult salmon; (3) within 2 years after relicensing, using trash racks with 1-inch clear bar spacing to the full depth of the turbine intakes during the downstream migration seasons of eels, alosines, and Atlantic salmon; (4) opening the project's log sluice (between 3 percent [225 cfs] and 9 percent [690 cfs] of hydraulic capacity) starting the first passage season following relicensing to provide additional downstream passage for smolts for a 3-week period during the spring;<sup>21</sup> (5) conducting a minimum of 3 years of monitoring to evaluate the effectiveness of existing passage operations and additional measures (installation of the full-depth trash rack with 1-inch clear bar spacing and operation of the log sluice) in passing smolts downstream past the dam;<sup>22</sup> (6) reevaluating upstream and downstream passage effectiveness for Atlantic salmon every 10 years; (7) conducting a study to evaluate smolt mortality in the project impoundment; and (8) implementing adaptive management measures that could include additional operational, structural, and/or habitat enhancement measures, if necessary, to improve passage and/or address performance criteria for upstream and downstream migrating Atlantic salmon.<sup>23</sup>

38. Continue to operate and maintain project recreation facilities.

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and remembering without reinforcement is called imprinting. Imprinted adult salmon would be motivated to migrate to habitats upstream of Weldon Dam and, thus, are needed to study upstream passage effectiveness.

<sup>21</sup> In a letter filed on January 25, 2017, GLHA indicated that the 3-week period would be determined in consultation with the resource agencies.

<sup>22</sup> In the final license application, GLHA stated that it would conduct at least 3 years of monitoring to evaluate the effectiveness of the downstream passage for smolts. However, in response to stakeholder comments, GLHA stated in its July 7, 2017 filing that it would conduct a minimum of 3 years of monitoring, and monitoring would conclude when the performance standard for downstream smolt survival is met for a total of 3 years.

<sup>23</sup> GLHA's proposed Species Protection Plan includes two adaptive management measures to: (1) address performance criteria for downstream passage, should the proposed measures be inadequate; and (2) implement additional operational and structural modifications and/or habitat enhancement measures, if necessary, to improve passage for outmigrating Atlantic salmon smolts and kelts and upstream migrating Atlantic salmon adults. Because of the similarity in these two measures, staff combined them into this single adaptive management measure that captures the intent of the two measures proposed by GLHA.

39. To enhance recreational opportunities, GLHA proposes recreation facility improvements at the existing downstream angler access area within 3 years of license issuance that include installing a pulley system to assist boaters with moving car top boats and other small watercraft up and down the stairs and a ramp adjacent to the existing picnic shelter to provide wheelchair access.

40. To protect archaeological and historic architectural resources, GLHA proposes to develop a Historic Properties Management Plan (HPMP).

### **SUMMARY OF LICENSE REQUIREMENTS**

41. The license, which authorizes 19.2 MW of renewable energy generation capacity, requires most of the proposed measures listed above except: (1) GLHA's proposal for nighttime turbine shutdowns to provide passage for eels; and (2) monitoring downstream eel passage for two seasons. It also includes the staff-recommended measures and modifications described below, as well as the conditions required by Maine DEP's water quality certification (Appendix A), Interior and NMFS's section 18 fishway prescriptions (Appendices B and C, respectively), and the incidental take terms and conditions of the biological opinion submitted by NMFS under section 7 of the Endangered Species Act (Appendix D). Combined, these measures will protect water quality, fisheries, wildlife, recreation, and cultural resources at the project.

42. To document that the project is operating according to the license's impoundment water level and downstream minimum flow requirements, the license requires GLHA to modify its proposed Operation Monitoring Plan to include: (1) the methods to be used for estimating outflows from the fishways; (2) procedures for maintaining and calibrating the water level sensor; (3) clarification on the turbine units to be used when conducting tests to verify the accuracy of the existing curves used to monitor flows that pass through the turbines; (4) a provision for filing the existing water-to-wire efficiency testing reports for turbine units 2 and 3 with the Commission;<sup>24</sup> (5) a schedule for conducting the first

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<sup>24</sup> In the proposed Operations Monitoring Plan, GLHA included references to, but did not attach, the following three reports that provide existing information on the water-to-wire efficiency testing conducted on turbine units 2 and 3:

Alden Research Laboratories (ARL). 1984. Performance Tests – Weldon Hydroelectric Station. February 1984.

Alden Research Laboratories (ARL). 2006. Field Performance Testing of a Fixed Blade and Kaplan Turbine. March 2006.

General Electric Hydro (GE). 2005. Technical Report on Commissioning – Mechanical Tests. September 2005.

verification testing event that would occur no more than 2 years after installation of the full-depth trash racks with 1-inch clear bar spacing; (6) methods and a schedule for verifying the accuracy of outflow estimates through the log sluice, roller gate, spillway, and fish passages; (7) methods and a schedule for verifying the accuracy of outflow estimates using in-stream field measurements during the first verification testing event; (8) methods and a schedule for recalibrating the existing curves if verification testing indicates existing curves are inaccurate; and (9) documentation of the head at which all verification testing will be conducted.

43. To ensure that the upstream and downstream eel passage effectiveness monitoring plans required by Interior's fishway prescription are designed to accurately assess upstream passage effectiveness and downstream passage survival of eels, the license requires that the plans to be developed by GLHA and required by Interior's fishway prescription, include: (1) a goals and objectives section; (2) passage performance criteria; (3) a proposed methodology for monitoring passage effectiveness and efficiency; (4) provisions for reporting the results of the monitoring and consultation with the agencies on the results to identify any recommendations for (a) additional monitoring, or (b) operational and structural modifications, and/or habitat enhancement measures to provide safe and effective eel passage.

44. To ensure the existing fishways are operating properly, the license requires GLHA to modify the proposed Fish Passage O&M Plan to include: (1) clearing debris from the trash racks of all turbine intakes; (2) monitoring flows in the downstream bypass pipe to detect debris blockages; (3) clearing blockages in the downstream bypass pipe; (4) performing fishway maintenance before the migration season; (5) procedures for shutting down fishways and for operation and maintenance during emergencies; (6) operating the upstream eel fishway for a one-season "shakedown" period;<sup>25</sup> (7) providing an annual report that documents periods of fishway operation, maintenance, and shutdown; and (8) reviewing the Fish Passage O&M Plan each year with the resource agencies.

45. To adequately assess the effectiveness of the existing upstream and downstream fishways for Atlantic salmon and to meet the 95 percent upstream and 96 percent downstream passage performance standards specified in NMFS's incidental take statement, the license requires GLHA to modify the proposed Species Protection Plan for Atlantic salmon to include: (1) a determination on when to begin phased spill measures for downstream passage of smolts; (2) a determination as to the 3-week period during which log sluice or phased spill measures would occur for downstream passage of smolts; (3) removing the provision to stock uniquely marked smolts upstream of Weldon Dam in the first 3 years to serve as a source of imprinted adult salmon used for studying upstream

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<sup>25</sup> A "shakedown" is a period of testing and trial operation used to assess proper operation of fish passage facilities in accordance with their design.

passage of adults and downstream passage of kelts; and (4) removing provisions requiring reevaluation of upstream and downstream passage effectiveness every 10 years.

46. To protect the federally threatened northern long-eared bat, the license requires GLHA to limit removal of non-hazardous trees to the period of November 1 through March 31, which is outside the pup season (June 1 to July 31), and the broader active season (April 1 to October 31).

## WATER QUALITY CERTIFICATION

47. Under section 401(a)(1) of the Clean Water Act (CWA),<sup>26</sup> the Commission may not issue a license authorizing the construction or operation of a hydroelectric project unless the state water quality certifying agency either has issued water quality certification for the project or has waived certification by failing to act on a request for certification within a reasonable period of time, not to exceed one year. Section 401(d) of the CWA provides that the certification shall become a condition of any federal license that authorizes construction or operation of the project.<sup>27</sup>

48. On May 22, 2017, GLHA applied to Maine DEP for section 401 certification for the Mattaceunk Project. Maine DEP received the application on the same day. On April 27, 2018, GLHA withdrew and refiled its certification application, which Maine DEP received on the same day. On March 27, 2019, GLHA withdrew and refiled its certification application, which Maine DEP received on the same day. Maine DEP issued a certification for the project on March 25, 2020. On April 20, 2020, GLHA petitioned Maine DEP for a corrected certification.<sup>28</sup> Additionally, on April 23, 2020, GLHA appealed the water quality certification.<sup>29</sup> GLHA's appeal included an intent to file a request for minor revision of the certification, which GLHA concluded was needed to provide Maine DEP with the procedural ability to address all of the comments and requests included in GLHA's April 20, 2020 petition.<sup>30</sup> On May 13, 2020, GLHA filed a

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<sup>26</sup> 33 U.S.C. § 1341(a)(1).

<sup>27</sup> *Id.* § 1341(d).

<sup>28</sup> GLHA filed the April 20, 2020 petition as an attachment to its May 13, 2020 request for minor revision of the certification.

<sup>29</sup> *See* note 1 of the April 23, 2020 appeal, which was filed with the Commission on April 29, 2020.

<sup>30</sup> *See* note 7 of the April 23, 2020 appeal, which was filed with the Commission on April 29, 2020.

request for minor revision of the certification with Maine DEP.<sup>31</sup> On June 25, 2020, Maine DEP issued a revised certification with minor revisions and corrections.<sup>32</sup> On August 18, 2020, GLHA withdrew its appeal of the certification.

49. The June 25, 2020 certification for the project includes 9 conditions. Five of the conditions (conditions D, F, G, H, and I) are general or administrative in nature and are not discussed further.

50. Condition A requires GLHA to: (1) maintain project impoundment elevations, as proposed by GLHA and (2) update GLHA's proposed Operations Monitoring Plan by describing how the proposed minimum flows and impoundment levels would be provided and monitored.

51. Condition B requires GLHA to release minimum flows downstream of the project, as proposed by GLHA.<sup>33</sup>

52. Condition C requires GLHA to implement upstream and downstream passage measures for eels, alosines, and Atlantic salmon.

53. Condition E requires GLHA to operate and maintain recreational facilities and implement recreation facility improvements, as proposed by GLHA.

54. The certification conditions are set forth in Appendix A of this order and incorporated into the license by ordering paragraph (D).

55. As discussed below, in the final EA, staff did not recommend some of the measures included in certification condition C. Nevertheless, all conditions are included in the license because they are mandatory under section 401 of the CWA.

## **COASTAL ZONE MANAGEMENT ACT**

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<sup>31</sup> On May 13, 2020, GLHA also filed the request for minor revision of the certification with the Commission.

<sup>32</sup> Maine DEP filed the certification with the Commission on July 2, 2020.

<sup>33</sup> Certification condition B states that GLHA must release a daily average minimum flow of 2,393 cfs from July 1 through September 30, which is 1 cfs greater than the daily average minimum flow of 2,392 cfs that GLHA proposed and staff recommended in the final EA. On page 40 of the certification, Maine DEP also indicates that it supports continued project operation, which includes releasing a daily average minimum flow of 2,392 cfs from July 1 through September 30. Therefore, we conclude that 2,393 cfs included in condition B was written in error and should be 2,392 cfs.

56. Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA),<sup>34</sup> the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license 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 six months of its receipt of the applicant's certification. By email dated October 29, 2012,<sup>35</sup> the Maine Department of Agriculture, Conservation and Forestry stated that the project is not located within the state-designated coastal zone and does not require a consistency certification.

## **SECTION 18 FISHWAY PRESCRIPTION**

57. Section 18 of the FPA<sup>36</sup> provides that the Commission shall require the construction, maintenance, and operation by a licensee of such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate.

58. On May 23, 2017, Interior, on behalf of FWS, filed a preliminary fishway prescription. On June 27, 2018, Interior filed a final fishway prescription. Interior's fishway prescription requires GLHA to:

- (1) Design, construct, and operate (from June through August) upstream fish passage for eels, where 90 percent of the eels that enter the upstream passage facility pass within 24 hours (prescriptions 12.2.1, 12.2.2, 12.3, and 12.5.1):
- (2) Operate the project to provide seasonal downstream passage for eels, where 76 percent of the adult eels moving downstream survive passage (prescriptions 12.2.2, 12.4, and 12.5.1,);
- (3) Install full-depth trash racks with 1-inch clear bar spacing during downstream eel passage operations (prescription 12.4);
- (4) Develop a Fishway Operation and Maintenance Plan (Eel Passage Operations Plan) (prescription 12.5.2);
- (5) Develop an Upstream Fishway Effectiveness Monitoring Plan (Upstream Eel Monitoring Plan) (prescription 12.6.1);

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<sup>34</sup> 16 U.S.C. § 1456(c)(3)(A).

<sup>35</sup> See August 31, 2016 Final License Application at Appendix E-1.

<sup>36</sup> 16 U.S.C. § 811.

- (6) Develop a Downstream Passage Effectiveness Monitoring Plan (Downstream Eel Monitoring Plan) (prescription 12.6.2);
- (7) Provide FWS personnel, and FWS-designated representatives, timely access to the fish passage facilities at the project to document compliance with the fishway prescription (prescription 12.7); and
- (8) Provide information on fish passage operations and generation upon written request from FWS (prescription 12.5.2).

59. On May 23, 2017, NMFS, on behalf of the U.S. Department of Commerce, filed a preliminary fishway prescription, which it modified on June 28, 2018. NMFS's fishway prescription requires GLHA to:

- (1) Install full-depth trash racks with 1-inch clear bar spacing and measure approach velocities in front of the trash racks (prescription 7.3.2);
- (2) Design and install new fishways in consultation with resource agencies (prescription 7.3.5);
- (3) Monitor fishway effectiveness by: (1) developing study design plans in consultation with resource agencies; (2) beginning monitoring at the start of the second migratory season after each fishway facility is operational; and (3) conducting fishway "shakedowns" in the first season after fishways are constructed (prescription 7.3.4);
- (4) Monitor upstream and downstream eel passage (prescription 7.3.4);
- (5) Construct, operate, maintain, and monitor upstream fish passage for alosines (prescriptions 7.3.1, 7.3.3, and 7.3.4);
- (6) Operate, maintain, and monitor downstream fish passage for alosines (prescriptions 7.3.2, 7.3.3, and 7.3.4);
- (7) Implement additional operational and structural modifications of fishways or habitat enhancements, if necessary, for upstream and downstream migrating Atlantic salmon and alosines (prescriptions 7.3.1 and 7.3.2);
- (8) Operate, maintain, and monitor upstream and downstream fish passage for Atlantic salmon (prescriptions 7.3.1, 7.3.2, 7.3.3, and 7.3.4); and
- (9) Implement an adaptive management plan and additional operational, structural, and/or habitat enhancement measures, if necessary, to improve passage and/or address performance criteria for upstream and downstream migrating Atlantic salmon (prescription 7.3.2).

60. Interior's and NMFS's fishway prescriptions are attached to this order as Appendices B and C, respectively, and are made requirements of the license by Ordering Paragraph (E).

61. By letters filed on May 23, 2017, Interior and NMFS each requested that the Commission reserve authority to prescribe fishways. Consistent with Commission policy, Article 410 of the license reserves the Commission's authority to require fishways that may be prescribed by Interior or NMFS for the Mattaceunk Project.

62. As discussed below, in the final EA, Commission staff did not recommend some of the fishway prescriptions.

### **THREATENED AND ENDANGERED SPECIES**

63. Section 7(a)(2) of the Endangered Species Act of 1973 (ESA)<sup>37</sup> requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species or result in the destruction or adverse modification of their designated critical habitat.

64. In the final EA, staff analyzed the effects of the project on three federally listed species known to occur, or that potentially occur, in the vicinity of the project: Gulf of Maine Distinct Population Segment (Gulf of Maine DPS) of Atlantic salmon (*Salmo salar*); Canada lynx (*Lynx canadensis*); and northern long-eared bat (*Myotis septentrionalis*). Critical habitat for Atlantic salmon occurs at the project. No critical habitat for Canada lynx occurs at the project boundary, and there is no designated critical habitat for the northern long-eared bat. The project, however, is located within the white-nose syndrome buffer zone for the northern long-eared bat.

#### **A. Atlantic Salmon Gulf of Maine Distinct Population Segment and Atlantic Salmon Critical Habitat**

65. In the draft EA,<sup>38</sup> staff concluded that relicensing the project is likely to adversely affect the Gulf of Maine DPS of Atlantic salmon because continued project operation would result in the mortality of some smolts as they pass downstream of the project. Staff also determined that relicensing the project with GLHA's proposed Species Protection Plan for Atlantic salmon, with modifications, may affect, but is not likely to adversely affect, the designated critical habitat for the Gulf of Maine DPS of Atlantic salmon. On March 15, 2018, staff requested formal consultation with NMFS. In its letter filed on April 12, 2018, NMFS requested additional information regarding the federal

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<sup>37</sup> 16 U.S.C. § 1536(a).

<sup>38</sup> Draft EA at 183.

action in order to initiate consultation. Staff provided additional information in a letter issued August 8, 2018, and in the final EA issued on September 25, 2018. Commission staff also hosted a technical meeting on November 28, 2018, to discuss the federal action and NMFS's preference to include, as a condition of the license, a requirement for GLHA to conduct studies to evaluate smolt mortality in the project impoundment.<sup>39</sup> On March 25, 2019, NMFS filed a letter again requesting that Commission staff include a recommendation for a license condition requiring GLHA to conduct studies to evaluate smolt mortality in the project impoundment. In a letter issued on April 18, 2019, Commission staff again found the measure to be unwarranted because the record of existing information did not change and therefore staff had no basis for changing the recommendation made in the final EA.

66. On May 28, 2019, NMFS filed a letter indicating that it had received all necessary information on April 18, 2019, to commence formal consultation. On August 19, 2019, NMFS filed a request for a 60-day extension of time (from August 31, 2019, to October 30, 2019) to submit a biological opinion, and, on August 22, 2019, staff issued a letter concurring with the extension of time request. On November 22, 2019, NMFS filed a request for an additional 51 days to submit a biological opinion, and, on November 26, 2019, staff issued a letter concurring with the extension of time request.

67. On August 6, 2020, NMFS issued a biological opinion with its determination that the project may adversely affect but is not likely to jeopardize the continued existence of the Gulf of Maine DPS of Atlantic salmon. NMFS also concurred that the project is not likely to destroy or adversely modify critical habitat designated for the Gulf of Maine DPS. NMFS's biological opinion includes an incidental take statement with five reasonable and prudent measures to minimize take of listed Atlantic salmon. The incidental take statement also includes two terms and conditions to implement reasonable and prudent measure 1, eleven terms and conditions to implement reasonable and prudent measure 2, two terms and conditions to implement reasonable and prudent measure 3, and one term and condition to implement reasonable and prudent measures 4 and 5.<sup>40</sup> The reasonable and prudent measures and terms and conditions are included in Appendix D and are made part of the license by Ordering Paragraph (G).

68. NMFS's biological opinion includes a "discretionary" conservation recommendation to require GLHA to carry out activities that "improve the environmental

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<sup>39</sup> As discussed below, in the final EA, Commission staff did not recommend that GLHA conduct post-license studies to evaluate smolt mortality in the project impoundment.

<sup>40</sup> The incidental take statement is organized such that there is one term and condition that jointly applies to the implementation of reasonable and prudent measure 4 and reasonable and prudent measure 5.

baseline” in the action area or in the larger Penobscot Bay Salmon Habitat Recovery Unit. Because the measure is discretionary, we evaluate it under section 10(a)(1) of the FPA, as discussed below.

### **B. Canada Lynx**

69. Canada lynx from the eastern part of their range (Maine) prefer areas of open, early successional vegetation where their prey (snowshoe hares) are located. This type of habitat is more common in the western and northern sections of Maine and is not common in the project area. Since this habitat is sparse in the project area, it is unlikely the snowshoe hare and lynx would be present, or that the project would have any impact on this species.<sup>41</sup> Therefore, we conclude that relicensing the Mattaceunk Project will have no effect on the Canada lynx and no further action is required for the species under ESA.

### **C. Northern Long-Eared Bat**

70. Suitable habitat for the northern long-eared bat may exist within the project boundary. While no new construction is proposed,<sup>42</sup> project-related maintenance activities (i.e., recreation site and transmission line right-of-way vegetation management) may affect suitable summer roosting habitat for this species over the term of the license. Any incidental take that may result from these activities is not prohibited under the final 4(d) rule for the northern long-eared bat,<sup>43</sup> unless tree removal occurs near a known hibernaculum or entails removing occupied maternity roost trees or any trees within 150 feet of an occupied roost tree.

71. Given that tree removal could occur over the duration of the license, staff recommended that GLHA develop a Species Protection Plan for the federally threatened northern long-eared bat that would limit the time of year of non-hazardous tree removal.<sup>44</sup> However, because the specific seasonal limits on non-hazardous tree removal

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<sup>41</sup> Final EA at 198.

<sup>42</sup> *Id.* at 264-265.

<sup>43</sup> FWS. 2016. *Endangered and Threatened Wildlife and Plants; 4(d) Rule for the Northern Long-Eared Bat*. 81 Fed. Reg. 1900-1922 (Jan. 14, 2016).

<sup>44</sup> FWS defines “tree removal” as cutting down, harvesting, destroying, trimming, or manipulating in any other way the trees, saplings, snags, or any other form of woody vegetation likely to be used by northern long-eared bat. Hazardous trees are trees that are removed for the protection of human life and property. Removal of hazardous trees is not prohibited under the 4(d) rule. 81 Fed. Reg. 1901-1902 (Jan. 14, 2016).

are well defined in the final EA,<sup>45</sup> implementing those limits would minimize any adverse effects of project maintenance activities on the northern long-eared bat without necessitating the development of a Species Protection Plan. Therefore, Article 409 requires GLHA to limit the removal of trees, greater than or equal to 3 inches diameter, to the period of November 1 through March 31, which is outside the pup season (June 1 to July 31) and the broader active season (April 1 to October 31) in order to minimize adverse effects on the federally threatened northern long-eared bat.

72. On September 25, 2018, staff issued a letter to FWS requesting streamlined consultation under the 4(d) rule and requested FWS's concurrence with staff's determination. On October 22, 2018, the FWS responded to staff's request by offering comments, but did not concur with staff's determination that relicensing the project may affect the northern long-eared bat. FWS indicated that staff's initial request did not include a value for either forest conversion or timbering. To address FWS's comments, and better define the proposed action, staff updated its request, in a letter dated April 19, 2019, using the optional streamlined consultation framework, and designating the minimum acreage (0.1 acres) of forest conversion. FWS did not file a response to staff's April 19, 2019 letter. According to the streamlined consultation framework, because no response was received from FWS, staff's determination satisfies the Commission's responsibilities under the ESA for northern long-eared bat. Therefore, no further action under the ESA is required for this species.

## **ESSENTIAL FISH HABITAT**

73. Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act<sup>46</sup> requires federal agencies to consult with the Secretary of Commerce regarding any action or proposed action authorized, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat (EFH) identified under the Act. Under section 305(b)(4)(A) of the Magnuson Stevens Act, NMFS is required to provide EFH Conservation Recommendations for actions that would adversely affect EFH.<sup>47</sup> Under section 305(b)(4)(B) of the Act,<sup>48</sup> an agency must, within 30 days after receiving recommended conservation measures from NMFS or a Regional Fishery Management

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<sup>45</sup> Final EA at 199.

<sup>46</sup> 16 U.S.C. § 1855(b)(2).

<sup>47</sup> *Id.* § 1855(b)(4)(A).

<sup>48</sup> *Id.* § 1855(b)(4)(B).

Council, describe the measures proposed by the agency for avoiding, mitigating, or offsetting the effects of the agency's activity on EFH.<sup>49</sup>

74. EFH for Atlantic salmon is present at the project. Atlantic salmon use that habitat for migration and for spawning and rearing downstream from the dam. In the final EA,<sup>50</sup> Commission staff concluded that licensing the project as proposed by GLHA and with staff's recommended measures, would not adversely affect Atlantic salmon EFH habitat in the Penobscot River because the project would be operated in run-of-river mode, GLHA would release year-round minimum flows, and GLHA would provide passage for Atlantic salmon to access EFH at and near the project. Therefore, no EFH consultation with NMFS is required.

### **NATIONAL HISTORIC PRESERVATION ACT**

75. Under section 106 of the National Historic Preservation Act (NHPA)<sup>51</sup> and its implementing regulations,<sup>52</sup> federal agencies must take into account the effect of any proposed undertaking on properties listed or eligible for listing in the National Register of Historic Places, defined as historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking. This generally requires the Commission to consult with the State Historic Preservation Officer (SHPO) to determine whether and how a proposed action may affect historic properties, and to seek ways to avoid or minimize any adverse effects.

76. To satisfy its responsibilities under section 106 of the NHPA, the Commission executed a Programmatic Agreement (PA) on October 10, 2018, with the Maine SHPO. GLHA and The Penobscot Indian Nation concurred with the stipulations in the PA.<sup>53</sup> The PA requires GLHA to prepare an HPMP for the project, and upon Commission approval, implement the HPMP for the term of the new license. Execution of the PA demonstrates the Commission's compliance with section 106 of the NHPA. Article 411

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<sup>49</sup> The measures recommended by the Secretary of Commerce are advisory, not prescriptive. However, if the federal agency does not agree with the recommendations of the Secretary of Commerce, the agency must explain its reasons for not following the recommendations.

<sup>50</sup> Final EA at 8-9 and 156.

<sup>51</sup> 54 U.S.C. § 306108.

<sup>52</sup> 36 C.F.R. Part 800.

<sup>53</sup> October 31, 2018 letter from Frank H. Dunlap, GLHA; October 3, 2018 letter from Chief Kirk E. Francis, Penobscot Indian Nation.

requires the licensee to implement the PA and to file its HPMP for approval with the Commission within one year of license issuance.

### **RECOMMENDATIONS OF FEDERAL AND STATE FISH AND WILDLIFE AGENCIES PURSUANT TO SECTION 10(j) OF THE FPA**

77. Section 10(j)(1) of the FPA<sup>54</sup> requires the Commission, when issuing a license, to include conditions based on recommendations submitted by federal and state fish and wildlife agencies pursuant to the Fish and Wildlife Coordination Act<sup>55</sup> to “adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including related spawning grounds and habitat)” affected by the project.

78. In response to the March 24, 2017 public notice that the project was ready for environmental analysis, Maine DMR, NMFS, and Interior filed a total of 45 recommendations pursuant to section 10(j).<sup>56</sup> Twenty-two of the 45 recommendations (four by NMFS and 18 by Maine DMR) are outside the scope of section 10(j) because they are not specific fish and wildlife measures, are related to uncertain future actions, or are conditioned on future events that might not occur. Thirteen of the 22 recommendations are required by mandatory conditions and are not discussed further. Nine of the 22 recommendations outside the scope of section 10(j), are considered under the broad public-interest standard of section 10(a)(1) of the FPA in the next section.

79. The license includes conditions consistent with 21 of the 23 remaining recommendations that are within the scope of section 10(j), including:

- (1) Interior, NMFS, and Maine DMR’s recommendation to operate the project in run-of-river mode, with impoundment fluctuation limits (Article 403, Maine DEP condition A);
- (2) NMFS and Maine DMR’s recommendation to discharge: (a) a continuous minimum outflow of 1,674 cfs, or inflow, whichever is less, throughout the year; and (b) a daily average minimum outflow of 2,392 cfs from July 1

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<sup>54</sup> 16 U.S.C. § 803(j)(1).

<sup>55</sup> 16 U.S.C. §§ 661 *et seq.*

<sup>56</sup> Maine DMR filed 38 10(j) recommendations on May 22, 2017; NMFS filed seven 10(j) recommendations on May 23, 2017, and two additional 10(j) recommendations on June 28, 2018; and Interior filed one 10(j) recommendation on May 23, 2017. When the same recommendation is made by more than one agency, it is counted only once in the total number of 45 distinct recommendations.

through September 30 and 2,000 cfs from October 1 through June 30 (Article 403, Maine DEP condition B);

- (3) NMFS's recommendation to develop plans to monitor impoundment water levels (Article 402);
- (4) Maine DMR's recommendation to install and maintain, seasonally, an upstream eel fishway within 2 years of the effective date of the new license (Interior prescription 12.1);
- (5) Maine DMR's recommendation to operate the upstream eel fishway from June 1 to September 15 each year (Interior prescription 12.5.1);
- (6) Maine DMR's recommendation to monitor the upstream eel fishway for use and effectiveness for one passage season (NMFS prescription 7.3.4);
- (7) Maine DMR's recommendation to conduct a 3-year radio-telemetry study to develop an adequate predictive model of downstream migrating eels at the Mattaceunk Project (Article 405);
- (8) Maine DMR's recommendation to provide downstream passage for eels for 12 weeks from August 1 through October 31 each year (Interior prescription 12.4);
- (9) Maine DMR's recommendation to install full-depth trash racks with 1-inch clear bar spacing during the downstream migrating eels, alosines, and Atlantic salmon (Interior prescription 12.4, NMFS prescription 7.3.2);
- (10) Maine DMR's recommendation to conduct routine fishway maintenance before the migration season of migratory species (Article 406, Maine DEP condition C);
- (11) Maine DMR's recommendation to keep all fishways in proper working order and maintained free of debris to prevent passage delay (Article 406, Maine DEP condition C);
- (12) Maine DMR's recommendation to draft fishway operating procedures that include schedules of routine maintenance, routine operation, monitoring and reporting on the operation of each fishway, procedures and schedules for annual fishway start-up and shutdown, and fishway operating procedures during emergencies and project outages (Article 406, Maine DEP condition C);
- (13) Maine DMR's recommendation to continue to maintain and operate the upstream fishway annually from May 1 to November 10 for adult Atlantic

salmon (Article 407, Maine DEP condition C, NMFS prescription 7.3.1 and 7.3.3);

- (14) Maine DMR's recommendation to continue to provide auxiliary attraction flow to the existing upstream fishway entrance of 7 cfs (Maine DEP condition C);
- (15) Maine DMR's recommendation to continue to operate and maintain the downstream fish bypass to provide downstream passage for Atlantic salmon smolts from April 1 to June 15 and Atlantic salmon kelts from October 17 to December 1 (Article 407, Maine DEP condition C, NMFS prescription 7.3.3);
- (16) Maine DMR's recommendation to conduct up to 3 years of upstream fishway effectiveness monitoring for adults and up to 3 years of downstream passage monitoring for kelts (Article 407, Maine DEP condition C, NMFS prescription 7.3.1 and 7.3.2);
- (17) Maine DMR's recommendation to open the project's log sluice (between 3 percent [225 cfs] and 9 percent [690 cfs] of hydraulic capacity) starting the first passage season following relicensing to provide additional passage for downstream Atlantic salmon smolts for a 3-week period during the spring (Article 407, Maine DEP condition C, NMFS prescription 7.3.2);
- (18) Maine DMR's recommendation to conduct up to 3 years of downstream passage effectiveness monitoring for Atlantic salmon smolts (Article 407, Maine DEP condition C, NMFS prescription 7.3.2);
- (19) NMFS's recommendation for a flow monitoring plan (Article 402);
- (20) NMFS's recommendation that GLHA verify the accuracy of generation versus flow curves used to estimate compliance with minimum flows (Article 402); and
- (21) Maine DMR's recommendation to stock uniquely marked Atlantic salmon smolts upstream of Weldon Dam to serve as a source of imprinted adult salmon used for studying upstream passage of adults and downstream passage of kelts (Article 407).

80. If the Commission believes that any section 10(j) recommendation may be inconsistent with the purposes and requirements of Part I of the FPA or other applicable law, section 10(j)(2) requires the Commission and the agencies to attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory

responsibilities of such agencies.<sup>57</sup> If the Commission still does not adopt a recommendation, it must explain how the recommendation is inconsistent with Part I of the FPA or other applicable law and how the conditions imposed by the Commission adequately and equitably protect, mitigate damages to, and enhance fish and wildlife resources.

81. In the draft EA,<sup>58</sup> Commission staff made an initial determination that Maine DMR's recommendation to implement downstream eel passage measures beginning the first passage season following license issuance may be inconsistent with the comprehensive planning standard of section 10(a)(1) and the public interest standard of section 4(e) of the FPA because the measures would not provide benefits justifying their costs.

82. By letter issued March 15, 2018, Commission staff advised Maine DMR of its preliminary determination and attempted to resolve the apparent inconsistency. Maine DMR did not request a meeting pursuant to section 10(j); therefore, the inconsistency has not been resolved.

83. In the final EA,<sup>59</sup> Commission staff determined that downstream eel passage prior to the first passage season was not needed, and that implementing the measures in a coordinated manner, consistent with NMFS's prescription, was the more effective approach to protecting downstream migrating eels at the project. For this reason, Commission staff determined that the benefits of the measure did not outweigh the cost.

84. In the draft EA,<sup>60</sup> Commission staff made an initial determination that Maine DMR's recommendation for GLHA to begin installing the full-depth trash racks with 1-inch clear bar spacing during the first passage season for Atlantic salmon smolts and kelts, may be inconsistent with the comprehensive planning standard of section 10(a)(1) and the public interest standard of section 4(e) of the FPA. By letter issued March 15, 2018, Commission staff advised Maine DMR of its preliminary determination and attempted to resolve the apparent inconsistency. Because Maine DMR did not file comments or request a 10(j) meeting, the inconsistencies could not be resolved.

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<sup>57</sup> 16 U.S.C. § 803(j)(2).

<sup>58</sup> Draft EA at 269.

<sup>59</sup> Final EA at 267.

<sup>60</sup> Draft EA at 270.

85. In the final EA,<sup>61</sup> Commission staff did not recommend installing full-depth trash racks with 1-inch clear bar spacing during the downstream passage seasons for smolts and kelts at any time, because smolts and kelts are already sufficiently protected by the existing trash rack configuration, and therefore, installing trash racks with 1-inch clear bar spacing at any time, is not worth the \$456,750 additional annual cost. Maine DEP's condition C and NMFS's fishway prescription 7.3.2 require that full-depth trash racks with 1-inch bar spacing be installed within two years of license issuance, rather than within one year as recommended by Maine DMR.

86. The license requires GLHA to operate the project in run-of-river mode, minimize impoundment level fluctuations, maintain a downstream minimum flow, install and maintain an upstream fishway for American eels, provide downstream passage for American eels, maintain and operate the existing upstream fishway for Atlantic salmon, and provide downstream passage for Atlantic salmon. These measures will sufficiently protect fish and other aquatic resources in the Penobscot River during project operation.

87. For the above reasons, Maine DMR's recommendations to implement downstream eel passage measures beginning the first passage season and to install full-depth trash racks for Atlantic salmon during the first passage season are inconsistent with the comprehensive planning standard of section 10(a)(1) and the public interest standard of section 4(e) of the FPA. In accordance with section 10(j)(2)(B) of the FPA, the measures required by the license, including Article 403; Maine DEP's conditions A, B, and C; Interior's prescriptions 12.2, 12.3, and 12.4; and NMFS's prescriptions 7.3.1, 7.3.2, and 7.3.3 as discussed above, will adequately and equitably protect, mitigate damages to, and enhance fish and wildlife resources affected by the project.

#### **SECTION 10(a)(1) OF THE FPA**

88. Section 10(a)(1) of the FPA<sup>62</sup> requires that any project for which the Commission issues a license be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce; for the improvement and utilization of waterpower development; for the adequate protection, mitigation, and enhancement of fish and wildlife; and for other beneficial public uses, including irrigation, flood control, water supply, recreation, and other purposes.

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<sup>61</sup> Final EA at 258-259.

<sup>62</sup> 16 U.S.C. § 803(a)(1).

### A. Operation Compliance Monitoring

89. As discussed above, on September 14, 2018, GLHA filed an Operation Monitoring Plan in response to discussions during the 10(j) meeting. However, the filed plan lacks the detail needed to effectively monitor compliance.

90. In the plan, GLHA indicates that, for the purpose of meeting the minimum flow requirements of the license (Maine DEP condition B in Appendix A and Article 403), outflow from the log sluice, roller gate, fishways, and spillway will be determined by reading and recording gate settings and pond level and calculating flow based on engineering curves for each component. Appendix A of the plan provides curves for the log sluice, roller gate, and spillway, but no curves or other methods are provided to estimate outflows from the fishways (i.e., downstream surface bypass and upstream pool and weir fishway). Because outflows from the fishways are needed to estimate total outflow from the project and compliance with the minimum flows that are mandatory under section 401 of the CWA (Article 403 and Appendix A), Article 402 requires that GLHA modify the plan to include the methods for estimating outflows from the fishways.

91. In its plan, GLHA states that a pressure sensitive headwater sensor (transducer) is in place at the dam and provides real-time impoundment water levels. However, the plan does not include the proposed procedures GLHA would use to maintain and calibrate the headwater sensor to ensure it provides accurate water level measurements. Therefore, Article 402 requires that GLHA modify the plan to include a description of these procedures.

92. In the plan, section 4.1, *Unit Minimum Flow Verification*, GLHA indicates that it would verify the accuracy of the existing curves used to monitor flows that pass through the turbines (i.e., flow versus kilowatts), using the same methodology used in 1984 and 2005.<sup>63</sup> In one section of the plan, GLHA indicates that it would conduct the verification testing on turbine units 2 and 3;<sup>64</sup> however, in a separate section, GLHA indicates that it would conduct the verification testing on turbine units 1 and 3.<sup>65</sup> Because the plan is

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<sup>63</sup> Alden Research Laboratories conducted water-to-wire efficiency testing on turbine unit 2 in 1984 and turbine unit 3 in 2005, and General Electric Hydro conducted testing on unit 2 in 2005. Water-to-wire efficiency testing is used to measure the efficiency of a hydropower system by measuring turbine input (water) relative to generator output (wire).

<sup>64</sup> GLHA's September 14, 2018 Operation Monitoring Plan at section 4.1, page 7.

<sup>65</sup> *Id.* at section 4.1, page 8.

unclear with respect to which turbine units will be included in the verification testing, Article 402 requires that GLHA modify the plan to clarify this.

93. In the plan, GLHA includes references to, but does not attach, the three reports<sup>66</sup> that provide information on the water-to-wire efficiency testing conducted on turbine units 2 and 3. GLHA indicates that to determine whether the performance of the turbines has changed over time, it will compare the testing results from those reports to the results from the verification testing proposed under a new license. The Commission must be able to review those reports to exercise its oversight responsibilities. Therefore, Article 402 requires GLHA to file the reports with the Commission.

94. In Appendix B<sup>67</sup> of the plan, GLHA indicates that the proposed verification testing would be conducted at the rated net head of the project (i.e., 39 feet), which GLHA indicates is consistent with the testing previously conducted at the project. However, GLHA does not state, in the body of the proposed plan, the head at which the verification testing would be conducted. Therefore, Article 402 requires GLHA to modify the plan to include the head at which GLHA would conduct the proposed verification testing.

95. Commission staff estimate that the annual cost of developing and implementing GLHA's Operation Monitoring Plan with the modifications discussed above would be \$11,079, and conclude that the benefits of the modified plan outweigh the cost.

## **B. Historical Flow Data**

96. In a June 28, 2018 filing, subsequent to the 10(j) meeting discussed above, NMFS recommended that GLHA develop a flow monitoring plan, in consultation with the resource agencies that would include a provision to make historical flow data electronically available on the internet within 1 year of license issuance.<sup>68</sup> In the final

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<sup>66</sup> See *supra* note 24.

<sup>67</sup> Appendix B is a table of GLHA's responses to NMFS's comments on a draft Operation Monitoring Plan that GLHA provided to NMFS.

<sup>68</sup> In a letter May 23, 2017, NMFS included a 10(j) recommendation to make flow data electronically accessible, consistent with USGS format. NMFS did not include this recommendation in its June 28, 2018 letter. Nonetheless, in the draft EA (at page 263) and final EA (at page 285), Commission staff determined that NMFS's recommendation was not within the scope of section 10(j). Further, in the draft EA (at pages 232-233) Commission staff did not recommend adopting NMFS's recommendation because GLHA would continue to make the most recent flow data available on the internet. Thus, staff determined there would be no benefit to making the flow data available in another format.

EA,<sup>69</sup> Commission staff did not recommend making historical flow data electronically available on the internet within 1 year of license issuance because providing historical flow data on the internet would not serve a project-related purpose. Consequently, there is no project-related benefit to providing historical flow data on the internet at an annual cost of \$546. Therefore, the license does not require GLHA to make historical flow data electronically available on the internet.

97. In the final EA,<sup>70</sup> Commission staff recommended that GLHA provide historical flow data to the public upon request on the basis that doing so could assist the Commission in ensuring license compliance. However, as noted above, Article 402 of the license already requires GLHA to file an operation compliance monitoring plan with sufficient provisions for assisting the Commission's compliance administration duties. Therefore, there is no need to require GLHA to also provide historical flow data to the public upon request for compliance administration purposes and the license does not require GLHA to do so.

### **C. Water Temperature Monitoring**

98. NMFS recommends that GLHA monitor water temperature continuously downstream of the dam from April 1 through October 31. NMFS contends that project operation could intensify the potential effects of climate change on water temperature below the dam, and thus influence smolt emigration, adult immigration, and juvenile development in nursery habitats downstream of the dam. As discussed in the final EA,<sup>71</sup> the project operations do not result in the release of warm water downstream of the project dam because the impoundment has a relatively short residence time<sup>72</sup> (40.7 hours) and does not stratify by temperature.<sup>73</sup> Further, continuous water temperature monitoring conducted by GLHA from May through September 2012 indicates little difference in water temperature between locations in the impoundment and downstream of the dam. These findings support the conclusion that project operation is unlikely to cause water temperature warming downstream of the dam. Because there is no project effect that

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<sup>69</sup> Final EA at 249.

<sup>70</sup> *Id.*

<sup>71</sup> Final EA at 78-79.

<sup>72</sup> The hydraulic residence time is a measurement of the average length of time that water is stored in an impoundment.

<sup>73</sup> Temperature stratification can occur when heating by the sun causes a body of water to develop a warm layer of water that sits on top of a cold layer of water.

would justify the need for water temperature monitoring downstream of the dam, the license does not require GLHA to monitor water temperature at the project.

99. The Penobscot Indian Nation comments that water temperature monitoring conducted by GLHA in 2012 does not adequately characterize the water temperature variation at the project. The Penobscot Indian Nation believes that a plan for monitoring water temperature for multiple years is necessary. As discussed in the final EA,<sup>74</sup> the 2012 monitoring occurred during 4.5 months (May–September) of a relatively dry, low-flow year. Thus, the 2012 data was collected under conditions when project operation would be most likely to cause increased river temperatures. However, the 2012 monitoring data shows that even under relatively dry conditions, the project has little effect on water temperature in the Penobscot River. Therefore, there is no reason to conclude that GLHA’s data is inadequate, and there is no project-related justification for requiring additional water temperature monitoring. Thus, the license does not require GLHA to monitor water temperature.

#### **D. Downstream American Eel Passage Measures**

100. GLHA proposes to provide downstream passage via an open roller gate for eels by implementing annual night-time generation shutdowns (8:00 p.m. to 4:00 a.m.), with the seasonal schedule developed in consultation with the resource agencies and informed by a predictive model.<sup>75</sup> In the interim (i.e., prior to the development of the predictive model), GLHA would implement a night-time shutdown period of up to 6 weeks (8:00 p.m. to 4:00 a.m.), beginning as early as the first significant rain event (1 inch of rain or greater) occurring on, or after, August 15. The night-time shutdown period, however, would start no later than September 15 if no such rainfall occurs. Interior’s prescription 12.4 and Maine DMR’s section 10(j) recommendation require GLHA to cease<sup>76</sup> all generation nightly (8:00 p.m. to 4:00 a.m.) from August 1 through October 31, annually.

101. In the final EA,<sup>77</sup> Commission staff determined that shutting generation down through the entire out-migrating season would provide a somewhat greater level of

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<sup>74</sup> Final EA at 79.

<sup>75</sup> GLHA’s consultation with the resource agencies should identify: (1) a cut-off probability value; (2) the environmental triggers for shutting down and restarting project operation; and (3) the mechanism for measuring the success of implementing the predictive model, in terms of passage survival and generation losses.

<sup>76</sup> Night-time shutdowns are commonly used at hydropower projects to protect adult eels migrating downstream. *See* final EA at 93-94.

<sup>77</sup> Final EA at 272.

protection for adult eels passing through the project than GLHA's proposal, but would also result in unnecessary shutdowns and lost generation during periods when eels are not migrating.<sup>78</sup> Staff estimated that the agencies' measures would result in generation losses of 12,520 MWh at an annual cost of \$626,000, which is double the cost of GLHA's proposal (i.e., \$313,000). Thus, staff concluded that GLHA's proposal would provide the more reasonable balance between resource protection and cost. Nonetheless, the measure is required by the license, because it is mandatory under section 18 of the FPA.

#### **E. American Eel Passage Effectiveness Monitoring**

102. Interior's prescriptions 12.6.1 and 12.6.2 require GLHA to develop upstream and downstream eel monitoring plans, respectively, to document the effectiveness of the eel passage measures implemented at the project. In addition, Maine DMR recommends, and Maine DEP's condition C requires, effectiveness monitoring for the upstream and downstream eel passage measures at the project.

103. In the final EA,<sup>79</sup> Commission staff concluded that upstream and downstream eel passage effectiveness studies would provide the project-related benefit of verifying that the eel passage measures function as designed. Staff determined that the benefits of developing the monitoring plans are worth the \$864 annual cost.<sup>80</sup> Because Interior's prescriptions 12.6.1 and 12.6.2 and Maine DEP's condition C lack specific details for effectiveness monitoring, Article 405 requires that the eel passage monitoring plans required by Interior's prescriptions 12.6.1 and 12.6.2 and Maine DEP's condition C include specific details, including goals and objectives, performance criteria, monitoring methodologies, and reporting provisions.

#### **F. Duration of Downstream American Eel Monitoring**

104. Interior's prescription 12.6.2 requires GLHA to monitor the effectiveness of the downstream eel passage measures implemented at the project, but does not specify a duration for the monitoring.<sup>81</sup> NMFS's prescription 7.3.4, which is consistent with Maine DEP's condition C and GLHA's proposal, requires GLHA to monitor downstream

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<sup>78</sup> *Id.* at 94-95 and 273.

<sup>79</sup> *Id.* at 100.

<sup>80</sup> *Id.* at 251.

<sup>81</sup> Interior indicates that 4 years of monitoring in the upper Penobscot River may be needed to develop an adequate predictive model of downstream migrating eel at the Mattaceunk Project. *See* Interior's April 30, 2018 comments at 3.

eel passage for 2 years. In the final EA,<sup>82</sup> Commission staff recommended 3 years of monitoring to support development of the predictive model for downstream eel passage. Staff determined that the benefit of monitoring adult eel movement at the project for 3 years is worth the \$7,613 annual cost.<sup>83</sup> Therefore, Article 405 requires a total of 3 years of downstream eel passage monitoring.

### **G. Adaptive Management for Fish Passage**

105. GLHA proposes, Maine DMR recommends, Maine DEP's condition C requires, and NMFS's prescriptions 7.3.1 and 7.3.2 require that GLHA implement an adaptive management plan, and additional operational and structural modifications and habitat enhancement measures, if necessary, to provide upstream and downstream passage for Atlantic salmon, alosines, and American eels. In the final EA,<sup>84</sup> Commission staff did not recommend adopting these measures for Atlantic salmon or alosines, because no specific operational and/or structural modifications had been proposed, recommended, or prescribed as part of the measure, and, thus, no project-related need or benefit was identified. Nonetheless, the condition and prescriptions for an adaptive management plan and additional operational, structural, and habitat enhancement measures, if necessary, are included in the license as mandatory conditions under section 18 of the FPA and section 401 of the CWA. However, prior to implementing any future, and currently unspecified operational, structural, and habitat enhancement measures that may be used to improve passage or address performance criteria for upstream and downstream migrating Atlantic salmon, GLHA must file an application to amend the license.

106. Commission staff also did not recommend adopting Maine DMR's recommendation for additional operational and structural modifications and/or habitat enhancement measures, if necessary, for American eels,<sup>85</sup> concluding that Maine DMR did not identify any specific measures to be implemented.<sup>86</sup> However, staff recommended, in the final EA,<sup>87</sup> that FWS, NMFS, Maine DMR, and Maine DEP be afforded an opportunity to review the monitoring results and provide any recommendations for: (1) additional monitoring studies; or (2) operational and structural

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<sup>82</sup> Final EA at 251.

<sup>83</sup> *Id.*

<sup>84</sup> *Id.* at 263-264, 291, and 294.

<sup>85</sup> *Id.* at 291.

<sup>86</sup> *Id.* at 99.

<sup>87</sup> *Id.* at 244-245.

modifications and/or habitat enhancement measures to improve passage for eels. Adding this provision to the eel passage effectiveness plans will have no cost to GLHA. Therefore, Article 405 of the license requires staff's recommended provision.

#### **H. Upstream Alosine Passage**

107. In the final EA,<sup>88</sup> Commission staff did not recommend adopting NMFS's prescription 7.3.1, which is consistent with Maine DEP's Condition C, requiring that GLHA install, in year 15 of the new license, an upstream passage structure for alosines that would be operational in year 16. Staff concluded that alosine spawning habitat downstream of the Mattaceunk Project appears underutilized at this time.<sup>89</sup> Moreover, numerous factors make it difficult to predict the run sizes of alosines in the Penobscot River in year 15 of the license, and whether the number of fish seeking passage past the Mattaceunk Project would warrant the installation of an additional fishway at the dam. Therefore, Commission staff concluded that it is premature to assess the need for the future measure pursuant to sections 4(e) and 10(a) of the FPA. Nonetheless, the conditions are included in the license because they are mandatory under section 18 of the FPA and section 401 of the CWA. However, any upstream passage measure identified under these conditions must be approved by the Commission prior to implementation and after the filing of an application to amend the license.

108. In the final EA,<sup>90</sup> Commission staff did not recommend adopting certain measures that are contingent on the installation of a new upstream passage structure for alosines. These measures include NMFS's prescriptions 7.31, 7.32, 7.33, and 7.34, which are consistent with Maine DEP's condition C, requiring that GLHA extend the operation season of the existing downstream passage facilities (to June 1 through November 30) once the new alosine fishway is operational in order to accommodate outmigrating juvenile and adult alosines,<sup>91</sup> monitor for 2 years each the upstream and downstream passage effectiveness of alosines, and implement any additional operational and structural modifications and/or habitat measures, if necessary, to address any performance standard deficiencies for upstream migrating or outmigrating alosines. In addition, NMFS's prescription 7.3.3 requires the new upstream passage structure to be

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<sup>88</sup> *Id.* at 273-274.

<sup>89</sup> *Id.* at 102-103.

<sup>90</sup> *Id.* at 274.

<sup>91</sup> Maine DEP's condition C requires the extended downstream passage season to begin one year after the new upstream fishway for alosines is operational, rather than the same year the upstream fishway commences operation, as required by NMFS's prescription 7.3.3.

operated seasonally from May 1 through July 31. Staff did not recommend these measures because they are contingent on the installation of a new upstream passage structure for alosines, which, pursuant to section 10(a) of the FPA, was not recommended in the final EA. Nevertheless, these measures are required by the license because they are mandatory under section 18 of the FPA and section 401 of the CWA.

109. The Penobscot Indian Nation, Atlantic Salmon Federation, and Bruce Haines recommend that the new upstream alosine fishway be installed sooner than year 15 of the license as prescribed by NMFS pursuant to section 18 and required by Maine DEP pursuant to section 401 of the CWA. The Penobscot Indian Nation recommends installing the fishway in year 2 of the license, but the Atlantic Salmon Federation and Bruce Haines did not provide a specific timeline for installation. As discussed above, pursuant to section 10(a) of the FPA, staff determined there would be minimal benefit to providing access to additional alosine habitat upstream of the Mattaceunk Project because habitat downstream appears underutilized at this time. Further, the minimal benefit to installing an upstream alosine fishway would not be worth the \$233,981 annual cost.<sup>92</sup> Therefore, we have no basis under section 10(a) of the FPA for requiring that the fishway be installed sooner than required by the mandatory conditions.

### **I. Upstream Sea Lamprey Passage**

110. Sea lamprey are an anadromous species that currently pass upstream of the West Enfield Dam (first dam downstream from the Mattaceunk Project) and are potentially present immediately downstream of the project. Sea lamprey could attempt to use the existing pool and weir fishway to pass upstream, but because sea lamprey are poor swimmers, they are unlikely to successfully move through the weirs and up successive pools because the fishway was designed for strong swimmers like salmon. NMFS recommends that GLHA design the proposed upstream alosine fishway to provide sea lamprey with a safe passage route upstream of the project.

111. As discussed in the final EA,<sup>93</sup> the need for sea lamprey to pass safely upstream of the project is not evident. Although sea lamprey were historically present upstream of the project, the relative abundance and importance of upstream habitat to the historical and existing sea lamprey population is not known. Because the abundance and importance of upstream habitat is not known, a benefit to passing sea lamprey upstream of the project cannot be identified. Thus, the license does not require upstream passage for sea lamprey.

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<sup>92</sup> Final EA at 225.

<sup>93</sup> *Id.* at 110.

## J. Trash Rack Design

112. Penobscot Indian Nation recommends that GLHA install trash racks at the project that meet FWS's fish passage design criteria.<sup>94</sup> The four most pertinent criteria<sup>95</sup> are: (1) hydraulic capacity (i.e., fish bypass flow should be at least 5 percent of the station's hydraulic capacity); (2) normal intake velocity (i.e., not greater than 2 feet per second [fps] in front of the trash racks);<sup>96</sup> (3) trash rack clear bar spacing of 0.75 inch for eels and 1 inch for Atlantic salmon; and (4) sweeping to normal velocity ratio equal to, or greater than 1.<sup>97</sup>

113. As discussed in the final EA,<sup>98</sup> Commission staff determined that GLHA's proposed trash rack would adhere to FWS's design criteria for hydraulic capacity by operating the existing surface bypass, opening the log sluice, and opening the roller gate during the downstream passage season. In addition, staff determined that GLHA's proposed full-depth trash racks with 1-inch clear bar spacing would have a normal velocity of 1.6 fps, which adheres to the FWS design criteria.<sup>99</sup> With regard to trash rack bar spacing, staff determined that: (1) there would be no additional protective benefit to installing full-depth trash racks with 1-inch clear bar spacing for Atlantic salmon smolts and kelts;<sup>100</sup> and (2) a trash rack with 0.75-inch clear bar spacing would exclude only a small additional percentage of eels compared to the slightly larger 1-inch clear bar

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<sup>94</sup> Upstream eel passage must be designed consistent with FWS's eel passage design criteria. *See* FWS. 2017. Fish Passage Engineering Design Criteria. USFWS, Northeast Region R5, Hadley Massachusetts. Filed May 26, 2017, as part of NMFS's section 18 Administrative Record (Accession Number 20170526-4005).

<sup>95</sup> FWS's May 23, 2017 section 18 Administrative Record, containing Sojkowski, B. 2017. Memorandum – Downstream Passage Design Alternatives for the Mattaceunk Hydroelectric Project.

<sup>96</sup> Normal velocity is the component of velocity in front of the trash racks that is perpendicular to the trash rack bars.

<sup>97</sup> Sweeping velocity is the component of velocity in front of the trash racks that is parallel to the trash rack bars.

<sup>98</sup> Final EA at 91-92.

<sup>99</sup> *Id.* at 92.

<sup>100</sup> *Id.* at 258-259.

spacing, given the size range and burst speed typical of outmigrating silver eels.<sup>101</sup> Finally, staff determined that designing trash racks to achieve a ratio of sweeping velocity to normal velocity equal to or greater than 1 may not improve downstream passage at the Mattaceunk Project, but would require substantial structural modifications at the project.<sup>102</sup>

114. The license requires a suite of downstream passage measures<sup>103</sup> that will provide downstream passage for eels and Atlantic salmon. Designing trash racks for the project, as recommended by the Penobscot Indian Nation, would cost \$1,594,896 annually, which is \$1,177,684 more than the cost to design and install the trash racks recommended by Commission staff with the potential for little to no added benefit to eels and Atlantic salmon.<sup>104</sup> Therefore, the license does not require the trash rack design recommended by the Penobscot Indian Nation.

### **K. Trash Rack Approach Velocities**

115. In the final EA,<sup>105</sup> Commission staff did not recommend NMFS's prescription 7.3.2 to take point measurements of approach velocities immediately upstream of the project trash racks after installation of the full-depth trash racks with 1-inch clear bar spacing and ensure that point measurements do not exceed 2.0 fps. Pursuant to section 10(a) of the FPA, Commission staff concluded that there would be no incremental benefit to justify the expense and effort of measuring approach velocities because: (1) average approach velocities are already estimated to be 1.7 fps; and (2) there are no proposed changes to the project that would be expected to cause deviations from 1.7 fps.

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<sup>101</sup> *Id.* at 93.

<sup>102</sup> *Id.* at 92 (American eel) and 179-180 (Atlantic salmon).

<sup>103</sup> For eels, these measures include installing full-depth trash racks with 1-inch clear bar spacing (Maine DEP condition C, Interior prescription 12.4, and NMFS prescription 7.3.2), opening the roller gate to provide a low-level passage route (Article 404), and turbine shutdowns during the out-migration period (Interior prescription 12.4). For Atlantic salmon, these measures include continued operation of the existing bypass (Maine DEP condition C and NMFS prescription 7.3.2 and Article 407), opening the log sluice for 3 weeks during the smolt migration season (Maine DEP condition C and NMFS prescription 7.3.2), and installing full-depth trash racks with 1-inch clear bar spacing (Maine DEP condition C and NMFS prescription 7.3.2).

<sup>104</sup> Final EA at 221 and 270.

<sup>105</sup> *Id.* at 267-268.

Nonetheless, NMFS's prescription is required by the license because it is mandatory under section 18 of the FPA.

#### **L. Fishway Design and Operation**

116. Maine DMR recommends that, once each new fishway is constructed or an existing one is modified, GLHA be required to: (1) operate each fishway for a "one-season shakedown period" to determine whether the fishway operates as designed by the agencies, (2) make any necessary minor adjustments to the fishway or operation after the shakedown operation period, and (3) provide to Maine DMR, NMFS, and FWS, as-built drawings along with a licensed engineer's letter of certification stating that the fishway has been constructed and operates as designed in consultation with the resource agencies.

117. This measure is essentially redundant with other requirements in the license and is unnecessary. The project's fishway design plans will be developed in consultation with resource agencies having expertise in fishway design and engineering, including NMFS, Maine DMR, and FWS, and the shakedown period operation reports will be sent to NMFS, FWS, and Maine DMR for review and approval (Article 401). The agency approved fishway design plans and shakedown period reports will also be filed with the Commission for final review and approval (Article 401). Finally, Maine DEP's condition C and NMFS's prescription 7.3.5 require that GLHA provide the agencies with a copy of the as-built fishway drawings submitted to the Commission for review and approval pursuant to Article 205.

#### **M. Downstream Bypass Attraction Flows**

118. To improve downstream passage effectiveness, the Penobscot Indian Nation and Bruce Haines recommend that GLHA redesign the existing bypass to provide an attraction flow of 5 percent of hydraulic capacity to meet the design criteria recommended by FWS.<sup>106</sup> The existing downstream bypass pipe has a maximum flow capacity of 2 percent of hydraulic capacity. In the final EA,<sup>107</sup> Commission staff determined that increasing the capacity to 5 percent of hydraulic capacity would improve attraction flows, but would require structural changes and subsequent effectiveness testing to identify the benefits. As an alternative, GLHA proposes, Maine DEP's certification requires, NMFS's prescription requires, and Maine DMR recommends opening the project's log sluice (at between 3 percent and 9 percent of hydraulic capacity, or between approximately 225 cfs and 690 cfs)<sup>108</sup> starting the first passage season

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<sup>106</sup> See *supra* note 94.

<sup>107</sup> Final EA at 277-278.

<sup>108</sup> The log sluice has a gated capacity of 690 cfs.

following relicensing to facilitate downstream smolt out-migration for a 3-week period during the spring. In the final EA,<sup>109</sup> Commission staff determined that this measure has the potential to be effective at increasing attraction of smolts toward a safe route. This approach could be tested to identify the benefits without requiring structural changes.

119. Compared to Bruce Haines' and Penobscot Indian Nation's recommendation, GLHA's proposed log sluice operations have the potential to provide equally effective attraction. In the final EA,<sup>110</sup> Commission staff determined that the levelized cost of redesigning the bypass to provide a bypass attraction flow of 5 percent would be \$172,924.<sup>111</sup> Conversely, the levelized cost of implementing the proposed log sluice operations would be \$37,250.<sup>112</sup> Because of the higher cost of providing a 5 percent attraction flow through the bypass, and the likelihood that it would be equally effective and beneficial as the log sluice operations, which as noted above, are mandatory license conditions, GLHA's proposal provides the more appropriate balance between resource protection and developmental cost. Therefore, the license does not require that GLHA redesign the bypass to provide an attraction flow of 5 percent of hydraulic capacity.

#### **N. Operating Period for the Downstream Bypass**

120. Bruce Haines recommends operating the downstream bypass with a 5 percent attraction flow 365 days per year for Atlantic salmon smolts and kelts. In the final EA,<sup>113</sup> Commission staff determined, based on existing information on the downstream migration of smolts and kelts, that GLHA's proposal to operate the downstream bypass from April 1 to June 15 for smolts and kelts, and from October 17 to December 1 for kelts covers the timeframe when smolts and kelts are most likely to be migrating downstream of the project. Because most smolts and kelts are not migrating outside of the proposed timeframe, providing passage outside of this timeframe would not provide a substantial incremental benefit to the passage success of smolts or kelts. Further, the annual cost of operating the bypass with 5 percent attraction flows, 365 days per year

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<sup>109</sup> Final EA at 277-278.

<sup>110</sup> *Id.* at 233.

<sup>111</sup> This levelized cost only includes the cost to redesign the bypass to provide a 5 percent attraction flow, and does not include additional costs to operate and maintain a bypass that is capable of providing 5 percent attraction flows.

<sup>112</sup> Final EA at 237.

<sup>113</sup> *Id.* at 233.

would be \$190,095.<sup>114</sup> Operating the downstream bypass when most smolts and kelts are likely to be migrating would cost \$25,000.<sup>115</sup> Because there is no substantial incremental benefit to operating the bypass 365 days per year, and because the levelized annual cost is \$165,095 greater than the cost of GLHA's proposed bypass operations, which as noted above, are mandatory license conditions, GLHA's proposal provides the more appropriate balance between resource protection and environmental costs. Therefore, the license requires GLHA to only operate the downstream bypass from April 1 to June 15 for smolts and kelts, and from October 17 to December 1 for kelts.

## **O. Operation and Maintenance of Existing Fishways**

### *Modifications to the Fish Passage O&M Plan*

121. GLHA proposes to continue implementing its Fish Passage O&M Plan, which includes provisions for using a trash rake<sup>116</sup> to clear debris from the intakes of units 3 and 4. GLHA has indicated that the intakes are cleared prior to opening the downstream bypass at the beginning of the season, but the frequency of debris removal during the migration season is not stated in the Fish Passage O&M Plan.<sup>117</sup> Further, there is no indication that the intakes of units 1 and 2 are also cleared of debris. Commission staff determined in the final EA<sup>118</sup> that using the trash rake to routinely clear debris from the trash racks in front of all four intakes during the downstream migration season would have the benefit of reducing fish entrainment and would be worth the levelized annual cost of \$259. Therefore, Article 406 requires GLHA to modify the Fish Passage O&M Plan to include a provision for clearing debris from the trash racks at all four turbine intakes.

122. NMFS recommends that GLHA conduct real-time monitoring of the downstream bypass using pressure transducers to detect debris blockages that could reduce bypass flow and passage efficiency for Atlantic salmon smolts and kelts.<sup>119</sup> GLHA currently

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<sup>114</sup> *Id.*

<sup>115</sup> *Id.* at 235.

<sup>116</sup> GLHA operates a trash rake that is operated by an electrical hoist on a trolley beam.

<sup>117</sup> GLHA July 7, 2017 letter.

<sup>118</sup> Final EA at 251-254.

<sup>119</sup> NMFS filed this recommendation as an attachment C to comments on the draft biological assessment on May 23, 2017.

conducts daily visual inspections of the outflow from the bypass pipe in accordance with the existing Fish Passage O&M Plan, which should help determine whether a blockage is preventing 140 cfs (i.e. maximum flow capability of the bypass) from flowing through and out of the bypass pipe. However, Commission staff noted<sup>120</sup> that a blockage incident in 2015 indicates that the current procedures for visual inspections may not always detect debris blockages. In the final EA,<sup>121</sup> Commission staff determined that rather than conduct real time flow monitoring, other less intensive and potentially less costly monitoring, such as daily visual inspection of the outflow from the bypass pipe could improve detection of debris blockages relative to current conditions. Therefore, staff concluded that the more appropriate balance of resource protection and development cost would be achieved through additional visual inspections of the outflow from the bypass pipe instead of adding real time flow monitoring. Article 406 requires GLHA to modify the Fish Passage O&M Plan with a provision that includes a detailed approach to visually monitoring flows that pass through the downstream bypass pipe and procedures for clearing blockages from the bypass pipe to ensure proper function.<sup>122</sup>

*Meeting Annually to Review Fishway Operational Data*

123. Maine DMR recommends that GLHA meet with Maine DMR, FWS, and NMFS annually in March to review fishway operational data from the previous year. However, Maine DMR does not identify a specific project-related need or public benefit to meeting annually to review the fishway operational data. Further, in the final EA,<sup>123</sup> Commission staff determined that with proper fishway operation and maintenance, which is required by Article 406 of the license as discussed above, there is no reason to believe that the existing fishways would not perform as designed. Thus, staff concluded there would be no project-related benefit to meeting annually. Nonetheless, the license requires that GLHA meet with the resource agencies to review fish passage data from the previous year, if needed, because it is mandatory under section 401 of the CWA.

*Counting Fish Passing Through the Fishways*

124. Maine DMR recommends that GLHA document the number of fish using the fishway each day by species. Maine DEP's condition C requires the same measure, but only in the event that fish counts are reinstated or requested by resource agencies. Similarly, NMFS's prescription 7.3.1 requires that GLHA maintain the existing fish trap

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<sup>120</sup> Final EA at 182-183.

<sup>121</sup> *Id.* at 253.

<sup>122</sup> *Id.* at 254.

<sup>123</sup> *Id.* at 254-255.

for counting adult Atlantic salmon as they exit the existing upstream fishway. In the final EA,<sup>124</sup> Commission staff concluded that documenting Atlantic salmon, or any other migratory species' use of the fishway serves no project-related purpose. Nonetheless, the license requires GLHA to document the number of fish passed daily by species, in the event counts are reinstated or requested by resource agencies, because it is mandatory under section 401 of the CWA. Further, NMFS prescription 7.3.1 requires GLHA to count adult Atlantic salmon as they exit the existing upstream fishway.

#### *Annual Fishway Operations Plan*

125. Maine DMR recommends that GLHA develop a plan for fishway operations prior to the beginning of each fish passage season. Maine DEP's condition C requires the same measure, but only if a plan is needed at the beginning of each fish passage season. In the final EA,<sup>125</sup> Commission staff determined that the Fish Passage O&M Plan and the staff recommended modifications to it, which are required in Article 406, would be adequate to ensure proper operation and maintenance of the fishways during each year such that additional yearly operations plans are unnecessary. Nonetheless, the license requires GLHA to develop a plan for fishway operations each year, if needed, because it is mandatory under section 401 of the CWA. However, because any such plan could result in changes to project operations or facilities, any annual plan must be approved by the Commission prior to implementation.

### **P. Upstream and Downstream Passage for Atlantic Salmon**

#### *Smolt Mortality in the Project Impoundment*

126. To evaluate smolt mortality in the project impoundment, GLHA proposes, in the Species Protection Plan for Atlantic salmon, to conduct an evaluation of the sources of impoundment mortality, along with any additional modifications deemed appropriate during agency consultation to protect smolts in the impoundment. Maine DMR recommends that GLHA conduct up to 3 years of studies to assess the sources of impoundment mortality. Maine DEP's condition C requires GLHA to conduct a 1-year voluntary study to assess the sources of impoundment mortality. NMFS's reasonable and prudent measure 5 requires GLHA to develop and implement a plan to identify the sources of impoundment mortality.

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<sup>124</sup> *Id.* at 115.

<sup>125</sup> *Id.* at 252-253.

127. In the final EA,<sup>126</sup> Commission staff did not recommend conducting post-licensing studies to evaluate smolt mortality in the project impoundment, as proposed by GLHA and recommended by Maine DMR. Commission staff concluded that existing studies demonstrate that mortality in the project impoundment is not consistently different from that in the non-impounded reaches of the Penobscot River. Moreover, the study results show no consistent evidence of project-related mortality. Thus, staff determined that there is no project-related need for post-license studies to evaluate smolt mortality in the impoundment, and concluded that it was not worth the \$11,270<sup>127</sup> annual cost of GLHA's proposal or the \$25,372 annual cost of Maine DMR's proposal. Nonetheless, the license requires GLHA to develop and implement a plan to identify the sources of smolt mortality in the project impoundment as condition of NMFS's incidental take statement in Appendix D.

128. NMFS filed a recommendation for GLHA to develop a mitigation plan for the loss of Atlantic salmon smolts as a result of maintaining the project impoundment. Reasonable and prudent measure 5 of NMFS's incidental take statement also requires GLHA to: (1) develop and implement a plan to reduce smolt mortality in the project impoundment to a rate equivalent to "natural mortality in an appropriate un-impounded reach of the Penobscot River;" and (2) develop and implement a plan to carry out mitigation to result in "no net loss" of smolts in the project impoundment by year nine of the license, if it is not possible to reduce the mortality rate. In the final EA,<sup>128</sup> staff addressed NMFS's recommendation and concluded, for the same reasons discussed above, that there is no project-related need for measures to mitigate impoundment mortality, and concluded that developing a mitigation plan for the loss of smolts in the impoundment was not worth the annual cost of \$432. For the same reasons, staff also does not recommend pursuant to section 10(a) of the FPA, the plans specified by reasonable and prudent measure 5 of NMFS's incidental statement in the license. Nonetheless, the plans required by reasonable and prudent measure 5 of NMFS's incidental take statement are included in the license pursuant to the ESA as a condition of NMFS's incidental take statement in Appendix D.

129. The terms and conditions of reasonable and prudent measure 3 of NMFS's incidental take statement requires that GLHA: (1) develop, within 2 years of license issuance, a plan to measure project-related losses of smolts in the project impoundment;

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<sup>126</sup> *Id.* at 261-262.

<sup>127</sup> GLHA did not specify the number of years of study it would conduct. However, in the final EA (at 238 and note y at 241), staff estimated the cost of GLHA's proposal by assuming 1 year of study.

<sup>128</sup> Final EA at 261-262.

and (2) use a Cormack-Jolly-Seber model,<sup>129</sup> or other acceptable approach, to estimate survival rates and associated error bounds. For the reasons discussed above, staff does not recommend, pursuant to section 10(a) of the FPA, the measures stipulated by reasonable and prudent measure 3. Nonetheless, the license includes requirements for measuring and monitoring smolt mortality rates in the project impoundment and identifying the causes of mortality pursuant to the ESA, as a condition of NMFS's incidental take statement in Appendix D.

*Phased Spill During Smolt Out-Migration*

130. GLHA proposes in the Species Protection Plan for Atlantic salmon, and NMFS's prescription 7.3.2 and Maine DEP's condition C require opening the log sluice for 3 weeks during the migration season to improve downstream passage for smolts. If the downstream passage effectiveness studies demonstrate that the downstream bypass with log sluice operations is unable to meet the survival performance standard included in NMFS's incidental take statement, and operational or structural modifications of the bypass and log sluice are not feasible, GLHA proposes to move to a phased spill approach<sup>130</sup> for 3 weeks during the migration period. For administrative purposes related to the survival performance standard required by NMFS's incidental take statement, Article 407 requires GLHA to modify the Species Protection Plan for Atlantic salmon by adding a provision to determine, with final approval from the Commission, the 3-week period during which any log sluice or phased spill measures would occur for downstream passage of smolts.

131. In the final EA,<sup>131</sup> Commission staff also determined that GLHA should begin implementing the phased spill measures after a minimum of 1 year and a maximum of 3 years of conducting downstream passage effectiveness studies for smolts with non-spill passage measures. Commission staff concluded that defining when the phased spill measures could begin would prevent the establishment of a continuous cycle of effectiveness studies and structural or operational modification for downstream fish passage, without implementation of phased spill measures. Therefore, Article 407 requires GLHA to modify the Species Protection Plan for Atlantic salmon by including a provision to determine, with final approval from the Commission, when to begin implementation of phased spill measures for downstream passage of smolts after a

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<sup>129</sup> The Cormack-Jolly-Seber model is a quantitative approach to estimating vital rates of animals using data collected from mark-recapture studies.

<sup>130</sup> The phased spill approach is discussed in detail in the final EA at 185-186.

<sup>131</sup> *Id.*

minimum of 1 year and a maximum of 3 years of conducting downstream passage effectiveness studies for smolts with non-spill passage measures.

132. In the final EA,<sup>132</sup> Commission staff did not recommend NMFS's prescription 7.3.3 requiring that GLHA open the existing upstream fishway prior to May 1 if the fish lift at Milford dam begins capturing adult Atlantic salmon earlier than May 1. Commission staff did not recommend NMFS's prescription because it places no limit on how early the fishway should be operated before May 1. In the absence of limits on the fishway operating schedule, staff has no information to analyze whether a particular schedule modification would or would not provide benefits to the Gulf of Maine Distinct Population Segment (Gulf of Maine DPS)<sup>133</sup> of Atlantic salmon, and therefore, we have no justification for the measure. Nonetheless, NMFS's prescription is required by the license because it is mandatory under section 18 of the FPA.

#### *Passage Effectiveness Studies*

133. Maine DEP's condition C, NMFS's prescription 7.3.4, and the terms and conditions for implementing reasonable and prudent measure 1 of NMFS's biological opinion require GLHA to evaluate the effectiveness of upstream and downstream passage for Atlantic salmon at the project. After these upstream and downstream passage effectiveness studies demonstrate that performance standards are met, GLHA proposes, in the Species Protection Plan for Atlantic salmon, to reevaluate upstream and downstream passage of Atlantic salmon at the project once every 10 years to verify continued achievement of the performance standard. In the final EA,<sup>134</sup> Commission staff determined the Fish Passage O&M Plan with staff recommended modifications (discussed above) would ensure that the fishways continue to function as designed. Therefore, there would be no benefit to reevaluating upstream and downstream passage every ten years after the performance standard has been met. Therefore, Article 407 requires GLHA to modify the Species Protection Plan for Atlantic salmon by removing

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<sup>132</sup> *Id.* at 276-277.

<sup>133</sup> The Gulf of Maine DPS of Atlantic salmon is a federally endangered population that includes all freshwater bodies in the Androscoggin Basin up to Rumford Falls on the Androscoggin River and up to Snow Falls on the Little Androscoggin River; all freshwater bodies in the Kennebec Basin up to Grand Falls on the Dead River and the unnamed falls (currently impounded by Indian Pond Dam) immediately above the Kennebec River Gorge; and all freshwater bodies in the Penobscot Basin up to Big Niagara Falls on Nesowadnehunk Stream, Grand Pitch on Webster Brook, and Grand Falls on the Passadumkeag River. 74 Fed. Reg. 29,346 (June 19, 2009)

<sup>134</sup> Final EA at 260.

the provision requiring reevaluation of upstream and downstream passage effectiveness every 10 years.

134. In the final EA,<sup>135</sup> Commission staff did not recommend NMFS's prescription 7.3.4 that would require passage effectiveness studies for upstream migrating Atlantic salmon and downstream migrating kelts to begin at the start of the second migratory season after fishways are operational. Commission staff determined that the effectiveness studies for smolts and kelts could not begin during the second migratory season because study fish would not be available until at least the third year after license issuance<sup>136</sup> and could not be present within the time constraints of NMFS's prescription. Nonetheless, NMFS's prescription is required by the license because it is mandatory under section 18 of the FPA.

#### *24-hour Downstream Passage Criteria*

135. In the final EA,<sup>137</sup> Commission staff did not recommend NMFS's prescription 7.3.4 for GLHA to only count those smolts and kelts that pass the project forebay area within 24 hours (24-hour criteria) to be considered a successful passage attempt during downstream passage effectiveness studies. Commission staff determined that there is no evidence attributing a specific threshold of duration of passage to excessive smolt or kelt mortality, and thus there is no evidence to indicate that smolts or kelts that do not pass a dam within 24 hours will experience higher mortality than those that do pass the dam within 24 hours. Nonetheless, NMFS's prescription is required by the license because it is mandatory under section 18 of the FPA.

#### *Monitoring and Reporting Program for Incidental Take*

136. Reasonable and prudent measure 2 of the incidental take statement requires GLHA to complete an annual monitoring and reporting program to confirm that they minimize incidental take and report all project-related observations of dead or injured Atlantic

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<sup>135</sup> *Id.* at 279.

<sup>136</sup> The effectiveness studies on upstream migrating adult Atlantic salmon and downstream migrating kelts would require salmon that are imprinted to habitats upstream of the project, and thus motivated to migrate upstream of the Mattaceunk Project. This requirement necessitates stocking smolts upstream of the project, which would be imprinted to those habitats, migrate out to sea, and return on average 2 years later to be telemetry tagged and used in the effectiveness studies. If smolts are stocked in the first year after any new license is issued, adults would not likely return until at least the third year after any new license is issued. *See* Final EA at 161-163.

<sup>137</sup> Final EA at 279-280.

salmon to NMFS. Similarly, reasonable and prudent measure 4 of the incidental take statement requires GLHA to complete an annual monitoring and reporting program to confirm that they minimize incidental take of Atlantic salmon smolts in the project impoundment and report all project-related observations of dead or injured smolts to NMFS. To enable the Commission to track and enforce the requirements of reasonable and prudent measures 2 and 4 for the protection of Atlantic salmon, Commission staff also recommended that GLHA develop a plan to describe how it will monitor and report all project-related observations of dead or injured Atlantic salmon to NMFS and the Commission. Therefore, Article 408 requires GLHA to develop the plan.

#### *NMFS Conservation Recommendation*

137. NMFS biological opinion includes a “discretionary” conservation recommendation for the Commission and GLHA to work with state and federal fisheries resource agencies to identify suitable projects (e.g., removal of other barriers to fish migration in the Penobscot River watershed or the construction of fishways) that are likely to contribute to the recovery of Atlantic salmon and address the effects of degradation of critical habitat over the duration of the license term. The license already requires sufficient measures to protect and enhance salmon habitat in the project area (e.g., run-of-river operation with limited impoundment fluctuation, suitable minimum flows, and upstream and downstream fish passage improvements). Therefore, there is no justification for requiring GLHA to identify and implement additional, unspecified measures to enhance salmon habitat in the Penobscot River watershed.

### **ADMINISTRATIVE PROVISIONS**

#### **A. Annual Charges**

138. The Commission collects annual charges from licensees for administration of the FPA. Article 201 provides for the collection of these charges.

#### **B. Exhibit F and G Drawings**

139. The Commission requires licensees to file sets of approved project drawings in electronic file format. Article 202 requires the filing of these drawings.

#### **C. Amortization Reserve**

140. The Commission requires that for new major licenses, non-municipal licensees must set up and maintain an amortization reserve account upon license issuance. Article 203 requires the establishment of the account.

#### **D. Headwater Benefits**

141. Some projects directly benefit from headwater improvements that were constructed by other licensees, the United States, or permittees. Article 204 requires the licensee to reimburse such entities for these benefits if they were not previously assessed and reimbursed.

#### **E. As-Built Exhibits**

142. Where new construction or modifications to the project are involved (*e.g.*, new fish passage facilities), the Commission requires licensees to file revised exhibits of project features as-built. Article 205 provides for the filing of these exhibits.

#### **F. Review of Final Plans and Specifications**

143. Article 301 requires the licensee to provide the Commission's Division of Dam Safety and Inspections (D2SI)-New York Regional Engineer with plans and specifications of any construction, along with a supporting design report, prior to the start of construction.

144. Article 302 requires the licensee to provide the Commission's D2SI-New York Regional Engineer with cofferdam and deep excavation construction drawings prior to the start of any construction requiring cofferdams or deep excavations.

145. Article 303 requires the licensee to consult with the Commission's D2SI-New York Regional Engineer on any project modifications resulting from environmental requirements.

#### **G. Commission Approval of Resource Plans, Notification, and Filing of Reports and Amendments**

146. In Appendices A, B, and C, there are certain certification conditions and fishway prescriptions that either do not require the licensee to file plans with the Commission for approval; do not require the licensee to file reports with the Commission; require agency, but not Commission notification of emergencies and other activities; or require license amendments. Therefore, Article 401 requires the licensee to: (1) file the plans with the Commission for approval; (2) file reports with the Commission after monitoring has been completed; (3) notify the Commission of emergencies and other activities; and (4) file amendment applications, as appropriate.

#### **H. Use and Occupancy of Project Lands and Waters**

147. Requiring a licensee to obtain prior Commission approval for every use or occupancy of project land would be unduly burdensome. Therefore, Article 412 allows the licensee to grant permission, without prior Commission approval, for the use and

occupancy of project lands for such minor activities as landscape planting. Such uses must be consistent with the purposes of protecting and enhancing the scenic, recreational, and environmental values of the project.

## STATE AND FEDERAL COMPREHENSIVE PLANS

148. Section 10(a)(2)(A) of the FPA,<sup>138</sup> requires the Commission 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.<sup>139</sup> Under section 10(a)(2)(A), Commission staff identified and reviewed 25 comprehensive plans relevant to this project.<sup>140</sup> No conflicts were found.

## APPLICANT'S PLANS AND CAPABILITIES

149. In accordance with sections 10(a)(2)(C) and 15(a) of the FPA,<sup>141</sup> Commission staff evaluated GLHA's record as a licensee for the following areas: (A) conservation efforts; (B) compliance history and ability to comply with the new license; (C) safe management, operation, and maintenance of the project; (D) ability to provide efficient and reliable electric service; (E) need for power; (F) transmission services; (G) cost effectiveness of plans; and (H) actions affecting the public. This order accepts staff's findings in each of the following areas.

### A. Conservation Efforts

150. Section 10(a)(2)(C) of the FPA requires the Commission to consider the electricity consumption improvement program of the applicant, including its plans, performance, and capabilities for encouraging or assisting its customers in conserving electricity cost-effectively, and taking into account the published policies, restrictions, and requirements of state regulatory authorities. GLHA sells the project's energy to the wholesale market administered by the Independent System Operator of New England (ISO New England).

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<sup>138</sup> 16 U.S.C. § 803(a)(2)(A).

<sup>139</sup> Comprehensive plans for this purpose are defined at 18 C.F.R. § 2.19.

<sup>140</sup> The list of applicable plans can be found in section 5.4 of the final EA for the project. Commission staff also reviewed the Recovery Plan for the Gulf of Maine Distinct Population Segment of Atlantic Salmon (*Salmo salar*), Final Plan for the 2009 ESA Listing, which was filed with the Commission on March 8, 2019, and subsequent to the final EA issuance date of September 25, 2018.

<sup>141</sup> 16 U.S.C. §§ 803(a)(2)(C) and 808(a).

151. Given the limits of its ability to influence users of the electricity generated by the project, staff concludes that GLHA will continue to operate the project in a manner that is consistent with section 10(a)(2)(C) of the FPA.

**B. Compliance History and Ability to Comply with the New License**

152. Based on a review of GLHA's compliance with the terms and conditions of the existing license, GLHA's overall record of making timely filings and complying with its license is satisfactory. Therefore, GLHA can satisfy the conditions of a new license.

**C. Safe Management, Operation, and Maintenance of the Project**

153. Commission staff reviewed GLHA's management, operation, and maintenance of the Mattaceunk Hydroelectric Project pursuant to the requirements of Part 12 of the Commission's regulations and the Commission's Engineering Guidelines. Staff concludes that the dams and other project works are safe and that there is no reason to believe that GLHA cannot continue to safely manage, operate, and maintain these facilities under a new license.

**D. Ability to Provide Efficient and Reliable Electric Service**

154. Commission staff reviewed GLHA's plans and its ability to operate and maintain the project in a manner most likely to provide efficient and reliable electric service. Staff's review indicates that GLHA regularly inspects the project turbine-generator units to ensure they continue to perform in an optimal manner, schedules maintenance to minimize effects on energy production, and since the project has been in operation, has undertaken several initiatives to ensure the project is able to operate reliably into the future. Therefore, GLHA is capable of operating the project to provide efficient and reliable electric service in the future.

**E. Need for Power**

155. To assess the need for power, staff looked at the needs in the operating region in which the project is located. Project power will be used to meet regional electrical demand. The project will be located in the Northeast Power Coordinating Council New England region of the North American Electric Reliability Council (NERC). According to NERC, summer peak demand in the region is expected to increase at an average rate of 0.21 percent per year over the 10-year planning period from 2017-2026. The project's power and contribution to the region's diversified generation mix will help meet a need for power in the region.

**F. Transmission Services**

156. GLHA is an independent power producer and does not own the local transmission system. Project generators connect to a substation, located adjacent to the powerhouse.

There, each pair of generators connect to a bank of three transformers which step-up the voltage from 6.9 to 34.5 kilovolts, then to a 9-mile-long, primary transmission line. The primary transmission line interconnects to the New England grid at the Powersville substation.

### **G. Cost Effectiveness of Plans**

157. GLHA proposes several modifications to project facilities and environmental measures for enhancement of fish and wildlife at the project. Based on GLHA's record as an existing licensee, these plans are likely to be carried out in a cost-effective manner.

### **H. Actions Affecting the Public**

158. GLHA provided opportunities for public involvement in the development of its application for a new license for the Mattaceunk Project. In addition, during the previous license period, GLHA operated the project in a manner that supported recreation activities, including boating and fishing in the Penobscot River upstream and downstream of the project. GLHA uses the project to help meet local power needs.

## **PROJECT ECONOMICS**

159. In determining whether to issue a new license for an existing hydroelectric project, the Commission considers several public interest factors, including the economic benefits of project power. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corp.*,<sup>142</sup> the Commission uses current costs to compare the costs of the project and likely alternative power with no forecasts concerning potential future inflation, escalation, or deflation beyond the license issuance date. The basic purpose of the Commission's economic analysis is to provide a general estimate of the potential power benefits and the costs of a project, and of reasonable alternatives to project power. The estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license.

160. In applying this analysis to the Mattaceunk Project, staff considered four options: no-action alternative, GLHA's proposal, GLHA's proposal with staff modifications (staff alternative), and the staff alternative with mandatory conditions as licensed herein.<sup>143</sup>

161. Under the no-action alternative, the project would continue to operate as it does now. The project generates an average of 123,334 MWh of electricity annually. The

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<sup>142</sup> 72 FERC ¶ 61,027 (1995).

<sup>143</sup> In the final EA, staff recommended the staff alternative which excluded certain mandatory conditions, for consideration, but the license must include all mandatory conditions.

average annual project cost is about \$4,848,180, or \$39.31/MWh, in 2020 dollars. When an estimate of average generation is multiplied by the alternative power cost of \$47.63/MWh, the total value of the project's power is \$5,874,303. To determine whether the proposed project is currently economically beneficial, the project's cost is subtracted from the value of the project's power. Therefore, the project costs \$1,026,122 or \$8.32/MWh, less to produce power than the likely alternative cost of power.

162. As proposed by GLHA, the levelized annual cost of operating the Mattaceunk Project is \$7,073,411, or \$60.80/MWh. The proposed project would generate an average of 116,339 MWh of energy annually. When this estimate of average generation is multiplied by the alternative power cost of \$47.63/MWh, the total value of the project's power is \$5,541,227, in 2020 dollars. Therefore, in the first year of operation, project power would cost \$1,533,348, or \$13.18/MWh, more than the likely alternative cost of power.

163. As licensed herein with mandatory conditions and staff measures, the levelized annual cost of operating the Mattaceunk Project is \$6,085,603, or \$53.97/MWh. The proposed project would generate an average of 112,759 MWh of energy annually. When this estimate of average generation is multiplied by the alternative power cost of \$47.63/MWh, the total value of the project's power is \$5,370,711, in 2020 dollars. Therefore, in the first year of operation, project power would cost \$714,892, or \$6.34/MWh, more than the likely alternative cost of power.

164. In considering public interest factors, the Commission takes into account that hydroelectric projects offer unique operational benefits to the electric utility system (ancillary service benefits). These benefits include the ability to help maintain the stability of a power system, such as by quickly adjusting power output to respond to rapid changes in system load; and to respond rapidly to a major utility system or regional blackout by providing a source of power to help restart fossil-fuel based generating stations and put them back on line.

165. Although staff does not explicitly account for the effects inflation may have on the future cost of electricity, the fact that hydropower generation is relatively insensitive to inflation compared to fossil-fueled generators is an important economic consideration for power producers and the consumers they serve. Project economics is only one of the many public interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

## COMPREHENSIVE DEVELOPMENT

166. Sections 4(e) and 10(a)(1) of the FPA<sup>144</sup> require the Commission to give equal consideration to the power development purposes and to the purposes of 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. Any license issued must be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. The decision to license this project, and the terms and conditions included herein, reflect such consideration.

167. The final EA for the project contains background information, analysis of effects, and support for related license articles. Based on the record of this proceeding, including the final EA and the comments thereon, licensing the Mattaceunk Project as described in this order would not constitute a major federal action significantly affecting the quality of the human environment. The project will be safe if operated and maintained in accordance with the requirements of the license.

168. Based on staff's independent review and evaluation of the Mattaceunk Project, recommendations from the resource agencies and other stakeholders, and the no-action alternative, as documented in the final EA, the project as licensed herein, is best adapted to a comprehensive plan for improving or developing the Penobscot River.

169. This alternative is selected because: (1) issuance of a new license will serve to maintain a beneficial, and dependable source of electric energy; (2) the required environmental measures will protect and enhance fish and wildlife resources, water quality, recreational resources, and cultural resources; and (3) the 19.2 MW of electric capacity comes from a renewable resource that does not contribute to atmospheric pollution.

## LICENSE TERM

170. Section 15(e) of the FPA<sup>145</sup> provides that any new license issued shall be for a term that the Commission determines to be in the public interest, but not less than 30 years or more than 50 years.

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<sup>144</sup> 16 U.S.C. §§ 797(e) and 803(a)(1).

<sup>145</sup> 16 U.S.C. § 808(e).

171. On October 19, 2017, the Commission established a 40-year default license term policy for original and new licenses, effective as of October 26, 2017.<sup>146</sup> The Policy Statement provides for exceptions to the 40-year default license term under certain circumstances: (1) establishing a shorter or longer license term if necessary to coordinate license terms for projects located within the same river basin; (2) deferring to a shorter or longer license term explicitly agreed to in a generally-supported comprehensive settlement agreement; and (3) establishing a longer license term upon a showing by the license applicant that substantial voluntary measures were either previously implemented during the prior license term, or substantial new measures are expected to be implemented under the new license.

172. Because none of the above exceptions apply in this case, a 40-year license for the Mattaceunk Project is appropriate.

The Director orders:

(A) This license is issued to Great Lakes Hydro America, LLC (licensee) to operate and maintain the Mattaceunk Hydroelectric Project, for a period of 40 years, effective the first day of the month in which this order is issued. This license is subject to the terms and conditions of the Federal Power Act (FPA), which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the FPA.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, enclosed by the project boundary shown by Exhibit G filed January 25, 2017:

<u>Exhibit G Drawing</u>	<u>FERC Drawing Number</u>	<u>Drawing Title</u>	<u>Filename Drawing Title</u>
G-1	P-2520-1003	Boundary Map	Boundary Map
G-2	P-2520-1004	Boundary Map	Boundary Map

(2) Project works consisting of: (a) a 1,664-acre impoundment with a total storage capacity of 20,981 acre-feet at a normal pool elevation of 240.0 feet USGS

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<sup>146</sup> *Policy Statement on Establishing License Terms for Hydroelectric Projects*, 161 FERC ¶ 61,078 (2017) (Policy Statement).

datum; (b) a 1,060-foot-long, 45-foot-high dam (Weldon Dam) with a variable crest elevation consisting of (i) a 110-foot-long earthen embankment extending to the left abutment; (ii) a combined intake and powerhouse structure; (iii) a 10-foot-wide log sluice controlled by an 8-foot-high vertical slide gate; (iv) a 90-foot-long, 19-foot-high gated spillway with a single roller gate; (v) a 657.5-foot-long, 70-foot-high concrete gravity overflow spillway with a permanent crest elevation of 236.0 feet and a flashboard crest elevation of 240.0 feet when equipped with 4-foot-high wooden flashboards; and (vi) a retaining wall as the right abutment; (c) an upstream pool and weir fishway; (d) an intake with trash racks that have 1-inch clear bar spacing covering the top 16 feet (at normal pool) and 2.63-inch bar spacing at depths greater than 16 feet; (e) a downstream surface bypass fishway; (f) a 142-foot-long, 99-foot-wide powerhouse (Weldon Station) integral to the dam containing two Kaplan and two fixed blade propeller turbine/generating units with a combined capacity of 19.2 megawatts; (g) a substation adjacent to the powerhouse; (h) a 9-mile-long, 34.5-kilovolt (kV) transmission line; and (i) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of Exhibits A and F shown below:

Exhibit A: Pages A-1 through A-11, Section 2.0 through 6.0, filed on August 31, 2016.

Exhibit F: The following drawings filed on August 31, 2016:

<b><u>Exhibit F Drawing</u></b>	<b><u>FERC Drawing Number</u></b>	<b><u>Drawing Title</u></b>	<b><u>Filename Drawing Title</u><sup>147</sup></b>
F-1	P-2520-1001	Plan and Sections of Dam and Station	Views of Dam & Station
F-2	P-2520-1002	Plan and Sections of Powerhouse and Dike	Views of Powerhouse & Dike

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project, all portable property that may be employed in connection with the project, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

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<sup>147</sup> These exact drawing titles must be used in the filename when filing the electronic file format drawings required in license Article 202. Commission staff shortened the drawing titles due to filename character limits. There is no need to modify the titles as they appear on the drawings.

(C) The Exhibits A, F, and G described above are approved and made part of the license.

(D) This license is subject to the conditions submitted by the Maine Department of Environmental Protection under section 401(a)(1) of the Clean Water Act, 33 U.S.C. § 1341(a)(1), as those conditions are set forth in Appendix A to this order.

(E) This license is subject to the conditions submitted by the Secretary of the U.S. Department of the Interior and the Secretary of the U.S. Department of Commerce under section 18 of the FPA, as those conditions are set forth in Appendices B and C to this order, respectively.

(F) This license is subject to the incidental take terms and conditions of the biological opinion submitted by the National Marine Fisheries Service under section 7 of the Endangered Species Act, as those conditions are set forth in Appendix D to this order.

(G) This license is also subject to the articles set forth in Form L-3, (October 1975), entitled "Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States" (*see* 54 F.P.C. 1792, *et seq.*), as reproduced at the end of this order, and the following additional articles:

Article 201. Administrative Annual Charges. The licensee must pay the United States annual charges, effective as of the first day of the month in which the license is issued, and as determined in accordance with the provisions of the Commission's regulations in effect from time to time, to reimburse the United States for the cost of administration of Part 1 of the Federal Power Act. The authorized installed capacity for that purpose is 19.2 megawatts.

Article 202. Exhibit F and G Drawings. Within 45 days of the date of issuance of this order, as directed below, the licensee must file the approved exhibit drawings and geographic information system (GIS) data in electronic file format.

a) The licensee must prepare digital images of the approved exhibit drawings in electronic format. Prior to preparing each digital image, the licensee must add the FERC Project-Drawing Number (*i.e.*, P-2520-1001 through P-2520-1004) in the margin below the title block of the corresponding approved drawing. The licensee must separate the Exhibit F drawings from the other project exhibits, and **label and file them as Critical Energy Infrastructure Information (CEII) material under 18 CFR § 388.113** (The submission should consist of: 1) a public portion consisting of a cover letter, the Exhibit G drawings, and GIS data; and 2) a CEII portion containing only the Exhibit F drawings). Each drawing must be a separate electronic file, and the file name must include: FERC Project-Drawing Number, FERC Exhibit Number, Filename Title, date of this order, and file extension in the following format [P-2520-5, F-1, View of Dam and

Station, MM-DD-YYYY.TIF].

Each Exhibit G drawing that includes the project boundary must contain a minimum of three known reference points (*i.e.*, latitude and longitude coordinates or state plane coordinates), arranged in a triangular format for GIS georeferencing the project boundary drawing to the polygon data. The licensee must identify the spatial reference for the drawing (*i.e.*, map projection, map datum, and units of measurement) on the drawing and label each reference point. In addition, a registered land surveyor must stamp each project boundary drawing. All digital images of the exhibit drawings must meet the following format specification:

IMAGERY:	black & white raster file
FILE TYPE:	Tagged Image File Format, (TIFF) CCITT Group 4 (also known as T.6 coding scheme)
RESOLUTION:	300 dots per inch (dpi) desired, (200 dpi minimum)
DRAWING SIZE:	22" x 34" (minimum), 24" x 36" (maximum)
FILE SIZE:	less than 1 megabyte desired

b) Project boundary GIS data must be in a georeferenced electronic file format (such as ArcGIS shapefiles, GeoMedia files, MapInfo files, or a similar GIS format). The filing must include both polygon data and all reference points shown on the individual project boundary drawings. Each project development must have an electronic boundary polygon data file(s). Depending on the electronic file format, the polygon and point data can be included in single files with multiple layers. The georeferenced electronic boundary data file must be positionally accurate to  $\pm 40$  feet in order to comply with National Map Accuracy Standards for maps at a 1:24,000 scale. The file name(s) must include: FERC Project Number, data description, date of this order, and file extension in the following format [P-2520, boundary polygon or point data, MM-DD-YYYY.SHP]. The filing must include a separate text file describing the spatial reference for the georeferenced data: map projection used (*i.e.*, UTM, State Plane, Decimal Degrees, *etc.*), the map datum (*i.e.*, North American 27, North American 83, *etc.*), and the units of measurement (*i.e.*, feet, meters, miles, *etc.*). The text file name must include: FERC Project Number, data description, date of this order, and file extension in the following format [P-2520, project boundary metadata, MM-DD-YYYY.TXT].

Article 203. Amortization Reserve. Pursuant to section 10(d) of the Federal Power Act, a specified reasonable rate of return upon the net investment in the project must be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. The licensee must set aside in a project amortization reserve account at the end of each fiscal year one half of the project surplus earnings, if any, in excess of the specified rate of return per annum on the net investment. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year, the licensee must deduct the amount of that

deficiency from the amount of any surplus earnings subsequently accumulated, until absorbed. The licensee must set aside one-half of the remaining surplus earnings, if any, cumulatively computed, in the project amortization reserve account. The licensee must maintain the amounts established in the project amortization reserve account until further order of the Commission.

The specified reasonable rate of return used in computing amortization reserves must be calculated annually based on current capital ratios developed from an average of 13 monthly balances of amounts properly included in the licensee's long-term debt and proprietary capital accounts as listed in the Commission's Uniform System of Accounts. The cost rate for such ratios must be the weighted average cost of long-term debt and preferred stock for the year, and the cost of common equity must be the interest rate on 10-year government bonds (reported as the Treasury Department's 10-year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Article 204. Headwater Benefits. If the licensee's project was directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement during the term of the prior license (including extensions of that term by annual licenses), and if those headwater benefits were not previously assessed and reimbursed to the owner of the headwater improvement, the licensee must reimburse the owner of the headwater improvement for those benefits, at such time as they are assessed, in the same manner as for benefits received during the term of this new license. The benefits will be assessed in accordance with Part 11, Subpart B, of the Commission's regulations.

Article 205. As-built Exhibits. Within 90 days of completion of construction of the facilities authorized by this license, including any new upstream and downstream anadromous fish and American eel passage facilities, the licensee must file for Commission approval, revised Exhibits A, F, and G, as applicable, to describe and show those project facilities as built.

Article 301. Contract Plans and Specifications. At least 60 days prior to the start of any construction, the licensee must file final design documents with the Secretary of the Commission, preferably through eFiling. The licensee must also submit two hard copies of the documents to the Division of Dam Safety and Inspections (D2SI) – New York Regional Engineer. The design documents must include: final plans and specifications, a supporting design report, a Quality Control and Inspection Program, a Temporary Construction Emergency Action Plan, and a Soil Erosion and Sediment Control Plan. The licensee may not begin construction until the D2SI – New York Regional Engineer has reviewed and commented on the documents, determined that all preconstruction requirements have been satisfied, and authorized start of construction.

Article 302. Cofferdam and Deep Excavation Construction Drawings. Should construction require cofferdams or deep excavations, the licensee must: (1) have a Professional Engineer who is independent from the construction contractor, review and approve the design of contractor-designed cofferdams and deep excavations prior to the start of construction; and (2) ensure that construction of cofferdams and deep excavations is consistent with the approved design. At least 30 days before starting construction of any cofferdams or deep excavations, the licensee must file the approved cofferdam and deep excavation construction drawings and specifications, and the letters of approval with the Secretary of the Commission, preferably through eFiling. The licensee must also submit two hard copies of the documents to the Commission's Division of Dam Safety and Inspections – New York Regional Engineer.

Article 303. Project Modification Resulting from Environmental Requirements. If environmental requirements under this license require modification that may affect the project works or operations, the licensee must consult with the Commission's Division of Dam Safety and Inspections – New York Regional Engineer. Consultation must allow sufficient review time for the Commission to ensure that the proposed work does not adversely affect the project works, dam safety, or project operation.

Article 401. Commission Approval, Filing Reports, Notification, and Filing of Amendments.

(a) Resource Plan Requirements

Conditions found in Appendices A, B, C, and D of this license require the licensee to prepare: (1) upstream and downstream American eel passage design plans (U.S. Department of Interior [Interior] prescription 12.1); (2) a fish passage operation and maintenance plan for American eel passage (Interior prescription 12.5.2) in consultation with Interior and the Maine Department of Marine Resources (Maine DMR); (3) upstream and downstream American eel passage effectiveness plans (Maine Department of Environmental Protection [Maine DEP] Condition C.3.b; and Interior prescriptions 12.6.1 and 12.6.2); (4) upstream and downstream Atlantic salmon passage effectiveness plans (National Marine Fisheries Service [NMFS] condition 1 for implementing reasonable and prudent measure [RPM] 1, condition 2 for implementing RPM 1); and (5) an Atlantic salmon smolt mortality in the impoundment plan (NMFS condition 1 for implementing RPM 3). In addition, Maine DEP and the NMFS require the licensee to: (1) construct upstream passage facilities for alosines in year 15 of the license, which would be operational in year 16 (Maine DEP condition C.2.a and NMFS prescription 7.3.1.c); (2) operate newly constructed fishways for a one season shakedown period (Maine DEP condition C.7.a and NMFS prescription 7.3.4); (3) install full-depth trash racks with 1-inch clear bar spacing, as well as operate the existing downstream fish passage structure(s) and open the log sluice on a schedule determined in consultation with the resource agencies (Maine DEP conditions C.4.b and C.4.c; and NMFS

prescriptions 7.3.2.a and 7.3.2.b); and (4) monitor the effectiveness of the upstream and downstream anadromous fish passage facilities (Maine DEP conditions C.1.d.1.a, C.2.b, and C.3.b; and NMFS prescriptions 7.3.1.d, 7.3.2.c, and 7.3.4). The conditions either do not provide for Commission approval, do not specify when the plan(s) would be filed with the Commission for approval, or do not specifically require design plans or shakedown plans for the required fish passage facilities. Therefore, the due date for filing each plan with the Commission is as specified below:

<b>Conditions</b>	<b>Plan Name</b>	<b>Commission Due Date</b>
Interior prescription 12.1 and 12.3	Upstream American eel fishway design plan	Within 6 months of license issuance
Interior prescription 12.1 and 12.4	Downstream American eel fishway design plan (includes new full-depth trash rack with 1-inch clear bar spacing)	Within 6 months of the issuance date of this license
Interior prescription 12.5.2	Fishway operation and maintenance plan for upstream and downstream American eel passage	Within 6 months of the issuance date of this license
NMFS prescription 7.3.1.c	Upstream alosine fish passage design plan	December 31, 2035
NMFS prescription 7.3.2.a & 7.3.2.b	Downstream anadromous fish passage design plan (includes new full-depth trash rack with 1-inch clear bar spacing)	Within 6 months of the issuance date of this license
Maine DEP condition C.7.a & NMFS prescription 7.3.4	Shakedown plan for newly constructed fishways for American eel and Alosines	Within 6 months of license issuance for eels  December 31, 2035 for alosines
Maine DEP condition C.1.d.1.a, C.2.b, & C.3.b  NMFS prescription 7.3.1.d & 7.3.4  Interior prescription 12.6.1	Upstream diadromous fishway effectiveness study plan(s) for: Atlantic salmon, American eels, and Alosines	Within 2 years of the issuance date of this license for Atlantic salmon  Within 6 months of the issuance date of this license for eels

Conditions	Plan Name	Commission Due Date
NMFS condition 2 for implementing RPM 1		December 31, 2035 for alosines
NMFS prescription 7.3.2.c & 7.3.4  Interior prescription 12.6.2  NMFS condition 1 for implementing RPM 1	Downstream diadromous fishway effectiveness study plan(s) for: Atlantic salmon, American eels, and Alosines	Within 2 years of the issuance date of this license for Atlantic salmon  Within 6 months of the issuance date of this license for Atlantic salmon & eels  December 31, 2035 for alosines
NMFS condition 1 for implementing RPM3	Atlantic salmon smolt mortality in the impoundment plan	Within 2 years of the issuance date of this license

The licensee must include, with each plan filed with the Commission, documentation that the licensee developed the plan after consultation with Interior (through the U.S. Fish and Wildlife Service [FWS]), NMFS, Maine DMR, Maine DEP, and the Penobscot Indian Nation, and received approval from Interior, NMFS, and Maine DEP. Each such plan also must include a provision to file any resulting reports with the Commission, as well as the appropriate agency or agencies. In addition, each report must include any recommended additional operational and structural modifications and/or habitat enhancement measures to provide passage for eels, alosines, and Atlantic salmon, if other proposed passage measures are ineffective.

The Commission reserves the right to make changes to any plan submitted. Upon Commission approval, the plan becomes a requirement of the license, and the licensee must implement the plan or changes in the project operation or facilities, including any changes required by the Commission.

(b) Requirement to Notify Commission of Planned and Unplanned Deviations from License Requirements, and Fulfilling License Requirements

One Maine DEP condition in Appendix A, one Interior prescription in Appendix B and one NMFS prescription in Appendix C would allow the licensee to modify the timing of seasonal American eel, Atlantic salmon, and alosine fishway operations based on empirical passage timing data. Any modification(s) in the seasonal timing of fishway operation must be based on consultation with Maine DEP, Interior, NMFS, Maine DMR, and the Penobscot Indian Nation. Temporary modifications must not exceed 30 days. Any modification exceeding 30 days requires prior Commission approval. The

Commission reserves the right to further modify the timing of fishway operations for any reason, including to address any project or public safety concerns.

<b>Maine DEP Certification Condition No.</b>	<b>NMFS Fishway Prescription Condition No.</b>	<b>Interior Fishway Prescription Condition No.</b>	<b>License Requirement</b>
C.7.e	7.3.3	12.5.1	Timing of seasonal fishway operation

One Maine DEP condition in Appendix A requires the licensee to implement recreation improvements within 3 years of license issuance. Within 90 days of completion of the improvements, the licensee must file with the Commission as-built documentation for all recreation facilities identified in the condition. The documentation may include photographs, aerial photographs, as-built drawings, or other means, provided that the documentation identifies the location and type of all recreation facilities required by the condition and clearly demonstrates the recreation improvements have been constructed in substantial conformity as approved.

<b>Maine DEP Certification Condition No.</b>	<b>NMFS Fishway Prescription No.</b>	<b>Interior Fishway Prescription No.</b>	<b>Filing</b>	<b>Commission Due Date</b>
E			Recreation Facilities As-built Documentation	Within 90 days of completion of recreation enhancements

(c) Requirement to File Amendment Applications

Certain conditions of Maine DEP’s certification in Appendix A, Interior’s prescription in Appendix B, and NMFS’s prescription in Appendix C contemplate unspecified long-term changes to project operation or facilities for the purposes of complying with the agencies’ fishway prescriptions or mitigating environmental impacts (e.g., Conditions C.1.d.2, C.2.c., C.4.f, C.5.c, and C.6.b of Maine DEP’s certification, Condition 12.6.2 of Interior’s prescription, and Conditions 7.3.1 and 7.3.2 of NMFS’s prescription require fishway effectiveness monitoring and potential additional protective measures or alternative actions to ensure that passage criteria are met). Such changes may not be implemented without prior Commission authorization granted after the filing of an application to amend the license.

Article 402. Operation Compliance Monitoring Plan. Within 90 days of license issuance, the licensee must file, with the Commission for approval, a revised Operations

Monitoring Plan as required by Maine Department of Environmental Protection's (Maine DEP) conditions A and B (Appendix A) that is based on, and includes the provisions of the Operations Monitoring Plan, filed on September 14, 2018, with the following additions:

- (1) methods for estimating outflows from the fishways;
- (2) procedures for maintaining and calibrating the water level sensor;
- (3) clarification on the turbine units to be used when conducting tests to verify the accuracy of the existing curves used to monitor flows that pass through the turbines;
- (4) file the existing water-to-wire efficiency testing reports for turbine units 2 and 3 with the Commission;
- (5) a provision to identify a schedule for conducting the first verification testing event, to occur no more than 2 years after installation of the full-depth trash racks with 1-inch clear bar spacing;
- (6) methods and schedule for verifying the accuracy of outflow estimates through the log sluice, roller gate, spillway, and fish passages;
- (7) methods and schedule for verifying the accuracy of outflow estimates using in-stream field measurements during the first verification testing event;
- (8) methods and schedule for recalibrating the existing curves if the verification testing indicates the existing curves are inaccurate; and
- (9) the head at which all verification testing will be conducted.

The revised Operations Monitoring Plan must be developed after consultation with Maine DEP, Maine Department of Marine Resources, Maine Department of Inland Fisheries and Wildlife, National Marine Fisheries Service, U.S. Fish and Wildlife Service, and U.S. Geological Survey. The licensee must include with the plan documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the agencies above, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission for approval. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project specific information.

The Commission reserves the right to require changes to the plan. Implementation of the plan must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee must implement the plan, including any changes required by the Commission.

Article 403. Project Operation. In addition to implementing the impoundment level requirements of Maine Department of Environmental Protection's (Maine DEP) condition A (Appendix A) and minimum flow requirements of Maine DEP's condition B (Appendix A), the licensee must operate the Mattaceunk Project in a run-of-river mode with year round use of the 4-foot-high flashboards such that average daily outflow approximates average daily inflow.

The run-of-river, impoundment level, and minimum flow requirements may be temporarily modified as follows:

#### Planned Deviations

Run-of-river operation, impoundment level, and minimum flow requirements may be temporarily modified for short periods, of up to 3 weeks, after mutual agreement among the licensee and the U.S. Fish and Wildlife Service, National Marine Fisheries Service, Maine DEP, and Maine Department of Marine Resources (collectively, resource agencies). After concurrence from the resource agencies, the licensee must file a report with the Secretary of the Commission as soon as possible, but no later than 14 calendar days after the onset of the planned deviation. Each report must include: (1) the reasons for the deviation and how project operations were modified, (2) the duration and magnitude of the deviation, (3) any observed or reported environmental effects and how potential effects were evaluated, and (4) documentation of consultation with the resource agencies. For planned deviations exceeding 3 weeks, the licensee must file an application for a temporary variance from operational requirements, and receive Commission approval prior to implementation.

#### Unplanned Deviations

Run-of-river operation, impoundment level, and minimum flow requirements may be temporarily modified if required by operating emergencies beyond the control of the licensee (*i.e.*, unplanned deviations). For any unplanned deviation that lasts longer than 3 hours *or* results in visible environmental effects such as a fish kill, turbidity plume, bank erosion, or downstream flooding, the licensee must file a report as soon as possible, but no later than 14 days after each such incident. The report must include: (1) the cause of the deviation, (2) the duration and magnitude of the deviation, (3) any pertinent operational and/or monitoring data, (4) a timeline of the incident and the licensee's response, (5) any comments or correspondence received from the resource agencies, or confirmation that no comments were received from the resource agencies, (6) documentation of any observed or reported environmental effects, and (7) a description of measures implemented to prevent similar deviations in the future.

For unplanned deviations lasting 3 hours or less that do not result in visible environmental effects, the licensee must file an annual report, by March 1, describing each incident that occurred during the prior January 1 through December 31 time period. The report must include for each 3 hours or less deviation: (1) the cause of the deviation, (2) the duration and magnitude of the deviation, (3) any pertinent operational and/or

monitoring data, (4) a timeline of the incident and the licensee's response to each deviation, (5) any comments or correspondence received from the resource agencies, or confirmation that no comments were received from the resource agencies, and (6) a description of measures implemented to prevent similar deviations in the future.

Article 404. *American Eel Downstream Passage Measures.* The licensee must file a downstream passage plan for American eels in accordance with U.S. Department of Interior's prescriptions 12.1 and 12.4 (Appendix B) and Article 401(a) of the license. In addition to turbine shut-downs and installing a full-depth trash rack with 1-inch clear bar spacing, the downstream eel passage measures included in the plan must also include opening the project's roller gate during the downstream eel migratory season.

Article 405. *American Eel Upstream and Downstream Passage Monitoring Plans.* In accordance with U.S. Department of Interior's prescription 12.6 (Appendix B), the licensee must develop fish passage effectiveness monitoring plans for upstream American eel passage (prescription 12.6.1) and downstream American eel passage (prescription 12.6.2). In addition to the provisions included in prescription 12.6, the plans must include:

- (1) goals and objectives of the monitoring;
- (2) performance criteria for determining the success of the eel passage measures;
- (3) methodology used to monitor the effectiveness and efficiency of the upstream and downstream passage measures, as applicable; and
- (4) provisions for reporting the results of the monitoring and consultation with the U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NMFS), the Maine Department of Marine Resources (Maine DMR), and the Maine Department of Environmental Protection (Maine DEP) regarding the results (to include an annual meeting) and allowing the agencies 30 days to review the results and provide any recommendations for (a) additional monitoring studies, or (b) operational and structural modifications and/or habitat enhancement measures to improve eel passage.

Article 406. *Fish Passage Operations and Maintenance.* Within 1 year of license issuance, the licensee must file, with the Commission for approval, a Fish Passage Operations and Maintenance Plan as required by Maine Department of Environmental Protection's (Maine DEP) condition C.7 (Appendix A) and the terms and conditions for implementing reasonable and prudent measure 2 of National Marine Fisheries Service's (NMFS) biological opinion incidental take statement (Appendix D). The Fish Passage Operations and Maintenance Plan must be based on, and include the provisions of the final Fish Passage Operations and Maintenance Plan, filed on August 31, 2016, with the following additions:

- (1) clear debris from the trash racks of all turbine intakes prior to the migration season, and determine the frequency of debris clearing during the migration season;
- (2) identify methods to visually monitor flows in the downstream surface bypass pipe to detect debris blockages during the fish passage season;
- (3) clear debris from the downstream surface bypass pipe when blockages are detected;
- (4) perform routine fishway maintenance before the migration season as required by Maine DEP's condition C.7 (Appendix A);
- (5) develop and include procedures for shutting down fishways and for fishway operation and maintenance during emergencies as required by Maine DEP's condition C.7 (Appendix A);
- (6) operate the upstream eel fishway required by U.S. Department of Interior's prescription 12.2.1 (Appendix B) for a one-season "shakedown" period as required by Maine DEP's condition C.7 (Appendix A);
- (7) draft an annual report as required by Maine DEP's condition C.7 (Appendix A) that must be filed with the Commission and include periods of fishway operation, maintenance, and shutdowns; and
- (8) review the plan each year with NMFS, U.S. Fish and Wildlife Service (FWS), Maine Department of Marine Resources (Maine DMR), Maine DEP, and Penobscot Indian Nation, as required by the terms and conditions for implementing reasonable and prudent measure 2 of NMFS's biological opinion incidental take statement (Appendix D).

All additions to the Fish Passage Operations and Maintenance Plan must be developed after consultation with NMFS, FWS, Maine DEP, Maine DMR, and the Penobscot Indian Nation. The licensee must include with the plan documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the agencies above, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission for approval. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project specific information.

The Commission reserves the right to require changes to the Fish Passage Operations and Maintenance Plan. Implementation of the plan must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee must implement the plan, including any changes required by the Commission.

Article 407. Atlantic Salmon Species Protection Plan. Within 90 days of license issuance, the licensee must file, with the Commission for approval, a revised Atlantic Salmon Species Protection Plan. The plan must be based on, and include the provisions of, the final Atlantic Salmon Species Protection Plan, filed on August 31, 2016, as Attachment A of Volume V of the Final License Application, with the following revisions:

- (1) identify when to begin implementation of phased spill measures for downstream passage of smolts, with the restriction that phased spill measures would be implemented after a minimum of 1 year and a maximum of 3 years of conducting downstream passage effectiveness studies for smolts, and non-spill passage measures;
- (2) identify the 3-week period during which any log sluice or phased spill measures would occur for downstream passage of smolts;
- (3) remove the provision requiring stocking uniquely marked smolts upstream of Weldon Dam in the first 3 years after license issuance to serve as a source imprinted adult salmon used for studying upstream passage of adults and downstream passage of kelts; and
- (4) remove the provisions requiring reevaluation of upstream and downstream passage effectiveness every 10 years.

The revised Atlantic Salmon Species Protection Plan must be developed after consultation with the National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (FWS), Maine Department of Marine Resources (Maine DMR), and Penobscot Indian Nation. The licensee must include with the plan, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the agencies above, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project specific information.

The Commission reserves the right to require changes to the plan. Implementation of the plan must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee must implement the plan, including any changes required by the Commission.

Article 408. Atlantic Salmon Incidental Take Monitoring and Reporting. Within six months of license issuance, the licensee must file with the Commission for approval, a plan that describes how it will monitor and report all project-related observations of dead or injured Atlantic salmon to the National Marine Fisheries Service (NMFS) and the

Commission as required by reasonable and prudent measures 2 and 4 of NMFS's biological opinion incidental take statement (Appendix D).

The licensee must prepare the plan after consultation with NMFS. The licensee must include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to NMFS, and specific descriptions of how NMFS's comments are accommodated by the plan. The licensee must allow a minimum of 30 days for NMFS to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project specific information.

The Commission reserves the right to require changes to the plan. Implementation of the plan must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee must implement the plan, including any changes required by the Commission.

Article 409. *Seasonal Restriction on Tree Removal.* To protect northern long-eared bat habitat, the licensee must limit non-hazardous tree removal to November 1 through March 31, which is outside of the northern long-eared bat pup season (June 1 to July 31), and the broader active season (April 1 to October 31). Tree-removal is defined herein as cutting down, harvesting, destroying, trimming, or manipulating in any other way the non-hazardous trees, saplings, snags, or any other form of woody vegetation likely to be used by northern long-eared bats (i.e., woody vegetation greater than or equal to 3 inches diameter at breast height).

Article 410. *Reservation of Authority to Prescribe Fishways.* Authority is reserved to the Commission to require the licensee to construct, operate, and maintain, or provide for the construction, operation, and maintenance of such fishways as may be prescribed by the Secretary of the Interior and the Secretary of Commerce pursuant to section 18 of the Federal Power Act.

Article 411. *Programmatic Agreement and Historic Properties Management Plan.* The licensee must implement the "Programmatic Agreement between the Federal Energy Regulatory Commission and the Maine State Historic Preservation Officer for Managing Historic Properties that may be affected by Issuing a License to Great Lakes Hydro America, LLC for the Operation of the Mattaceunk Hydroelectric Project in Aroostook and Penobscot Counties, Maine," executed on October 10, 2018 by the Maine State Historic Preservation Officer (SHPO), and including but not limited to the Historic Properties Management Plan (HPMP) for the project. Pursuant to the requirements of this Programmatic Agreement, the licensee must file, for Commission approval, a HPMP within one year of issuance of this order. When filing the HPMP for Commission approval, the licensee must include documentation of consultation with the Maine SHPO

and the Penobscot Indian Nation Tribal Historic Preservation Officer (THPO) during the development of the HPMP.

The Commission reserves the authority to require changes to the HPMP at any time during the term of the license. If the Programmatic Agreement is terminated prior to Commission approval of the HPMP, the licensee must obtain approval from the Commission, the Maine SHPO, and the Penobscot Indian Nation THPO before engaging in any ground-disturbing activities or taking any other action that may affect any historic properties within the project's area of potential effects.

Article 412. Use and Occupancy. (a) In accordance with the provisions of this article, the licensee must have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee must also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee must take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 water craft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee must require multiple use and occupancy of facilities for access to project lands or waters. The licensee must also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee must: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control

erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the impoundment shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project impoundment. No later than January 31 of each year, the licensee must file with the Commission a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 water craft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must file a letter with the Commission, stating its intent to convey the interest and briefly describing

the type of interest and location of the lands to be conveyed (a marked Exhibit G map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Commission's authorized representative, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee must consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee must determine that the proposed use of the lands to be conveyed is not inconsistent with any approved report on recreational resources of an Exhibit E; or, if the project does not have an approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed must not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the grantee must take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee must not unduly restrict public access to project lands and waters.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project must be consolidated for consideration when revised Exhibit G drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article must not apply to any part of the public lands and reservations of the United States included within the project boundary.

(H) The licensee must serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(I) This order constitutes final agency action. Any party may file a request for rehearing of this order within 30 days from the date of its issuance, as provided in section 313(a) of the Federal Power Act, 16 U.S.C. § 825*l*, and section 385.713 of the Commission's regulations, 18 C.F.R. § 385.713. The filing of a request for rehearing does not operate as a stay of the effective date of this license or of any other date specified in this order. The licensee's failure to file a request for rehearing will constitute acceptance of this order.

for  
Terry L. Turpin  
Director  
Office of Energy Projects

**Form L-3**  
(October, 1975)

**FEDERAL ENERGY REGULATORY COMMISSION**

**TERMS AND CONDITIONS OF LICENSE FOR CONSTRUCTED  
MAJOR PROJECT AFFECTING NAVIGABLE  
WATERS OF THE UNITED STATES**

**Article 1.** The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

**Article 2.** No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

**Article 3.** The project area and project works shall be in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

**Article 4.** The project, including its operation and maintenance and any work incidental to additions or alterations authorized by the Commission, whether or not conducted upon lands of the United States, shall be subject to the inspection and

supervision of the Regional Engineer, Federal Energy Regulatory Commission, in the region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him such information as he may require concerning the operation and maintenance of the project, and any such alterations thereto, and shall notify him of the date upon which work with respect to any alteration will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall submit to said representative a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of any such alterations to the project. Construction of said alterations or any feature thereof shall not be initiated until the program of inspection for the alterations or any feature thereof has been approved by said representative. The Licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

**Article 5.** The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights or occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

**Article 6.** In the event the project is taken over by the United States upon the termination of the license as provided in Section 14 of the Federal Power Act, or is transferred to a new licensee or to a non-power licensee under the provisions of Section

15 of said Act, the Licensee, its successors and assigns shall be responsible for, and shall make good any defect of title to, or of right of occupancy and use in, any of such project property that is necessary or appropriate or valuable and serviceable in the maintenance and operation of the project, and shall pay and discharge, or shall assume responsibility for payment and discharge of, all liens or encumbrances upon the project or project property created by the Licensee or created or incurred after the issuance of the license: Provided, That the provisions of this article are not intended to require the Licensee, for the purpose of transferring the project to the United States or to a new licensee, to acquire any different title to, or right of occupancy and use in, any of such project property than was necessary to acquire for its own purposes as the Licensee.

**Article 7.** The actual legitimate original cost of the project, and of any addition thereto or betterment thereof, shall be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.

**Article 8.** The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may be mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

**Article 9.** The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

**Article 10.** The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other

projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

**Article 11.** Whenever the Licensee is directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission shall determine to be equitable, and shall pay to the United States the cost of making such determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the United States, the Licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the cost of making the determinations pursuant to the then current regulations of the Commission under the Federal Power Act.

**Article 12.** The United States specifically retains and safeguards the right to use water in such amount, to be determined by the Secretary of the Army, as may be necessary for the purposes of navigation on the navigable waterway affected; and the operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Secretary of the Army may prescribe in the interest of navigation, and as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Secretary of the Army may prescribe in the interest of navigation, or as the Commission may prescribe for the other purposes hereinbefore mentioned.

**Article 13.** On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice

and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

**Article 14.** In the construction or maintenance of the project works, the Licensee shall place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the Licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life. None of the provisions of this article are intended to relieve the Licensee from any responsibility or requirement which may be imposed by any other lawful authority for avoiding or eliminating inductive interference.

**Article 15.** The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

**Article 16.** Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

**Article 17.** The Licensee shall construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration

to the needs of the physically handicapped, and shall comply with such reasonable modifications of the project, as may be prescribed hereafter by the Commission during the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested Federal or State agencies, after notice and opportunity for hearing.

**Article 18.** So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

**Article 19.** In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

**Article 20.** The Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

**Article 21.** Material may be dredged or excavated from, or placed as fill in, project lands and/or waters only in the prosecution of work specifically authorized under the license; in the maintenance of the project; or after obtaining Commission approval, as appropriate. Any such material shall be removed and/or deposited in such manner as to reasonably preserve the environmental values of the project and so as not to interfere with traffic on land or water. Dredging and filling in a navigable water of the United States shall also be done to the satisfaction of the District Engineer, Department of the Army, in charge of the locality.

**Article 22.** Whenever the United States shall desire to construct, complete, or improve navigation facilities in connection with the project, the Licensee shall convey to

the United States, free of cost, such of its lands and rights-of-way and such rights of passage through its dams or other structures, and shall permit such control of its pools, as may be required to complete and maintain such navigation facilities.

**Article 23.** The operation of any navigation facilities which may be constructed as a part of, or in connection with, any dam or diversion structure constituting a part of the project works shall at all times be controlled by such reasonable rules and regulations in the interest of navigation, including control of the level of the pool caused by such dam or diversion structure, as may be made from time to time by the Secretary of the Army.

**Article 24.** The Licensee shall furnish power free of cost to the United States for the operation and maintenance of navigation facilities in the vicinity of the project at the voltage and frequency required by such facilities and at a point adjacent thereto, whether said facilities are constructed by the Licensee or by the United States.

**Article 25.** The Licensee shall construct, maintain, and operate at its own expense such lights and other signals for the protection of navigation as may be directed by the Secretary of the Department in which the Coast Guard is operating.

**Article 26.** If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

**Article 27.** The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

**Article 28.** The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

**APPENDIX A****Water Quality Certificate Conditions for the Mattaceunk Hydroelectric Project  
issued by the Maine Department of Environmental Protection  
Order No. L-10124-33-K-M, on June 25, 2020****A. WATER LEVELS**

1. Except as temporarily modified by: 1) approved maintenance activities, 2) extreme hydrologic conditions,<sup>1</sup> 3) emergency electrical system conditions,<sup>2</sup> or 4) agreement between the Applicant, the Department, and appropriate state and/or federal agencies as appropriate, the daily Project impoundment water level in the Mattaceunk impoundment water level fluctuations shall be maintained no lower than 2.0 feet below (238.0 feet) the crest of the 4-foot-high flashboards (240.0 feet) when the flashboards are fully installed or no lower 1.0 feet below (235.0 feet limit) the sill elevation (236.0 feet) of the Mattaceunk dam when the flashboards are not fully installed.
2. The Applicant shall, within six months of issuance of a New License for the Project by FERC or upon such other schedule as established by FERC, update its Final Operations Monitoring Plan, describing how the Project impoundment water levels required by Part A of this condition are provided and monitored.

**B. MINIMUM FLOWS**

1. Except as temporarily modified by: 1) approved maintenance activities, 2) extreme hydrologic conditions (see footnote 16) 3) emergency electrical system conditions (see footnote 17), or 4) agreement between the Applicant, the

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<sup>1</sup> For the purposes of this certification, “extreme hydrologic conditions” means the occurrence of events beyond the Applicant’s control, such as, but not limited to, abnormal precipitation, extreme runoff, flood condition, ice condition or other hydrologic conditions such that the operational restrictions and requirements contained herein are impossible to achieve or are inconsistent with the safe operation of the Project.

<sup>2</sup> For the purposes of this certification, “emergency electrical system conditions” means operating emergencies beyond the Applicant’s control which require changes in flow regimes to eliminate such emergencies which may in some circumstances include, but are not limited to, equipment failure or other temporary abnormal operating conditions, generating unit operation or third-party mandated interruptions under power supply emergencies, and orders from local, state, or federal law enforcement or public safety authority.

Department, and state and/or federal agencies as appropriate, a total minimum flow of 1,674 cfs or inflow, whichever is less, and a daily average minimum flow of 2,393 cfs from July 1 through September 30 or 2,000 cfs from October 1 through June 30, shall be released from the Project to protect downstream fish and aquatic resources, unless inflow is less than the stated daily average minimum flows, in which case outflow from the Project would equal the inflow to the Project.

2. The Applicant shall, within six months of issuance of a new license for the Project by FERC or upon such other schedule as established by FERC, update its Final Operations Monitoring Plan, describing how the minimum flow releases required by Part A of this condition are provided and monitored.

## C. FISH PASSAGE

### 1. ATLANTIC SALMON UPSTREAM PASSAGE

- a. The Applicant shall continue to operate the existing upstream fish passage facility annually from May 1 to November 10 for adult Atlantic salmon.
- b. If required by NMFS, the Applicant shall provide counts of adult Atlantic salmon that exit the fishway and enter the headpond to, and in consultation with, MDMR, USFWS, and NMFS.
- c. The Applicant shall continue to provide 7 cfs of auxiliary attraction water to the fishway entrance via a gravity-fed pipe.
- d. The Applicant shall implement the following measures in support of the federally endangered Gulf of Maine Distinct Population Segment of Atlantic salmon:
  1. The Applicant shall coordinate with MDMR, USFWS, and NMFS to stock uniquely marked Atlantic salmon smolts originating from the Green Lake National Fish Hatchery upstream of the Mattaceunk dam, to study upstream passage of adults and downstream passage of kelts at the Project.
    - a. The Applicant shall conduct up to three years of upstream fishway effectiveness testing utilizing these uniquely marked fish. An Effectiveness Testing Plan shall be designed in consultation with MDMR, USFWS, NMFS and other state and

federal resource agencies, and shall be reviewed and approved by the Department prior to implementation.

2. The Applicant shall adopt additional operations, structural modifications and/or habitat enhancement measures, if necessary, to improve upstream migration of Atlantic salmon adults.

## 2. ALOSINE UPSTREAM PASSAGE

- a. The Applicant shall, within 15 years of issuance of a new license for the Project by FERC, install a new upstream fish passage structure for alosines, to be operational by year 16. The new upstream fish passage facility shall be designed in consultation with MDMR, USFWS, NMFS and other state and federal resource agencies as appropriate, and shall be reviewed and approved by the Department prior to installation.
- b. Following construction of a new upstream fish passage facility, the Applicant shall conduct two years of study to assess the effectiveness of the new facility for passing adult alewife, American shad, and blueback herring upstream of the Project. An Upstream Effectiveness Testing Plan shall be designed in consultation with MDMR, USFWS, NMFS and other state and federal resource agencies, and shall be reviewed and approved by the Department prior to implementation.
- c. The Applicant shall conduct additional operational, structural modifications, and/or habitat enhancement measures, as determined necessary by the Department, in consultation with MDMR and other state and federal resource agencies, to provide alosine passage in accordance with passage criteria based on a review of the performance of comparable fish passage measures in New England.

## 3. EEL UPSTREAM PASSAGE

- a. Within two years of issuance of a new license for the Project by FERC the Applicant shall install an upstream passage facility for American eel at the Mattaceunk Project.
  1. The upstream eel passage facility shall be located in consultation with MDMR, USFWS, and NMFS.
  2. The upstream eel passage facility shall be designed in consultation with MDMR, USFWS, and NMFS, which shall be provided review of the 30%, 60% and 90% design drawings.

- b. The Applicant shall conduct one year of effectiveness testing; An Effectiveness Testing Plan shall be designed in consultation with MDMR, USFWS, NMFS and other state and federal resource agencies, and shall be reviewed and approved by the Department prior to implementation.

4. DOWNSTREAM PASSAGE IMPROVEMENTS - ATLANTIC SALMON

- a. The Applicant shall continue to operate the existing downstream fish passage facility from April 1 to June 15 for downstream migrating Atlantic salmon smolts and kelts and from October 17 to December 1 for kelts.
- b. Within two years of issuance of a new license by FERC, the Applicant shall install new full-depth trashracks having one-inch clear spacing; the trashracks must be deployed from April 1 to June 15 and from August 1 to December 1, annually, to protect American eel and Atlantic salmon smolts and kelts from entrainment.
- c. Beginning in the first passage season following issuance of a new license by FERC, the Applicant shall open the Project's log sluice for three weeks, annually, and shall provide a flow of water between 3% and 9% of station capacity (between 225 cfs and 690 cfs) in support of downstream migrating Atlantic salmon smolts. The three-week period shall be determined in consultation with MDMR, USFWS, and NMFS and will be based on environmental factors including river temperatures and flows.
- d. The Applicant shall conduct up to three years of \*effectiveness studies including a one-year voluntary assessment of impoundment mortality, designed in consultation with MDMR, USFWS, and NMFS, to assess sources of impoundment mortality and the effectiveness of the existing fish passage operations to pass Atlantic salmon smolts and kelts downstream in a safe, timely, and effective manner under implementation of new measures, including operation of the log sluice and installation of the 1-inch clear spacing full-depth trashracks.
- e. In accordance with its Species Protection Plan for the protection of Atlantic salmon, the Applicant shall implement the appropriate adaptive management measures to address performance criteria for downstream passage for Atlantic salmon smolts and kelts, should the proposed

measures be found inadequate, as determined in consultation with the Department, MDMR and other state and federal resource agencies.

- f. The Applicant shall adopt additional operational and structural modifications and/or habitat enhancement measures, if necessary, as determined by the Department in consultation with MDMR and other state and federal resource agencies, to address outmigrating Atlantic salmon smolts and kelts.

5. DOWNSTREAM PASSAGE IMPROVEMENTS - AMERICAN EEL

- a. Within two years of issuance of a new license by FERC, the Applicant shall institute annual nighttime turbine shutdowns (between 8:00 P.M. and 4:00 A.M.) in combination with installation of 1-inch clear spacing full-depth trashracks and roller gate operations, to support downstream migrating American eels. The seasonal schedule for downstream eel passage operations will be determined in consultation with the agencies and based on a predictive model for eel movement through the Project.
- b. The Applicant shall conduct two years of studies, designed in consultation with MDMR, USFWS, and NMFS, to determine the effectiveness of the nighttime shutdowns, installation of the full-depth trashracks with 1-inch clear spacing, and water releases from the roller gate at passing American eels downstream in a safe, timely, and effective manner. Such Effectiveness Studies shall be reviewed and approved by the Department. During these two years of studies the downstream fish passage season for American eel will be from August 1 to October 31. Following the studies, the fish passage season for American eel may be modified on the basis of these study results and in consultation with MDMR, USFWS and NMFS.
- c. The Applicant shall implement additional operational and/or structural modifications and/or habitat enhancement measures, if necessary, in consultation with MDMR, USFWS, and NMFS, to improve eel passage at the Project (passage criteria for eels shall be based on a review of the performance of comparable fish passage measures in New England).

6. DOWNSTREAM PASSAGE IMPROVEMENTS - ALOSINE

- a. Beginning the year after a new upstream fish passage facility for alosines becomes operational, the Applicant shall extend the annual seasonal operation of the downstream fishway and log sluice operation (providing downstream flows between 225 cfs and 690 cfs) from June 1 to

November 30, as necessary, based on two years of studies to determine the effectiveness of the facility in passing juvenile and adult alosines downstream. Such studies shall be designed in consultation with MDMR, USFWS, NMFS, and other state and federal resource agencies.

- b. The Applicant shall implement additional operational and structural modifications and/or habitat enhancement measures, if determined necessary by the Department, in consultation with MDMR, USFWS and NMFS, to improve downstream alosine passage (passage criteria for alosines shall be based on a review of performance of comparable fish passage measures in New England).

## 7. GENERAL PROVISIONS FOR FISH PASSAGE

- a. Once each new fish passage facility is constructed or an existing one is modified, the Applicant will operate each fish passage facility for a one-season “shakedown” period to ensure that it is generally operating as designed and to make minor adjustment to the facilities and operation. The Applicant shall provide to MDMR, USFWS, and NMFS a copy of the as-built fishway drawings as submitted to FERC.
- b. In consultation with MDMR, USFWS, and NMFS, the Applicant shall draft and maintain a written Fish Passage Operations and Maintenance Plan (FPOMP) for the upstream and downstream fishways associated with the Mattaceunk Project. The FPOMP will include general schedules of routine maintenance, procedures for routine operation, procedures for monitoring and reporting on the operation of each fish passage facility or measure, schedules and procedures for annual start-up and shut-down, and procedures for emergency and scheduled Project outages significantly affecting fishway operations. Copies of the FPOMP and any revisions made during the term of the license shall be provided to MDMR, USFWS, and NMFS.
- c. The Applicant shall, consistent with safe working practices \*and the Project’s Fish Passage Operations and Maintenance Plan, maintain the fishways in proper working order and shall keep fishway areas clear of trash, logs, and material that may hinder passage. Routine maintenance shall be performed sufficiently before each migratory period such that fishways can be tested and inspected and will be operational during the migratory periods.
- d. The Applicant shall meet with MDMR, USFWS, and NMFS to review fish passage operational data from the previous year, draft an annual

report, and develop an operational plan for the upcoming year, \*if needed. The fish passage operational data should include the number of fish passed daily (by species), daily water and air temperature data, and other related fishway operational information in the event counts are reinstated or requested by the agencies.

- e. Once installed, the Applicant shall maintain and operate permanent fishways during the upstream and downstream migration periods for Atlantic salmon, American shad, blueback herring, alewife, and American eel. The migration periods are based on known information regarding run timing on the Penobscot and other Maine rivers. Any of the operating schedules during these migration periods may be modified during the term of the license based on migration data, new information, and in consultation with MDMR, USFWS, and NMFS. Upon request of the Applicant, the actual dates of operation may be varied in any given year in response to river conditions, maintenance requirements, or annual variability in fish migration patterns, with the approval of MDMR, USFWS, and NMFS, as appropriate.

#### D. WATER QUALITY

Upon any future determination by the Department that operation of the Mattaceunk Project, as approved by this certification and as conditioned by FERC for the Project, may be causing or contributing to a decline in water quality or non-attainment of water quality standards, including standards involving fish passage and habitat for fish and other aquatic life, the Department reserves the right to, in its discretion and upon notice to the Applicant and opportunity for hearing in accordance with its regulations, reopen this certification to consider requiring modifications to this certification or additional conditions, as determined necessary by the Department, to ensure that the Project sufficiently meets all applicable water quality standards and does not cause or contribute to any decline in water quality or non-attainment of any water quality standards, including standards involving fish passage and habitat for fish and other aquatic life.

#### E. RECREATIONAL ACCESS AND USE

- a. The Applicant shall, within three years of issuance of a new license for the Project by FERC or upon such other schedule as established by FERC shall complete installation of the following improvements at the downstream angler access area: (1) a pulley system to assist boaters with moving car-top boats and other small watercraft up and down the existing stairs; and (2) a ramp adjacent to the existing recreation pavilion to provide wheel chair access to the pavilion and its associated picnic table. Within 90 days of completion, the Applicant

shall file with the Department a report documenting the completed recreation improvements. The documentation may include photographs, aerial photographs, as-built drawings, or other means, provided that the documentation clearly demonstrates the recreation improvements have been constructed in substantial conformity as approved.

- b. The Applicant must operate and maintain the following recreational facilities for the term of the license: (1) the existing canoe portage located on the western side of the impoundment with a take-out about 650 feet upstream from the dam and put-in below the dam; and (2) the Downstream Angler Access Area, located on the east bank of the Penobscot River which includes angler access via stairs from the parking area to the river, a covered picnic area adjacent to the parking area, and parking for six to eight vehicles.

#### F. LIMITS OF APPROVAL

This approval is limited to and includes the proposals and plans contained in the application and supporting documents submitted and affirmed to by the Applicant. Any variations from the plans and proposal contained in said documents are subject to the review and approval of the Department prior to implementation.

#### G. COMPLIANCE WITH APPLICABLE LAWS

The Applicant shall secure and appropriately comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements and orders required for the operation of the Project, in accordance with the terms of this certification.

#### H. EFFECTIVE DATE

This Water Quality Certification shall be effective concurrent with the effective date of the New License issued for the Project by FERC.

#### I. SEVERABILITY

In the event that any provision or part thereof of this certification is declared to be unlawful by a reviewing court, the remainder of the certification shall remain in full force and effect and shall be construed and enforced in all respects as if such unlawful provision or part thereof had been omitted, unless otherwise direct by the court.

## APPENDIX B

### U.S. Department of the Interior – U.S. Fish and Wildlife Service Section 18 Fishway Prescription Filed May 23, 2017

#### 12.1 TIMING OF PASSAGE IMPLEMENTATION

American eel are currently present in the Penobscot River watershed and at the Mattaceunk Project and would benefit from immediate implementation of safe, timely, and effective upstream and downstream passage. The Commission will need to include appropriate license articles requiring preparation of detailed design plans, installation schedules and studies to evaluate effectiveness of all upstream and downstream measures to be developed in consultation with the Service and other resource agencies. In order to allow for proper consultation with resources agencies and approval by the Commission of all design plans, permanent American eel upstream and downstream passage must be operational no later than 2 years after the date of issuance of a new license.

#### 12.2 DESIGN CRITERIA

##### 12.2.1 DESIGN POPULATION

The Licensee will design upstream and downstream fish passage for American eels that is sufficient to pass all available upstream and downstream migrating eels that arrive at the Project.

The total number of American eels reaching the Projects depends on a number of factors, including the overall efficiency and cumulative losses of eels attempting to migrate upstream at the Milford, Orono, Stillwater, and West Enfield dams. The Service does not have a precise estimate of the number of eels that would be expected to use upstream fish passage at the Project. Given the cumulative effect from the dams below the Project and the presence of eel at the Project, fish passage will enhance the American eel population of the western Atlantic Ocean and adjacent continental waters and assist towards achieving state and regional management goals.

##### 12.2.2 AMERICAN EEL PASSAGE EFFICIENCY

The Licensee shall operate the Project to minimize the impact of the Project on upstream migration for juvenile American eel that approach the Project tailwater and spillway. Numerical criteria for upstream American eel passage attraction efficiency may be developed in the future when additional information about eel abundance and movement in the vicinity of the Project becomes available. Once eels have entered an eel ramp, 90 percent must move upstream and exit within 24 hours, based upon standard eel ramp

evaluation methods developed by the Service and MDMR for eel ramp fishways at Maine hydroelectric projects (FERC No's. 2555, 2556, 2364, 2365, 2611, 2574, 2322, 2325, 5073, 2942, 2984, 2931, 2941, and 2932).

The Licensee shall operate the Project to exceed the minimum downstream survival efficiency criterion of 76 percent of the adult (i.e. silver) American eel moving downstream past the Project. This performance standard is based upon Sweka et al. (2014) which indicates that cumulative silver eel survival passing three to four dams—in this case, Mattaceunk, West Enfield dams followed by either Milford dam for eels passing down the main stem, or the Stillwater and Orono dams for eels passing down the Stillwater Branch of the river – must exceed a minimum of 76 percent at each dam, and must be higher to rebuild the American eel population.

### 12.3 UPSTREAM EEL PASSAGE

Within two years of License issuance, the Licensee shall design and construct an eel upstream passage ramp at the west abutment of the spillway. The exact location of this eel fishway and other design criteria to be determined by the U.S. Fish and Wildlife Service following consultation with the licensee and Maine Department of Marine Resources. The design shall be consistent with Service eel passage design criteria contained in the *2017 Fish Passage Engineering Design Criteria Manual* (USFWS 2017).

### 12.4 DOWNSTREAM EEL PASSAGE

Licensee shall shutdown all generation nightly (8 pm to 4 am) from August 1 through October 31 annually to provide out-migrating American eels safe and timely downstream passage. Licensee shall install full depth one inch trash racks, as either permanent structures or seasonal overlays, during the downstream eel passage operations.

### 12.5 FISHWAY OPERATION AND MAINTENANCE

#### 12.5.1 OPERATING DATES

The Licensee shall operate the upstream eel fishway during the months of June through August. The Licensee shall operate the downstream eel fishway during the months of August through October. The seasonal schedule for downstream eel passage operations may be modified in consultation with agencies based upon empirical passage timing data developed for the Project and/or a predictive model for eel movement through the Project waters.

## 12.5.2 FISHWAY OPERATION AND MAINTENANCE PLAN

Within 12 months of license issuance, Licensee will develop a Fishway Operation and Maintenance Plan (FOMP) covering all operations and maintenance of the upstream and downstream fish passage facilities provided for American eel. The FOMP shall be submitted to the Service for review and approval. Thereafter, Licensee will keep the FOMP updated on an annual basis, to reflect any changes in fishway operation and maintenance planned for the year. If the Service requests a modification of the FOMP, Licensee shall amend the FOMP within 30 days of the request and send a copy of the revised FOMP to the Service. Any modifications to the FOMP by Licensee will require approval by the Service prior to implementation. Licensee shall provide information on fish passage operations, and Project generating operations that may affect fish passage, upon written request from the Service. Such information shall be provided within 10 days of the request, or upon a mutually agreed upon schedule.

## 12.6 FISH PASSAGE EFFECTIVENESS MONITORING PLAN

Efficiency testing of both upstream and downstream American eel passage is critical to evaluating the success of the passage structures and operations, diagnosing problems, and determining when fish passage modifications are needed and what modifications are likely to be effective. It is essential to ensuring the effectiveness of fishways over the term of the license, particularly in cases where the changing size of fish populations may also change fish passage efficiency or limit effectiveness.

### 12.6.1 UPSTREAM AMERICAN EEL EFFECTIVENESS MONITORING

The Licensee will develop a Fishway Effectiveness Monitoring Plan (Upstream Plan) in consultation and with the approval of the Service and submit the Upstream Plan to the FERC for approval within six months of license issuance. The Upstream Plan shall include an upstream efficiency study on juvenile American eel at the new upstream eel fishway to determine the upstream passage efficiency of the fishway throughout the upstream migration season.

The Upstream Plan shall include the standard methods required by the Service and MDMR for eel ramp fishways at Maine hydroelectric projects on the Kennebec and Presumpscot Rivers (FERC No's. 2555, 2556, 2364, 2365, 2611, 2574, 2322, 2325, 5073, 2942, 2984, 2931, 2941, and 2932), and other projects. These standard study methods consist of two components; (1) evaluating attraction efficiency to the facility, and (2) evaluating effectiveness passing eels that have entered the upstream eel passage structure. Attraction efficiency shall be assessed with nighttime observations of migrating eels at the Project in comparison to the number of eels passed. Attraction shall be assessed on a minimum of three nights during the first year of operation. Passage effectiveness shall be assessed with captive eels placed in a holding tank at the fishway entrance. A minimum of 100 eels shall be used in the study and 90 percent must pass the fishway within 24

hours, a criterion developed by MDMR and used to assess all of the eel ramps installed at dams on the Kennebec and Presumpscot Rivers, and at other projects.

#### 12.6.2 DOWNSTREAM AMERICAN EEL EFFECTIVENESS MONITORING

The Licensee will develop a Downstream Passage Effectiveness Monitoring Plan (Downstream Plan) in consultation and with the approval of the Service and submit the Downstream Plan to the FERC for approval within six months of license issuance. The Downstream Plan shall demonstrate that downstream passage survival meets the criterion in Section 12.2.2. If this passage rate is not met, then Licensee and the Service will assess passage enhancements including, but not limited to, an extended passage season, 0.75 inch trash rack spacing, a deep bypass gate, or new downstream eel passage facilities based upon angled trash racks (Sojkowski 2017, entire). Licensee will implement the solution selected by the Service.

The Service recommends that silver eel passage effectiveness monitoring be conducted with radio telemetry methods in order to determine migratory delay, route of downstream passage (i.e. via the two surface bypasses, the roll gate, spill, turbines, or spillway), immediate survival, and latent survival passing Mattaceunk Dam.

#### 12.7 FISHWAY INSPECTIONS

The Licensee will provide Service personnel and other Service-designated representatives, timely access to the fish passage facilities at the Project and to pertinent Project operational records for the purpose of inspecting the fishways to determine compliance with the Fishway Prescription.

## APPENDIX C

### U.S. Department of the Commerce – National Marine Fisheries Service Section 18 Fishway Prescription Filed May 23, 2017; modified on June 28, 2018

#### 7.3 Section 18 Modified Fishway Prescription

We hereby submit the following modified fishway prescriptions pursuant to Section 18 of the FPA, 16 USC §811. Section 18 of the FPA states in relevant part that, “the Commission must require the construction, maintenance, and operation by a Licensee of...such fishways as may be prescribed by the Secretary of Commerce or the Secretary of the Interior.” Congress provided guidance on the term “fishway” in 1992 when it stated as follows:

“The items which may constitute a ‘fishway’ under Section 18 for the safe and timely upstream and downstream passage of fish must be limited to physical structures, facilities, or devices necessary to maintain all life stages of such fish, and Project operations and measures related to such structures, facilities, or devices which are necessary to ensure the effectiveness of such structures, facilities, or devices for such fish.” Pub.L. 102-486, Title XVII, § 1701(b), Oct. 24, 1992.

The following mandatory fishway prescriptions are based on the best biological and engineering information available at this time, as described in the explanatory statements that accompany each prescription. This prescription has been developed over a period of several years by our biological and engineering staff, in close consultation with the Licensee, the USFWS and other entities that participated in this relicensing proceeding. Each prescription is supported by substantial evidence contained in the record of pre-filing consultation, and subsequent updates, compiled and submitted in accordance with the Commission’s procedural regulations. The explanatory statements included with each prescription are intended to summarize the supporting information and analysis upon which these prescriptions are based. Our Administrative Record was previously submitted under separate cover (Accession # 20170530-0009).

##### 7.3.1 Upstream Fish Passage – Anadromous Species

The Licensee shall construct, operate and maintain upstream fish passage facilities that pass anadromous fish species in a safe, timely and effective manner consistent with the performance standards described in Section 7.3.4. Based on the fish passage alternative report filed in the FLA, and the best scientific information available at this time, we believe that any one of the following fishways could be satisfy the standard of

safe, timely and effective: a nature-like fishway, fish lift, or vertical slot fishway for alosines and Atlantic salmon in conjunction with the existing pool and weir fishway for Atlantic salmon. We also consider ice harbor fishways to be an acceptable design for passing alosines because they are successful at passing American shad at projects on the U.S. West Coast. However, because the fishway will not be built for another 15 years, and because new studies and testing will occur during this interim time period, the specific performance criteria by which safe, timely and effective passage will ultimately be determined pursuant to the process identified in section 7.3.5.

The Licensee shall keep the fishways in proper order and shall keep fishway areas clear of trash, logs, and material that would hinder passage. Anticipated maintenance shall be performed in sufficient time before a migratory period such that fishways can be tested and inspected and will properly operate prior to the migratory periods.

The Licensee proposed the following actions to increase survival of upstream migrating anadromous fish:

- a. Maintain the existing pool and weir fishway for Atlantic salmon.
- b. Additional operational and structural modifications and/or habitat enhancement measures, if necessary, to address performance standard deficiencies for upstream migrating Atlantic salmon adults.
- c. Installation of an effective upstream passage structure for alosine species in year 15 of the new license, to be operational year 16.
- d. Conduct up to three years of upstream passage monitoring for Atlantic salmon and two years of upstream passage monitoring of alosines.
- e. Additional operational and structural modifications and/or habitat enhancement measures, if necessary, to provide alosine passage (passage criteria for alosine shall be based on a review of the performance of comparable fish passage measures in New England).

We incorporate by reference the GLHA proposed measures in this prescription and further require the following:

- Maintain the trap associated with the existing pool and weir fishway for Atlantic salmon.
- Additional protective measures or alternative actions (e.g., additional fishway entrances, increased attraction flows) may be necessary based on monitoring, and as determined by the resource agencies, to address performance standard deficiencies for upstream migrating Atlantic salmon and alosines.

Additional protective measures or alternative actions (e.g., spillage, turbine shutdowns) may be necessary for Atlantic salmon pending analysis of the Commission's proposed action under section 7 of the ESA and conclusions of our anticipated Biological Opinion.

### 7.3.2 Downstream Fish Passage – Anadromous

The Licensee shall construct, operate and maintain downstream fish passage facilities for anadromous fish species that provide safe, timely and effective downstream passage consistent with the performance standards described in Section 7.3.5. The downstream passage facility shall be comprised of a protective barrier leading to a bypass system. The bypass system shall be comprised of (1) a surface entrance leading to a pipe or sluice to convey fish around the project and discharge to flowing water below the project such as the tailrace with sufficient depth (at least 4 ft.) to avoid injury (USFWS 2017) and (2) increased spill through an opening (e.g., log sluice) adjacent to the powerhouse discharging to flowing water below the project with sufficient depth (at least 4 ft.) to avoid injury. Downstream passage facilities shall be operational within two years after the issuance of a new license. The Licensee shall keep the downstream passage facilities in proper order and clear of trash, logs, and material that would hinder passage. Anticipated maintenance shall be performed in sufficient time before a migratory period such that fishways can be tested and inspected and will operate effectively prior to the migratory periods.

The Licensee proposed the following actions to improve survival of downstream migrating anadromous fish:

- a. Installation of trash racks having 1-inch clear spacing to the full depth of all turbine intakes within two years of license issuance. The trash racks would be deployed during the fish passage season.
- b. Beginning in the first passage season following license issuance, operate existing downstream fishway plus open the log sluice (between 3% and 9% of station capacity or between 225 cfs and 690 cfs) for three weeks. The schedule will be determined in consultation with agencies and based on environmental factors including river temperatures and flows.
- c. Conduct up to three years of downstream passage monitoring for Atlantic salmon and two years of downstream passage monitoring of alosines.
- d. Annual extended seasonal operation of the downstream fishway and log sluice operation (~225 cfs and 690 cfs) from June 1 to December 1, as necessary based on smolt and alosine study results, once upstream passage for alosines (American shad and river herring) is operational (expected year 16 of a new license term).

e. Implement an adaptive management plan to address performance criteria for downstream passage should the proposed measures be inadequate.

f. Additional operational and structural modifications such as spill and/or habitat enhancement measures, if necessary, to address performance standard deficiencies for outmigrating Atlantic salmon smolts and kelts, and alosines.

We incorporate by reference GLHA proposed measures in this prescription and prescribe the following additional measures:

- Additional protective measures or alternative actions such as additional spill or intakes screening sufficient to attain performance standards for outmigrating Atlantic salmon smolts and kelts, and alosines. Additional protective measures for Atlantic salmon will be determined during the section 7 consultation with FERC regarding the issuance of a new license for the Project.
- Point measurements of approach velocities immediately upstream of the intakes and trash racks shall not exceed 2.0 feet per second (fps) within a 2-foot square grid as measured within 6 to 12 inches upstream of the racks.

The proposed actions, including the modifications identified above, provide a reasonable approach for mitigating project impacts on downstream migrating anadromous fish. Additional measures, such as increasing the amount of spill, specific to Atlantic salmon may also be required depending on outcome of the ESA section 7 consultation and requirements of any Incidental Take Statement issued as part of the anticipated Biological Opinion.

### 7.3.3 Seasonal Migration Windows

Fishways shall be operational during the migration windows for each life stage of Atlantic salmon (adults, kelts and smolts), and adults and juveniles of American shad, blueback herring, and alewife. These dates may change based on new information and agency consultation. The migratory seasons for anadromous fish are well known in the major rivers of the Northeast (Loesch 1987, ASMFC 2000). Based on state-wide and Penobscot River watershed specific data, approved fish passage protective measures shall be operational during the follow migration windows:

- a. Upstream alosine (once construction of the new fishway is complete): May 1 to July 31
- b. Upstream Atlantic salmon: May 1 – Nov 10 unless the Milford fishways begins capturing fish earlier in the calendar year in which case the fishway will open prior to May 1

- c. Downstream alosine (once construction of the new fishway is complete):  
June 1 –November 30
- d. Downstream kelt: April 1 to June 15 and October 17 – December 1 or ice in.
- e. Downstream smolt: April 1 to June 15

#### 7.3.4 Passage Performance Standards and Monitoring

The degree to which fish passage facilities are considered safe, timely and effective will be evaluated based on performance criteria. Fishways (upstream and downstream) must operate in a way that complies with any Incidental Take Statement issued as part of the anticipated Biological Opinion. A performance standard of 95% for adult Atlantic salmon upstream passage and 96% for downstream passage of Atlantic salmon smolts and kelts is identified in GLHA's proposed Species Protection Plan. This proposal is consistent with requirements for other projects in the Penobscot River. We note that the upstream and/or downstream passage standards may be modified by the Incidental Take Statement in any Biological Opinion issued by us for this project. When analyzing telemetry test data, individual salmon (smolt or kelt) approaching within 200 meters of the dam structure must pass within 24 hours in order for it to be considered a successful passage attempt that can be applied towards the downstream passage performance standard (i.e., if a fish takes longer than 24 hours it will not be considered to have passed successfully). When analyzing telemetry test data, we anticipate the upstream passage performance standard of 95% will be considered achieved if: 1) 75% of adult test fish pass the project area within 48 hours of approaching the dam; and 2) the remaining 20% of test fish pass the project within 96 hours. The project area is defined as 200 meters downstream of the project dam/powerhouse to the upstream fishway exit. In the event that monitoring results indicate that fishways at the project do not meet the performance criteria for Atlantic salmon, additional operational and structural modifications (e.g., spill) and/or habitat enhancement measures shall be required as determined by the resource agencies and as specified in the adaptive management steps contained in the Atlantic salmon Species Protection Plan or as modified by the Incidental Take Statement in any Biological Opinion issued by NMFS for this project.

Preliminary modelling results from Stich et al. (*in review*) indicate that once passage is provided at a dam, high upstream and downstream passage survival of American shad is necessary, including at the Mattaceunk Project, to reach and maintain population management goals. Fishways that are able to pass shad are able to pass alosines given similarities in swimming performances and behavior (USFWS 2017); accordingly, we have prescribed a fishway that can pass shad in a safe, timely and effective manner. To achieve stated recovery goals for alosines upstream of the Mattaceunk Project, we will require that the Licensee meet fish passage performance standards for American shad and river herring. Because we are not requiring

construction of the new fishway until 2034, and the performance standards need to be based on the best available information at that time, we will delay establishing the performance standards until we can determine what is safe, timely and effective upstream and downstream passage for alosines. Based on currently available information (Stich et al. *in review*), we anticipate that safe, timely and effective passage for shad and river herring is likely to mean that 90% of alosine must pass upstream of the project within 24 hours (and survive the passage attempt) and that 95% of alosines must pass downstream of the project (and survive the passage attempt). This, however may change in the next several years. In the event that monitoring results indicate that fishways at the project do not meet the established performance criteria for American shad or river herring, additional operational and structural modifications (as described above) shall be required as determined by the resource agencies in consultation with the Licensee.

The Licensee shall monitor the ability of Atlantic salmon, American shad, blueback herring and alewife to use the upstream and downstream fish passage facilities. Monitoring for all fish passage facilities is required to ensure they function as designed and intended for providing safe, timely and effective passage. This includes pre-season inspection and maintenance consistent with measures described in 7.3.1 for upstream fishways and 7.3.2 for downstream fishways. Monitoring will help identify potential issues and deficiencies that may affect successful passage. Monitoring should include behavioral responses, numbers and species passing, and condition of the fish passing through the facilities. Based on the results of monitoring, structural or operational modifications may be required to meet the goals of the prescription (FERC 1993, 2004). In this case, we expect that structural or operational modifications would be required if the performance standards outlined in section 7.3.5 are not met.

The Licensee proposed to conduct the following monitoring studies:

- a. Atlantic salmon - up to three years of monitoring for the upstream fishway effectiveness, downstream kelt studies using the returning imprinted adult fish, and smolt downstream passage measures.
- b. Alosine - two years of monitoring for the new upstream and downstream measures.
- c. American eel - one year of monitoring for the upstream eel ramp and two years of monitoring of downstream eel passage.

The proposed timeframes are acceptable; however, additional years may be needed in the event of poor passage performance, extreme weather, or inadequate sampling methodologies. Specific to Atlantic salmon, additional monitoring may be necessary and will be described in any appropriate Incidental Take Statement issued as part of the anticipated Biological Opinion. In addition to the Licensee's proposal, the following is required:

- Study design plans will be developed in consultation with NMFS and state and federal resource agencies. The study design shall be approved by the agencies prior to filing with the Commission for final approval.
- All monitoring will be completed with scientifically accepted practices.
- Monitoring shall begin at the start of the second migratory season after the each fishway facility (Atlantic salmon, alosines and American eel) is operational and shall continue to be conducted for the time frames proposed or as otherwise required. The first season after fishway construction shall be used as a “shake-down” period to ensure the fishway is functioning as designed.
- Reports of the monitoring studies shall be provided to the resource agencies for a minimum 30-day review and consultation prior to submittal to the Commission for final approval.
- The Licensee shall include resource agencies’ comments in the annual reports submitted to the Commission for final review.

### 7.3.5 Fishway Design Review

The Licensee shall submit design plans to the resource agencies for review and consultation during the conceptual, 30, 60 and 90 percent design stages. Conceptual designs shall be provided to the agencies no later than two years before the anticipated operational date. Conceptual designs for the proposed full-depth 1” clear trash racks shall be provided at least six months prior to the first downstream passage season following issuance of any new license by FERC. Following resource agency approval, the Licensee shall submit final design plans to the Commission for final approval prior to the commencement of fishway construction activities; this filing must include all unaddressed resource agency comments. Once the fishway is constructed, final as-built drawings that accurately reflect the project as constructed should be filed with us and the USFWS.

## 7.4 **Reservation of Authority**

This modified prescription was developed in response to the proposals being considered by the Commission in this proceeding, our current policies and mandates, and our understanding of current environmental conditions at the Project. If any of these factors change over the term of the license, then we may need to alter or add to the measures prescribed in this licensing process. Therefore, we hereby reserve authority under Section 18 of the FPA to prescribe such additional or modified fishways at those locations and at such times as we may subsequently determine are necessary to provide for effective upstream and downstream passage of anadromous fish through the Project

facilities, including without limitation, our authority to amend the following fishway prescriptions upon approval by us of such plans, designs, and completion schedules pertaining to fishway construction, operation, maintenance, and monitoring as may be submitted by the Licensee in accordance with the terms of the license articles containing such fishway prescriptions. We propose to reserve authority by requesting that the Commission include the following condition in any license it may issue for the Project:

*Pursuant to Section 18 of the Federal Power Act, the licensee shall build the fishways described in the National Marine Fisheries Service' Prescription for Fishways at the Mattaceunk Project (FERC No.2520). The Secretary of Commerce reserves his authority to prescribe additional or amended fishways as he may decide are required in the future.*

## APPENDIX D

### **Incidental Take Statement, Reasonable and Prudent Measures, and Terms and Conditions included in the National Marine Fisheries Service's Biological Opinion for the Relicensing of the Mattaceunk Project (FERC Project No. 2520) filed August 6, 2020**

#### 10. INCIDENTAL TAKE STATEMENT

Section 9 of the ESA prohibits the take of endangered species of fish and wildlife. "Fish and wildlife" is defined in the ESA "as any member of the animal kingdom, including without limitation any mammal, fish, bird (including any migratory, non-migratory, or endangered bird for which protection is also afforded by treaty or other international agreement), amphibian, reptile, mollusk, crustacean, arthropod or other invertebrate, and includes any part, product, egg, or offspring thereof, or the dead body or parts thereof" (16 U.S.C. §1532(8)). "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by NMFS to include any act that actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns including breeding, spawning, rearing, migrating, feeding, or sheltering. On December 21, 2016, we issued *Interim Guidance on the Endangered Species Term "Harass."*<sup>1</sup> In this guidance, we interpret "harass" to mean to "...create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. "Otherwise lawful activities" are those actions that meet all State and Federal legal requirements except for the prohibition against taking in ESA Section 9 (51 FR 19936, June 3, 1986), which would include any state endangered species laws or regulations. Section 9(g) makes it unlawful for any person "to attempt to commit, solicit another to commit, or cause to be committed, any offense defined [in the ESA]" (16 U.S.C. § 1538(g)). See also 16 U.S.C. § 1532(13) (definition of "person").

An incidental take statement (ITS) exempts action agencies and their permittees from the ESA's section 9 penalties and prohibitions if they comply with the reasonable and prudent measures and the implementing terms and conditions of the ITS. An ITS must specify the amount or extent of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary and appropriate to minimize and/or monitor incidental take and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent

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<sup>1</sup> <http://www.nmfs.noaa.gov/op/pds/documents/02/110/02-110-19.pdf>

measures. The measures described in this section are nondiscretionary. If FERC fails to include these conditions in the license articles or GLHA fails to assume and carry out the terms and conditions of this ITS, the protective coverage of section 7(a)(2) may lapse. To monitor the effect of incidental take, FERC must require GLHA to report the progress of the action and its effect on the GOM DPS to us, as specified in this incidental take statement (50 CFR §402.14(i)(3)).

### 10.1. Amount or Extent of Take

The following sections describe the amount or extent of take that we expect will result from the anticipated consequences of the proposed action. If the proposed action results in take of a greater amount or extent than that described, FERC would need to reinitiate consultation immediately. The exempted take includes only take incidental to the proposed action.

#### *Smolts*

We assume it could take up to 10 years of monitoring and adaptive management to achieve the downstream smolt performance standard of 96%. While we expect downstream passage for smolts to improve at the project during this period, the best available information suggests that smolt survival at the project could be as low as 89.3% during the 10-year adaptive management period.

The best available information suggests that 8.7% of all smolts migrating through the Mattaceunk Project impoundment could be injured or killed during the first 10 years after license issuance. GLHA will implement a plan to identify the sources of mortality of smolts in the impoundment. Following that study, GLHA will reduce and/or eliminate sources of mortality. If that is not possible, GLHA will identify and implement habitat enhancement projects designed to increase productivity of habitats upstream of the project with the goal of increasing the number of smolts migrating through the impoundment. In this case, the percentage of smolts dying in the impoundment may not be reduced.

Therefore, this ITS exempts the following amount of annual take for smolts in the action area:

#### Years 1-10 of the License:

- The death or injury of up to 10.7% (10.2% immediate and 0.5% indirect) of smolts passing the Mattaceunk (Weldon) Dam.
- The harassment of up to 8.8% of salmon smolts due to significant delays in passing the project dam.
- The death or injury of up to 8.7% of smolts migrating through the project impoundment.

- The death of up to 6% of smolts passing the Mattaceunk Project due to dam related mortality experienced in the estuary.

Years 11-40 of the License:

- The harassment, death or injury of up to 4% of smolts passing the Mattaceunk (Weldon) Dam.
- The death or injury of up to 8.7% of smolts migrating through the project impoundment. We note that during this period, operational and/or mitigation measures will be required to result in “no net loss” of smolts.
- The death of up to 6% of smolts passing the Mattaceunk Project due to dam related mortality experienced in the estuary.

*Pre-Spawned Adults*

We assume it could take up to 10 years of monitoring and adaptive management to achieve the upstream adult salmon performance standard of 95%. The best available information indicates the existing upstream fishway at the project has a minimum efficiency of 71%. Therefore, up to 29% of pre-spawn Atlantic salmon run in the action area could be impacted during the 10 year adaptive management period. Of the 29% of Atlantic salmon that do not successfully use the upstream fishway during this period, 1% (or 0.29% of the run) will die based upon an expert panel convened by us in 2010. As an example, for Years 1-10 of the license, for every 100 adults that attempt to pass upstream, we expect that up to 29 will fail to pass and to spawn successfully elsewhere in the river (we consider this to be harassment, with the exception of 1% of those 29 adults that will die); we expect 71 to pass upstream of the dam and access upstream spawning habitat, but up to 50% of those adults will take longer than 48-hours to pass (harassment). In Years 11-40 of the license, for every 100 adults that attempt to pass upstream, we expect up to 5 to fail to pass and to spawn successfully elsewhere in the river (harassment, with the exception of 1% of those 5 adults that will die); we expect 95 to pass upstream of the dam and access upstream spawning habitat, with 75% of those adults passing in less than 48 hours and up to 25% taking up to 96 hours (harassment).

Therefore, this ITS exempts the following amount of annual take for pre-spawned, adult Atlantic salmon in the action area for Years 1-10 of the license:

- The harassment of up to 29% of Atlantic salmon adults that attempt to pass the existing fishway but are unsuccessful and instead spawn elsewhere in the river or return to the ocean.
- The death of up to 1% of the adult salmon that do not pass upstream of the project (i.e., no more than 0.29% of the total adults attempting to pass upstream of the project each year).

- The harassment of up to 50% of adult Atlantic salmon that pass upstream of the project; with the trigger for harassment being met when passage takes longer than 96 hours.

In Years 11-40 of the license, we expect 95% of adults to pass upstream of the dam within 96 hours; of those, no more than 25% will take longer than 48 hours. Of the 5% that fail to pass within 96 hours, some will eventually pass, some will spawn in downstream areas, and 1% will die. The ITS exempts the following amount of annual take for pre-spawned adult Atlantic salmon in the action area for Years 11-40 of the license:

- The harassment of up to 23.75% (25% of the 95% that pass within 96 hours) of Atlantic salmon adults (with harassment considered when a passage attempt takes longer than 48 hours).
- The harm or harassment of up to 4.95% of Atlantic salmon adults (99% of the 5% of salmon that fail to pass) and the death of no more than 0.05% of the total adults attempting to pass upstream. We consider harm to have occurred when a passage attempt takes longer than 96 hours and harassment is considered to have occurred if a fish fails to pass and spawns successfully downstream.

### *Kelts*

The best available information indicates that 75.8% of kelts survive passage at the Mattaceunk Project under no-spill conditions. Therefore, this ITS exempts the death or injury of up to 24.5% of kelts migrating in the action area annually during Years 1-10 of the license. In years 11-40 of the license, this ITS exempts the death or injury of up to 4% of kelts passing the Mattaceunk Project under any flow condition in the Penobscot River.

### *Fish Passage Monitoring*

To assess whether the upstream passage standard for pre-spawned Atlantic salmon is being achieved at the Mattaceunk Project, GLHA will tag up to 50 adults (if/when sufficient adults are available for study) for three years to measure upstream passage efficiency. GLHA will also conduct three years of kelt downstream studies likely using up to 50 post-spawned Atlantic salmon each year. We anticipate that all 300 adults used in adult studies will be handled, tagged, and injured and that up to 2% (six fish) will be killed.

To assess whether the downstream smolt performance standard is being achieved at the Mattaceunk Project, GLHA will tag up to 2,000 hatchery smolts over ten year adaptive management period. All of these fish are anticipated to be injured due to the effects of handling and tag insertion. Up to 2% of the smolts may die due to the effects of handling and tagging.

We will consider take to be exceeded if more than 2% of the tagged fish die prior to release.

GLHA will also conduct studies to assess project-related losses of smolts migrating through the Mattaceunk Project impoundment. For purposes of this analysis, we assume this study will be combined with the downstream passage studies such that no additional take needs to be exempted.

We believe this level of incidental take is a reasonable estimate of incidental take that will occur given the seasonal distribution and abundance of Atlantic salmon in the action area. In the accompanying biological opinion, we determined that this level of anticipated take is not likely to result in jeopardy to the species.

### **10.2. Reasonable and Prudent Measures**

The following reasonable and prudent measures are necessary and appropriate to minimize and monitor incidental take of Atlantic salmon. These reasonable and prudent measures and terms and conditions are in addition to the requirements set forth under the Commission's "Staff Alternative with Mandatory Conditions" as presented in FERC's September 2018 Final Environmental Assessment (FEA) for Hydropower License for the Mattaceunk Project. As those measures will become requirements of any new license issued, we do not repeat them here as they are considered to be part of the proposed action.

The following RPMs are applicable to the FERC:

1. FERC must ensure, through enforceable conditions of the Project license, that the licensee measure and monitor the effectiveness of the proposed fish passage measures as well as measure and monitor the amount and extent of take exempted in the ITS of this Opinion.
2. FERC must ensure, through enforceable conditions of the Project licenses, that the licensee complete an annual monitoring and reporting program to confirm that they are minimizing incidental take and reporting all project-related observations of dead or injured salmon to us.
3. FERC must ensure, through enforceable conditions of the Project license, that the licensee measure and monitor the mortality rate for smolts moving through the project impoundment for a sufficient period of time and through a sufficient variety of in-river conditions (e.g., low flow and high flow springs) to verify the mortality rate of smolts attributable to the impoundment and identify the causes of that mortality. This information will be used to inform the impoundment mortality minimization and/or mitigation program to be implemented by Year 10 of the license.

4. FERC must ensure, through enforceable conditions of the Project license, that the licensee completes an annual monitoring and reporting program to confirm that they are minimizing incidental take for smolt in the project impoundment and reporting all project-related observations of dead or injured salmon to us.

The following RPMs are applicable to GLHA:

5. GLHA must develop and implement a plan to identify the sources of mortality of smolts in the impoundment and develop and implement a plan to minimize the mortality of smolts in the impoundment to a mortality rate equivalent to natural mortality in an appropriate un-impounded reach of the Penobscot River. If it is not possible to reduce the mortality rate, GLHA must develop and implement a plan to carry out mitigation to result in “no net loss” of smolts in the project impoundment by year nine of the license.

### 10.3. Terms and Conditions

In order to be exempt from prohibitions of section 9 of the ESA, FERC and GLHA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and which outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

To implement reasonable and prudent measure #1, FERC must require GLHA to do the following:

1. Prepare in consultation with NMFS a plan to measure the survival performance standard for downstream migrating Atlantic salmon smolts and kelts at the Mattaceunk Project. The plan must be prepared within two years of license issuance. The need for studies will be confirmed in annual consultation with NMFS.
  - a. Require GLHA to measure the survival of downstream migrating Atlantic salmon smolts and kelts at the Mattaceunk Project using a scientifically acceptable methodology.
    - i. Measure the survival of downstream migrating smolts approaching within 200 meters of the trashracks downstream to the point where delayed effects of passage can be quantified. GLHA must coordinate with us in selecting an adequate location for the downstream receivers.
    - ii. A Cormack-Jolly-Seber (CJS) model, or other acceptable approach, must be used to estimate survival rates and associated error bounds.
    - iii. GLHA must consult with us concerning the application of appropriate statistical methodology and must provide an electronic copy of model(s) and data to us.

- b. All tags released in the system should have codes that are not duplicative of tags used by other researchers in the river, including university, state, federal and international tagging programs.
  - c. FERC must only consider the downstream performance standards achieved if, based upon an average of three-years, 96% (point estimate) of smolts and kelts survive downstream passage at the Mattaceunk Project. When analyzing telemetry test data, smolts approaching within 200 meters of the dam structure must pass within 24 hours in order for it to be considered a successful passage attempt that can be applied towards the downstream passage performance standard (i.e., if a fish takes longer than 24 hours it will not be considered to have passed successfully).
2. Prepare, in consultation with us a plan to measure the survival performance standard for upstream migrating pre-spawned Atlantic salmon at the Mattaceunk Project. The plan must be prepared within two years of license issuance. The need for studies will be confirmed in annual consultation with us.
- a. Require GLHA to measure the survival of migrating pre-spawned adult Atlantic salmon using a scientifically acceptable methodology.
    - i. A Cormack-Jolly-Seber (CJS) model, or other acceptable approach, must be used to estimate survival rates and associated error bounds.
    - ii. GLHA must consult with us concerning the application of appropriate statistical methodology and must provide an electronic copy of model(s) and data to us.
  - b. All tags released in the system should have codes that are not duplicative of tags used by other researchers in the river, including university, state, federal and international tagging programs.
  - c. FERC must only consider the upstream performance standard achieved if, based upon an average of three-years, 95% (point estimate) of pre-spawned adult Atlantic salmon approaching the project survive upstream passage. When analyzing telemetry test data, at least 75% of adult test fish pass the project area within 48 hours of approaching the dam; and, 2) the remaining 20% of test fish pass the project within 96 hours. The project area is defined as 200 meters downstream of the project dam/powerhouse to the upstream fishway exit.

In order to maximize the likelihood of having adult salmon available for upstream effectiveness studies, FERC must require GLHA to coordinate with resource agencies to develop and implement a plan to stock uniquely marked Atlantic salmon upstream of the Mattaceunk Project annually for three years (to support up to three years of studies). Stocking should be implemented following the installation of the new 1” rack, which is expected by 2023. As such, stocking is anticipated to be needed in 2024-2026. These fish would then serve as a source of imprinted adult fish (i.e., fish homing to areas upstream of Weldon Dam) for up to three years of upstream effectiveness testing of the fishway and upstream fish passage

monitoring. GLHA must submit a plan to NMFS and the U.S. FWS describing their proposal for this stocking; dependent on resource needs GLHA may be responsible for costs associated with raising fish, marking, and stocking these fish; we note that a stocking permit will be needed from the Maine DMR. GLHA must also work with the resources agencies to develop an alternative plan to be implemented in the event that hatchery resources are not available to support the proposed stocking in one or more years. In all cases, a stocking plan must be developed and submitted to NMFS, U.S. FWS, and Maine DMR at least one year prior to any planned stocking.

To implement reasonable and prudent measure #2, FERC must require GLHA to do the following:

1. Inspect the upstream and downstream fish passage facilities at the Project daily when they are open. The licensee must submit summary reports to us weekly during the fish passage season.
2. Operate and maintain a PIT system at upstream fishways to monitor Atlantic salmon movements in the project area annually throughout the term of the new license. GLHA must provide all PIT tag data to NMFS annually by December 30.
3. Notify us of any changes in operation including maintenance activities and debris management at the project during the term of the new license.
4. Remove any debris that could affect the ability of fish to pass either the downstream or the upstream fish passages immediately upon inspection.
5. Consult with us annually concerning the replacement of flashboards.
6. Prepare an Operations and Maintenance plan for the upstream and downstream fishways in consultation with resource agencies within the first year of license issuance. The Operations and Maintenance plan should be reviewed each year by resource agencies and the licensee and updated as necessary to accurately reflect any changes in operation and upcoming maintenance scheduling.
7. Submit as-built drawings to us for the current configuration of the upstream and downstream fishways within one year of license issuance.
8. Require that GLHA seek comments from us on any new fish passage design plans at the 30%, 60%, and 90% design phase.
9. Allow us to inspect the upstream and downstream fishways at reasonable times, including but not limited to annual engineering inspection.
10. Contact us within 24 hours of any interactions with Atlantic salmon, including non-lethal and lethal takes (Jeff Murphy: by email (Jeff.Murphy@noaa.gov) or phone (207) 866- 7379 and to: incidental.take@noaa.gov.
11. In the event of any lethal takes, any dead specimens or body parts must

be photographed, measured, and preserved (refrigerate or freeze) until disposal procedures are discussed with NMFS.

To implement reasonable and prudent measure #3, GLHA must do the following:

1. Prepare in consultation with us a plan to measure project-related losses of smolts in the Mattaceunk Project impoundment. The plan must be prepared within two years of license issuance. The need for studies will be confirmed in annual consultation with us.
2. A Cormack-Jolly-Seber (CJS) model, or other acceptable approach, must be used to estimate survival rates and associated error bounds.
  - a. GLHA must consult with NMFS concerning the application of appropriate statistical methodology and must provide an electronic copy of model(s) and data to NMFS.
  - b. All tags released in the system should have codes that are not duplicative of tags used by other researchers in the river, including university, state, federal and international tagging programs.

To implement reasonable and prudent measures #4 and #5, GLHA must do the following:

1. Within one year of the completion of impoundment mortality studies, prepare a plan in consultation with us outlining plans to address project-related losses of smolts migrating through the project impoundment. This plan must: a) describe the mortality rate for smolts migrating through the project impoundment; b) describe the anticipated mortality rate for smolts migrating through an appropriately representative un-impounded reach of the Penobscot River (i.e., control reach); c) describe measures that will be implemented to reduce smolt mortality in the impoundment and the reductions in mortality anticipated to result from implementation of those measures; d) describe any measures that were considered but were determined to be infeasible; e) describe a plan, with associated timeline, for implementing measures to reduce mortality of smolts in the impoundment to background levels. If it is determined that measures can not be implemented to reduce mortality to background levels, Brookfield must consult with NMFS to determine the required amount of compensatory mitigation (i.e., the number of smolts that are expected to be killed annually due to impoundment mortality and the number of habitat units required for restoration of access or habitat improvement). The plan must describe habitat enhancement measures that will be taken to either: a) restore access to the identified number of habitat units, and/or b) improve productivity in the

identified number of habitat units. The plan must include a monitoring component designed to evaluate the effectiveness of the mortality reduction measures and/or the habitat productivity improvements. This plan must be implemented no later than Year 10 of the license.

Prepare a smolt stocking plan in consultation with us if enhancement and mitigation measures cannot be fully implemented by the 10-year milestone to serve as an interim mitigation solution. The final plan must be submitted at least one year prior to the 10-year milestone. Given the significant consultation necessary to develop and implement the stocking plan with various state and federal resource agencies and the Penobscot Indian Nation, GLHA must submit a draft of the plan to NMFS (for coordination with the appropriate state and federal agencies and PIN) within 3 years of license issuance. The plan must address the source of the stocked fish and plans for tagging and stocking. GLHA will be responsible for any costs associated with sourcing, raising, tagging, transport, and stocking these fish. It should be noted that smolts stocked as part of any impoundment mitigation plan must not be reallocated from the conservation hatchery program already in place for the Penobscot River (e.g., it would not be acceptable to divert fish that would have been stocked below the project to the impoundment for purposes of mitigation). The final plan must be submitted at least one year prior to the 10-year milestone and shall not be implemented until approved by NMFS, which will be done in coordination with relevant state and Federal resource agencies and the PIN.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize and monitor the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, reinitiation of consultation and review of the reasonable and prudent measures are required. FERC must immediately provide an explanation of the causes of the taking and review with us the need for possible modification of the reasonable and prudent measures.

The discussion below explains why the RPM and Terms and Conditions are necessary and appropriate to minimize or monitor the level of incidental take associated with the proposed action and how they represent only a minor change to the action as proposed by FERC.

RPM #1 and its associated Term and Conditions for FERC are necessary and appropriate as they describe how FERC and GLHA will be required to measure and monitor the success of the proposed performance standards. These procedures represent only a minor change to the proposed action as following these procedures should not increase the cost of the project or result in any delays or reduction of efficiency of the project.

RPM #2 and its associated Term and Conditions for FERC and GLHA are necessary and appropriate to ensure the proper documentation of any interactions with listed species as well as requiring that these interactions are reported to us in a timely manner with all of the necessary information. This is essential for monitoring the level of incidental take associated with the proposed action. This RPM and the Terms and Conditions represent only a minor change as compliance will not result in any increased cost, delay of the project or decrease in the efficiency of the project.

RPM #3 and its associated Terms and Conditions for GLHA are necessary and appropriate as they describe how GLHA will be required to measure and monitor impoundment losses of smolts at the Mattaceunk Project. These procedures represent only a minor change to the proposed action as following these procedures should not increase the cost of the project or result in any delays or reduction of efficiency of the project.

RPM #4 and its associated Terms and Conditions for GLHA are necessary and appropriate to ensure the proper documentation of any interactions with listed species and to ensure GLHA prepares a plan for addressing and minimizing project-related losses of smolts in the project impoundment. This is essential for monitoring the level of incidental take associated with this activity. This RPM and the Terms and Conditions represent only a minor change as compliance will not result in any increased cost, delay of the project or decrease the efficiency of the project.

RPM#5 and its associated Terms and Conditions for GLHA are necessary and appropriate to ensure that GLHA minimizes the mortality of smolts in the impoundment and to ensure that any mitigation plan is appropriately designed to carry out the goals of “no net loss” of smolts in the impoundment by year nine of the license.