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STATE OF MAINE
DEPARTMENT OF MARINE RESOURCES
21 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0021

CARL J. WILSON
COMMISSIONER

July 14, 2025

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

Subject: Maine DMR comments, recommendations, and preliminary terms and conditions for the Lewiston Falls Project (P-2302)

Dear Secretary Reese:

On May 15, 2025 the Federal Energy Regulatory Commission (FERC) published its Notice of Application Ready for Environmental Analysis and Soliciting Comments, Recommendations, Terms and Conditions, and Prescriptions for the Lewiston Falls Hydroelectric Project (FERC No. 2302) on the Androscoggin River in Maine. Enclosed are the Maine Department of Marine Resources (MDMR) comments, recommendations, and preliminary terms and conditions for the Project pursuant to section 10(j) of the Federal Power Act (FPA).

The Department of Marine Resources looks forward to further collaboration with the Licensee on diadromous fish passage at the Lewiston Falls Project. Please contact Casey Clark (casey.clark@maine.gov; 207-350-9791) or Lars Hammer (lars.hammer@maine.gov; 207-557-1564) if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads 'Carl J. Wilson'.

Carl J. Wilson, Commissioner

Cc: Sean Ledwin; MDMR
Bill McDavitt; NMFS
Laura Paye, Robert Wood; MDEP
John Perry, James Pellerin, Nicholas Kalejs; MDIFW
Patrick Dockens, Amanda Cross; USFWS

1.0 Introduction

The MDMR is concerned with the Project's continuing direct and indirect effects on diadromous fishes, namely American eel, in and around the Project area. Below, we provide our preliminary comments, recommendations, and terms and conditions for the protection of, mitigation of damages to, and enhancement of fish resources pursuant to Section 10(j) of the Federal Power Act. These are based, in part, on MDMR's goals and objectives for the Androscoggin River, the results of studies performed during the licensing process and filed with the Commission by Brookfield White Pine Hydro LLC (Licensee) or incorporated into the license application, and in consultation with the state and federal resource agencies.

1.1 MDMR statutory authority

MDMR is a cabinet level agency of the State of Maine. MDMR was established to regulate, conserve, and develop marine, estuarine, and diadromous fish resources; to conduct and sponsor scientific research; to promote and develop marine coastal industries; to advise and cooperate with state, local, and federal officials concerning activities in coastal waters; and to implement, administer, and enforce the laws and regulations necessary for these purposes. MDMR is the lead state agency in the restoration and management of diadromous (anadromous and catadromous) species of fishes.

MDMR has been an active participant throughout the licensing process. In 2022, MDMR provided written comments on the Pre-Application Document (PAD) and submitted six study requests. In addition, we have participated in several meetings and conference calls with the Licensee to discuss study plans and study results.

2.0 Goals and objectives for the Androscoggin River

MDMR's goal is to restore Maine's native diadromous fishes to their historic habitat. Restoration of diadromous species in the Androscoggin River is guided primarily by the Draft Fisheries Management Plan for the Lower Androscoggin River, Little Androscoggin River, and Sabattus River ("Fisheries Management Plan"; MDMR and MDIFW 2017). The Fisheries Management Plan incorporates the goals and objectives of various state and interstate fisheries management plans and relevant Addenda (ASMFC 1985; ASMFC 1988; ASMFC 2000).

2.1 Target species and specific management goals

All of Maine's native diadromous species are found in the Androscoggin River system, but only Atlantic salmon, sea lamprey, and American eel likely ascended Lewiston Falls prior to dam construction. While the area upstream of Lewiston Falls is not currently managed for anadromous species, MDMR's management objective in this region is to maximize the production of the catadromous American eel by providing access to and from historical growth habitat within the watershed through safe, timely, and effective upstream and downstream passage at barriers. Previous studies have documented thousands of

eels at the Worumbo project downstream of Lewiston Falls¹, and eels upstream of Rumford Falls². While the Licensee conducted upstream eel surveys at Lewiston Falls, MDMR has significant concerns about the effectiveness of methods used during the study³. At this time, we have no estimate for the potential abundance of American eel upstream of the project nor for the potential number of eels that may attempt to migrate upstream past the project each year.

2.2 Target passage numbers

Juvenile American eels are randomly distributed along the coast by ocean currents and enter river systems by chance. In order to estimate the number of American eel that might migrate upstream in the Androscoggin River, we present a range of juvenile American eel that have passed upstream of the Worumbo project (the next downstream project) and in the nearby Penobscot River. The 2023 Upstream Eel passage assessment at the Worumbo project⁴ documented 4,637 potentially unique eels attempting to pass the dam across 15 nighttime surveys from June 13 – September 7. While this provides an estimate of American eels actively attempting to pass, the actual population attempting to pass the Worumbo project is likely much larger and surveys were unable to fully document them due to their limited temporal scope and the inability of biologists to check all available habitat. In 2020, the number of American eel that passed the second dam (West Enfield Project eel ramp) on the Penobscot River was more than 200,000⁵.

2.3 Migration periods for target species

These dates are based on migration periods observed in the Saco, Androscoggin, Kennebec, and Penobscot River and may change based on new information, evaluation of new literature, and agency consultation. The American eel is denoted as (C) for catadromous.

Species	Upstream migration period	Downstream migration period
American eel (C)	June 1 – September 15	August 15 – November 15 (night)

3.0 Factual background

3.1 Project description

The project consists of a dam comprised of four stone masonry sections, a concrete dam section, and an island spillway; a 200-acre impoundment; a powerhouse near the east end of Dam #4 containing two turbine/generators; two gatehouse buildings; electrical connections; and appurtenant facilities. One of the gatehouses discharges into the Lewiston canal system, which was a project facility in the past, but is no longer included in the project footprint. The Project impoundment has a normal maximum surface area of 169 acres at a full pond elevation of 168.17 ft msl. A 1.34-foot-high flashboard system is installed on the dam crest of the concrete dam (Dam #5), a split rubber bladder is installed on Dam #4, and a single rubber bladder is installed on each of Dams #1, 2, and 3. The project has a normal pond elevation of

¹ Accession No. 20231004-5054

² Accession No. 20230217-5029

³ Accession No. 20230329-5098

⁴ Accession No. 20231004-5054

⁵ Accession No. 20250328-5363

168.17, with negligible useable storage when operated in run-of-river-mode. The powerhouse is located at the east end of the falls and contains two vertical Kaplan turbine/generators with a combined FERC authorized rating of 28.44 MW. The powerhouse intake is equipped with trash racks constructed of 0.75-inch bar steel at 4-inches on center, resulting in a clear spacing of 3.25-inches.

3.2 Project fishways

The Lewiston Falls project does not currently have upstream or downstream fishways for any diadromous species.

3.3 Project operation

The Lewiston Falls project is operated as a run-of-river facility with allowable impoundment fluctuations. The project discharges a continuous 1,430 cfs minimum flow, which is typically discharged from the Project powerhouse minus 50 cfs through the Lewiston Canal System. Additionally, there is a project license requirement to provide periodic “refreshment flows” of 300 cfs to the Canal System.

3.4 Historic fisheries resources

Historically 12 species of native diadromous fishes were found in the Androscoggin River and its tributaries. The historic range of harvested species is fairly well known, while the range of others is less certain. Atlantic sturgeon, shortnose sturgeon and rainbow smelt did not pass beyond Great Falls in Brunswick. On the mainstem Androscoggin River, Lewiston Falls stopped the upstream migration of alewife, American shad, blueback herring, and perhaps sea lamprey⁶, while Rumford Falls was a barrier to Atlantic salmon (Foster and Atkins 1868). On the Little Androscoggin River, the upstream migration of Atlantic salmon was stopped at Snows Falls (Foster and Atkins 1868). Biscoe Falls, the only other natural falls on the Little Androscoggin River identified by DeRoche (1967), may have been the upstream limit of alewife, blueback herring, and American shad. The historical upstream limit of American eel is unknown. However, the Maine Department of Inland Fisheries and Wildlife (MDIFW) has documented the presence of this species in the last 35 years in lakes and ponds above both Rumford Falls and Snow Falls.

Prior to dam construction, alewife, American shad, blueback herring, Atlantic salmon, and American eel were very abundant in the Androscoggin River. However, in 1807 a low-head dam was constructed at the head-of-tide on the Androscoggin River that caused the rapid decline of alewife and American shad runs. Atlantic salmon were able to leap over the low head dam and continue upstream. Construction of higher, insurmountable dams caused their complete extirpation above tidal waters in 1844. Remnant

⁶ While Foster and Atkins (1868) mention sea lamprey, the reference does not include any information on the species in the Androscoggin River. At the time of writing, sea lamprey were not commercially or recreationally valuable and were not worth documenting comprehensively as was done with other species. At this time, the upstream extent of sea lamprey on the Androscoggin River is unknown but is assumed to be Rumford Falls as that is the historic upstream extent of Atlantic salmon. Given the lack of natural barriers and the similarities in upstream migration behavior and spawning habitat between Sea Lamprey and Atlantic salmon, it is assumed that Sea Lamprey had a similar historic extent as salmon in all Maine rivers.

populations of alewife and American shad continued to reproduce in the six-mile stretch of river below Brunswick, but severe water pollution and commercial fisheries had further reduced their abundance by the 1930s.

3.5 Current fisheries resources

MDMR initiated an anadromous fish restoration program in the Androscoggin River in 1983. Water quality had improved in the river, upstream and downstream fish passage was installed at the Brunswick Project Dam, and fish passage was anticipated at the next two upstream projects. Passage was constructed at the Pejepscot Dam in 1987 and the Worumbo Project Dam in 1988. Passage at all three projects resulted from recommendations made by State and federal resource agencies during the federal relicensing process. MDMR has used a combination of active (stocking) and passive (fish passage) techniques to restore diadromous fishes to the Androscoggin River watershed.

3.6 American eel

The American eel is a highly migratory, semelparous, facultative catadromous species that spends the majority of its life in freshwater or estuarine environments and spawns in the ocean (Collette and Klein-Macphée 2002; Shepard 2015). The species occurs across more than 50 degrees of latitude, from the southern tip of Greenland, along the entire eastern coast of North America, around the Gulf of Mexico, and through most of the West Indies (Smith 1989). Within its range, the American eel may use the broadest habitat types of any fish species (Helfman et al. 1987). Spawning occurs in the winter and early spring in a region of the Atlantic Ocean called the Sargasso Sea (McCleave and Kleckner 1982; Wippelhauser et al. 1985; McCleave et al. 1987). Eggs hatch and release a long-lived larval stage called a leptocephalus, which drift and swim in the upper 300 m of the water column for several months, slowly growing to a length of 5-6 cm (McCleave and Kleckner 1982). Ocean currents facilitate transport of leptocephali to the southwest into the Gulf Stream, which transports them northward along the east coast of the United States. Once over the continental shelf, leptocephali metamorphose into a miniature transparent glass eel. Glass eels actively migrate toward land and freshwater and ascend rivers during the winter and spring by drifting on flood tides and holding position near the bottom on ebb tides (McCleave and Kleckner 1982; Wippelhauser and McCleave 1987) and also by actively swimming along the shoreline in estuaries and above tidal influence (Sheldon and McCleave 1985). Once migrating glass eels become pigmented, they are termed elvers or yellow eels. Depending on where they cease their upstream migration, some yellow eels reach the extreme upper portions of rivers, while others stay behind in brackish areas (Hardy 1978, Fahay 1978). After a period of growth in freshwater, yellow eels undergo a final metamorphosis into silver eels. These adult silver eels will migrate to the Sargasso Sea to spawn and die. The migration timing of American eel is well-known in Maine from commercial harvests and MDMR monitoring activities. The upstream migration of glass eels is considered to occur from March 15 – June 15 while the upstream migration season for elvers and yellow eels is June 1 – September 30. Silver eels generally migrate downstream from August 15 – November 15. Migration occurs mostly at night although glass eels may occasionally move during the day.

During a 2003 boat electrofishing survey of the Androscoggin River, Yoder (2006) documented American Eel in the Androscoggin River estuary and the Androscoggin River to the Deer Rips impoundment. Eels have also been documented downstream of the Worumbo project and upstream of Rumford Falls. Safe, timely, and effective fish passage is necessary for this species to migrate upstream to freshwater growth habitat and migrate downstream to the sea to spawn.

4.0 Section 10(j) Recommendations

Section 10(j) of the FPA requires that each license issued for a hydropower project contain conditions to adequately and equitably protect, mitigate damages to, and enhance, fish and wildlife affected by the development, operation, and management of a project (16 U.S.C. § 803(j)). Therefore, each license issued shall include such conditions, based on recommendations of the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and state fish and wildlife agencies. MDMR supports one Fisheries Environmental Measure that has been proposed by the Licensee for the Lewiston Falls project. MDMR is submitting six 10(j) recommendations that are based upon our enabling legislation, the goals and objectives for the Androscoggin River contained in the Fisheries Management Plan, and information developed during the licensing proceeding and consultation with other resource agencies and the Licensee.

4.1 Proposed Fisheries Environmental Measures supported by MDMR

1. Continue to implement the provisions of the current SPP for the protection of listed Atlantic salmon.

4.2 Recommendation #1 Upstream American eel passage

The Licensee shall construct, operate, and maintain upstream fish passage facilities that provide safe, timely, and effective upstream passage for American eel. During the first two full passage seasons after license issuance, the Licensee shall conduct nighttime visual monitoring surveys (at least 12 per season) on foot in the bypass reach in conjunction with temporary upstream eel ramp deployments with collection traps to determine the proper location of the upstream eel passage(s). At least two temporary upstream eel ramps shall be deployed in low flow areas that may attract migrating eels. As a starting place, the Licensee shall deploy temporary eel ramps at congregation points 1 and 2 as identified in the Upstream American Eel Study Report for the Project. Additional locations should be decided in consultation with MDMR and the other resource agencies. Based on the results of the surveys, the Licensee shall, in consultation with MDMR and other resource agencies, determine optimal locations for siting the permanent upstream eelway(s). Permanent upstream eel passage shall be operational no later than the third full passage season after license issuance.

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 the migratory period such that fishways can be tested and inspected and will properly operate prior to the migratory periods.

Justification

The Licensee has proposed an environmental measure for upstream eel passage at the Project. While the Licensee's proposed measure is similar to MDMR's recommended measure, there are some key differences.

1. Our recommendation specifies that the Licensee shall conduct 12 nighttime surveys on foot in the bypass reach per season compared to the Licensee's proposed "appropriate surveys and monitoring."

2. We specify that at least two temporary eel ramps will be required in Year 1 and Year 2 compared to the Licensee's generic proposal.
3. We recommend permanent eel passage should be operational in Year 3 rather than Year 4 as proposed.

The Licensee conducted 14 daytime backpack electrofishing surveys and 15 nighttime visual surveys for American eel at the project and observed a limited number of eels ($n = 34$). Eel observations were likely limited during electrofishing surveys because eels are not particularly active during the day and were more likely to be in deeper water or buried underneath rocks and inaccessible by the backpack electrofishing unit. Nighttime observations were limited by survey area and distance, as nighttime surveys were only conducted along a small portion of the project, and from a considerable distance. The ineffectiveness of these previous surveys indicates a need for very specific license conditions to ensure that the appropriate studies are conducted at the project. The standard for upstream eel siting studies includes multiple repeated nighttime surveys on foot immediately downstream of the dam⁷. Thus, MDMR has incorporated that specificity into our recommendation.

MDMR has also specified that at least two temporary eel ramps need to be deployed within the bypassed reach. The Licensee's proposal did not specify a number of eel ramps nor a formal process to determine an appropriate number of eel ramps to provide effective temporary passage at the site. Given the large bypass reach area with multiple dams and various sources of flowing water, MDMR believes that multiple temporary eelways will be needed to obtain appropriate information for the siting of permanent eelways.

We also recommend permanent eel passage should be operational for the eel passage season in Year 3 rather than Year 4 as proposed by the Licensee. While eel passage can be complex, upstream eelways are typically much easier to install and much cheaper than upstream fishways for anadromous species. Upstream eel passage has often been required at other projects within two years of license issuance⁸, so this recommendation is reasonable.

Dedicated upstream eel passage is necessary to provide access to growth habitat upstream of the project throughout the migratory eel passage season. Observations of upstream migrating eels at the Brunswick Project, the Worumbo Project, and Lewiston Falls, coupled with fish surveys conducted by Yoder et al. (2006) document eels can reach the project facilities at Lewiston Falls. The configuration of the Lewiston Falls project (five dam sections) may create multiple attraction points for upstream migrating eels. Therefore, more than one eel passage will likely be needed to provide effective passage. The most suitable locations for permanent eel passage(s) should rely on empirical data, which will be collected during the temporary eel ramp deployments.

4.3 Recommendation #2 Downstream American eel passage

The Licensee shall construct, operate, and maintain a downstream fish passage and protection system that provides safe, timely, and effective downstream passage for American eels. Beginning in the first year following License issuance, the Licensee shall implement interim, targeted, nighttime turbine shutdowns to protect emigrating American eel until permanent measures are implemented as described below. Nighttime turbine shutdowns shall occur from dusk (1/2 hour after sunset) to dawn (1/2 hour

⁷ Haro A and S Gephard. Protocol for Observational Surveys for Upstream Migrant Eels. USGS Memorandum. March 2023.

⁸ Accession Nos. 20210226-3016,

before sunrise) during the duration of the downstream eel passage season, currently defined as August 15 – November 15. Within three years of license issuance, the Licensee shall implement permanent downstream American eel passage and protection measures. Based on current best available information, MDMR recommends the installation of a full-depth, angled trash rack with a maximum clear-spaced opening of 0.75 inches for Units 1 and 2. MDMR also recommends two low-level bypasses integrated on the face of the rack, which lead to a shared pipe that exits to the tailrace with a bypass flow of 330 cfs, which is 5% of station capacity. The licensee should also exclude fish from entering the Lewiston canal system, as passing via this route may induce undo injury, mortality, and migratory delay.

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 the migratory period such that fishways can be tested and inspected and will properly operate prior to the migratory period.

Justification

Ten years after license issuance, the Licensee has proposed implementing interim nighttime turbine shutdowns at the Lewiston Falls Project from September 1 through October 31. Following implementation of the nighttime shutdowns, the Licensee proposes to implement a one or two year study to assess the effectiveness of nighttime shutdowns as a long-term passage measure for American eel.

Unfortunately, the Licensee's proposal is deficient and includes unwarranted delay in implementation of downstream passage measures. The Licensee proposes to begin interim measures 10 years after license issuance (i.e., 2036 assuming license issuance in 2026). This proposal was made despite evidence of eels passing upstream of the project during the relicensing studies (MDMR's study method concerns notwithstanding). Eels have also recently been observed above Rumford Falls⁹. Thus, American eels are currently upstream of this project and have been since at least 2006 (Yoder et al. 2006).

Downstream passage studies conducted as part of this relicensing indicated that at least 90% of tagged American eels passed through the turbines¹⁰. The study estimated passage survival for eel of 83.7% (95% CI = 73.8 to 92.0%) when all passage routes are considered and 74.5% (95% CI = 62.2 to 85.1%) for the turbines. However, the study may have been biased by the inclusion of freshly dead eels in the analysis, so the Licensee also reported an adjusted survival of 68.9% (95% CI = 56.7 to 80.0%) when all passage routes are considered. The Licensee did not include a direct assessment of injuries related to turbine passage, which may have decreased cumulative survival or led to migration difficulties at downstream projects. Consequently, downstream movement does not currently indicate safe passage. The presence of eel upstream coupled with the negative impacts (i.e., injury and mortality) caused by turbine passage at this site highlight the need for downstream passage protections immediately. Safe, timely, and effective downstream passage is essential for reaching MDMR's restoration goals for American eel in the watershed.

Even after a ten-year delay, the proposed nighttime shutdowns at the project are not likely to provide safe, timely, and effective passage for downstream migrating American eels as a permanent solution. First, the proposed shutdown season (September 1 through October 31) is not long enough to cover the

⁹ Accession No. 20230217-5029

¹⁰ The study documented 90%, but eel entrainment may have been higher without a large spill event that occurred during the study.

downstream eel season of August 15 to November 15 referenced in Section 2.3. Relatedly, even MDMR's assumed season may not capture the entire downstream eel migration window in the Androscoggin River. Thus, some eels may pass the project while proposed protections are not in place. The same can be said for the daily timing of nighttime shutdowns. While the Licensee did not propose a daily shutdown duration, MDMR assumes a typical 8-hour shutdown window, which would not cover all nighttime hours during certain times of the year (e.g. the latter half of September and all of October). Furthermore, the Lewiston Falls project does not have a deep-opening gate or appropriate bypass structure to safely transport eels downstream during nighttime shutdown operations. Eels are primarily bottom-oriented and do not use surface bypasses effectively. A 2003 paper found that 94% of eels used a bottom bypass when presented with surface and bottom opening bypasses.¹¹ A study in 2008 of silver eel passage at a hydroelectric project on the Magaguadavic River in New Brunswick found only 21% of tagged eels used a new surface bypass weir, 11% passed safely by other routes and the remaining silver eels entered the turbines soon after encountering this route and died, as evidenced by cessation of movement¹². Thus, the licensee proposed downstream measures will not be effective for American eel.

Based on currently available information, safe, timely, and effective downstream passage for American eels can be achieved at Lewiston Falls via a new angled rack for Units 1 and 2 with 0.75 inch clear spacing or less, with low-level bypasses capable of passing a minimum of 5% of station capacity in accordance with federal guidelines (USFWS 2019). Trash racks with 0.75 inch clear spacing are commonly prescribed in New England to prevent entrainment of American eels at hydropower projects (e.g., Woronoco FERC No. 2631, Scotland FERC No. 2662, Central Falls FERC No. 3063, Rollinsford FERC No. 3777).

4.4 Recommendation #3 American eel fish passage effectiveness testing

Beginning in the first migratory season after the new permanent upstream American eel passage(s) are operational, the Licensee shall conduct a minimum of two years of quantitative effectiveness testing. Testing shall include the standard methods required by MDMR for eelways at Maine hydroelectric projects (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 new facility, and (2) evaluating passage effectiveness for eels. 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 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 USFWS and used to assess all of the eel ramps installed at dams on the Kennebec and Presumpscot Rivers, and at other projects in Maine.

Beginning in the second migratory season after the new permanent downstream passage facilities are operational, the licensee shall conduct two years of quantitative fish passage effectiveness testing to determine whether the facilities are achieving safe, timely, and effective passage for American Eel. Year 1 should include a route of passage study to determine whether eels are using designated downstream

¹¹ Durif, C., P. Elie, C. Gosset, J. Rives, and F. Travade. 2003. Behavioral study of downstream migrating eels by radio-telemetry at a small hydroelectric power plant. Pages 343–356 in D.A. Dixon, editor. Biology, management, and protection of catadromous eels. American Fisheries Society Symposium 33. Page 350.

¹² Carr, J. W., and F. G. Whoriskey. 2008. Migration of silver American eels past a hydroelectric dam and through a coastal zone. Fisheries Management and Ecology 15(5– 6):393–400. Page 396–398.

bypasses effectively or if they are still passing through the turbines. Year 2 should include a Hi-Z balloon tag study coupled with x-ray or gross dissection of recaptured individuals to determine injury and mortality rates for each passage route. The facility will be considered safe, timely, and effective if 95% of eels pass downstream malady-free¹³ within 24 hours.

No later than 8 months after the initiation of an effectiveness study, the Licensee shall distribute a draft study report to MDMR and other agencies. If performance standards have not been achieved, the Licensee will consult with MDMR within 30 days of distribution of the effectiveness testing report to review the deficiencies and initiate the adaptive management process outlined in Recommendation 5.

Justification

Fishways need to be tested to ensure they are constructed, operating, and functioning as intended, and whether improvements are needed to ensure safe, timely, and effective passage is provided. The study methods recommended by MDMR are appropriate and represent the standard methods for assessing both upstream and downstream eel passage facilities.

MDMR recommends an upstream performance standard of 90% passage within 24 hours. This criterion has been developed by the USFWS and MDMR and has been used to assess multiple eelways in Maine (FERC No's. 2555, 2556, 2364, 2365, 2611, 2574, 2322, 2325, 5073, 2942, 2984, 2931, and 2932). A similar 90% upstream passage standard is incorporated into the license for the Mattaceunk Project on the Penobscot River¹⁴. A similar standard (95%) is also included in the Connecticut River American Eel Management Plan.¹⁵ Thus, this standard is consistent with eelway evaluation on many river systems in the region.

MDMR recommends a downstream performance standard of 95% based on several similar standards at other projects throughout the New England and mid-Atlantic regions of the U.S. These include: (1) 95% project survival for eels in the Connecticut River¹⁶; (2) 85% downstream survival at each mainstem dam on the Susquehanna River¹⁷; (3) 95% downstream passage survival for each project on the Merrimack River¹⁸; and (4) 95% downstream survival for dams on the Naugatuck River in Connecticut¹⁹. The USFWS has also noted that numerous other FERC-licensed projects require downstream passage standards ranging from 85% to 95% survival for eels (e.g., Muddy Run (FERC No. 2355), York Haven (FERC No. 1888), Wyre Wynd (FERC No. 3472), Normanskill (FERC No. 2955). MDMR recommends that Lewiston Falls be held to a 95% downstream standard until a river specific passage standard is established for American eels on the Androscoggin River. As demonstrated above, this standard is consistent with many river systems in the region and takes into account that there are additional projects on the Androscoggin River (e.g., Brunswick, Pejepscot, Worumbo, Gulf Island/Deer Rips, Livermore, Otis, Jay, etc.) that American eel must pass on their downstream migration to complete their lifecycle.

¹³ Malady-free is defined here as passage without mortality or injury to ensure eels can successfully migrate downstream and complete their lifecycle.

¹⁴ Accession No. 20210226-3016

¹⁵ CRASC. 2023. Connecticut River American Eel Management Plan.

¹⁶ CRASC. 2023. Connecticut River American Eel Management Plan.

¹⁷ SRAFR. 2013. American Eel Restoration Plan for the Susquehanna River Basin.

¹⁸ Merrimack Technical Committee. 2021. Merrimack River Comprehensive Plan for Diadromous Fishes. The Technical Committee for the Anadromous Fishery Management of the Merrimack River Basin. 180 pp.

¹⁹ CTDEEP. 2022. The plan to restore diadromous fishes to the Naugatuck River watershed. Connecticut Department of Energy and Environmental Protection, Bureau of Natural Resources, Fisheries Division. October 2022.

4.5 Recommendation #4 Fishway Operation and Maintenance Plan

Within 12 months of license issuance, the licensee will prepare in consultation with MDMR and the other resource agencies (MDIFW, USFWS, and NMFS) a Fishway Operation and Maintenance Plan (FOMP) covering all operations and maintenance of the upstream and downstream fish passage facilities in operation at the time. The FOMP shall include 1) a schedule for routine fishway maintenance to ensure the fishways are ready for operation at the start of the migration season; 2) procedures for routine upstream and downstream fishway operations; and 3) procedures for monitoring and reporting on the operation and maintenance of the facilities as they affect American eel passage.

The FOMP shall be submitted to MDMR and other resource agencies for review and approval prior to submitting the FOMP to the Commission for its approval. The Licensee shall update the FOMP annually to reflect any changes in fishway operation and maintenance planned for the year. If MDMR requests a modification of the FOMP, the Licensee shall amend the FOMP within 30 days of the request and send a copy of the revised FOMP to MDMR.

The Licensee shall provide information on fish passage operations and project generating operations that may affect fish passage, upon written request from MDMR or other resource agencies. Such information shall be provided within 10 calendar days of the request, or upon a mutually agreed upon schedule.

Justification

The existence of a robust fishway operation and maintenance plan is essential to ensure fishways are constructed, operated, and maintained correctly. Adhering to the operations and maintenance plan will ensure infrastructure is in working order throughout its operational life and will assist the Licensee in achieving and maintaining performance.

4.6 Recommendation #5 Adaptive Management Plan

The Licensee shall implement the following adaptive management plan that outlines clear steps and timelines for implementation and testing of American eel passage measures at the Lewiston Falls Project. Should the project fail to achieve either of MDMR's performance standards, the plan will include a timeline for the implementation of additional measures. For Lewiston Falls this will include the following measures and milestones:

- A. If upstream and/or downstream performance standards have not been achieved, but the results are close (within 10% of performance standard criteria for passage efficiency or timing), the Licensee can implement minor operational or structural modifications no later than 1 year after the distribution of the effectiveness testing report, in consultation with MDMR, to address the deficiency and retest the facility as described in Recommendation 3.
- B. If upstream and/or downstream performance standards have not been achieved, and the results are not close (not within 10% of performance standard criteria for passage efficiency or timing), the Licensee shall construct additional measures no later than 2 years after the distribution of the effectiveness testing report. The specific measures shall be selected in consultation with MDMR and other resource agencies to address areas of deficiency at the project.

- C. Once the Licensee has implemented adaptive measures, the licensee will repeat the relevant testing procedure identified in Recommendation 3 and continue adaptive management until deficiencies have been addressed. This includes the potential design and development of new or replacement eelways, rack configurations, or bypasses that could achieve performance standards.

Justification

A robust adaptive management plan is necessary to provide clear steps and timelines that identify a path for curing deficiencies in passage at the project. The measures proposed by MDMR are the best scientific and technical solutions common to the American eel in the northeast and utilize USFWS design criteria (2019). Therefore, we expect that MDMR's recommended actions, combined with an effective adaptive management program, if necessary, will achieve our recommended performance standards.

4.7 Recommendation #6 Project Operations and Flow Monitoring Plan

The licensee shall develop a project operations and flow monitoring plan that outlines procedures to reregulate the inflow that the project receives, when inflow is within the hydraulic capacity of the project, to mitigate fluctuations in flow as a result of hydro-peaking operations from projects upstream. Reregulation shall occur from April 1 to October 31, which covers the upstream migration period for Atlantic salmon, American eel, alewives, and sea lamprey. Temporary modifications to this timeline shall include: 1) approved maintenance activities, 2) emergency electrical system conditions, and 3) other agreed upon conditions between the licensee and MDMR. The plan will describe how headpond elevation levels and total project outflow will be recorded and reported, and will identify monitoring methods and locations to ensure the project is operated in a manner consistent with all of the conditions in the Commission's Order Issuing New License.

The plan shall also include provisions for reporting when impoundment elevations or instream flows fall below levels required by the new license. Any such report shall include 1) operational data necessary to determine compliance with this article, 2) a description of any corrective measures implemented at the time of occurrence and those implemented or proposed to ensure similar incidents do not recur, and 3) comments or correspondence received from resource agencies regarding the incident.

The licensee shall prepare the project operations and flow monitoring plan in consultation with MDMR, and shall include documentation of consultation, copies of comments and recommendations, and specific descriptions of how MDMR's comments have been addressed in the plan.

Justification

The Gulf Island/Deer Rips project is a hydro-peaking facility upstream of the Lewiston Falls project, and thus provides inflow to the Lewiston Falls. The USGS gage 01059000 is downstream of the Lewiston Falls project and exhibits substantial sub-daily variation (Figure 1) despite Lewiston Falls being a run-of-river project. Thus, Lewiston Falls perpetuates peaking flows further downstream. An instream flow demonstration was conducted at the Lewiston Falls project in 2014 and 2015 to document and evaluate the effects of peaking operations at Lewiston Falls on downstream habitat in the Androscoggin River²⁰. The report showed a decrease in wetted width (max decrease of 8.1 ft) and water depth (max decrease of 3.2 ft) downstream of the project between generation (7,812 cfs) and minimum flow (2,431) scenarios. A

²⁰ Accession No. [20160329-5151](#)

comparison of the total amount of water available indicates that there is 45% less water during minimum flow vs the generation scenario at Transect 1. While this is a controlled example, multiple days showed similar flow decreases during 2024. One example occurred in the early hours of May 24, 2024 where flows rapidly decreased from 6,500 cfs to 2,800 cfs (Figure 2)

Sub-daily flow variations that result from hydropower operations can negatively impact aquatic ecosystems including through increased stranding risk²¹, migration delays²², and alternation of the thermal regime²³.

The Lewiston Falls Project headpond is currently allowed to fluctuate by 1 ft, occasionally varying by 4 ft, with a usable storage capacity of 642 acre-feet²⁴. Based on available storage capacity, it is possible for outflows to vary from inflows when flows are within hydraulic capacity. The plan should seek to reduce or eliminate rapid changes in flows to improve habitat conditions in the Androscoggin River.

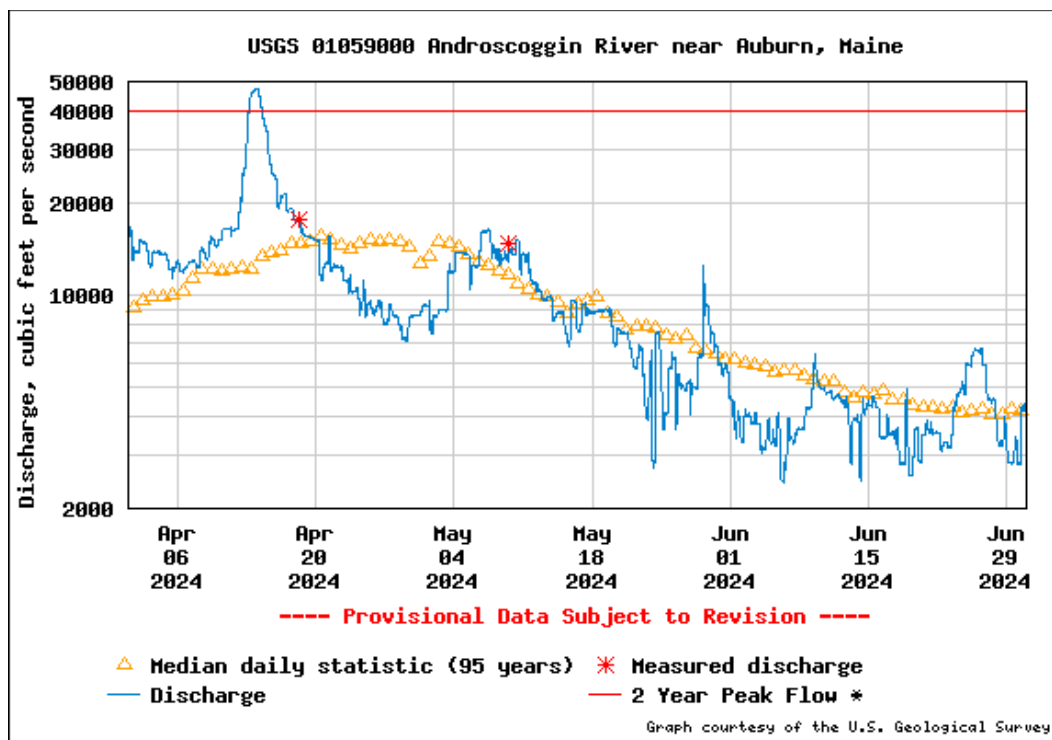


Figure 1. Hydrograph of the Androscoggin River downstream of the Lewiston Falls project, including the Little Androscoggin River.

²¹ Bozeman, B. B., Pracheil, B. M., & Matson, P. G. (2024). The environmental impact of hydropower: a systematic review of the ecological effects of sub-daily flow variability on riverine fish. *Reviews in Fish Biology and Fisheries*.

<https://doi.org/10.1007/s11160-024-09909-4>

²² Coutant, C. C. (2023). Hydropower peaking and stalled salmon migration are linked by altered reservoir hydraulics: A multidisciplinary synthesis and hypothesis. *River Research and Applications*, 39(8), 1439-1456.

<https://doi.org/10.1002/rra.4146>

²³ Casas-Mulet, R., Saltveit, S. J., & Alfredsen, K. T. (2016). Hydrological and thermal effects of hydropeaking on early life stages of salmonids: A modelling approach for implementing mitigation strategies. *Science of The Total Environment*, 573, 1660-1672. <https://doi.org/10.1016/j.scitotenv.2016.09.208>

²⁴ Accession No. [20240828-5049](https://www.federalregister.gov/documents/2024/08/28/2024-0828-5049) Final License Application Table 3.2-1

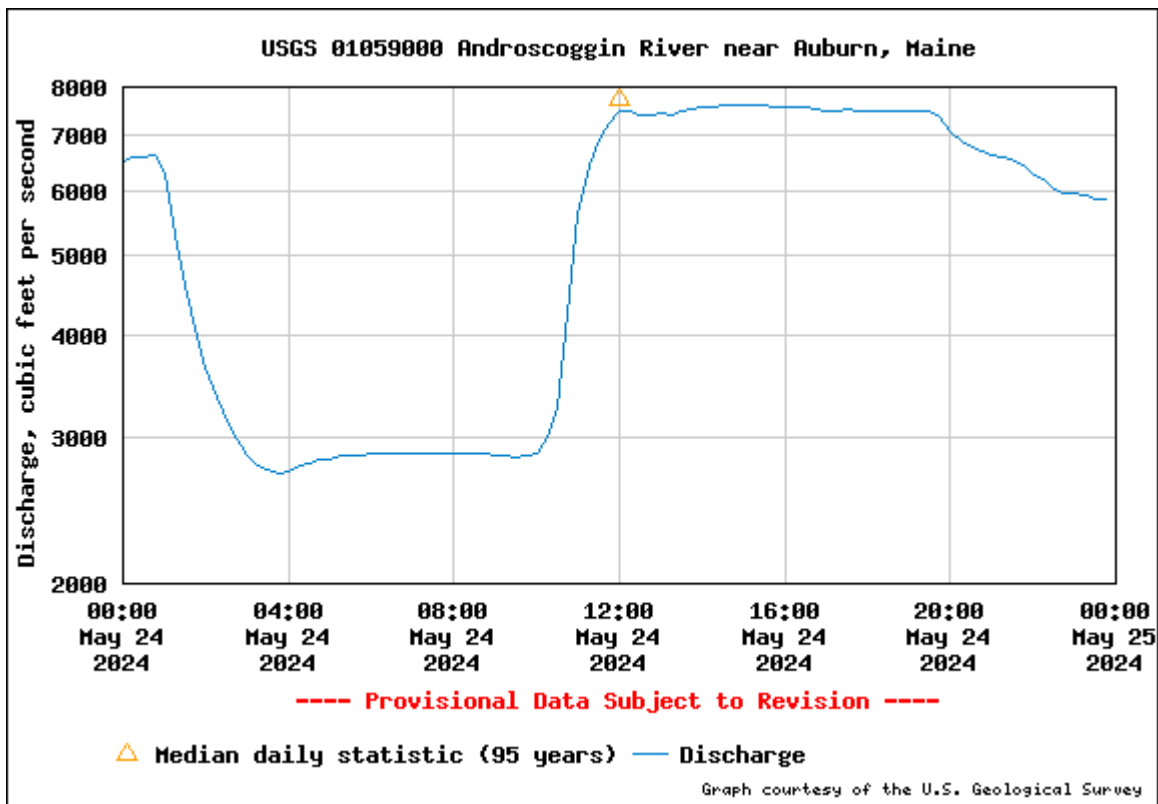


Figure 2. Discharge in the Androscoggin River in Auburn derived from 15-minute data. Source: waterdata.usgs.gov

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