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04333-0021

CARL J. WILSON
COMMISSIONER

August 27, 2025

Claire Briggs, Project Manager
Maine Department of Environmental Protection
17 State House Station
Augusta, Maine 04333-0017

Subject: MDMR Comments on 401 Water Quality Certification for the Lewiston Falls Hydroelectric Project (P-2302)

Dear Ms. Briggs:

On July 14, 2025, the Maine Department of Environmental Protection (DEP) published their Notification of Project Review for Water Quality Certification pursuant to Section 401 of the Clean Water Act, 33 U.S.C. §§ 1251 *et. seq.* for the federal relicensing and continued operation of the Lewiston Falls Hydroelectric Project (P-2302). The Maine Department of Marine Resources (MDMR) is an active participant in federal licensing and relicensing activities through the Federal Energy Regulatory Commission (FERC) for these projects. MDMR's comments on Brookfield White Pine Hydro LLC's (applicant, licensee) July 9, 2025 application for water quality certification are attached.

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,

Sean Ledwin

Sean Ledwin, Director
Bureau of Sea-Run Fisheries and Habitat

Executive Summary

Restoration of American eel, sea lamprey, and Atlantic salmon in the Androscoggin River is currently limited by lack of passage at the Lewiston Falls project. Atlantic salmon and sea lamprey likely ascended as far upstream as Rumford Falls and American eels have been observed above Rumford Falls in recent years. Thus, a large proportion of spawning, rearing, and growth habitat is not available or underutilized for these species in the river.

The applicant’s proposal for fish passage measures described in the Water Quality Certification application and the applicant’s Final License Application¹ is inadequate for American eel passage and precludes future passage opportunities for native anadromous species within the subsequent license term. Thus, the proposal will continue to have significant adverse impacts on these indigenous fish species and their habitats. The proposal includes unnecessary delay in upstream eel passage implementation, ineffective downstream passage measures coupled with delays in implementation, and no consideration of future upstream or downstream anadromous fish passage. Furthermore, the proposal does not outline passage standards for American eel, nor plans for managing and improving project passage should standards remain unfulfilled. When taken cumulatively, the lack of effective measures, could prevent meaningful restoration of American eel above this project, will prevent indigenous Atlantic salmon and sea lamprey restoration upstream of the project, and would prevent the achievement of MDMR’s management goals for the Androscoggin River.

MDMR recommends rapid implementation of upstream and downstream eel passage facilities at the Lewiston Falls project including multiple upstream eelways and safe, timely, and effective downstream passage and associated low-level bypasses. We also recommend a clear framework for effectiveness testing, which will evaluate effectiveness of passage measures based on our recommended performance standards of 90% upstream passage within 24 hours and 95% downstream passage within 24 hours for American eel. If performance is not achieved, our recommended adaptive management framework shall ensure that deficiencies are resolved in a timely manner. We also recommend that the applicant create a project flow and operations monitoring plan, as we believe the effects of peaking at the Gulf Island/Deer Rips project are evident downstream and are having negative impacts on diadromous species and aquatic habitat below the project. Finally, we recommend upstream passage for Atlantic salmon and sea lamprey if determined necessary by MDMR and DEP, such that restoration of these species is not precluded throughout the subsequent license term. This determination shall be made in 2048 based on relicensing of other projects in the watershed. Below, we provide a series of detailed recommendations to DEP related to specific Water Quality Certification conditions that would provide meaningful restoration for indigenous sea-run fish species. In addition, we have provided a list of relevant documents on the FERC record (Appendix 1).

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¹ Accession No. 20240828-5049

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Species Goals for the Androscoggin River Above Lewiston Falls

MMDR’s goal is to restore Maine’s indigenous diadromous fishes to their historic habitat. Restoration of diadromous species in the Androscoggin River is guided in part by the Draft Fisheries Management Plan for the Lower Androscoggin River, Little Androscoggin River, and Sabattus River (“Fisheries Management Plan”)². The Fisheries Management Plan incorporates the goals and objectives of various state and interstate fisheries management plans and relevant Addenda^{3,4,5}. 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, it is historic habitat for these species, and therefore, it could be managed for these species in the future as fisheries restoration progresses and upstream dams are relicensed. MMDR’s current management **objective in this region is to maximize the production of 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 Falls⁶ and yellow eels upstream of Rumford Falls⁷. Furthermore, there is evidence of American eels upstream of the Lewiston Falls project going back over 20 years⁸. Thus, safe, timely, and effective passage is needed as soon as possible to facilitate upstream and downstream migration of this species in the system and minimize project related impacts on this migratory species.

Recommendations

Recommendation 1 Upstream Eel Passage: The applicant shall construct, operate, and maintain safe, timely, and effective upstream eel passage facilities at the project. During the first two full passage seasons after license issuance, the applicant 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 applicant shall deploy temporary eel ramps at congregation points 1 and 2 as

² MMDR and MDIFW. 2017. Draft Fisheries Management Plan for the Lower Androscoggin River, Little Androscoggin River, and Sabattus River.
³ ASMFC (Atlantic States Marine Fisheries Commission). 1985. Fishery management plan for the anadromous alosid stocks of the eastern United States: American shad, hickory shad, alewife, and blueback herring: Phase II in interstate management planning for migratory alosids of the Atlantic coast. Washington, DC. XVIII+347 pp.
⁴ ASMFC (Atlantic States Marine Fisheries Commission). 1988. Supplement to the fishery management plan for the anadromous alosid stocks of the eastern United States: American shad, hickory shad, alewife, and blueback herring. Washington, DC. 210 pp.
⁵ ASMFC (Atlantic States Marine Fisheries Commission). 2000. Interstate Fishery Management Plan for American eel. Washington, DC. 79 pp.
⁶ Accession No. 20231004-5054
⁷ Accession No. 20230217-5029
⁸ Yoder, C. O., B. H. Kulik, J. M. Audet. And J. D. Bagley. 2006. The Spatial and Relative Abundance Characteristics of the Fish Assemblages in Three Maine Rivers. Midwest Biodiversity Institute, Columbus Ohio. Technical report MBI/12 -05-1. 269 pages.

identified in the Upstream American Eel Study Report for the Project. Additional locations should be decided in consultation with MDMR. Based on the results of the surveys, the Licensee shall, in consultation with MDMR and as approved by DEP, determine optimal locations for siting the permanent upstream eelways. Given the length of the dams at the project is approximately 813 feet in total, not including the powerhouse, ledge sections, or canal gates, MDMR finds that it is prudent to expect that a single eelway will not be adequate to effectively pass upstream migrants that approach the project. MDMR is recommending a minimum of two eelways for the project, however additional eelways may be necessary based on results of the surveys during the first two passage seasons. 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 applicant has proposed an environmental measure for upstream eel passage at the Project in their Final License Application (FLA)⁹. While the applicant's proposed measure is similar to MDMR's recommended measure, there are some key differences that make the applicant's proposal deficient.

1. Our recommendation specifies that the Licensee shall conduct at least 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 applicant 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 typically active at night and were more likely to be in deeper water or buried underneath rocks and inaccessible by the backpack electrofishing unit during the day. Nighttime observations were limited by survey area and distance, as nighttime surveys were only conducted along a small portion of the project from a considerable distance¹⁰. 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 dam¹¹. 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 applicant'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

⁹ Accession No. 20240828-5049

¹⁰ Accession No. 20231004-5054

¹¹ Haro A and S Gephard. Protocol for Observational Surveys for Upstream Migrant Eels. USGS Memorandum. March 2023.

multiple temporary eelways will be needed to obtain appropriate information for the siting of permanent eelways and that multiple permanent eelways will be needed.

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 applicant. While eel passage can be complex, upstream eelways are typically much easier to design and construct than upstream fishways for anadromous species. There is clear documentation^{12,13,14} of eels downstream and upstream of this project already and there is no reason to delay passage implementation beyond a reasonable design and construction period. Upstream eel passage has often been required at other projects within two years of license issuance¹⁵, 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.¹⁴ 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, and consultation with the resource agencies.

Recommendation 2 Downstream Eel Passage: The applicant 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 applicant 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 before sunrise) during the duration of the downstream eel passage season, currently defined as August 15 – November 15. Within 2 years of license issuance, the applicant shall develop and submit a plan for permanent downstream passage measures that requires approval by DEP in consultation with DMR. Within five years of license issuance, the applicant shall implement permanent downstream American eel passage and protection measures. The permanent downstream measure must be reasonably anticipated to meet MDMR's downstream performance standard (see Recommendation 3). 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 minimum bypass flow of 330 cfs, which is 5% of station capacity. Until a thorough plan for passage through the canal system is developed, and approved by MDMR, the applicant should exclude fish from entering the Lewiston canal system, as passing via this route may induce undo injury, mortality, and migratory delay.

The applicant 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.

¹² Accession No. 20230217-5029

¹³ Accession No. 20231004-5054

¹⁴ Yoder, C. O., B. H. Kulik, J. M. Audet. And J. D. Bagley. 2006. The Spatial and Relative Abundance Characteristics of the Fish Assemblages in Three Maine Rivers. Midwest Biodiversity Institute, Columbus Ohio. Technical report MBI/12-05-1. 269 pages.

¹⁵ Accession No. 20210226-3016

Justification

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

Unfortunately, the applicant's proposal is deficient and includes unwarranted delay in implementation of downstream passage measures. The applicant 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 studies¹⁶, the observation of eels upstream of Rumford Falls¹⁷, and eels observed upstream of Lewiston Falls in 2003¹⁸. American eels can mature and initiate downstream migration across a wide age range, but eels in Canada typically mature between 8 and 23 years¹⁹. Thus, there is no biological basis to delay downstream passage for an additional 10 years after license issuance, particularly considering eels have been upstream of the project since at least 2003.

Downstream passage studies conducted as part of this relicensing indicated that at least 90% of tagged American eels passed through the turbines²⁰. 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 (and likely lower for the turbine route, although this estimate was not reported). 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 the proposed ten-year delay, 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 downstream eel season of August 15 to November 15. 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

¹⁶ Accession No. 20240828-5049

¹⁷ Accession No. 20230217-5029

¹⁸ Yoder, C. O., B. H. Kulik, J. M. Audet. And J. D. Bagley. 2006. The Spatial and Relative Abundance Characteristics of the Fish Assemblages in Three Maine Rivers. Midwest Biodiversity Institute, Columbus Ohio. Technical report MBI/12-05-1. 269 pages.

¹⁹ Cairns, D.K., Chaput, G., Poirier, L.A., Avery, T.S., Castonguay, M., Mathers, A., Casselman, J.M., Bradford, R.G., Pratt, T., Verreault, G., Clarke, K., Veinott, G., and Bernatchez, L. 2014. Recovery Potential Assessment for the American Eel (*Anguilla rostrata*) for eastern Canada: life history, distribution, reported landings, status indicators, and demographic parameters. DFO Can. Sci. Advis. Sec. Res. Doc. 2013/134. xiv + 157 p.

²⁰ Accession No. 20230217-5029

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 both surface and bottom opening bypasses²¹. A 2008 study 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 movement²². Thus, the applicant's proposed downstream measures will not be effective for American eel.

Recommendation 3 Eel Passage Testing and Performance Standards: Beginning in the first migratory season after the new permanent upstream American eel passage(s) are operational, the applicant 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 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-free²³ within 24 hours.

No later than 8 months after the initiation of an effectiveness study, the applicant shall distribute a draft study report to MDMR and DEP. If performance standards have not been achieved, the applicant will consult with MDMR and DEP 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

²¹ 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.

²² 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.

²³ Malady-free is defined here as passage without mortality or injury to ensure eels can successfully migrate downstream and complete their lifecycle.

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 River²⁴. A similar standard (95%) is also included in the Connecticut River American Eel Management Plan²⁵. 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 New England and mid-Atlantic regions of the U.S. These include: (1) 95% project survival for eels in the Connecticut River¹⁸; (2) 95% downstream passage survival for each project on the Merrimack River²⁶; and (3) 95% downstream survival for dams in the Naugatuck River in Connecticut²⁷. The USFWS²⁸ has also noted that numerous other FERC-licensed projects require downstream passage standards for eels (e.g., Muddy Run FERC No. 2355, York Haven FERC No. 1888, Wyre Wynd FERC No. 3472, Normanskill FERC No. 2955, Susquehanna River²⁹). Projects on the Kennebec River in Maine have similar performance standards³⁰, and MDMR recently recommended³¹ 95% downstream passage within 24 hours for American eel to DEP for the Lockwood (P-2574), Hydro-Kennebec (P-2611), Shawmut (P-2322), and Weston (P-2325) projects on the Kennebec River. As demonstrated above, this standard is consistent with many river systems in the region and considers that there are additional projects on the Androscoggin River (e.g., Brunswick, Pejepscoot, Worumbo, Gulf Island/Deer Rips, Livermore, Otis, Jay, etc.) that American eel must pass on their downstream migration to complete their lifecycle.

Recommendation 4 Adaptive Management Plan (American eel): The applicant 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 applicant can implement minor operational or structural modifications no later than 1 year after the distribution of

²⁴ Accession No. 20210226-3016

²⁵ CRASC. 2023. Connecticut River American Eel Management Plan.

²⁶ 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.

²⁷ 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.

²⁸ Accession No. 20240603-5215

²⁹ SRAFRC. 2013. American Eel Restoration Plan for the Susquehanna River Basin.

³⁰ Accession Number: 20030729-3001 and 20030807-0326. Article 406 requires a 90% standard for permanent facilities.

³¹ MDMR Comments on July 14, 2025 to DEP regarding the Water Quality Certification for the Lockwood (P-2574), Hydro-Kennebec (P-2611), Shawmut (P-2322), and Weston (P-2325) projects on the Kennebec River.

the effectiveness testing report, in consultation with MDMR and requiring approval by DEP, 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 applicant 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 require approval of DEP to address areas of deficiency at the project.

C. Once the applicant 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 initial measures proposed by MDMR are the best scientific and technical solutions common to American eel projects 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.

Recommendation 5 Fishway Operations and Maintenance Plan: Within 12 months of license issuance, the applicant will prepare in consultation with MDMR and DEP 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 DEP for review with approval by DEP prior to submitting the FOMP to the Commission for its approval. The applicant shall update the FOMP annually to reflect any changes in fishway operation and maintenance planned for the year. If MDMR or DEP 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 and DEP.

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

Justification

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 applicant in achieving and maintaining performance.

Recommendation 6 Project Operations and Flow Monitoring Plan: The applicant shall develop a project operations and flow monitoring plan that outlines procedures to limit unnatural fluctuations in discharges that may impact spawning, rearing, or migration of sea-run fish as a result of hydropeaking operations upstream to the extent practicable. Flow planning shall encompass April 1 to October 31, which covers the upstream migration period for Atlantic salmon, American eel, alosines, 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 applicant, MDMR, and DEP. The plan will describe how headpond elevation levels and total project outflow will be recorded and reported, and will identify monitoring methods and locations.

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 applicant shall prepare the project operations and flow monitoring plan in consultation with MDMR, and requiring approval from DEP. The plan 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 located upstream of Lewiston Falls project and operates as a hydro-peaking facility. The USGS gage 01059000 is downstream of the Lewiston Falls project and exhibits substantial sub-daily variation (e.g., Figure 1) despite Lewiston Falls being a run-of-river project. Thus, Lewiston Falls perpetuates peaking flows further downstream. An instream flow study 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 River³². 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 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 risk³³, migration delays³⁴, and alteration of the thermal regime³⁵.

³² Accession No. 20160329-5151

³³ 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>

³⁴ 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>

³⁵ 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>

The Lewiston Falls project headpond is currently allowed to fluctuate by 1 ft, occasionally varying by 4 ft, with a useable storage capacity of 642 acre-feet³⁶. 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.

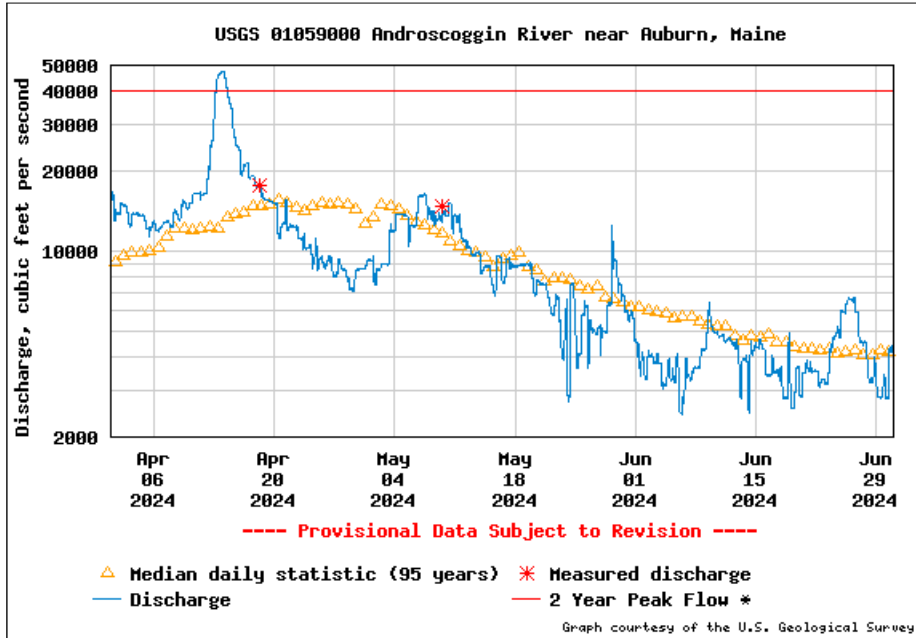


Figure 1. Hydrograph of the Androscoggin River downstream of the Lewiston Falls project, including the Little Androscoggin River.

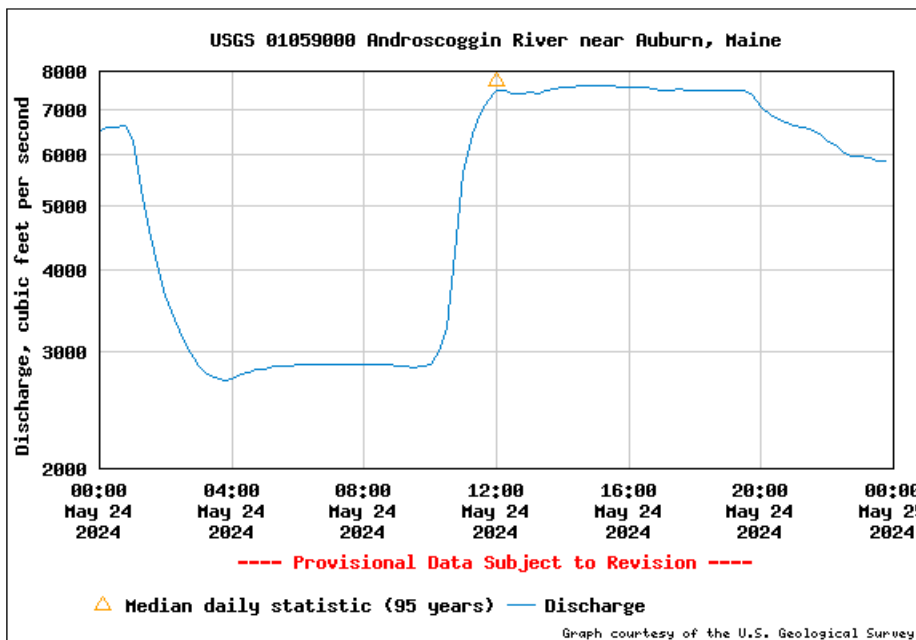


Figure 2. Discharge in the Androscoggin River in Auburn derived from 15-minute data. Source: waterdata.usgs.gov

³⁶ Accession No. 20240828-5049 Final License Application Table 3.2-1

Recommendation 7 Sea Lamprey and Atlantic Salmon Passage: The applicant shall design and construct upstream and downstream fish passage facilities capable of passing Atlantic salmon and sea lamprey on a timeline determined by MDMR and MDEP if determined to be necessary by DEP and DMR. This determination shall occur in 2048, based on other relicensing timelines in the watershed and upstream projects. The applicant shall develop, design, and submit plans to DEP for review and approval, in consultation with MDMR at 30%, 60%, 90%, and final design stages. DEP and MDMR shall have 30 days to review and comment on any submitted design drawings. Designs shall be consistent with USFWS Engineering Design Criteria (USFWS 2019) or other updated versions or guidance, as determined by DEP. The applicant shall submit final design plans, approved by DEP in consultation with MDMR, to FERC for approval prior to the commencement of fishway construction activities. Once fish passage measures are installed, final as-built drawings that accurately reflect the Project as constructed shall be filed with DEP, MDMR, and FERC.

At least one year prior to the second upstream passage season after construction (if required), the applicant shall design and submit passage effectiveness testing plans for Atlantic salmon and sea lamprey to MDMR and DEP for a 30-day agency comment period. Final plans must be approved by DEP. The applicant shall initiate the first year of study coincident with the second upstream passage season after construction of the passage facilities. The purpose of the study shall be to assess whether the passage facilities meet performance standards for these species as determined by MDMR. No later than four months after the conclusion of the passage study, the applicant shall submit a study report to MDMR and DEP.

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 applicant can implement minor operational or structural modifications no later than 1 year after the distribution of the effectiveness testing report, in consultation with MDMR and requiring approval by DEP, to address the deficiency and retest the facility as described above.

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 applicant 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 require approval of DEP to address areas of deficiency at the project.

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

Justification

Sea lamprey and Atlantic salmon are native to the Androscoggin River with both species likely migrating above Lewiston Falls prior to dam construction. While anadromous fish are currently not managed above the Lewiston Falls project, MDMR's management goal is to restore Maine's native diadromous fish species to historical habitat, including upstream of the project. MDMR anticipates that anadromous fish restoration will continue in the river during the subsequent license at Lewiston Falls and that sea lamprey and potentially Atlantic salmon could become more abundant downstream of the project. Upon further restoration as determined by MDMR, it will be appropriate to provide upstream passage for these species at the Lewiston Falls project. Multiple hydroelectric projects upstream of Lewiston Falls will be undergoing relicensing in 2048, which represents an opportunity to synchronize

upstream anadromous fish passage in the Androscoggin River watershed to maximize biological benefits. A robust design, testing, and adaptive management framework will ensure that new fishways at Lewiston Falls are designed using the best-available information and are tested to demonstrate the achievement of performance standards necessary to promote population recovery. If performance standards are not achieved initially, an adaptive management plan will provide a clear process for the project to meet performance standards.

Recommendation 8 Design Process for New Infrastructure

Brookfield shall develop, design, and submit plans to DEP for review and approval, in consultation with MDMR at 30%, 60%, 90%, and final design stages. DEP and MDMR shall have 30 days to review and comment on any submitted design drawings. Designs shall be consistent with Federal Engineering Criteria (2019 or current version)³⁷ or other updated versions or guidance, as determined by DEP. Brookfield shall submit final design plans, approved by DEP in consultation with MDMR, to FERC for approval prior to the commencement of fishway construction activities. Once the fish passage measures are installed, final as-built drawings that accurately reflect the Project as constructed shall be filed with DEP, MDMR, and FERC.

Justification: Design coordination and approval from Dep is critical through the license term to ensure all new fish passage measures will support safe, timely and effective fish passage at the Project. The staged review allows for multiple opportunities for Brookfield, DEP, and MDMR to develop designs to meet project performance standards and follow fish passage design criteria.

³⁷ USFWS (U.S. Fish and Wildlife Service). 2019. Fish Passage Engineering Design Criteria. USFWS, Northeast Region R5, Hadley, Massachusetts.

Appendix 1: List of Relevant Documents on FERC Record for the Lewiston Falls Project

1. Accession No. 20250714-5176: Comments, recommendations, and preliminary terms and conditions of MDMR for the Lewiston Falls Project.
2. Accession No. 20240520-5105: Comments of MDMR on the Draft License Application for the Lewiston Falls Project.
3. Accession No. 20231004-5054: 2023 Upstream eel passage assessment at the Worumbo Project.
4. Accession No. 20230823-5091: Comments of MDMR on the Downstream eel study report at the Lewiston Falls Project.
5. Accession No. 20230329-5098: Comments of MDMR on Initial Study Report for the Lewiston Falls Project.
6. Accession No. 20230217-5029: Comments of MDIFW on Final License Application for the Rumford Falls Project.
7. Accession No. 20220114-5002: Comments of MDMR on the Pre Application Document for the Lewiston Falls Project.