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STATE OF MAINE
DEPARTMENT OF MARINE RESOURCES
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AUGUSTA, MAINE
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COMMISSIONER

Stillwater

MDMR recommends that LIHI certification for Orono be delayed or be contingent on committing to a prudent timeline to complete the additional studies of downstream passage as identified in our responses to your questions below.

Orono

MDMR recommends that LIHI certification for Orono be delayed or be contingent on A) carrying out the below recommendations for upstream passage, in addition to B) committing to a prudent timeline to complete the additional studies as identified in our responses to your questions below.

In addition, any documentation of the Orono project impact should include an acknowledgement of the presence of American eel and Sea lamprey within Zone 1, 2, and 3 of the Project.

Medway

MDMR recommends that LIHI certification for Medway be delayed or be contingent on completion of improvements to downstream passage for eels.

For further questions regarding these projects or our comments, please contact Casey.Clark@maine.gov and Gail.Wippelhauser@maine.gov.

MDMR responses to Pat McIlvaine's Questions dated December 14th, 2020

Finding a passage facility is safe and effective

BBHP stated in their application that the approach being used at this time to evaluate passage success is to conduct requested monitoring and then, based on stakeholder consultation, make the improvements recommended by you to enhance either up or downstream migratory passage. In your opinion, has BBHP been accommodating in making modifications to the various passage facilities or project operations that you have been suggesting?

It is our opinion that BBHP has been accommodating in making modifications at some, but not all, passage facilities or project operations. It is also important to note that while BBHP has been accommodating in carrying out the required monitoring at most projects, the pace of monitoring studies has been very slow as BBHP have chosen an iterative approach. This approach has resulted in monitoring for one aspect (E.g. route of passage or survival) for often only one species, lifestage, and direction of migration in a given year (E.g. downstream juvenile alewife route of passage). Due the slow

pace of monitoring studies, BBHP lacks the required information to determine if fish passage is safe, timely, and effective for many species and lifestages and the Orono, and Stillwater projects. This also means that MDMR and other resource agencies lack the required information to inform recommendations for modification of passage facilities or project operations for many species and lifestages and the Medway, Orono, and Stillwater projects. In addition, some of the monitoring completed by BBHP has been under non-normal project operations (E.g. spill at a project during a downstream study in a year with exceptionally low flow that was below station capacity), which makes the result irrelevant to normal operational conditions.

I also understand that to date, specific numerical standards for determining "safe and effective" passage have not been developed, except for downstream passage of Atlantic salmon (and these standards have not yet been met.) From your perspective, will these be required for all other designated species? Can you tell me if there is a target date for establishment of these standards for the other target species?

BBHP has stated that they do not intend to develop numerical standards for their projects. MDMR and other resource agencies are developing specific numerical standards for determining safe, effective, and timely passage for all diadromous species that occur in Maine. We anticipate these numeric standards will be established in the next five years.

Medway

In 2020, the effectiveness of the downstream passage facility at the Medway Project was tested for American eel. The agencies have just commented on the draft study report.

Major findings of the study were not encouraging.

- 1) 84% (42/50) of the eels passed through the turbines;
- 2) 12% (6/50) of the eels passed by an unknown route, but turbine passage seems likely since rack spacing is 2.25-inch clear spacing;
- 3) 2% (1/50) of the eels used the bypass;
- 4) 2% (1/50) of the eels did not pass; and
- 5) When adjusted for transit time > 38.7 hours, 61-76% (75% CI) of the eels survived from passage to Station M8.

MDMR and USFWS requested some additional analysis, and the USFWS recommended consultation to discuss next steps (i.e., proposed operational changes, structural changes, etc.).

MDMR recommends that LIHI certification for Medway be delayed or be contingent on completion of improvements to downstream passage for eels.

Upstream passage at Orono:

- 1) BBHP informed us that that no further upstream passage studies for Atlantic salmon beyond that conducted in 2014 and 2015 will be needed at Orono as "We were only required to conduct an upstream passage study to determine whether salmon that were attracted to the Orono bypass reach during times of spill or generation flows were delayed in making their way to the Milford facility and the 2015 study showed they were not."

Do you agree that no further studies are needed as a result of the 2015 study findings?

MDMR has reviewed the study reports and we do not agree that the 2015 study findings are sufficient to prove that upstream passage for Atlantic salmon at Orono is safe, timely, and effective. The 2014 and 2015 studies were not designed to explicitly assess fish passage at the Orono Project.

The studies were assessments of the Milford fishway, which used fish that were captured at the top of the Milford fishway and placed them downstream in order to re-approach the Milford fishway. Due to the study design the results of the study are biased towards fish that had already approached Milford and therefore are a biased assessment of the Orono Project as fish were unlikely to be motivated to pass the project. MDMR recommends further studies to determine passage is safe, timely, and effective for Atlantic salmon at Orono.

- 2) At this time, can you comment on whether or not upstream passage performance standards for river herring and American shad will be likely be developed and testing required, or given the fact that fisheries restoration is focused on the Penobscot River mainstem rather than the Stillwater Branch, is it more likely that such standards will never be established?

MDMR may develop upstream performance standards for river herring and American shad for the Orono Project during the 5-year LIHI certification, and require additional testing.

- 3) Would you also agree that based on the 2016 upstream American eel passage studies, that no further studies for eels will be required, as reported to us by BBHP? (BBHP has noted to LIHI that additional upstream passage studies for eel however will likely be required at Stillwater.) Or will possible future studies be requested if numerical standards for passage effectiveness are established?

Future upstream American eel studies will likely be requested to ensure the Orono project meets numerical standards for passage effectiveness, once they are established.

Downstream Eel Passage at Stillwater and Orono

1. From your perspective, have sufficient studies been conducted to determine that downstream eel passage has been shown to be safe and effective at these sites or will numerical standards still be developed in the future and new studies required to make this determination?

Downstream eel passage was studied at the Stillwater and Orono projects in 2016. At Orono, all eels went over the spillway or through the lower level bypass, but the Orono project also spilled water for all but ten days of the study even though river flows were below station capacity. Spill at Orono is not normal given the river flows during the study period and thus the study results are not relevant for normal operations. At Stillwater most eels went over the spillway or through the bypasses, but 12% went through turbine A. MDMR requested examination of the rack, but there is no record if BBHP carried out this examination. In summary, the estimated survival rates were high, but operations at Orono were not normal and survival to a downstream receiver was not adjusted for excessive time to reach the receiver as was done in the 2020 Medway study (see below).

In the Medway study, the median time for freshly-dead tagged eels to drift from the release site (below the powerhouse) to a downstream receiver (M8) was determined. Tagged live eels that reached M8 in a period of time exceeding the median drift time were classified as a project mortality.

MDMR may develop downstream performance standards for American eel during the 5-year LIHI certification, and require additional testing.

MDMR recommendations for Orono upstream operations:

Upstream Passage at Orono

The number of river herring returning to the Penobscot River has increased dramatically since the completion of the Penobscot Restoration project. Due in part to the increased river herring return, the Orono Fishway has been overwhelmed by river herring and resulted in a fish kill during the 2018 season. As a result of this fish kill event, BBHP convened a meeting with resources agencies. In the 2019 and 2020 seasons, BBHP committed more staff time to the trucking effort at the Orono project.

In response to the fish kill event and the meeting with resources agencies, MDMR developed the following recommendations that BBHP complete in order to improve upstream passage at Orono.

BBHP stated that BBHP staff devoted:

- 1) Multiple full or partial days assisting with passage studies; namely shad and river herring tagging;
- 2) Multiple full or partial days on fish cleanup efforts after fish kill; and
- 3) Multiple full or partial days looking for and recovering stranded fish after drawdowns at the Orono, Stillwater, and Milford Facilities;
- 4) Partial/most of a day handling a sturgeon captured at the Milford facility.

All these activities occurred during the river herring run. Much of the time that could have been spent trapping and trucking river herring from the Orono facility was lost due to these activities. The lost time due to the lack of dedicated full time Orono staff decreased the number of fish transported, and therefore successfully passed the project, for that season.

MDMR recommends that BBHP Dedicate full time staff (3-4 persons) to the Orono Facility during the trapping and transport season and use additional staff for activities required at their other projects.

BBHP stated that at times, the river herring did not start running until late morning/early afternoon and that much staff time was spent waiting for fish to enter the trap. Similar run timing is observed at Milford.

MDMR recommends that BBHP coordinate their crew hours with river herring run timing to maximize efficiency in moving fish. This could be accomplished by daily observations at the Orono Facility. If crew observations confirm that the river herring are not moving until afternoon, staff starting times could be shifted to later in the day.

BBHP stated that they do not always operate the Orono fishway with the attraction water operational. It was mentioned that this was to prevent overcrowding of the hopper.

At other facilities like Benton Falls, which also struggles at times to handle the numbers of fish present at the facility, MDMR/Benton Falls Hydro has had success by raising the entrance gate to create a velocity barrier to restrict fish passage. This provides a method for metering the rate of fish entering the trap facility while still maintaining attraction flow to attract other species such as Atlantic salmon and shad. Operating with no attraction flow will limit other fish species from being attracted to the fishway entrance. MDMR recommends that BBHP investigate varying entrance gate settings as an alternative to

current practice and report results to DMR for further discussion. MDMR recognizes that there may still be times which attraction water must be operated at a reduced level or off if necessary.

BBHP staff have also state verbally that fish are able to access the hopper area even with the V gates closed, to the point of overcrowding the hopper, and for this reason attraction water is not run over night.

If fish access to the hopper is due to damage or malfunction of the V-gates, MDMR would request that repairs be made. If this is due to improper engineering, many of the gates at the Milford facility had to be lined with lobster wire to prevent fish from passing through the gates. MDMR would like to see this issue addressed such that attraction water can be run overnight and throughout the day for the following reasons:

- 1) It has been observed at the Milford facility, that salmon tend to move when alewives are not running hard. At Milford, salmon are typically captured in the morning prior to heavy alewife movements. Having the attraction water running overnight at the Orono Facility would attract salmon to the facility throughout the night and in the early morning, such that they should be at the gates waiting when staff arrive in the morning. This is standard practice at other projects.
- 2) Running attraction flow over night would provide attraction for river herring to help maximize earlier lifts. MDMR understands that when Orono staff arrive on site, they turn on the attraction water to the fishlift. Fish below the dam must then “reorient” to the new flow regime, which creates lost hours for attracting fish during the early morning. This is missed opportunity with respect to trapping and trucking fish. There are always fish more driven than others. This will also increase efficiency and the numbers of fish that BBHP can move.

In summary MDMR recommends:

- 1) Dedicated staff (3-4 persons) specific to the Orono Facility utilized for trap and transport of river herring and salmon during the river herring season
- 2) Staff time optimized to match river herring daily run timing during the season
- 3) Repairs and/or modifications to the trap/V-gates to eliminate fish entering the hopper area while the V-gates are closed:
- 4) Investigate varying entrance gate settings in attempts to optimize hopper lifts and to limit overcrowding the hopper;
- 5) Run attraction water 24 hours per day as prescribed by designs.
- 6) Provide weekly reports for the site that document the following metrics: fish passage numbers, fish passage operations and changes in fish passage operations at the facility, project operations and changes in operations at the facility, number of staff and numbers of hours per staff dedicated to fish passage operations, and flow conditions.