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

JANET T. MILLS
GOVERNOR

PATRICK C. KELIHER
COMMISSIONER

November 12, 2024

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

Subject: Maine DMR comments on the Proposed Study Plan for the Brunswick Project (P-2284)

Dear Acting Secretary Reese:

On August 2, 2024, Brookfield White Pine Hydro LLC (Licensee, BWPH) filed a Proposed Study Plan (PSP) for the relicensing of the Brunswick Hydroelectric Project (FERC No. 2284) on the Androscoggin River in Maine. Enclosed are the Maine Department of Marine Resources (MDMR) comments on the PSP for the project.

MDMR looks forward to continued collaboration with the Licensee on issues related to diadromous fish at the Brunswick 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,

Patrick C. Keliher, Commissioner

Cc: MDMR, Sean Ledwin, Erin Wilson
NMFS, Matt Buhyoff, Don Dow
USFWS, Kyle Olcott, Bryan Sojkowski
MDEP, Robert Wood, Laura Paye
MDIFW, John Perry, James Pellerin, Nicholas Kalejs

Executive Summary

On June 20, 2024, MDMR submitted eight study requests for the Brunswick Hydroelectric Project (P-2284) under the regulations set forth in FERC's integrated licensing process (ILP). On August 2, 2024, BWPH submitted its proposed study plan (PSP), which adopted four of our study requests with modifications, and did not adopt four other study requests. On August 28, 2024 and October 8, 2024, BWPH hosted study plan meetings to discuss information needs and potential modifications to studies in the PSP. MDMR continues to request Downstream fish passage effectiveness studies for adult and juvenile alewife, blueback herring, American shad, and American eel, which were requested by MDMR, the National Marine Fisheries Service (NMFS), and the United States Fish and Wildlife Service (USFWS) but were not adopted by BWPH. MDMR supports the adoption of our four other requested studies, provided the inclusion of several study modifications that are detailed below.

Comments on PSP

PDF Page 17: "Table 2.0-1: Estimated Start and Completion Field Dates for Proposed Studies"
MDMR Comment: While MDMR is very supportive of the Diadromous Fish Behavior, Movement, and Interaction Study (interaction study), the schedule of the current phased approach makes it highly unlikely that BWPH will be able to use the information collected in a meaningful way. Phase 2 of the study (i.e. tagging and data collection) is currently scheduled to begin in May of 2026, and it is anticipated that preliminary results from the study will not be available until October 2026. At this point, BWPH would already have completed Phase 1 of the Upstream and Downstream Passage alternatives study, much of Phase 2, and the CFD modeling, the exact studies that the interaction study is supposed to inform. Given the existing knowledge about ineffective passage at this site, particularly in the upstream direction, it is in the best interest of all parties to complete the interaction study as soon as possible such that BWPH, FERC, and the agencies can effectively coordinate on appropriate PME measures at the Project. Delays in completion of Phase 2 of the interaction study will result in an incomplete draft license application, put additional burden on FERC and resource agency staff, and cost BWPH in time and capital. MDMR requests that BWPH either 1) skip phase 1 of the interaction study and move straight to phase 2 or 2) conduct a curtailed phase 1 interaction study as early as possible, such that phase 2 can be completed during the 2025 fish passage season. MDMR is able to assist in support of this goal as appropriate. MDMR has attached example receiver configurations (Figure 1 and Figure 2) to help facilitate study development such that phase 2 can be completed during the 2025 fish passage season.

PDF Page 23: "BWPH does not see the benefit in conducting extensive and costly studies on a potentially outdated downstream passage system that may end up being dramatically changed as a result of this licensing proceeding."

PDF Page 24: "The USFWS requested that BWPH conduct an assessment of downstream American Eel passage to determine the impact of the Project on the outmigration of silver eels in the Androscoggin River. See Section 4.2.1 for discussion pertaining to BWPH's approach to downstream fish passage."
MDMR Comment: To our knowledge, no study has evaluated downstream passage at the Brunswick project for adult and juvenile alosines or adult American eels. Field studies provide critical information on where migrants pass downstream of the project and where and to what extent they may experience injury or mortality. Both route of passage and locations and extent of injury/mortality are site-specific information that cannot be obtained through modeling efforts, which can only estimate impacts and only those impacts from turbine blade strike. Not only are these studies important to understand whether Protection, Mitigation, and Enhancement (PME) measures are needed, but they are also needed to identify what measures are appropriate to address site-specific passage problems. Without these studies, it will be difficult, or impossible, for BWPH to justify selection of science-based and site-specific alternatives in the Downstream Passage Alternatives Study. Without these studies BWPH will have no site-specific information movements of eels and alosines at the project and the

extent of impacts at the project, especially related to passage through the turbines and other routes during the time of year for downstream passage of these species. Additionally, FERC will not be able to fully analyze any proposed PME measures or complete a NEPA analysis without information from these studies. Thus, MDMR highly recommends that BWPH adopt these studies in the RSP and consult with the agencies on their design and completion.

PDF Page 39: "Figure 5.2.1.5-1: Proposed CFD Model Extents."
MDMR Comment: As discussed and agreed to by BWPH during the October 9, 2024 follow-up study plan meeting, MDMR supports the extension of the CFD model extent further upstream to approximately 43.918496 N, -69.970748 W. We also request that BWPH conduct a 2D CFD model in the reach below the spillway to further evaluate flow conditions and potential for false attraction in this location. MDMR is not aware of any information on flow conditions in the reach below the spillway. This information is important to understand potential for stranding, false attraction, and will help inform potential changes to operations at the project. For example, if the upstream behavior study finds that fish are attracted to the falls below the spillway reach, a 2D CFD model of the reach will allow us to compare flows with the tailrace and recommend changed operations to redirect flow. In addition, 2D CFD modeling in the reach below the spillway will identify areas that are and areas that are not suitable for upstream migration for juvenile eels, which will add to information collected in the upstream eel study and identify if a change in operations to reduce/increase flow in the bypass reach would support or undermine upstream eel passage.

PDF Page 40: "The additional field studies requested by MDMR, NMFS and USFWS require a high level-of-effort, are costly, and are not necessary to inform upstream and downstream fish passage improvements at the Project."
MDMR Comment: As we indicated in our comments on the PAD and study requests, desktop evaluations of entrainment are not an appropriate substitute for site-specific field studies. As described in the PAD, the effectiveness of the downstream passage facility has only been studied for Atlantic salmon smolts. Apart from information related to current management practices for striped bass , no site-specific information (E.g. route of passage, injury, mortality, or delay) exists on downstream passage of any other diadromous fishes at the Brunswick project.

The proposed desktop evaluations of entrainment potential will not provide accurate and necessary information to inform downstream passage alternatives at the project. For example, MDMR ran a theoretical TBSA model for 1000 smolts at the project using the "tbsa" package in R with turbine and discharge data from the PAD and a distribution of fish lengths similar to those from the 2014 smolt study. MDMR is not aware of information related to turbine efficiency and the ratio of discharge at best efficiency to hydraulic capacity, so those parameters were estimated based on parameters in the example data for the package. The theoretical TBSA model suggested 97.4% smolt survival through Unit 1. However, actual data from the smolt studies at the project indicate Unit 1 survival is much lower (as low as 70.9% in 2014). This highlights the need for specific field studies to evaluate downstream passage at hydroelectric projects generally, but specifically identifies that the TBSA desktop evaluation is not accurate for the Brunswick Project.

Furthermore, while TBSA models can be useful tools to guide assessment needs for some species, the application of a negative length-survival relationship to juvenile alosines is not supported by literature on the species and lifestage. Survival estimates from TBSA models typically follow a negative relationship with fish size (i.e., larger fish have lower survival estimates and small fish have high survival estimates). However, this relationship is largely based on studies of salmon smolts and larger alosines (> 90 mm), and is not supported by studies on juvenile alosines < 90 mm. In fact, one study on alewives that had an average fish length of 51 mm found a 0.1% survival after one hour (Franke et al. 1997). Similarly, Heisey et al. (1992) found a 97% survival rate for American shad (90 – 144 mm fork length) while Kynard et al. (1982) found mortality rates of 62-82% for

smaller shad and blueback herring (60 – 90 mm). Thus, it is not appropriate to apply a negative length-survival relationship to juvenile alosines.

PDF Page 42: "The configuration of the Project's upstream and downstream passage facilities will be compared with the current USFWS guidelines (2019) for designing upstream and downstream passage for the migratory species present, including Atlantic Salmon, American Shad, river herring, and American Eel."
MDMR Comment: Please edit the text to read "with the current USFWS guidelines (2019; or updated guidelines as available)." MDMR is aware that the USFWS is updating the 2019 guidelines, which may become available prior to initiation of this study. As such, BWPH should use the most up-to-date information available at the time of the study.

PDF Page 42: "BWPH will perform a literature review to identify several upstream and downstream passage alternatives and/or modifications that have been utilized at other hydroelectric projects for passage of the diadromous species that are found at the Project."
MDMR Comment: MDMR requests that BWPH perform an extensive literature review that is inclusive of all scientifically supported alternatives. Recognizing that many upstream and downstream passage alternatives at other hydroelectric projects were designed decades ago and supported by species information in-hand at the time, which largely focused on Atlantic salmon. Alternatives should include examples that have been utilized at other hydroelectric projects for passage of diadromous species and be broad in scope, E.g. nature-like fishways, ice harbor fishways.

PDF Page 44: "To avoid having personnel positioned downstream of the Project dam and spillway during the evening hours, surveys will be conducted from safely accessible locations along existing project structures (e.g., walkways, behind railings)."
MDMR Comment: The methods proposed by BWPH (i.e., attempting to view eels from a distance with binoculars) have proven ineffective at the Lewiston Falls project upstream, where very limited information was collected to inform potential eel ramp locations[1]. MDMR does not recommend these methods be used as they will not collect adequate information for development of upstream measures for American eel. Due to the location of vantage point 1 (lower half of existing fishway), observers may be close enough to view some eels with binoculars and red lights but not as effectively as walking surveys in these areas, and spotlights are not recommended for observations of eels. However, the area overlooking the ogee overflow spillway (vantage point 2) and the deck structure on the Topsham side (vantage point 3) will be too distant to reliably observe eels and we recommend BWPH utilize other methods for these locations. For example, the area immediately downstream of the ogee spillway and tainter gate structures could be viewed more effectively by observers positioned downstream of the project. Observers could access these areas with a small, hand carried watercraft and communicate with operations staff to slightly lower the headpond to allow adequate time for observers to evacuate the area in the event of a station trip. This same process has been used in eel studies at other projects in Maine[2], and would likely result in a much more accurate account of eel congregation locations below the project. Eels have already been observed upstream of this project in abundance, so the main goal of this study is to identify appropriate locations to site an upstream eelway or eelways and potential need to changes in discharge at the project. If inadequate information is collected, BWPH and the agencies may not be able to initially site an eelway location(s) that are effective, resulting in the need for adaptive management, potentially substantial manipulation, and increased costs post-licensing.

Crew safety is important and MDMR will not advocate for studies for which we have information that indicates they will compromise crew safety. If BWPH has information that indicates that the study methods MDMR and

[1] Accession No. 20240520-5105
[2] Accession No. 20210907-5141

USFWS proposed are unsafe, we request that BWPH provide detailed documentation to support this finding including documenting the process that BWPH followed to arrive at this conclusion.

PDF Page 45: "BWPH is proposing to conduct the study during one study year. "
MDMR Comment: If environmental conditions or survey methods impact the study results to the extent that they are unusable (i.e., survey dates are reduced due to weather and/or results do not include the beginning and end of the season and/or surveys do not capture the range of flow conditions during the passage season and/or survey locations leave gaps that do not inform potential eel ramp locations), BWPH should be prepared to repeat the study.

PDF Page 47: "Determine whether JSATS is an appropriate tool to address the study goal when considering the hydro-morphological conditions of the Androscoggin River and the downstream study area as influenced by the Project facilities and its operations."
MDMR Comment: The objective should be to determine what tool is appropriate to address the study goals, and resources information needs. As written the process indicates that BWPH will evaluate if JSATS is appropriate and if it is not appropriate they would not pursue the remainder of the study. This is unacceptable because it will not address the resource information needs. Please outline the process to collect the required information if JSATS is not determined to be effective.

If the pilot study fails and an alternative method is not available, that would represent a substantial change from the proposed study, and MDMR or federal resource agencies would request that the licensee complete the Upstream Passage Effectiveness study for sea lamprey requested by MDMR and other agencies in response to the PAD[3]. There is currently no information related to sea lamprey passage at the project and this study would be needed to address information gaps at the project, should the proposed Diadromous Fish Interactions study fail to move forward.

PDF Page 48: "Results of this study will help BWPH, and the stakeholders determine whether the current passage facilities and operations allow for safe, timely, and effective passage at the Project and'
MDMR Comment: As described in previous upstream passage studies at the project, we know that the current fishway provides injurious, delayed, and ineffective passage. The purpose of this study is to provide the required information to support the development of passage enhancements at the project. As such, please edit the text to read "Results of this study will provide information to support BWPH and stakeholders in the development of passage enhancements at the Project such as improvements to the existing fishway, channel, modification(s), and/or design of new passage facilities." As we noted in our PAD comments, improvements to the existing fishway are unlikely to result in safe, timely, and effective passage, and new passage facilities will likely be necessary.

PDF Page 50: "Due to the relatively shallow water depths and high turbulence during spill conditions, BWPH does not intend to install acoustic receivers in the ledge areas located immediately downstream of the spillway."
MDMR Comment: Due to the ability of sea lamprey and other species to climb wetted ledge structures, MDMR recommends that the study area includes the area below the spillway and tainter gate structures. It would be sufficient to install two receivers in this location to monitor presence/absence, and thus the ability for fish (particularly lamprey) to ascend the falls and move toward the spillway. We do not believe that this request will add substantially to the study as it will likely require less than two days to deploy and retrieve the receivers and will not require significant additional time to analyze the data from these two receivers. The study area should also include immediately below the falls to obtain information on fish falsely attracted to that area. The feasibility of installing acoustic receivers in these areas should be assessed prior to implementation of the study.

[3] Accession No. 20240620-5317

If installation is infeasible, the area should at least be monitored regularly with mobile tracking equipment when tagged fish (particularly sea lamprey) are known to be in the area.

PDF Page 51: "To inform the cost and level of effort for this study, BWPH has assumed the tagging of 200 adult river herring, 200 adult American Shad, and 100 Sea Lamprey."
MDMR Comment: It is unclear how BWPH came up with the sample sizes for each species, or if these are just considered placeholders to obtain a general estimate of cost. Sample size determination should follow a statistically rigorous approach that will result in meaningful results. MDMR suggests utilizing methods developed by Molina-Moctezuma and Zydlewski (2020)[4] to assist in this effort, as was recommended for a similar study at the Lawrence Hydroelectric project[5].

PDF Page 60: "Potential for egress will be characterized for three size classes of fish that are broadly representative of the sizes and behaviors of fish that are vulnerable to stranding at the site.
• Large fish: characterized by adult sturgeons
• Medium fish: characterized by adult salmon
• Small fish: characterized by adult river herring"
MDMR Comment: MDMR is concerned about stranding impacts to juvenile eels and juvenile herring due to changes in project operations. We request that egress and swimming ability for these smaller fish be included in the study. A recent stranding study[6] observed small fish (e.g., landlocked salmon and brook trout parr) being stranded more often than large fish.

[4] Molina-Moctezuma A, and J Zydlewski. 2020. An interactive decision-making tool for evaluating biological and statistical standards of migrating fish survival past hydroelectric dams. River Research and Applications 1-9.
[5] Accession No. 20240425-5214 (see PDF page 12)
[6] Accession No. 20240909-5038

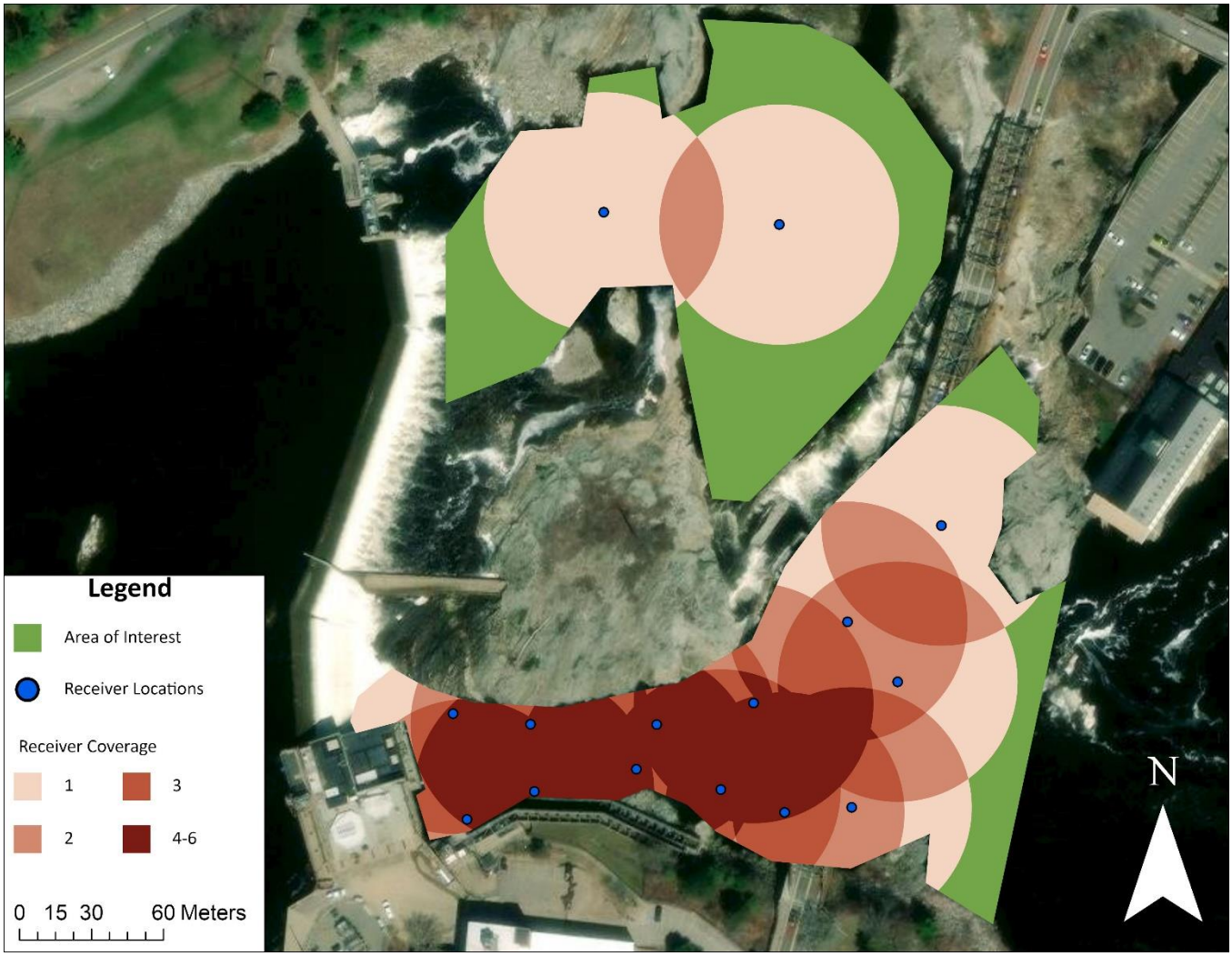

Figure 1. Example receiver configuration below the Brunswick Hydroelectric Project for use in the Diadromous Fish Behavior, Movement, and Project Interaction Study. Green is the assumed area of interest, and potential receiver locations are shown as blue circles. Receivers in this figure have an assumed range of 50 m, represented by the larger circles extending beyond receiver locations. The color of the larger circles represents the number of overlapping receivers covering a particular area, with dark colors indicating more receiver coverage. The literature suggests that simultaneous coverage of at least four receivers is needed to obtain accurate 3D locations for tagged fish.[7] The number of receivers indicated does not necessarily represent the maximum number of receivers needed for the study.

[7] Nebiolo KP, and TH Meyer. 2021. High precision 3-D coordinates for JSATS tagged fish in an acoustically noisy environment. Animal Biotelemetry 9:20. https://doi.org/10.1186/s40317-021-00244-0

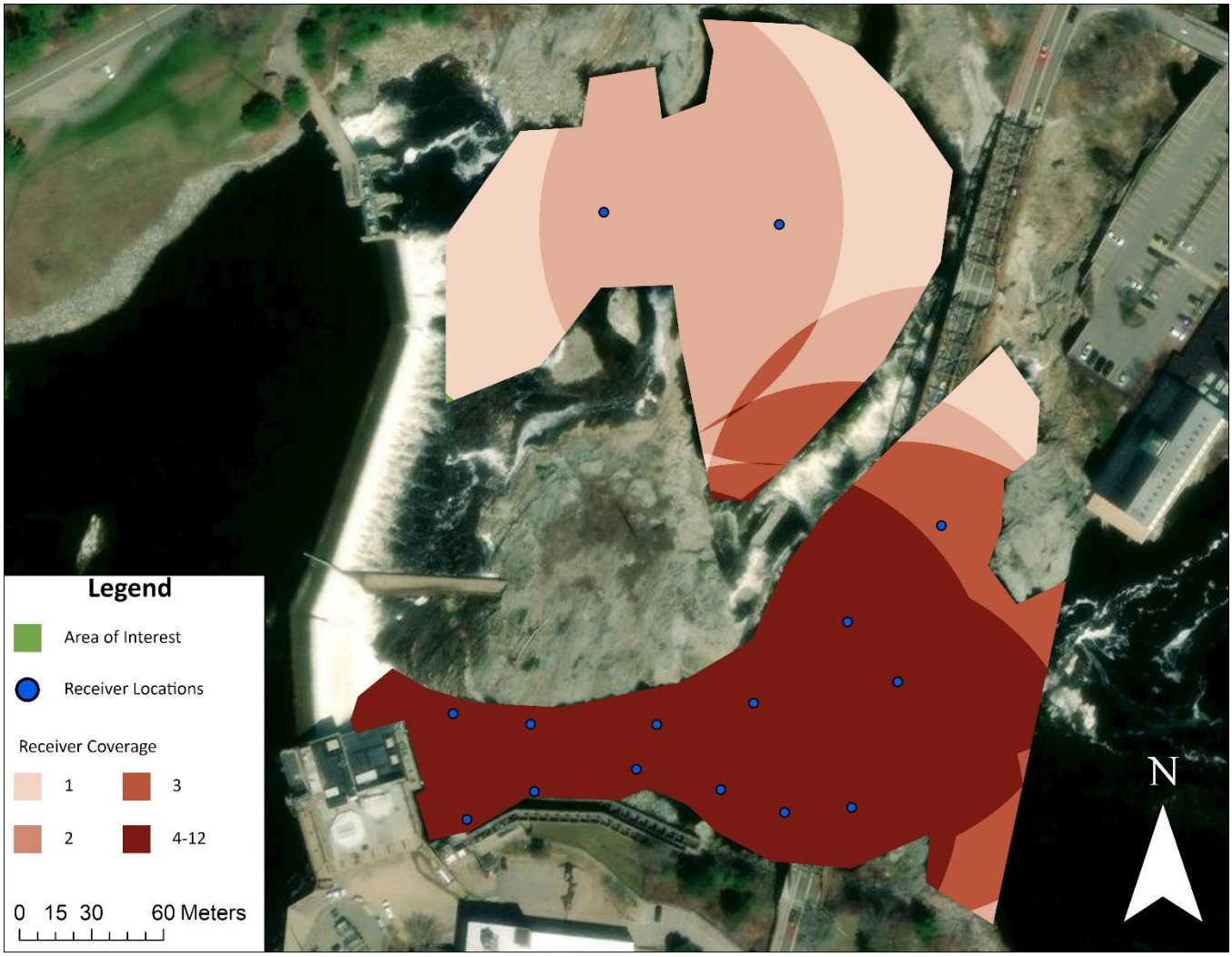

Figure 2. Example receiver configuration below the Brunswick Hydroelectric Project for use in the Diadromous Fish Behavior, Movement, and Project Interaction Study. Green is the assumed area of interest, and potential receiver locations are shown as blue circles. Receivers in this figure have an assumed range of 100 m, represented by the larger circles extending beyond receiver locations. The color of the larger circles represents the number of overlapping receivers covering a particular area, with dark colors indicating more receiver coverage. The literature suggests that simultaneous coverage of at least four receivers is needed to obtain accurate 3D locations for tagged fish.[8] The number of receivers indicated does not necessarily represent the maximum number of receivers needed for the study.

[8] Nebiolo KP, and TH Meyer. 2021. High precision 3-D coordinates for JSATS tagged fish in an acoustically noisy environment. Animal Biotelemetry 9:20. https://doi.org/10.1186/s40317-021-00244-0