

155 FERC ¶ 61,185
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Norman C. Bay, Chairman;
Cheryl A. LaFleur, Tony Clark,
and Colette D. Honorable.

Merimil Limited Partnership
Brookfield White Pine Hydro, LLC

Project Nos. 2574-069
2574-075
2322-054
2325-077

ORDER AMENDING LICENSES TO REQUIRE INTERIM SPECIES PROTECTION
PLAN FOR ATLANTIC SALMON, AND HANDLING AND PROTECTION PLAN
FOR SHORTNOSE AND ATLANTIC STURGEON

(Issued May 19, 2016)

1. On February 21, 2013, Brookfield White Pine Hydro, LLC (Brookfield), on behalf of itself and Merimil Limited Partnership (Merimil), filed an application to amend the licenses for three hydroelectric projects on the Kennebec River in Maine to require an interim species protection plan (Interim Plan) for endangered Atlantic salmon. The Interim Plan, for years 2013 through 2019, would require interim measures to avoid and minimize impacts to endangered Atlantic salmon during operation of Merimil's Lockwood Project No. 2574, and Brookfield's Shawmut Project No. 2322 and Weston Project No. 2325.¹ On March 29, 2013, Brookfield amended its application to

¹ Merimil is (and has always been) the licensee for the Lockwood Project. Brookfield is the general partner for Merimil, and is responsible for operating the Lockwood Project. Brookfield is the licensee for the other two projects. The Commission originally licensed the Shawmut and Weston Projects to Central Maine Power Company, and approved a transfer of the licenses to FPL Energy Maine Hydro, LLC, on December 28, 1998. *Central Main Power Co.*, 85 FERC ¶ 62,208 (1998). The Commission amended the licenses to reflect the company's new name, Brookfield White Pine Hydro, LLC, on July 29, 2013. *FPL Energy Main Hydro, LLC*, 144 FERC ¶ 62,075 (2013). For convenience, we refer to Brookfield as the licensee throughout this order.

include a sturgeon handling and protection plan (Sturgeon Plan) that would require permanent measures to avoid and minimize impacts to endangered shortnose sturgeon and threatened Atlantic sturgeon at the Lockwood Project. Several parties have intervened in opposition to the Interim Plan for Atlantic salmon, contending that it is inadequate and conflicts with an earlier settlement agreement for fish protection measures in the Kennebec River Basin. One intervenor opposes both plans, contending that the Commission should instead require removal of the Lockwood Dam. For the reasons discussed below, we amend the licenses to require both plans.

Background

2. The Commission originally licensed the Lockwood, Shawmut, and Weston projects in the 1960s, and has subsequently relicensed them. The 6.915-megawatt (MW) Lockwood Project is located at river mile 63 in Waterville, Maine, and is the first dam on the mainstem of the Kennebec River.² The Hydro-Kennebec Project No. 2611, which is the next dam upriver from the Lockwood Project, is located just upstream at river mile 64. It is not involved in this amendment proceeding but obtained a similar amendment to require an interim plan for Atlantic salmon in 2013.³ The 8.775-MW Shawmut Project is located at river mile 66.⁴ The 14.75-MW Weston Project is the next upstream dam and is located at river mile 82.⁵

² The Commission issued an original license for the Lockwood Project in 1969, and relicensed the project on March 4, 2005. The license expires in 2036. *See Merimil Limited Partnership*, 110 FERC ¶ 61,240 (2005).

³ *See Hydro-Kennebec, LLC*, 142 FERC ¶ 62,174 (2013) (approving Interim Species Protection Plan for Atlantic Salmon). As part of that plan, the licensee was required to file final plans and a schedule for construction of upstream fish passage facilities. Commission staff approved the licensee's final design plans for those facilities on March 7, 2016. *Hydro-Kennebec, LLC*, 154 FERC ¶ 62,161 (2016).

⁴ The Commission issued an original license for the Shawmut Project in 1964, and relicensed the project on January 5, 1981. *Central Main Power Co.*, 14 FERC ¶ 62,004 (1981). The current license expires in 2021, and the licensee is now involved in the pre-filing phase of the relicensing process.

⁵ The Commission issued an original license for the Weston Project in 1964 and relicensed the project on November 25, 1997. *Central Main Power Co.*, 81 FERC ¶ 61,251 (1997). The license expires in 2036.

3. The Kennebec River supports a varied fish population, including both resident and migratory species. In 1987, licensees of a number of projects on the Kennebec (including Lockwood, Shawmut, and Weston) and Sebasticook Rivers⁶ and state fisheries agencies entered into an agreement, known as the Kennebec Hydro Developers Group Agreement (KH DG Agreement or Kennebec Agreement), to facilitate the restoration of American shad, alewife, and Atlantic salmon in the Kennebec River Basin. The licensees agreed to provide funding to the state fishery agencies for interim trap and truck operations at the projects, to install and operate permanent downstream and upstream fish passage facilities according to a schedule, and to conduct studies related to the restoration efforts. Among other things, the Kennebec Agreement assumed that fish passage would be provided at the Edwards Project No. 2389, which at the time was the first dam on the Kennebec River, within the next few years.

4. This did not happen, and in 1997 the Commission denied a new license for the Edwards Project and ordered the licensee to file a plan for dam removal.⁷ Thereafter, on May 28, 1998, the licensees of the Edwards Project and seven upstream projects (again including Lockwood, Shawmut, and Weston), together with state and federal fisheries agencies and environmental groups, filed an offer of settlement, known as the Lower Kennebec River Comprehensive Settlement Accord.⁸ This settlement modified and replaced the earlier agreement, and parties continued to refer to it as the KH DG

⁶ The Sebasticook River joins the Kennebec River about half a mile downstream of the Lockwood Project.

⁷ *Edwards Manufacturing Co., Inc.*, 81 FERC ¶ 61,255 (1997).

⁸ Signatories to the 1998 Kennebec Agreement are: Edwards Manufacturing Company and the City of Augusta, Maine (the licensees for the now-removed Edwards Project); U.S. Fish and Wildlife Service; National Marine Fisheries Service, the State of Maine; Central Maine Power Company (the then licensee for the Fort Halifax Project No. 2552, the Shawmut Project, and the Weston Project); Merimil Limited Partnership (licensee for the Lockwood Project); Hydro Kennebec Limited Partnership (licensee for the Hydro Kennebec Project No. 2611); Benton Falls Associates (licensee for the Burnham Project No. 11472); and a group of intervenors collectively called the Kennebec Coalition, comprising American Rivers, Inc., Atlantic Salmon Federation, Kennebec Valley Chapter of Trout Unlimited, Natural Resources Council of Maine, and Trout Unlimited.

Agreement.⁹ The revised agreement included provisions for removing the Edwards Dam and, on the occurrence of certain triggering events, installing fish passage at the upstream projects. Later that year, the Commission amended the licenses for these projects to incorporate the new terms of the Kennebec Agreement.¹⁰ The Edwards Project was removed in 1999.

5. In 2005, the Commission issued a new license for the Lockwood Project that continued to require the fish passage measures of the Kennebec Agreement, some of which were already being developed. To implement part of the agreement, Brookfield installed a fish lift and trap and truck facility at the Lockwood powerhouse as an interim upstream fish passage facility and began operating it in 2006. Brookfield also developed operational and effectiveness study plans for the new fish lift in consultation with resource agencies, and the Commission approved these plans on April 26, 2006.

6. The Lockwood, Shawmut, and Weston Projects are located within the range of several species of fish listed as threatened or endangered under the Endangered Species Act (ESA). The Lockwood Project is within the range of endangered shortnose sturgeon and within two Distinct Population Segments (DPS)¹¹ of Atlantic sturgeon (Gulf of Maine DPS and New York Bight DPS). All three projects (Lockwood, Shawmut, and Weston) are within the range of the endangered Gulf of Maine DPS of Atlantic salmon.

⁹ Because the settlement agreement includes a number of parties who are not members of the Kennebec Hydro Developers Group, we refer to it as the Kennebec Agreement in this order.

¹⁰ See *Edwards Manufacturing Co., Inc., et al.*, 84 FERC ¶ 61,227 (1998) (incorporating relevant parts of the 1998 Kennebec Agreement in the licenses for the Lockwood, Shawmut, and Weston Projects, among others). The new license for the Lockwood Project, issued in 2005, includes the relevant provisions of the 1998 Kennebec Agreement as a condition of the project's water quality certification. See *Merimil Limited Partnership*, 110 FERC ¶ 61,240 at Appendix B.

¹¹ A Distinct Population Segment or DPS is the smallest division of a species permitted to be protected under the ESA. It is a population or group of populations that is discrete from other populations of the species and is significant in relation to the entire species. The ESA provides for listing species, subspecies, or distinct population segments of vertebrate species. See the joint Fish and Wildlife Service (FWS) and NMFS policy statement, 61 Fed. Reg. 4722 (1996).

7. Regarding sturgeon, the National Marine Fisheries Service (NMFS) had issued a final recovery plan for shortnose sturgeon in December 1998,¹² and the new license for the Lockwood Project included a shortnose sturgeon handling and protection plan. The listing of Atlantic sturgeon came later. On February 26, 2012, NMFS listed the Atlantic sturgeon as endangered in the New York Bight DPS¹³ and as threatened in the Gulf of Maine DPS.¹⁴

8. Regarding Atlantic salmon, NMFS and the U.S. Fish and Wildlife Service (FWS; collectively, the Services) listed the Gulf of Maine DPS of Atlantic salmon as endangered on November 17, 2000.¹⁵ At the time, the listing range for the Gulf of Maine DPS of Atlantic salmon did not include areas where the Lockwood, Shawmut, and Weston Projects are located. On June 19, 2009, the Services expanded the listing range for these fish to include these areas.¹⁶ At the same time, NMFS designated critical habitat for the Gulf of Maine DPS of Atlantic salmon that includes the location of all three projects.¹⁷

9. Concerned that the projects might affect Atlantic salmon, Brookfield initially contacted NMFS in 2009 to discuss obtaining an Incidental Take Permit¹⁸ through a Habitat Conservation Plan¹⁹ under section 10 of the ESA.²⁰ After preparing a draft

¹² Shortnose sturgeon were listed as endangered on March 11, 1967 (32 Fed. Reg. 4001), and remained on the endangered list with the enactment of the ESA in 1973.

¹³ 77 Fed. Reg. 5880 (2012).

¹⁴ 77 Fed. Reg. 5914 (2012).

¹⁵ 65 Fed. Reg. 69,459 (2000).

¹⁶ 74 Fed. Reg. 29,344 (2009).

¹⁷ 74 Fed. Reg. 29,300 (2009).

¹⁸ An Incidental Take Permit is a permit issued under section 10(a)(1)(B) of the ESA to a non-federal party undertaking an otherwise lawful activity that might result in the take of an endangered or threatened species. As defined in ESA section 3(19), the term “take” means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”

¹⁹ A Habitat Conservation Plan is a plan that outlines ways of maintaining, enhancing, and protecting a given habitat type needed to protect ESA-listed species. A Habitat Conservation Plan is required before an incidental take permit may be issued.

Habitat Conservation Plan for review, Brookfield met with NMFS and indicated that instead, it would develop an Interim Plan for Atlantic salmon that could be incorporated in the project licenses as a license amendment. On January 31, 2013, Brookfield requested that the Commission designate it as the Commission's non-federal representatives for the purpose of informal consultation with NMFS on Atlantic salmon. Commission staff agreed and made the requested designation by letter issued on February 7, 2013.

10. On February 21, 2013, Brookfield filed its proposed Interim Plan for Atlantic salmon, together with a draft Biological Assessment of the plan.²¹ Brookfield requested that the Commission initiate formal consultation with NMFS on the Interim Plan and incorporate the proposed measures in the project licenses.

11. On March 14, 2013, Commission staff adopted Brookfield's Biological Assessment and initiated formal consultation with NMFS on Atlantic salmon. Based on the analysis in the Biological Assessment, Commission staff concluded that operation of the projects under the Interim Plan may adversely affect Atlantic salmon and the species' designated critical habitat.

12. Meanwhile, on March 4, 2013, Brookfield requested that the Commission designate it as the Commission's non-federal representative to consult informally with NMFS regarding effects of operating the Lockwood Project on endangered shortnose sturgeon and threatened Atlantic sturgeon. Shortly thereafter, in a letter to NMFS dated March 25, 2013, Commission staff made the requested designation.

13. On March 29, 2013, Brookfield filed its Sturgeon Plan and an addendum to its earlier draft Biological Assessment to address effects of operating the Lockwood Project on Atlantic and shortnose sturgeon.²² Brookfield requested that the Commission initiate formal consultation with NMFS on the Sturgeon Plan and include the plan as part of a single ESA consultation on both the Interim Plan and the Sturgeon Plan to address all three listed species (Atlantic salmon, Atlantic sturgeon, and shortnose sturgeon).

²⁰ See NMFS Biological Opinion at 5-6, which provides a consultation history (filed July 22, 2013).

²¹ The Interim Plan appears in Appendix A to Brookfield's draft Biological Assessment (filed February 21, 2013).

²² The Sturgeon Plan is Attachment A to Brookfield's addendum to the Biological Assessment (filed March 29, 2013).

14. On May 1, 2013, Commission staff adopted the addendum to the Biological Assessment and initiated formal consultation with NMFS on shortnose and Atlantic sturgeon. Based on the analysis in the Biological Assessment, Commission staff concluded that operation of the Lockwood Project under the Sturgeon Plan is likely to adversely affect shortnose sturgeon and the Gulf of Maine DPS and New York Bight DPS of Atlantic sturgeon. By letter filed on May 15, 2013, NMFS informed the Commission that it had received all the information needed for formal consultation and would prepare a single Biological Opinion addressing both the Interim Plan and the Sturgeon Plan.

15. On July 9, 2013, a group of intervenors collectively called the Kennebec Coalition, comprising American Rivers, Inc., Atlantic Salmon Federation, Kennebec Valley Chapter of Trout Unlimited, Natural Resources Council of Maine, and Trout Unlimited, filed comments opposing the Interim Plan and Commission staff's Biological Assessment for Atlantic salmon. The Kennebec Coalition expressed concern that the Interim Plan is inadequate to protect Atlantic salmon and would conflict with and be less stringent than existing license articles for the three projects and the terms of the Kennebec Agreement, particularly with respect to provisions for downstream passage of endangered Atlantic salmon and other species.

16. On July 22, 2013, NMFS filed its Biological Opinion, addressing not only the Interim Plan for Atlantic salmon at Lockwood, Shawmut, and Weston, but also the Sturgeon Plan for Atlantic and shortnose sturgeon at Lockwood.²³ On September 3, 2013, NMFS filed an amendment to its Biological Opinion, clarifying its consideration of the effects of the Lockwood Project on Atlantic and shortnose sturgeon and adding a condition to the incidental take statement for the project. For Atlantic salmon, NMFS concluded that operation of the Lockwood, Shawmut, and Weston Projects under the Interim Plan may adversely affect but is not likely to jeopardize the continued existence

²³ The Biological Opinion also included an Interim Plan for Atlantic salmon at the Brunswick Project No. 2284 and the Lewiston Falls Project No. 2302, as well as a Sturgeon Plan for Atlantic and shortnose sturgeon at the Brunswick Project. These two projects, which are located on the Androscoggin River, are not at issue in this amendment proceeding. The Androscoggin River joins the Kennebec River near tidewater at Merrymeeting Bay. Commission staff approved the protection plans for these projects on December 13, 2013. *See Brookfield White Pine Hydro, LLC*, 145 FERC ¶ 62,187 (2013) (approving Interim Plan and Sturgeon Plan for the Brunswick Project), and *Brookfield White Pine Hydro, LLC*, 145 FERC ¶ 62,188 (2013) (approving Interim Plan for the Lewiston Falls Project).

of the Gulf of Maine DPS of Atlantic salmon. NMFS further found that, although these projects would continue to adversely affect essential features of the species' designated critical habitat, the proposed action would improve the functioning of migratory habitat by constructing upstream fishways and by implementing an adaptive management strategy to improve downstream survival. NMFS therefore concluded that the proposed action would not lead to adverse modification or destruction of critical habitat. For sturgeon, NMFS concluded that implementing the Sturgeon Plan may adversely affect but is not likely to jeopardize the continued existence of shortnose sturgeon or the Gulf of Maine or New York Bight DPSs of Atlantic sturgeon, and that the plan would protect listed shortnose and Atlantic sturgeon that occur downstream of the Lockwood Project.²⁴

17. On January 29, 2014, the Atlantic Salmon Federation (Atlantic Salmon) and the Natural Resources Council of Maine (Natural Resources) filed a request that, before incorporating the Interim Plan for Atlantic salmon in the licenses for the projects, the Commission should require Brookfield to file a formal application for a license amendment and should issue public notice of the amendment application, when filed. In support, they argued that the Biological Opinion and Interim Plan would require physical changes to the projects if the Interim Plan is included in the licenses.

18. On March 18, 2014, Atlantic Salmon filed a motion to intervene in the proceeding to consider the Interim Plan at Lockwood, Shawmut, and Weston. The Maine Department of Marine Resources (Maine Marine Resources) filed a notice of intervention on May 2, 2014, stating that if the Interim Plan is approved, the Department's efforts to restore American shad and blueback herring to historical habitats above the Lockwood Project will be thwarted or indefinitely delayed. On June 18, 2014, in response to Maine Marine Resources' comments, NMFS filed comments supporting the Interim Plan.

19. On July 17, 2014, Atlantic Salmon, Natural Resources, and Trout Unlimited filed comments objecting to the Biological Opinion and Interim Plan for Atlantic salmon at the projects. They requested that the Commission reject the Biological Opinion and deny any license amendments to incorporate the Interim Plan. On July 28, 2014, Maine Rivers filed similar comments, urging the Commission to reject both the Biological Opinion and the Interim Plan.

²⁴ See letter from John Bullard, NMFS, to Kimberly Bose, Commission Secretary, at 1 (attaching the Biological Opinion and summarizing its conclusions).

20. On August 11, 2014, Natural Resources filed a motion to intervene. On September 5, 2014, Brookfield filed a response to the comments of Maine Marine Resources and others, indicating actions it had taken at the projects to implement provisions of the Kennebec Agreement.
21. On September 5, 2014, Brookfield filed a response to Maine Marine Resources' notice of intervention and comments, noting that while Brookfield did not oppose the intervention, it had already met many of its obligations under the Kennebec Agreement. Brookfield added that it was working with Maine Marine Resources and other resource agencies to design additional fish passage facilities at the Hydro Kennebec and Lockwood Projects to ensure that the fish passage needs of all species covered by the agreement are addressed, consistent with the schedule for fishway improvements in the Interim Plan.
22. On January 7, 2015, Atlantic Salmon, Natural Resources, and Trout Unlimited filed additional comments, expressing concern about the failure to meet the biological triggers of the Kennebec Agreement for upstream passage facilities at any of the dams on the mainstem Kennebec River. Among other things, they stated that as provided in the Kennebec Agreement, because the biological triggers for permanent fish passage had not been met by December 2014, they were planning to meet with Brookfield to assess progress in restoring fish species covered by the agreement and would attempt to reach consensus on future fish passage measures. On January 14, 2015, Douglas Watts, an intervenor in the Lockwood Project relicensing proceeding, filed comments expressing concern about the failure of the Lockwood Dam and fish trap to pass American shad. On February 12, 2015, Atlantic Salmon, Natural Resources, and Trout Unlimited filed additional comments opposing the Biological Opinion and Interim Plan.
23. On February 13, 2015, Brookfield filed a request to amend the schedule in the Interim Plan to extend the date for completing construction and beginning operation of the volitional component of the fish lift at Lockwood from May 1, 2016 to May 1, 2017.²⁵ The company stated that the additional time would allow Brookfield to focus on determining why fewer American shad than expected are captured in Lockwood's fish lift and to work with the agencies and other parties to the Kennebec Agreement to attempt to find a solution. Brookfield attached a record of consultation indicating that NMFS, FWS, Maine Department of Inland Fisheries and Wildlife, Maine Department of Environmental Protection, and Maine Marine Resources supported the request for a delay. In contrast, Atlantic Salmon, Natural Resources, and Trout Unlimited stated that they did not concur

²⁵ A volitional component of a fish passage system is a structure, like a fish ladder, that allows but does not force fish to use it.

with the proposal and reiterated their opposition to the Biological Opinion and Interim Plan.

24. On July 9, 2015, the Maine Council of Atlantic Salmon, Natural Resources, the Kennebec Valley Chapter of Trout Unlimited, and Maine Rivers filed a complaint for a declaratory judgment and injunctive relief in the United States District Court for the District of Maine, seeking judicial review of the Biological Opinion and an injunction directing NMFS to withdraw it.²⁶ Among other things, they requested that the court direct NMFS to reinitiate consultation with the Commission and prepare a new Biological Opinion that complies with the ESA.

25. On August 27, 2015, Commission staff issued a public notice of Brookfield's application to amend the licenses for the Lockwood, Shawmut, and Weston Projects to incorporate the Interim Plan, and to amend the license for the Lockwood Project to incorporate the Sturgeon Plan. The notice established a deadline for filing comments, motions to intervene, and protests by September 27, 2015.²⁷

26. On September 8 and 9, 2015, Mr. Watts filed additional information on American shad for consideration in the proceeding. On September 14, 2015, Mr. Watts filed a motion to intervene. NMFS filed a notice of intervention on September 18, 2015. On September 24, 2015, Maine Marine Resources filed comments, noting its earlier comments and intervention opposing the Interim Plan and including additional information on fish passage effectiveness at the Lockwood Project. On September 25,

²⁶ See *Maine Council of the Atlantic Salmon Federation, et al. v. National Marine Fisheries Service*, No. 2:15-cv-00261-JAW, U.S. Dist. Ct. Maine (filed July 8, 2015). The complaint also seeks judicial review of a 2012 Biological Opinion for a proposed amendment to incorporate an interim species protection plan for Atlantic salmon in the license for the Hydro-Kennebec Project No. 2611. As noted, Commission staff granted that amendment request in 2013. See note 3, *supra*. The complaint asks the court to direct Brookfield to request that the Commission revoke this license amendment.

²⁷ Because September 27, 2015, was a Sunday, the filing deadline was Monday, September 28, 2015. See 18 C.F.R. § 385.2007(a)(2) (2015). Thus, all interventions were timely, including those filed before the notice was issued. If the proceeding is one for which intervention is permitted, a party can intervene once the application is filed, even if Commission staff has not yet accepted the application or issued notice of it. See *Central Nebraska Public Power and Irrigation District*, 43 FERC ¶ 61,225, at 61,578 & n.8 (1988).

2015, the U.S. Department of the Interior filed a letter stating that it had no comments on the application.

27. On September 28, 2015, Atlantic Salmon, Natural Resources, Trout Unlimited, and the Kennebec Valley Chapter of Trout Unlimited, collectively, filed a motion to intervene in opposition to the amendment. Among other things, they objected to the fish passage provisions in the Interim Plan and requested that, in light of their suit challenging the Biological Opinion, the Commission defer action on the amendment application pending resolution of that litigation. On September 29, 2015, Mr. Watts filed comments on the proposed amendment applications, contending that because of the failure to pass American shad at the Lockwood Project, the Commission should reject the Interim Plan and require that the Lockwood Dam be breached to provide effective passage for not only American shad but also Atlantic and shortnose sturgeon and striped bass.

28. On February 16, 2016, Mr. Watts filed additional information regarding American shad passage at Commission-licensed dams in Maine.

29. On March 29, 2016, Brookfield filed an annual report of its activities to implement the Interim Plan. Brookfield's cover letter accompanying the report indicates, among other things, that it has been conducting studies and meeting with NMFS and other resource agencies regarding progress under the plan and other issues concerning Atlantic salmon.²⁸ Brookfield states that it met with resource agencies on February 25, 2016 to discuss the results of shad-related studies conducted at the Lockwood Project in 2015. Brookfield further states that, at that meeting, it was decided that Brookfield should proceed with the engineering design and construction of the new upstream volitional fish passage component for the existing Lockwood fish lift. Brookfield adds that at this time, it anticipates that the engineering design will take place in 2016 and construction will begin in 2017.

Discussion

30. Before turning to the parties' arguments, we provide a brief review of the major provisions of the Kennebec Agreement. We then review the actions contemplated in the Interim Plan for Atlantic salmon and the Sturgeon Plan, and review the incidental take provisions of the Biological Opinion. Finally, we address the parties' arguments concerning the two protection plans and explain our reasons for amending the licenses to include them.

²⁸ Letter from Kelly Maloney, Brookfield, to Kimberly Bose, Commission Secretary, at 7 (filed March 29, 2016).

A. The Kennebec Agreement

31. In 1998, the Commission amended the Lockwood, Shawmut and Weston Project licenses to include the relevant provisions of the Kennebec Agreement.²⁹ The agreement provides a process and schedule for installing interim and permanent upstream and downstream fish passage facilities for American shad, alewife, blueback herring, Atlantic salmon, and American eel at a series of hydroelectric projects on the Sebasticook and Kennebec Rivers, including the Lockwood, Shawmut, and Weston Projects. The schedule is based on the anticipated growth of the American shad population in the Kennebec River. However, the State of Maine's goal to restore anadromous fish upstream of the Lockwood Project also includes restoring Atlantic salmon, alewife, and blueback herring above the Lockwood, Hydro Kennebec, Shawmut, and Weston Projects. If the growth of Atlantic salmon, alewife, or blueback herring populations requires a different approach for triggering fishway installation (that is, one not based on American shad), the licensees and resource agencies³⁰ will meet to attempt to reach consensus on the need, timing, and design of permanent upstream passage facilities at the four projects. The interim upstream passage facilities were installed and operational at Lockwood by May 2006.

32. Under the Kennebec Agreement, interim downstream passage is to be accomplished through a combination of controlled spills, turbine shutdown, and sluicing. New structures are not required. If turbine passage is pursued as an alternative, the licensees must conduct qualitative and quantitative studies demonstrating that passage through the turbines does not cause significant mortality. Before installing permanent downstream passage facilities, passage studies are required to determine the effectiveness of various techniques and alternatives.

33. Permanent upstream and downstream passage must be installed and operating within two years after 8,000 American shad are captured at the interim Lockwood fish trap in a single season, or the licensees and resource agencies determine that upstream

²⁹ *See* note 10, *supra*.

³⁰ Section I of the Kennebec Agreement identifies the resources agencies as the National Marine Fisheries Service, Maine Department of Inland Fisheries and Wildlife, Maine Marine Resources, Maine State Planning Office, and the U.S. Fish and Wildlife Service.

passage is warranted based on an alternative approach, whichever occurs earlier. To date, neither condition has occurred.³¹

34. The Kennebec Agreement further provides that, if by December 2014 the biological triggers for permanent upstream passage facilities have not been met at one or more of the dams covered by the agreement, the parties will meet to assess the progress in restoring the species covered by the agreement and will attempt to reach consensus on future fish passage measures. Any disputes are to be handled through the Commission's process. As noted, the parties have initiated discussions under this provision but have not reached consensus.

B. Existing Upstream Fish Passage Facilities

35. In accordance with the license and the Kennebec Agreement, in 2006 Brookfield completed construction of a fish lift and an interim trap, sort, and transport system at the Lockwood Project to trap and truck fish upstream of the Lockwood, Shawmut, and Weston Projects. The Lockwood fish lift facility is located on the west side of the powerhouse adjacent to Unit 7. The lift operates with an attraction flow of up to 150 cubic feet per second (cfs), and has a cycle time of about 10 minutes.

36. The attraction flow attracts the fish through the fish lift entrance gate into the lower flume of the fish lift. The fish then swim through a vee-gate crowder and remain in the lower flume of the lift. The vee-gate crowder closes to hold the fish in a 1,800-gallon water-filled hopper. The hopper lifts the fish to the holding tank elevation and the fish are sluiced into a 2,500-gallon discharge tank. The sorting and trucking portion of the facility includes: the discharge tank, which collects fish discharged from the hopper; two 1,250-gallon holding tanks that sluice fish into Maine Marine Resources' stocking trucks; and a 250-gallon holding tank for Atlantic salmon. The discharge tank is also equipped with piping that can discharge fish back into the tailrace.

³¹ The Kennebec Agreement provides for the possibility of a biologically-based trigger based on the status and growth of Atlantic salmon or river herring (river herring refers collectively to alewives and blueback herring). Thus, under the agreement, an alternative trigger for permanent passage facilities could be based on a biological review of the status of Atlantic salmon. In this case, however, the licensees and resource agencies did not adopt an alternative trigger for installing permanent passage facilities under the Kennebec Agreement. Instead, the status of Atlantic salmon as endangered, together with expansion of its geographic range, provided the trigger for development of the Interim Plan to protect Atlantic salmon at these projects.

C. Existing Downstream Fish Passage

37. Currently, downstream passage at the Lockwood Project is accomplished by a surface sluice installed in the forebay canal. An angled 300-foot-long floating guide boom is installed seasonally and is operated from April 1 to June 15 and from November 1 to December 15. A 32-foot-long section of the floating boom supports a 10-foot-deep metal punch plate screen to guide downstream migrants to the surface sluice.³² In addition to the guide boom and surface sluice, downstream passage is also provided through three orifices, each 3-feet long by 8-inches high, cut into the flashboards along the spillway. The orifices pass approximately 50 cfs, and provide downstream passage routes along the spillway even when the project is not spilling water over the top of the flashboards. In addition, river flows exceed the turbine capacity for much of the time period that downstream fish migrations occur, thus providing substantial fish passage capability over the spillway whenever water is spilling over the dam.

38. At the Shawmut Project, downstream fish passage is provided through a surface sluice located on the right-hand side of the intake structure next to Unit 6. With all three stoplogs removed, the sluice passes flows between 30 and 35 cfs. Flows from this sluice discharge over the face of the dam and drain into a 3-foot-deep plunge pool below the dam. In addition, there is a 7-foot-high, 10-foot-wide Taintor gate located next to this sluice that can pass 600 cfs. This gate is used to pass debris and excess flows, which also discharge over the face of the dam into a shallow plunge pool connected to the river.

39. Downstream fish passage at the Weston Project is provided by a 300-foot-long floating guidance boom with 10-foot-deep sections of 5/16-inch metal punch plate screens suspended from the boom. The boom leads to the log sluice gate, which in turn discharges by way of an existing concrete flume to a plunge pool below the dam. During the downstream migration period, the gate is opened to pass 6 percent of turbine unit flow to attract fish to the log sluice. The gate is opened for smolt and kelt passage³³ generally from April 1 through June 15 and between November 1 and December 31, if river and ice conditions allow. The gate is capable of discharging up to 2,250 cfs, which is approximately 38 percent of turbine unit flow.

³² A metal punch plate screen is a metal sheet with holes that functions as a net but is more sturdy.

³³ A smolt is a young salmon when it becomes covered with silvery scales and first migrates from fresh water to the sea. Kelt is a salmon that has spawned. Kelt requires downstream passage because Atlantic salmon can spawn more than once.

D. Interim Plan for Atlantic Salmon

40. The Interim Plan identifies measures necessary to avoid and minimize the effects of operating the Lockwood, Shawmut, and Weston Projects on federally-listed Atlantic salmon. It covers a 7-year period, from 2013 through 2019, and contemplates that a final protection plan will be developed and filed for Commission approval in 2019 to cover the remaining period from 2020 to expiration of the project licenses in 2036.³⁴ The Interim Plan provides for installing new upstream fishways at the three projects and conducting upstream and downstream passage and survival studies for Atlantic salmon. These studies are to be conducted as part of an adaptive management strategy designed to achieve high passage and survival rates for Atlantic salmon through the Lockwood, Shawmut, and Weston Projects. As described in its annual reports of activities under the Interim Plan, Brookfield has implemented some parts of the plan, such as studies, that could be accomplished consistent with the existing license terms.

1. Upstream Passage of Atlantic Salmon

41. Under the Interim Plan, Brookfield proposes to continue to operate the Lockwood Project fish lift during upstream migration periods for Atlantic salmon from about May 1 through October 31 and to increase the daily number of lifts from the current range of three to five lifts per day to the proposed range of five to eight lifts per day. The exact timing would continue to be determined in consultation with Maine Marine Resources. Brookfield proposes to: (1) trap and sort all fish species, including Atlantic salmon; (2) capture and hold Atlantic salmon for Maine Marine Resources to transfer them to sites or facilities as determined by the fishery management agencies; (3) undertake measures necessary to keep the fish lift in good operating condition; (4) if the fish lift breaks down during the migration period, repair and return it to service as soon as it can safely and reasonably be done; and (5) maintain records of all fish trapped or moved in the fish lift, and allow Maine Marine Resources to continue to collect data on the size, age, and condition of all Atlantic salmon captured in the fish lift.

42. Brookfield also proposes to design a volitional component to the upstream passage facility at Lockwood, and to install it in 2016 and begin operating it in 2017.³⁵ Although

³⁴ Because the Shawmut Project license expires in 2021, the final plan would be considered in that project's relicensing proceeding.

³⁵ The Interim Plan provides that this volitional component of the upstream fishway will be operational in 2016. As noted earlier, however, Brookfield requested a delay to allow time for the agencies to consider issues concerning passage of American shad.

this component is not yet designed, Brookfield has indicated that it will involve a modification of the existing fishway.³⁶ Once the volitional component has been installed, Brookfield would conduct Atlantic salmon adult upstream passage effectiveness studies for up to three years. The licensee would: (1) continue to use underwater cameras in and around the fish lift to observe Atlantic salmon behavior and identify any issues with Atlantic salmon movement into the fish lift; (2) monitor areas of the tailrace that can be visually observed for the presence of holding Atlantic salmon and collect information on numbers and time periods, and monitor angler activity near the fish lift and collect available information on numbers of Atlantic salmon accidentally captured or observed; (3) monitor the bypass reach ledge area during flashboard replacement; (4) with Maine Marine Resources' assistance, collect adult Atlantic salmon for transfer to the Sandy River³⁷ or release back into the Kennebec; and (5) collaborate with Hydro Kennebec Project personnel to gather visual observation data on Atlantic salmon that may migrate to the Hydro Kennebec Project via the Lockwood spillway section.

43. Under the Interim Plan, Brookfield would continue to use the existing Lockwood fish lift and trap and truck system to provide interim upstream passage for Atlantic salmon past the Shawmut and Weston Projects. The company would also design new upstream passage facilities at the Shawmut and Weston projects, in consultation with the fisheries agencies, incorporating the biological needs of Atlantic salmon, in 2016 and 2017, respectively. Brookfield anticipates starting construction of the upstream fish passage facilities in 2017 at the Shawmut Project and in 2019 at the Weston Project. These facilities would then be completed and operating at Shawmut and Weston, respectively, during the 2018 and 2020 upstream migration seasons.

2. Downstream Passage of Atlantic Salmon

44. For downstream passage, Brookfield proposes to expand operation of the downstream passage facilities at the Lockwood, Shawmut, and Weston Projects from April 1 to December 31 for use by adult and juvenile Atlantic salmon. The sluice gates at each project would be operated to maintain an interim flow of 6 percent of station unit flow through each of the gates during evening passage hours. As applicable at Lockwood and Weston, Brookfield would undertake measures necessary to keep the guidance booms in place and in good operating condition. If the guidance booms become

³⁶ See Biological Opinion at 19 (filed July 22, 2013).

³⁷ The Sandy River is a tributary to the Kennebec River and enters the Kennebec several miles upstream of the Weston Project.

dislodged or damaged, the company would repair or replace them as soon as the work could be safely and reasonably done.

45. Spill flows are an important aspect of downstream fish passage at the projects. Flows in excess of total turbine capacity would be spilled in accordance with the projects' high water guidelines and reservoir fluctuation limits, unless Brookfield determines in consultation with NMFS that additional spill is needed for downstream passage. At flows less than the projects' total hydraulic capacity, downstream passage would be provided through the sluice gates, unless Brookfield determines in consultation with NMFS that additional spill is needed.

3. Atlantic Salmon Passage Studies

46. Under the Interim Plan, Brookfield would study downstream smolt passage from 2013 to 2015 at the projects. The study at each project would use between 100 and 200 smolts each year obtained from the Great Lakes National Fish Hatchery. The company would use a paired release study design. Using radio-tagged smolts released upstream of each project and detections at the upstream side of each dam, radio telemetry would record tagged smolts' arrival and passage through the projects. Survival through each project's dam spillway, turbines, or downstream fishway would be determined by the number of smolts known to have arrived alive at each project minus the number of smolts detected alive downstream of the project. An overall survival rate for out-migrating smolts in the Kennebec River would be calculated as the product of each project's individual survival rate. To estimate mortality unrelated to dam passage and occurring within the downstream river reach of each project, a release of tagged smolts would be conducted in each project's tailrace and compared to the smolts arriving at the next downstream project. An overall survival rate for out-migrating smolts in the Kennebec River would be calculated as the product of each project's individual survival rate. Brookfield would consult with NMFS, FWS, and Maine Marine Resources to develop a detailed study plan. In addition to the adult and smolt passage studies, Brookfield also proposes to conduct downstream passage studies of kelts for up to three years between 2015 and 2017 to determine the downstream survival of Atlantic salmon kelts.³⁸ The company would consult with NMFS to develop a detailed study plan for this effort as well.

³⁸ On February 7, 2014, the licensees amended the Interim Plan to postpone the downstream kelt passage studies to 2015 based on a shortage of available kelts.

4. Adaptive Management and Reporting

47. Adaptive management is an integral part of the Interim Plan. Measures included in the plan would be subject to revision after agency consultation and, if necessary, Commission approval. To that end, Brookfield would prepare an annual report, describing the previous year's activities under the Interim Plan and the company's progress on implementing the plan's measures. Brookfield would provide a draft report to the agencies by January 31 of each year and would then meet with the agencies to discuss the draft report, implementation of the Interim Plan, and any other issues related to Atlantic salmon restoration and management activities in the Kennebec River. Brookfield would file a final report with the resource agencies and the Commission by March 31 of each year.

E. Sturgeon Handling and Protection

48. Sturgeon are not present in the Kennebec River in the vicinity of the Shawmut and Weston projects, but are found downstream of the Lockwood Project. Sturgeon will not be passed upstream of Lockwood because the dam location is thought to be the historical upper limit of upstream migration for sturgeon on the Kennebec River and because of concerns about the safety of downstream passage for these fish.³⁹ To protect Atlantic and shortnose sturgeon downstream of the Lockwood Project, Brookfield proposes to implement its Sturgeon Handling and Protection Plan (Sturgeon Plan). The purpose of the plan is to protect sturgeon from effects associated with the operation and maintenance of the Lockwood Project and fish lift.

49. For each sturgeon found in the fish lift, Brookfield would scan the fish for an existing tag and record river flow, bypassed reach minimum flow, and water temperature. Any live, uninjured sturgeon would be returned to the Kennebec River downstream of the project, and Brookfield would report this to NMFS within 24 hours. If any injured sturgeon are found, the licensee would measure, photograph if possible, and report them to NMFS within 24 hours. Brookfield would retain any severely injured fish until notified by NMFS of instructions for potential rehabilitation. Any dead sturgeon would be recovered and preserved in a freezer until after the licensee notifies NMFS and discusses disposal procedures.

50. The project's flashboards are replaced about once a year. Sturgeon may potentially be stranded in the pools below the dam whenever the flashboards are replaced. Sturgeon found in the pools would be removed by dip net or other appropriate equipment.

³⁹ See Biological Opinion at 20.

Alive, injured, or dead sturgeon would be handled in generally the same manner as fish found in the fish lift, as discussed above.

F. Endangered Species Act Consultation

51. Section 7(a)(2) of the ESA requires federal agencies to ensure, in consultation with NMFS or FWS as appropriate, that their actions are not likely to jeopardize the continued existence of federally-listed threatened and endangered species, or destroy or adversely modify critical habitat established for those species. NMFS is the lead agency for Atlantic salmon protection under the ESA in Maine.

52. As noted, Commission staff consulted formally with NMFS on Brookfield's request to include the Interim Plan in the licenses for the Lockwood, Shawmut, and Weston Projects to protect Atlantic salmon, and to include the Sturgeon Plan in the license for the Lockwood Project to protect Atlantic and shortnose sturgeon. The Biological Opinion that NMFS filed with the Commission assumes that the measures provided in these two plans are part of the proposed action and that the Commission will require them in the licenses for these projects.⁴⁰

53. The Biological Opinion includes an incidental take statement, which specifies the amount of incidental take of Atlantic salmon that can occur through 2019 as a result of project operations and the activities that will take place under the Interim Plan. The incidental take statement also specifies the amount of incidental take of Atlantic sturgeon and shortnose sturgeon that can occur at the Lockwood Project as a result of activities under the Sturgeon Plan. Unlike the Interim Plan, however, the Sturgeon Plan applies throughout the remainder of the license term.

54. The incidental take statement includes three reasonable and prudent measures (RPM) to avoid or minimize incidental take of the species, as well as terms and conditions to implement those measures. NMFS states that these terms and conditions are non-discretionary actions that the Commission must require in order to comply with the take prohibitions of section 9 of the ESA.⁴¹ NMFS adds that these terms and conditions are in addition to the measures provided in the two protection plans.⁴² The

⁴⁰ Biological Opinion at 152.

⁴¹ Section 9 of the ESA prohibits any taking of listed species unless the take is authorized in an incidental take statement after formal consultation under ESA section 7, or in an incidental take permit issued under ESA section 10.

⁴² Biological Opinion at 153.

terms and conditions of the Biological Opinion are set out in Appendix A and are adopted as conditions of this order by ordering paragraph (C).

55. RPM 1 requires the Commission to ensure, through enforceable conditions of the project license, that the licensee conducts all in-water and near-water construction activities in a manner that minimizes incidental take of ESA-listed species or those proposed for listing and conserves the aquatic resources on which ESA-listed species depend. To implement RPM 1, the Biological Opinion lists 17 terms and conditions related to: (a) contractor education; (b) timing of construction; (c) erosion control and protection of water quality; (d) storage and staging of materials and construction equipment; and (e) riparian vegetation management.

56. Under RPM 2, the Commission must ensure, through enforceable conditions, that Brookfield measures and monitors the provisions contained in the Interim Plan in a way that adequately protects listed Atlantic salmon, shortnose sturgeon and Atlantic sturgeon. To implement RPM 2, the Biological Opinion includes 10 terms and conditions for the Lockwood, Shawmut, and Weston Projects. Under these conditions, Brookfield is required to: (a) prepare plans to study the passage and survival of migrating salmon; (b) not allow test fish to migrate upstream of the project until volitional fish passage is provided at all dams downstream of the Sandy River; (c) provide NMFS the opportunity to comment on any fishway design at various design phases; (d) allow NMFS to inspect the fishways at least annually; (e) inspect the fishways each day between April 1 and December 31; (f) conduct maintenance requiring shutdown of the upstream fishways during the first two weeks of August; and (g) develop project specific adaptive management plans to address any downstream passage deficiencies at the project, documented through site-specific survival studies during the period of the Interim Plan. Three of the ten terms and conditions are not applicable to the Lockwood, Shawmut, or Weston Projects because they pertain to operation of the Lewiston Falls Project No. 2302 or the Brunswick Project No. 2574. These terms and conditions are omitted from Appendix A.

57. Under RPM 3, the Commission must ensure, through enforceable conditions, that Brookfield completes an annual monitoring and reporting program to confirm that it is minimizing incidental take and is reporting to NMFS all project-related observations of dead or injured salmon or sturgeon. To implement RPM 3, the Commission must require the licensee to: (a) notify NMFS of any changes in operation, maintenance activities, and debris management; (b) contact NMFS within 24 hours of any interactions with Atlantic salmon or sturgeon, including any non-lethal and lethal takes; (c) in the event of lethal take, to photograph, measure, and preserve any dead salmon or body parts until after discussing disposal with NMFS; and (d) follow specific procedures when collecting fin clips of any sturgeon captured at the Lockwood Project.

58. NMFS also included four conservation recommendations in its Biological Opinion.⁴³ The first conservation recommendation provides guidance for contaminant testing of any salmon or sturgeon involved in lethal take at the projects. While Brookfield may choose to implement this recommendation, we will not require it, because there is no direct link between the recommendation and project operations or protection of salmon and sturgeon at the projects.

59. The remaining three recommendations address operation of all Commission-licensed hydroelectric projects in Maine that are within the range of federally-listed Atlantic salmon. First, NMFS recommends that the Commission use its authorities to implement license requirements for all of these projects to provide safe and effective upstream and downstream passage for listed Atlantic salmon and other diadromous species. NMFS notes that, for Atlantic salmon, this can be accomplished through station shutdowns during the smolt passage season (April to June) and kelt passage season (October to December and April to June) or by installing highly effective fishways. Second, NMFS recommends that the Commission require all licensed projects in Maine to document the effectiveness of station shutdowns or fishways in protecting listed species. Third, NMFS recommends that the Commission require all licensed projects in Maine to operate in a manner that protects listed species. NMFS notes that this can be accomplished by requiring these projects to operate in a run-of-river mode to simulate a natural stream hydrograph.

60. These last three recommendations are not specific to the Lockwood, Shawmut, or Weston Projects and are therefore not included in these licenses. The Commission considers project-specific recommendations in its licensing and amendment proceedings, and must review and balance a range of public interest considerations, both developmental and environmental, in doing so. We are unable to adopt general recommendations for a broad class of projects.⁴⁴ The proposed amendments include provisions for upstream and downstream passage for Atlantic salmon and other species, monitoring and studies of their effectiveness, and measures to protect listed species. Nothing further is required in this case.

⁴³ Conservation recommendations are discretionary agency activities intended to minimize or avoid effects to listed species or critical habitat, to help implement recovery plans, or to develop information.

⁴⁴ In addition, section 6 of the FPA, 16 U.S.C. § 798 (2012), limits the Commission's ability to unilaterally alter project licenses.

G. Comments and Objections Concerning the Interim Plan

61. As noted earlier, several members of the Kennebec Coalition request that the Commission defer action on the Interim Plan while their petition for judicial review of the Biological Opinion is pending.⁴⁵ We deny this request. Because NMFS has listed the Gulf of Maine DPS of Atlantic salmon as endangered and has designated critical habitat for the species, any taking of the species is prohibited unless authorized by an incidental take permit under ESA section 10 or an incidental take statement after formal consultation under ESA section 7. Brookfield prepared the Interim Plan in consultation with NMFS and requested these license amendments in order to obtain that authorization for any incidental harm that its projects may cause. If we were to delay our approval of the amendment pending judicial review, this would also delay the interim protection for Atlantic salmon and designated critical habitat that the Interim Plan and Biological Opinion are designed to provide.⁴⁶

62. We encourage our licensees to take a proactive approach and consult informally with the Services to protect listed species if ongoing operation of their projects may affect the species or their critical habitat. We do so because ongoing operation of a licensed hydroelectric project is not considered federal agency action under the ESA, but rather is private action that does not trigger formal consultation.⁴⁷ If the licensee and the Service can agree on what actions are needed to protect listed species and their critical habitat, the licensee can then request a license amendment, thus providing the necessary federal agency action (approval of the amendment) to trigger formal ESA consultation. In this case, we consulted formally with NMFS on Brookfield's Interim Plan and are now in a position to approve the amendment and incorporate the terms and conditions of the

⁴⁵ See motion to intervene of Atlantic Salmon, Natural Resources, Trout Unlimited, and the Kennebec Valley Chapter of Trout Unlimited at 6 (filed September 28, 2015).

⁴⁶ In addition, it is unclear whether judicial review of the Biological Opinion is available now in federal district court, or must instead await review of this amendment order in the court of appeals. See 16 U.S.C. § 825l(b) (2012); *City of Tacoma, Washington v. FERC*, 460 F.3d 53, 76 (D.C. Cir. 2006) (observing that when a Biological Opinion is prepared in the course of a Commission proceeding, the only means of challenging its validity is on review of the Commission's decision in the court of appeals).

⁴⁷ See *California Sportfishing Protection Alliance v. FERC*, 472 F3d 593 (9th Cir. 2006).

incidental take statement in the Biological Opinion. If any changes to the plan are ultimately required as a result of the court review, we can consider them in a future amendment proceeding. We see no basis for doing nothing now, simply because of the possibility that some future action might be required.

63. In their comments and objections, intervenors raise three main concerns with the Interim Plan: that it is inadequate to protect and recover endangered Atlantic salmon, that it relies on fish passage facilities that are ineffective to pass American shad and other fish species, and that it violates the Kennebec Agreement. We address these arguments in turn.

64. The Kennebec Coalition,⁴⁸ several of its members (Atlantic Salmon, Natural Resources, and Trout Unlimited),⁴⁹ and Maine Rivers⁵⁰ contend that the projects harm Atlantic salmon and that the measures in the Interim Plan are inadequate to protect and restore these fish. The Coalition argues that the proposed upstream fishways at the Lockwood Project will not work to restore Atlantic salmon upstream of the project, because there has been no study of upstream passage efficiency, the Biological Opinion does not explain why the estimated 40 percent passage efficiency will be adequate to restore Atlantic salmon, and there are no performance standards for upstream and downstream passage. The Coalition also maintains that the passage studies proposed in the Interim Plan rely on an unrealistically high estimate of the number of smolts available for the study and provide no estimate of the number of fish needed to draw statistically valid conclusions. Similarly, Maine Rivers contends that the Interim Plan provides no evidence that it will improve Atlantic salmon recovery. Maine Rivers is also concerned that investing millions of dollars on inefficient and non-functional fishways will make it difficult to correct these problems in the future.

⁴⁸ See Kennebec Coalition's Comments (filed July 9, 2013). This is the only filing on behalf of all five members of the Kennebec Coalition. Subsequent filings include three or four of the five. For convenience, we consider these comments together and refer to the Coalition in discussing them, while noting the subsequent filings of the various Coalition members.

⁴⁹ See comments of Atlantic Salmon, Natural Resources, and Trout Unlimited (filed July 17, 2014, January 7, 2015, and February 12, 2015, respectively).

⁵⁰ See Maine Rivers' comments (filed July 28, 2014).

65. As discussed above, Brookfield developed the Interim Plan in consultation with NMFS to provide interim measures to protect Atlantic salmon and avoid or minimize incidental take as a result of project operation. The plan includes adding a volitional component to upstream fish passage facilities, upstream and downstream passage studies, and adaptive management to revise these measures, as needed. Commission staff consulted formally with NMFS under section 7 of the ESA on the Interim Plan, and NMFS determined in its Biological Opinion that, if the plan is implemented, the projects may adversely affect but are not likely to jeopardize the continued existence of the Gulf of Maine DPS of Atlantic salmon. NMFS further concluded that the projects will continue to adversely affect essential features of designated critical habitat for the species over the interim period. However, NMFS concluded that the plan is anticipated to improve the functioning of migratory habitat by constructing three volitional upstream fishways, and by implementing an adaptive management strategy to improve downstream survival of Atlantic salmon smolts and kelts in the Kennebec River. NMFS therefore concurred in Commission staff's determination that the proposed action will not lead to adverse modification or destruction of critical habitat.

66. The Coalition faults the Biological Opinion for failing to set performance standards for upstream and downstream passage. However, this is an interim plan, and NMFS states that the passage and survival studies, together with adaptive management, will be used to make any needed changes to the study design, project structures, or project operation during the interim period, and to establish performance standards that will be incorporated in the final protection plan.⁵¹

67. The Interim Plan outlines a process by which Brookfield will study upstream and downstream Atlantic salmon passage at the projects. Under the Interim Plan, the licensee would study downstream smolt passage through telemetry to determine smolt passage routes, out-migration travel time and movement rates through the Lockwood, Shawmut, and Weston Projects and determine project-related mortality of downstream migrating smolts for the three projects.

68. For upstream passage of adult salmon under the Interim Plan, the licensee would continue to use an underwater camera to monitor salmon behavior in and around the fish lift, as well as angler activity, and would conduct upstream passage effectiveness studies by telemetry.

⁵¹ See Biological Opinion at 13.

69. The purpose of the Interim Plan is to develop studies designed to address many of the concerns expressed by the Coalition and Maine Marine Resources, such as determining the adequacy of any zone of passage leading to the fish lift entrance, and passage efficiency and effectiveness. Through the knowledge gained by these studies, Brookfield, after consulting with NMFS and other resource agencies, should be able to design, construct and operate efficient and effective passage for Atlantic salmon that can be included in the final species protection plan for these projects.

70. NMFS is the expert agency charged with implementing the ESA for these fish, and is therefore in the best position to make discretionary factual determinations about what measures might be needed to protect them. Although the Commission is ultimately responsible for ensuring, in consultation with NMFS, that its actions are in compliance with the ESA, the Commission is entitled to defer to that agency's expertise, and need not undertake a separate, independent analysis of the issues addressed in a Biological Opinion.⁵² In any event, based on our review and adoption of Brookfield's draft Biological Assessment in this case, we have no basis for concluding that the Interim Plan is inadequate to protect Atlantic salmon.

71. The Coalition and Maine Marine Resources contend that the Interim Plan will undermine the Kennebec Agreement because it applies only to Atlantic salmon rather than shad, blueback herring, and alewife. Maine Marine Resources⁵³ further maintains that the plan will thwart or indefinitely delay the agency's efforts to restore shad, alewife, and blueback herring to the Kennebec River upstream of the Lockwood Project. Maine Marine Resources contends that the Lockwood fish lift is ineffective at passing shad upstream and the Interim Plan does not address the failure of the fish lift to attract shad to the fish lift's entrance. Maine Marine Resources is also concerned that under the Interim Plan, permanent downstream passage for species other than Atlantic salmon would not be quantitatively tested to ensure safe, efficient, and effective passage of other fish species. Mr. Watts expresses similar concerns, and provides information for the record on shad passage at other dams in Maine as compared to Lockwood.

72. As Brookfield has acknowledged, since 2006 when the Lockwood fish lift began operating, it has captured very few American shad despite an apparently increasing shad population in the Kennebec River below the project.⁵⁴ Beginning in February 2014,

⁵² See *City of Tacoma, Washington v. FERC*, 460 F.3d at 75-76.

⁵³ See Maine Marine Resources' Motion to Intervene (filed May 2, 2015).

⁵⁴ See Brookfield's request for a one-year delay in the schedule for providing volitional passage at the Lockwood Project at 1 (filed February 13, 2015).

Brookfield began consulting with Maine Marine Resources, NMFS, FWS, and Atlantic Salmon to identify studies and operational measures to improve shad passage at the project.⁵⁵ In 2014, Brookfield operated the fish lift with the maximum attraction flow of 170 cfs, made underwater video observations of shad in the tailrace, and collected addition bathymetric data of the tailrace. In 2015, the licensee again operated the fish lift with a maximum attraction flow of 170 cfs and made underwater video observations in the tailrace. Brookfield also agreed to use underwater acoustics to survey for project-related sounds that may negatively affect shad use of the lift, to develop a 2-dimensional hydraulic model of the tailrace and spillway area, and to conduct a telemetry study of shad behavior in the project tailrace and spillway area to determine if any operational changes may improve fish passage at the project. Maine Marine Resources reports that, as of September 2015, only the telemetry study had been completed and that despite these efforts, interim upstream passage of shad continues to be ineffective.⁵⁶

73. The Kennebec Agreement provides that, if by December 2014 the biological triggers for permanent upstream passage facilities have not been met (i.e., the earlier of either 8,000 American shad captured in a single season at the Lockwood interim fish trap, or a different biological assessment trigger is developed for Atlantic salmon, alewife, or blueback herring), parties to the agreement will meet to assess progress and attempt to reach consensus on future fish passage measures. To date, neither condition has been met; that is, very few shad have been captured at Lockwood each year, and an alternative biological trigger has not been developed. Therefore, Brookfield and the other parties began consulting as contemplated in the agreement. This effort is separate from Brookfield's development of the Interim Plan, which deals exclusively with endangered Atlantic salmon as a result of the expanded geographic range for the Gulf of Maine DPS of Atlantic salmon.

74. As NMFS points out,⁵⁷ the Interim Plan did not cause the lack of fish passage improvements at the projects and would not preclude Maine Marine Resources from seeking fish passage improvements at any hydro projects on the Kennebec River, including those which are part of the Interim Plan. We see no reason why the parties cannot continue to consult under the Kennebec Agreement on ways to improve fish passage at the projects for American shad, alewife, and blueback herring while improvements and studies are underway to protect endangered Atlantic salmon.

⁵⁵ See Maine Marine Resources' Comments at 1 (filed September 25, 2015).

⁵⁶ *Id.* at 1-2.

⁵⁷ See NMFS Comments at 2 (filed June 18, 2014).

Therefore, we conclude that the Interim Plan and the Kennebec Agreement are not in conflict. More importantly, however, Atlantic salmon are listed as endangered, and the other fish species addressed in the Kennebec Agreement are not. As a result, the Commission must give priority to protection of Atlantic salmon in the event of any conflict, whether actual or perceived, with the Kennebec Agreement.

75. Mr. Watts⁵⁸ states that, to achieve the long-term fish passage and recovery goals of the Kennebec Agreement, the Lockwood Project Dam must be breached. He argues that the recent approval of 185 MW of wind generation to be sited near the Kennebec River in Bingham, Maine and adjacent towns makes the 5-MW capacity of the Lockwood Project inconsequential, while the project's negative effects on fish restoration are severe. Mr. Watts states that the licensee has had over 17 years to develop efficient adult shad passage at the project, and failure of shad passage at Lockwood would ensure passage failure at the upstream projects. He maintains that the low numbers of shad, alewife, and blueback herring passed upstream at the project are a fraction of the number he estimates to be in the spillway area and attempting to move upstream. Mr. Watts also states that he observed a sturgeon attempting to ascend the Kennebec River in the spillway area. He believes that, if not for the presence of the dam, sturgeon would have continued to ascend the Kennebec River upstream of the Lockwood Project, and that the geographic range for both ESA-listed sturgeon species must be extended.⁵⁹ In summary, Mr. Watts contends that the fish lift's poor history of passing Atlantic salmon, shad, blueback herring and alewife makes the Lockwood Project a public nuisance that must be removed.

76. These comments are beyond the scope of this amendment proceeding. Moreover, they are insufficient to suggest a need to initiate a proceeding to reopen and amend the license for the Lockwood Project to consider possible dam breach or removal. The Commission can consider whether to reopen and amend a license if a project has unanticipated, serious impacts on fishery resources.⁶⁰ In this case, the project's effects on

⁵⁸ See comments of Douglas Watts at 3 (filed September 29, 2015).

⁵⁹ Mr. Watts also contends that before construction of dams on the Kennebec, sturgeon historically migrated farther upstream than the location of the Lockwood Project, which NMFS recognized in its Biological Opinion as the historic upper migration limit for sturgeon. In support, Mr. Watts cites the results of an archaeological excavation of a food cache some 35 miles upstream of the Lockwood Project that included one sturgeon bone. *Id.* at 7-8. Lacking any information about how the bone ended up in this food cache, we find this information insufficient to support a conclusion that sturgeon historically migrated past the location of the Lockwood Project.

⁶⁰ See *Hoopa Valley Tribe v. FERC*, 629 F.3d 209 (D.C. Cir. 2010).

fishery resources are both anticipated and addressed in the Kennebec Agreement, which provides that if the triggering condition for permanent upstream fish passage is not met by December 2014, the parties will consult and attempt to reach a consensus on future fish passage measures. As noted, Brookfield began this consultation in January 2015. Any additional studies or fish passage measures that may be needed can be considered as part of that consultation. In these circumstances, we believe it is appropriate to allow the Kennebec Agreement process to proceed.

77. Apart from Mr. Watt's arguments concerning sturgeon migration and the possible need for dam breach or removal, no party commented on Brookfield's Sturgeon Plan. We find that the Sturgeon Plan provides appropriate protection for Atlantic and shortnose sturgeon, and there is no need to provide upstream passage for those species. To the contrary, NMFS provides in its Biological Opinion that if sturgeon are found in the fish lift, they are to be returned unharmed to the river downstream of the Lockwood Project.

Conclusion

78. For the above reasons, we conclude that Brookfield's Interim Plan will help improve conditions for Atlantic salmon and will avoid or minimize incidental take of Atlantic salmon at the Lockwood, Shawmut, and Weston Projects. The licensee began implementing the Interim Plan in 2013 in consultation with NMFS and other resource agencies. Work under the Interim Plan involves designing and building upstream fish passage facilities, planning upstream passage effectiveness studies, and conducting studies of existing downstream passage facilities. The Interim Plan would also help to ensure compliance with the ESA. We therefore approve the Interim Plan and amend the licenses for those projects to require Brookfield to implement the plan.

79. We also conclude that Brookfield's Sturgeon Plan will provide adequate protection for Atlantic and shortnose sturgeon that may be affected by operation of the Lockwood fish lift and replacement of the project's flashboards. We therefore approve the Sturgeon Plan and amend the license for the Lockwood Project to require the licensee to implement it.

80. The licensee must follow the terms and conditions of the incidental take statement included with NMFS's July 22, 2013 Biological Opinion that apply to the Lockwood, Shawmut, or Weston Projects and the supplemental term and condition filed September 3, 2013, to ensure exemption from the take prohibitions of Section 9 of the ESA. Therefore, these terms and conditions are attached to this order as Appendix A, and are incorporated in the project licenses by ordering paragraph (C).

81. Under the Interim Plan and the terms and conditions of NMFS's incidental take statement, the licensee will design and install upstream fish passage facilities at the projects. The Commission must review and approve final plans and schedules related to

this work to ensure that they are consistent with Commission regulations. Therefore, the final plans and schedule for upstream fish passage facilities must be filed for Commission approval, prior to the start of construction, as provided in ordering paragraph (D).

The Commission orders:

(A) The Interim Species Protection Plan (Interim Plan) filed on February 21, 2013, by Brookfield White Pine Hydro LLC (Brookfield), on behalf of itself as licensee for the Shawmut Hydroelectric Project No. 2322 and the Weston Hydroelectric Project No. 2325, and on behalf of Merimil Limited Partnership, licensee for the Lockwood Hydroelectric Project No. 2574, is approved. The licensee must implement the Interim Plan at the Lockwood, Shawmut, and Weston Projects.

(B) The Sturgeon Handling and Protection Plan (Sturgeon Plan) filed on March 29, 2013, by Brookfield on behalf of Merimil Limited Partnership, licensee for the Lockwood Hydroelectric Project No. 2574, is approved. The licensee must implement the Sturgeon Plan at the Lockwood Project.

(C) The terms and conditions of the incidental take statement included with the National Marine Fisheries Service's July 22, 2013 Biological Opinion are hereby incorporated in the licenses for the Lockwood, Shawmut, and Weston Projects. The terms and conditions are attached to this order as Appendix A.

(D) Prior to the start of construction, the licensee must file, for Commission approval, final plans and a schedule for construction of upstream fish passage facilities at the Lockwood, Shawmut, and Weston Projects. The plans and schedule shall be accompanied by evidence that the National Marine Fisheries Service has approved them. The filing shall include copies of comments and recommendations from the U.S. Fish and Wildlife Service, Maine Department of Marine Resources, and the Maine Department of Inland Fisheries and Wildlife, or evidence that these agencies were given at least 30 days to provide comments and chose not to do so. If the licensee does not adopt an agency recommendation, the plan should include the licensee's reasons, based on site-specific information.

(E) The licensee must file, for Commission approval, plans for Atlantic salmon adult upstream passage effectiveness monitoring studies, Atlantic salmon kelt downstream passage monitoring studies, and any remaining Atlantic salmon smolt downstream passage studies for 2016 through 2019. The Commission must approve the study plans before the studies begin. The study plans must be accompanied by evidence that the National Marine Fisheries Service has approved them, and copies of comments and recommendations from the U.S. Fish and Wildlife Service, Maine Department of Marine Resources, and the Maine Department of Inland Fisheries and Wildlife, or

evidence that these agencies were given at least 30 days to provide comments and chose not to do so. If the licensee does not adopt any agency recommendations, the plans should include the licensee's reasons, based on site-specific information.

(F) The licensee must file any remaining annual reports described in the Interim Species Protection Plan (Interim Plan) by March 31 of each year for activities completed during the preceding calendar year, beginning on March 31, 2017, for calendar year 2016. Each annual report must include, at minimum: (1) results of fish passage studies, and a summary of progress on the elements described in the Interim Plan; (2) a summary of consultation and other correspondence with the National Marine Fisheries Service (NMFS) and other resource agencies regarding progress on the elements in the Interim Plan, as well as any other pertinent issues regarding Atlantic salmon; (3) anticipated schedules associated with the elements in the Interim Plan; and (4) descriptions of any issues that arise that may affect the timely completion of the elements in the Interim Plan, and how the issues are being addressed in consultation with NMFS, the U.S. Fish and Wildlife Service (FWS), Maine Department of Marine Resources (Maine DMR), and the Maine Department of Inland Fisheries and Wildlife (Maine DIFW). The annual reports should also describe any plans and schedules discussed with NMFS regarding revisions to the Interim Plan and preparation of a Final Species Protection Plan. Copies of the annual reports should be provided to NMFS, FWS, Maine DMR, and Maine DIFW at the same time they are filed with the Commission.

(G) The licensee must inform Commission staff, via telephone or email, as soon as possible after contacting the National Marine Fisheries Service (NMFS) regarding any issue pursuant to the terms and conditions of the incidental take statement included with the NMFS July 22, 2013 Biological Opinion. The licensee must then file a written report on the issue with the Commission within 15 days of the issue.

(H) Article 406 of the license for the Lockwood Hydroelectric Project No. 2574 is amended by adding Atlantic sturgeon to the Shortnose Sturgeon Handling and Protection Plan; referencing the terms and conditions of the incidental take statement filed by the National Marine Fisheries Service (NMFS) on July 22, 2013, and the supplement filed by NMFS on September 3, 2013; and omitting the requirement to file annual revisions to the sturgeon handling plan; to read as follows:

Article 406. Sturgeon Handling and Protection Plan. Pursuant to the terms and conditions of the incidental take statement filed by the National Marine Fisheries Service (NMF) on January 1, 2005, the incidental take statement filed by NMFS on July 22, 2013, and the supplement filed by NMFS on September 3, 2013, the licensee must implement the Sturgeon Handling and Protection Plan for the Lockwood Project. Within 24 hours of any interactions with shortnose or Atlantic

sturgeon (lethal and non-lethal), the licensee must notify NMFS by email or phone, complete the Sturgeon Reporting Sheet for the Lockwood Project, and mail and fax the completed form to the attention of the NMFS Endangered Species Coordinator.

The Commission reserves the right to require changes to the plan. Any updates to the plan that would result in long-term changes to project operations or facilities may not be implemented without prior Commission authorization granted after the filing of an application to amend this license.

(I) The licensee shall file with the Commission, by March 31st of each year, an annual report of the licensee's actions undertaken in the previous calendar year to implement the project's Sturgeon Handling and Protection Plan. Copies of the annual reports must be provided to NMFS, the U.S. Fish and Wildlife Service, Maine Department of Marine Resources, and Maine Department of Inland Fisheries and Wildlife at the same time they are filed with the Commission.

(J) This order constitutes final agency action. Any party may file a request for rehearing of this order within 30 days from the date of its issuance, as provided in section 313(a) of the Federal Power Act, 16 U.S.C. § 8251 (2012), and the Commission's regulations at 18 C.F.R. § 385.713 (2015). The filing of a request for rehearing does not operate as a stay of the effective date of this order, or of any other date specified in this order. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

By the Commission.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.

APPENDIX A

DEPARTMENT OF COMMERCE NATIONAL MARINE FISHERIES SERVICE

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS OF THE INCIDENTAL TAKE STATEMENT INCLUDED IN THE BIOLOGICAL OPINION FOR THE LOCKWOOD HYDROELECTRIC PROJECT NO. 2574, SHAWMUT HYDROELECTRIC PROJECT NO. 2322, AND WESTON HYDROELECTRIC PROJECT NO. 2325

Filed July 22, 2013, and supplemented September 3, 2013

Reasonable and Prudent Measures

1. FERC and the ACOE [Army Corps of Engineers] must ensure, through enforceable conditions of the Project licenses, that the licensee conduct all in-water and near-water construction activities in a manner that minimizes incidental take of ESA-listed or proposed species and conserves the aquatic resources on which ESA-listed species depend.
2. FERC must ensure, through enforceable conditions of the Project licenses, that the licensee measure and monitor the provisions contained in the March 14, 2013 Interim Species Protection Plan (SPP) in a way that is adequately protective of listed Atlantic salmon.
3. FERC must ensure, through enforceable conditions of the Project licenses, that the licensee complete an annual monitoring and reporting program to confirm that they are minimizing incidental take and reporting all project-related observations of dead or injured salmon or sturgeon to NMFS.

Terms and Conditions

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

- a. Hold a pre-construction meeting with the contractor(s) to review all procedures and requirements for avoiding and minimizing impacts to Atlantic salmon and to emphasize the importance of these measures for protecting salmon.
- b. Timing of in-water work: Work below the bankfull elevation should occur outside of the smolt outmigration period (April 1 to June 15) or within a dewatered cofferdam. The licensee must notify NMFS one week before in-water work begins.
- c. Use Best Management Practices that will minimize concrete products (dust, chips, larger chunks) mobilized by construction activities from entering flowing or standing waters. Best practicable efforts shall be made to collect and remove all concrete products prior to rewatering of construction areas.
- d. Employ erosion control and sediment containment devices at the Lockwood, Shawmut, and Weston Dams during in-water construction activities. During construction, all erosion control and sediment containment devices shall be inspected weekly, at a minimum, to ensure that they are working adequately. Any erosion control or sediment containment inadequacies will be immediately addressed until the disturbance is minimized.
- e. Provide erosion control and sediment containment materials (e.g., silt fence, straw bales, aggregate) in excess of those installed, so they are readily available on site for immediate use during emergency erosion control needs.
- f. Ensure that vehicles operated within 150 feet (46 m) of the construction site waterways will be free of fluid leaks. Daily examination of vehicles for fluid leaks is required during periods operated within or above the waterway.
- g. During construction activities, ensure that BMPs are implemented to prevent pollutants of any kind (sewage, waste spoils, petroleum products, etc.) from contacting water bodies or their substrate.

- h. In any areas used for staging, access roads, or storage, be prepared to evacuate all materials, equipment, and fuel if flooding of the area is expected to occur within 24 hours.
 - i. Perform vehicle maintenance, refueling of vehicles, and storage of fuel at least 150 feet (46 m) from the waterway, provided, however, that cranes and other semi-mobile equipment may be refueled in place.
 - j. At the end of each work shift, vehicles will not be stored within, or over, the waterway.
 - k. Prior to operating within the waterway, all equipment will be cleaned of external oil, grease, dirt, or caked mud. Any washing of equipment shall be conducted in a location that shall not contribute untreated wastewater to any flowing stream or drainage area.
 - l. Use temporary erosion and sediment controls on all exposed slopes during any hiatus in work exceeding seven days.
 - m. Place material removed during excavation only in locations where it cannot enter sensitive aquatic resources.
 - n. Minimize alteration or disturbance of the streambanks and existing riparian vegetation to the greatest extent possible.
 - o. Remove undesired vegetation and root nodes by mechanical means only. No herbicide application shall occur.
 - p. Mark and identify clearing limits. Construction activity or movement of equipment into existing vegetated areas shall not begin until clearing limits are marked.
 - q. Retain all existing vegetation within 150 feet (46 m) of the edge of the bank to the greatest extent practicable.
2. To implement reasonable and prudent measure #2, FERC must require the licensee to do the following:
- a. Prepare in consultation with NMFS a plan to study the passage and survival of migrating Atlantic salmon (adults, smolts, and kelts) at the Lockwood,

Shawmut, and Weston Projects [reference to the Brunswick Project omitted].

- b. Upstream passage studies at the Lockwood Project should not allow test fish to migrate upstream of the Project until such time as there is volitional passage all the way to the Sandy River.
 - c. [omitted]
 - d. [omitted]
 - e. [omitted]
 - f. The licensee should seek comments from NMFS on any fish passage design plans at the 30%, 60%, and 90% design phase.
 - g. The licensee should allow NMFS staff to inspect fishways at the Projects at least annually.
 - h. The licensee should inspect the upstream and downstream fish passage facilities at the Lockwood, Shawmut, and Weston Projects daily during from April 1 to December 31, annually [reference to the Brunswick Project omitted]. Submit summary reports to NMFS weekly during the fish passage season.
 - i. Annual maintenance requiring the shutdown of upstream fishways should be conducted during the first two weeks of August. The fishway should not be inoperable for any longer than it takes to make the necessary repairs. If water temperatures make it unsafe to sample Atlantic salmon, they should be allowed to volitionally swim through the fishway without being handled.
3. Require that the licensee develop, in consultation with NMFS, project specific adaptive management plans to address any downstream passage deficiencies at the Weston, Shawmut, and Lockwood Projects [reference to the Brunswick Project omitted] as documented through site-specific survival studies during the period of the ISPP. The plans should include descriptions of: 1. potential measures to be implemented at each project to improve survival, 2. the statistical methodology that will be used to interpret study results, and 3. the monitoring studies that will be used to verify the efficacy of the permanent

downstream fish passage facilities. These plans should be completed no later than January 1, 2014. To implement reasonable and prudent measure #3, FERC must require the licensee to do the following:

- a. Notify NMFS of any changes in operation including maintenance activities and debris management at the project during the term of the ISPP.
- b. Contact NMFS within 24 hours of any interactions with Atlantic salmon, shortnose sturgeon or Atlantic sturgeon including non-lethal and lethal takes (Dan Tierney: by email (Dan.Tierney@noaa.gov) or phone (207) 866- 3755 and the Section 7 Coordinator (incidental.take@noaa.gov)).
- c. In the event of any lethal takes, any dead specimens or body parts must be photographed, measured, and preserved (refrigerate or freeze) until disposal procedures are discussed with NMFS.
- d. Ensure that fin clips are taken from any sturgeon at the Lockwood Project and that the fin clips are submitted to the NOAA repository in Charleston, SC for genetic analysis [reference to the Brunswick Project omitted].
A 1 cm² fin clip from one of the pelvic fins from living sturgeon should be taken and placed in a labeled vial with an o-ring caps containing 95% nondenatured ethyl alcohol (EtOH) for genetic analysis (the pelvic fin is regarded at the least intrusive, particularly for small individuals) (following the procedures described in Damon-Randall et al. 2010). Fin clips of mortalities must be taken prior to preservation of other fish parts or whole bodies.