

3. I am the NMFS staffer responsible for Atlantic salmon Section 7 consultations with the Federal Energy Regulatory Commission (FERC). I consulted informally with the FERC to determine whether formal consultation pursuant to Section 7 of the ESA would be needed for the proposed repairs of the Worumbo Project located on the Androscoggin River in Lisbon Falls, Maine.

4. The Worumbo Project is located within the geographic range of the GOMDPS of federally endangered Atlantic salmon (74 FR 29344; June 19, 2009). The Worumbo Project is also located within designated critical habitat for Atlantic salmon (74 FR 29300; June 19, 2009).

5. The GOM DPS includes all anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River. Included are all associated conservation hatchery populations used to supplement these natural populations; currently, such conservation hatchery populations are maintained at Green Lake National Fish Hatchery and Craig Brook National Fish Hatchery.

6. Critical habitat has been designated for listed Atlantic salmon pursuant to section 4(b)(2) of the ESA. The critical habitat designation for GOM DPS includes 45 specific areas occupied by Atlantic salmon at the time of listing that include approximately 19,571 km of perennial River, stream, and estuary habitat and 799 square km of lake habitat within the range of the GOM DPS and in which are found those physical and biological features essential to the conservation of the species. The entire occupied range of the GOM DPS for which critical habitat is designated is within the State of Maine. The lower Androscoggin River, including the action area, is designated as critical habitat.

7. The Atlantic salmon is an anadromous fish species that spends most of its adult life in the ocean but returns to freshwater to reproduce. Atlantic salmon have a complex life

history that includes territorial rearing in rivers to extensive feeding migrations on the high seas. During their life cycle, Atlantic salmon go through several distinct phases that are identified by specific changes in behavior, physiology, morphology, and habitat requirements. Adult Atlantic salmon return to rivers from the sea and migrate to their natal stream to spawn. Adults ascend the rivers within the GOM DPS beginning in the spring. The ascent of adult salmon continues into the fall. Although spawning does not occur until late fall, the majority of Atlantic salmon in Maine enter freshwater between May and mid-July (Meister 1958; Baum 1997). Embryos develop in the redd for a period of 175 to 195 days, hatching in late March or April (Danie et al. 1984). Newly hatched salmon referred, to as larval fry, alevin, or sac fry, remain in the redd for approximately 6 weeks after hatching and are nourished by their yolk sac (Gustafson-Greenwood and Moring 1991). When fry reach approximately 4 cm in length, the young salmon are termed parr (Danie et al., 1984). Parr have eight to eleven pigmented vertical bands on their sides that are believed to serve as camouflage (Baum 1997). In a parr's second or third spring (age 1 or age 2 respectively), when it has grown to 12.5 to 15 cm in length, a series of physiological, morphological, and behavioral changes occur (Schaffer and Elson 1975). This process, called "smoltification," prepares the parr for migration to the ocean and life in salt water. During the smoltification process, parr markings fade and the body becomes streamlined and silvery with a pronounced fork in the tail. Smolts enter the sea during May to begin their first ocean migration (USASAC 2004). After their second winter at sea, the salmon over-winter in the area of the Grand Banks before returning to their natal rivers to spawn (Reddin and Shearer 1987).

8. Adult returns to the GOM DPS have been very low for many years and remain extremely low in terms of adult abundance in the wild. After a period of population growth in the 1970s, adult returns of salmon in the GOM DPS have been steadily declining since the early

1980s and appear to have stabilized at very low levels since 2000.

9. The majority of all adults in the GOM DPS return to a single river, the Penobscot, which accounted for 93 percent of all adult returns to the GOM DPS in 2010. Of the 1,316 adult returns to the Penobscot the vast majority are the result of smolt stocking and only a small portion naturally-reared.

10. The Androscoggin River is not presently stocked with hatchery-origin Atlantic salmon as part of a conservation hatchery program administered by the U.S. Fish and Wildlife Service. As part of the “Fish Friends” school program, a small number of juvenile, Penobscot River-origin Atlantic salmon are stocked in the lower Androscoggin River downstream of the Worumbo Project. Despite the absence of an active restoration program for the Androscoggin River, the Androscoggin River continues to support a small, remnant population of listed Atlantic salmon. Over the last 10 years (2001 to 2010), annual adult Atlantic salmon returns to the river have ranged between 2 and 24, with an average of approximately 11 fish per year. Only seven Atlantic salmon adults returning to the Androscoggin River over the last 10 years have been of wild origin. Returning adults to the Androscoggin River typically constitute less than 1% of all individual Atlantic salmon adults in the GOM DPS.

11. The numbers of adult Atlantic salmon returning to the Androscoggin River are documented at the Brunswick Dam fishway (first dam on the river). Since 2001, the number of annual adult returns are as follows: 2001 (5); 2002 (2); 2003 (3); 2004 (11); 2005 (10); 2006 (6); 2007 (20); 2008 (16); 2009 (24); 2010 (9) (Annual Report of the U.S. Atlantic Assessment Committee. Report No. 23-2010 Activities. Prepared for U.S. Section to NASCO). Most adult Atlantic salmon enter the Androscoggin River during May to July. Using the data collected from the Brunswick fishway between 2008 and 2010, the proportion of Atlantic salmon returning to

the Androscoggin River after August 1 is 9% (approximate since the fishway was closed in August 2010). As of August 8, 2011, 45 Atlantic salmon were documented at the Brunswick Dam fishway. That information is publically available from the Maine Department of Marine Resources webpage: http://www.maine.gov/asc/research/trap_count_stats.shtml.

12. Habitat in the vicinity of the Worumbo Projects is generally not suitable for Atlantic salmon reproduction. The bypass reach of river at the Worumbo Project may contain some suitable habitat for juvenile life stages of Atlantic salmon. However, since little or no reproduction occurs in the vicinity of the Worumbo Project, few if any juvenile Atlantic salmon are likely to occur in the action area. Habitat near the Worumbo Project provides a migratory corridor for adults returning the Androscoggin River to spawn upstream of the action area and for juveniles (smolts) migrating to the ocean to grow and mature (74 FR 29300; June 19, 2009).

13. I reviewed the Licensee's repair plans for the project. Based on my review of the repair plans, it is my understanding that the repairs of the Worumbo Dam are expected to occur approximately in this sequence and schedule:

- July 15, 2011: Cofferdam construction begins. The contractor is expected to mobilize prior to July 15 in order to have the resources in place to begin cofferdam construction on this date and to begin construction of the dam as soon as possible thereafter.
- October 1, 2011: Mass concrete placement has been completed, and all mass concrete has attained a minimum compressive strength of 2,000 psi.
- October 15, 2011: Obermeyer bondout concrete has been poured and attained the specified 28-day compressive strength of 3,000 psi. The contractor may propose mixes
- November 1, 2011 – November 15, 2011: Construction of the dam is complete including installation of the Obermeyer system, and cofferdam removal/rewatering may commence.
- November 15, 2011 – November 30, 2011: Cofferdam removal will commence upon Owner's Notice to Proceed.

14. After reviewing the Licensee's repair plans, I suggested several alterations to the

proposed work to minimize effects to Atlantic salmon both during construction and post-construction including alterations to the proposed spillway configuration and alterations to the rubber dam section to facilitate safe downstream passage of Atlantic salmon at the project. I also requested that the Licensee utilize Best Management Practices during construction to minimize effects to Atlantic salmon potentially occurring in the action area. I also recommended that the Licensee coordinate with downstream dam owners to determine the number of adult Atlantic salmon in the Androscoggin River to verify that few Atlantic salmon are present in the action area. The Licensee agreed to these suggestions.

15. On April 28, 2011, I participated in a conference call with FERC and Miller Hydro. During the call, FERC determined the present condition of the Worumbo Dam was in such disrepair that use of the emergency consultation procedures as outlined in 50 CFR 402.05 would be appropriate. I recommended that the Licensee conduct daily Atlantic salmon monitoring, turbidity monitoring, and environmental inspections to ensure that instream work would have minimal effects to the GOM DPS of Atlantic salmon. The Licensee agreed to conduct these activities. FERC also required the Licensee to conduct monthly conference calls to review work progress and environmental monitoring.

16. The potential effects associated with the demolition and subsequent repairs of the Worumbo Dam include inhibiting fish passage during construction, increasing suspended sediment, causing direct injury and mortality during construction, and potentially spilling toxic substances (e.g., equipment leaks). Regarding fish passage, the Worumbo Dam upstream fishway will remain operable throughout the construction period for adults moving upstream to spawn. Therefore, passage for Atlantic salmon is not a concern. Utilizing Best Management Practices, the Licensee will minimize sedimentation in the river and monitor sediment levels in the action

area daily during construction to ensure the effects of sedimentation are low. All instream work will occur behind cofferdams so that the potential for direct injury or mortality is significantly reduced. Best Management Practices for refueling and other toxins is required in the U.S. Army Corps permit to the Licensee.

17. Instream work to repair the Worumbo Dam is planned to occur from late July through mid-October, 2011. As such, the only life stage of Atlantic salmon that could likely occur in the action area are adults returning to spawn in the fall. Adults enter the Androscoggin River mostly during May through July. Over the last several years, less than 10% of adults enter the river after August 1st. During summer months, Atlantic salmon tend to hold in cold water refugia found in seeps, tributaries, or deep sections of the river until ambient water temperatures cool to more favorable conditions for the species. It's my understanding that a cool water tributary is found approximately 500 meters downstream of the Worumbo Project. Consistent with this, several Atlantic salmon equipped with radio telemetry transmitters have been documented holding at this location.

18. On or about July 18, 2011, the Licensee commenced instream construction work to repair the Worumbo Dam. Work was initiated with installation of sediment curtains to protect aquatic organisms including Atlantic salmon.

19. Starting July 18, 2011, the Licensee submitted daily monitoring reports to FERC and NMFS of construction and environmental monitoring efforts at the projects. No significant impacts to Atlantic salmon have been reported to date (as of August 8, 2011). Daily reports have not documented any dead, injured or stranded Atlantic salmon. Sedimentation levels in the river have generally remained low during construction, however, episodic events of elevated sediment levels have been documented during daily environmental and biological monitoring at the site.

These episodic events have not appeared to cause any harm to the species as two Atlantic salmon have remained in the action area throughout construction. Typically, fish will avoid high sediment levels by relocating to areas with reduced levels. Since this has not occurred, it is likely that sediment levels have not exceeded levels that Atlantic salmon can tolerate. Also, no release of toxins to the river has been reported.

20. Two (2) radio tagged adult Atlantic salmon have been documented downstream of the Worumbo Dam since late June, 2011. These adults had remained within several hundred feet of the dam throughout construction at the site. However, on Saturday, August 6, 2011, Miller Hydro conducted a scuba survey of this area and found that one salmon had regurgitated its radio tag and that the other adult was no longer in the area. Accordingly, I do not believe there are any salmon in the project area at this time.

21. Pursuant to NMFS' Section 7 Consultation Handbook (March 1998), if NMFS' initial review of an emergency response indicates the action "may result in jeopardy or adverse modification, and no means of reducing or avoiding this effect are apparent, the agency should be so advised, and the [NMFS's] conclusions documented." Based upon my initial review of the repair project, the fact that less than 1% of adult Atlantic salmon in the GOM DPS occur in the entire Androscoggin River watershed, and the expectation that few, if any, Atlantic salmon would be present during construction, I had no indication that the proposed repairs of the Worumbo Dam would result in jeopardy or adverse modification of listed Atlantic salmon. In addition, since the project currently has operating upstream and downstream fishways, bypass reach minimum flows, and downstream minimum flows, I had no indication that re-building the Worumbo Dam would result in jeopardy or adverse modification of listed Atlantic salmon. Therefore, I did not advise the FERC that the project could result in jeopardy or adverse

modification of Atlantic salmon. Nonetheless, I am informally consulting with the FERC and the Licensee to minimize the effects to Atlantic salmon and its critical habitat. Specifically, I recommended daily monitoring of sediments and other environmental conditions at the project, documenting the location and behavior of any radio tagged Atlantic salmon in the action area, as well as the use of Best Management Practices for erosion and sedimentation control.

22. Pursuant to 50 C.F.R. § 402.05, FERC will initiate formal Section 7 consultation as soon as practical after the repairs at the Worumbo Dam are completed. Based upon information submitted to NMFS concerning the nature of the emergency and any impacts to listed Atlantic salmon, NMFS will issue an emergency Biological Opinion including information and recommendations given during the emergency consultation. Effects of project operations will also be evaluated in the emergency Biological Opinion.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge, information and belief.

Executed in Orom, NE on this 8th day of August, 2011.



Jeff Murphy, Fishery Biologist
Protected Resources Division
Northeast Regional Office
National Marine Fisheries Service