

**UNITED STATES OF AMERICA**

**NUCLEAR REGULATORY COMMISSION**

**BEFORE THE ATOMIC SAFETY AND LICENSING BOARD**

**In the Matter of** )  
**Entergy Nuclear Generation Company** )  
**Entergy Nuclear Operations Inc.** )  
**Pilgrim Nuclear Power Station** )  
**License Renewal Application** )

**Docket # 50-293 LR**

**Affidavit of E. Pine duBois**

1. My name is E. Pine duBois and I live at 93 Elm St., Kingston, which is approximately 8.53 miles from PNPS. I have lived there for almost 17 years. I have lived in Kingston, within 12 miles of PNPS for 37 years.
2. I am the executive director and a cofounder of the Jones River Watershed Association, Inc. (JRWA). JRWA is a 501(c)(3) corporation that was formed in 1985. "The purposes of the corporation shall include the exercise of power and authority to acquire and preserve natural resources and wildlife areas for the use and enjoyment of present and future generations, to preserve and protect historic sites, to educate the public about the wise use of natural resources, and to work with other organization having the same purposes." As part of this mission, JRWA has worked to monitor and improve the habitats and populations of diadromous fishes, including, in particular, river herring. The annual filings for JRWA are complete through corporate year 2010.

3. I have been directly involved with JRWA's operations and programs since 1985. This involvement has included work on many projects to perform in water research, studies, fish monitoring, etc., that relate to river habitats, and water quality and stream flows, as well as the interrelationship between fresh water rivers and marine ecosystems. As a result of my work, JRWA and I have received numerous awards, grants, and recognition for the work that I led to protect river and marine aquatic ecosystems. As a result of my experience and on the job learning about fisheries in Cape Cod Bay and the Jones River, I have been designated by JRWA to make comments in various regulatory processes, including the relicensing of PNPS. I have also been designated and authorized by JRWA and its members to request a hearing in the above-referenced licensing proceeding before the NRC and/or ALSB.
4. The address of JRWA is Jones River Landing Environmental Heritage Center (Jones River Landing) at 55 Landing Rd. Kingston, not quite 8 miles from PNPS. Jones River Landing is a supporting organization of JRWA. Together, the organizations own three parcels of land totaling about one acre on the Jones River including two historic boatyards. JRWA owns two additional properties within the Jones River watershed containing about 13 acres.
5. Of approximately 219 households that are active members of the JRWA, 215 families live and work within a 50-mile radius of the PNPS. JRWA members live, work and recreate in the Jones River and Cape Cod Bay. Some members raise oysters in the bay and go boating to enjoy fishing, exercise, kayaking and birding. Others raise food crops, including organic cranberries, and

produce organic vegetables and animals for home use or sale through Community Supported Agriculture programs; members engage in photography and other forms of artistry requiring nature observation. Many volunteer to help count fish in the annual monitoring program. For the last six years, over 50 JRWA volunteers have maintained a river herring count on the Jones River during the spawning season in April and May.

6. In about 1991, I first became concerned about the potential impact of PNPS upon the fisheries in the Jones River and on the marine aquatic resources of Cape Cod Bay to which the river discharges. I became concerned because of discussions I had with Robert Lawton who worked for MA Division of Marine Fisheries (DMF) to assess the impact of PNPS on the fish populations in Jones River. I became aware of the terrible impact PNPS had on these fish and the need for restoration efforts.
7. Since it was founded, JRWA has taken action to try to improve the water quality of Jones River by soliciting grants to improve flows and storm water discharges so that river herring and other fish could productively spawn. Beginning in 1994, we installed water quality systems at the Elm St. dam and in the estuary to improve water quality in the river, and we established a volunteer monitoring program to find discharges and to sample water quality. At the request of Bob Lawton, Boston Edison supplied JRWA with a grant that helped defray the costs of lab work for this program.

8. In the summer of 2000, the Board of Directors determined that JRWA should expand its mission beyond the 30 square mile reach of the Jones River Watershed to include Cape Cod Bay (CCB), and other connected regions in Southeastern Massachusetts. The Jones River is the largest river draining to CCB and the Bay is a critical habitat within the Gulf of Maine. Catadromous and anadromous fish that inhabit the Jones River swim to the river from CCB. This includes the near shore areas in front of PNPS.
9. In 2001, the previous fish ladder at Elm St. dam on the Jones River in Kingston was replaced using state funds with an Alaskan Steep Pass type in order to assist the diadromous fish, and especially the river herring, in migration and spawning. I became a member of the fish committee in Kingston so that I could learn more about the condition of the herring and to assist in improving this important fishery in the Jones River. In 2003, JRWA purchased Jones River Landing and began a closer working relationship with DMF on programs to monitor river herring and other species, including American eels and Sand Tiger Sharks. All these species use CCB seasonally for critical life cycle support including foraging for food, spawning migration, and nursery habitats for their young. All near shore species that enter the Jones River must swim past the PNPS.
10. In the spring of 2005, JRWA began its volunteer monitoring program to count river herring that pass at the Elm Street fish ladder on Jones River under the statewide DMF initiative and training. I went to the initial training and initiated the program in Jones River.

11. JRWA knows from our annual counts that the Jones River river herring population is severely diminished in relation to the historic population. A 1926 State Legislative Report, and local anecdotal reports, discuss massive herring populations in Jones River and throughout the region, prior to 1980. One of the first laws of the Commonwealth was to protect the migration of alewives.
12. JRWA has adopted a goal to restore river herring spawning to Silver Lake, which is about 11 miles from PNPS. To do this, JRWA became involved with a region-wide effort to protect the river herring and improve their habitat because of significant population declines. We work with our partners in the Watershed Action Alliance of Southeastern Massachusetts to secure grants and created an educational kiosk to promote restoration of herring runs by removing dams and restoring rivers in towns and watersheds in the region.
13. Recently, I became aware of the existence and details of the NPDES permit for PNPS that regulates the intake and discharge of once through cooling water from Cape Cod Bay. I learned that the NPDES permit expired in 1996. I tried to find out more about the permit in 2007, and found that there had been no action on the application for NPDES permit renewal filed by Boston Edison in 1995.
14. In 2006 and 2007, I studied reports relative to operations at PNPS to provide comment at the hearings and in writing to the NRC on the PNPS application to renew its operating license for 20 years.

15. The reports provided by Entergy show that river herring (blueback herring and alewives) are killed every year at the PNPS facility, and are the third most numerous species impinged over all (Normandeau 2006b).
16. JRWA has continued its herring count every year since 2005 and has reported our results to NOAA and DMF, who are keeping records of other runs in Massachusetts. We also became involved with the Herring Alliance, which is addressing the problem of fisheries by-catch and working to have federal regulations adopted that will prevent the accidental catch of river herring at sea, especially by mid-water trawlers. On its website ([http://www.mass.gov/dfwele/dmf/spotlight/river\\_herring.htm](http://www.mass.gov/dfwele/dmf/spotlight/river_herring.htm)) DMF states that the by-catch of river herring. “While significant, this amount of mortality is not sufficient to cause the coastwide decline of the river herring stocks and so there must be other, currently unidentified factors contributing to mortality.” (Webpage as above, Spotlight: River Herring Moratorium; emphasis added)
17. Starting in 2007, JRWA worked to remove the Wapping Rd. dam in order to enlarge the spawning habitat for river herring upstream, and ultimately to restore river herring to Silver Lake.
18. From 2007 through 2011, JRWA secured grant funds and managed the project to remove the Wapping Rd dam on the Jones River, which was JRWA’s first major structural alteration to advance its goal to restore the spawning population of river herring. This was the first of three dams being

targeting by JRWA. The Wapping Road dam was demolished in September 2011. Local, state and federal funds applied to the five year effort was about 0.75 million dollars.

19. I reviewed the NRC's 2006 draft supplemental environmental impact statement prepared under NEPA for PNPS. I attend and provided testimony at the NRC public meetings held in Plymouth, Massachusetts in January 2007. JRWA's testimony and February 2007 written comments included information about the impact of PNPS's once through cooling water operations on marine aquatic species, diadromous fish, including river, herring, and the overall impact on the health of CCB.
20. In that testimony, JRWA requested that the once through cooling operations at PNPS be improved or that Pilgrim not be re-licensed for another 20 years because of the existing, known impacts of facility operations on marine aquatic resources.
21. It is JRWA's position that the NRC re-licensing record lacks scientific data sufficient to assess the impact on Cape Cod Bay from PNPS operations. Since the health of CCB is linked to Jones River's ability to protect anadromous and catadromous fisheries in the region, JRWA is harmed if the environmental impact assessment fails to include material and relevant scientific data on impacts to the Bay.
22. At the time, I was aware that the NPDES permit renewal process for PNPS was considering changes and improvements to once through cooling at the facility. JRWA had relied upon U.S. EPA to move forward in a timely manner

to renew the PNPS NPDES permit while NRC was reviewing and deciding the parameters for reissuing the facility's operating license. JRWA knew the NRC's role includes review of the impact of PNPS on marine aquatic resources including endangered, threatened, and candidate species, and fish habitat. JRWA relied on EPA and the NRC to perform their responsibilities in this regard.

23. In the spring of 2011, I contacted EPA to determine where the NPDES process was in review, and obtained the permit that was issued in 1991. In December I asked for an update on their process to issue the permit and to review their file. By early February 2012, JRWA learned: that the NPDES permit process for PNPS was stalled; that the consultation process under the Endangered Species Act between NMFS and the NRC had not been concluded on the NRC 2006 Biological Assessment; that the NRC has not completed an Essential Fish Habitat Assessment for Alewives, blueback herring, Rainbow smelt that migrate through CCB, past the PNPS and into Jones River, a designated EFH; and that Atlantic sturgeon is now proposed for listing as endangered under the ESA by NOAA. Further, we learned that, in November 2011, river herring had been designated as a candidate species by NMFS.

24. On February 6, 2012, JRWA sent a letter to NMFS to request a copy of their concurrence letter with the NRC biological assessment and PNPS GEIS conclusions regarding Endangered Species and EFH. A copy is attached hereto as Exhibit 1. JRWA sought to determine if NMFS had completed its consultation with the NRC on the Biological Assessment. JRWA also raised



concerns about the overall impact of PNPS operations on the marine aquatic resources in Cape Cod Bay, and informed NMFS of significant informational and data gaps in the BA. JRWA has not received any written reply to this letter or evidence of NMFS formal concurrence.

25. On March 2, 2012 an acquaintance sent me an electronic copy of a NRC letter dated February 29, 2012 to NMFS requesting their concurrence on the Atlantic Sturgeon (attached). JRWA has not received any notice from the NRC on this issue.

26. JRWA's interests in the health of the Jones River and Cape Cod Bay, and its ability to carry out its mission is harmed by the following issues relating to PNPS's plans to continue to use once through cooling water during the 20 year re-licensed period: (a) The absence of NMFS concurrence on the NRC's 2006 Biological Assessment and the failure to include results of the ESA § 7 process in the final GEIS; (b) the incomplete ESA § 7 process on Atlantic sturgeon; (c) the lack of an Essential Fish Habitat Assessment and compliance with the consultation provisions of the Magnuson Stevens Fisheries Act; (d) the lack of information on river herring, and (e) the lack of information in the GEIS on these issues.

27. The information referred to in the preceding paragraph is critical to fully assessing the impacts of the continued operation of PNPS for 20 more years on the interests of JRWA in the marine aquatic resources in Cape Cod Bay that are linked to the Jones River.

Executed in Accord with 10 C.F.R. 2.304(d) on March 6, 2012

A handwritten signature in black ink, appearing to read "E. Pine duBois". The signature is written in a cursive style with a horizontal line above the name.

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March 6, 2012



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February 6, 2012

CERTIFIED MAIL and email

Ms. Mary Colligan  
Assistant Regional Administrator  
Protected Resources Division  
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**Re: Endangered Species Act, Section 7 Consultation:  
U.S. Nuclear Regulatory Commission, Pilgrim Nuclear Power Station,  
Plymouth, Massachusetts: Relicensing**

Dear Ms. Colligan:

We are writing about the Section 7 consultation by the National Marine Fisheries Service (NMFS) for the Pilgrim Nuclear Power Station (PNPS) in Plymouth, Massachusetts. This consultation is required under the Endangered Species Act (ESA), 16 U.S.C.S. §§ 1536 *et seq.* As you may know, the U.S. Nuclear Regulatory Commission (NRC) is conducting relicensing proceedings on PNPS's operating license. The license expires on June 8, 2012 and the licensee, Entergy Nuclear Operations, Inc. (Entergy) seeks permission to continue operating for another 20 years. See, Pilgrim LR Proceeding, 50-293-LR, 06-848-02-LR, NRC Docket No. 50-293. Since it began operation in December, 1972, PNPS has been using once-through cooling water from Cape Cod Bay and discharging pollutants to the Bay.

Our research appears to show that the NMFS has yet to concur with the NRC's July 2007 "biological assessment" under the ESA, nor has NMFS issued its own biological opinion or otherwise concluded an informal consultation. The last relevant communication in the relicensing proceeding record is a January 23, 2007 letter from NMFS stating "[c]omments relative to the Section 7 Endangered Species Act consultation will be provided by NMFS Protected Resources Division under separate cover." NUREG-1437, Supp. 29, page E-45.<sup>1</sup> We have been unable to locate a NMFS concurrence letter or any subsequent comments from NMFS on the NRC biological assessment for PNPS.

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<sup>1</sup> Unless otherwise noted, citations are to NRC's "Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants, Supplement 29, Regarding Pilgrim Nuclear Power Station, Final Report, July 2007," NUREG-1437, and its Appendices. (NUREG-1437). Available on line: <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement29/index.html>; Vol. 1 ML 071990020; Vol. 2 Appendices ML 071990027.

**If NMFS has yet to make its decision on whether to concur with the NRC’s biological assessment, we urge the NMFS to withhold concurrence at this time, for the reasons stated below. If NMFS has concurred, we request that the concurrence letter be placed in the NRC docket as part of the record in NRC’s operating relicensing proceeding.**

### **Relevant Law**

The ESA regulations at 50 CFR 402.14(a) provide in pertinent part, “[e]ach Federal agency shall review its actions at the earliest possible time to determine whether any action **may affect listed species or critical habitat**. If such a determination is made, **formal consultation is required**, except as noted in paragraph (b) of this section.”

The two exceptions in 50 CFR 402.15(b) provide,

“(1) A Federal agency need not initiate formal consultation if, as a result of the preparation of a **biological assessment** under § 402.12 or **as a result of informal consultation** with the Service under § 402.13, the Federal agency determines, **with the written concurrence of the Director**, that the proposed action **is not likely to adversely affect any listed species or critical habitat**.” In this case, the Director is the assistant administrator of NMFS. 50 CFR 402.02. (emphasis supplied)

The NRC has determined that **ten federally listed endangered or threatened species** that are under full or partial NMFS jurisdiction “**may be affected** by continuing operations of PNPS.” NUREG-1437, p. E-73. The NMFS also informed the NRC that Cape Cod Bay is critical habitat for the Northern right whale. See, NMFS letter to NRC, June 8, 2006, NUREG-1437, p. E-15. ESA consultation is also required on this critical habitat in its own right as well as on the ten listed species. The NRC has not addressed the critical habitat for Northern right whales in the 2007 biological assessment.

In its 2007 biological assessment, NRC determined that operation of PNPS for another 20 years “would not have any adverse impact on any threatened or endangered marine aquatic species.” NUREG-1437, p. E-73. On this conclusion, the NRC is required to initiate a formal consultation, obtain NMFS concurrence on the 2007 biological assessment, or otherwise conclude an informal consultation.

### **Relevant Facts**

PNPS is located on Cape Cod Bay and withdraws up to 510 million gallons per day (mgd) of **once through cooling water** from the Bay. Under the federal Clean Water Act and its state counterpart, PNPS has an NPDES permit. This permit expired on April 29, 1996, but has been administratively extended by U.S. EPA for 16 years.<sup>2</sup> The state water quality

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<sup>2</sup> Jointly issued State Permit No. 359 and Federal Permit No. MA 0003537. The NPDES permit is based on a daily plant operating capacity of 655 MW. See, Aug. 30, 1994 Modification of NPDES permit. Following a power optimization overhaul in 2003, Entergy is now producing 715 MW daily. NUREG-1437, p. 1-8. The annual capacity factor for 2010 was 98.5%, meaning that PNPS operated at 100% capacity for 98.5% of the time. Entergy “Marine Ecology Study” No. 77, Annual Report for 2010, p. 2. This raises questions about whether the

certification is also expired. In addition to NPDES regulated pollutants, liquids containing radioactive wastes are also discharged to Cape Cod Bay under NRC regulations. The NPDES permit allows Entergy to discharge to Cape Cod Bay least 510 mgd of heated condenser cooling water (daily maximum), 255 mgd of thermal backwash (daily maximum), 19.4 mgd of service cooling water (monthly average), .06 mgd of make up water (daily maximum), 4.1 mgd of intake screen wash, and stormwater runoff from at least four storm drains.

As described by the Massachusetts Supreme Judicial Court in upholding the state's authority to regulate the PNPS intake and discharges, "the environmental impact of these systems is staggering." Entergy Nuclear Generation Company vs. Department of Environmental Protection, SJC-10732, 2011 Mass. Lexis 163, April 11, 2011. The state's highest court further stated:

"As the sources referenced by the department indicate, the ecological harms associated with CWISs are well understood. The intake of water by a CWIS at "a single power plant can kill or injure billions of aquatic organisms in a single year." Riverkeeper, Inc. v. United States Env'tl. Protection Agency, 475 F.3d 83, 90 (2d Cir. 2007), rev'd in part on other grounds, Entergy Corp. v. Riverkeeper, Inc., 129 S. Ct. 1498, 173 L. Ed. 2d 369 (2009). See Riverkeeper, Inc. v. United States Env'tl. Protection Agency, 358 F.3d 174, 181 (2d Cir. 2004). In light of the SJC's ruling, a careful ESA consultation is warranted.

In the PNPS relicensing process, Energy prepared an Environmental Report (ER) that the NRC used, along with other information, as the basis for its final environmental impact statement. NUREG-1437, p. E-53. The NRC agency staff then produced the 2007 biological assessment based on the final environmental impact statement.

Entergy has submitted a NPDES renewal application to EPA. Entergy makes no secret about its position that it should not be required to change its operating methods to reduce its environmental impacts on Cape Cod Bay.<sup>3</sup> The pending NPDES permit renewal process, which Entergy is likely to delay by challenging any efforts to require operational changes to its water use and discharge, should not drive NMFS's consultation process. Entergy itself has argued against a delay in a similar nuclear power plant relicensing proceeding.<sup>4</sup> While we are not suggesting that NMFS has delayed its concurrence decision pending EPA action on the NPDES permit and State Water Quality Certification, we are simply pointing out Entergy's position that NMFS should not delay its decision.

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annual quantity thermal discharges and discharges of other pollutants has been higher in recent years, including 2010, given the increased annual operating capacity.

<sup>3</sup> See, e.g., ENSR and Entergy Corp., "Application of a Comprehensive Framework for Assessing Alternative Cooling Water Intake Structure Technologies Under 316b", <http://www.gunderboom.com/PDFfiles/ENSR%20Technical%20Paper.pdf>

<sup>4</sup> Letter from Goodwin Proctor to NRC, Sept. 6, 2011 on Indian Point reactors. <http://pbadupws.nrc.gov/docs/ML1125/ML11257A103.pdf>

## **Deficiencies in NRC's Biological Assessment**

It is our view that NMFS concurrence with the NRC's biological assessment is unwarranted and would be inconsistent with the ESA. The assessment relies almost entirely upon information produced by Entergy's consultants and ignores scientifically and commercially available data. 16 U.S.C. 1536(a)(2). The species and habitat data is clearly not sufficient to make an informed decision as to the effects of PNPS's operations. Bob Marshall Alliance v. Watt, 685 F. Supp. 1514, (D. Mt. 1986), aff'd in part and rev'd in part and rev'd in part on other grounds, 852 F.2d 1223 (9<sup>th</sup> Cir.) cert. den. 489 U.S. 1066 (1989).<sup>5</sup> The NRC's biological assessment ignores readily available data from such organizations as the Whale and Dolphin Conservation Society (WDOS), Provincetown Center for Coastal Studies, and others that would provide specific information about the impacts of PNPS on listed species.

Some specific deficiencies in the NRC's biological assessment are listed below. This is not a comprehensive list.

**First**, the biological assessment **unlawfully limits the geographical area** it covers. The action area for purposes of the ESA is defined in 50 CFR 402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The NRC has improperly attempted to limit the scope of its biological assessment to "near PNPS" or "at PNPS." See e.g., E-66, p. E-67, E-68, E-73. One reason this is improper is highlighted by comments by the Massachusetts Office of Coastal Zone Management (CZM) on Entergy's Clean Water Act 316 demonstration report. *Exhibit 1, hereto*, June 27, 2000 letter. CZM has stated that the thermal loading from the PNPS may impact "hundreds of acres of Cape Cod Bay." Thus, it is this agency's position that Entergy's operations at PNPS affect not just the area "at" or "near" PNPS but "hundreds of acres of Cape Cod Bay". While CZM's comments relate to Entergy's CWA compliance, it is also relevant to the assessment of impacts on listed species and critical habitat in Cape Cod Bay.

CZM stated Entergy's impingement events may impact "food web dynamics in the region of Cape Cod Bay near the Entergy-Pilgrim station" and "at least one modeling study predicts that hundreds of acres of Cape Cod Bay may increase by one degree Celsius or more due to thermal loading from the discharge...." It cites "evidence that the rate of fish impinged by the continuous action of the cooling water intake structures is thousands to tens of thousands per year...." The NRC has not addressed how thermal loading, impingement, and entrainment impact the food web, food supply for the listed species and critical habitat.

**Second**, the biological assessment ignores scientific data readily available **about whale activity in the area**. For example, a quick review of available data produced this photo of a federally endangered fin whale (*balaenoptera physalus*) in front of PNPS. The NRC's biological assessment contains a scant half page of "assessment" of the impacts of PNPS on the fin whale. NUREG-1437, p. E-71.

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<sup>5</sup> In this case, the court ruled the Department of Interior violated ESA by failing to gather species and habitat data sufficient to make informed biological assessment of effects of oil and gas leasing in National Forest area, because such failure during agency planning process creates likelihood of future conflict as development proceeds and, in effect, gives development priority over endangered species.



Photo courtesy of Whale and Dolphin Conservation Society. A view of PNPS from Cape Cod Bay is also shown in another photo, which provides a clearer picture of the four tanks at PNPS also shown in the WDCS photo. From the Boston Globe: [http://www.boston.com/business/ticker/2008/11/nuclear\\_watchdo.html](http://www.boston.com/business/ticker/2008/11/nuclear_watchdo.html)

**Third**, NRC’s Biological Assessment as to the **effects on sea turtles** is contradictory and lacking in specific habitat data. It relies on stranding data, and on Entergy’s monitoring data. p. E-66. It states, “The applicant has been monitoring aquatic communities in western Cape Cod Bay since 1969. No Federally endangered or threatened species have ever been observed in Cape Cod Bay near PNPS, or in the facility intake and discharge areas, during the duration of these studies.”

The reliance on Entergy’s “monitoring” is totally misplaced because Entergy’s monitoring covers only fisheries and plankton – not turtles or whales. Based upon our preliminary review of the 77 Environmental Monitoring Reports prepared by PNPS in the last forty years, we have found no requirement that the presence of sea turtles or whales be documented or reported.<sup>6</sup> Therefore, these reports cannot form the basis of a reasonable biological assessment regarding sea turtles.

Further, the NRC’s statement about the absence of listed species near PNPS is at odds with the statement in the EIS at NUREG-1437, page E-65 that a federally endangered loggerhead turtle was stranded .63 miles south of PNPS on Priscilla Beach in 2003. Finally, as NMFS has noted, sea turtles have been impacted by other nuclear power plants on the East Coast. See, e.g. Nov. 21, 2006 NMFS Biological Opinion for Oyster Creek Nuclear Generating Station.

**Fourth**, the NRC biological assessment fails to address the fact that **river herring are now considered a candidate species under the ESA**. 76 Fed. Reg. 67652, 67656 (Nov. 2, 2011). About two months ago, NMFS announced a 90-day finding for a petition to list

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<sup>6</sup> The monitoring is done under Entergy’s NPDES Permit, Paragraphs A.8.b & e, and Attachment A, Paragraph 1.F.

Alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*), collectively referred to as river herring, as threatened under the ESA and to designate critical habitat concurrent with a listing. 76 Fed. Reg. at 67652. NMFS's ESA determination on river herring is due by August 5, 2011.<sup>7</sup>

According to the NRC, alewife (*Alosa pseudoharengus*) "is one of the most commonly impinged species at PNPS (ENSR 2006). Alewife larvae and juveniles have been collected in the PNPS entrainment sampling. Juveniles and/or adults have been consistently collected in the PNPS impingement sampling program. Over the last 25 years (1980 to 2005), alewives have had the third highest number of individuals impinged at PNPS, based on annual extrapolated totals (Normandeau 2006b)." NUREG-1437, p. 2-34. This assessment raises several serious questions. For example, the NRC states that alewife "spawning occurs in freshwater rivers and streams," p 2-34, but then says larvae are found in the entrainment sampling at PNPS. It seems extraordinary that larvae would be entrained at PNPS's saltwater intake, several miles from suitable freshwater habitat in the area such as Eel River and Jones River. This raises the question, which has not been assessed, as to whether PNPS thermal discharges are disrupting alewife reproduction.

Entergy's own records show that during a ten-year period, 1994 to 2004, 46,286 alewife and 16,188 blueback herring were impinged at PNPS, for a total of 62,474 river herring. These facts stand in stark contrast to the wholly inaccurate predictions on the impact to alewife from PNPS in the mid-1970s. In 1975, PNPS's consultant Stone and Webster stated that over the 40 year operation of PNPS (1972 to 2012) impingement and entrainment would result in a loss of 29,410 alewife.<sup>8</sup> Worse yet, this prediction was based on the operation of **two** nuclear generating units at PNPS – the second one was not built. The impingement numbers for alewife (42,286) and blueback herring (16,188) from 1994 to 2004, a ten year period, were 1.5 times as many alewife impinged as predicted for the full 40 year time period.

In relation to the total Jones River river herring stock, PNPS's impingement and entrainment numbers are significant. In 2004 alone, PNPS impinged 2,192 river herring (alewife and blueback herring). In the following year, 2005, the total estimated Jones River river herring stock was 804 – therefore in 2004, PNPS impinged 2.75 times as many fish as the entire Jones River river herring run the next year (2005).

**Fifth**, the NRC improperly excluded potential impacts from Entergy's dredging project from the biological assessment. The EIS states, "other activities that may affect marine aquatic resources in Cape Cod Bay include periodic maintenance dredging....However, based on discussions with plant personnel, there are no plans for dredging of the intake embayment or discharge canal at PNPS." NUREG-1437, p. 4-75. This is inaccurate. In 2012, Entergy is scheduled to dredge the intake channel. It has permission from the state to dredge 43,200 cubic yards of in-situ sediments plus a potential 11,000 cubic yards of over dredge.<sup>9</sup> Entergy requested and received a waiver of the state requirement for an

<sup>7</sup> The decision on listing river herring could be made before the NRC makes its decision on PNPS' nuclear plant operating relicensing. The duty to consult with NMFS under the ESA can be ongoing, and consultation must be reinitiated under certain circumstances. 50 CFR 402.16. If the listing decision on river herring is made before June 8, 2012, a new consultation must be initiated.

<sup>8</sup> "316 Demonstration for Pilgrim Nuclear Power Station, Units 1 and 2, July 1975", prepared by Stone & Webster Engineering Corporation, p. 7-4.

<sup>9</sup> See, Massachusetts Environmental Policy Act Certificate, EEOEA #14744.



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environmental impact report for this project. And, by improperly excluding this project from the NRC's EIS, Entergy's dredging project has evaded federal review. ESA consultation is required because as NRC states, "periodic maintenance dredging" **may affect** marine aquatic resources in Cape Cod Bay." NUREG, p. 4-75. "Marine aquatic resources" clearly include listed species, and the candidate species river herring.

Thank you for consideration of our inquiry. We look forward to hearing your response to how NMFS will be addressing the need for concurrence on NRC's conclusions. Please feel free to contact Meg Sheehan a 508-259-9154 or meg@ecolaw.biz if you have any questions about the issues raised in this letter.

Very truly yours,  
For Jones River Watershed Association

*Margaret E. Sheehan*

Margaret E. Sheehan, Esq.

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Cc:

Nuclear Regulatory Commission  
U.S. EPA, Curt Spaulding, Region I Administrator  
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Pilgrim Watch  
Conservation Law Foundation  
Sierra Club, Massachusetts Chapter  
MassPIRG  
Toxics Action Project  
The Herring Alliance  
Whale and Dolphin Conservation Society  
Provincetown Center for Coastal Studies  
Massachusetts Audubon Society  
The Nature Conservancy, Massachusetts Chapter  
Cape Cod Hook Fisherman's Association  
Trout Unlimited, Massachusetts/Rhode Island Chapter  
Massachusetts Rivers Alliance  
Connecticut River Watershed Council  
Town of Plymouth, Board of Selectmen, Town Manager, Department of Public Works and Conservation Commission  
Town of Kingston, Board of Selectmen and Conservation Commission  
Town of Duxbury, Board of Selectmen and Conservation Commission  
Cape Downwinders  
Pilgrim Coalition  
Cape Cod Bay Watch



**THE COMMONWEALTH OF MASSACHUSETTS**  
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS  
OFFICE OF COASTAL ZONE MANAGEMENT  
100 CAMBRIDGE STREET, BOSTON, MA 02202  
(617) 626-1200 FAX (617) 626-1240

June 27, 2000

Mr. Dave Webster  
Manager, Massachusetts State Program Office  
U.S. Environmental Protection Agency  
New England Region  
1 Congress St.  
Boston, MA 02114

RE: MCZM review of the Entergy-Pilgrim Station § 316 Demonstration Report.

Dear Dave:

The Massachusetts Coastal Zone Management Office (MCZM) has reviewed the § 316 Demonstration Report prepared by Entergy Nuclear Generation Company (ENG) for Entergy-Pilgrim Station. We find that the Demonstration Report does not adequately support the conclusion of no significant impact to the species inhabiting the waters surrounding Entergy-Pilgrim Station.

The Demonstration Report provides 25 years of hydrothermal and biological data collected near the intake and discharge structures of Entergy-Pilgrim Station. While the hydrothermal data provided show that biological impacts are minimal, at least one modeling study predicts that hundreds of acres of Cape Cod Bay may increase by one degree Celsius or more due to thermal loading from the discharge. The Demonstration Report does not provide adequate evidence to determine how a temperature increase of just a few degrees may affect the development and survivorship of eggs and larvae or how a temperature increase may affect the future fecundity of adults exposed to the discharge plume in Cape Cod Bay.

The Demonstration Report provides evidence that the rate of fish impinged by the continuous action of the cooling water intake structures is thousands to tens of thousands per year. Certain schooling species (e.g., smelt and silversides) that are prey for recreationally and commercially important fish and shorebirds, comprise the majority of these impinged individuals. While large impingement events are confined to only a few fish species, it has yet to be determined how large single-day losses of these important prey species affect food web dynamics in the region of Cape Cod Bay near the Entergy-Pilgrim Station.

Of most concern is the entrainment of eggs and planktonic larvae by the cooling water intake structures. The Demonstration Report provides ample evidence that eggs

and larvae of many commercially and biologically important fish species are entrained by the cooling water intake structures. The removal of these eggs and larvae from the ecosystem and food web is an issue that has not been adequately addressed by the Demonstration Report. The death and physical destruction of these early life forms effectively removes these individuals from one trophic level and places their biomass and the energy it represents into another trophic level.

Because winter flounder is a species of interest in Cape Cod Bay, the Demonstration Report determines equivalent adult figures for the number of winter flounder adults that would have lived had the larvae not been entrained (but not for any other species). We do not believe that the ENG C has provided enough evidence to state that the number of equivalent adults killed by entrainment is not an adverse impact. By ENG C's calculations, between 47,000 and 77,000 equivalent adult winter flounder were killed in 1997 and 1998, respectively. When converted to pounds of fish taken, these values approach 40% of the annual total recreational and commercial catch. Given that winter flounder stocks are declining and the Entergy-Pilgrim Station is killing tens of thousands of winter flounder annually, we cannot agree that ENG C has demonstrated that they are not having an adverse environmental impact.

In Summary, we find that the Demonstration Report presents 25 years of data that suggest that thermal loading and impingement due to the cooling water intake structures at the Entergy-Pilgrim Station have relatively minor impacts to adult fish. The Demonstration Report does not provide sufficient scientific evidence to state unequivocally that the entrainment of fish larvae and eggs does not constitute a long-term adverse impact to the food web comprised of the collective populations of species within Cape Cod Bay.

Sincerely,



Thomas W. Skinner  
Director

TWS/tpc

cc: Gerald Szal  
DEP CERO  
Bob Maietta  
DEP CERO  
Nick Prodany, Senior Permit Writer

US EPA  
Jack Paar, Senior Biologist  
US EPA Lexington Laboratory  
Bob Lawton, Fisheries Biologist  
DMF Pocasset



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

February 29, 2012

Ms. Patricia A. Kurkul  
Northeast Regional Administrator  
National Marine Fisheries Service  
55 Great Republic Dr.  
Gloucester, MA 01930-2276

SUBJECT: REQUEST FOR CONCURRENCE ON DETERMINATION OF EFFECTS  
CONCERNING ATLANTIC STURGEON AT PILGRIM NUCLEAR POWER  
STATION

Dear Ms. Kurkul:

The U.S. Nuclear Regulatory Commission (NRC, the staff) is writing you to request your concurrence on the U.S. Nuclear Regulatory Commission (NRC)'s determination of effects concerning the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), which was recently listed under the Endangered Species Act of 1973, as amended (ESA), at Pilgrim Nuclear Power Station (Pilgrim).

Pilgrim is located in the Town of Plymouth, Plymouth County, Massachusetts, on the western shore of Cape Cod Bay. In a letter dated January 25, 2006, Entergy Nuclear Operations, Inc. (Entergy) submitted an application to the NRC for a renewed license, which if granted, would allow Entergy to operate Pilgrim for an additional 20 years beyond the current operating license expiration date of June 8, 2012. As part of the NRC staff's environmental review of Entergy's license renewal application, the staff assessed the potential impacts of the proposed license renewal on Federally listed species.

The NRC submitted a biological assessment to your office via letter dated December 8, 2006, to support the staff's review of Entergy's license renewal application. The biological assessment appears in Appendix E of NUREG-1437, Supplement 29, "Generic Environmental Impact Statement for License Renewal Regarding Pilgrim Nuclear Power Station," and it considers the effects of the proposed license renewal on four species of sea turtles, five species of whales, and the shortnose sturgeon (*Acipenser brevirostrum*). In the biological assessment, the staff concluded that the proposed license renewal would have no effect on any of these species, and Entergy has not reported any takes of Federally listed species at Pilgrim since the issuance of the 2006 biological assessment that would call into question these conclusions. The December 8, 2006, letter transmitting the biological assessment summarized the assessment's conclusions and requested your concurrence on the NRC's effect determinations.

On February 6, 2012, the NMFS listed five distinct population segments of the Atlantic sturgeon under the ESA (77 FR 5880; 77 FR 5914). Atlantic sturgeon in the vicinity of Pilgrim are part of the Gulf of Maine distinct population segment, which is listed as threatened. Within Massachusetts, the Atlantic sturgeon occurs in the Merrimack, Taunton, and Connecticut Rivers (NMFS 2007). Subadults and adults are expected to occur in Cape Cod occasionally during migration, but the available literature does not indicate that they are common to the Plymouth

P. Kurkul

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area near Pilgrim. In the enclosed supplement, the NRC concludes that the proposed license renewal of Pilgrim would have **no effect** on the Atlantic sturgeon.

The NRC requests your concurrence on the NRC's determination concerning the Atlantic sturgeon as well as the NRC's 2006 biological assessment per 50 CFR 402.12(j). Please contact Ms. Briana Balsam, biologist, of my staff with any additional information you might need to assess the potential impacts to listed species at Pilgrim. You can reach her at 301-415-1042 or by e-mail at [Briana.Balsam@nrc.gov](mailto:Briana.Balsam@nrc.gov).

I have also forwarded a copy of this letter to Ms. Julie Crocker of your office. Ms. Crocker has been NRC's main point of contact for ESA issues related to the Pilgrim license renewal review.

Sincerely,



Andrew S. Imboden, Chief  
Environmental Review and  
Guidance Update Branch  
Division of License Renewal  
Office of Nuclear Reactor Regulation

Docket No. 50-293

Enclosure:  
As stated

cc w/encl: Listserv

**Biological Assessment  
Supplement**

**Pilgrim Nuclear Power Station  
Proposed License Renewal**

**February 2012**

**Docket Number 50-293**

**U.S. Nuclear Regulatory Commission  
Rockville, Maryland**

Prepared by:

Briana Balsam  
Division of License Renewal  
Office of Nuclear Reactor Regulation

ENCLOSURE

# Supplement to Biological Assessment of the Potential Effects of Pilgrim's Nuclear Power Station's Proposed License Renewal on Federally Listed Species

## Introduction

In December 2006 letter (NRC 2006a), the U.S. Nuclear Regulatory Commission (NRC) forwarded a biological assessment (NRC 2006b) to the National Marine Fisheries Service (NMFS) that the NRC staff prepared pursuant to compliance with the Endangered Species Act of 1973, as amended (ESA). The biological assessment considered the potential effects of the proposed license renewal at Pilgrim Nuclear Power Station (Pilgrim) on Federally listed species. The NRC staff assessed the effects of the proposed license renewal on four species of sea turtles, five species of whales, and the shortnose sturgeon (*Acipenser brevirostrum*) and concluded that the proposed license renewal would have no effect on any listed species.

In February 2012, the NMFS listed five distinct population segments (DPSs) of the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) under the ESA. This supplement to the NRC's 2006 biological assessment assesses the potential effects of the proposed license renewal on the Atlantic sturgeon, Gulf of Maine DPS.

## Life History

The Atlantic sturgeon is an anadromous bony fish that can grow to 14 ft (4.3 m) and weigh up to 800 lbs (370 kg) (Gilbert 1989; NOAA 2012). Atlantic sturgeon are similar in appearance to shortnose sturgeon—bluish-black to olive brown dorsally with pale sides and underbelly—but are larger in size and have a smaller and differently shaped mouth (NOAA 2012). Females reach maturity at 7 to 30 years of age, and males reach maturity at 5 to 24 years of age, with those fish inhabiting the southern range maturing earlier (ASMFC 2007).

Atlantic sturgeon larvae hatch in freshwater, and larvae migrate downstream from freshwater to brackish estuarine environments, where they remain for a few months to a few years (NOAA 2012). Juveniles and non-spawning adults inhabit estuaries and coastal marine waters dominated by gravel and sand substrates (NOAA 2012). Adults return to their natal rivers to spawn.

## Distribution

Historically, the Atlantic sturgeon has inhabited riverine, estuarine, and coastal ocean waters from St. Lawrence River, Canada to St. John's River, Florida (ASMFC 2009). Within the U.S., the species was present in approximately 38 rivers from St. Croix, Maine to Saint John's River, Florida. Currently, the species resides in 36 U.S. rivers and spawns in at least 20 of these rivers (ASSRT 2007). Within Massachusetts, the Atlantic sturgeon occurs in the Merrimack, Taunton, and Connecticut Rivers. No evidence exists of spawning in any of these three rivers (ASSRT 2007).

## Population Status

Atlantic sturgeon have been commercially fished from as early as 1628, though a substantial Atlantic sturgeon fishery did not appear until the late 1800s (Shepard 2006). Overfishing and habitat degradation caused a decline in landings beginning in the early



1900s; however, landings increased from 1950 to 1980, specifically in the Carolinas, and ranged from 45 metric tons per year (mt/yr) to 115 mt/yr (Shepard 2006). In 1998, the Atlantic States Marine Fisheries Commission (ASMFC), which manages the commercial harvest of the species, instituted a moratorium on Atlantic sturgeon harvest in U.S. waters (NOAA 2012). Today, the species is still caught as bycatch. Based on data from 2001 to 2006, the ASMFC (2007) estimated that in U.S. waters, between 2,752 and 7,904 individuals per year are caught as bycatch in sink gillnets, and 2,167 to 7,210 individuals per year are caught as bycatch in trawls.

Information is unavailable on the current estimated population size of the Gulf of Maine DPS or its subpopulations. In the U.S., estimates exist for only the Hudson River, New York (870 spawning adults/year) and the Atlamaha River, Georgia (343 spawning adults/year) (75 FR 61872). These two rivers are considered to have the healthiest subpopulations (ASSRT 2007); therefore, the Gulf of Maine DPS subpopulations are predicted to have fewer spawning adults per year than either of these.

#### ESA Listing History

In 2007, the NMFS considered listing the Atlantic sturgeon under the ESA, but concluded that listing was not warranted at that time. In 2009, the Natural Resources Defense Council (NRDC) petitioned for the NMFS to reconsider the listing of the species (NRDC 2009). The NMFS accepted the NRDC's petition in a 90-Day Finding on January 6, 2010 (75 FR 838). On October 6, 2010, the NMFS published Proposed Listing Determinations for five Atlantic sturgeon DPSs (75 FR 61872; 75 FR 61904). On February 6, 2012, the NMFS listed the five Atlantic sturgeon DPSs under the ESA (77 FR 5880; 77 FR 5914). Atlantic sturgeon in the vicinity of Pilgrim are part of the Gulf of Maine DPS, which is listed as threatened.

#### Determination of Effects

Within Massachusetts, the Atlantic sturgeon occurs in the Merrimack, Taunton, and Connecticut Rivers (ASSRT 2007). Subadults and adults are expected to occur in Cape Cod occasionally during migration, but the available literature does not indicate that they are common to the Plymouth area near Pilgrim.

Per NRC regulations, Entergy must report events or situations related to protection of the environment to the NRC for which notification to other government agencies has been or will be made (10 CFR 50.72(b)(2)(xi)). Incidental takes of Federally listed species would constitute an event that Entergy must report to the NRC per this regulatory requirement. The NRC staff reviewed event reports for Pilgrim and found none that indicated that a take of Atlantic sturgeon has occurred at Pilgrim since it began operating in 1972.

#### Conclusion

Based on the available information on the distribution of Atlantic sturgeon and the absence of any record of incidental takes of the species at Pilgrim since it began operating, the NRC concludes that the proposed license renewal of Pilgrim will have **no effect** on the Atlantic sturgeon.

## References

References that appear with an Agencywide Document Access and Management System (ADAMS) accession number can be accessed through NRC's web-based ADAMS at the following URL: <http://adams.nrc.gov/wba/>.

10 CFR Part 50. *Code of Federal Regulations*, Title 10, *Energy*, Part 50, "Domestic licensing of production and utilization facilities."

75 FR 838. National Oceanic and Atmospheric Administration. "Endangered and Threatened Wildlife; Notice of 90-Day Finding on a Petition to List Atlantic Sturgeon as Threatened or Endangered under the Endangered Species Act (ESA)." *Federal Register* 75(3):838-841. January 6, 2010.

75 FR 61872. National Oceanic and Atmospheric Administration. "Endangered and Threatened and Plants; Proposed Listing Determinations for Three Distinct Population Segments of Atlantic Sturgeon in the Northeast Region." *Federal Register* 75(193):61872-61904. October 6, 2010.

75 FR 61904. National Oceanic and Atmospheric Administration. "Endangered and Threatened Wildlife and Plants; Proposed Listing Determinations for Two Distinct Population Segments of Atlantic Sturgeon in the Southeast Region." *Federal Register* 75(193):61904-61929. October 6, 2010.

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77 FR 5914. National Oceanic and Atmospheric Administration. "Endangered and Threatened Wildlife and Plants; Final Listing Determinations for Two Distinct Population Segments of Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) in the Southeast." *Federal Register* 77(24):5914-5982. February 6, 2012.

[ASMFC] Atlantic States Marine Fisheries Commission. 2007. *Estimation of Atlantic Sturgeon Bycatch in Coastal Atlantic Commercial Fisheries of New England and the Mid-Atlantic*. Special Report to the ASMFC Atlantic Sturgeon Management Board. August 2007. Available at <<http://www.asmfc.org/speciesDocuments/sturgeon/bycatchReportAug07.pdf>> (accessed 14 February 2012).

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[NRC] U.S. Nuclear Regulatory Commission. 2006a. Letter to Colosi PD, Assistant Regional Administrator for Habitat Conservation, NMFS, from Kuo PT, Acting Division Director of License Renewal. Subject: Biological assessment and essential fish habitat assessment for license renewal of Pilgrim Nuclear Power Station. December 8, 2006. ADAMS No. ML063390166.

[NRC] U.S. Nuclear Regulatory Commission. 2006b. *Biological Assessment for License Renewal of Pilgrim Nuclear Power Station*. Appendix E to NUREG-1437, Supplement 29, *Generic Environmental Impact Statement for License Renewal Regarding Pilgrim Nuclear Power Station*. December 2006. 29 p. ADAMS No. ML063260173.

[NRDC] Natural Resources Defense Council. 2009. *Before the Secretary of Commerce, Petition to List Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) as an Endangered Species, or List Specified Atlantic Sturgeon DPSs as Threatened and Endangered Species, and to Designate Critical Habitat*. September 30, 2009. Available at [http://www.nmfs.noaa.gov/pr/pdfs/species/petition\\_atlanticsturgeon\\_nrdc.pdf](http://www.nmfs.noaa.gov/pr/pdfs/species/petition_atlanticsturgeon_nrdc.pdf) (accessed 14 February 2012).

Shepard G. 2006. "Status of Fishery Resources off the Northeastern U.S.: Atlantic and Shortnose Sturgeons." December 2006. Available at [http://www.nefsc.noaa.gov/sos/spsyn/af/sturgeon/archives/42\\_Atlantic\\_ShortnoseSturgeons\\_2006.pdf](http://www.nefsc.noaa.gov/sos/spsyn/af/sturgeon/archives/42_Atlantic_ShortnoseSturgeons_2006.pdf) (accessed 14 February 2012).