



United States Department of the Interior



FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960

October 25, 2011

Laurel Bauer
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Service Federal Activity Code: 41420-2011-CPA-0317
Service Consultation Code: 41420-2011-I-0299
Date Received: September 19, 2011
Project: Extended Power Uprate at Turkey
Point Nuclear Power Plant
County: Miami-Dade

Dear Ms. Bauer:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter dated September 9, 2011, and other information submitted by the U.S. Nuclear Regulatory Commission (NRC) for the project referenced above. This letter is submitted in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*).

PROJECT DESCRIPTION

The NRC is reviewing a proposal from Florida Power and Light (FPL) to amend their operation license for existing nuclear power units 3 and 4 at the Turkey Point Nuclear Power Plant. The license amendment would allow an extended power uprate (*i.e.*, an increase in electrical power production) at the facility. The proposed power uprate would increase the maximum thermal power output at the facility about 15 percent from 2,300 megawatts-thermal (MWt) to 2,644 MWt. If approved, FPL would begin operating at the extended power uprate level in the spring of 2012 for unit 3 and in the fall of 2012 for unit 4, and would continue power production at this level until the expiration dates for the nuclear power units (July 19, 2032, for unit 3 and April 10, 2033 for unit 4). The project would include several modifications to the power plant including: changing pipes, valves, pumps, and heat exchangers; replacing the high pressure turbine and condenser; and upgrading switchyard equipment. All plant modifications are proposed within developed areas of the existing power plant site. However, based on modeling conducted by FPL, the increase in power production may increase the temperature of the water discharged into the 5,900-acre cooling canal system, located immediately west of units 3 and 4, a maximum of 2.0 degrees F (1.1 degrees C). The increased temperature of the discharged water may also increase evaporative water loss and could increase salinity in cooling canal system by about 2 to 3 parts per thousand (ppt). The project site is located at the Turkey Point Power Facility, in Florida City, Miami-Dade County, Florida.

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THREATENED AND ENDANGERED SPECIES

The project site occurs within the geographic range of the threatened American crocodile (*Crocodylus acutus*) and is located within designated critical habitat for this species. Crocodiles are known to occur and nest within the 5,900-acre cooling canal system located immediately west of the Turkey Point Power plant. The cooling canal system is a closed system and does not discharge water to either Biscayne Bay or adjacent freshwater wetlands. The cooling canal system was originally filled with seawater from Biscayne Bay and is now augmented only by rainfall and freshwater pumped periodically from the Interceptor ditch (located along the western boundary of the cooling canal system) during the dry season. Heated water is currently discharged into the discharge canal located at the north end of the cooling canal system from nuclear power production units 3 and 4 and oil burning power production units 1 and 2 located immediately north of the nuclear units. The heated water circulates to the southern end of the cooling canal system, then east and northward back to the Intake Canal for reuse in cooling units 1, 2, 3, and 4.

The Service notes the cooling canal system currently supports a large population of crocodiles because the berms constructed in association with the canal system provide high quality nesting habitat. However, the water in the cooling canal system provides a physically challenging environment for crocodiles. Due to the original use of sea water for cooling purposes, the ongoing deposition of heated water from power production, and the limited influx of freshwater, the water in cooling canal system is hypersaline (45 to 75 ppt). At times during the year, sections of the cooling canal system may exhibit salinities and water temperatures above the known limits of tolerance for the crocodile. Crocodiles respond to high water temperatures by moving into areas of lower temperature within or outside of the cooling canal system. Crocodiles are also able to survive the hypersaline environment by excreting salt through salt glands in their tongue, but require access to freshwater to persist. Sources of freshwater are known to occur at various localities within the cooling canal system (*i.e.*, depressions and specially constructed ponds that collect rainwater runoff located on the canal system's berms), and outside of the cooling canal system within the adjacent interceptor ditch and freshwater marsh.

The Service notes that FPL has projected an increase in temperature of about 2 degrees F, and an increase in salinity of about 2 to 3 ppt, in the cooling canal system. The effect of an increase in water temperature and salinity of this magnitude on the crocodile population within the cooling canal system is unclear. However, an increase in water temperature could conceivably reduce the amount of habitat suitable for crocodiles in the cooling canal system during the warmest part of the year. As discussed, crocodiles within areas of unsuitable water temperatures may relocate to areas of cooling canal system with more favorable temperatures. Because crocodiles are known to maintain well defined social hierarchies based on access to resources such as preferred temperature regimes, animals lower in social hierarchy could be displaced from the cooling canal system. The effect of increased water temperature and salinity could also reduce hatchling survival because hatchlings are more limited in their ability to behaviorally thermoregulate and excrete salt than adult crocodiles. Based on the unknown effects of the proposed power uprate, the NRC has determined the project "may affect, and is likely to adversely affect" the American crocodile, and may result in an adverse modification to critical habitat.

The Service notes that currently, four power production units (oil burning units 1 and 2 and nuclear units 3 and 4) contribute to thermal loading of the cooling canal system. However, FPL has advised the Service they will be significantly curtailing power production at oil burning units 1 and 2 because these units are less efficient and cost effective to operate than the two nuclear units and the natural gas burning power unit at the Turkey Point Site. Units 1 and 2 would likely only be operational as an emergency power source in the event that a mechanical malfunction causes a disruption in power production at unit 3, unit 4, or at the natural gas power unit. As indicated above, the Service notes FPL projected the increase in water temperature and salinity in the cooling canal system of about 2 degrees F and 2 to 3 parts per thousand, respectively. This increase was based on the thermal contributions of four power generating units. However, it appears oil burning units 1 and 2 will no longer be providing heated water to the cooling canal system on a regular basis. Therefore, the Service believes the projected increase in water temperature and salinity due to proposed increase in power production at units 3 and 4 will be less than originally estimated, or the increase may not occur. Consequently, we find the project "may affect, but is not likely to adversely affect" the American crocodile and is unlikely to result in a modification to designated critical habitat. We recommend the NRC change its determination for the project to "may affect, not likely to adversely affect" the American crocodile or its critical habitat. Should the NRC be willing to change its determination, this letter can be used as concurrence of this finding.

Because the effects to crocodiles from the possible slight increase in water temperature and salinity in the cooling canals due to the proposed power uprate are unclear, FPL will increase their crocodile monitoring efforts in the project area. Specifically, FPL will determine growth, survival, abundance, and spatial distribution of crocodiles at the Turkey Point site prior to and following the uprate. Mark/recapture surveys (three capture events per year), and spotlight surveys (conducted every other month) are proposed to ascertain this information. Twenty-six data loggers located throughout the cooling canal system will be used to record water temperature and salinity immediately prior to each survey. To provide a baseline of the crocodile population prior to the uprate, FPL has already completed 2 years of baseline monitoring using the methods described above. An additional 2 years of monitoring are proposed following implementation of the power uprate at the Turkey Point site. FPL will provide a report to the Service detailing the results of monitoring on a semi-annual basis. Should the monitoring reveal measurable, negative effects on the crocodile in this area, it will be considered additional information involving effects on a listed species and NRC (or FPL on their behalf) should contact the Service to reinstate consultation.

As a conservation measure to enhance habitat for crocodiles, FPL has agreed to excavate three new ponds on the existing berms located within the southwestern portion of the cooling canal system. The ponds will collect rain water and provide additional sources of freshwater for crocodiles. Access to freshwater is particularly important to juvenile crocodiles following hatching, and the majority of crocodile nesting at Turkey Point site occurs within this portion of the cooling canal system. The 3 new ponds will enhance the system of 32 freshwater ponds that have previously been installed within and adjacent to the cooling canal system.

This letter fulfills the requirements of section 7 of the Act and further action is not required. If modifications are made to the project, if additional information involving potential effects to listed species becomes available, or if a new species is listed, reinitiation of consultation may be necessary.

Thank you for your cooperation in the effort to protect federally listed species. If you have any questions regarding this project, please contact John Wrublik at 772-469-4282.

Sincerely yours,

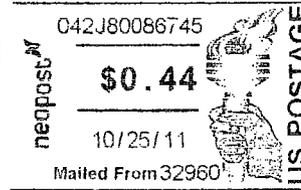
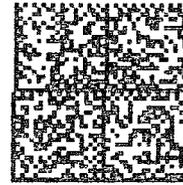
A handwritten signature in black ink that reads "Steve Trayler For". The signature is written in a cursive style.

Larry Williams
Field Supervisor
South Florida Ecological Services Office

cc: electronic only
FWC, Tallahassee, Florida (FWC-CPS)
NOAA Fisheries, West Palm Beach, Florida (Brandon Howard)

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