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**Supplement 11, Second Renewal, to NUREG-1437**

# Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 11, Second Renewal, Regarding Subsequent License Renewal for St. Lucie Plant, Units 1 and 2

Draft Report for Comment

Docket Numbers: 50-335 and 50-389

Issued: DECEMBER 2025

Environmental Center of Expertise

Environmental Center of Expertise
Division of Rulemaking, Environmental, and Financial Support
Office of Nuclear Material Safety and Safeguards

# COMMENTS ON DRAFT REPORT

**Proposed Action** Issuance of subsequent renewed facility operating licenses DPR-67 and NPF-16 for St. Lucie Plant, Units 1 and 2, respectively, in St. Lucie County, Florida

**Type of Statement** Draft Supplemental Environmental Impact Statement

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**Comments:**

Any interested party may submit comments on this draft supplemental environmental impact statement. The public commenting process affords an opportunity for public input on the U.S. Nuclear Regulatory Commission's (NRC's, the Commission's) decision-making, including the NRC's analysis of potential environmental effects. Public commenting allows the NRC to make better informed decisions.

The deadline for submitting comments on this draft supplemental environmental impact statement is 45 days after the date that it is published in the *Federal Register*. Comments received after the expiration of the comment period will be considered if it is practical to do so, but assurance of consideration of late comments cannot be given. The NRC encourages electronic comment submission through the Federal Rulemaking website (https://www.regulations.gov) or via email to SaintLucieEnvironmental@nrc.gov. Please include Docket ID NRC-2021-0197 in your comment submission. The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at https://www.regulations.gov, as well as enter the comment submissions into the NRC's Agencywide Documents Access and Management System (ADAMS). The NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment into ADAMS.

# COVER SHEET

**Responsible Agency**: U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards

**Title**: Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 11, Second Renewal, Regarding Subsequent License Renewal for St. Lucie Plant, Units 1 and 2, Draft Report for Comment

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# ABSTRACT

The U.S. Nuclear Regulatory Commission (NRC, the Commission) prepared this supplemental environmental impact statement in response to an application submitted by Florida Power & Light Company to subsequently renew the renewed facility operating licenses for St. Lucie Plant, Units 1 and 2, for an additional 20 years. This supplemental environmental impact statement, in combination with the Commission's NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*, evaluates the environmental impacts of the proposed action and includes an analysis of any negative environmental impacts of not implementing the proposed action. The NRC staff's preliminary recommendation is that the adverse environmental impacts of subsequent license renewal for St. Lucie Plant, Units 1 and 2, are not so great that preserving the option of subsequent license renewal for energy-planning decision-makers would be unreasonable.

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# EXECUTIVE SUMMARY

By letter dated August 3, 2021, Florida Power & Light Company (FPL) submitted to the U.S. Nuclear Regulatory Commission (NRC, the Commission) an application requesting subsequent renewal of the renewed facility operating licenses for St. Lucie Plant, Units 1 and 2 (St. Lucie) for an additional 20-year period (NRC 2021-TN12261). The current renewed facility operating license for Unit 1 expires at midnight on March 1, 2036, and the current renewed facility operating license for Unit 2 expires at midnight on April 6, 2043. FPL submitted the subsequent license renewal application pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 54 (TN4878), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." The NRC staff found FPL's application acceptable for docketing as announced in the *Federal Register* on September 29, 2021 (86 FR 53986-TN12259).

On October 22, 2021, in accordance with 10 CFR Part 51 (TN10253), "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," the NRC regulation implementing the National Environmental Policy Act of 1969, as amended (TN661), the NRC staff published in the *Federal Register* (86 FR 58701-TN12260) a notice of intent to conduct an environmental scoping process to gather information to prepare an environmental impact statement (EIS) to evaluate environmental impacts related to the proposed subsequent license renewal of St. Lucie. The EIS would be a supplement to the Commission's NUREG-1437, Revision 2, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Final Report* (LR GEIS), dated August 2024 (NRC 2024-TN10161).

The proposed Federal action is the issuance of subsequent renewed facility operating licenses for St. Lucie. The purpose and need for the proposed action is to provide an option that allows for power generation capability beyond the term of the current nuclear power plant operating licenses to meet future system generating needs, as such needs may be determined by authorized Federal (other than the NRC) and State decision-makers, as well as utility stakeholders. For the proposed action, the NRC's decision-making authority is limited to deciding whether or not to issue the subsequent renewed facility operating licenses; therefore, there are no alternatives to the proposed action that meet the purpose and need of the proposed action. However, as part of its required analysis of any negative environmental impacts of not issuing the subsequent renewed facility operating licenses (i.e., the no-action alternative), the NRC staff evaluated the environmental impacts of a reasonable range of replacement energy alternatives/new energy generation to meet the energy demand currently being met by the power generated by St. Lucie, relying, in part, on the discussion in Appendix D of the LR GEIS of alternative energy sources and their environmental impacts to each resource area that would be associated with their construction and operation.

Based on its review presented in Chapter 2, the NRC staff concluded that the environmentally preferred alternative is the proposed action. With respect to the proposed action, the LR GEIS evaluated 80 environmental issues related to nuclear plant operation and classified each issue as either a Category 1 issue (generic to all or a distinct subset of nuclear plants) or a Category 2 issue (specific to individual nuclear plants) (NRC 2024-TN10161). The NRC staff has identified no information that is both new and significant related to Category 1 issues. Thus, the NRC staff relied upon the conclusions of the LR GEIS for all Category 1 issues applicable to St. Lucie subsequent license renewal. Additionally, a summary of the NRC staff's analysis of the Category 2 issues (i.e., plant-specific) applicable to St. Lucie subsequent license renewal is presented in Table 3-2, with more detail presented in Chapter 3. The NRC staff considered mitigation measures for each Category 2 issue, as applicable, and concluded that no additional mitigation measures are warranted.

Based on the above, the NRC staff's preliminary recommendation is that the adverse environmental impacts of subsequent license renewal for St. Lucie are not so great that preserving the option of subsequent license renewal for energy-planning decision-makers would be unreasonable.

# ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| µm | micrometer(s) |
| °C | degree(s) Celsius |
| °F | degree(s) Fahrenheit |
| | |
| ac | acre(s) |
| ACHP | Advisory Council on Historic Preservation |
| ADAMS | Agencywide Documents Access and Management System |
| | |
| BTA | best technology available |
| | |
| CFR | *Code of Federal Regulations* |
| cm | centimeter(s) |
| CWA | Clean Water Act of 1972, as amended |
| | |
| DOE | U.S. Department of Energy |
| DPS | distinct population segment |
| | |
| EAB | exclusion area boundary |
| ECT | Environmental Consulting & Technology, Inc. |
| EFH | essential fish habitat |
| EIS | environmental impact statement |
| EMF | electromagnetic field |
| EPA | U.S. Environmental Protection Agency |
| EPU | extended power uprate |
| ER | environmental report |
| ESA | Endangered Species Act of 1973, as amended |
| | |
| FAC | Florida Administrative Code |
| FDEP | Florida Department of Environmental Protection |
| FDOH | Florida Department of Health |
| FE | federally endangered |
| fps | feet per second |
| FPD | federally proposed designated (critical habitat) |
| FPL | Florida Power & Light Company |
| FPT | proposed for Federal listing as threatened |
| ft | feet/foot |
| FT | federally threatened |
| FWS | U.S. Fish and Wildlife Service |
| | |
| GEIS | generic environmental impact statement |
| GHG | greenhouse gas |
| GPP | groundwater protection program |

| | |
|---|---|
| ha | hectare(s) |
| HAPC | habitat area of particular concern |
| IM&E | impingement mortality and entrainment |
| in. | inch(es) |
| ISFSI | independent spent fuel storage installation |
| kg | kilogram(s) |
| km | kilometer(s) |
| kV | kilovolt(s) |
| L | liter(s) |
| LAA | may affect and is likely to adversely affect |
| LR GEIS | *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NUREG-1437) |
| m | meter(s) |
| mi | mile(s) |
| MGD | million(s) of gallons per day |
| MLD | million(s) of liters per day |
| MMPA | Marine Mammal Protection Act |
| mm | millimeter(s) |
| MSA | Magnuson–Stevens Fishery Conservation and Management Act of 1976, as amended |
| m/s | meter(s) per second |
| MWe | megawatt(s) electric |
| MWt | megawatt(s) thermal |
| NE | no effect |
| NEPA | National Environmental Policy Act of 1969, as amended |
| NGVD | National Geodetic Vertical Datum of 1929 |
| NHPA | National Historic Preservation Act of 1966, as amended |
| NLAA | not likely to adversely affect |
| NMFS | National Marine Fisheries Service |
| NMSA | National Marine Sanctuaries Act |
| NOAA | National Oceanic and Atmospheric Administration |
| NPDES | National Pollutant Discharge Elimination System |
| NRC | U.S. Nuclear Regulatory Commission or the Commission |
| NUREG | NRC technical report designation |
| OMWM | Open Marsh Water Management |
| PBF | physical and biological feature |
| PCE | primary or constituent element |

| | | |
|---|---|---|
| pCi/L | pico curie(s) per liter |
| PNNL | Pacific Northwest National Laboratory |
| POANHI | Process for the Ongoing Assessment of Natural Hazard Information |
| ppb | parts per billion |
| ppt | parts per thousand |
| | |
| RCP | Representative Concentration Pathway |
| REMP | Radiological Environmental Monitoring Program |
| ROW | right-of-way |
| RPM | reasonable and prudent measure |
| | |
| SAFMC | South Atlantic Fishery Management Council |
| SHPO | State Historic Preservation Officer |
| SLR | subsequent license renewal |
| SR | State Road |
| St. Lucie | St. Lucie Plant, Units 1 and 2 |
| | |
| TDS | total dissolved solids |
| | |
| USACE | U.S. Army Corps of Engineers |
| U.S.C. | *United States Code* |
| USGCRP | U.S. Global Change Research Program |

# 1 INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC, the Commission) environmental protection regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51 (TN10253), "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," implement the National Environmental Policy Act of 1969, as amended (NEPA), as amended (TN661). The regulations in 10 CFR Part 51 require, in part, that the NRC staff prepare an environmental impact statement (EIS), which is a supplement to the Commission's NUREG-1437, Revision 2, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Final Report* (LR GEIS), dated August 2024 (NRC 2024-TN10161), for the renewal of a nuclear power plant operating license.

The Atomic Energy Act of 1954 (Atomic Energy Act), as amended (TN663), specifies that licenses for commercial nuclear power reactors can be granted for up to 40 years. The NRC regulations in 10 CFR Part 54 (TN4878), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," allow for an option to renew such licenses for terms of up to an additional 20 years. The initial 40-year licensing period was based on economic and antitrust considerations rather than on technical limitations of the nuclear facility. There are no limitations in the Atomic Energy Act or NRC's regulations restricting the number of times that a license may be renewed.

The decision to seek a subsequent renewed license rests entirely with nuclear power facility owners and, typically, is based on the facility's economic viability and the investment necessary to continue to meet NRC requirements. The NRC makes the decision to grant or deny a subsequent license renewal application based on whether the applicant has demonstrated that NRC requirements can be met during the subsequent license renewal term.

## 1.1 Proposed Federal Action

The proposed Federal action (subsequent renewal of renewed facility operating licenses DPR-67 and NPF-16 for St. Lucie Plant, Units 1 and 2 [St. Lucie], respectively) was initiated by Florida Power & Light Company's (FPL) submittal to the NRC of a subsequent license renewal application on August 3, 2021 (NRC 2021-TN12261). The current renewed facility operating license for Unit 1 expires at midnight on March 1, 2036, and the current renewed facility operating license for Unit 2 expires at midnight on April 6, 2043. The NRC's Federal action is to determine whether to issue subsequent renewed facility operating licenses for St. Lucie for an additional 20 years. If the NRC subsequently renews the renewed facility operating licenses, FPL would be authorized to operate Unit 1 until midnight on March 1, 2056, and Unit 2 until midnight on April 6, 2063.

## 1.2 Purpose and Need for the Proposed Agency Action

The purpose and need for the proposed action (subsequent renewal of renewed facility operating licenses) is to provide an option that allows for power generation capability beyond the term of the current nuclear power plant operating licenses to meet future system generating needs, as such needs may be determined by authorized Federal (other than the NRC) and State decision-makers, as well as utility stakeholders. This definition of purpose and need reflects the Commission's recognition that, absent findings in the safety review required by the Atomic Energy Act or in the environmental review required by NEPA that would lead the NRC to reject a subsequent license renewal application, the NRC has no role in the energy-planning decisions of State regulators and utility officials (NRC 2024-TN10161).

If the subsequent renewed licenses are issued, the power plant owners, State regulators, and, in some cases, other Federal agencies will ultimately decide whether the nuclear power plant will continue to operate based on economics, energy reliability goals, and other factors within their jurisdiction or the owners' purview. If the subsequent renewed licenses are not issued, the nuclear power plant must shut down on or before the expiration dates of the current renewed licenses.

## 1.3 Major Environmental Review Milestones

The NRC has established a subsequent license renewal process that can be completed in a reasonable period of time with clear requirements to ensure safe plant operation for up to an additional 20 years. The NRC staff conducts a safety review in parallel with an environmental review and documents the findings of the safety review in a safety evaluation report and the findings of the environmental review in a supplemental EIS. The safety evaluation report and the EIS are both factors in the NRC's decision to either grant or deny the issuance of subsequent renewed licenses. The safety evaluation report and the EIS schedules for the St. Lucie subsequent license renewal application are provided at the NRC's project website: https://www.nrc.gov/reactors/operating/licensing/renewal/applications/st-lucie-subsequent.html.

By letter dated August 3, 2021 (NRC 2021-TN12261), FPL submitted a subsequent license renewal application to the NRC for St. Lucie, which included an environmental report (ER) (FPL 2021-TN12166). On September 29, 2021, after reviewing the subsequent license renewal application, including the ER, for sufficiency, the NRC staff published a notice of acceptance for docketing and opportunity to request a hearing in the *Federal Register* (86 FR 53986-TN12259). On October 22, 2021, the NRC staff published a notice of intent to conduct an environmental scoping process, which began a 30-day scoping comment period, and to prepare a supplemental EIS (86 FR 58701-TN12260). At the conclusion of the scoping process, the NRC staff issued a scoping summary report (NRC 2022-TN12268). The scoping process is discussed further in Appendix A.

To independently verify the information provided in FPL's ER, the NRC staff conducted an environmental audit from February 28 to March 3, 2022 (NRC 2022-TN12266). During the audit, the NRC staff held meetings with nuclear power plant personnel and reviewed plant-specific documentation and photos. The NRC staff captured the findings from the audit in a summary dated April 25, 2022 (NRC 2022-TN12267). FPL provided responses to the NRC staff's audit requests in a letter dated June 14, 2022 (FPL 2022-TN12263).

On February 24, 2022, the Commission issued three memoranda and orders that addressed the NRC staff's subsequent license renewal environmental review process. In CLI-22-03 (NRC 2022-TN8272), the Commission directed the NRC staff to update NUREG-1437, Revision 1, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Final Report* (the 2013 LR GEIS) (NRC 2013-TN2654), so that it covers the environmental impacts of renewing the operating license of a nuclear power plant for the subsequent license renewal term. The Commission stated that it believed the most efficient way to proceed would be for the NRC staff to update the 2013 LR GEIS and then take appropriate action with respect to pending subsequent license renewal applications, such as the St. Lucie subsequent license renewal application, to ensure that the environmental impacts for the subsequent license renewal term were considered. Alternatively, the Commission allowed subsequent license renewal applicants to submit a revised ER providing additional information about environmental impacts during the subsequent license renewal term, in which they would evaluate, on a site-specific basis, the environmental impacts that were dispositioned in Table B-1 in Appendix B to

Subpart A of 10 CFR Part 51 (TN10253) and the 2013 LR GEIS as Category 1 issues (generic to all or a distinct subset of nuclear power plants).

FPL did not revise the St. Lucie subsequent license renewal application prior to the publication of NUREG-1437, Revision 2, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Final Report,* in August 2024 (the 2024 LR GEIS) (NRC 2024-TN10161). Instead, after the publication of the 2024 LR GEIS, by letter dated February 3, 2025, FPL submitted a supplement to the ER (FPL 2025-TN12167) to (1) update the status of permits, licenses, and authorizations; (2) provide the results of a review of potentially new and significant information since the submittal of the ER; and (3) provide an assessment of applicable new Category 2 issues from the 2024 LR GEIS.

In response to FPL's submission of the supplement to its ER, the NRC staff conducted a second environmental audit during the week of April 22, 2025 (NRC 2025-TN12269). The audit was supplemented by a site visit on May 13, 2025, and additional discussions before a formal exit conducted on May 21, 2025. The NRC staff captured the findings from the second audit in a summary dated June 10, 2025 (NRC 2025-TN12270). FPL provided responses to the NRC staff's audit requests in a letter dated July 8, 2025 (FPL 2025-TN12264).

Upon completion of the scoping period and the environmental audits, the NRC staff compiled its assessments and initial findings in this draft EIS. This draft EIS is made available for public comment for 45 days. Based on the information gathered, the NRC staff will amend the findings of this draft EIS, as necessary, and publish a final EIS. Figure 1-1 shows the major milestones of the NRC's subsequent license renewal application environmental review process.

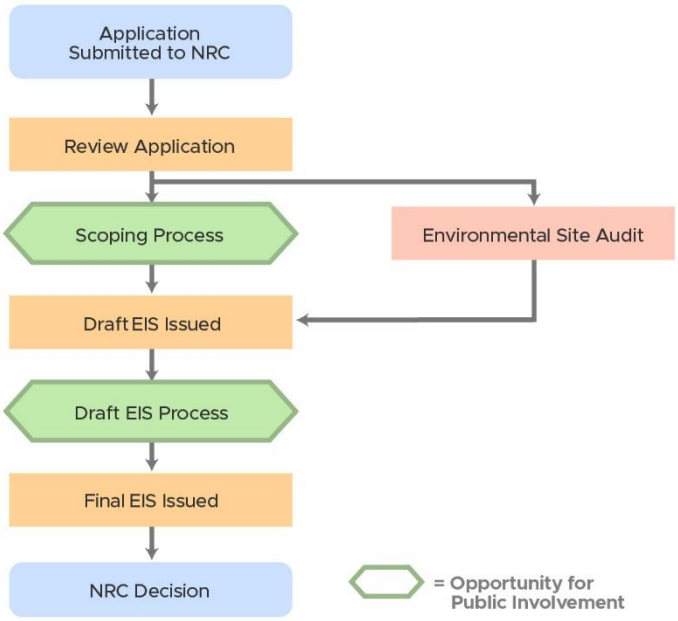



**Figure 1-1 Environmental Review Process for Subsequent License Renewal of Nuclear Power Plants**

## 1.4 Generic Environmental Impact Statement

The 2024 LR GEIS was published in August 2024 (NRC 2024-TN10161). The 2024 LR GEIS (Revision 2) updated the issues and findings of the 2013 LR GEIS (Revision 1) (NRC 2013-TN2654). Lessons learned and knowledge gained from initial license renewal and subsequent license renewal environmental reviews provided an important source of new information for this assessment. In addition, new research, findings, public comments, changes in applicable laws and regulations, and other information were considered in evaluating the environmental impacts associated with license renewal for the 2024 LR GEIS. The purpose of the 2024 LR GEIS was to identify and evaluate environmental issues for license renewal and determine which issues could result in the same or similar impact at all nuclear power plants or a specific subset of plants (i.e., generic or Category 1 issues) and which could result in different levels of impact (i.e., plant-specific or Category 2 issues, or uncategorized). The 2024 LR GEIS also provides descriptions of replacement energy alternatives and their environmental impacts to each resource area that would be associated with their construction and operation.

On August 6, 2024, the NRC published a final rule (89 FR 64166-TN10321) revising its environmental protection regulations in 10 CFR Part 51. Specifically, the final rule updated the potential environmental impacts associated with the renewal of an operating license for a nuclear power plant for up to an additional 20 years, which could either be an initial or a subsequent license renewal. Table B-1 in Appendix B to Subpart A of 10 CFR Part 51, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant" (TN10253), provides a summary of the staff's findings for license renewal environmental issues as evaluated in the 2024 LR GEIS (NRC 2024-TN10161), which provided the technical basis for the final rule. The 2024 LR GEIS and final rule identified 80 environmental issues (i.e., 59 Category 1 issues, 20 Category 2 issues, and 1 issue that remains uncategorized) that may be associated with nuclear power plant operations and refurbishment during an initial or a subsequent license renewal term.

Table B-1 in Appendix B to Subpart A of 10 CFR Part 51 (TN10253) defines three levels of significance for potential impact findings for environmental issues: SMALL, MODERATE, and LARGE, which are defined below.

> **SMALL**: Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. For the purposes of assessing radiological impacts, the Commission has concluded that those impacts that do not exceed permissible levels in the Commission's regulations are considered SMALL.
>
> **MODERATE**: Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
>
> **LARGE**: Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

These levels are used for describing the environmental impacts of the proposed action as well as the environmental impacts of alternatives to the proposed action. Resource-specific effects or impact definitions from applicable environmental laws and executive orders, other than SMALL, MODERATE, and LARGE, are used instead, where appropriate.

Issues are assigned a Category 1 (generic to all or a distinct subset of plants) or a Category 2 (plant-specific) designation. Category 1 issues are those that meet all the following three criteria:

1. The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic.
2. A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for offsite radiological impacts of spent nuclear fuel and high-level waste disposal and offsite radiological impacts—collective impacts from other than the disposal of spent fuel and high-level waste).
3. Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation.

For generic issues (Category 1), an EIS that supplements the LR GEIS (NRC 2024-TN10161) requires no additional plant-specific evaluation unless new and significant information has been identified.

- **New information** can be identified from many sources, including the applicant, the NRC, other agencies, or public comments. If a new issue is revealed, it is first analyzed to determine whether it is within the scope of the license renewal environmental review. If the new issue is in scope, the NRC staff would determine the significance of the issue and document that analysis in the EIS.
- **New and significant information** either identifies an environmental issue that was not covered in the LR GEIS or was not considered in the analysis in the LR GEIS and leads to an impact finding that is different from the finding presented in the LR GEIS.

Plant-specific issues (Category 2) are those that do not meet one or more of the three criteria of Category 1 issues; therefore, an EIS requires plant-specific review for these issues.

Figure 1-2 illustrates the subsequent license renewal environmental review process. The results of the plant-specific review are documented in this EIS.

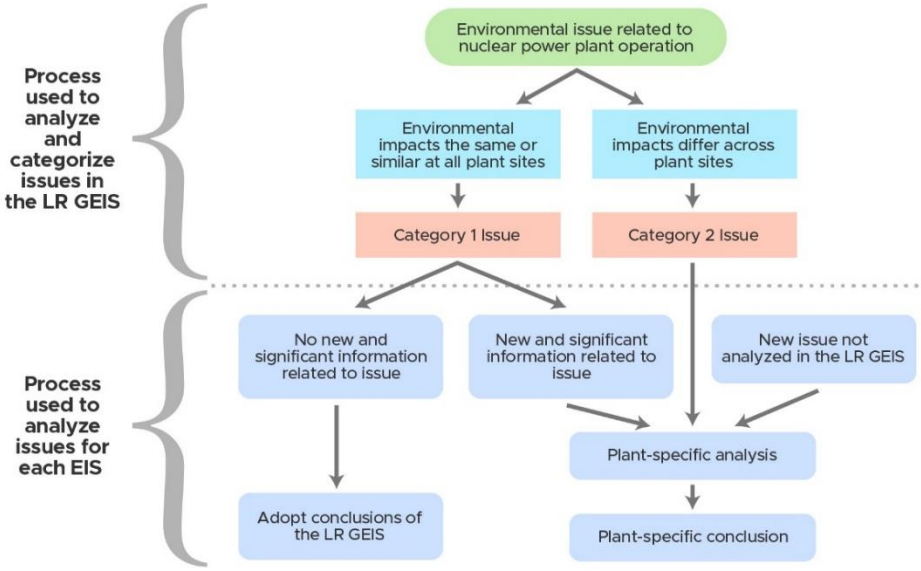



**Figure 1-2 Environmental Issues Evaluated for Subsequent License Renewal of Nuclear Power Plants**

## 1.5 Supplemental Environmental Impact Statement

This EIS supplements the LR GEIS to present an analysis that considers the environmental effects of the continued operation of St. Lucie during the subsequent license renewal term, alternatives to subsequent license renewal, and mitigation measures for minimizing adverse environmental impacts. Chapter 2 describes the St. Lucie site and its operation, the proposed action (subsequent renewal of the St. Lucie renewed licenses), and alternatives to the proposed action. Chapter 3 contains an analysis of the potential environmental impacts from the proposed action. Chapter 4 presents the preliminary recommendation of the NRC staff on whether the adverse environmental impacts of subsequent license renewal for St. Lucie are so great that preserving the option of subsequent license renewal for energy-planning decision-makers would be unreasonable. Details regarding any exemptions implemented by the NRC staff as part of this analysis are presented in Appendix B, "Applicable Laws, Regulations, and Other Requirements."

The NRC staff based its preliminary recommendation on:

- the analysis and findings in the 2024 LR GEIS
- the applicant's ER, as supplemented
- the NRC staff's consultation with Federal, State, and local agencies and Indian Tribes
- the NRC staff's independent environmental review
- the NRC staff's consideration of public comments received during the scoping process

The NRC staff's final recommendation will be made after consideration of public comments received on the draft EIS during the public comment period.

## 1.6 Decision to Be Supported by the Supplemental Environmental Impact Statement

The decision to be supported by this EIS supplementing the LR GEIS is whether to subsequently renew the St. Lucie renewed licenses for an additional 20 years. The regulation in 10 CFR 51.103(a)(5) (TN10253) that specifies the NRC's environmental review decision standard states the following:

> In making a final decision on a license renewal action pursuant to Part 54 of this chapter, the Commission shall determine whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decision-makers would be unreasonable.

There are many factors that the NRC takes into consideration when deciding whether to renew the operating license of a nuclear power plant. The analyses of environmental impacts evaluated in the 2024 LR GEIS, as supplemented by this EIS, will provide the NRC's decision-maker (i.e., the Commission) with important environmental information for consideration in deciding whether to subsequently renew the St. Lucie renewed licenses.

## 1.7 Cooperating Agencies

During the scoping process, the NRC staff did not identify any Federal, State, or local agencies or Indian Tribes as cooperating agencies for this EIS.

## 1.8 Required Consultations

License renewal environmental reviews may require consultation with other Federal, State, regional, and local agencies and Indian Tribes. For license renewal, the NRC staff must consider the effects of its actions on ecological resources protected under Federal statutes, including the Endangered Species Act of 1973, as amended (ESA) (TN1010), and the Magnuson–Stevens Fishery Conservation and Management Act of 1976, as amended (TN9966). Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA) (TN4839), requires Federal agencies to take into account the effects of their undertakings on historic properties. Appendix C presents a list of the agencies and groups with which the NRC staff consulted and a description of the consultations and related correspondence.

## 1.9 Correspondence

Appendix D and Appendix E list correspondence that the NRC staff sent and received with external parties as part of the agency's environmental review of the St. Lucie subsequent license renewal application, excluding the consultation correspondence listed in Appendix C and the public comments discussed in Appendix A.

## 1.10 Status of Compliance

FPL is responsible for complying with all NRC regulations and other applicable Federal, State, and local requirements. Appendix F to the 2024 LR GEIS describes some of the major applicable Federal statutes (NRC 2024-TN10161). Numerous permits and licenses are issued by Federal, State, and local authorities for activities at St. Lucie. Appendix B contains further information about FPL's status of compliance.

# 2 THE PROPOSED FEDERAL ACTION AND THE NO-ACTION ALTERNATIVE

This chapter describes (1) St. Lucie and its operation, (2) the proposed Federal action (subsequent renewal of the St. Lucie renewed licenses), (3) alternatives to the proposed action, (4) the no-action alternative, and (5) the environmental impacts of the proposed action as compared to those of the no-action alternative.

## 2.1 Description of Nuclear Power Plant Facility and Operation

The NRC staff incorporates by reference herein the information in Section 2.2 of FPL's ER, as supplemented (FPL 2021-TN12166, FPL 2025-TN12167). St. Lucie is a steam electric generating facility situated on the east coast of Florida, approximately 7 miles (mi) (11 kilometers [km]) southeast of the city of Fort Pierce, Florida. The plant consists of two nuclear power units designated as St. Lucie, Units 1 and 2.

The St. Lucie reactors are pressurized light-water moderated and cooled systems designed by Combustion Engineering. St. Lucie Units 1 and 2 were originally licensed and operated at 2,560 megawatts thermal (MWt). Commercial operation began on March 1, 1976, for Unit 1 and on April 6, 1983, for Unit 2. Both units' operating licenses were subsequently amended to allow operation at the stretch power limit of 2,700 MWt.

In 2012, an extended power uprate (EPU) increased the reactor core thermal power to 3,020 MWt for each unit. The original steam generators for Units 1 and 2 were removed and replacement steam generators designed and manufactured by B&W (Unit 1) and AREVA (Unit 2) were installed. Each steam and power conversion system, including its turbine generator, is designed to permit generation of a gross electrical output of approximately 1,026 megawatts-electric (MWe) for Unit 1 and 1,045 MWe for Unit 2.

### 2.1.1 External Appearance and Setting

Chapter 3 of FPL's ER (FPL 2021-TN12166) includes a detailed description of the external appearance and setting of the St. Lucie site. This description includes the following areas: reactor and containment systems; maintenance, inspection, and refueling activities; cooling and auxiliary water systems; power transmission systems; radioactive waste management systems; and nonradioactive waste management systems. The prominent structures and housed facilities and equipment associated with each of the units include the containment building, the turbine generator building, the auxiliary building, the fuel-handling building, and the FLEX (diverse and flexible coping strategies) equipment storage building.

Figure 2-1 shows the general features of the facility and the exclusion area boundary (EAB). As established by 10 CFR Part 100 (TN282), FPL has the authority to determine all activities including exclusion or removal of personnel and property from the area within the EAB. As discussed in Section 3.1.2 of FPL's ER, State Road (SR) A1A traverses FPL property and the EAB in a north-south direction east of the plant restricted area. Formal arrangements have been made with the State of Florida to control the traffic and activities of the public on SR A1A and on the State and Federal waters and beach adjacent to the property. Recreational facilities for limited use by FPL employees and their families are located within the site boundary.

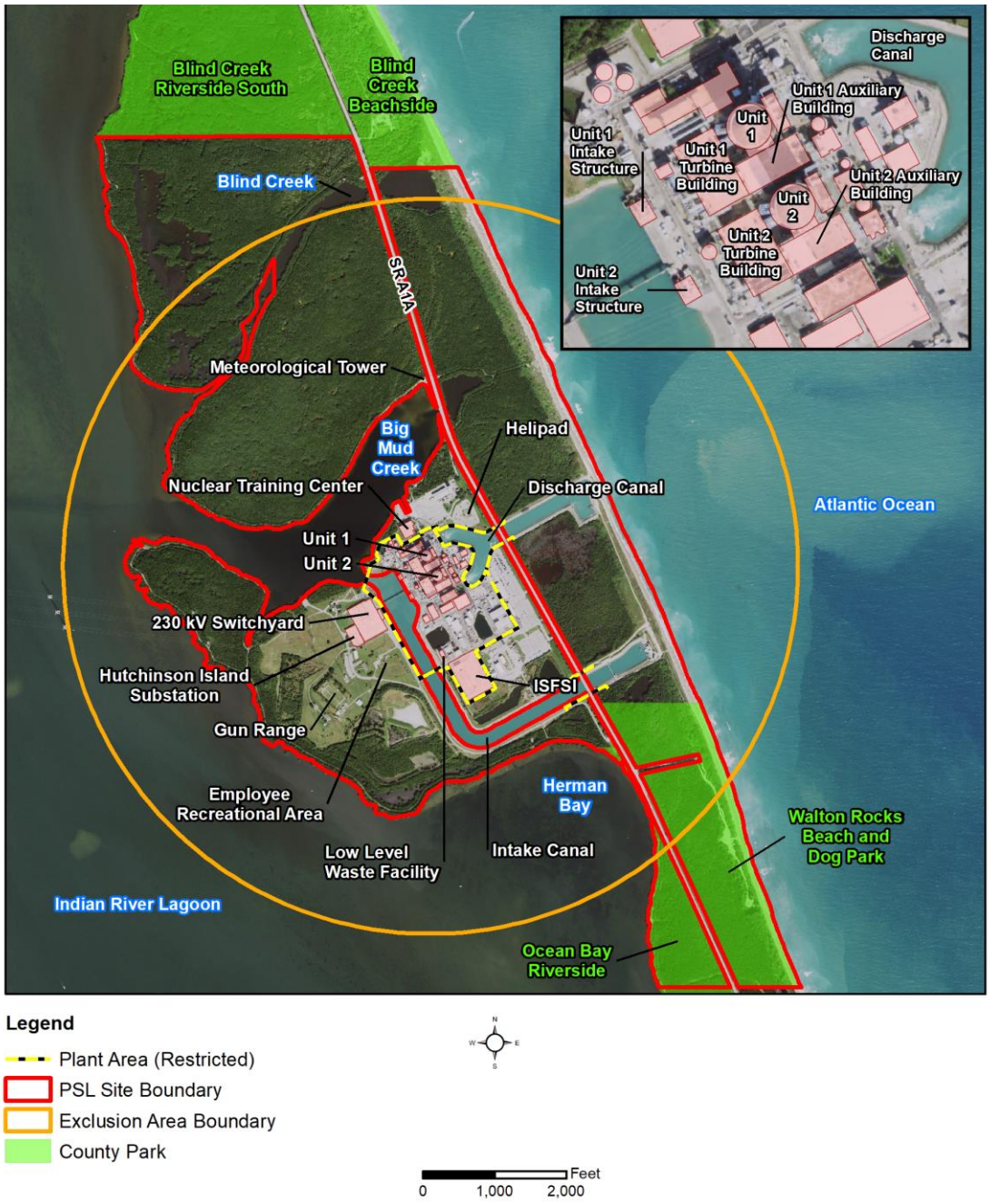



**Figure 2-1 Map Showing St. Lucie Layout. Source: FPL ER Figure 3.1-1 (FPL 2021-TN12166).**

## 2.2 Proposed Federal Action

As stated in Section 1.1, the proposed Federal action is to determine whether to issue subsequent renewed facility operating licenses for St. Lucie for an additional 20 years, which would authorize FPL to operate Unit 1 from March 1, 2036, to March 1, 2056, and Unit 2 from April 6, 2043, to April 6, 2063 (i.e., the subsequent license renewal term). Section 2.2.1 provides a description of normal nuclear power plant operations during the subsequent license renewal term.

### 2.2.1 Nuclear Power Plant Operations during the Subsequent License Renewal Term

Nuclear power plant operations during the subsequent license renewal term would be the same as, or similar to, those occurring during the current renewed license term. Section 2.2 of FPL's ER describes the general types of activities carried out during nuclear power plant operations. FPL's ER states that St. Lucie would continue to operate during the subsequent license renewal term in the same manner as during the current renewed license term except for additional aging management programs, as necessary (FPL 2021-TN12166). Such programs would address structure and component aging in accordance with 10 CFR Part 54 (TN4878), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

### 2.2.2 Refurbishment and Other Activities Associated with License Renewal

Refurbishment activities include replacement and repair of major systems, structures, and components. The major refurbishment class of activities characterized in the LR GEIS (NRC 2024-TN10161) is intended to encompass actions that typically take place only once in the life of a nuclear plant, if at all. Examples of these activities include, but are not limited to, replacement of turbines and pressurized-water reactor steam generators. These actions may have an impact on the environment beyond those that occur during normal power plant operations and may require evaluation, depending on the type of action and the plant-specific design. In preparation for its subsequent license renewal application, FPL performed an evaluation of St. Lucie's systems, structures, and components, in accordance with 10 CFR 54.21 (TN4878), to identify the need to undertake any major refurbishment activities that would be necessary to support the continued operation of St. Lucie during the subsequent license renewal term. As a result of this evaluation, FPL did not identify the need to undertake any major refurbishment or replacement activities associated with subsequent license renewal to support the continued operation of St. Lucie during the subsequent license renewal term. Therefore, such activities are not discussed as part of the analysis of the environmental impacts of the proposed action in Chapter 3.

### 2.2.3 Termination of Nuclear Power Plant Operations and Decommissioning after the Subsequent License Renewal Term

NUREG-0586, Supplement 1, Volumes 1 and 2, *Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities Regarding the Decommissioning of Nuclear Power Reactors: Final Report* (the Decommissioning GEIS) (NRC 2002-TN665), describes the environmental impacts of decommissioning. The majority of plant operational activities would cease with reactor shutdown. However, some activities (e.g., security and oversight of spent nuclear fuel) would remain unchanged, whereas others (e.g., waste management, administrative work, laboratory analysis, surveillance, monitoring, and maintenance) would continue at reduced or altered levels. Systems dedicated to reactor operations would cease operations. However, if these systems are not removed from the site after reactor shutdown, their physical presence may continue to affect the environment. Impacts associated with dedicated systems that remain in place, or with shared systems that continue to operate at normal capacities, could remain unchanged.

Decommissioning will occur whether St. Lucie is shut down at the end of its current renewed licenses or at the end of the subsequent license renewal term 20 years later. The LR GEIS concludes that subsequent license renewal would have a negligible (SMALL) effect on the impacts of terminating operations and decommissioning on all resources and that this is a Category 1 issue generic to all plants (NRC 2024-TN10161).

## 2.3 Alternatives

NEPA Section 102(2)(C)(iii) requires discussion of a reasonable range of alternatives to the proposed action be included in EISs. These discussions should include an analysis of any negative environmental impacts of not implementing the proposed action (i.e., the no-action alternative) that are technically and economically feasible and meet the purpose and need of the proposal. For license renewal, the NRC's decision-making authority is limited to deciding whether or not to issue renewed licenses for nuclear power plants; therefore, there are no alternatives to that proposed action that meet the purpose and need of the proposed action. However, as part of its analysis of the no-action alternative, the NRC staff evaluates the environmental impacts of a reasonable range of replacement energy alternatives/new energy generation. For a replacement energy alternative/new energy generation to be considered reasonable, it must be either (1) commercially viable on a utility scale and operational before the reactor's operating licenses expire or (2) expected to become commercially viable on a utility scale and operational before the reactor's operating licenses expire. Comparing the environmental impacts of issuing the subsequent renewed licenses for St. Lucie to the environmental impacts of the potential consequences of not issuing those licenses (i.e., the environmental impacts of the construction and operation of reasonable replacement energy alternatives/new energy generation under the no-action alternative) helps inform the NRC's determination under 10 CFR 51.103(a)(5) of whether or not the adverse environmental impacts of St. Lucie subsequent license renewal are so great that preserving the option of subsequent license renewal for energy-planning decision-makers would be unreasonable (TN10253). The ultimate decision about which energy alternative(s) to implement, which may include the continued operation of nuclear power plants that are issued renewed licenses, falls to the power plant owners and State, utility, system, and, where authorized, Federal (other than NRC) energy-planning decision-makers.

The no-action alternative and its negative environmental impacts from the shutdown of St. Lucie and from the construction and operation of reasonable replacement energy alternatives/new energy generation are described in Section 2.4. For the discussion therein regarding replacement energy alternatives/new energy generation, the NRC staff relied upon the description of replacement energy alternatives and their environmental impacts to each resource area that would be associated with their construction and operation in Sections 2.3 and 2.4 and Appendix D of the LR GEIS (NRC 2024-TN10161) and Sections 2.6.2 and 7.2.3, and Chapter 8 of FPL's ER (FPL 2021-TN12166). Accordingly, that information is incorporated by reference into this EIS. In this manner, this EIS satisfies NEPA Section 102(2)(C)(iii) and supports its dual mandates to foster both informed decision-making and informed public participation.

## 2.4 No-Action Alternative and New Energy Generation

Under the no-action alternative, the NRC would not subsequently renew the St. Lucie renewed licenses, and the reactor units would shut down on or before the current license expiration dates of March 1, 2036, for Unit 1 and April 6, 2043, for Unit 2.

After termination of reactor operations, nuclear power plant operators would initiate decommissioning in accordance with NRC regulations in 10 CFR 50.82 (TN249), "Termination of License." The NRC's Decommissioning GEIS (NRC 2002-TN665) describes the environmental impacts of decommissioning activities at a nuclear power plant. The analyses and findings in the Decommissioning GEIS bound the environmental impacts of most of the plant-specific decommissioning activities that would likely take place after FPL terminates

reactor operations at St. Lucie. A licensee must also assess in its post-shutdown decommissioning activities report required by the NRC's regulations whether the environmental effects of planned site-specific activities would be bounded by the impacts described in previously issued EISs. Section 2.2.3 describes the incremental environmental effects of subsequent license renewal on decommissioning activities. As part of its analysis of the negative environmental impacts of the no-action alternative, the NRC staff summarizes in Table 2-1 the "Impacts of St. Lucie Shutdown" on each applicable resource area.

Termination of reactor operations also would result in the total cessation of electrical power generation at St. Lucie. Based on the reasonable assumption that there would be a need to generate power to meet future electrical system needs, the no-action alternative (not subsequently renewing the renewed licenses) would necessitate the construction and operations of replacement energy alternatives/new energy generation within the FPL service area to replace the electrical power no longer being generated by St. Lucie. Therefore, as part of its analysis of the negative environmental impacts of the no-action alternative, in addition to the "Impacts of St. Lucie Shutdown," the NRC staff evaluated the impacts of constructing and operating "new energy generating assets" and summarizes those impacts in Table 2-1.

Based on an independent review of the FPL service area, as well as the information in FPL's ER and the LR GEIS, the NRC staff determined which replacement energy alternatives/new energy generation would be reasonable and, therefore, appropriate for consideration under the no-action alternative. The NRC staff concluded that for the no-action alternative to St. Lucie's subsequent license renewal, the reasonable replacement energy alternatives/new energy generation are new nuclear (e.g., constructing large light water reactors or small modular reactors at the already-licensed Turkey Point Nuclear Generating Plant Units 6 and 7), natural gas-fired combined cycle units, or solar installations with battery storage (FPL 2021-TN12166: Section 2.6.2). These technologies were considered to be reasonable based on the following criteria:

- The need to replace the electrical power generation of St. Lucie (approximately 2,000 MWe) beyond the St. Lucie current license renewal term to meet future electrical system needs.
- The need to be fully operational by 2036 when the St. Lucie Unit 1 current renewed licenses expire, taking into consideration the development of the technology, permitting, construction of the facility or facilities, and connection to the grid.
- The need or expectation to be technically feasible and commercially viable on a utility scale.

In reaching its conclusion regarding which replacement energy alternatives/new energy generation were reasonable and in its evaluation of the negative environmental impacts of those technologies, the NRC staff specifically considered the specific attributes of the replacement energy alternatives/new energy generation as described in Sections 2.3 and 2.4 and Appendix D of the LR GEIS (NRC 2024-TN10161).

## 2.5 Comparison of the Environmental Impacts of the Proposed Federal Action and the No-Action Alternative

Based on the analysis and findings in the LR GEIS; FPL's ER, as supplemented; its consultation with Federal, State, and local agencies and Indian Tribes; its independent environmental review; and its consideration of public comments, the NRC staff determined the environmental impacts of the proposed Federal action, as described in Chapter 3, and the environmental impacts of the no-action alternative, which consist of the impacts of St. Lucie shutdown and the impacts

of reasonable new energy generating assets, on each applicable resource area. For the environmental impacts of the no-action alternative, the NRC staff specifically relied on Sections 2.3 and 2.4 and Appendix D of the LR GEIS (NRC 2024-TN10161) and Sections 2.6.2 and 7.2.3, and Chapter 8, of FPL's ER (FPL 2021-TN12166), incorporated by reference herein.

The NRC staff assigned to each resource area an envionmental impact significance level of SMALL, MODERATE, or LARGE, as defined in this EIS and in the NRC's regulations, or, as applicable, the appropriate resource-specific effects or impact definitions from environmental laws and executive orders. The results of the NRC staff's analysis of the environmental impacts of the proposed action and the no-action alternative, including the impacts from new energy generation from alternatives deemed reasonable associated with the no-action alternative, are summarized in Table 2-1 and are presented so that they may be compared. This comparison supports both informed decision-making and informed public participation. Descriptions of the resource areas can be found in the LR GEIS (NRC 2024-TN10161).

If the NRC does not subsequently renew St. Lucie's renewed operating licenses (i.e., the no-action alternative), energy-planning decision-makers would have to choose replacement energy alternatives/new energy generation similar to the ones evaluated in this supplemental EIS. Replacement energy alternatives/new energy generation have the potential to have greater environmental impacts in any number of the applicable resource areas. Based on its review of the proposed action and the no-action alternative, the NRC staff concludes that the environmentally preferred alternative is the proposed action.

**Table 2-1 Comparison of Environmental Impacts of the Proposed Federal Action and the No-Action Alternative at the St. Lucie Plant**

| Resource Area | Proposed Federal Action | No-Action Alternative (Impacts of St. Lucie Shutdown) | No-Action Alternative (Impacts of New Energy Generation) |
|---|---|---|---|
| Land Use | SMALL | SMALL. Onsite land use would remain similar to that during operations. Plant structures and other facilities would remain in place until decommissioning. Transmission lines and ROWs would remain in place after the cessation of reactor operations. | SMALL to LARGE, depending on the location and type of new energy generation. New transmission line and pipeline construction also could have potential land use impacts; use of existing infrastructure would minimize these impacts during construction. |
| Visual Resources | SMALL | SMALL. Termination of reactor operations if the licenses are not renewed would not immediately change the visual appearance of the St. Lucie site. The most visible structures would likely remain in place for some time during decommissioning until they are eventually dismantled. | SMALL to LARGE, depending on the location and type of new energy generation. |
| Air Quality | SMALL | SMALL. Permanent cessation of St. Lucie operations would reduce overall air emissions (e.g., the SMALL air emissions from boiler, diesel generators, and vehicle traffic would be reduced). | SMALL to LARGE. Construction of new energy generating facilities would result in temporary air quality impacts. Additionally, depending on the type of new energy generation (i.e., fossil fuel, nuclear, renewable), air emissions from operations can be significant. New natural gas-fired combined cycle units would result in substantial new pollutant emissions. Operations of new nuclear or solar with storage would have minimal emissions. |
| Noise | SMALL | SMALL. Permanent cessation of St. Lucie operations would result in a reduction in the otherwise SMALL noise impacts associated with emergency diesel generators and from vehicle traffic (e.g., workers, deliveries). As site activities are reduced, the impact on ambient noise levels from the plant are expected to be lower than those from current plant operations. | SMALL to MODERATE. Noise associated with new energy generation would occur during construction. Depending on the distance between the facility site and transmission line corridor to noise-sensitive receptors, noise may occur at noticeable levels during construction. During operations of new natural gas-fired combined cycle units, noise from pipeline blowdowns could constitute a new noise source. Depending on the distance of noise-sensitive receptors to the pipeline corridor, noise from pipeline blowdowns may be noticeable. Noise from operations of new nuclear or solar with storage would likely be SMALL but would depend on the distance between the facility site and transmission line corridor to noise-sensitive receptors. |

| Resource Area | Proposed Federal Action | No-Action Alternative (Impacts of St. Lucie Shutdown) | No-Action Alternative (Impacts of New Energy Generation) |
|---|---|---|---|
| Geologic Environment | SMALL | SMALL. There would be few or no incremental impacts on site geology and soils associated with the shutdown of St. Lucie. In this case, before beginning decommissioning activities, little or no new ground disturbance would occur at the plant site while operational activities are being reduced and eventually terminated. | SMALL to MODERATE. Ground disturbance would occur during construction of new energy generating facilities, regardless of whether the new facility is sited on a brownfield or greenfield site and regardless of the type of facility. Depending on the location of the facilities, impacts to prime or important farmlands could occur. |
| Water Resources | SMALL | SMALL. Water withdrawals would greatly decrease and eventually cease. Stormwater would continue to be discharged from the site, but wastewater discharges would be reduced considerably. | SMALL to LARGE. Impacts would occur associated with the construction of all types of new energy generating facilities. Operations of new nuclear or natural gas-fired combined cycle facilities could have cooling water requirements similar to those of the existing St. Lucie plant and impacts would vary depending on the location of the facilities, whereas operations of solar with storage facilities would have SMALL impacts. Use of existing infrastructure would minimize construction impacts. |
| Terrestrial Resources | SMALL | SMALL. Much of the operational noise and human activity at St. Lucie would cease, thereby reducing the already SMALL disturbances to wildlife in forest cover and other natural vegetation on and near the site. Reducing human activity and frequency of operational noise may constitute minor beneficial effects on wildlife inhabiting nearby natural habitats. | SMALL to MODERATE. Impacts would depend on the location and footprint of the new energy generating facility and would be minimized through the use of best management practices and adherence to applicable regulations. Construction impacts would be further minimized through the use of existing infrastructure. |
| Aquatic Resources | SMALL | SMALL. Some withdrawal of water would continue during the shutdown period to provide cooling to spent fuel in the spent fuel pool until that fuel could be transferred to dry storage. The amount of water withdrawn for these purposes would be a small fraction of water withdrawals during operations (which are already SMALL), would decrease over time, and would likely end within the first few years following shutdown. The reduced demand for cooling water would substantially decrease the effects of impingement, entrainment, and thermal effluent on aquatic organisms, and these effects would entirely cease following the transfer of spent fuel to dry storage. | SMALL to MODERATE. Impacts would depend on the location and footprint of the new energy generating facility and would be minimized through the use of best management practices and adherence to applicable regulations. Construction impacts would be further minimized through the use of existing infrastructure. |

| Resource Area | Proposed Federal Action | No-Action Alternative (Impacts of St. Lucie Shutdown) | No-Action Alternative (Impacts of New Energy Generation) |
|---|---|---|---|
| Federally Protected Ecological Resources | Varies by specific protected species and habitat; see Note[a] | Impacts on federally protected ecological resources would depend on the specific shutdown activities, the action area of those activities, and whether any listed species or critical habitats are present in that area when the no-action alternative is implemented. | Impacts on federally protected ecological resources would depend on various factors including site selection, current land uses, planned construction activities, temporary and permanent structure locations and parameters, the timeline of the new energy generating facility, and the federally protected ecological resources present in the action area. Consultation with appropriate agencies would be conducted and would minimize impacts. Additionally, the requirements for consultation under the ESA, MSA, and NMSA would depend on whether Federal permits or authorizations are required to implement each new energy generating facility. |
| Historic and Cultural Resources | No adverse effect on historic properties | No effect on historic properties or historic and cultural resources. Shutdown activities would not impact such properties or resources. | No effect to No adverse effect on historic properties or historic and cultural resources. Impacts would depend on the presence of historic properties or historic and cultural resources on sites selected for new energy generating facilities and would likely be less for brownfield sites. Compliance with best management practices and Section 106 of the NHPA, as applicable, would minimize these impacts. |
| Socioeconomics | SMALL | SMALL to LARGE. The loss of jobs, income, and tax revenue would have an immediate, noticeable socioeconomic impact. As jobs are eliminated, some, but not all, workers could leave. Income from the buying and selling of goods and services needed to maintain the nuclear power plant also would be reduced. In addition, loss of tax revenue could affect the availability of public services. If workers and their families move away, increased vacancies and reduced demand for housing would likely cause property values to fall. | SMALL to MODERATE. Construction and operations of new energy generating facilities would depend on the location, type, and size of the facilities and could result in added services jobs, as well as indirect impacts on taxes, housing, land use, and public services in the area surrounding the facility. |

| Resource Area | Proposed Federal Action | No-Action Alternative (Impacts of St. Lucie Shutdown) | No-Action Alternative (Impacts of New Energy Generation) |
|---|---|---|---|
| Human Health | SMALL and UNCERTAIN[(b)] | SMALL. Human health risks following nuclear power plant shutdown would be smaller than the SMALL risks during operations. The reactor units, which currently operate within regulatory limits, would emit less radioactive gaseous, liquid, and solid material to the environment. In addition, following shutdown, the variety of potential accidents at the nuclear power plant (radiological or industrial) would be reduced to a limited set associated with shutdown events and fuel handling and storage. | SMALL and UNCERTAIN. Construction and operations of new energy generating facilities could result in human health impacts. However, those impacts would be mitigated by adherence to best management practices, safety standards, and applicable regulations. Given the regulatory oversight exercised by Federal and State agencies, the NRC staff concludes that the human health impacts from construction and operations of the new energy generating facilities would be SMALL, except for “chronic effects of electromagnetic fields (EMFs),” for which the impacts are UNCERTAIN. Human health impacts are discussed in Section D.4.8 of the LR GEIS (NRC 2024-TN10161). |
| Waste Management | SMALL[(c)] | SMALL to MODERATE. Continued at-reactor storage of spent fuel would generate much less low-level, mixed, and nonradioactive waste than an operating facility. Any replacement of the ISFSI, repackaging of spent fuel canisters, and construction, operation, and replacement of dry transfer system would generate a small fraction of the low-level waste generated during reactor decommissioning. The quantity of mixed waste generated from storage would be a small fraction of that generated during the licensed life of the reactor. Although large amounts of nonradioactive waste would be generated by any replacement of dry cask storage facilities, it would still be less than the waste generated during reactor decommissioning and would not likely have a noticeable impact on local or regional landfill capacity and operations. It is expected that sufficient low-level waste disposal capacity would be made available when needed. A relatively small quantity of mixed waste would be generated from storage, and proper management and disposal regulations would be followed. The amount of nonradioactive waste that would be generated and impacts to nonradioactive waste landfill capacity are difficult to accurately estimate for the storage timeframe. | SMALL. The amount and types of waste generated would depend on the size and type of the new energy generating facility. Impacts would be minimized by adherence to best management practices and proper onsite management and offsite disposal management. |

| Resource Area | Proposed Federal Action | No-Action Alternative (Impacts of St. Lucie Shutdown) | No-Action Alternative (Impacts of New Energy Generation) |
|---|---|---|---|
| Greenhouse Gas Emissions | SMALL | SMALL. Shutdown of St. Lucie would result in a reduction to the otherwise SMALL GHG emissions from operations of the facility. | SMALL to MODERATE[(d)]. GHG emissions would occur associated with the construction of all types of new energy generating facilities. Operations of new nuclear or solar with storage facilities could have GHG emissions similar to those of the existing St. Lucie plant, whereas operations of natural gas-fired combined cycle facilities would have significantly more GHG emissions. |

EMF = electromagnetic field; ESA = Endangered Species Act of 1973, as amended; GHG = greenhouse gas; ISFSI = independent spent fuel storage installation LR GEIS = *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*, Final Report; MSA = Magnuson–Stevens Fishery Conservation and Management Act of 1976, as amended; NMSA = National Marine Sanctuaries Act; NRC = U.S. Nuclear Regulatory Commission; ROW = right-of-way; SLR = subsequent license renewal; SMR = small modular reactor.

(a) For a full listing of effect determinations for ecological resources protected under the Endangered Species Act of 1973, as amended, Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended, essential fish habitat effect determinations, and National Marine Sanctuaries Act, see Table 3-3, Table 3-5, Table 3-6, and Section 3.5.4.

(b) The chronic effects of electromagnetic fields on human health associated with operating nuclear power and other electricity generating plants are uncertain as discussed in Section 3.7.3.

(c) NUREG-2157, *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel* (NRC 2014-TN4117), discusses the environmental impacts of spent fuel storage beyond reactor operations.

(d) Consideration of GHG emissions is presented in Table 8.0-3 of FPL's ER (FPL 2021-TN12166).

# 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

## 3.1 Introduction

As outlined in Sections 1.4 and 1.5, this EIS documents the NRC staff's evaluation of the reasonably foreseeable environmental impacts of the proposed Federal action of determining whether to issue subsequent renewed facility operating licenses for St. Lucie for an additional 20 years. This environmental review is based on the analysis and findings in the LR GEIS; the applicant's subsequent license renewal application (NRC 2021-TN12261), as supplemented; the NRC staff's consultation with Federal, State, and local agencies and Indian Tribes; the NRC staff's independent environmental review; and the NRC staff's consideration of public comments. This EIS is a supplement to the LR GEIS (NRC 2024-TN10161), which identifies 80 issues (divided into 59 Category 1 [generic to all or a distinct subset of plants] issues, 20 Category 2 [nuclear plant-specific] issues, and 1 uncategorized issue) to be evaluated, as applicable, for the license renewal of nuclear plants. Those issues applicable to St. Lucie subsequent license renewal are discussed below, either generically or on a site-specific basis, as appropriate, and, based on that discussion, assigned an envionmental impact significance level of SMALL, MODERATE, or LARGE, as defined in this EIS and in the NRC's regulations, or, as applicable, the appropriate resource-specific effects or impact definitions from environmental laws and executive orders.

### 3.1.1 Category 1 Issues

As explained in Section 1.4, for applicable Category 1 (generic to all or a distinct subset of plants) issues, the NRC staff relies on the analysis presented in the LR GEIS (NRC 2024-TN10161), unless new and significant information has been identified.

With respect to the proposed action, the NRC staff conducted an independent review consistent with NUREG-1555, Supplement 1, Revision 2, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Operating License Renewal* (NRC 2024-TN10251), for identifying new and significant information, which included, but was not limited to, the following:

- review of the applicant's ER (FPL 2021-TN12166) and ER supplement (FPL 2025-TN12167) and the process described therein for discovering and evaluating the significance of new information
- audits with the applicant
- review of public comments
- review of environmental quality standards and regulations
- coordination with Federal, State, and local environmental protection and resource agencies and Indian Tribes
- review of technical literature

As a result of this review, the NRC staff did not identify any new and significant information for applicable Category 1 issues. Therefore, the NRC staff concluded that no additional plant-specific evaluation was required for these issues. These issues, the related sections of the LR GEIS, and the impact findings are provided in Table 3-1. Consistent with its regulations, the NRC staff adopts the conclusions of the LR GEIS for these issues in this EIS.

**Table 3-1 Applicable Category 1 (Generic) Issues for St. Lucie Plant**

| Environmental Category – Issue | LR GEIS Section | Impact Finding |
|---|---|---|
| **Land Use** – Onsite land use | 4.2.1.1.1 | SMALL |
| **Land Use** – Offsite land use | 4.2.1.1.2 | SMALL |
| **Visual Resources** – Aesthetic impacts | 4.2.1.2.1 | SMALL |
| **Air Quality** – Air quality impacts | 4.3.1.1.1 | SMALL |
| **Air Quality** – Air quality effects of transmission lines | 4.3.1.1.2 | SMALL |
| **Noise** – Noise impacts | 4.3.1.2.1 | SMALL |
| **Geologic Environment** – Geology and soils | 4.4.1.1 | SMALL |
| **Surface Water Resources** – Surface water use and quality (non-cooling system impacts) | 4.5.1.1.1 | SMALL |
| **Surface Water Resources** – Altered current patterns at intake and discharge structures | 4.5.1.1.2 | SMALL |
| **Surface Water Resources** – Scouring caused by discharged cooling water | 4.5.1.1.5 | SMALL |
| **Surface Water Resources** – Discharge of metals in cooling system effluent | 4.5.1.1.6 | SMALL |
| **Surface Water Resources** – Discharge of biocides, sanitary wastes, and minor chemical spills | 4.5.1.1.7 | SMALL |
| **Surface Water Resources** – Surface water use conflicts (plants with once-through cooling systems) | 4.5.1.1.8 | SMALL |
| **Surface Water Resources** – Effects of dredging on surface water quality | 4.5.1.1.10 | SMALL |
| **Surface Water Resources** – Temperature effects on sediment transport capacity | 4.5.1.1.11 | SMALL |
| **Groundwater Resources –** Groundwater contamination and use (non-cooling system impacts) | 4.5.1.2.1 | SMALL |
| **Groundwater Resources –** Groundwater use conflicts (plants that withdraw less than 100 gallons per minute) | 4.5.1.2.2 | SMALL |
| **Terrestrial Resources** – Exposure of terrestrial organisms to radionuclides | 4.6.1.1.2 | SMALL |
| **Terrestrial Resources** – Cooling system impacts on terrestrial resources (plants with once-through cooling systems or cooling ponds) | 4.6.1.1.4 | SMALL |
| **Terrestrial Resources** – Bird collisions with plant structures and transmission lines | 4.6.1.1.5 | SMALL |
| **Terrestrial Resources** – Transmission line right-of-way (ROW) management impacts on terrestrial resources | 4.6.1.1.7 | SMALL |
| **Terrestrial Resources** – Electromagnetic fields effects on terrestrial plants and animals | 4.6.1.1.8 | SMALL |
| **Aquatic Resources** – Entrainment of phytoplankton and zooplankton | 4.6.1.2.3 | SMALL |

| Environmental Category – Issue | LR GEIS Section | Impact Finding |
|---|---|---|
| **Aquatic Resources** – Infrequently reported effects of thermal effluents | 4.6.1.2.6 | SMALL |
| **Aquatic Resources** – Effects of nonradiological contaminants on aquatic organisms | 4.6.1.2.7 | SMALL |
| **Aquatic Resources** – Exposure of aquatic organisms to radionuclides | 4.6.1.2.8 | SMALL |
| **Aquatic Resources** – Effects of dredging on aquatic resources | 4.6.1.2.9 | SMALL |
| **Aquatic Resources** – Non-cooling system impacts on aquatic resources | 4.6.1.2.11 | SMALL |
| **Aquatic Resources** – Impacts of transmission line right-of-way (ROW) management on aquatic resources | 4.6.1.2.12 | SMALL |
| **Socioeconomics** – Employment and income, recreation and tourism | 4.8.1.1 | SMALL |
| **Socioeconomics** – Tax revenue | 4.8.1.2 | SMALL |
| **Socioeconomics** – Community services and education | 4.8.1.3 | SMALL |
| **Socioeconomics** – Population and housing | 4.8.1.4 | SMALL |
| **Socioeconomics** – Transportation | 4.8.1.5 | SMALL |
| **Human Health** – Radiation exposures to plant workers | 4.9.1.1.1 | SMALL |
| **Human Health** – Radiation exposures to the public | 4.9.1.1.1 | SMALL |
| **Human Health** – Chemical hazards | 4.9.1.1.2 | SMALL |
| **Human Health** – Microbiological hazards to plant workers | 4.9.1.1.3 | SMALL |
| **Human Health** – Physical occupational hazards | 4.9.4.1.5 | SMALL |
| **Postulated Accidents** – Design-basis accidents | 4.9.1.2.1 | SMALL |
| **Postulated Accidents** – Severe accidents | 4.9.1.2.1 | SMALL |
| **Waste Management** – Low-level waste storage and disposal | 4.11.1.1 | SMALL |
| **Waste Management** – Onsite storage of spent nuclear fuel | 4.11.1.2 | SMALL |
| **Waste Management** – Offsite radiological impacts of spent nuclear fuel and high-level waste disposal | 4.11.1.3 | (a) |
| **Waste Management** – Mixed-waste storage and disposal | 4.11.1.4 | SMALL |
| **Waste Management** – Nonradioactive waste storage and disposal | 4.11.1.5 | SMALL |
| **Greenhouse Gas Emissions and Climate Change** – Greenhouse gas impacts on climate change | 4.12.1 | SMALL |
| **Uranium Fuel Cycle** – Offsite radiological impacts—individual impacts from other than the disposal of spent fuel and high-level waste | 4.14.1.5 | SMALL |
| **Uranium Fuel Cycle** – Offsite radiological impacts—collective impacts from other than the disposal of spent fuel and high-level waste | 4.14.1.5 | (b) |
| **Uranium Fuel Cycle** – Nonradiological impacts of the uranium fuel cycle | 4.14.1.5 | SMALL |
| **Uranium Fuel Cycle** – Transportation | 4.14.1.5 | SMALL |

| Environmental Category – Issue | LR GEIS Section | Impact Finding |
|---|---|---|
| **Termination of Nuclear Power Plant Operations and Decommissioning** – Termination of plant operations and decommissioning | 4.14.2.1 | SMALL |

LR GEIS = NUREG-1437, Revision 2, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*.

(a) The ultimate disposal of spent fuel in a potential future geologic repository is a separate and independent licensing action that is outside the regulatory scope of this review. Per 10 CFR Part 51 (TN10253), Subpart A, the Commission concludes that the impacts presented in NUREG-2157 (NRC 2014-TN4117) would not be sufficiently large to require the National Environmental Policy Act conclusion, for any plant, that the option of extended operation under 10 CFR Part 54 (TN4878) should be eliminated. Accordingly, while the Commission has not assigned a single level of significance for the impacts of spent fuel and high-level waste disposal, this issue is considered Category 1.

(b) There are no regulatory limits applicable to collective doses to the general public from fuel-cycle facilities. The practice of estimating health effects on the basis of collective doses may not be meaningful. All fuel-cycle facilities are designed and operated to meet the applicable regulatory limits and standards. Per 10 CFR Part 51 (TN10253), Subpart A, the Commission concludes that the collective impacts are acceptable in that these impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR Part 54 should be eliminated.

Sources: Table B-1 in Appendix B to Subpart A of 10 CFR Part 51-TN10253; NRC 2024-TN10161.

### 3.1.2 Category 2 Issues

For applicable Category 2 (plant-specific) issues, which are not bound or generically dispositioned by the LR GEIS and require a plant- or site-specific review, the applicant's ER must contain analyses of the environmental impacts of the proposed action, including the impacts of refurbishment activities, if any, associated with license renewal and the impacts of operation during the renewal term in accordance with 10 CFR 51.53(c) (TN10253). In turn, the NRC staff's supplemental EIS must contain an analysis of those Category 2 issues. Ultimately, the NRC staff's recommendation regarding the environmental acceptability of a license renewal action must be made by integrating the conclusions in the LR GEIS for applicable Category 1 issues, considering any new and significant information, as discussed above, with the information developed for applicable Category 2 issues. This ensures both informed decision-making and informed public participation.

With respect to the proposed action, the NRC staff evaluated the environmental impacts associated with the applicable Category 2 issues on the affected environment, which is the environment that currently exists at and around the St. Lucie site. Because this environment is at least partially the result of past construction and nuclear power plant operations, the NRC staff's analyses considered the nature and impacts of past and ongoing actions and how, together, these actions shaped the current environment. Where appropriate, the NRC staff also considered reasonably foreseeable actions or projects and relevant ongoing environmental trends. The NRC staff's description of the affected environment and independent evaluation of the environmental consequences to that affected environment associated with applicable Category 2 issues are in Sections 3.2 through 3.8 and summarized in Table 3-2. NUREG-1555, Supplement 1, Revision 2 (NRC 2024-TN10251) describes in detail the NRC staff's analysis approach for Category 2 issues.

The NRC staff also considered whether any environmental issues exist for St. Lucie subsequent license renewal that are not identified in the LR GEIS. The NRC staff determined that the environmental issue of the Marine Mammal Protection Act (MMPA) applies in this instance despite not being identified in the LR GEIS. Therefore, the NRC staff considers that issue in Section 3.5.5.

**Table 3-2 Applicable Category 2 (Plant-Specific) Issues for St. Lucie Plant**

| Environmental Category – Issue | LR GEIS Section | Impact Finding[(a)] |
|---|---|---|
| **Groundwater Resources** – Radionuclides released to groundwater | 4.5.1.2.7 | SMALL |
| **Terrestrial Resources** – Non-cooling system impacts on terrestrial resources | 4.6.1.1.1 | SMALL |
| **Aquatic Resources** – Impingement mortality and entrainment of aquatic organisms (plants with once-through cooling systems or cooling ponds) | 4.6.1.2.1 | SMALL |
| **Aquatic Resources** – Effects of thermal effluents on aquatic organisms (plants with once-through cooling systems or cooling ponds) | 4.6.1.2.4 | SMALL |
| **Federally Protected Ecological Resources** – Endangered Species Act: federally listed species and critical habitats under U.S. Fish and Wildlife Service jurisdiction | 4.6.1.3.1 | See Section 3.5.1 of this EIS |
| **Federally Protected Ecological Resources** – Endangered Species Act: federally listed species and critical habitats under National Marine Fisheries Service jurisdiction | 4.6.1.3.2 | See Section 3.5.2 of this EIS |
| **Federally Protected Ecological Resources** – Magnuson–Stevens Act: essential fish habitat | 4.6.1.3.3 | See Section 3.5.3 of this EIS |
| **Federally Protected Ecological Resources** – National Marine Sanctuaries Act: sanctuary resources | 4.6.1.3.4 | See Section 3.5.4 of this EIS |
| **Historic and Cultural Resources** – Historic and cultural resources | 4.7.1 | See Section 3.6 of this EIS |
| **Human Health** – Microbiological hazards to the public | 4.9.1.1.3 | SMALL |
| **Human Health** – Electromagnetic fields (EMFs)[(b)] | 4.9.1.1.4 | Uncategorized (Uncertain Impact) |
| **Human Health** – Electric shock hazards | 4.9.1.1.5 | SMALL |
| **Greenhouse Gas Emissions and Climate Change** – Climate change impacts on environmental resources | 4.12.2 | See Section 3.8 of this EIS |

LR GEIS = NUREG-1437, Revision 2, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*; EIS = environmental impact statement.

(a) Impact determinations for Category 2 issues based on findings described in Sections 3.2 through 3.8, as applicable, for the proposed action.

(b) This issue was not designated as Category 1 or Category 2 and is discussed in Section 3.7.3.

Sources: Table B-1 in Appendix B to Subpart A of 10 CFR Part 51 (TN10253); NRC 2024-TN10161.

## 3.2 Groundwater Resources

### 3.2.1 Affected Environment

The NRC staff reviewed Sections 3.5 and 3.6 of FPL's ER (FPL 2021-TN12166) and Chapter 2.5 of the St. Lucie Updated Final Safety Analysis Report (NRC 2025-TN12333) and evaluated other information related to the hydrogeology of the St. Lucie site and groundwater resources during the environmental site audit, the scoping process, and review of other available information as cited in this EIS.

*Site Geology*

The St. Lucie site is located within the Florida section of the Coastal Plain physiographic province on Hutchinson Island, a coastal lowland barrier island characterized by relatively flat relief and marshy terrain. Hutchinson Island was likely formed as a bar during a period of higher sea level. The St. Lucie site is bounded by the Atlantic Ocean to the east and Indian River Lagoon to the west. Surface elevations on Hutchinson Island are less than 20 feet (ft) (6 meters [m]) National Geodetic Vertical Datum of 1929 (NGVD).

The natural surficial sediments at the St. Lucie site, Holocene-age quartz sands, were removed during construction. All excavations were within the Anastasia Formation, a Pleistocene-age interbedded mixture of sand, silt, clay, shells, and limestone that is present to depths of about −145 feet (ft) (−44 m) NGVD. Excavations extended to about −62 ft (−19 m) NGVD with sediments replaced by compacted Class I fill in the power block area and compacted Class II fill outside of the power block area. Class I fill is clean sand and gravel with a maximum of 12 percent fines (particle size <0.08 millimeter [mm]), and Class II fill is silty or clayey sand and gravel with a maximum of 40 percent fines (NRC 2025-TN12333). The fill materials were sourced from sediments that were excavated and dredged from the Anastasia Formation (NRC 2025-TN12333). Underlying the Anastasia Formation is a thin sequence of shells and marls (the Tamiami Formation) and about 550 ft (168 m) of partially cemented and indurated sands, clays, and sandy limestones of the Miocene-age Hawthorne Formation. The low permeability Hawthorne Formation acts as an upper confining unit of the Floridan aquifer system, a sequence of primarily carbonate (limestone and dolomite) Tertiary-age rocks that are about 3,000 ft (910 m) thick at the St. Lucie site (USGS 1990-TN6648).

Depths of building foundations are about −27 ft (−8 m) NGVD for the reactor containment buildings and −20 to −7 ft (−6 to −2 m) NGVD for the reactor auxiliary buildings (FPL 2025-TN12264). A sheet pile retaining wall structure along the intake canal at the intake structure extends to −63 ft (−19 m) NGVD. Bottom elevations of the intake and discharge canals are about −30 ft (−9 m) NGVD and −10 ft (−3 m) NGVD, respectively (FPL 2025-TN12264). The sides of the intake canal are unlined or lined with permeable filter fabric bags to −13 ft (−4 m) NGVD. The discharge canal is lined with concrete by the apron, with stone on the straight portion of the banks, and with grout-filled fabric near the headwall. The concrete liner of the discharge canal contains two 2-inch (in.) (5-centimeter [cm]) diameter pipes per 12 ft (3.7 m) panel. Four onsite evaporation/percolation ponds used to manage stormwater discharge and discharge from certain plant systems are unlined. Figure 3-1 is a geologic cross section oriented northeast to southwest through the St. Lucie site that illustrates the occurrence of the fill materials, building excavations depths, and depths of the intake canal and one of the onsite ponds.

*Local and Regional Groundwater Resources*

The surficial aquifer in the St. Lucie region is about 150 ft (46 m) thick and occurs mainly in the Anastasia Formation. This aquifer is a primary water source on the mainland but is not a source of potable water on Hutchinson Island due to salinity. The saltwater interface in the surficial aquifer generally occurs along the east coast of the mainland. Recharge to the surficial aquifer is primarily from precipitation. Groundwater in the surficial aquifer generally flows toward the ocean with discharge to local streams and lakes and to the ocean.

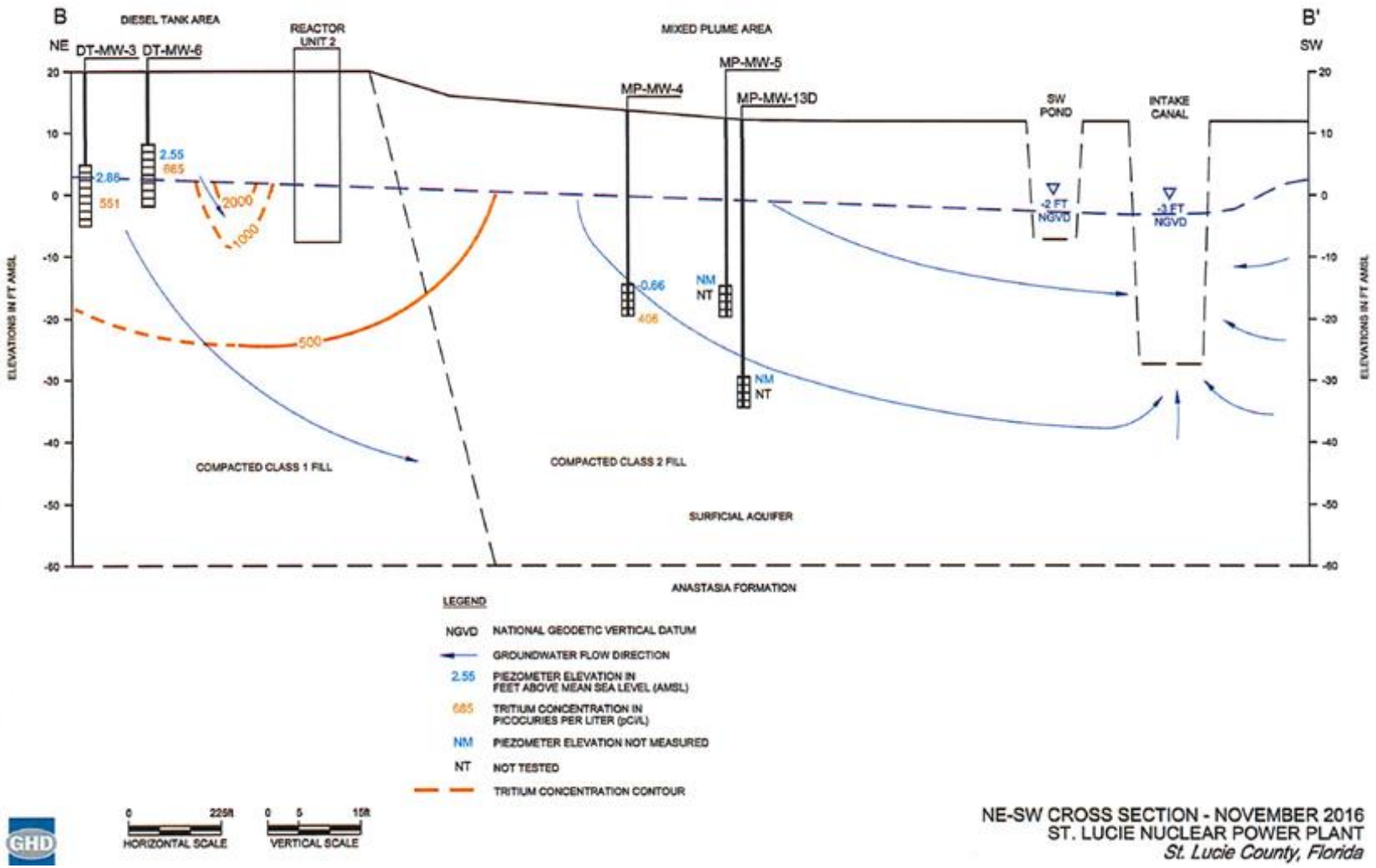


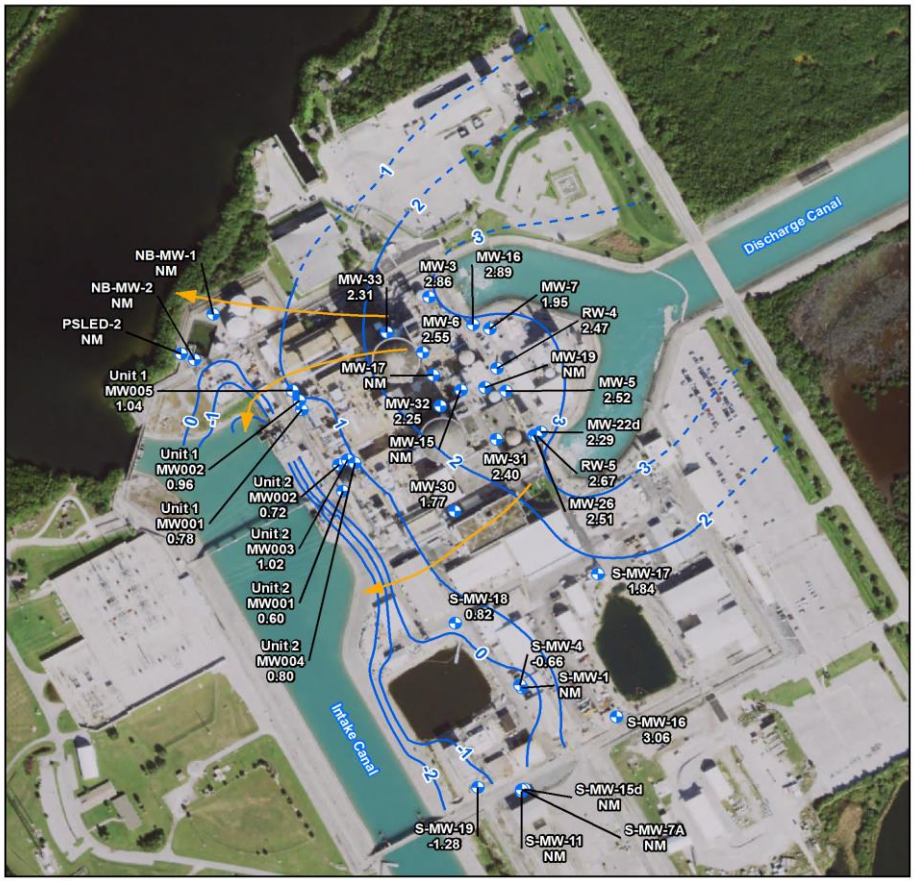

**Figure 3-1 Northeast to Southwest Geologic Cross Section through the St. Lucie Plant Site. Source: FPL 2025-TN12264, FPL 2024-TN12334 (For Transect Location).**

At the St. Lucie site, the surficial aquifer occurs in the fill materials and the Anastasia Formation, and is nominally at an elevation of 2 to 3 ft (0.6 to 0.9 m) NGVD (FPL 2021-TN12166). Groundwater flow paths at the site are influenced by the relative water surface elevations of Indian River Lagoon, the ocean, and the plant-related water bodies. Water surface elevations of the plant-related water bodies vary in response to operations, but average values from observations in 2007 and 2022 were 8.5 ft (2.6 m) NGVD for the discharge canal, −3.4 ft (−1 m) NGVD for the intake canal, 4.8 ft (1.5 m) NGVD for the East Basin, and 4.2 ft (1.3 m) NGVD for the West Basin (FPL 2025-TN12264). These elevations indicate that the discharge canal and basins are typically sources of discharge to the local groundwater, while the groundwater flows locally into the intake canal. The degree of water exchange between the discharge canal and the surrounding groundwater is likely limited where the canal is lined by concrete (due to the limited area of perforation by pipes) and grout-filled fabric. Plant structures that extend below the surficial aquifer surface, including the sheet pile retaining wall, will also affect groundwater flow paths locally. Surficial aquifer groundwater at the site ultimately discharges to the intake canal, the Big Mud Creek north of the plant, or the ocean.

The Floridan aquifer system is used as a source of water in the St. Lucie region and throughout Florida. In the St. Lucie region, the aquifer system is confined by the Hawthorne Formation and consists of the Upper and Lower Floridan aquifers, which are separated by a middle confining unit. The principal recharge area for the Floridan aquifer system is in Polk County, in the central part of the State northwest of St. Lucie, where the Hawthorne Formation is absent or thin. Floridan aquifer groundwater in the St. Lucie region flows toward the ocean. The dominant form of discharge is to springs where the aquifer is confined (USGS 1990-TN6648). No natural springs occur in St. Lucie County or in the surrounding counties (FPL 2021-TN12166). At the St. Lucie site, hydraulic head in the Upper Floridan Aquifer is higher than in the surficial aquifer (FPL 2021-TN12166; USGS 1990-TN6648), indicating that groundwater impacted by the plant does not have the potential to affect the Floridan aquifer system. St. Lucie is not located on or adjacent to a designated sole source aquifer or a recharge source zone for a sole source aquifer (EPA 2020-TN6709).

Information about St. Lucie site groundwater conditions is obtained from a network of 42 onsite wells and 10 boundary wells installed in the surficial aquifer. Locations of the wells are shown in Figure 3-2. The majority of wells with known screen depths are screened near the top of the surficial aquifer (i.e., near the water table), but some wells are screened at greater depths. Plant grade at St. Lucie is about 19 ft (5.8 m) NGVD. During November 2016, groundwater elevations for the onsite wells ranged from less than 1 ft (0.3 m) NGVD near the intake canal and from 2 to 3 ft (0.6 to 0.9 m) NGVD elsewhere (FPL 2021-TN12166). Boundary wells are monitored by the State; no water level data from these wells was reviewed. Based on water levels in onsite wells, the average horizontal hydraulic gradient across the protected area is about 0.003 (about 1.5 ft [0.5 m] over 500 ft [150 m]). Vertical gradients based on water levels in onsite wells during 2007 were reported to vary from 0.007 downward to 0.002 upward (FPL 2021-TN12166). Tests conducted in onsite wells provided saturated hydraulic conductivity estimates of 4.0 ft/day ($1.4 \times 10^{-3}$ cm/s) for the Class I fill and 0.89 ft/day ($1.3 \times 10^{-4}$ cm/s) for the Class II fill (FPL 2025-TN12264).

Groundwater velocities and transport pathways in the area of the plant are difficult to estimate due to the variable subsurface materials, site infrastructure, and limited data. In addition, transport in groundwater is affected by water level variations in the intake and discharge canals and the tides. Based on groundwater conditions described in FPL's ER (FPL 2021-TN12166) and provided to the NRC staff during the 2025 audit (FPL 2025-TN12264), as summarized in this section, the general direction of groundwater flow in the protected area of St. Lucie is



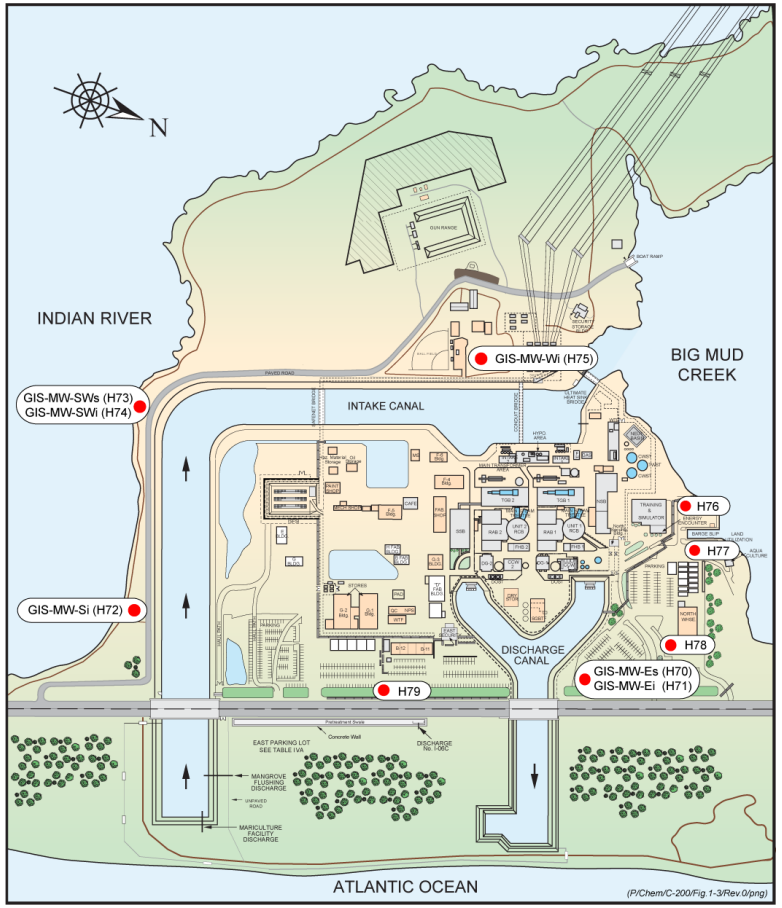




**Figure 3-2 Onsite Wells (left) and Boundary Wells (right) at St. Lucie Plant Site. Source: FPL 2021-TN12166; NRC 2025-TN12336.**

toward, and discharging into, the intake canal. Groundwater in the northern part of the protected area may discharge to Big Mud Creek. Using the estimated hydraulic conductivity and assuming a porosity value of 0.25 for the fill materials, the NRC staff estimated a horizontal groundwater velocity of about 0.05 ft/day (0.15 m/day) in the Class I fill and about 0.01 ft/day (0.003 m/day) in the Class II fill. The NRC staff expects that downward vertical groundwater flow would not be significant due to the controlling influence of the canals and the surrounding water bodies.

*Groundwater Use and Quality*

The surficial and Floridan aquifers are the principal sources of water in St. Lucie, Indian River, and Martin Counties for public, domestic, and industrial uses. Groundwater is a significant fraction of water use for irrigation in the three counties (Dieter et al. 2018-TN6681). Groundwater use in 2015 was provided in FPL's ER (FPL 2021-TN12166: Table 3.6-5) and is incorporated herein by reference. Approximately two-thirds of public supply groundwater withdrawals in the three counties were saline (Dieter et al. 2018-TN6681). All public supply withdrawals in 2015 were from groundwater sources. St. Lucie uses about 131,500 gal/day (597,800 L/day) of groundwater for potable water and plant service needs, which is supplied by the City of Fort Pierce and the Fort Pierce Utilities (FPL 2021-TN12166). No other groundwater is used for plant purposes. Groundwater on Hutchinson Island is not a source of drinking water due to its salinity. No registered water wells are located within 2 mi (3.2 km) of St. Lucie (FPL 2021-TN12166).

Groundwater quality in the St. Lucie region is generally good as evidenced by its prevalent use for public supply and domestic needs. The typical water quality concern is elevated total dissolved solids (TDS) concentration (USGS 1990-TN6648). Florida designates groundwater into four classes for the application of water quality standards, based primarily on TDS (Fla. Admin. Code 62-520-TN1252). Groundwater in the vicinity of St. Lucie is Class G-III (FPL 2021-TN12166), designated for non-potable use, which is groundwater in an unconfined aquifer with a TDS concentration of 10,000 milligrams per liter (mg/L) or greater (an approximate salinity of 10 parts per thousand [ppt] or greater). Salinity measured in 2007 in onsite wells varied from 0.4 to 2.5 ppt at depths less than 23 ft (7 m) below land surface (estimated elevation above −10 ft [−3 m]) and was 24.4 to 30.6 ppt at estimated elevation below −18.4 ft (−5.6 m) (FPL 2025-TN12264). Water quality criteria for Class G-III groundwater restrict discharges that result in harmful effects, create a nuisance, or impair the use of adjacent waters (Florida Administrative Code [FAC] 62-520-400).

*Groundwater Protection Program and Tritium in Groundwater*

FPL adopted procedures in 2010 to implement the Industry Groundwater Protection Initiative (NEI 2019-TN6775). A review of the site conceptual model was most recently completed in 2022 to satisfy requirements of the Industry Groundwater Protection Initiative (FPL 2025-TN12264). The St. Lucie Groundwater Protection Program (GPP) currently includes monitoring of 42 onsite wells for environmental conditions, groundwater elevation, and to detect inadvertent releases of radionuclides (FPL 2021-TN12166). Monitoring wells are sampled annually, quarterly, or more frequently for tritium with results reported in the Annual Radiological Effluent Release Reports and publicly available from the NRC (NRC 2024-TN12338). Notification of spills, leaks, or discovery of contamination are made to the NRC and other outside agencies when they meet specified criteria. Ten boundary wells are monitored quarterly for tritium and gamma emitters by the Florida Department of Health as part of the Radiological Environmental Monitoring Program and in support of the GPP. Results are reported in the Annual Radiological Environmental Operating Reports and publicly available from the NRC (e.g., NRC 2024-TN12338).

FPL identified seven reportable or otherwise significant radionuclide release events that occurred from 2007 to 2012 (FPL 2025-TN12264). These events mostly involved tritium-contaminated water entering catch basins. One event involved contaminated water discharged to the south settling basin and one event in which soil at the south basin was found to contain Cs-137. No significant radiological events were reported from 2013 to 2025. Tritium levels discharged during normal operations are below 20,000 picocuries per liter (pCi/L), and tritium in onsite groundwater wells has been detected at levels up to 19,600 pCi/L since at least 2015 (FPL 2021-TN12166; NRC 2024-TN12338). Tritium in groundwater has consistently exceeded 1,000 pCi/L in samples from onsite wells MW-6 and MW-17 from 2019 to 2024 and in well MW-18d from 2019 to 2022. Tritium exceeded 10,000 pCi/L in well MW-6 from 2019 to 2021 and in 2024 with the maximum level of 19,600 pCi/L observed in May 2024. Wells MW-6, MW-17, and MW-18d are located east of the reactor buildings, with well MW-18d screened at elevation −24 ft (−7 m) and the other two wells screen at a shallow depth (FPL 2024-TN12334, FPL 2021-TN12166). Tritium has been detected at low levels in two boundary wells from 2019 to 2024 and was above the detection limit at only well H71 in 2024 with a maximum value of 530 pCi/L (FPL 2025-TN12264).

### 3.2.2 Environmental Consequences: Radionuclides Released to Groundwater

Section 4.5.1.2.7 of the LR GEIS (NRC 2024-TN10161) provides background information for the Groundwater Resources – Radionuclides released to groundwater Category 2 issue, which is incorporated herein by reference. This issue was included in the LR GEIS because of the accidental releases of liquids containing radioactive material into the groundwater at many nuclear power reactor sites (NRC 2024-TN11047). The LR GEIS determined that impacts on groundwater quality from the release of radionuclides (e.g., tritium) could be SMALL or MODERATE depending on the magnitude of the leak, the radionuclides involved, hydrogeologic factors, the distance to receptors, and the response time of plant personnel to identify and stop the leak.

The issue of radionuclides released to groundwater was discussed in Section 5.1 of FPL's ER supplement (FPL 2025-TN12167). FPL monitors groundwater at St. Lucie as part of its GPP, which is implemented to conform with Nuclear Energy Institute 07-07 (NEI 2019-TN6775) and satisfy the requirements of 10 CFR 20.1501 (TN283). Section 3.6.4.2 of FPL's ER (FPL 2021-TN12166) describes the historic detection of tritium in the surficial aquifer at monitoring wells located west of the reactor buildings (the turbine lube oil area), southeast of west pond (the mixed plume area), and east of the reactor buildings (the diesel tanks area). Tritium in groundwater is attributed to historic releases near the reactor containment buildings (FPL 2025-TN12167). The historic maximum tritium activity was 161,000 pCi/L in 2000 (NRC 2024-TN11047). Based on information provided in FPL's ER, as supplemented (FPL 2021-TN12166, FPL 2025-TN12167), the annual radiological effluent release and environmental operating reports, and information reviewed by the NRC staff during the environmental site audits, tritium in St. Lucie groundwater from 2019 to 2024 has been below detection limits in most wells and has been consistently above 1,000 pCi/L during this period in only three wells east of the reactor containment buildings. Tritium levels from 2019 to 2024 have been the highest in well MW-6 but do not appear to show any consistent trend over this period. The average tritium activity in well MW-6 was about 8,400 pCi/L in 2024, with a maximum of 19,600 pCi/L in May 2024.

Based on the information reviewed, the NRC staff determined that elevated tritium levels occur in groundwater beneath the St. Lucie protected area. Tritium activity from 2019 to 2024 was consistently above 1,000 pCi/L east of the reactor containment buildings but did not exceed the drinking water standard (20,000 pCi/L) or the reporting limit (30,000 pCi/L). The only boundary

well sampled as part of the GPP that has consistently had tritium levels above the detection limit (about 200 pCi/L) is located east of the St. Lucie Unit 1 arm of the discharge canal. Average tritium activity in this perimeter well (H71) was about 500 pCi/L from 2019 to 2024, based on data reported in the Annual Radiological Environmental Operating Reports (NRC 2024-TN11680) and by FPL (FPL 2025-TN12264), and does not exhibit any significant trend.

Groundwater impacted by St. Lucie is limited to the surficial aquifer due to the hydraulic control of surrounding water bodies and the plant intake and discharge canals. The surficial aquifer is not used as a drinking water source on Hutchinson Island due to its salinity. Groundwater conditions reviewed by the NRC staff indicate that shallow groundwater at the site mostly discharges into the onsite canals with some discharge likely occurring to Big Mud Creek and the ocean. Available data show that tritium has been detected near the plant buildings but has not been transported to the site boundary at significant levels (i.e., the average activity is about 500 pCi/L at a single boundary well). Offsite users of groundwater would not be affected by any accidental releases of radionuclides to groundwater because the contamination would be largely entrained in the plant's intake canal and ultimately discharged to the ocean. The existing monitoring wells are likely to provide detection of any releases and the small groundwater velocities allow time for an adequate response. Based on the above, the NRC staff concludes that the groundwater resources impacts due to the release of radionuclides to groundwater would be SMALL during the St. Lucie subsequent license renewal term.

## 3.3 Terrestrial Resources

### 3.3.1 Affected Environment

The St. Lucie terrestrial and wetland environment is described in the supplemental EIS for the initial license renewal (NRC 2003-TN3152: Section 2.2.6) and in the applicant's ER (FPL 2021-TN12166: Section 3.7.2). Those descriptions are incorporated herein by reference. In addition, there are several changes to the affected environment not included in the previous EIS or the ER. Specifically, in 2022, FPL removed the West Test Facility and Quality Control Building, though the concrete pad remains for possible siting of a future building; in 2025, FPL completed a second switchyard; and FPL coordinates dune renourishment after hurricanes based on severity of erosion, with the last dune renourishment completed in 2023 (FPL 2025-TN12264).

### 3.3.2 Environmental Consequences: Non-Cooling System Impacts on Terrestrial Resources

Section 4.6.1.1.1 of the LR GEIS (NRC 2024-TN10161) provides background information for the Category 2 issue of non-cooling system impacts on terrestrial resources, which is incorporated herein by reference.

According to the LR GEIS (NRC 2024-TN10161), non-cooling system impacts on terrestrial resources can include impacts that result from site and landscape maintenance activities, stormwater management, elevated noise levels, and other ongoing operations and maintenance activities that would occur during the subsequent license renewal term on and near a plant site. The NRC staff based its analysis in this section on information derived from FPL's ER, as supplemented (FPL 2021-TN12166, FPL 2025-TN12167), unless otherwise cited. FPL has not identified any refurbishment activities during the proposed subsequent license renewal term (FPL 2021-TN12166). Therefore, no further analysis of potential impacts from refurbishment activities is necessary. In addition, FPL stated in its ER that it has not yet determined if there will be a need to expand the independent spent fuel storage installation at St. Lucie. However, if the

independent spent fuel storage installation were to be expanded, that would likely be done on already disturbed land (FPL 2021-TN12166).

A number of State-endangered or threatened terrestrial species can occur on or near the St. Lucie site and can be impacted by non-cooling system impacts such as stormwater management and ongoing operations and maintenance activities. These include 10 bird species, 2 reptile species, and 23 plant species (see Appendix C). Of the bird species, the least tern, the American Oystercatcher, the black skimmer, the little blue heron, the roseate spoonbill, the southeastern American kestrel, and the tricolored heron have been observed on the St. Lucie site. Of these State-endangered species, the least tern (*Sternula antillarum*) has been impacted by St. Lucie stormwater management practices and would likely continue to experience these impacts during the subsequent license renewal term.

The least tern is a Florida State-designated threatened species (FFWCC 2022-TN12424). Terns are seabirds and the least tern is the smallest tern in North America. They are colony nesters (nesting in large groups). As such, entire colonies have been wiped out by human activity such as development or trampling, predation by pets such as dogs and cats, as well as natural predators including foxes or raccoons. In Florida, they have lost extensive nesting habitat due to beach development and catastrophic storms. Due to habitat loss, least terns have adapted by nesting on flat roofs.

Least terns are found at open beaches along the St. Lucie site. They also nest on open sand and pebble areas and on building rooftops. In two incidents in 1991 and 1998, stormwater washed a total of 17 juvenile least terns from their nests on the Units 1 and 2 Training Center. The loss of the least terns occurred because of failure of the protective netting system covering the stormwater system. This was reported to the U.S. Fish and Wildlife Service (FWS) and the stormwater system was modified (FPL 2021-TN12166).

Since the 2021 ER (FPL 2021-TN12166) was submitted to the NRC, least terns have established more colonies on St. Lucie rooftops. The St. Lucie C1 and C2 building rooftops have become the site of the largest and most productive least tern nesting colony in St. Lucie County. A survey conducted in 2024 by Inwater Research Group, Inc. (Inwater Research) found one least tern colony on the C1 and C2 rooftops with approximately 42 nests. Two incidents occurred where downy chicks fell from the roof, but both were returned to the roof by FPL staff. Inwater Research recommended covers be placed over water drainage pipes and chick fencing be placed around the buildings to contain chicks (FPL 2025-TN12264). The NRC expects that over the subsequent license renewal term, least terns will continue to nest on St. Lucie rooftops and require protective netting, covers, or other tools to protect chicks and juvenile birds from falling from rooftops or being swept away by stormwater drains.

American oystercatchers (*Haematopus palliatus*) and black skimmers (*Rynchops niger*) have been observed nesting along the intake shoreline. FPL currently has no ground-disturbing activities planned for the shorelines near the intake. However, FPL would complete nesting surveys for these two species in the event of any ground-disturbing activities (FPL 2021-TN12166).

The NRC staff appropriately assumes that FPL would continue to comply with applicable requirements of Federal and State regulatory programs during the subsequent license renewal term. FPL has procedures and policies relating to the handling and management of migratory birds. FPL holds a Federal Migratory Bird Special Purpose Utility permit (MB697722-0), which involves the tracking and uploading of data for the handling of any injured or deceased bird

found within the site as well as nest relocation if necessary. Injured birds are taken to rehab facilities, if feasible. FPL submits a yearly report to FWS to comply with Federal regulations (FPL 2021-TN12166).

In its ER, FPL states that ongoing operational and maintenance activities during the subsequent license renewal term, such as maintenance and repair of plant infrastructure (roadways, piping installation, fencing, other security infrastructure) would likely be confined to previously disturbed areas such as paved areas, areas of mowed grass, or early successional vegetation (FPL 2021-TN12166). The NRC staff expects that any physical disturbance would not encroach into wetlands. As such, the NRC staff agrees with FPL that the anticipated activities would have only minimal effects on terrestrial resources.

Operational noise from St. Lucie facilities extends into the remaining natural areas on the site. However, these areas have been exposed to similar operational noise levels since St. Lucie began operations. Therefore, the NRC staff expects that wildlife in the affected habitats has long ago acclimated to the noise and human activity of St. Lucie operations and adjusted behavior patterns accordingly. Extending the same level of operational noise during the 20-year subsequent license renewal term is unlikely to noticeably change the patterns of wildlife movement and habitat use.

After reviewing landscape and grounds maintenance, stormwater management, noise levels and vibration, and ground-disturbing activities and their effects on terrestrial resources, the NRC staff concludes that non-cooling system impacts on terrestrial resources at St. Lucie during the subsequent license renewal term would be SMALL.

## 3.4 Aquatic Resources

### 3.4.1 Affected Environment

For the purposes of the following analysis, the NRC staff considers that the baseline condition of the resource is the nearshore marine community as it occurs today, which is described in Appendix C. While species richness, evenness, and diversity within the community may change or shift between now and when the proposed subsequent license renewal term would begin, the NRC staff finds the present aquatic community to be a reasonable surrogate in the absence of fishery and species-specific projections. Key environmental factors—such as temperature, salinity, substrate, and hydrodynamics—are expected to remain relatively stable in the near term, and using current conditions as a surrogate is a standard, scientifically sound, and practical approach for impacts analysis.

### 3.4.2 Environmental Consequences: Impingement Mortality and Entrainment of Aquatic Organisms (Plants with Once-Through Cooling Systems or Cooling Ponds)

This issue pertains to impingement mortality and entrainment (IM&E) of finfish and shellfish at nuclear power plants with once-through cooling systems or cooling ponds. The NRC staff relies upon, and incorporates herein by reference, the information presented in Sections 4.6.1.2 and 4.6.1.2.1 of the LR GEIS (NRC 2024-TN10161) to provide background information for this Category 2 issue. Specifically, Section 4.6.1.2 discusses the following information relevant to this issue:

- What IM&E is and how it can affect aquatic ecological communities

- Results of NRC impingement and entrainment analyses at nuclear power plants from 2013–2024
- Clean Water Act Section 316(b) requirements for minimizing IM&E at existing facilities, including best technology available (BTA) standards and ecological study requirements
- The NRC staff's reliance on the expertise and authority of the National Pollutant Discharge Elimination System (NPDES) permitting authority with respect to the impacts of IM&E
- The NRC staff's analysis approach in the absence of BTA determinations by the NPDES permitting authority

As stated in the LR GEIS, if the NPDES permitting authority has made IM&E BTA determinations and the nuclear power plant has implemented any associated requirements, then the NRC staff assumes that adverse impacts on the aquatic environment would be minimized and that the impacts of IM&E would be SMALL; if this is not the case, impacts could be SMALL, MODERATE, or LARGE. The sections below analyze the impacts of IM&E on aquatic organisms at St. Lucie.

### *3.4.2.1 St. Lucie Cooling Water Intake System*

The St. Lucie cooling water intake system impinges and entrains aquatic organisms as it withdraws water from the Atlantic Ocean. Section 2.2.3 of FPL's ER describes St. Lucie's cooling and auxiliary water systems in detail and is incorporated herein by reference. This section summarizes the features of those systems relevant to the impingement and entrainment analysis.

St. Lucie's cooling water intake system consists of three velocity cap structures, three ocean intake pipelines, two headwall structures, and an intake canal. Ocean water enters the system from three reinforced concrete velocity cap structures located approximately 1,200 ft (365 m) offshore and 6.75 ft (2.1 m) below the water surface at Mean Low Water. The velocity caps change the incoming current direction from vertical to horizontal, a design that reduces fish entrainment into the cooling water intake system because fish can detect horizontal velocity and then swim away to avoid being drawn further into the impingement area of influence. The velocity caps consist of large flat concrete plates placed above each vertical shaft of the intake structure. A vertical sheet pile section minimizes intake of sand and small debris, but no screens or grates prevent fish and other marine organisms from accessing the intake pipes.

Ocean water gravity feeds into the velocity caps and travels through one of three intake pipes. Horizontal velocities are approximately 0.4 feet per second (fps) (0.12 meters per second [m/s]) at the two intake pipe inlets with a 12 ft (3.7 m) diameter (serving Unit 1) and 1 fps (0.3 m/s) at the third intake pipe inlet (serving Unit 2), which has a 16 ft (4.9 m) diameter. Organisms within the source water that cannot resist or escape this flow are drawn into the cooling water intake structure along with the water. Along their path, the intake pipes change angles from horizontal to vertical. At these transition points, water velocity increases to approximately 4.2 feet per second (fps) (1.3 m/s) in the 12 ft (3.7 m) diameter pipe and 6.8 fps (2.1 m/s) in the 16 ft (4.9 m) diameter pipe. Following travel through the intake pipes, water passes through two headwall structures and into a single intake canal where water velocity returns to 1 fps (0.3 m/s) (FPL 2018-TN12345).

Following travel through the intake pipes, marine organisms within the source water enter the intake canal. The intake canal is a 4,920 ft (1,500 m) long trapezoidal channel within which

water occupies an area of 180 ft (55 m) wide by 30 ft (9.1 m) deep at typical water levels (NRC 2003-TN3152). Larger fish, sea turtles, and marine mammals in the canal may encounter one of several barriers designed to prevent marine organisms from entering the intake wells, which pump water to the main turbine condensers. The first permanent barrier is a taut, sloped 5 in. (12.7 cm) mesh barrier net that spans the width of the intake canal midway between the headwall structures and the SR A1A bridge (see Figure 3-3). The second permanent barrier is an 8 in. (20 cm) mesh net that spans the width of the canal immediately east of the SR A1A Bridge. This net prevents larger marine organisms that have passed the primary barrier net from entering the intake wells.

If marine organisms pass both the primary and secondary barrier nets, individuals may enter the intake wells and become entrapped or may continue through the intake wells to encounter trash racks and traveling screens where they may become impinged or entrained. The trash racks consist of vertical bars with 3 in. (7.6 m) spacing. The eight traveling screens (four per unit) are made of ⅜ in. (0.95 cm) mesh wire. A spray wash system periodically removes debris and impinged aquatic organisms from the screens. Organisms washed off the screens are disposed of as waste; there is no fish return system (FPL 2021-TN12344).

Organisms small enough to pass through the traveling screens, such as fish eggs, larvae, and other zooplankton, are entrained into the cooling water system. Entrained organisms pass through the entire cooling system and reenter the Atlantic Ocean, along with heated effluent, through offshore discharge pipes. During this process, entrained organisms are subject to mechanical, thermal, and toxic stresses.

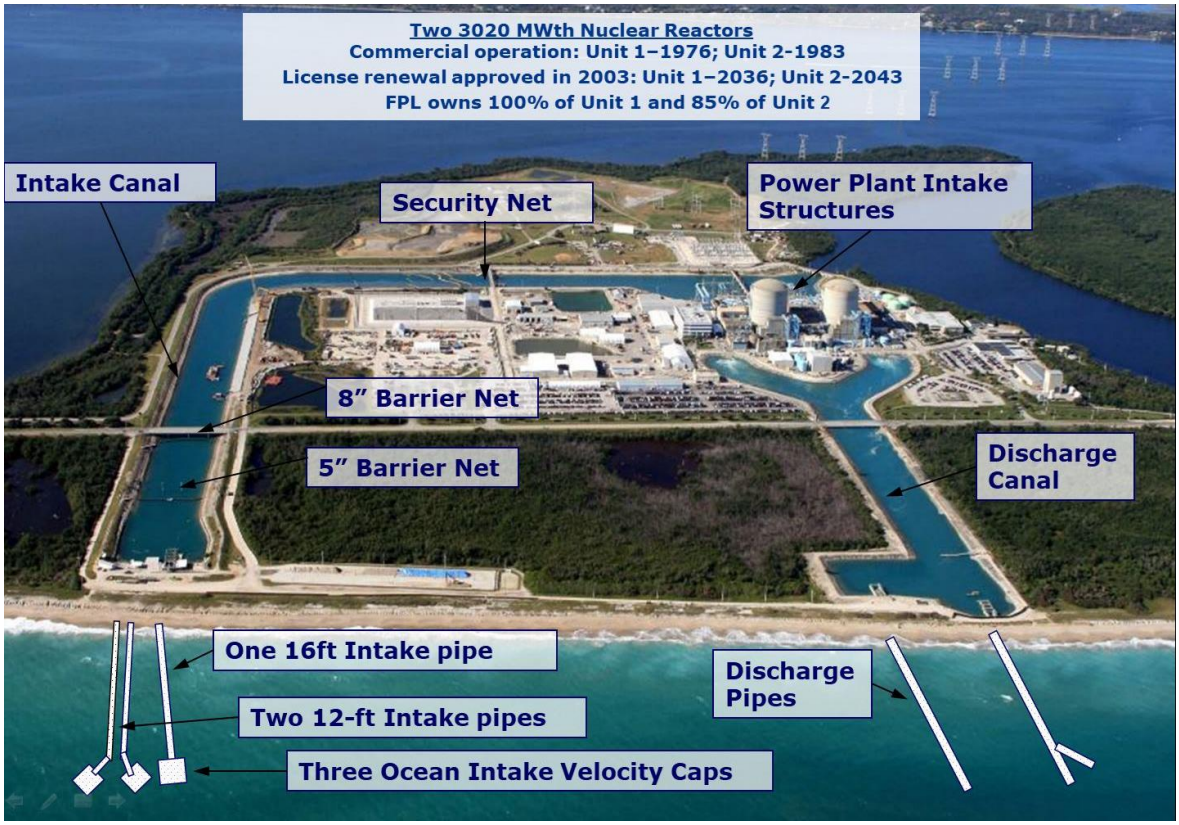



**Figure 3-3 Overview of Cooling System at St. Lucie Plant Site. Source: NRC 2019-TN7340.**

### *3.4.2.2 Impingement Mortality BTA*

On March 24, 2025, the Florida Department of Environmental Protection (FDEP) issued a renewed NPDES permit (FPL 2025-TN12346) to FPL for St. Lucie. In Section 4(b)(3)(1) of the permit, the FDEP determined that the existing offshore velocity caps comply with impingement mortality BTA standards per 40 CFR 125.94(c)(4) (TN254).

In April 2021, FPL submitted the IM&E information required by 40 CFR 122.21(r) (TN2769) and the 2014 final rule establishing Clean Water Act of 1972, as amended (CWA), Section 316(b) regulations for existing facilities, along with its NPDES permit renewal application, to the FDEP.

In its CWA Section 316(b) compliance submittal (FPL 2021-TN12344), FPL requested the FDEP's concurrence that St. Lucie's cooling water intake system meets the regulatory criteria for operation of an offshore velocity cap as defined at 40 CFR 125.92(v) (i.e., IM&E Option 4 as described in Section 4.6.1.2 of the LR GEIS [NRC 2024-TN10161]). FPL believes that the design and operation of St. Lucie's cooling water intake system complies with IM&E Option 4 for the following reasons (FPL 2021-TN12344): the velocity caps were constructed prior to October 14, 2014, the effective date of the 2014 CWA Section 316(b) final rule; the velocity caps are located approximately 1,200 ft (370 m) offshore, which is well beyond the 800 ft (240 m) requirement in the rule; and the design of the velocity caps is a standard one to achieve horizontal flow, and the permitting record makes clear that such was the objective of the design.

With respect to exclusionary measures for sea turtles and other large aquatic organisms that may be entrained into St. Lucie's intake canal, FPL has investigated and tested the potential design of physical excluder devices in connection with the terms and conditions of a biological opinion issued by the National Marine Fisheries Service (NMFS) under the ESA (NMFS 2016-TN4778). After several years of investigation, FPL and its experts concluded that excluder devices in the form of physical barriers are likely to result in increased risk to the listed animals (FPL 2018-TN12345). Partially as a result of these findings, in 2022, the NMFS issued a new biological opinion that revised previous requirements for excluder devices to the following (NMFS 2022-TN12343):

> NRC must ensure FPL implements a deterrent(s) at the 3 intake structures that will result in at least a 40% reduction of protected species take in a 3-year reporting period. The deterrent(s) must be operational by January 1, 2028.

Pursuant to this requirement, FPL is currently testing bubble curtains and/or a combination of bubble curtains and lighting as potential deterrents that would reduce the entrainment of listed marine species under the NMFS's jurisdiction. This effort is described in more detail in Section 3.5.2, which discusses ESA consultation with the NMFS and analyzes the potential impacts of St. Lucie subsequent license renewal on federally listed marine species.

### *3.4.2.3 Entrainment BTA*

As part of its April 2021 CWA Section 316(b) compliance submittal, FPL submitted to the FDEP analyses in support of a site-specific entrainment BTA determination. After considering the results of entrainment characterization studies and weighing the costs and benefits of certain entrainment reduction technologies, FPL requested the FDEP's determination that the existing design and operational measures at St. Lucie are entrainment BTA without additional measures.

FPL evaluated several other options to address entrainment, including incorporation of closed-cycle cooling, installation and use of variable-speed pumps, and installation and operation of fine mesh screens. FPL believes none of the candidate entrainment mitigation technologies to be reasonable options based on their relative social costs and social benefits as well as other factors. Environmental Consulting & Technology, Inc. (ECT) (FPL 2021-TN12344) found that retrofitting St. Lucie's cooling system with closed-cycle cooling (i.e., cooling towers) would create a new source of particulate air emissions, increase noise, and cause generation output loss and potential system reliability issues. Cooling towers would also require a large area of land to construct, which would adversely affect onsite wetlands and other sensitive habitats. ECT determined variable-speed pumps to be unreasonable because they present no real opportunity for flow reduction. ECT found fine mesh screens to be infeasible due to concerns regarding biofouling, debris, and sedimentation, which would result in unacceptable headloss and impacts to water supply reliability.

In Section 4(b)(3)(2) of the March 24, 2025, renewed NPDES permit (FPL 2025-TN12346), the FDEP concurred that the entrainment technologies considered are not justified for retrofitting the facility based on costs and benefits in accordance with 40 CFR 125.98(f)(4) (TN254). Accordingly, the FDEP determined that the existing cooling water intake system is BTA for entrainment and that FPL need not implement any additional mitigation.

#### *3.4.2.4 Impingement Mortality and Entrainment Conclusion*

As explained previously in this section, the NRC staff relies on the expertise and authority of the NPDES permitting authority when evaluating the environmental impacts of IM&E. If the NPDES permitting authority has made BTA determinations for a facility and that facility has implemented any associated requirements or those requirements would be implemented before the proposed subsequent license renewal term, then the NRC staff appropriately assumes that adverse impacts on the aquatic environment would be minimized. In such cases, the NRC staff concludes that impacts would be SMALL. Based on the FDEP's IM&E BTA determination in the 2025 renewed NPDES permit, St. Lucie is in compliance with the impingement mortality BTA standard under IM&E Option 4 described in Section 4.6.1.2 of the LR GEIS and the site-specific entrainment requirements, and no cooling water intake system modifications or upgrades are necessary to further mitigate these effects. Therefore, the NRC staff finds that the impacts of IM&E on aquatic organisms during the St. Lucie subsequent license renewal term would be SMALL.

### 3.4.3 Environmental Consequences: Effects of Thermal Effluents on Aquatic Organisms (Plants with Once-Through Cooling Systems or Cooling Ponds)

This issue pertains to acute, sublethal, and community-level effects of thermal effluents on finfish and shellfish from operation of nuclear power plants with once-through cooling systems and cooling ponds during an initial or subsequent license renewal term. This includes plants with helper cooling towers that are seasonally operated to reduce thermal load to the receiving water body, reduce entrainment during peak spawning periods, or reduce consumptive water use during periods of low river flow. The NRC staff relies upon, and incorporates herein by reference, the information in Sections 4.6.1.2 and 4.6.1.2.4 of the LR GEIS (NRC 2024-TN10161) to provide background information for this Category 2 issue. Specifically, these sections of the LR GEIS discuss the following information relevant to this issue:

- What thermal effects aquatic ecological communities can experience, including acute effects, sublethal effects, and community-level effects

- Results of NRC thermal impact analyses at nuclear power plants from 2013 through 2024
- CWA Section 316(a) requirements for assuring the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the receiving body of water
- The NRC staff's reliance on the expertise and authority of the NPDES permitting authority with respect to the impacts of thermal effluents
- The NRC staff's analysis approach in the absence of CWA 316(a) variances by the NPDES permitting authority

As stated in the LR GEIS, if the NPDES permitting authority has granted a 316(a) variance and the nuclear power plant has implemented any associated requirements, then the NRC staff assumes that adverse impacts on the aquatic environment would be minimized and that thermal impacts would be SMALL; if this is not the case, impacts could be SMALL, MODERATE, or LARGE. The sections below analyze the impacts of thermal effluents on aquatic organisms at St. Lucie.

### *3.4.3.1 St. Lucie Effluent Discharge*

St. Lucie discharges heated effluent offshore to the Atlantic Ocean. St. Lucie's NPDES permit (FPL 2025-TN12346) designates this discharge point as Outfall D-001. The structure of the discharge pipes, which feature a Y-port (Unit 1) and a multiport diffuser (Unit 2), distributes thermal effluent over a wide area and ensures rapid mixing with ambient waters.

The discharge canal is about 2,200 ft (670 m) long with transverse dimensions like the intake canal. The discharge canal terminates at two discharge pipes. The Unit 1 pipe is 12 ft (3.7 m) in diameter. It extends about 1,500 ft (457 m) offshore and discharges thermal effluent through a Y-port diffuser. The Unit 2 pipe is 16 ft (4.9 m) in diameter. It extends about 3,400 ft (1,036 m) offshore and discharges thermal effluent through a multiport diffuser. The diffusers are designed to distribute thermal effluent over a wide area and ensure rapid mixing with ambient waters. Both discharge pipes extend from the discharge canal beneath the beach and dune system and into the open ocean.

The surface thermal plume is influenced by the ambient current direction. The plume bends to the north during northward currents and to the south during southward currents and moves directly offshore during slack currents (Golder 2010-TN12432). The approximate acreage of the combined Unit 1 and 2 plumes is 180 acres (ac) (73 hectares [ha]) during maximum southerly currents of 1.3 fps (0.4 m/s); 210 ac (85 ha) during maximum northerly currents of 0.7 fps (0.2 m/s); and 126 ac (51 ha) during slack water (Golder 2010-TN12432). The thermal plume is further described in Section 3.4.3.4, "Thermal Studies."

### *3.4.3.2 CWA 316(a) Thermal Variance*

Because St. Lucie operates in compliance with the thermal discharge provisions in Florida's surface water quality standards, a CWA 316(a) variance to these standards does not apply to St. Lucie operations. The following subsection (Section 3.4.3.3) describes these standards and St. Lucie's adherence to them.

### *3.4.3.3 Florida Surface Water Quality Standards for Thermal Effluent*

Chapter 62-302 of the FAC (TN776) establishes thermal surface water criteria for Florida waters in accordance with the CWA. St. Lucie's discharge thermal effluent to open water is, therefore, subject to the provisions of FAC Rule 62-302.520(4)(c) concerning thermal discharges to open waters of the State. "Open waters" are all waters of the State extending seaward from the most seaward 18 ft (5.5 m) depth contour line, which is offshore from any island; exposed bar or submerged reef; or mouth of any embayment or estuary which is narrowed by headlands. For discharges to such waters, the rule allows that heated water with a temperature at the point of discharge up to 17 degrees Fahrenheit (°F) (−8 degrees Celsius [°C]) above ambient temperature of the receiving water body may be discharged from an open or closed conduit under the following restraints:

- The surface temperature of the receiving water body shall not be raised to more than 97°F (36°C).
- The point of discharge must be sufficient distance offshore to ensure that the adjacent coastal waters are not heated beyond the temperatures permitted in such waters.

The FDEP initially established thermal limitations and mixing zone requirements for St. Lucie in accordance with the above rule in 1987. These requirements appeared in St. Lucie's Conditions of Certification and were subsequently incorporated into the NPDES permit. The FDEP continued these requirements in subsequent NPDES permits based on FPL's demonstration that St. Lucie's discharge met the open water quality standard at the end of the mixing zone for the diffusers (FDEP 2016-TN12433).

In 2012, the NRC approved, and FPL implemented, an EPU, which increased the licensed thermal power level from 2,700 MWt to 3,020 MWt for each unit (an increase of 11.85 percent above the previously licensed level). Because the EPU increased the thermal load being absorbed by the plant's cooling water, it also caused the temperature of the discharge to the Atlantic Ocean at Outfall D-001 to increase from 113°F to 115°F (from 45°C to 46°C). Accordingly, FPL sought a revision to its NPDES permit to allow for the additional heat load. As part of the revised NPDES permit, the FDEP issued an Administrative Order requiring FPL to conduct thermal and biological studies. The thermal study modeled the predicted thermal plume that would result from the uprate to demonstrate that thermal limitations would be met at the edge of the mixing zone under EPU conditions. FPL conducted baseline and post-uprate thermal monitoring to verify its model predictions. The biological study evaluated whether the increased discharge temperatures would cause adverse effects on the balanced, indigenous population of fish and shellfish in the vicinity of the discharge. These studies are described in more detail in Section 3.4.3.4. The FDEP reviewed and approved the thermal and biological studies. As a result, FDEP continued the thermal limitations and thermal mixing zone requirements originally established in 1987 in the current 2025 NPDES permit (FPL 2025-TN12346). Specifically, the permit imposes the following thermal effluent limitations:

- During normal operations, effluent discharged from Outfall D-001 to the Atlantic Ocean shall not exceed a maximum daily temperature of 115°F (46°C).
- During maintenance activities, effluent discharged from Outfall D-001 to the Atlantic Ocean shall not exceed a maximum daily temperature of 117°F (47°C).
- During normal operations, the temperature difference between the intake and discharge shall not exceed a daily maximum of 30°F (−1°C).

- During maintenance activities, the temperature difference between the intake and discharge shall not exceed a daily maximum of 32°F (0°C).

Concerning the mixing zone, the permit limits the total area of the mixing zone to 1,306 $m^2$ (0.32 ac; 0.13 ha) with the following additional requirements.

- Heated water from any port of the multiport diffuser (i.e., the Unit 2 discharge) shall not exceed 17°F (−8°C) above ambient temperature in the receiving body of water outside a thermal mixing zone extending 5.5 m (18 ft) seaward along the center line and 2.15 m (7.1 ft) each side of the centerline of each port (a total of 12 $m^2$ [0.003 ac; 0.0012 ha] for each port).
- Heated water discharged from the Y-port diffuser (i.e., the Unit 1 discharge) shall not exceed the ambient temperature in the receiving body of water outside a circular thermal mixing zone with a 13.93 m (45.7 ft) radius originating at the mid-point between the orifices of the Y-port diffuser (a total area of 610 $m^2$).

FPL monitors characteristics of St. Lucie's thermal effluent to ensure compliance with the above requirements and submits monthly reports to the FDEP.

#### *3.4.3.4 Thermal Studies*

After implementation of the 2012 EPU, FPL performed studies to determine the impacts of the additional thermal load on the characteristics of St. Lucie's thermal effluent discharge. Thermal monitoring data indicated that the increase in the size of the thermal plume attributable to the EPU was relatively small. The Y-port (Unit 1) diffuser thermal plume increased in volume by about 1,000 $ft^3$ (28 $m^3$) at the lowest recorded discharge temperature (96°F [35.6°C]) to about 2,000 $ft^3$ (57 $m^3$) at the highest recorded discharge temperature (111°F [43.9°C]). The multiport (Unit 2) diffuser thermal plume increased in volume by about 50 to 350 $ft^3$ (1.4 to 10 $m^3$). Researchers calculated that heated water exiting the diffusers at 115°F (46.1°C), the maximum allowable discharge temperature under the NPDES permit, would be cooled down to 96°F (35.6°C) within about 12.5 seconds, and the potential decrease in dissolved oxygen concentration under EPU conditions is on the order of about 0.01 mg/L (0.01 parts per million) (FPL 2021-TN12166).

Golder Associates (NRC 2015-TN12434) also performed an analysis of potential incursions of the thermal plume into coastal waters. This analysis suggested that the 2°F (−17°C) isotherm infrequently crosses into coastal waters. Such incursions were observed almost entirely at the central coastal monitoring station, which was located between the two discharge diffusers, and most of the incursions occurred when surface currents were southbound. Golder Associates postulated that one possible explanation for this pattern is the northeasterly net direction of the Y-port diffuser. This orientation of the Y-port diffuser facilitates smoother entrainment of the plume into a northbound current, but with a southbound current, the Y-port diffuser discharge velocity is counter to the current, which may result in the plume becoming more laterally dispersed or ballooning out before being carried southward.

As a result of these observations, Golder Associates (NRC 2015-TN12434) conducted two alternative analyses to assess an upper and lower bound to the potential levels of influence of the plume on coastal waters. The upper bound analysis, which represented a worst-case scenario, suggested that the 2°F (−17°C) isotherm plume exceeded FAC criteria at the coastal water boundary less than 1 percent of the time with an average temperature of 0.5°F (−17.5°C) above the regulatory limit. The lower bound analysis suggested that the 2°F (−17°C) isotherm

plume exceeded FAC criteria at the coastal water boundary less than 0.24 percent of the time with an average temperature of 0.3°F (−17.6°C) above the regulatory limit. However, under all scenarios, heated water quickly mixes with ambient ocean water. Fish and other mobile aquatic organisms in the direct vicinity of the plume can swim away to avoid the small area of heated water. The discharge does not interact with benthic habitats or bottom sediments because the heated water will float as it mixes. Golder Associates concluded that the influence of St. Lucie's thermal plume on coastal waters is de minimus and that the plume will not cause any adverse environmental impacts.

The FDEP also required FPL to conduct biological monitoring to determine whether elevated water temperatures associated with the EPU affected the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in the Atlantic Ocean. Ecological Associates, Inc. (EAI) performed baseline and post-EPU monitoring every other month from August 2011 through February 2015 (EAI 2015-TN12435). Researchers sampled water quality; collected fish and shellfish by trawl, gill net, and beach seine; and monitored sea turtle utilization of nearshore hardbottom habitat. Samples were collected at three sites: one centered around St. Lucie within the zone of thermal influence and two control sites located north and south of the plant.

Clupeids (anchovies, herrings, and sardines) accounted for over 38 percent of all fish collected by trawl. These fish provide forage for a variety of predatory fish, many of which are commercially and recreationally important. Roughneck shrimp (*Riniapenaeus constriclus*), unidentified roughneck shrimp (*Rimapenaeus* spp.), pink shrimp (*Fatfantepenaeus duorarum*), and speckled swimming crabs (*Arenaeus cribrarius*), all of which are commercially or recreationally important, constituted 77 percent of the crustaceans captured in trawl samples. EAI (EAI 2015-TN12435) identified no statistically significant differences in the mean number of fish, representative important species, or commercially or recreationally important decapod crustacean taxa among study sites either before or after the EPU. Likewise, there were no statistically significant differences among areas during baseline monitoring with respect to the mean catch per unit effort for any of these groups or for individual representative important taxa. EAI concluded that the EPU did not have a measurable effect on the benthic community in the vicinity of St. Lucie.

In gill net samples, EAI (EAI 2015-TN12435) collected Atlantic sharpnose shark (*Rhizoprionodon terraenovae*), Atlantic bumper (*Chloroscombrus chrysurus*), bonnethead shark (*Sphyrna tiburo*), and spot (*Leiostomus xanthurus*), which collectively accounted for over half of all captures. The most abundant representative important species were spot, Atlantic croaker (*Micropogonias undulatus*), and Spanish mackerel (*Scomberomorus maculatus*). As with trawl sampling, samples yielded considerable variability in the number of taxa and catch per unit effort per event. However, researchers identified no statistically significant differences in any metrics that would indicate impacts from the EPU. EAI concluded that the EPU did not have a measurable effect on water column fish assemblages in the vicinity of St. Lucie.

Other sampling methods yielded considerable variability among events with respect to the number of taxa and, in particular, the number of individuals captured by beach seine. This was due mainly to a large catch of scaled sardines at the southern control site during two sampling events. Throughout the entire study period, that species accounted for 68 percent of all individuals collected by seine. Sand drum (*Umbrina coroides*), Atlantic bumper, tidewater mojarra (*Eucinostomus harengulus*), and Spanish sardine (*Sardinella aurita*) also occurred in relatively high numbers. Researchers identified no statistically significant differences in any

metrics that would indicate impacts from the EPU. EAI concluded that the EPU did not have a measurable effect on surf zone fish in the vicinity of St. Lucie (EAI 2015-TN12435).

Plankton sampling yielded numerous taxa of fish and crustacean eggs and larvae. Clupeids dominated the larval fish collections, accounting for 39 percent of all fish larvae captured. Mole crabs (*Albunea* spp.) dominated crustacean larvae, accounting for 30 percent of all specimens captured during plankton sampling. As with other biological sampling, there was considerable variability among sampling events but no statistically significant differences in any metrics that would indicate impacts from the EPU. EAI concluded that the EPU did not have a measurable effect on planktonic stages of fish and invertebrates in the vicinity of St. Lucie (EAI 2015-TN12435).

The mean number of green turtles sighted within the discharge site was significantly greater than the means in either control site during pre-EPU events but only significantly higher than the southern control site during post-EPU events. This change in the relationship among study sites appeared to be due to a slight increase in sightings at the northern control site following the EPU and a small corresponding decrease at the discharge site. However, none of these changes were statistically significant within any study area, including the discharge, indicating that the EPU had no effect on the number of small green sea turtles using nearshore hardbottom habitat in the vicinity of St. Lucie (EAI 2015-TN12435).

In summary, EAI (EAI 2015-TN12435) found that data collected during the study characterize a diverse and abundant fish and shellfish community in nearshore waters of the Atlantic Ocean in the vicinity of St. Lucie. These communities are extremely dynamic in terms of spatial and temporal variability, but no significant differences were identified among sites for most variables or between pre- and post-EPU sampling events. This indicates that the EPU resulted in no measurable effect on local fish and wildlife populations in the vicinity of St. Lucie. Given the large capacity of the receiving water body to dissipate heat, the effectiveness of the offshore discharge pipes in diffusing heated cooling water, the limited spatial area historically affected by thermal discharges, and the small change in discharge temperatures resulting from the EPU, EAI concluded that these findings are not unexpected.

#### *3.4.3.5 Thermal Conditions During the Subsequent License Renewal Term*

FPL proposes no operational changes during the subsequent license renewal term that would increase or otherwise alter thermal effluent discharged to the Atlantic Ocean. During the subsequent license renewal term, FPL would continue to be subject to FAC thermal surface water criteria as well as limitations and requirements set forth in the St. Lucie NPDES permit. FDEP has established these requirements pursuant to the provision of the CWA to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the Atlantic Ocean.

#### *3.4.3.6 Thermal Impacts Conclusion*

Because St. Lucie operates in compliance with the thermal discharge provisions in Florida's surface water quality standards, a CWA Section 316(a) variance to these standards does not apply to St. Lucie operations, and the NRC staff finds that the adverse impacts on the aquatic environment associated with thermal effluent are minimized. Further, thermal studies associated with the 2012 EPU indicate no measurable impact on the aquatic community in the vicinity of St. Lucie from St. Lucie's thermal discharge. Because the characteristics of the thermal effluent would remain the same under the proposed action, the NRC staff anticipates similar effects

during the subsequent license renewal term. Further, the FDEP would continue to ensure FPL's compliance with FAC requirements through the NPDES permit. The FDEP may require additional mitigation or monitoring in a future renewed NPDES permit if it deems such actions to be appropriate to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the Atlantic Ocean. The NRC staff appropriately assumes that any additional requirements that the FDEP imposes would further reduce the impacts of St. Lucie's thermal effluent over the course of the subsequent license renewal term. For these reasons, the NRC staff finds that thermal impacts during the subsequent license renewal term would neither destabilize nor noticeably alter any important attribute of the aquatic environment and would, therefore, result in SMALL impacts on aquatic organisms.

## 3.5 Federally Protected Ecological Resources

The NRC staff must consider the effects of agency actions on ecological resources protected under several Federal statutes and must consult with the FWS and the NMFS or the National Oceanic and Atmospheric Administration (NOAA) prior to acting in cases where an agency action may affect those resources. These statutes include the following:

- Endangered Species Act of 1973, as amended (ESA) (TN1010)
- Magnuson–Stevens Fishery Conservation and Management Act, as amended (TN9966)
- National Marine Sanctuaries Act, as amended (NMSA) (TN4482)
- Marine Mammal Protection Act of 1972, as amended (MMPA) (TN4478)

In the following sections, the NRC staff summarizes its findings with respect to federally protected ecological resources protected under these statutes and the related consultations with the FWS, NMFS, and NOAA.

### 3.5.1 Endangered Species Act: Federally Listed Species and Critical Habitats under U.S. Fish and Wildlife Service Jurisdiction

Congress enacted the ESA (TN1010) in 1973 to protect and recover imperiled species and the ecosystems upon which they depend. The ESA provides a program for the conservation of endangered and threatened plants and animals (collectively, listed species) and the habitats in which they are found. The FWS and the NMFS (collectively, the Services) are the lead Federal agencies for implementing the ESA, and these agencies are charged with identifying species that warrant listing. Under Section 7(a)(2) of the ESA, Federal agencies must consult with the Services for Federal actions that may affect listed species or designated critical habitats.

The NRC staff evaluated the impacts of the proposed action of St. Lucie subsequent license renewal on federally listed species and critical habitats under the FWS's jurisdiction. Table 3-3 identifies for each potentially applicable species and critical habitat the NRC staff's ESA effect determination, the Federal status, and the determination of whether the species is potentially present in the action area. Consultation is ongoing at this time, and the NRC staff will report on the results of the consultation in the final EIS. For the full biological evaluation for the following species and habitats, please refer to Appendix C.

**Table 3-3 Effect Determinations for Federally Listed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction for the Proposed St. Lucie Plant Subsequent License Renewal**

| Species or Critical Habitat | Federal Status[a] | Potentially Present in the Action Area? | ESA Effect Determination[b] |
|---|---|---|---|
| American alligator (*Alligator mississippiensis*) | SAT | Yes | Not Applicable |
| American crocodile (*Crocodylus acutus*), Florida population | FT | No | NE |
| crested caracara (*Caracara plancus audubonii*), Florida DPS | FT | Yes | NLAA |
| eastern black rail (*Laterallus jamaicensis* ssp. *jamaicensis*) | FT | Yes | NLAA |
| eastern indigo snake (*Drymarchon couperi*) | FT | Yes | NLAA |
| Everglade snail kite (*Rostrhamus sociabilis plumbeus*) | FE | Yes | NLAA |
| Florida panther (*Puma concolor coryi*) | FE | No | NE |
| Florida scrub-jay (*Aphelocoma coerulescens*) | FT | No | NE |
| fragrant prickly-apple (*Cereus eriophorus* var. *fragrans*) | FE | No | NE |
| green sea turtle (*Chelonia mydas*) North Atlantic DPS | FT | Yes | NLAA |
| hawksbill sea turtle (*Eretmochelys imbricata*) | FE | Yes | NE |
| Kemp's ridley sea turtle *(Lepidochelys kempii)* | FE | Yes | NE |
| leatherback sea turtle (*Dermochelys coriacea*) | FE | Yes | NLAA |
| loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean DPS | FT | Yes | NLAA |
| monarch butterfly (*Danaus plexippus*) | FPT | Yes | NLAA |
| piping plover (*Charadrius melodus*), Atlantic Coast and Northern Great Plains populations | FT | Yes | NLAA |
| puma (mountain lion) (*Puma concolor* [all subspecies except *coryi*]), Florida population | SAT | No | Not Applicable |
| southeastern beach mouse (*Peromyscus polionotus niveiventris*) | FT | Yes | NLAA |
| tiny polygala (*Polygala smallii*) | FE | No | NE |
| West Indian manatee (*Trichechus manatus*) | FT | Yes | LAA |

| Species or Critical Habitat | Federal Status[(a)] | Potentially Present in the Action Area? | ESA Effect Determination[(b)] |
|---|---|---|---|
| wood stork (*Mycteria americana*), Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina populations | FT | Yes | NLAA |
| Proposed critical habitat of the green sea turtle | FPD | Yes | NLAA |
| Critical habitat of the loggerhead sea turtle | FD | Yes | NLAA |
| Critical habitat of the West Indian manatee | FD | Yes | NLAA |

DPS = distinct population segment; FD = federally designated; FE = federally endangered; FPD = proposed for Federal designation; FPT = proposed for Federal listing as threatened; FT = federally threatened; FWS = U.S. Fish and Wildlife Service; LAA = may affect and is likely to adversely affect; NE = no effect; NLAA = may affect but is not likely to adversely affect; NMFS = National Marine Fisheries Service; NRC = U.S. Nuclear Regulatory Commission; SAT = federally threatened by similarity of appearance.

(a) Indicates protection status under the Endangered Species Act.

(b) The NRC staff made its effect determinations for federally listed species in accordance with the language and definitions specified in the FWS and NMFS Endangered Species Consultation Handbook (FWS and NMFS 1998-TN1031).

### 3.5.2 Endangered Species Act: Federally Listed Species and Critical Habitats under National Marine Fisheries Service Jurisdiction

The NRC staff determined that eight federally listed species under NMFS jurisdiction occur in the action area: loggerhead sea turtle (*Caretta caretta*) (Northwest Atlantic Ocean Distinct Population Segment [DPS]), green sea turtle (*Chelonia mydas*) (North Atlantic and South Atlantic DPSs), leatherback sea turtle (*Dermochelys coriacea*), hawksbill sea turtle (*Eretmochelys imbricata*), Kemp's ridley sea turtle (*Lepidochelys kempii*), olive ridley sea turtle (*Lepidochelys olivacea*), giant manta ray (*Manta birostris*), and smalltooth sawfish (*Pristis pectinata*). Additionally, the action area overlaps with two critical habitats: Unit FL-01 of the green sea turtle (North Atlantic DPS) and Unit LOGG-N-18 of the loggerhead sea turtle (Northwest Atlantic Ocean DPS). The NRC staff used the ER, as supplemented (FPL 2021-TN12166, FPL 2025-TN12167); the NMFS's critical habitat mapper; available ecological surveys; and information from past ESA consultations to summarize habitat requirements and information on the occurrence of each species within the action area in Table 3-4 below. Further information on the life histories, habitat requirements, status and trends, distribution of, and threats to each of these species is available in the NMFS's 2022 biological opinion (NMFS 2022-TN12343) and Inwater Research's 2025 biological assessment (IRG 2025-TN12351).

**Table 3-4 Occurrences of Federally Listed Species and Critical Habitats Under National Marine Fisheries Service Jurisdiction in the St. Lucie Plant Subsequent License Renewal Action Area**

| Species or Critical Habitat | Federal Status[(a)] | Habitat | Type and Likelihood of Occurrence in Action Area |
|---|---|---|---|
| loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean DPS | FT | Inhabit subtropical and temperate regions of the Atlantic, Pacific, and Indian Oceans, and the Mediterranean Sea. | **Present.** Loggerheads may occur within the action area in nearshore regions containing hard bottom habitats and their preferred prey of mollusks and other benthic invertebrates. Certain |

| Species or Critical Habitat | Federal Status[a] | Habitat | Type and Likelihood of Occurrence in Action Area |
|---|---|---|---|
| | | | subpopulations nest in Florida, and adult females, eggs, and hatchlings may be found on action area beaches during the nesting season. Loggerhead turtles are the most commonly collected sea turtle species at St. Lucie. Since the first recorded collection of the species at the plant in 1975, individuals have been collected in the intake canal at a rate of 56.7 turtles per year. |
| green sea turtle (*Chelonia mydas*), North Atlantic DPS | FT | Occupy subtropical and temperate regions of the Atlantic, Pacific, and Indian Oceans, and the Mediterranean Sea. | **Present**. Green turtles may occur within the action area in nearshore regions containing marine algae and seagrasses. Most nesting within the southeastern United States occurs in Florida, and adult females, eggs, and hatchlings may be found on action area beaches during the nesting season. Green turtles are the second most commonly collected sea turtle species at St. Lucie. Since the first recorded collection of a green sea turtle at the plant in 1976, individuals have been collected in the intake canal at a rate of 53.5 turtles per year. |
| green sea turtle (*Chelonia mydas*), South Atlantic DPS | FT | Occupy subtropical and temperate regions of the Atlantic, Pacific, and Indian Oceans, and the Mediterranean Sea. | **Present.** Same as above. |
| leatherback sea turtle (*Dermochelys coriacea*) | FE | Occur in the Atlantic, Pacific, and Indian Oceans. Nesting beaches are primarily located in tropical latitudes around the world. | **Present.** Leatherbacks spend most of their life in the open ocean but may inhabit nearshore areas within the action area while foraging. The Atlantic population nests in Florida, and females are more common in nearshore areas during the nesting season. Adult females, eggs, and hatchlings may be found on action area beaches during the nesting season. Leatherbacks are occasionally collected in St. Lucie's intake canal. Since the first recorded collection of a leatherback at the plant in 1976, individuals have been collected in the intake canal at a rate of 0.76 turtles per year. |

| Species or Critical Habitat | Federal Status[(a)] | Habitat | Type and Likelihood of Occurrence in Action Area |
|---|---|---|---|
| hawksbill sea turtle (*Eretmochelys imbricata*) | FE | Occupy tropical regions of the Atlantic, Pacific, and Indian Oceans in areas with coral reefs, rocky areas, lagoons, and shallow coastal areas. Also found in mangrove-fringed bays and estuaries. | **Present.** Hawksbills may occur within the action area in regions with coral reefs, rocky outcrops, and high energy shoals which are optimum sites for sponge growth, which is one of their primary prey. This species does not nest within the action area and is not expected to be found on beaches. Hawksbills are occasionally collected in St. Lucie's intake canal. Since the first recorded collection of a hawksbill at the plant in 1978, individuals have been collected in the intake canal at a rate of one turtle per year. |
| Kemp's ridley sea turtle (*Lepidochelys kempii*) | FE | Juveniles associate with floating Sargassum algae for the first 1–2 years of life. Adults inhabit the open ocean and nearshore coastal habitats in the Gulf of Mexico and Atlantic Ocean with muddy or sandy bottoms where their preferred prey of crabs are found. | **Present.** Kemp's ridleys may occur within the action area in regions with sandy and muddy areas in shallow, nearshore waters containing their preferred prey of crabs, jellyfish, and mollusks. This species does not nest in Florida and is not expected to be found on beaches. Since the first recorded collection of a Kemp's ridley at the plant in 1981, individuals have been collected in the intake canal at a rate of 2.25 turtles per year. |
| olive ridley sea turtle (*Lepidochelys olivacea*), Wherever found, except when listed as endangered under 50 CFR 224.101 (TN4470) | FT | Primarily inhabit the open ocean but also known to inhabit coastal areas. | **Rare.** Olive ridleys spend most of their life in the open ocean and generally do not occur in Florida. However, FPL has reported the capture of three olive ridleys since the plant began operating: in 1975, 2019, and 2023. NMFS considered these individuals to be "lost" to their populations. |
| giant manta ray (*Manta birostris*) | FT | Found worldwide in tropical, subtropical, and temperate bodies of water and is commonly found offshore, in oceanic waters, and in productive coastal areas. | **Present.** Manta rays occur in the action area and are rarely collected in St. Lucie's intake canal. Since the NMFS issued a final rule to list the species in 2018 (83 FR 2916-TN12437), FPL has reported the capture of two individuals in the intake canal. Both were in 2020, and both were released back to the Atlantic Ocean alive and unharmed. |

| Species or Critical Habitat | Federal Status[(a)] | Habitat | Type and Likelihood of Occurrence in Action Area |
|---|---|---|---|
| smalltooth sawfish (*Pristis pectinata*), U.S. DPS | FE | Tropical seas and estuaries of the Atlantic Ocean. Individuals most often occupy shallow, coastal waters and sometimes enter the lower reaches of freshwater river systems. | **Present.** Smalltooth sawfish occur in the action area and are occasionally collected in St. Lucie's intake canal. Since the NMFS issued a final rule to list the species in 2003 (68 FR 15674-TN12438), FPL has reported the capture of 7 individuals in the intake canal. All were released back to the Atlantic Ocean alive and unharmed. |
| Critical habitat of the green sea turtle, North Atlantic DPS | FPD | Unit FL-01, Florida | **Present.** Critical habitat occurs in the action area in nearshore areas from the mean high-water line to 66 ft depth. |
| Critical habitat of the loggerhead sea turtle, Northwest Atlantic Ocean DPS | FD | Unit LOGG-N-18, Florida Constricted Migratory Corridor | **Present.** Critical habitat occurs in the action area in nearshore areas from the mean high-water line to 98 ft depth. |

DPS = distinct population segment; ft = foot/feet; m = meter(s); FPL = Florida Power & Light Company; NMFS = National Marine Fisheries Service.

(a) Indicates protection status under the Endangered Species Act. FD = federally designated (critical habitat); FE = federally endangered; FT = federally threatened; and FPD = federally proposed for designation (critical habitat).

Sources: FPL 2001-TN12165, FPL 2025-TN12167, IRG 2025-TN12351, NMFS 2022-TN12343, NMFS 2025-TN12488.

There is a long history of ESA consultations with NMFS to address the potential impacts of St. Lucie operations on sea turtles and other protected species that dates back to the 1970s. Much of that history can be found in the NRC's 2019 biological assessment (NRC 2019-TN7340) and NMFS's biological opinions (NRC 2001-TN12468; NMFS 2016-TN4778, NMFS 2022-TN12469).

The NRC and NMFS most recently consulted on St. Lucie operations from 2019 through 2022. On November 18, 2019, the NRC requested to reinitiate consultation with NMFS under Section 7 of the ESA (NRC 2019-TN12470). The NRC sought reinitiated consultation because FPL had met or exceeded the annual incidental take limits of smalltooth sawfish (*Pristis pectinata*) non-lethal captures, green sea turtle (*Chelonia mydas*) causal mortalities, and Kemp's ridley sea turtle (*Lepidochelys kempii*) non-lethal captures specified in the incidental take statement of NMFS's March 24, 2016, biological opinion for St. Lucie (NMFS 2016-TN4778). Additionally, the NRC sought reinitiated consultation to address a reasonable and prudent measure (RPM) and its implementing terms and conditions in NMFS's 2016 biological opinion that required FPL to design, test, construct, and implement excluder devices on St. Lucie's intake pipe velocity caps to prevent adult sea turtles from becoming entrained into the intake canal. During FPL's testing of such excluder devices, a loggerhead sea turtle (*Caretta caretta*) "failed" the test by becoming wedged in the test excluder device grating. NMFS instructed FPL to suspend further testing until the NRC and NMFS had reviewed available test results and could discuss and agree upon next steps. The NRC's reinitiation request proposed an alternative to the excluder devices.

During consultation, in November 2020, FPL notified the NRC and NMFS that it had captured two giant manta rays (*Mobula birostris*), a federally threatened species, in the St. Lucie intake canal. Both animals were alive, and FPL personnel released them back to the ocean

unharmed. Following discussions among FPL, the NRC, and NMFS, the agencies incorporated this species into the reinitiated consultation.

As a result of the reinitiated consultation, NMFS issued a new biological opinion on August 8, 2022 (NMFS 2022-TN12469). Notably, the new biological opinion

- revised the amount or extent of incidental take of sea turtles and smalltooth sawfish
- evaluated the giant manta ray and allowed for incidental take of this species
- established new RPMs and terms and conditions

Of particular note, RPM 1, "Minimize Entrainment into the SLNPP [St. Lucie] Intake Canal," states, in part, that the NRC must ensure that FPL designs, tests, constructs, and implements a deterrent(s) at the three intake structures that will reduce the number of sea turtles entering the St. Lucie intake canal. Unlike the excluder devices specified in NMFS's 2016 biological opinion, these deterrents do not have to physically exclude sea turtles to meet the requirement of the RPM.

Term and Condition 1 of RPM 1 further specifies that the deterrents must result in at least a 40 percent reduction in the incidental take of protected species in any 3-year reporting period. This includes smalltooth sawfish and giant manta ray, in addition to sea turtles, although the studies that NMFS based these criteria on were specific to green sea turtle bycatch in gillnets illuminated with LED lights. Since that time, FPL has been working toward these requirements. NMFS approved FPL's deterrent testing plan in 2024, and FPL is currently constructing a test tank for a 1-year onshore deterrent testing period, which will test the response of healthy loggerhead and green sea turtles to bubble curtains and lights in a controlled test tank environment.

In 2024, however, FPL met or exceeded the authorized level of incidental take specified in the 2022 biological opinion for the 2022–2024 period for several species and categories of take. These species and categories were: live green turtle captures, live leatherback captures, causal Kemp's ridley mortalities, and live loggerhead captures. The ESA regulations at 50 CFR 402.16(a)(1) (TN4312) require Federal agencies to reinitiate consultation if the amount or extent of takings specified in an incidental take statement are exceeded.

On September 10, 2024, the NRC designated FPL as its non-Federal representative to prepare a biological assessment in support of the reinitiated consultation (NRC 2024-TN12472). FPL submitted its biological assessment to the NRC on July 9, 2025 (IRG 2025-TN12351), and the NRC reinitiated formal ESA consultation with NMFS on July 16, 2025 (NRC 2025-TN12473). The reinitiated consultation addresses both the 2024 incidental take limit exceedances as well as the continued operation of St. Lucie during the proposed subsequent license renewal term. FPL's biological assessment, prepared by Inwater Research, is incorporated by reference herein. Based on this information, Table 3-5 summarizes the effects and ESA determinations for each of the listed species and the two critical habitats. Consultation is ongoing at this time, and the NRC staff will report on the results of the consultation in the final EIS.

**Table 3-5 Effect Determinations for Federally Listed Species and Critical Habitats Under National Marine Fisheries Service Jurisdiction in the St. Lucie Plant Subsequent License Renewal Action Area**

| Species or Critical Habitat | Federal Status[(a)] | Summary of Effects | ESA Effect Determination[(b)] |
|---|---|---|---|
| loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean DPS | FT | Relatively frequent entrainment of individuals into the intake canal would continue and would constitute take under the ESA and could result in injury or mortality. Frequency of take is expected to decrease once FPL implements the sea turtle deterrent devices required by NMFS's 2022 biological opinion. All other impacts on this species would be insignificant or discountable. | LAA |
| green sea turtle (*Chelonia mydas*), North Atlantic DPS | FT | Relatively frequent entrainment of individuals into the intake canal would continue and would constitute take under the ESA and could result in injury or mortality. Frequency of take is expected to decrease once FPL implements the sea turtle deterrent devices required by NMFS's 2022 biological opinion. All other impacts on this species would be insignificant or discountable. | LAA |
| green sea turtle (*Chelonia mydas*), South Atlantic DPS | FT | Same as above. | LAA |
| leatherback sea turtle (*Dermochelys coriacea*) | FE | Rare entrainment of individuals into the intake canal would continue and would constitute take under the ESA and could result in injury or mortality. Frequency of take is expected to decrease once FPL implements the sea turtle deterrent devices required by NMFS's 2022 biological opinion. All other impacts on this species would be insignificant or discountable. | LAA |
| hawksbill sea turtle (*Eretmochelys imbricata*) | FE | Rare entrainment of individuals into the intake canal would continue and would constitute take under the ESA and could result in injury or mortality. Frequency of take is expected to decrease once FPL implements the sea turtle deterrent devices required by NMFS's 2022 biological opinion. All other impacts on this species would be insignificant or discountable. | LAA |
| Kemp's ridley sea turtle (*Lepidochelys kempii*) | FE | Occasional entrainment of individuals into the intake canal would continue and would constitute take under the ESA and could result in injury or mortality. Frequency of take is expected to decrease once FPL implements the sea turtle deterrent devices required by NMFS's 2022 biological opinion. All other impacts on this species would be insignificant or discountable. | LAA |

| Species or Critical Habitat | Federal Status[a] | Summary of Effects | ESA Effect Determination[b] |
|---|---|---|---|
| olive ridley sea turtle (*Lepidochelys olivacea*), Wherever found, except when listed as endangered under 50 CFR 224.101 (TN4470) | FT | Extremely rare entrainment of individuals into the intake canal would continue and would constitute take under the ESA and could result in injury or mortality. Frequency of take is expected to decrease once FPL implements the sea turtle deterrent devices required by NMFS's 2022 biological opinion. All other impacts on this species would be insignificant or discountable. | LAA |
| giant manta ray (*Manta birostris*) | FT | Rare entrainment of individuals into the intake canal would continue and would constitute take under the ESA and could result in injury or mortality. Frequency of take may decrease once FPL implements the sea turtle deterrent devices required by NMFS's 2022 biological opinion, depending on how this species responds to the devices. All other impacts on this species would be insignificant or discountable. | LAA |
| smalltooth sawfish (*Pristis pectinata*), U.S. DPS | FE | Rare entrainment of individuals into the intake canal would continue and would constitute take under the ESA and could result in injury or mortality. Frequency of take may decrease once FPL implements the sea turtle deterrent devices required by NMFS's 2022 biological opinion, depending on how this species responds to the devices. All other impacts on this species would be insignificant or discountable. | LAA |
| Critical habitat of the green sea turtle, North Atlantic DPS | FPD | The intake and discharge pipes have small structural footprints that do not affect any of the nearshore essential features (reproductive, migratory, and benthic foraging/resting) of this critical habitat identified by NMFS or the physical and biological features (extra-tidal sandy beaches, sufficient darkness, and natural coastal processes) of this critical habitat identified by FWS. Likewise, the thermal plume affects only a very small area, which is a negligible amount of the critical habitat. Therefore, continued operations of St. Lucie would have insignificant effects on this designated critical habitat. | NLAA |
| Critical habitat of the loggerhead sea turtle, Northwest Atlantic Ocean DPS | FD | The intake and discharge pipes have small structural footprints that do not affect any of the nearshore reproductive PCEs or the constricted migratory habitat PCEs of this critical habitat. Likewise, the thermal plume affects only a very small area, which is a negligible amount of the critical habitat. In its 2022 biological opinion, NMFS concluded that St. Lucie operations would not result in any changes to the area and | NLAA |

| Species or Critical Habitat | Federal Status[a] | Summary of Effects | ESA Effect Determination[b] |
|---|---|---|---|
| | | would not alter any of the PCEs or reduce the conservation value of the critical habitat. Therefore, continued operations of St. Lucie would have an insignificant effect on this designated critical habitat. | |

DPS = distinct population segment; ESA = Endangered Species Act; FPL = Florida Power & Light Company; FWS = U.S. Fish and Wildlife Service; LAA = may affect and is likely to adversely affect; NLAA = may affect but is not likely to adversely affect; NMFS = National Marine Fisheries Service; PCE = primary or constituent element; St. Lucie = St. Lucie Plant.

(a) Indicates protection status under the Endangered Species Act. FD = federally designated (critical habitat); FE = federally endangered; FT = federally threatened; and FPD = federally proposed for designation (critical habitat).

(b) The NRC staff made its effect determinations for federally listed species in accordance with the language and definitions specified in the FWS and NMFS Endangered Species Consultation Handbook (FWS and NMFS 1998-TN1031).

Source: NMFS 2022-TN12343.

### 3.5.3 Magnuson–Stevens Act: Essential Fish Habitat

Under the provisions of the Magnuson–Stevens Act (TN9966), the Fishery Management Councils and NMFS have designated essential fish habitat (EFH) for certain federally managed species. EFH is defined as the waters and substrate necessary to fish spawning, breeding, feeding, or growth to maturity (16 *United States Code* [U.S.C.] § 1802(10)) (TN9966). For each federally managed species, the Fishery Management Councils and NMFS designate and describe EFH by life stage (i.e., egg, larva, juvenile, and adult). On the Atlantic Coast of Florida, the responsible Fishery Management Council is the South Atlantic Fishery Management Council.

The NRC staff evaluated the impacts of the proposed action of St. Lucie subsequent license renewal on EFH. Table 3-6 and Table 3-7 provide a summary, and Appendix C provides the details of the NRC staff's EFH evaluation. The NRC staff will engage in EFH consultation with NMFS regarding the determinations of this evaluation following the issuance of this draft EIS.

**Table 3-6 Effect Determinations for Essential Fish Habitat Species and Life Stages for St. Lucie Plant Subsequent License Renewal**

| Species or Management Unit and Relevant Life Stages[a] | EFH Effect Determination[b] |
|---|---|
| bluefish—J, A | Minimal adverse effects |
| brown shrimp—All life stages | Minimal adverse effects |
| pink shrimp—All life stages | Minimal adverse effects |
| white shrimp—All life stages | Minimal adverse effects |
| spiny lobster—All life stages | Minimal adverse effects |
| summer flounder—L, J, A | Minimal adverse effects |
| king mackerel—All life stages | Minimal adverse effects |
| Spanish mackerel—All life stages | Minimal adverse effects |
| cobia—All life stages | Minimal adverse effects |
| sailfish—J, A | Minimal adverse effects |
| skipjack tuna—A | Minimal adverse effects |

| Species or Management Unit and Relevant Life Stages[(a)] | EFH Effect Determination[(b)] |
|---|---|
| octocorals—All life stages | Minimal adverse effects |
| Atlantic sharpnose shark (Atlantic stock)—N, J, A | Minimal adverse effects |
| blacknose shark (Atlantic stock)—J, A | Minimal adverse effects |
| blacktip shark (Atlantic stock)—J, A | Minimal adverse effects |
| bonnethead shark (Atlantic stock)—J, A | Minimal adverse effects |
| bull shark—J, A | Minimal adverse effects |
| Caribbean reef shark—All life stages | Minimal adverse effects |
| great hammerhead shark—All life stages | Minimal adverse effects |
| lemon shark—J, A | Minimal adverse effects |
| nurse shark—J, A | Minimal adverse effects |
| sandbar shark—A | Minimal adverse effects |
| scalloped hammerhead shark—J, A | Minimal adverse effects |
| smooth hammerhead shark—All life stages | Minimal adverse effects |
| spinner shark—J, A | Minimal adverse effects |
| tiger shark—N, J, A | Minimal adverse effects |
| snapper grouper complex—All life stages | Minimal adverse effects |

(a) E = eggs; L = larvae; N = neonatal; J = juveniles; and A = adults.
(b) The NRC staff made its effect determinations for essential fish habitat (EFH) in accordance with the language and definitions specified in the EFH regulations at 50 CFR Part 600 (TN1342) and the National Marine Fisheries Service's guidance for Federal action agencies (NOAA 2004-TN1344).

**Table 3-7 Summary of Effects to Habitat Areas of Particular Concern in the Vicinity of the St. Lucie Plant Site**

| Effect | Coastal Inlets, Mangroves, and Submerged Aquatic Vegetation | Nearshore Hardbottom, Phragmatopoma, and Nearshore Migratory Corridor |
|---|---|---|
| Physical removal of habitat through withdrawals | **Minimal adverse effects.** Withdrawal of water from Big Mud Creek occurs on a quarterly basis for a maximum of 2 minutes per test (FPL 2025-TN12264). Aside from quarterly tests, water would only be withdrawn from Big Mud Creek in an emergency situation where cooling water from the Atlantic Ocean is unable to be utilized. No emergencies requiring Big Mud Creek withdrawals have occurred during St. Lucie's operating history, and it is extremely unlikely that any withdrawals from Big Mud Creek, beyond the minimal volume required for quarterly testing, will occur during the proposed SLR term. | **Minimal adverse effects.** St. Lucie withdraws water continuously from the Atlantic Ocean. A small amount of water is lost to cooling, but the majority of water is returned to the Atlantic Ocean. The consumptive water use represents a small portion of the local ocean habitat. These temporary habitat losses would have negligible impacts on the quality or quantity of fish habitat. |
| Physical alteration of habitat through discharges | **No adverse effects.** There would be no discharges into these HAPCs. | **Minimal adverse effects.** St. Lucie continuously discharges heated effluent offshore to the Atlantic Ocean. The thermal plume created by the discharge may affect habitat for epipelagic species that utilize |

| Effect | Coastal Inlets, Mangroves, and Submerged Aquatic Vegetation | Nearshore Hardbottom, Phragmatopoma, and Nearshore Migratory Corridor |
|---|---|---|
| | | these HAPCs. However, EFH species that would be present in these areas would be motile and able to avoid the areas of heated water. The thermal plume would affect a relatively small area and would not meaningfully affect the available habitat. |
| Chemical alteration of habitat through discharges | **Minimal adverse effects.** There would be no discharges into these HAPCs. However, there is potential for tritium to enter the aquatic environment as gas through the air. Radiological monitoring in the area has not detected tritium, or other radionuclides, attributable to St. Lucie and the presence of radionuclides within the HAPCs of Big Mud Creek is considered extremely unlikely. | **Minimal adverse effects.** St. Lucie discharges certain nonradiological chemical pollutants in accordance with NPDES permit limitations established by the FDEP. These discharges are monitored and the quality of HAPCs in the area is extremely unlikely to be affected by nonradiological contamination. FPL monitors radioactive contaminants under its REMP. The REMP has not detected measurable levels of radiological isotopes attributable to St. Lucie operations in ocean substrates, plants, or animals. |
| Maintenance dredging | **Not applicable.** Dredging is not anticipated to occur during the SLR term. However, if it were to occur, any adverse effects associated with dredging would be addressed during the USACE permitting review and a separate consultation. Therefore, this issue is not evaluated here. | **Not applicable.** Dredging is not anticipated to occur during the SLR term. However, if it were to occur, any adverse effects associated with dredging would be addressed during the USACE permitting review and a separate consultation. Therefore, this issue is not evaluated here. |
| Reduction in prey base | **Minimal adverse effects.** There is potential for the prey base of EFH species to be impacted by the quarterly withdrawal of water from Big Mud Creek. However, this minimal withdrawal is not expected to noticeably alter the availability of prey within these HAPCs. | **Minimal adverse effects.** The continuous withdrawal and discharge of ocean water for cooling has the potential to impact the prey base of EFH species that use HAPCs within the Atlantic Ocean through impingement, entrainment, or exposure to thermal effluent discharges. However, these impacts are not expected to noticeably alter the availability of prey within these HAPCs. |

EFH = essential fish habitat; FDEP = Florida Department of Environmental Protection; FPL = Florida Power & Light Company; HAPC = habitat area of particular concern; NPDES = National Pollutant Discharge Elimination System; REMP = Radiological Environmental Monitoring Program; SLR = subsequent license renewal; USACE = U.S. Army Corps of Engineers.

Note: The NRC staff made its effect determinations for EFH in accordance with the language and definitions specified in the EFH regulations at 50 CFR Part 600 (TN1342) and the National Marine Fisheries Service's guidance for Federal action agencies (NOAA 2004-TN1344).

### 3.5.4 National Marine Sanctuaries Act: Sanctuary Resources

Congress enacted the NMSA (TN4482) in 1972 to protect areas of the marine environment that have special national significance. The NMSA authorizes the Secretary of Commerce to establish the National Marine Sanctuary System and designate sanctuaries within that system, which includes 15 sanctuaries and 2 marine national monuments, encompassing more than 600,000 $mi^2$ (1,550,000 $km^2$) of marine and Great Lakes waters from Washington State to the Florida Keys and from Lake Huron to American Samoa. Within these areas, sanctuary resources include any living or nonliving resource of a national marine sanctuary that contributes to the conservation, recreational, ecological, historical, educational, cultural, archaeological, scientific, or aesthetic value of the sanctuary.

No national marine sanctuaries occur within the affected area for St. Lucie subsequent license renewal. The closest sanctuaries are the Florida Keys National Marine Sanctuary, which lies over 120 mi (190 km) south of the site, and the Gray's Reef National Marine Sanctuary, which lies over 270 mi (435 km) north of the site off the coast of Georgia. Because no national marine sanctuaries occur within or near the affected area, the NRC staff concludes that the proposed action would have no effect on sanctuary resources.

### 3.5.5 Marine Mammal Protection Act

As part of its environmental review under NEPA and its regulations implementing NEPA, the NRC considers the requirements of the MMPA (TN4478) for any action it authorizes, funds, or carries out that may affect marine mammals. The MMPA prohibits the "take" of marine mammals—defined to include harassment, hunting, capturing, collecting, or killing—unless authorized by the appropriate agency: either the NMFS or the FWS, depending on the species.

For subsequent license renewal, while the NRC is not responsible for obtaining authorization under the MMPA, the applicant must secure any necessary authorization if the proposed action may result in the incidental take of marine mammals. The NRC cannot complete its obligations under Section 7(a)(2) of the ESA (TN1010) until such authorization is in place. This is particularly relevant at St. Lucie, where there is a documented history of West Indian manatee (*Trichechus manatus*) entrapment in the intake canal system. Because the manatee is protected under both the ESA and the MMPA, the NRC staff considers this history in its environmental analysis and ESA consultation. The potential effects of the proposed action on the West Indian manatee are discussed further in Appendix C.

## 3.6 Historic and Cultural Resources

### 3.6.1 Affected Environment

Section 2.2.9 of NUREG-1437, Supplement 11, the St. Lucie initial license renewal supplemental EIS, describes historic and cultural resources on or near the St. Lucie site (NRC 2003-TN3152). This information is incorporated herein by reference. In addition, Section 3.8 of FPL's ER, as supplemented (FPL 2021-TN12166, FPL 2025-TN12167), also describes and updates information on historic and cultural resources on or near the St. Lucie site. This information is also incorporated herein by reference. Based on its technical review, site audits, scoping, and evaluation of other available information, the NRC staff determined that there is no new and significant information that would alter the descriptions of historic and cultural resources in the St. Lucie initial license renewal supplemental EIS (NRC 2003-TN3152) and in FPL's ER, as supplemented (FPL 2021-TN12166, FPL 2025-TN12167).

The descriptions of historic and cultural resources in the St. Lucie initial license renewal supplemental EIS (NRC 2003-TN3152) and in FPL's ER, as supplemented (FPL 2021-TN12166, FPL 2025-TN12167), are based on historic and archaeological site file searches in the Florida Division of Historical Resources' Florida Master Site File. The purpose of those searches was to identify historic and cultural resources that might be present on or near the St. Lucie site. The St. Lucie initial license renewal supplemental EIS (NRC 2003-TN3152) and FPL's ER, as supplemented (FPL 2021-TN12166, FPL 2025-TN12167), identify five archaeological sites on or immediately adjacent to the St. Lucie site. Only one site is considered potentially eligible for listing in the National Register of Historic Places. Two of the sites lack sufficient information for National Register of Historic Places eligibility determination, and the other two sites are shipwrecks that have not been evaluated by the State Historic Preservation Officer. The Florida Master Site File lists no historic structures at St. Lucie, nor have any been documented through the Historic American Buildings Survey or Historic American Engineering Record programs.

FPL has no cultural resources management or unanticipated discoveries plan for St. Lucie. Any inadvertent discovery of human remains (e.g., offences concerning dead bodies and graves; unmarked human burials) would be handled under Florida statutes.

### 3.6.2 Environmental Consequences: Historic and Cultural Resources

Table 3-2 identifies one plant-specific (Category 2) historic and cultural resources issue applicable to St. Lucie subsequent license renewal. The environmental consequences of the proposed action associated with this issue are described below.

Section 106 of the NHPA (54 U.S.C. § 306108-TN4839) requires Federal agencies to consider the effects of their undertakings on historic properties. Renewing a nuclear power plant operating license is an undertaking that could potentially affect historic properties. The definition of historic property is provided in Protection of Historic Properties regulations at 36 CFR 800.16(l) (TN513).

The NRC complies with NHPA Section 106 through its NEPA review process and is required to identify affected historic properties in the area of potential effect. The area of potential effect for the proposed action consists of the St. Lucie site and immediate environs. The NRC is also required to assess and resolve any adverse effects on historic properties in consultation with the State Historic Preservation Officer and any affected Indian Tribe.

Based on the location of historic properties and the fact that there are no planned physical changes or ground-disturbing activities at St. Lucie during the subsequent license renewal term, the NRC staff concludes that the proposed action (subsequent license renewal) would not adversely affect historic properties.

## 3.7 Human Health

### 3.7.1 Affected Environment

Section 3.10 of FPL's ER (FPL 2021-TN12166) provides affected environment information pertaining to microbiological hazards and electric shock hazards. The description of these hazards in the ER addresses the conditions likely to contribute to the occurrence of pathogenic thermophilic microbiological organisms and methodology and procedures designed to meet the regulatory requirements and standards for limiting potential

induced current hazards arising from energized in-scope transmission lines. This information is incorporated herein by reference.

### 3.7.2 Environmental Consequences: Microbiological Hazards to the Public

The NRC relies upon the information in Section 3.9.2.2 of the LR GEIS (NRC 2024-TN10161) to provide background information for microbiological hazards to the public from nuclear power plants.

Because St. Lucie uses a once-through cooling system for both units that draws salt water from the Atlantic Ocean and discharges back to the ocean, the microbiological hazards are lower than for a system that draws from a freshwater river or lake. Permit limits for St. Lucie effluent temperatures are regulated under St. Lucie's industrial wastewater facility permit (No. FL0002208). This permit specifies that the daily maximum effluent temperature limit is 115°F (46°C) during normal operation and that the difference between the intake and discharge temperatures can be a maximum of 30°F (17°C) (FPL 2025-TN12487). There have been no thermal limit exceedances since the submittal of the St. Lucie subsequent license renewal ER. St. Lucie's discharge limits remain in effect as presented in FPL's subsequent license renewal ER (FPL 2021-TN12166).

FPL has consulted with the Florida Department of Health (FDOH), the State agency responsible for environmental health, regarding the potential existence and concentration of certain microorganisms noted in the LR GEIS in the receiving waters for plant cooling water discharge. Correspondence with the FDOH regarding the St. Lucie thermal discharge is included in FPL's ER (FPL 2021-TN12166) and FPL's responses to the 2022 audit (FPL 2022-TN12263). In summary, the FDOH concluded that exposure to heated wastewater discharge would be minimal or may not occur, particularly for the microorganisms of concern. This conclusion is supported by the facts that *N. fowleri* is not found in saltwater and that the discharge occurs 1,500 ft (460 m) offshore. Additionally, *Legionella* spp. exposure and amplification are unlikely in the Atlantic Ocean. The FDOH also reviewed its Merlin database for *Salmonella* spp. and *Shigella* spp. cases reported to the FDOH for the area from 2018–2021, which showed no cases of concern (See FPL 2022-TN12263: Enclosure 1 RCI response).

The NRC staff confirmed, per the FDOH's food and waterborne disease outbreak data (updated through 2021), that no outbreaks were reported for St. Lucie County from 2020–2021 (FDOH 2025-TN12476). The FDOH stated that of Florida's 38 cases of primary amebic meningoencephalitis documented from 1962 to 2020, none were due to exposures in St. Lucie County (FDOH 2025-TN12476). Additionally, the NRC staff reviewed (FDEP 2025-TN12410) FDEP's algal bloom sampling status database, which contains no reports of algal blooms in the vicinity of St. Lucie's thermal discharge (FPL 2025-TN12167). FPL is not aware of any algal or bacteria blooms in the Atlantic Ocean in the vicinity of the St. Lucie thermal discharge occurring since 2021.

Although the water in the discharge canal may have temperatures favorable to thermophilic microbes, their growth would be prohibited by the presence of biocides from treatment of the cooling system and the salinity of the water (*N. fowleri* does not live in seawater). The discharge canal is closed to the public and the water in the discharge canal is released into the Atlantic Ocean 1,500 ft (460 m) or more offshore and away from public access beaches. Once released, it is rapidly diluted with the ocean water.

During the proposed subsequent license renewal term, the public health risk from *N. fowleri*, Legionnaires' disease, or other microbiological hazards would remain extremely low, and the proposed action would not result in operational changes that would affect thermal effluent temperature or otherwise create favorable conditions. Based on its review of FPL's ER, as supplemented (FPL 2021-TN12166, FPL 2025-TN12167), FPL's 2025 responses to the NRC staff's information requests (FPL 2025-TN12264), and pertinent information available in the public domain, the NRC staff concludes that the impacts of microbiological hazards on the public due to continued nuclear power plant operations at St. Lucie during the subsequent license renewal term, when considering other past, present, and reasonably foreseeable actions, would be SMALL because thermal effluent discharges from St. Lucie during the subsequent license renewal term would not contribute to the proliferation of microorganisms of concern in the discharge canal or the Atlantic Ocean.

### 3.7.3 Environmental Consequences: Electromagnetic Fields

The NRC staff relies upon the information in Section 3.9.2.3 and Section 4.9.1.1.4 of the LR GEIS (NRC 2024-TN10161) to provide background information regarding electric fields and magnetic fields, referred to collectively as electromagnetic fields (EMFs), that are produced by any electrical equipment, including operating transmission lines.

In-scope transmission lines at St. Lucie are defined as:

- the overhead 230 kilovolts (kV) transmission line that connects the Units 1 and 2 power block main transformers to the switchyard
- the overhead 230 kV transmission line that provides power from the switchyard to the plant electrical system to power the plant during outages

Scientific consensus on the health implications of EMFs has not been established. The potential health effects from EMF exposure have been the subject of published studies as described in the LR GEIS (NRC 2024-TN10161), but consistent evidence of harmful effects remains inconclusive. The National Institute for Occupational Safety and Health does not consider EMFs to be a proven health hazard (NIOSH 1996-TN6766).

Although there are no Federal standards limiting residential or occupational exposure to EMFs from power lines, some States, including Florida, have set EMF standards for transmission lines (NIEHS 2002-TN6560). In Florida, EMFs from electrical transmission lines are regulated under the provisions of Section 403.061(31), Florida Statutes, and FAC Chapter 62-814 (TN644). Compliance with the EMF standards is demonstrated through monitoring and reporting by utilities, including FPL with respect to St. Lucie (FDEP 2025-TN12485).

Given the uncertainty surrounding the health effects of EMFs, the LR GEIS (NRC 2024-TN10161) and 10 CFR Part 51 (TN10253), Subpart A, Appendix B, do not designate the health effects of EMFs as either a Category 1 or a Category 2 issue, and they remain UNCERTAIN until a scientific consensus is reached on the health implications of EMFs. The NRC staff considers the LR GEIS finding of "UNCERTAIN" to still be applicable to the proposed action of St. Lucie subsequent license renewal and will continue to follow developments on this issue.

### 3.7.4 Environmental Consequences: Electric Shock Hazards

The NRC staff relies upon the information in Section 4.9.2.4 of the LR GEIS (NRC 2024-TN10161) to provide background information regarding electric shock hazards. Based on its evaluation in the LR GEIS (NRC 2024-TN10161), the NRC staff found electric shock resulting from direct access to energized conductors or from induced charges in metallic structures to not be a problem at most operating nuclear power plants. Therefore, the NRC staff also does not expect electric shock from such sources to be a human health hazard during a nuclear power plant's subsequent license renewal term. However, a plant-specific review is required to determine the significance of the electric shock potential along the portions of the transmission lines that are within the scope of this EIS.

Section 4.9.2.4 of FPL's ER (FPL 2021-TN12166) and Section 5.11.1.4 of FPL's ER Supplement (FPL 2025-TN12167) describe the electric shock hazards at St. Lucie, including both those to plant workers and to the public. The NRC staff summarizes that information below and incorporates those sections by reference herein.

Nuclear power plant workers may perform electrical work, electric power line maintenance, repair work, and maintenance activities and may be exposed to potential electric shock. At the St. Lucie site, FPL uses and follows Occupational Safety and Health Administration standards for electric power generation, transmission, and distribution, as delineated in 29 CFR 1910.269 (TN654). Work on and near the in-scope transmission lines is also governed by station procedure and FPL's comprehensive health and safety program. Continued adherence to these standards and procedures would minimize the potential for acute electric shock of workers during the proposed subsequent license renewal term.

As discussed in this EIS, the in-scope transmission lines are located completely within the St. Lucie property boundary and the owner-controlled area. Portions of the in-scope transmission lines span the fenced protected area, the intake canal, and the fenced switchyard, which have extra layers of control measures. Thus, the in-scope transmission lines are not accessible to the public (FPL 2021-TN12166); therefore, they present no electric shock hazard to the public.

As discussed during the 2025 audit, FPL conducted a LiDAR survey in 2011 of the in-scope transmission lines and the survey confirmed compliance with National Electrical Safety Code clearance standards (FPL 2025-TN12264), which establish safe separation distances between electric lines, the ground, and other structures to protect workers and the public. FPL has confirmed that in-scope transmission lines running from the plant to the onsite switchyard have adequate clearance. This was shown in the selected images from the survey made available for review by the NRC staff. The nearest point for public approach is from a publicly accessible internal plant road and parking spaces on the southeast corner of the switchyard. Clearance for the conductor to the ground near this point is approximately 41 ft (13.41 m). The required clearance for 230 kV lines is 22.5 ft (6.858 m) per the 2023 National Electrical Safety Code that the Florida Public Service Commission adopted on September 16, 2024 (FPL 2025-TN12264).

Based on FPL's ongoing commitment to standards and protocols to minimize hazards to workers from acute electric shock and the inaccessibility of the in-scope transmission lines to the public, the NRC staff concludes that the potential impacts from electric shock hazards during the subsequent license renewal term, when considering other past, present and reasonably foreseeable actions, would be SMALL.

## 3.8 Greenhouse Gas Emissions and Climate Change

### 3.8.1 Affected Environment

Table 3-2 identifies one plant-specific (Category 2) greenhouse gas emissions and climate change issue applicable to St. Lucie subsequent license renewal, which is climate change impacts on environmental resources. The scope of this issue and the NRC staff's environmental review under its regulations implementing NEPA is limited to the potential effects from continued nuclear power plant operation on the environment. The effects of climate change on St. Lucie is not within the scope of the NRC staff's environmental review. Instead, plant-specific environmental conditions are considered when siting nuclear power plants. This includes the consideration of meteorological and hydrologic siting criteria as set forth in 10 CFR Part 100 (TN282), "Reactor Site Criteria."

The NRC regulations require that plant structures, systems, and components important to safety be designed to withstand the effects of natural phenomena, such as flooding, without loss of capability to perform safety functions. Further, nuclear power plants are required to operate within technical safety specifications in accordance with the plants' NRC operating licenses, including coping with natural phenomena hazards. The NRC staff conducts safety reviews before allowing licensees to make operational changes due to changing environmental conditions. Additionally, the NRC staff evaluates nuclear power plant operating conditions and physical infrastructure to ensure safe operation under the plant's initial and renewed operating licenses through the NRC's Reactor Oversight Program. If new information about changing environmental conditions that threaten safe operating conditions or challenge compliance with a plant's technical specifications becomes available, the NRC staff will evaluate that information to determine if any safety-related changes are needed at the plant. The NRC has also implemented the Process for the Ongoing Assessment of Natural Hazard Information (POANHI) into nuclear plant oversight, recognizing that historical data may not fully reflect potential future impacts. Through the POANHI framework, the NRC staff is continually reviewing new natural hazard information for the purpose of identifying any potential gaps relevant to the NRC's licensing and oversight processes related to changing natural hazard conditions. Information on the POANHI is available on the NRC's website at https://www.nrc.gov/reactors/operating/ops-experience/poanhi.html. These are all separate and distinct processes from the NRC staff's subsequent license renewal environmental review and are not within the scope of the NRC staff's subsequent license renewal environmental review.

Climate change and its impacts can vary regionally and seasonally, depending on local, regional, and global factors. Observed climate changes and impacts have not been uniform across the United States. Annual average temperature data for a greater part of Florida between 2002 and 2021 (relative to 1901–1960) exhibit an increase of 1.0°F to 2.0°F (0.56°C to 1.1°C) (USGCRP 2023-TN9762). The number of hot days (days at or above 95°F [35°C]) has decreased by 9.7 days, the number of cold days (days at or below 32°F [0°C]) has increased by 3.0 days, and the number of warm nights (nights at or above 70°F [21°C ]) has increased by 7.9 days in the southeast region from 2002 to 2021 relative to 1901–1960 (USGCRP 2023-TN9762).

Average annual precipitation from 2002 to 2021 (relative to the 1901–1960 average) across Florida varies, with some areas experiencing an increase in precipitation (primarily western areas of the state) and other areas experience a decrease in precipitation (primarily central and eastern areas of the state) (USGCRP 2023-TN9762). The Southeast has experienced a 37 percent increase in the number of extreme precipitation days (defined as the top 1 percent of

heaviest precipitation events) from 1958 to 2021 (USGCRP 2023-TN9762). Between 1993 and 2020, off the eastern coast of Florida, average sea level rose 2–3 in. (5.1–7.7 cm) per decade (USGCRP 2023-TN9762). From 1901 through 2023, sea surface temperatures increased at an average rate of 0.14°F (0.078°C) per decade (EPA 2024-TN10205). From 1901 through 2022, sea surface temperatures off the east coast of Florida increased 1°F–1.5°F (0.56°C–0.83°C) (EPA 2024-TN10205).

### 3.8.2 Environmental Consequences: Climate Change Impacts on Environmental Resources

The NRC staff relies upon the information in Section 4.12.2 of the LR GEIS (NRC 2024-TN10161) to provide background information regarding the Category 2 issue of "climate change impacts on environmental resources." According to the LR GEIS, the impacts of climate change on environmental resources during the subsequent license renewal term are location-specific and cannot be generically evaluated. Changes in climate can have broad implications for certain resource areas. Climate change may impact the affected environment in a way that alters the environmental resources that are impacted by the proposed action. In order for a climate change impact on an environmental resource to be within the scope of the proposed action, the proposed action must have an incremental new, additive, or increased physical effect or impact on the resource or environmental condition beyond what is already occurring. Below, the NRC staff considers the effects of climate change on environmental resource areas that may also be directly affected by continued operations during the subsequent license renewal term.

The NRC staff considered the best available climate change studies performed by the U.S. Global Change Research Program (USGCRP) and partner agencies as part of the staff's assessment of potential changes in climate indicators during the St. Lucie subsequent license renewal terms (2036–2056 for Unit 1 and 2043–2063 for Unit 2). Reports from the USGCRP and partner agencies provide projected changes in temperature, precipitation patterns, and other climate outcomes on a regional level. The results of these studies are summarized below.

Regional projections for annual mean temperature are available from the Fourth National Climate Assessment based on the Representative Concentration Pathway (RCP) 4.5 and RCP 8.5 scenarios for the mid-century (2036–2065) as compared to the average for 1976–2005. The modeling predicts increases of 3.4–4.3°F (1.9–2.4°C) across the U.S. southeast region by mid-century (USGCRP 2017-TN5848). Under the RCP 8.5 scenario, the coldest and warmest daily temperatures of the year are expected to increase by 4.97°F and 5.69°F (2.76°C and 3.16°C), respectively, in the southeast by midcentury (USGCRP 2017-TN5848). For the portion encompassing Florida, the Fifth National Climate Assessment projects annual temperature increases from 2.0°F–3.0°F (1.1°C–1.7°C) under the 1.5°C (2.7°F) global warming level scenario and 6.0°F–7.0°F (3.3°C–3.9°C) under the 4.0°C (7.2°F) global warming level scenario (USGCRP 2023-TN9762), compared to the period 1851–1900.

Climate model simulations suggest spatial differences in annual mean precipitation change across the U.S. southeast with some areas experiencing an increase and others a decrease in precipitation. Based on the intermediate (RCP 4.5) emission scenarios for the mid-century (2036–2065), annual mean precipitation is projected to decrease by up to 2 in. (5.1 cm) relative to 1991–2020 in southern Florida (USGCRP 2023-TN9762). Average annual precipitation in southern Florida is projected to decrease by 0–5 percent compared with the period 1851–1900 for all global warming levels (USGCRP 2023-TN9762).

The Fifth National Climate Assessment projections include continued increases in the frequency and intensity of heavy or extreme precipitation events across the United States, including across the southeast region (USGCRP 2014-TN3472, USGCRP 2017-TN5848, USGCRP 2018-TN5847, USGCRP 2023-TN9762). For the southeast region, models predict an up to 10, 15, and 10 percent increase in the total precipitation on the heaviest 1 percent of days, 5-year maximum daily precipitation, and annual maximum daily precipitation, respectively, at the 3.6°F (2°C) global warming level in eastern Florida (USGCRP 2023-TN9762).

The Fifth National Climate Assessment reports that the average range of sea level rise by 2050 (relative to 2000) in the U.S. southeast is projected to increase by 1.3–1.9 ft (0.40–0.58 m) (USGCRP 2023-TN9762: Chapter 22). These sea level rise projections are based on five global mean sea level rise scenarios for 2100 (low: 1 ft [0.3 m], intermediate-low: 1.5 ft [0.5 m], intermediate: 3 ft [1 m], intermediate-high: 5 ft [1.5 m], and high: 6.5 ft [2 m]) and are downscaled to local and regional levels (Sweet et al. 2022-TN10207). The Interagency Sea Level Rise Scenario Tool developed sea level rise estimates at individual tide gauge locations. These estimates are observation-based extrapolations based on the five global mean sea level rise scenarios for 2100 and the rate and acceleration of sea level rise from 1970 to 2020 calculated from sea level rise observations from regional tide gauges. The Interagency Sea Level Rise Scenario Tool includes scenarios for Port Canaveral (approximately 75 mi [120 km] north of St. Lucie). The median range of sea level rise in Key West is projected to be 0.83–1.51 ft (0.25–0.46 m) by 2050 (relative to 2000) and 0.98–2.26 ft (0.29–0.68 m) by 2060 (relative to 2000) (NASA 2025-TN12411).

The Fifth National Climate Assessment reports that sea level rise will continue to cause permanent inundation and an increase in the severity of coastal flooding (USGCRP 2023-TN9762). By 2050, under an intermediate sea level scenario, minor (disruptive, 1–2 ft [0.3–0.6 m] of flooding in shoreline and vulnerable areas), moderate (damaging, 2–3 ft [0.6–0.9 m] of flooding in shoreline and vulnerable areas), and major (destructive, 3–5 ft [0.9–1.5 m] of flooding in shoreline and vulnerable areas) coastal flood frequencies will increase by a factor of 5 to 10, relative to 2020 (USGCRP 2023-TN9762: Figure 9.3).

Since the 1980s, hurricanes have been intensifying more rapidly and causing heavier rainfall and high storm surges (USGCRP 2023-TN9762). More North Atlantic hurricanes are expected to strengthen to at least a Category 4 intensity and undergo rapid intensification with greater increases in global surface temperature (USGCRP 2023-TN9762). The Fifth National Climate Assessment reports that recent research finds uncertainty in the future frequency of Atlantic hurricanes, landfall behavior, and their associated hazards. Sea surface temperatures are projected to continue to increase. Projections indicate an increase of 3.0°F (1.7°C) at 2.7°F (1.5°C) and up to 6.0°F (3.3°C) at 7.2°F (4.0°C) off the east coast of Florida (USGCRP 2023-TN9762).

*Air Quality*: Climate change can impact air quality as a result of changes in meteorological conditions. Air pollutant concentrations are sensitive to winds, temperature, humidity, and precipitation. Ozone levels and particulate matter have been found to be particularly sensitive to climate change influences. Ozone is formed by the chemical reaction of nitrogen oxides and volatile organic compounds in the presence of heat and sunlight. The emission of ozone precursors also depends on the temperature, wind, and solar radiation (IPCC 2007-TN7421). Warmer temperatures, air stagnation, droughts, and wildfires are favorable conditions for higher levels of ozone and particulate matter with a mean aerodynamic diameter of 2.5 micrometers (μm) or less (USGCRP 2023-TN9762). Studies indicate that the position of the Bermuda High in the summer influences surface ozone in the eastern part of the United States (Zhang and Wang

2016-TN10554). USGCRP reports that there is medium confidence that climate change is projected to worsen air quality in many U.S. regions (USGCRP 2023-TN9762). This is due to the uncertainty in how meteorological conditions will respond to climate change and affect air pollutant concentrations. St. Lucie County is designated in attainment for all National Ambient Air Quality Standards (40 CFR 81.310 [TN7226]). Under the RCP 4.5 emission scenario, East et al. (2024-TN10550) found that by mid-century the average 1-year ozone concentrations may increase by 2 parts per billion (ppb) across most of the United States, including the southeast, and the average number of days per year with ozone levels of 70 ppb or higher for 8 hours or longer may increase by at least 4 days per year. The findings of East et al. (2024-TN10550) suggest that increasing the frequency of high ozone concentrations can increase the risk of not meeting National Ambient Air Quality Standards by mid-century in areas currently attaining them. However, criteria pollutant emissions from the operation of St. Lucie are minor, and annual average emissions (for the 2015–2019 time period, presented in Table 3.3-10 of FPL's ER [2021-TN12166]) represent less than 1 percent of the 2020 St. Lucie County total emissions (EPA 2025-TN12495). Therefore, the NRC staff concludes that any climate change-related deterioration in air quality in St. Lucie County would not exacerbate the minor air quality impacts associated with St. Lucie subsequent license renewal.

*Surface Water Resources:* As described above, climate change projections suggest that a variety of impacts to water resources in the region where St. Lucie is located may occur over the subsequent license renewal period. These impacts may include an increase or decrease in annual mean precipitation depending on the simulation scenario, more extreme precipitation events, sea level rise, and increasing sea surface temperatures. St. Lucie surface water withdrawals are exclusively from the Atlantic Ocean. Therefore, climate change impacts to the Atlantic Ocean are the primary concern for this analysis. The Atlantic Ocean near St. Lucie has been classified by the State of Florida as a Class III marine body with designated uses of recreation, and propagation and maintenance of a healthy, well-balanced population of fish and wildlife (Fla. Admin. Code 62-302-TN776).

St. Lucie withdraws saltwater from the Atlantic Ocean to remove heat from the main condensers and other auxiliary equipment through three cooling water intake structures located about 1,200 ft (370 m) offshore, where the water is approximately 23 ft (7 m) deep (FPL 2021-TN12166). Separate buried pipes convey the withdrawn water beneath the beach and dune system to the approximately 4,920 ft (1,500 m) long, 180 ft (55 m) wide trapezoidal-shaped intake canal. Water is withdrawn from the intake canal at the intake wells (see FPL 2021-TN12166) and pumped through the main condensers to the discharge canal. The discharge canal transports the heated cooling water to two discharge pipes beneath the beach and dune system where thermal effluents are discharged back to the Atlantic Ocean through a series of diffusers. St. Lucie's Atlantic Ocean discharge is the sole thermal discharge along St. Lucie's approximately 2.35 mi (3.78 m) long oceanfront (FPL 2021-TN12166). Between 2020 and 2024, the St. Lucie once-through cooling system withdrew an average of approximately 1,400 million gallons per day (MGD) (5,300 million liters per day [MLD]) from the Atlantic Ocean (FPL 2021-TN12166, FPL 2025-TN12264).

Thermoelectric plant once-through cooling systems return most of their withdrawn water to the same surface water body, with evaporative losses of approximately 1 percent (Dieter et al. 2018-TN6681). The St. Lucie site water balance is illustrated in ER Figure 2.2-1 (FPL 2021-TN12166), which is incorporated by reference herein. Given the projected sea level rise and vast quantity of water available in the Atlantic Ocean, there are no anticipated or reasonably foreseeable conflicts in surface water supplies and allocations over the subsequent license renewal term.

St. Lucie's NPDES permit requires hourly temperature monitoring and establishes thermal limits for cooling water discharge to prevent an adverse effect on the balanced, indigenous population of fish and shellfish in the vicinity of the discharge. The NPDES permit requires that heated water from the diffusers, as measured near the exit from the discharge canal, does not exceed 115°F (46°C) or 30°F (16.7°C) above ambient during normal operations. A maximum temperature of 117°F (47°C) or 32°F (17.8°C) above ambient is permitted during certain maintenance operations (FPL 2025-TN12346). Over the past five years, St. Lucie has not needed to reduce power to meet thermal discharge limits (FPL 2025-TN12264), and there are no planned operational changes during the proposed subsequent license renewal term that would increase the temperature of St. Lucie's existing thermal discharge (FPL 2021-TN12166).

As discussed above, from 1901 through 2022, sea surface temperature off the east coast of Florida increased 1–1.5°F (0.56–0.83°C) (EPA 2024-TN10205).Figure 3-4 presents monthly average intake water temperatures for the months of July, August, and September from 2013 to 2024 from the Atlantic Ocean (FPL 2025-TN12264). The air and sea surface temperatures in the regions encompassing St. Lucie are predicted to increase. Projections indicate an increase of 3.0°F (1.7°C) at 2.7°F (1.5°C) global warming level and up to 6.0°F (3.3°C) at 7.2°F (4.0°C) global warming level off the east coast of Florida (USGCRP 2023-TN9762). Warmer water and higher air temperatures can reduce the efficiency of thermal power plant cooling technologies. Increased seawater temperatures could lead to an increase in annual average seawater withdrawal and other operational changes and/or an increase in the volume and temperature of the circulating cooling water discharged back to the Atlantic Ocean. Regardless of potential changes in future environmental conditions, St. Lucie withdrawal rates and thermal and chemical discharges would still need to meet applicable permit requirements. Additionally, regulatory agencies would be expected to account for changes in environmental conditions in their water resources allocation and environmental permitting programs, as necessary, to protect the water quality of the Atlantic Ocean.

Given (1) the projected sea level rise, (2) the vast quantity of water available in the Atlantic Ocean, (3) the thermal limits for cooling water discharge; and (4) the minimal water consumption, the NRC staff concludes that the impacts to water availability and quality from the continued operation of St. Lucie during the subsequent license renewal term would not be exacerbated by the projected changes in climate.

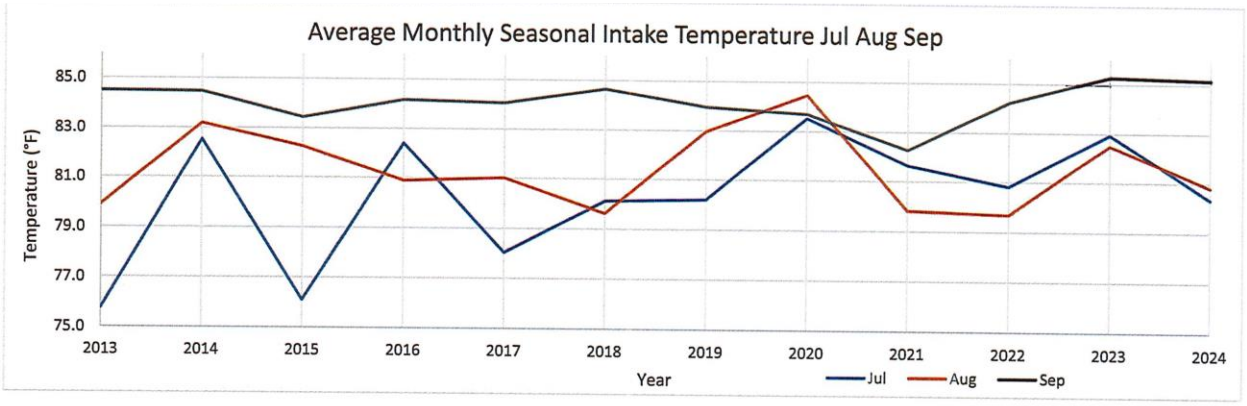



**Figure 3-4 Average Monthly Intake Water Temperature for July, August and September (2013–2024), Drawn as Cooling Water for the St. Lucie Plant**

*Ecological Resources:* With respect to aquatic ecological resources, as explained for surface water resources, increased seawater temperatures could lead to increased volumetric ocean water withdrawal requirements and related increases in discharge temperatures. The FDEP would continue to regulate ocean water withdrawal and discharge through St. Lucie's NPDES permit, the limits of which must meet the CWA's statutory requirements to minimize impacts on the aquatic environment. Regardless, if the plant withdraws more water, this would lead to a proportional increase in the number of aquatic organisms impinged and entrained and may result in a larger area in which aquatic organisms could experience elevated temperatures resulting from St. Lucie's thermal effluent discharge. Simultaneously, the aquatic ecosystem will be under additional pressure from increasing ocean and air temperatures and extreme weather events. For example, coral reefs are threatened by the cumulative impacts of ocean warming and acidification, marine heatwaves resulting in bleaching and higher susceptibility to diseases, increasingly powerful tropical cyclones causing loss of structural complexity, hypoxia (low oxygen) events, overfishing, and pollution, all of which are accelerating and will continue to accelerate loss of species richness and diversity (USGCRP 2023-TN9762). Compounding these effects, the timing of seasonal events such as spawning and egg hatching will shift, and certain species' ranges will change in response to temperature and weather changes. This may result in asynchronicities between predators and their prey, which could disrupt the trophic structure and food chains in aquatic ecosystems. Rising seawater temperatures may also favor invasive species, nuisance species, and aquatic pathogens, further exacerbating these effects. Nevertheless, given the vast quantity of water available in the Atlantic Ocean; the thermal limits for cooling water discharge; and the minimal water consumption of St. Lucie's once-through cooling system, the NRC staff concludes that the impacts to water availability and quality from the continued operation of St. Lucie during the subsequent license renewal term would not be exacerbated by the projected changes in climate.

# 4 CONCLUSION

## 4.1 Environmental Impacts of the Proposed Federal Action

This EIS documents the NRC staff's environmental review of the application for subsequent renewed facility operating licenses for St. Lucie. After conducting an independent review for identifying new and significant information for Category 1 issues applicable to St. Lucie, the NRC staff did not identify any such information. Therefore, the NRC staff adopted the conclusions of the LR GEIS for those issues in this EIS, as summarized in Table 3-1. The NRC staff also evaluated the environmental impacts associated with the applicable Category 2 issues, with the affected environment and the environmental consequences to that affected environment for each issue discussed in Sections 3.2 through 3.8 and summarized in Table 3-2. The NRC staff considered mitigation measures for each Category 2 issue, as applicable, and concluded that no additional mitigation measures are warranted. Finally, the NRC staff determined that the environmental issue of the MMPA applied to St. Lucie subsequent license renewal despite not being identified in the LR GEIS and evaluated that issue in Section 3.5.5. Taken together, the NRC staff has been informed by and has provided information on the totality of the environmental impacts of the proposed action.

## 4.2 Comparison of Alternatives

In Chapter 3, the NRC staff documents its analysis of the environmental impacts of the proposed action. In Chapter 2, the NRC staff documents its analysis of the environmental impacts of the no-action alternative, which consist of the impacts of St. Lucie shutdown and the impacts of new energy generating assets and, in Table 2-1, compares those impacts to the impacts of the proposed action. As shown in Table 2-1, the no-action alternative would have environmental impacts greater than the proposed action. Based on this review, the NRC staff concludes that the environmentally preferred alternative is the proposed action.

## 4.3 Recommendation

The NRC staff's preliminary recommendation is that the adverse environmental impacts of subsequent license renewal for St. Lucie are not so great that preserving the option of subsequent license renewal for energy-planning decision-makers would be unreasonable. This preliminary recommendation is based on:

- the analysis and findings in the LR GEIS
- the ER submitted by the applicant, as supplemented
- the NRC staff's consultation with Federal, State, and local governmental agencies and Indian Tribes
- the NRC staff's independent environmental review
- the NRC staff's consideration of public comments received during the scoping process

# 5 LIST OF PREPARERS

**Table 5-1 List of Preparers**

| Name | Education and Experience |
|---|---|
| Briana Arlene, NRC | Master Certification, NEPA<br>BS Conservation Biology<br>20 years of experience in ecological impact analysis, ESA Section 7 consultations, and EFH consultations |
| Mitchell Dehmer, NRC | PSM Environmental Science<br>GradCert Environmental Management<br>GradCert Energy Policy<br>BS Biology<br>10+ years of professional and technical experience |
| Lloyd Desotell, NRC | MS Civil Engineering<br>MS Water Resources Management<br>BA Environmental Studies<br>Over 20 years of experience conducting surface and subsurface hydrologic analyses |
| Peyton Doub, NRC | MS Plant Physiology<br>BS Plant Sciences (Botany)<br>Professional Wetland Scientist (PWS)<br>Certified Environmental Professional (CEP)<br>Duke NEPA Certificate<br>38 years of relevant experience |
| Shannon Healy, NRC | MS Environmental Science<br>BS Biology<br>10 years combined academic and professional experience |
| Caroline Hsu, NRC | BS Molecular Biology<br>BA English Literature<br>17 years of government experience |
| Stephen Koenick, NRC | MS Environmental Engineering<br>BS Mechanical Engineering<br>Over 30 years of government experience |
| Nancy Martinez, NRC | BS Earth and Environmental Science<br>MA Earth and Planetary Science<br>13 years of experience in environmental impact analysis |
| Leah Parks, NRC | PhD Environmental Management<br>MS Environmental Engineering<br>BS Systems and Information Engineering<br>17 years of academic and government experience including nuclear power plant operations, health physics, decommissioning, waste management, environmental impact analysis, and performance assessment |
| Lance Rakovan, NRC | MS Nuclear Engineering<br>BS Engineering Physics<br>PMP<br>Nearly 30 years project management experience; over 20 years of experience facilitating public NEPA interactions |
| William Rautzen, NRC | MS Health Physics<br>BS Health Physics<br>BS Industrial Hygiene<br>21 years of government experience including 15 years of environmental impact analysis |

| Name | Education and Experience |
|---|---|
| Jeffrey Rikhoff, NRC | MRP Regional Environmental Planning<br>MS Development Economics<br>BA English Composition<br>45 years of combined industry and government experience in NEPA compliance for DOE Defense Programs/NNSA and Nuclear Energy, DoD, and DOI; project management; land use and socioeconomic impact analysis, historic and cultural resource impact assessments, consultation with American Indian Tribes, and comprehensive land use and industrial development planning studies |
| Gerry Stirewalt, NRC | PhD Structural Geology with Two Postdoctoral Appointments<br>BA Geology and Mathematics<br>Registered PG and CEG<br>Over 50 years of experience in Environmental and Engineering Geology with academia, industry, and the Federal government including university teaching; evaluation of high-level radioactive waste disposal sites; characterization of nuclear power sites; three-dimensional geospatial modeling of subsurface stratigraphy, tectonic faults, and groundwater contaminant plumes; and preparation of EIS sections covering geologic environment and groundwater resources |
| Rao Tammara, NRC | MS Chemical and Environmental Engineering<br>BS Chemical Engineering<br>50 years of experience in Environmental, Nuclear Consulting |
| Teresa Carlon, PNNL | BS Information Technology<br>30 years of experience as SharePoint administrator, project coordinator, reference management, and databases |
| Leah Hare, PNNL | MS Geographic Information Science<br>BS Environmental Studies<br>10+ years of experience in environmental monitoring, regulatory compliance, project management, and environmental assessment |
| Philip Meyer, PNNL | PhD Civil Engineering<br>MS Civil Engineering<br>BA Physics<br>30+ years relevant experience in subsurface hydrology and contaminant transport, including 15+ years of experience in groundwater resource assessment and environmental impacts analysis |
| Dan Nally, PNNL | MA Urban and Environmental Policy and Planning<br>BS Biology<br>13 years of experience in preparation and review of NEPA documents, related regulatory compliance, and conducting public outreach and engagement |
| Mike Parker, PNNL | BA English Literature<br>25 years of experience copyediting, document design, and formatting and 20 years of experience in technical editing and formatting of NEPA documents |

AM or MA = Master of Arts; BA = Bachelor of Arts; BS = Bachelor of Science; CEG = Certified Engineering Geologist; DoD = U.S. Department of Defense; DOE = U.S. Department of Energy; DOI = U.S. Department of Interior; GradCert = Graduate Certificate; MBA = Master of Business Administration; MRP = Master of Regional Planning; MS = Master of Science; NEPA = National Environmental Policy Act of 1969; NNSA = National Nuclear Security Administration; NRC = U.S. Nuclear Regulatory Commission; PG = Professional Geologist; PhD = Doctor of Philosophy; PMP = Project Management Professional; PNNL = Pacific Northwest National Laboratory; PSM = Professional Science Masters; PWS = Professional Wetland Scientist.

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NRC (U.S. Nuclear Regulatory Commission). 2025. Letter from L.J. Rakovan, Senior Environmental Project Manager Environmental Project Management Branch 1) Division of Rulemaking, Environmental, and Financial Support, Office of Nuclear Material Safety and Safeguards, to R. Coffey, Executive Vice President Nuclear Officer Florida Power and Light Company Nuclear Division and Chief, dated April 2, 2025, regarding “St. Lucie Nuclear Plant, Units 1 and 2 – License Renewal Regulatory Audit Regarding the Environmental Review of the Subsequent License Renewal Application Supplement (EPID Number: L-2021-SLE-0003).” Washington, D.C. ADAMS Accession No. ML25078A071. TN12269.

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# APPENDIX A

# COMMENTS RECEIVED ON THE ST. LUCIE PLANT, UNITS 1 AND 2 ENVIRONMENTAL REVIEW

## A.1 Environmental Scoping Summary

The scoping process began on October 22, 2021, with the publication of the U.S. Nuclear Regulatory Commission (NRC, the Commission) notice of intent to conduct scoping in the *Federal Register* (86 FR 58701-TN12260). The scoping process included two virtual public meetings held on November 3, 2021. The meetings consisted of prepared statements by NRC staff and a public comment session. Attendees provided oral statements that were recorded and transcribed by a certified court reporter. Written statements submitted at the public meetings are captured in the NRC's Agencywide Documents Access and Management System. The transcripts of the public meetings are included as attachments to the summary of the meetings, dated March 18, 2024 (NRC 2021-TN12265). In addition to the comments received during the public meetings, comments were also received electronically via Regulations.gov and email. At the conclusion of the scoping process, the NRC staff issued a scoping summary report (NRC 2022-TN12268). The report contains a summary of comments received during the public meetings and electronically during the scoping period as well as the NRC staff's consideration of those comments.

## A.2 References

86 FR 58701. October 22, 2021. "Notice of Intent To Conduct Scoping Process and Prepare Environmental Impact Statement; Florida Power & Light Co.; St. Lucie Plant Units 1 and 2." *Federal Register*, Nuclear Regulatory Commission. TN12260.

NRC (U.S. Nuclear Regulatory Commission). 2021. Public Meeting Announcement, November 3, 2021, "Environmental Scoping Meeting Related to the St. Lucie Plant, Units 1 and 2, Subsequent License Renewal Application." Washington, D.C. ADAMS Accession No. ML21337A206. TN12265.

NRC (U.S. Nuclear Regulatory Commission). 2022. *Supplemental Environmental Impact Statement Scoping Process Summary Report St. Lucie Plant Units 1 and 2 Jensen Beach, FL*. Rockville, Maryland. ADAMS Accession No. ML22124A011. TN12268.

# APPENDIX B

# APPLICABLE LAWS, REGULATIONS, AND OTHER REQUIREMENTS

## B.1 Federal and State Requirements

Appendix F of the 2024 *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (LR GEIS) (NRC 2024-TN10161) discusses Federal laws, regulations, and other requirements that may affect the renewal and continued operation of nuclear power plants licensed by the U.S. Nuclear Regulatory Commission (NRC, the Commission). It provides additional information about environmental laws and regulations that may be applicable to license renewal. These include Federal laws, regulations, and other requirements designed to protect the environment, including land and water use, air quality, aquatic resources, terrestrial resources, radiological impacts, waste management, chemical impacts, and socioeconomic conditions. The NRC staff relies upon and incorporates by reference herein the regulatory discussions and information presented in Appendix F, Sections F.2–F.7 of the LR GEIS (NRC 2024-TN10161: pp. F-1–F-24). Therefore, these Federal laws, regulations, and other requirements are not duplicated in this appendix, which instead focuses on facility-specific information.

In addition to carrying out some Federal programs, State legislatures develop their own laws. State statutes can supplement, as well as implement, Federal laws for protection of air, surface water, and groundwater. State legislation may also address solid waste management programs, locally rare or endangered species, and historic and cultural resources. Additionally, the Atomic Energy Act of 1954, as amended (TN663), authorizes the NRC to enter into an agreement with any State that allows the State to assume regulatory authority for certain activities (TN10029). A State that enters into such an agreement with the NRC is called an Agreement State, which assumes regulatory responsibility over certain byproduct materials, source materials, and special nuclear materials in quantities not sufficient to form a critical mass. The Florida Department of Health administers the Florida Agreement State Program.

The U.S. Environmental Protection Agency (EPA) has the primary responsibility to administer the Federal Water Pollution Control Act of 1972, as amended, herein referred to as the Clean Water Act (CWA) (TN662). The National Pollutant Discharge Elimination System (NPDES) program addresses water pollution by regulating the discharge of potential pollutants to waters of the United States. The CWA allows for primary enforcement and administration through State or Tribal agencies, as long as the State program is at least as stringent as the Federal program. EPA has delegated the authority to issue NPDES permits to the Florida Department of Environmental Protection, Division of Water Resources Management, which implements State laws protecting the quality of Florida's drinking water, groundwater, rivers, lakes, estuaries, and wetlands, as well as reclamation of mined lands.

## B.2 Operating Permits and Other Requirements

St. Lucie Plant, Units 1 and 2 (St. Lucie) is subject to various Federal and State requirements. The applicant may prepare and submit for several regulatory approvals or permits prior to the NRC subsequent license renewal approval. As a convenient source of references of environmental requirements, Table B-1 lists the principal permits and licenses issued by Federal, State, and local authorities for activities at St. Lucie, as identified in the environmental report, as supplemented (FPL 2021-TN12166, FPL 2025-TN12167).

## Table B-1 Operating Permits and Other Requirements

| Permit | Responsible Agency | Number | Issuance/ Expiration Date | Authorized Activity |
|---|---|---|---|---|
| Operating license | NRC | Renewed DPR-67 | Expires on March 1, 2036 | Operation of St. Lucie Unit 1 |
| Operating license | NRC | Renewed NPF-16 | Expires on April 6, 2043 | Operation of St. Lucie Unit 2 |
| CWA (33 U.S.C. § 1251 et seq.); 40 CFR Part 122; Florida, NPDES Permit | FDEP | FL0002208 | Issued on March 24, 2025; Expires on March 23, 2030 | Discharges to Atlantic Ocean including cooling waters, low-volume waste, and storm waters |
| Resource Conservation and Recovery Act 42 U.S.C. § 6901 | EPA/FDEP | FLD0008077479 | Not Applicable | Very small quantity hazardous waste generator |
| Florida Statutes Chapter 403, Air Operation Permit | FDEP | 1110071-016-AO | Issued on November 2020; Expires on November 3, 2025 | Emissions from four emergency diesel generators; four diesel and propane emergency generators; miscellaneous diesel-driven equipment, and facility-wide fugitive emissions from storage tanks, roadways, and paint/sandblasting |
| State of Tennessee Department of Environment & Conservation | TDEC | T-FL003-L25 | Expires on December 31, 2025 | Radioactive material shipments |
| Clean Water Act Section 401(a)(2) | EPA | NA | NA | Neighboring jurisdiction process. EPA's determination of whether the discharge from a federally licensed or permitted activity may affect the water quality of a neighboring jurisdiction (EPA 2025-TN12604) |
| Power plant site certification | FDEP Siting Board | PA74-02J | Non-expiring permit that remains valid for the life of the facility; Modified on August 28, 2023 | Provides for CZMA certification confirmation and CWA 401 certification |

CAA = Clean Air Act; CFR = *Code of Federal Regulation*; CZMA = Coastal Zone Management Act; EPA = U.S. Environmental Protection Agency; FDEP = Florida Department of Environmental Protection; NA = not available; NPDES = National Pollutant Discharge Elimination System; NRC = U.S. Nuclear Regulatory Commission; TDEC = Tennessee Department of Environment & Conservation; U.S.C. = *United States Code*.
Sources: NRC 2021-TN12261; FPL 2025-TN12167.

## B.3 Exemptions

### Environmental Justice

SRM-COMSECY-25-0007, "Withdrawing the Environmental Justice Policy Statement and Environmental Justice Strategy," issued April 10, 2025, approved publication of a notice in the *Federal Register* (90 FR 17887-TN11684), which explained that in response to the policies in Executive Order 12898, the NRC had made voluntary commitments on environmental justice in its Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions (Environmental Justice Policy Statement) and its Environmental Justice Strategy (69 FR 52040-TN1009). Accordingly, with the revocation of Executive Order 12898, the NRC also withdrew its Environmental Justice Policy Statement and its Environmental Justice Strategy. Based on Executive Order 14173 and SRM-COMSECY-25-0007, and pursuant to 10 CFR 51.6 (TN10253), "Specific Exemptions," the NRC staff has, upon its own initiative, determined that an exemption from the requirement to address environmental justice in this EIS is authorized by law and otherwise in the public interest. Accordingly, this EIS does not address that issue.

### Cumulative Effects

The NRC regulations at 10 CFR 51.71(d) (TN10253) require that the NRC staff conduct a cumulative effects analysis for draft EISs. Additionally, 10 CFR Part 51, Subpart A, Appendix B, Table B-1, under the Category 2 issue "Cumulative Effects," requires inclusion of a site-specific cumulative effects analysis in license renewal EISs. Executive Order 14300, "Ordering the Reform of the Nuclear Regulatory Commission," Section 5(c) (90 FR 22587-TN12182), issued May 23, 2025, directs the NRC—in consultation with the Council on Environmental Quality—to revise its National Environmental Policy Act of 1969, as amended (NEPA), regulations to reflect the Fiscal Responsibility Act of 2023 (TN9775) and Executive Order 14154, "Unleashing American Energy" (90 FR 8353-TN11916, Jan. 20, 2025). These revisions must align with Section 102 of NEPA (TN661), which requires analysis only of reasonably foreseeable environmental effects and does not include the term "cumulative." Despite these changes, current NRC regulations at 10 CFR Part 51 still mandate cumulative effects analysis. However, Executive Order 14154 also directs the Council on Environmental Quality to revoke its NEPA implementing regulations, including the definition of "cumulative effects" and related guidance.

In light of NEPA Section 102, Executive Orders 14154 and 14300, and under 10 CFR 51.6 (TN10253), "Specific Exemptions," the NRC staff has determined that an exemption from the requirements to perform a cumulative effects analysis in this EIS is authorized by law and otherwise in the public interest. Accordingly, the NRC staff does not perform such an analysis for this EIS. This exemption from cumulative effects analyses only pertains to requirements in the NRC's NEPA implementing regulations in 10 CFR Part 51. This exemption does not affect requirements in other statutes such as the Endangered Species Act of 1973, as amended (TN1010) and the National Historic Preservation Act of 1966, as amended (TN4157).

## B.4 References

10 CFR Part 51. Code of Federal Regulations, Title 10, Energy, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." TN10253.

69 FR 52040. August 24, 2004. “Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions.” Federal Register, Nuclear Regulatory Commission. TN1009.

90 FR 8353. January 29, 2025. “Unleashing American Energy.” Executive Order 14154. Federal Register, Presidential Documents. TN11916.

90 FR 17887. April 30, 2025. “Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions; Environmental Justice Strategy.” Federal Register, Nuclear Regulatory Commission. TN11684.

90 FR 22587. May 23, 2025. “Ordering the Reform of the Nuclear Regulatory Commission.” Executive Order 14300. Federal Register, Presidential Documents. TN12182.

42 U.S.C. § 2021 et seq. U.S. Code Title 42, Public Health and Welfare, Section 2021, “Cooperation with States.” TN10029.

Atomic Energy Act of 1954. 42 U.S.C. § 2011 et seq. Public Law 112-239, as amended. TN663.

Endangered Species Act of 1973. 16 U.S.C. § 1531 et seq. TN1010.

EPA (U.S. Environmental Protection Agency). 2025. Email from T. Hoyord, PWS, CE, Wetlands & Streams Regulatory Section, Water Division, Region 4, to L. Desotell, Environmental Scientist, Environmental Center of Expertise, NRC, dated March 12, 2025, regarding “Re: Clean Water Act Section 401(A)(2) Neighboring Jurisdiction Determination Request for Saint Lucie Nuclear Plant, Units 1 and 2.” Atlanta, Georgia. ADAMS Accession No. ML25073A178. TN12604.

Federal Water Pollution Control Act of 1972 (commonly referred to as the Clean Water Act). 33 U.S.C. § 1251 et seq. TN662.

Fiscal Responsibility Act of 2023. 2 U.S.C. § 900 et seq. Note. Public Law 118-5. TN9775.

FPL (Florida Power & Light Company). 2021. Appendix E, Applicant’s Environmental Report, Subsequent Operating License Renewal Stage St. Lucie Nuclear Plant Units 1 and 2. Washington, D.C. ADAMS Accession No. ML21215A319. TN12166.

FPL (Florida Power & Light Company). 2025. Letter from K.A. Mack, Director, Licensing and Regulatory Compliance, to NRC Document Control Desk, dated February 3, 2025, regarding “St. Lucie Units 1 and 2 Docket Nos. 50-335 and 50-389 Renewed Facility Operating Licenses DPR-67 and NPF-16.” Jensen Beach, Florida. ADAMS Accession No. ML25034A029. TN12167.

National Environmental Policy Act of 1969 (NEPA), as amended. 42 U.S.C. § 4321 et seq. TN661.

National Historic Preservation Act. 54 U.S.C. § 300101 et seq. TN4157.

NRC (U.S. Nuclear Regulatory Commission). 2021. “St. Lucie, Units 1 and 2, Application for Subsequent Renewed Facility Operating Licenses.” Washington, D.C. ADAMS Accession No. ML21215A314. TN12261.

NRC (U.S. Nuclear Regulatory Commission). 2024. Generic Environmental Impact Statement for License Renewal of Nuclear Plants. NUREG-1437, Volumes 1-3, Revision 2, Washington, D.C. ADAMS Accession No. ML24087A133. TN10161.

# APPENDIX C

# ECOLOGICAL CONSULTATIONS

This appendix of the environmental impact statement (EIS) outlines the ecological consultations conducted by the U.S. Nuclear Regulatory Commission (NRC, the Commission) staff to inform its environmental review under the National Environmental Policy Act of 1969, as amended (NEPA) (TN661), of the subsequent license renewal application for St. Lucie Plant, Units 1 and 2 (St. Lucie). It includes documentation of the NRC staff's compliance with the Endangered Species Act of 1973, as amended (ESA) (TN1010), the Magnuson–Stevens Fishery Conservation and Management Act of 1976, as amended (MSA) (TN9966), and the National Marine Sanctuaries Act (NMSA) (TN4482). These consultations assess the potential effects of the proposed action of subsequently renewing the St. Lucie renewed licenses for an additional 20 years on federally listed species, designated critical habitats, essential fish habitats, and marine sanctuary resources.

To inform these consultations and the broader NEPA analysis, this appendix begins with information on terrestrial and aquatic resources within the project area. This integrated ecological context provides the scientific basis for evaluating the potential environmental impacts of the proposed action, ensuring consistency with applicable Federal statutes and supporting a comprehensive understanding of the affected environment.

## C.1 Terrestrial Resources

Detailed information on the NRC staff's analysis regarding terrestrial resources can be found in Section 3.3. A summary of that analysis can be found in Table C-1 and Table C-2 below.

**Table C-1 State-Listed Bird and Reptile Species Potentially Occurring in the Vicinity of the St. Lucie Plant Site**

| Common Name | Scientific Name | State Status |
|---|---|---|
| American oystercatcher[(a)] | *Haematopus palliates* | Threatened |
| black skimmer[(a)] | *Rynchops niger* | Threatened |
| burrowing owl | *Athene cunicularia* | Threatened |
| least tern[(a)] | *Sternula antillarum* | Threatened |
| little blue heron[(a)] | *Egretta caerulea* | Threatened |
| reddish egret[(a)] | *Egretta rufescens* | Threatened |
| roseate spoonbill | *Platalea ajaja* | Threatened |
| Florida sandhill crane[(a)] | *Grus canadensis* | Threatened |
| southeastern American kestrel[(a)] | *Falco sparverius Paulus* | Threatened |
| tricolored heron | *Egretta tricolor* | Threatened |
| Florida pine snake | *Pituophis melanoleucus mugitus* | Threatened |
| gopher tortoise[(a)] | *Gopherus polyphemus* | Threatened |

(a) Species documented onsite.

**Table C-2 State-Listed Plant Species Potentially Occurring in the Vicinity of the St. Lucie Plant Site**

| Common Name | Scientific Name | State Status |
|---|---|---|
| large-flowered rosemary[(a)] | *Conradina grandifloral* | Threatened |
| nodding pinweed | *Lechea cernua* | Threatened |
| piedmont jointgrass | *Coelorachis tuberculosa* | Threatened |
| many flowered pink grass | *Calopogon multiflorus* | Threatened |
| barbed wire cactus | *Acanthocereus pentagonus* | Threatened |
| common prickly pear | *Opuntia stricta* | Threatened |
| false buttonweed | *Spermacoce terminalis* | Threatened |
| Guiana plum | *Drypetes lateriflora* | Threatened |
| inkberry | *Scaevola plumieri* | Threatened |
| satinleaf | *Chrysophyllum oliviforme* | Threatened |
| yellow butterwort | *Pinguicula lutea* | Threatened |
| celestial lily | *Nemastylis floridana* | Endangered |
| coastal hoary-pea | *Tephrosia angustissima* var. *curtissii* | Endangered |
| coastal vervain[(a)] | *Glandularia maritima* | Endangered |
| pine pinweed | *Lechea divaricate* | Endangered |
| sand dune spurge | Chamaesyce cumulicola | Endangered |
| scrub bluestem | *Schizachyrium niveum* | Endangered |
| small's flax | *Linum carteri* var. *smallii* | Endangered |
| terrestrial peperomia | *Peperomia humilis* | Endangered |
| sea lavender | *Argusia gnaphalodes* | Endangered |
| burrowing four o'clock | *Okenia hypogaea* | Endangered |
| yellow nickerbean | *Caesalpinia major* | Endangered |
| blunt leaved peperomia | *Peperomia obtusifolia* | Endangered |

(a) Species documented onsite.

## C.2 Aquatic Resources

This section describes the aquatic environment at the St. Lucie site, as well as the relevant ecological studies and surveys conducted at St. Lucie and within the surrounding area. This information supplements and supports the NRC staff's analyses of potential impacts that the aquatic environment may experience as a result of the proposed action of subsequently renewing the St. Lucie renewed licenses for an additional 20 years, which are presented in Section 3.4.2 through Section 3.4.3.

St. Lucie lies on Hutchinson Island between two major aquatic ecosystems: the Atlantic Ocean to the east and the Indian River Lagoon to the west. The plant uses a once-through cooling system that withdraws water from and discharges heated effluent to the Atlantic Ocean via offshore intake and discharges structures. The plant's emergency cooling water intake system can withdraw water from the Indian River Lagoon via Big Mud Creek, but that pathway is closed during normal operations. This section describes the aquatic resources of these two ecosystems.

The NRC staff previously characterized these aquatic resources in Section 2.2.5 of the final EIS that analyzed the St. Lucie initial license renewal (NRC 2003-TN3152: pp. 2-18 to 2-24). Sections 3.7.1, 3.7.3, 3.7.4, and 3.7.5 of Florida Power & Light Company's (FPL's) environmental report (ER) (FPL 2021-TN12166: pp. 3-105 to 3-108 and 3-119 to 3-132), which was submitted as part of the St. Lucie subsequent license renewal application, also describe aquatic resources. This information is incorporated by reference herein, with key, new, and updated information summarized below in the following subsections. Following the description of the aquatic environment, the NRC staff analyzes the potential impacts of the proposed action (St. Lucie subsequent license renewal) on these resources.

### C.2.1 Atlantic Ocean

Three subtidal microhabitats occur offshore of St. Lucie: shallow beach terrace, offshore shoal, and a deeper trough between the two. Submerged coquinoid rock formations parallel the nearshore oceanic habitat along Hutchinson Island. These formations are made of limestone formed by the deposition and subsequent cementation of mineral and organic particles on the ocean floor. Shell material from the coquina clam (*Donax variabilis*) is the main component of this type of rock. Tube-building marine polychaete worms (family Sabellariidae) inhabit the rock formations, which establish the base of a diverse assemblage of nearshore invertebrates, algae, and fish. Seaward, the ocean floor consists of unconsolidated quartz and calcareous sands, broken shell fragments, and negligible amounts of silts and clays. The floor gently slopes in a trough with a maximum depth of 39 ft (11.9 m) at about 1.2 mi (1.9 km) offshore. Continuing offshore, the sea floor rises to form Pierce Shoal about 2 mi (3.2 km) east of Hutchinson Island (NRC 2003-TN3152).

Seasonal seawater temperatures along Hutchinson Island peak in the late summer and early fall and are lowest in mid to late winter. In its humid-subtropical climate, water temperatures can range from 65°F (18°C) to over 87°F (30.5°C). However, the size of the Atlantic Ocean mitigates much of the temperature variability in the water, whereas the Indian River Lagoon experiences more dramatic temperature fluctuations (FPL 2021-TN12166).

Prior to St. Lucie plant operation, FPL studied the marine communities in the vicinity of St. Lucie to develop a baseline of the aquatic environment. FPL continued biological monitoring upon the start-up of St. Lucie, Unit 1 in December 1976 as a requirement of its NRC operating license and the St. Lucie National Pollutant Discharge Elimination System (NPDES) permit. Most monitoring ended in 1983 prior to St. Lucie, Unit 2 commencing operations as it was demonstrated that Unit 1 operations were not having a substantial, persistent, or widespread effect on aquatic resources (Golder 2010-TN12356).

Researchers collected baseline plankton and zooplankton at five locations offshore of Hutchinson Island. Plankton are small and often microscopic organisms that drift or float in the water column. Phytoplankton are single-celled plant plankton and include diatoms (single-celled yellow algae) and dinoflagellates (single-celled organisms with two flagella). Phytoplankton live suspended in the water column and occur in the limnetic (open water) zone. Zooplankton are animals that either spend their entire lives as plankton (holoplankton) or exist as plankton for a short time during development (meroplankton). Zooplankton include rotifers, isopods, protozoans, marine gastropods, polychaetes, small crustaceans, and the eggs and larval stages of insects and other aquatic animals. Phytoplankton collections near Hutchinson Island were dominated by diatoms, the most common of which were the genera *Nitzschia*, *Bellerochea*, and *Chaetoceros*, and the species *Thalassionema nitzschioides* and *Skeletonema costatum* (NRC 2003-TN3152). Densities ranged from 1 to over 35,000 cells per liter (L) during the study period

but varied little from location to location. The zooplankton community was composed primarily of neritic holoplanktonic species (species that spend their entire life cycle in the water column) and was dominated by copepods (NRC 2003-TN3152). The genera *Acartia*, *Paracalamis*, *Oithona*, *Temora*, *Undinula*, *Corycaeus*, *Euterpina*, and *Labidocera* were the most common. Zooplankton densities ranged from 250 to 12,000 organisms per cubic meter ($m^3$), and zooplankton density appeared to be broadly correlated with phytoplankton density. Table 3.7-1 of FPL's ER (FPL 2021-TN12166) lists the phytoplankton and zooplankton taxa documented as occurring within the vicinity of St. Lucie.

Baseline gill net, trawl, and beach seine samples identified 934 taxa of benthic invertebrates, with many of the species previously unknown. The trough microhabitat supported the most abundant macroinvertebrate community because of the sediment heterogeneity in this area. The Atlantic calico scallop (*Argopecten gibbus*) was the only mollusk recorded of commercial value. Arthropods of potential commercial value included shrimp (of the family Penaeidae) and the blue crab (*Callinectes sapidus*). However, commercially valuable species were collected infrequently and in small numbers, and researchers concluded that the nearshore habitat does not provide suitable or preferred habitat for these shellfish (FPL 2021-TN12344, FPL 2001-TN12165; Golder 2010-TN12356).

Researchers collected baseline fish samples at nearshore and offshore locations and in the intake canal using gill nets, trawls, and beach seines. Notable species in offshore catches included Atlantic bumper, Spanish mackerel, king mackerel (*S. cavalla*), bluefish (*Pomatomus saltatrix*), Atlantic croaker, spot, cobia (*Rachycentron canadum*), weakfish (*Cynoscion regalis*), sheepshead (*Archosargus probatocephalus*), snook (*Centropomus undecimalis*), pigfish (*Orthopristis chrysoptera*), pompano (*Trachinotus* spp.), jacks (family Carangidae), and anchovies (family Engraulidae), as well as menhaden, sardines, and herring (family Clupeidae) (Golder 2010-TN12356).

Impingement, entrainment, and biological characterization studies conducted to fulfill requirements of Section 316(b) of the Federal Water Pollution Control Act of 1972, as amended, herein referred to as the Clean Water Act (CWA), have also helped characterize the aquatic community in the vicinity of St. Lucie. Applied Biology, Inc. conducted an impingement study from 1976 through 1978 and intake canal sampling from 1976 through 1984. Golder Associates, Inc. conducted a biological characterization study of the aquatic community in the vicinity of the St. Lucie cooling water system intake in 2006 and 2007. Environmental Consulting & Technology, Inc. performed entrainment characterization studies in 2006 and 2007 and in 2017 and 2018. Table C-3 lists fish and shellfish taxa commonly collected during these studies.

**Table C-3 Taxa Common in St. Lucie Plant Impingement and Entrainment Studies**

| Type of Organism | Taxa | Common Name | 2006–2007 Biological Characterization | 2006–2007 Entrainment | 2017–2018 Entrainment |
|---|---|---|---|---|---|
| Finfish | *Anchoa hepsetus* | broad-striped anchovy | X | X | X |
| Finfish | *Anchoa lamprotaenia* | big-eye anchovy | X | - | - |
| Finfish | *Anchoa mitchilli* | bay anchovy | X | X | X |
| Finfish | *Sphyraena borealis* | northern sennet | X | - | - |

| Type of Organism | Taxa | Common Name | 2006–2007 Biological Characterization | 2006–2007 Entrainment | 2017–2018 Entrainment |
|---|---|---|---|---|---|
| Finfish | Various species within Family Labrisomidae | blenny species | - | X | X |
| Finfish | *Bregmaceros houdei* | stellate codlet | - | - | X |
| Finfish | Various species within Family Blenniidae | combtooth blenny species | - | X | X |
| Finfish | Various species within Family Pomacentridae | damselfish species | - | X | X |
| Finfish | *Diplogrammus pauciradiatus* | spotted dragonet | - | X | X |
| Finfish | *Bairdiella chrysoura* | silver perch | X | X | X |
| Finfish | *Cynoscion nothus* | silver seatrout | X | - | - |
| Finfish | *Cynoscion regalis* | weakfish | - | X | X |
| Finfish | *Larimus fasciatus* | banded drum | X | - | - |
| Finfish | *Leiostomus xanthurus* | spot | X | X | X |
| Finfish | *Micropogonias undulatus* | Atlantic croaker | X | - | X |
| Finfish | *Sciaenops ocellatus* | red drum | X | X | X |
| Finfish | *Umbrina coroides* | sand drum | X | | X |
| Finfish | *Myrophis punctatus* | speckled worm eel | - | X | X |
| Finfish | *Achirus lineatus* | lined sole | X | X | X |
| Finfish | *Paralichthys oblongus* | fourspot flounder | - | - | X |
| Finfish | *Bathygobius soporator* | frillfin goby | - | X | X |
| Finfish | *Ctenogobius boleosoma* | darter goby | - | X | X |
| Finfish | *Dormitator maculatus* | fat sleeper | - | X | X |
| Finfish | *Gobioides broussonnetii* | violet goby | - | X | X |
| Finfish | *Gobiosoma ginsburgi* | seaboard goby | - | - | X |
| Finfish | *Gobiosoma robustum* | code goby | - | X | X |
| Finfish | *Microdesmus bahianus* | Bahia wormfish | - | - | X |
| Finfish | *Microgobius thalassinus* | green goby | - | - | X |
| Finfish | *Nes longus* | orangespotted goby | - | - | X |
| Finfish | *Harengula jaguana* | scaled herring | X | - | X |
| Finfish | *Sardinella aurita* | Spanish sardine | X | - | - |
| Finfish | *Sardinella brasiliensis* | orangespot sardine | - | - | X |
| Finfish | *Chloroscombrus chrysurus* | Atlantic bumper | X | X | X |

| Type of Organism | Taxa | Common Name | 2006–2007 Biological Characterization | 2006–2007 Entrainment | 2017–2018 Entrainment |
|---|---|---|---|---|---|
| Finfish | *Selene setapinnis* | Atlantic moonfish | X | X | - |
| Finfish | *Diapterus auratus* | Irish pompano | X | - | - |
| Finfish | *Lepidopa websteri* | sand crab | - | - | X |
| Finfish | Various species within Family Subfamily Scarinae | parrotfish species | - | - | X |
| Finfish | *Prionotus* spp. | sea robin species | X | - | X |
| Finfish | *Chaetodipterus faber* | Atlantic spadefish | X | X | X |
| Mollusks | Various species within Family Loliginidae | pencil squid species | - | - | X |
| Shellfish | *Brachyura* spp. | brachyuran crab species | - | X | X |
| Shellfish | *Gebiidea* | burrowing shrimp species | - | - | X |
| Shellfish | *Anomura* spp. | anomuran crab species | - | X | X |
| Shellfish | Various species within Order Euphausiacea | krill species | - | - | X |
| Shellfish | *Mysida* spp. | opossum shrimp species | - | - | X |
| Shellfish | *Farfantepenaeus aztecus* | brown shrimp | X | X | X |
| Shellfish | *Farfantepenaeus duorarum* | pink shrimp | X | X | X |
| Shellfish | *Rimapenaeus constrictus* | roughneck shrimp | X | X | X |
| Shellfish | *Callinectes* spp. | swimming crab species | X | X | X |
| Shellfish | *Caridea* spp. | caridean shrimp species | - | X | X |

"-" denotes not present, and "X" denotes present.
Source: FPL 2021-TN12344.

Florida's commercial fishing industry in the South Atlantic includes inshore and offshore fisheries. Shellfish are the major commercially valuable inshore species and include blue crab (*Callinectes sapidus*), stone crab (*Menippe mercenaria*), quahog clam (*Mercenaria mercenaria*), various oysters, and spiny lobster (Palinuridae species). Finfish typically dominate nearshore and offshore landings. Red snapper (*Lutjanus campechanus*), grouper (subfamily Epinephelinae), king mackerel, swordfish (*Xiphias gladius*), and mahi mahi (*Coryphaena hippurus*) are some of the most sought-after species in the State. The Florida Fish and Wildlife Conservation Commission manages fishing in State waters. The South Atlantic Fishery Management Council and National Marine Fisheries Service (NMFS) manage fisheries

in Federal waters off the east coast of Florida under multiple fishery management plans. Table C-4 lists average and total commercial landings of finfish in St. Lucie County over the past 5 years (2018–2022). Within the county, Spanish mackerel, swordfish, king mackerel, and albacore tuna (*Thunnus alalunga*) have yielded the most landings in pounds during this period.

**Table C-4 St. Lucie County Commercial Finfish Landings, 2018–2022**

| Taxa | Common Name | Average Annual Landings (in pounds)[(a)] | Total Landings (in pounds) |
|---|---|---|---|
| *Scomberomorus maculatus* | Spanish mackerel | 710,657 | 3,553,283 |
| *Xiphias gladius* | swordfish | 313,454 | 1,567,271 |
| *Scomberomorus cavalla* | king mackerel | 230,852 | 1,154,260 |
| *Thunnus alalunga* | albacore tuna | 112,562 | 562,808 |
| *Mugil cephalus* | black mullet | 87,510 | 437,550 |
| *Thunnus albacares* | yellowfin tuna | 80,999 | 404,995 |
| *Thunnus obesus* | bigeye tuna | 71,618 | 358,091 |
| Gerreidae | mojarras (family) | 68,166 | 340,830 |
| *Mugil curema* | silver mullet | 62,336 | 311,679 |
| *Caranx hippos* | Crevalle jack | 58,045 | 290,223 |
| *Lopholatilus chamaeleonticeps* | golden tilefish | 49,205 | 246,023 |
| Elopidae | ladyfish (family) | 45,161 | 225,807 |
| *Trachinotus* spp. | pompano species | 41,013 | 205,066 |
| *Thunnus thynnus* | bluefin tuna | 36,364 | 181,819 |
| *Archosargus probatocephalus* | sheepshead | 30,725 | 153,624 |
| *Coryphaena hippurus* | mahi mahi | 26,669 | 133,346 |
| *Leiostomus xanthurus* | spot | 25,915 | 129,574 |
| *Pomatomus saltatrix* | bluefish | 20,549 | 102,746 |
| *Euthynnus alletteratus* | little tunny | 16,617 | 83,086 |
| *Callinectes sapidus* | blue crab | 16,346 | 81,729 |
| Selachimorpha | sharks (superorder) | 14,641 | 73,203 |
| *Caranx crysos* | blue runner | 12,609 | 63,046 |
| *Pleoticus robustus* | royal red shrimp | 10,540 | 52,700 |
| *Seriola* spp. | amberjack species | 10,265 | 51,324 |
| Sciaenidae | croakers (family) | 9,405 | 47,023 |
| Carangidae | jacks (family) | 8,819 | 44,095 |
| *Rachycentron canadum* | cobia | 3,531 | 17,656 |
| *Acanthocybium solandri* | wahoo | 3,494 | 17,470 |
| *Lutjanus campechanus* | red snapper | 2,687 | 13,436 |
| *Paralichthys* spp. | flounder species | 2,616 | 13,078 |
| *Harengula jaguana* | scaled sardines | 2,212 | 11,062 |
| *Menticirrhus americanus* | kingfish | 2,208 | 11,042 |
| *Chloroscombrus chrysurus* | Atlantic bumper | 2,027 | 10,135 |

(a) Does not include species for which landings were an average of 2,000 pounds or less per year over the period or the generic categories “miscellaneous food fish” and “bait fish.”

Source: FFWCC 2022-TN12362.

One aquatic invasive species—the lionfish (*Pterois volitans*)—has been documented on the St. Lucie site. Lionfish are a predatory reef fish that outcompete native predators, such as grouper and snapper. Lionfish grow to about 12 to 15 in. (30 to 38 cm) in length, and they have venomous spines that are used defensively against predators. The Florida Fish and Wildlife Conservation Commission encourages people to remove and humanely euthanize lionfish from Florida waters to help limit negative impacts to native marine life and ecosystems (FFWCC 2022-TN12357). From 2014–2017, FPL captured and euthanized 31 lionfish at the St. Lucie site as part of a Florida Fish and Wildlife Conservation Commission special activities license (FPL 2021-TN12166).

Numerous marine mammals are common in the Atlantic Ocean near Hutchinson Island. These include bottlenose dolphin (*Tursiops truncates*), common dolphin (*Delphinus delphis*), finback whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), North Atlantic right whale (*Eubalaena glacialis*), sei whale (*Balaenoptera borealis*), sperm whale (*Physeter macrocephalus*), and West Indian manatee (*Trichechus manatus latirostris*).

Five species of sea turtles also occur in the area. Like fish, sea turtles can enter St. Lucie's intake pipes and become entrained into the intake canal. FPL captures and returns entrained sea turtles to the ocean under the terms and conditions of an NMFS-issued biological opinion. Sea turtles are described in more detail in Section 3.6.2, which addresses species protected under the ESA (TN1010).

### C.2.2 Aquatic Preserves

St. Lucie County manages several environmental preserve units near St. Lucie: Blink Creek Pass, Ocean Bay, and Walton Rocks. Blind Creek Pass Park is a 409 ac (166 ha) park located east of State Road A1A and north of St. Lucie. Within this park, a 108 ac (44 ha) beach is managed as an upland and wetland preserve. The beach is an important nesting area for green and loggerhead sea turtles during the summer. The park includes beach dune, coastal strand, maritime hammock, and estuarine tidal swamp habitats, as well as designated critical habitat for the West Indian manatee (FPL 2021-TN12166). Ocean Bay lies along the Atlantic Ocean and Indian River Lagoon and is approximately 53 ac (21 ha). It is divided by State Road A1A. The eastern half of the preserve unit is beach dune and coastal strand, and the western half is maritime hammock and mangrove swamp (FPL 2021-TN12166). Walton Rocks is located approximately 200 ft (60 m) south of the plant's intake canal. The Walton Rocks beach and preserve contains a rich and diverse association of fish, marine invertebrates, and algae (FPL 2021-TN12166).

The State of Florida also manages certain State-owned lands as aquatic preserves under Florida Statutes Chapter 258.39 (Fla. Stat. 258-TN12358). These areas are designated based on having exceptional biological, aesthetic, and scientific value. Two State aquatic preserves occur near St. Lucie—Jensen Beach to Jupiter Inlet Aquatic Preserve and the North Fork, St. Lucie River Aquatic Preserve. The Jensen Beach to Jupiter Inlet Aquatic Preserve is approximately 23,000 ac (9,300 ha) and is 37 mi (60 km) long. It is connected to the Atlantic Ocean by the St. Lucie Inlet and the Jupiter Inlet. This area contains a variety of substrate types, including sand, mud, and tidal flats, as well as mollusk reefs, algal beds, seagrass beds, and mangrove swamps (FDEP 2022-TN12363). The North Fork, St. Lucie River Aquatic Preserve is located approximately 5 mi (8 km) from the St. Lucie site. The preserve is 2,972 ac (1,202 ha) in size and consists of seagrass beds, mollusk reefs, estuarine tidal swamps, freshwater tidal swamps, sloughs, and unconsolidated sand beaches. It supports numerous rare tropical peripheral fishes, including gobies, sleepers, and pipefishes. The river is especially important habitat for juveniles of blue crab, snook, snapper, drum, and shrimp (FDEP 2022-TN12365).

### C.2.3 Indian River Lagoon

The Indian River Lagoon is a 156 mi (251 km) long estuarine system between Florida's barrier islands and its mainland. It consists of brackish water created by freshwater runoff, rain events, tributaries, and five inlets that connect the lagoon to the Atlantic Ocean. Flow varies with winds, and on any given day, water may flow north, south, or be stagnant depending on weather conditions. The width of the lagoon varies from 0.5 to 5 mi (0.8 to 8 km), and the average depth is 4 ft (1.2 m) (FSP 2022-TN12364).

The lagoon comprises about 40 percent of the eastern coast of Florida and contains approximately 27 percent of the state's eastern coastal salt marshes. Mangroves and seagrass beds are also common nearshore habitats. The lagoon basin contains more species than any other North American estuary with an estimated 685 species of fish, 370 bird species, and 2,100 plant species. Ocean beaches in the lagoon region provide one of the densest sea turtle nesting areas in the western hemisphere, and the shallow, brackish waters serve as a spawning and nursery ground for many of Florida's marine fish (SJRWMD 2007-TN12337).

The lagoon's geographic location along the transition zone between warm temperate and subtropical climates, combined with its large size and diverse physical characteristics, make it an estuary of extremely high biological productivity. Mangrove forests, seagrass beds, and attached and drift algae provide nursery habitat for a variety of fish and shellfish, many of which are important components of local sport and commercial fisheries. Because of its biological significance, the State of Florida has designated the Indian River Lagoon as an Outstanding Florida Water and a State preserve. The U.S. Environmental Protection Agency (EPA) has designated it an estuary of national significance, and it is part of the National Estuary Program (SJRWMD 2007-TN12337).

Commercial fisheries within the Indian River Lagoon were abundant in the late 1800s and early 1900s. Important species included snook (*Centropomus undecimalis*), Atlantic goliath grouper (*Epinephelus itajara*), redfish (*Sebastes* spp.), and sawfish (Family Pristidae). Today, Atlantic goliath grouper and sawfish are virtually gone from the lagoon, and commercial fishing in general is not as prevalent. The spotted sea trout (*Cynoscion nebulosus*) is one of the most important sport fish in the lagoon. However, this species has also experienced significant declines in recent decades. Since 1953, commercial catch of this species has declined by more than 50 percent, and sport anglers also report lower catches. Many causes likely contribute to these declines, as well as declines and large fluctuations in the annual catch of many other important species. These causes include loss of habitat from dredging and filling, alteration of shoreline habitats, reduced water quality, isolation of salt marsh and mangrove habitat for mosquito control, bacterial contamination of shellfish areas from septic systems and stormwater runoff, salinity regime changes, and overfishing (SJRWMD 2007-TN12337).

Three sub-bodies of the Indian River Lagoon exist within the St. Lucie site: Herman's Bay, Big Mud Creek, and Blind Creek. Herman's Bay is located just south of the site. It is largely a tourist area with beaches and dunes separating the bay from the Atlantic Ocean. Herman's Bay is a predominantly open inlet of the Indian River Lagoon and likely supports the same water quality and species composition as the lagoon. Big Mud Creek is a backwater cove of the Indian River Lagoon. It receives little tidal influence and has minimal water exchange with the lagoon, which creates stratification and anoxic conditions near the bottom of Big Mud Creek (NRC 2003-TN3152).

During construction of St. Lucie, FPL performed a study to select the cooling water source for the plant. Researchers determined that the biodiversity of the Indian River Lagoon was greater than that of the Atlantic Ocean and that the lagoon would, therefore, not be an appropriate source water body. FPL revised its plans and moved the cooling water intake and discharge to the Atlantic Ocean to protect important and imperiled species in the lagoon. In an emergency, St. Lucie's emergency cooling water intake system can withdraw water from the Indian River Lagoon via Big Mud Creek, but that pathway is closed during normal operations (FPL 2001-TN12165).

In 2006 and 2007, Golder and Associates, Inc. (Golder 2010-TN12356) performed trawl samples of the Indian River Lagoon as part of a biological characterization study. Researchers collected biweekly otter trawl samples at three locations: in Big Mud Creek in front of the emergency intake structure at depths of 9.8 to 13.1 ft (3 to 4 m), adjacent to the Big Mud Creek channel at depths of 6.6 to 9.8 ft (2 to 3 m), and east of and parallel to the Intracoastal Waterway at depths of 6.6 to 9.8 ft (2 to 3 m). Researchers collected six samples per event over a total of 45 events between January 2006 and October 2007. Sampling occurred during both day and night hours. Pinfish (*Lagodon rhomboides*) constituted most of the collection (50.4 percent of collected fish). Mojarras (Gerreidae), grunts (Haemulidae), and pipefish (Syngnathinae) were the next most common taxa groups at 15.9, 12.9, and 5.2 percent composition, respectively. The remaining taxa groups, which each accounted for less than 5 percent composition, consisted of gobies (Gobiidae) (4.8 percent), drums or croakers (Sciaenidae) (4.3 percent), snappers (Lutjanidae) (1.6 percent), and other species (4.9 percent). Fish densities were higher in the summer months and noticeably higher in 2006 than in 2007. Commercial shrimp (Penaeidae) and blue crabs represented 73 and 24 percent of shellfish collected, respectively.

Golder and Associates (Golder 2010-TN12356) also collected biweekly plankton samples across three transects during the same period using paired bongo plankton nets with 300 micrometers (μm) mesh. Researchers used paired bongo nets with 300 μm mesh to fish at mid-water depth. Samples consisted of five-minute tows, which resulted in a sampling of approximately 460 to 920 $ft^3$ (13 to 26 $m^3$) of water. Researchers collected six samples per event over a total of 45 events between January 2006 and October 2007. Sampling occurred during both day and night hours. Anchovies (Family Engraulidae) dominated collections at 49.5 percent of collected ichthyoplankton. Researchers were unable to identify much of the plankton collected due to individuals being undeveloped (20.5 percent), damaged (11.6 percent), or otherwise unidentifiable (9.6 percent). Gobies and herrings accounted for 1.8 and 1.6 percent of collections, respectively.

## C.3 Endangered Species Act Section 7 Consultation and Biological Evaluation

As a Federal agency, the NRC must comply with the ESA (TN1010) as part of any action authorized, funded, or carried out by the agency. In this case, the proposed agency action is whether to issue subsequent renewed licenses for St. Lucie. The proposed action would authorize FPL to operate St. Lucie for an additional 20 years beyond the terms of the current renewed licenses. Under Section 7 of the ESA, the NRC must consult with the U.S. Fish and Wildlife Service (FWS) and the NMFS ("the Services" [collectively] or "Service" [individually]), as appropriate, to ensure that the proposed action is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

Biological assessments are required for any agency action that is a “major construction activity” Title 50 of the *Code of Federal Regulations* (50 CFR 402.12(b)) (TN4312). A major construction activity is a construction project or other undertaking having construction-type impacts that is a major Federal action significantly affecting the quality of the human environment under NEPA (TN661) (51 FR 19926-TN7600). Federal agencies may fulfill their obligations to consult with the Services under ESA Section 7 and to prepare a biological assessment, if required, in conjunction with the interagency cooperation procedures required by other statutes, including NEPA (50 CFR 402.06(a)). In such cases, the Federal agency should include the results of ESA Section 7 consultation(s) in the NEPA document (50 CFR 402.06(b)).

Subsequent license renewal does not require the preparation of a biological assessment because it is not a major construction activity. Nonetheless, the NRC staff must consider the impacts of its actions on federally listed species and designated critical habitats. For cases in which the staff finds that subsequent license renewal “may affect” ESA-protected species or habitats, ESA Section 7 requires the NRC to consult with the relevant Service(s).

For federally listed species and critical habitats under the FWS’s jurisdiction, the NRC staff has incorporated its biological evaluation below, which considers the effects of the proposed action of St. Lucie subsequent license renewal. Table C-5 summarizes the species and habitats potentially present in the action area, the ESA effect determinations made by the NRC staff, and the status of FWS’s concurrence.

For federally listed species and critical habitats under the NMFS’s jurisdiction, the NRC designated FPL as its non-Federal representative, and FPL contracted Inwater Research Group, Inc. (Inwater Research) to prepare a biological assessment, the results of which are discussed in Section 3.5.2. Table C-6 summarizes the results of that biological assessment, including the species and habitats potentially present in the action area, the ESA effect determinations made by the NRC staff, and the NMFS’s concurrence.

**Table C-5 Summary of Federally Listed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction Potentially Present in the Action Area and the Associated Effects from St. Lucie Plant Subsequent License Renewal**

| Species or Critical Habitat | Federal Status[a] | Potentially Present in the Action Area? | ESA Effect Determination[b] | FWS Concurrence Date[c] |
|---|---|---|---|---|
| American alligator (*Alligator mississippiensis*) | SAT | Yes | N/A | N/A |
| American crocodile (*Crocodylus acutus*), Florida population | FT | No | NE | N/A |
| crested caracara (*Caracara plancus audubonii*), Florida DPS | FT | Yes | NLAA | TBD |
| eastern black rail (*Laterallus jamaicensis* ssp. *jamaicensis*) | FT | Yes | NLAA | TBD |
| eastern indigo snake (*Drymarchon couperi*) | FT | Yes | NLAA | TBD |
| Everglade snail kite (*Rostrhamus sociabilis plumbeus*) | FE | Yes | NLAA | TBD |

| Species or Critical Habitat | Federal Status[a] | Potentially Present in the Action Area? | ESA Effect Determination[b] | FWS Concurrence Date[c] |
|---|---|---|---|---|
| Florida panther (*Puma concolor coryi*) | FE | No | NE | N/A |
| Florida scrub-jay (*Aphelocoma coerulescens*) | FT | No | NE | N/A |
| fragrant prickly-apple (*Cereus eriophorus* var. *fragrans*) | FE | No | NE | N/A |
| green sea turtle (*Chelonia mydas*) North Atlantic DPS | FT | Yes | NLAA | TBD |
| hawksbill sea turtle (*Eretmochelys imbricata*) | FE | Yes | NE | N/A |
| Kemp's Ridley sea turtle *(Lepidochelys kempii)* | FE | Yes | NE | N/A |
| leatherback sea turtle (*Dermochelys coriacea*) | FE | Yes | NLAA | TBD |
| loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean DPS | FT | Yes | NLAA | TBD |
| monarch butterfly (*Danaus plexippus*) | FPT | Yes | NLAA | TBD |
| piping plover (*Charadrius melodus*), Atlantic Coast and Northern Great Plains populations | FT | Yes | NLAA | TBD |
| puma (mountain lion) (*Puma concolor* [all subsp. except *coryi*]), Florida population | SAT | No | N/A | N/A |
| southeastern beach mouse (*Peromyscus polionotus niveiventris*) | FT | Yes | NLAA | TBD |
| tiny polygala (*Polygala smallii*) | FE | No | NE | N/A |
| West Indian manatee (*Trichechus manatus*) | FT | Yes | LAA | TBD |
| wood stork (*Mycteria americana*), Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina population | FT | Yes | NLAA | TBD |
| proposed critical habitat of the green sea turtle | FPD | Yes | NLAA | TBD |
| critical habitat of the loggerhead sea turtle | FD | Yes | NLAA | TBD |
| critical habitat of the West Indian manatee | FD | Yes | NLAA | TBD |

DPS = distinct population segment; FD = federally designated (critical habitat); FE = federally endangered; FPD = federally proposed designated (critical habitat); FPT = proposed for Federal listing as threatened; FT = federally threatened; FWS = U.S. Fish and Wildlife Service; LAA = may affect and is likely to adversely affect; N/A = not applicable; NE = no effect; NLAA = may affect but is not likely to adversely affect; NRC = U.S. Nuclear Regulatory Commission; SAT = federally threatened by similarity of appearance; TBD = to be determined.
(a) Indicates protection status under the Endangered Species Act.

(b) The NRC staff makes its effect determinations for federally listed species in accordance with the language and definitions specified in the FWS and NMFS Endangered Species Consultation Handbook (FWS and NMFS 1998-TN1031).
(c) The Endangered Species Act does not require Federal agencies to seek FWS concurrence for "no effect" determinations or for NLAA determinations for candidate and proposed species. For species whose FWS concurrence date is listed as N/A or TBD, the NRC will seek the FWS's concurrence following the issuance of this draft environmental impact statement.

**Table C-6 Summary of Federally Listed Species and Critical Habitats Under National Marine Fisheries Service Jurisdiction Potentially Present in the Action Area and the Associated Effects from St. Lucie Plant Subsequent License Renewal**

| Species or Critical Habitat | Federal Status[(a)] | Potentially Present in the Action Area? | ESA Effect Determination[(b)] | NMFS Concurrence Date[(c)] |
|---|---|---|---|---|
| loggerhead sea turtle, Northwest Atlantic Ocean DPS | FT | Yes | LAA | TBD |
| green sea turtle, North Atlantic DPS | FT | Yes | LAA | TBD |
| green sea turtle, South Atlantic DPS | FT | Yes | LAA | TBD |
| leatherback sea turtle | FE | Yes | LAA | TBD |
| hawksbill sea turtle | FE | Yes | LAA | TBD |
| Kemp's ridley sea turtle | FE | Yes | LAA | TBD |
| olive ridley sea turtle | FT | Yes | LAA | TBD |
| giant manta ray | FT | Yes | LAA | TBD |
| smalltooth sawfish, U.S. DPS | FE | Yes | LAA | TBD |
| critical habitat of the green sea turtle, North Atlantic DPS | FPD | Yes | NLAA | TBD |
| critical habitat of the loggerhead sea turtle, Northwest Atlantic Ocean DPS | FD | Yes | NLAA | TBD |

DPS = distinct population segment; FD = federally designated (critical habitat); FE = federally endangered; FPD = federally proposed designated (critical habitat); FT = federally threatened; LAA = may affect and is likely to adversely affect; NLAA = may affect but is not likely to adversely affect; NMFS = National Marine Fisheries Service; NRC = U.S. Nuclear Regulatory Commission; TBD = to be determined.
(a) Indicates protection status under the Endangered Species Act.
(b) The NRC staff makes its effect determinations for federally listed species in accordance with the language and definitions specified in the FWS and NMFS Endangered Species Consultation Handbook (FWS and NMFS 1998-TN1031).
(c) For species whose NMFS concurrence date is listed as TBD, the NRC will update the status of the NMFS consultation in the final environmental impact statement.

### C.3.1 ESA: Action Area

The implementing regulations for ESA Section 7 define "action area" to mean all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02) (TN4312). The action area effectively bounds the analysis of federally listed species and critical habitats because only species and habitats that occur within the action area may be affected by the Federal action.

The action area consists of St. Lucie, located on a 1,130 ac (457 ha) site on Hutchinson Island on Florida's east coast, including associated intake and discharge pipelines that terminate in the Atlantic Ocean. The plant and associated cooling water intake structures and canals are approximately midway between Fort Pierce and St. Lucie Inlets. Indian River Lagoon bounds the St. Lucie site to the west, and the Atlantic Ocean is the eastern boundary. The action area extends into the Atlantic Ocean on the eastern side out to the mouth of the intake and discharge pipes and on the western side into the Indian River Lagoon. The island's eastern shoreline is a beach of sand and shell hash and has occasional rocky promontories on the southern portion. Coastal substrate near St. Lucie is sandy with shell pieces, and coquinoid rock formations occur farther offshore and parallel to the beach.

The NRC describes the St. Lucie site in further detail in several documents, including previous biological assessments (NRC 2006-TN12339, NRC 2007-TN3074, NRC 2019-TN7340) and the supplemental environmental impact statement for the initial license renewal of St. Lucie (NRC 2003-TN3152). FPL describes the cooling system configuration and operation in detail in its excluder device test report (FPL 2018-TN12345). Section 2.1 of the NMFS's (NMFS 2016-TN4778) biological opinion also describes the cooling water intake and discharge. Additionally, several figures in Appendix B of the NRC's 2019 biological assessment (NRC 2019-TN7340) depict the St. Lucie site and components of the ocean intake system. Figure B1 is an aerial photograph of the St. Lucie site with labels indicating the major components of the cooling intake and discharge systems. Figure B2 depicts the configuration of the three velocity caps. Figure B3 and Figure B4 are engineering diagrams of the velocity caps and vertical transition pipe sections for the Unit 1 12 ft (3.7 m) intake pipes and Unit 2 16 ft (4.9 m) intake pipe, respectively.

The NRC staff recognizes that, although the described action area is stationary, federally listed species can move in and out of the action area. For instance, a migratory bird could occur in the action area seasonally as it forages or breeds within the action area. Thus, in its analysis, the NRC staff considers not only those species known to occur directly within the action area but also those species that may passively or actively move into the action area. The NRC staff then considers if the life history and habitat requirements of each species make it likely to occur in the action area where it could be affected by the proposed subsequent license renewal.

### C.3.2 ESA: Federally Listed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction

The NRC staff identified 21 species under FWS jurisdiction that may occur in the action area. These include species that are federally listed as endangered or threatened under the ESA, federally listed as threatened due to similarity of appearance, and species that are proposed for listing. The NRC staff reviewed FPL's ER, as supplemented (FPL 2021-TN12166, FPL 2025-TN12167), the FWS Information for Planning and Conservation database, available ecological surveys, and other records to determine whether suitable habitat for each species occurs in the action area and whether the species itself may occur in the action area. The NRC staff also identified three critical habitats within or near the action area. These are the proposed critical habitat of the green sea turtle (*Chelonia mydas*), designated critical habitat of the loggerhead sea turtle (*Caretta caretta*), and designated critical habitat of the West Indian manatee (*Tricherus manatus*).

Table C-7 summarizes the results of the NRC staff's evaluation, including the habitat requirements and information on the occurrence of each species within the action area. The NRC staff's ESA effect determinations are discussed in detail below.

**Table C-7 Occurrences of Federally Listed and Proposed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction in the St. Lucie Subsequent License Renewal Action Area**

| Species or Critical Habitat | Federal Status[(a)] | Habitat | Type and Likelihood of Occurrence in Action Area |
|---|---|---|---|
| American alligator (*Alligator mississippiensis*) | SAT | Freshwater and slow-moving rivers; can also live in swamps, marshes, and lakes. Species can only tolerate salt water for brief periods because they do not have salt glands. | **Present.** Individuals regularly observed on the St. Lucie site in ponds and other aquatic features (NRC 2021-TN12261). Has been documented nearby the action area in Indian River Lagoon Species Inventory (Smithsonian Institution 2025-TN12366). |
| American crocodile (*Crocodylus acutus*), Florida population | FT | Brackish or saltwater areas, as well as ponds, coves, and creeks in mangrove swamps, in Florida. | **Absent.** St. Lucie County is within the northernmost area of this species' range, and the species has never been observed on the St. Lucie site. Therefore, the species is unlikely to occur in the action area. |
| crested caracara (*Caracara plancus audubonii*), Florida DPS | FT | Wet prairies with cabbage palms or wooded areas with saw palmetto, cypress, scrub oaks, and pastures in south central Florida, Texas, Arkansas, Mexico, Cuba, and Panama. | **Transient.** Crested caracaras do not migrate. Within St. Lucie County, the species is primarily found within western portions of the county. FPL reports no observations of the crested caracara on the St. Lucie site (NRC 2021-TN12261). However, the NRC staff conservatively assumes that individuals may occasionally occur in the action area in transit between more preferred habitats. |
| eastern black rail (*Laterallus jamaicensis* ssp. *jamaicensis*) | FT | Salt, brackish, and freshwater marshes with dense vegetative cover that allows movement beneath the canopy. | **Migratory.** Eastern black rails occur in Florida during the winter months. FPL reports no observations of the species on the St. Lucie site (FPL 2025-TN12167). However, because the species inhabits a variety of marsh types, the NRC staff conservatively assumes that individuals may occasionally occur in the action area during migration. |
| eastern indigo snake (*Drymarchon couperi*) | FT | Pine flatwoods, hardwood forests, moist hammocks, and areas that surround cypress swamps throughout Peninsular Florida and southeastern Georgia. | **Presumed Present.** FPL reports no observations of eastern indigo snakes on the St. Lucie site. However, the species has been observed on Hutchinson Island and is assumed to be present in the action area because of its history on Hutchinson Island and the presence of many gopher tortoise (*Gopherus polyphemus*) burrows onsite (FWEC 2001-TN12340), which the eastern indigo snake uses for habitat (NRC 2021-TN12261). |

| Species or Critical Habitat | Federal Status[a] | Habitat | Type and Likelihood of Occurrence in Action Area |
|---|---|---|---|
| Everglade snail kite (*Rostrhamus sociabilis plumbeus*) | FE | Shallow freshwater marshes and shallow grassy shorelines of lakes. | **Transient.** Everglade snail kites do not migrate and are restricted to south and central Florida. FPL reports no observations of everglade snail kites on the St. Lucie site (NRC 2021-TN12261). However, the action area contains scattered freshwater marshes that could provide suitable feeding and foraging habitat. Therefore, the NRC staff conservatively assumes that individuals may occasionally occur in the action area when moving between nearby areas of more suitable habitat. |
| Florida panther (*Puma concolor coryi*) | FE | Forested areas, pinelands, tropical hardwood hammocks, and mixed freshwater swamp forests within Florida. | **Absent.** A small population of the Florida panthers in the southwestern extent of the Florida peninsula represents the only known remaining wild population of this subspecies. Although panthers are known to occasionally travel up the eastern coastal peninsula, FPL reports no observations of the species on the site (NRC 2021-TN12261), and the action area does not provide suitable habitat. |
| Florida scrub-jay (*Aphelocoma coerulescens*) | FT | Isolated pockets of sand pine and xeric oak scrub, as well as scrubby flatwoods exclusively within Florida. Individuals rarely wander away from their own patch of scrub. | **Absent.** Suitable habitat is not present, and the species has never been observed within the action area (NRC 2021-TN12261). Because individuals rarely occur outside of their territories, occasional or migratory occurrences in the action area are unlikely. |
| fragrant prickly-apple (*Cereus eriophorus* var. *fragrans*) | FE | Scrubby flatwoods and xeric hammocks on the Atlantic Coastal Ridge, with sand live oak, myrtle oak, cabbage palm, and prickly pear. | **Extirpated.** FPL reports no occurrences of the species on the St. Lucie site (NRC 2021-TN12261). Additionally, the 2021 FWS Five Year Review states that this species is extirpated from South Hutchinson Island (FWS 2021-TN12342). |
| green sea turtle (*Chelonia mydas*) North Atlantic DPS | FT | Occupy subtropical and temperate regions of the Atlantic, Pacific, and Indian Oceans, and the Mediterranean Sea. | **Present.** Green sea turtles are regularly entrained into the St. Lucie intake canal, collected, and returned to the Atlantic Ocean in accordance with the terms of NMFS's biological opinion (NMFS 2022-TN12343) and applicable FWC permits. South Hutchinson Island is an important rookery for the species, and females use beaches in the action area for nesting from March to October. In 2023, researchers identified 2,270 green sea turtle nests on South Hutchinson Island, over 100 |

| Species or Critical Habitat | Federal Status[(a)] | Habitat | Type and Likelihood of Occurrence in Action Area |
|---|---|---|---|
| | | | of which were in Sector O where St. Lucie is located (FPL 2024-TN12347). |
| hawksbill sea turtle (*Eretmochelys imbricata*) | FE | Occupy tropical regions of the Atlantic, Pacific, and Indian Oceans in areas with coral reefs, rocky areas, lagoons, and shallow coastal areas. Also found in mangrove-fringed bays and estuaries. | **Present.** Hawksbill sea turtles are occasionally entrained into the St. Lucie intake canal, collected, and returned to the Atlantic Ocean in accordance with the terms of NMFS's biological opinion (NMFS 2022-TN12343) and applicable FWC permits. Hawksbills do not nest in Florida and are, therefore, unlikely to occur on beaches within the action area. |
| Kemp's ridley sea turtle (*Lepidochelys kempii)* | FE | Occupy the Gulf and may transient the Atlantic Ocean. Nesting is restricted to the western portion of the Gulf. | **Present.** Primarily found on the Gulf side of Florida. Juveniles may be found in the Atlantic Ocean. Though rare, the Kemp's ridley sea turtle has been observed in the aquatic portion of the action area. |
| leatherback sea turtle (*Dermochelys coriacea*) | FE | Occur in the Atlantic, Pacific, and Indian Oceans. Nesting beaches are primarily located in tropical latitudes around the world. | **Present.** Leatherbacks are regularly entrained into the St. Lucie intake canal, collected, and returned to the Atlantic Ocean in accordance with the terms of NMFS's biological opinion (NMFS 2022-TN12343) and applicable FWC permits. South Hutchinson Island is an important rookery for the species, and females use beaches in the action area for nesting from March to July. In 2023, researchers identified 338 leatherback nests on South Hutchinson Island. None were in Sector O where St. Lucie is located (FPL 2024-TN12347). |
| loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean DPS | FT | Inhabit subtropical and temperate regions of the Atlantic, Pacific, and Indian Oceans, and the Mediterranean Sea. | **Present.** Loggerheads are regularly entrained into the St. Lucie intake canal, collected, and returned to the Atlantic Ocean in accordance with the terms of NMFS's biological opinion (NMFS 2022) and applicable FWC permits. South Hutchinson Island is an important rookery for the species, and females use beaches in the action area for nesting from April to September. In 2023, researchers identified 14,360 loggerhead nests on South Hutchinson Island, over 300 of which were in Sector O where St. Lucie is located (FPL 2024-TN12347). |

| Species or Critical Habitat | Federal Status[(a)] | Habitat | Type and Likelihood of Occurrence in Action Area |
|---|---|---|---|
| monarch butterfly (*Danaus plexippus*) | FPT | Prairies, meadows, grasslands, and along roadsides across most of North America, especially in areas containing milkweed (*Asclepias* spp.). | **Present.** FPL reports that monarchs have been documented within the 6 mi vicinity of the St. Lucie site and that the species is likely to occur within the action area. FPL reports no presence of milkweed species within the action area (FPL 2025-TN12264). |
| piping plover (*Charadrius melodus*), Atlantic Coast and Northern Great Plains populations | FT | Coastal habitats include sand spits, small islands, tidal flats, shoals, and sandbars with inlets. Primary foraging habitats include sandy mud flats, ephemeral pools, and seasonally emergent seagrass beds with abundant invertebrates. | **Migratory.** Individuals migrate to Florida from late July through September and disperse from late February through April. The action area only contains marginal habitat on beach dunes. FPL reports no observations of piping plovers on the St. Lucie site (NRC 2021-TN12261). However, the NRC staff conservatively assumes that individuals may occasionally occur in the action area during the migratory period when moving between nearby areas of more suitable habitat. |
| puma (mountain lion) (*Puma concolor* [all subsp. except *coryi*]), Florida population | SAT | Steep, rocky canyons or mountainous terrain. | **Absent.** The only population of puma known to occur in Florida is the Florida panther, and this subspecies does not occur in the action area (see “Florida panther” above). |
| southeastern beach mouse (*Peromyscus polionotus niveiventris*) | FT | Sand dunes vegetated with sea oats and dune panic grass along the Florida Atlantic Coast from Volusia south to Martin County. | **Likely Extirpated.** FPL reports no observations of this species on the St. Lucie site (NRC 2021-TN12261). However, dunes within the action area provide suitable habitat for the species to burrow. Therefore, the NRC staff conservatively assumes that the species may inhabit the action area. |
| tiny polygala (*Polygala smallii*) | FE | Pine rocklands, scrub, sandhills, and open coastal spoil piles. | **Absent.** While tiny polygala is known to occur in St. Lucie County, FPL reports no documented occurrences of the species on the St. Lucie site (NRC 2021-TN12261). A 2001 site survey indicated that suitable habitat for the species is present (FWEC 2001-TN12340). However, the survey seems to indicate that this habitat is along transmission line ROWs, which are not under the purview of the NRC and not within the ESA action area for the proposed subsequent license renewal. |

| Species or Critical Habitat | Federal Status[(a)] | Habitat | Type and Likelihood of Occurrence in Action Area |
|---|---|---|---|
| West Indian manatee (*Trichechus manatus*) | FT | Shallow, slow-moving waters of rivers, estuaries, saltwater bays, canals, and coastal areas along Florida's southern Atlantic coastline and the Panhandle. Species can inhabit both freshwater and saltwater environments but prefer freshwater. | **Present.** Although this species' preferred habitats are in the Indian River Lagoon and other inland waterways where food sources are abundant, individuals occasionally travel up and down the coast near the shore. Thirteen occurrences of manatees entering the intake canal have occurred since St. Lucie began operating (NRC 2021-TN12261, FPL 2025-TN12264). Manatees are known to congregate in the warm-water effluents of power plants during winter months; however, FPL reports that St. Lucie is not a congregation site for the species (NRC 2021-TN12261). |
| wood stork (*Mycteria americana*), Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina population | FT | Mixed hardwood swamps, sloughs, mangroves, and cypress domes/strands in Florida. | **Present.** Individuals inhabit south Florida from late November through early March. FPL reports no observations of wood storks on the St. Lucie site. However, sightings have occurred on Hutchinson Island, and the action area contains wetlands and mangrove areas that could provide suitable feeding and foraging habitat (NRC 2021-TN12261). Therefore, the NRC staff assumes that individuals may occasionally occur in the action area during the migration period. |
| Proposed critical habitat of the green sea turtle | FPD | PBFs described in Section C.3.3.3. | **Critical Habitat Unit FL-05:** Incorporates in-water areas from the mean high-water line up to 66 ft depth near Hutchinson Island and the Caloosahatchee River system. These zones support green sea turtle nesting beaches and foraging habitat. (88 FR 46572-TN12359). |
| Critical habitat of the loggerhead sea turtle | FD | PBFs described in Section C.3.3.4. | **Critical Habitat Unit LOGG-N-18:** Nearshore reproductive habitat and constricted migratory habitat in the nearshore waters from the mean high-water line to the 100 ft depth contour off Floridana Beach to the Martin County/Palm Beach County line (79 FR 39856-TN12355). |

| Species or Critical Habitat | Federal Status[(a)] | Habitat | Type and Likelihood of Occurrence in Action Area |
|---|---|---|---|
| Critical habitat of the West Indian manatee | FD | PBFs described in Section C.3.3.9. | **Critical Habitat Unit FL-09:** Inshore waters from approximately 1.3 mi south of the Boynton Inlet to approximately 4.7 mi south of the Fort Pierce Inlet in Palm Beach, Martin, and St. Lucie Counties, Florida. Includes intracoastal waterways, rivers, and canals along the eastern Florida coast even with Lake Okeechobee (89 FR 78134-TN12360). |

DPS = distinct population segment; ESA = Endangered Species Act; FD = federally designated (critical habitat); FE = federally endangered; FPD = federally proposed for designation (critical habitat); FPT = federally proposed for listing as threatened; FT = federally threatened; FWC = Florida Wildlife Commission; FWS = U.S. Fish and Wildlife Service; PBF = physical and biological feature; ROW = right-of-way; SAT = federally listed due to similarity of appearance with a listed endangered species.
(a) Indicates protection status under the Endangered Species Act.
Sources: NRC 2021-TN12261; FPL 2025-TN12167; FWS 2025-TN12341

### C.3.3 ESA Effect Determinations for Federally Listed Species and Critical Habitats Under U.S. Fish and Wildlife Jurisdiction

In Section C.3.2, the NRC staff determined that 14 federally listed, or proposed for listing, species and 3 federally listed, or proposed for listing, critical habitats may occur in the action area. Below, the NRC staff analyzes the potential impacts of the proposed St. Lucie subsequent license renewal on these species. Table C-5 summarizes the NRC staff's ESA effect determinations for these species.

In Section C.3.2, the NRC staff describes several federally listed species and concludes that the American crocodile, Florida panther, Florida scrub-jay, fragrant prickly-apple, puma, and tiny polygala are not located within the action area. Therefore, the NRC staff does not address these species any further because St. Lucie subsequent license renewal would have no effect on them. Additionally, the NRC staff identified the presence of the Hawksbill and Kemp's Ridley sea turtle within the aquatic portion of the action area. Because sea turtles are managed jointly by the Services and they do not use the terrestrial portion of the action area, the NRC staff determined that St. Lucie subsequent license renewal will have "no effect" on the hawksbill and Kemp's ridley sea turtles with respect to FWS jurisdiction; impacts regarding their use of the aquatic portion of the action area are discussed in Section 3.5.2 with respect to NMFS jurisdiction. Table C-5 identifies these species and the NRC staff's "no effect" determination.

The following two species are federally listed because of their similarity in appearance to a federally listed endangered or threatened species. A species that is listed due to similarity of appearance is not biologically endangered or threatened and is not subject to ESA Section 7 consultation. Therefore, this EIS does not discuss further these two species:

- Puma (*Puma concolor* [all sub species except *coryi*]), which was listed for similarity in appearance to the Florida panther (*Puma concolor coryi*)
- American alligator (*Alligator mississippiensis*), which was listed for similarity in appearance to American crocodile (*Crocodylus acutus)*

### *C.3.3.1 Crested Caracara (Federally Threatened [FT]), Everglade Snail Kite (Federally Endangered [FE]), and Piping Plover (FT)*

In Section C.3.2, the NRC staff concludes that the crested caracara, everglade snail kite, and piping plover may occur in the action area throughout the undeveloped portions of the St. Lucie site and nearby wet prairies and marshes. The crested caracara is normally observed in the western portion of St. Lucie County. The everglade snail kite is traditionally observed further south in Florida. The migratory piping plover would only be present seasonally from February through April. FPL reports no observations of the crested caracara, everglade snail kite, or piping plover within the action area (FPL 2021-TN12166).

The primary drivers identified by FWS as commonly affecting the health of crested caracara, everglade snail kit, and piping plover are (1) habitat loss, degradation, and modification; (2) behavioral changes resulting from human disturbance near nesting, roosting, and forage sites; and (3) collisions with building infrastructure and vehicles (52 FR 25229-TN12367; 32 FR 4001-TN2750; 50 FR 50726-TN5502).

Habitat Loss, Degradation, and Modification

Crested caracara traditionally inhabits dry to wet prairies; however, due to recent land use changes they can now be found in freshwater marshes, shrub swamps, shrub and brushland, and urban areas (FWS 2025-TN12350). Everglade snail kites may use nearby wetlands and coastal marshes to forage and nest (FFWCC 2025-TN12352). During migration periods, piping plover may use nearby coastal habitats, including sand pits, small islands, tidal flats, shoals, and sandbars with inlets (FWS 2025-TN12353).

To date, FPL has not identified the need for refurbishment activities, additional land clearing, development, or construction during the proposed subsequent license renewal term (FPL 2025-TN12167). Any land disturbing activities, such as maintenance of roadways, piping, fencing, and other infrastructure, and mowing would take place within the previously disturbed industrialized area. Accordingly, the NRC staff finds the likelihood of future adverse effects of habitat loss, degradation, and modification on the crested caracara, everglade snail kite, and piping plover to be extremely unlikely, and therefore, is not considered further.

Behavioral Changes Resulting from Human Disturbance near Nesting, Roosting, and Forage Sites

Site activities during the proposed subsequent license renewal term, including site maintenance and infrastructure repair, could prompt behavioral changes in birds. Noise, vibration, and general human disturbance are stressors that may disrupt normal nesting, roosting, foraging, and breeding activities. At low noise levels or further distances, birds may initially be startled but would likely habituate to the low background noise levels. At closer range and louder noise levels, particularly if accompanied by physical vibrations from heavy machinery, many birds would likely be startled to the point of fleeing from daytime roosts. Fleeing birds could be more susceptible to predation and would expend more energy, which could decrease reproductive fitness. Increased noise may also reduce foraging success.

Within the action area, noise, vibration, and other human disturbances during the proposed subsequent license renewal term could dissuade birds from using the action area's wetland habitat during residency or migration. However, birds that use the action area have likely become habituated to such disturbances because St. Lucie has been consistently operating for several decades.

Continued operation of St. Lucie during the subsequent license renewal term would not include major construction or refurbishment and would involve no other maintenance or infrastructure repair activities besides routine activities already performed at the site. Levels and intensity of noise, lighting, and human activity associated with continued day-to-day activities and site maintenance during the subsequent license renewal term would be similar to ongoing conditions since St. Lucie began operating, and such activity would only occur on the developed, industrial-use portions of the site. While these disturbances would cause behavioral changes in migrating or resident birds, such as the expenditure of additional energy to find alternative habitat, the NRC staff assumes that protected birds, if present in the action area, have already acclimated to regular site disturbances. Additionally, FPL maintains a company-wide Avian Protection Plan that it developed in accordance with the Avian Power Line Interaction Committee and FWS Avian Protection Plan Guidelines. The plan includes guidelines for working around federally listed birds and their nests and procedures that workers follow to ensure that listed birds are protected during site activities, such as vegetation maintenance, power restoration, and continued use of existing facilities. FPL also has established nest buffers for protected avian species that may occur in the action area (FPL 2022-TN12263). The nest buffer for the crested caracara is 985 ft (300 m) during nesting season (November–April) (Ogden 1984-TN962). With adherence to these protection measures, the continued operation of St. Lucie during the subsequent license renewal term would not cause behavioral changes in birds to a degree that would be able to be meaningfully measured, detected, or evaluated, or that would reach the scale at which take may occur, and therefore, is not considered further.

Collisions with Building Infrastructure and Vehicles

The risk of collisions with tall structures and in-scope transmission lines poses a threat to protected birds. FPL's Avian Protection Plan includes guidance for reporting bird mortalities, nest management procedures, staff training, and a mortality risk assessment (FPL 2021-TN12166). FPL uses bird deterrent designs onsite, including bird discouragers, perch guards, and insulator shields, to reduce risk of electrocution (FPL 2021-TN12166). To date, there have been no federally protected bird mortalities within the action area. Since 2015, there have been no recorded protected bird mortalities of any species within the action area (FPL 2025-TN12264). Accordingly, the NRC staff finds the likelihood of federally protected avian collisions with buildings, infrastructure, or in-scope transmission lines during the proposed subsequent license renewal term to be extremely unlikely, and therefore, is not considered further.

During the proposed subsequent license renewal term, vehicular traffic from truck deliveries, site maintenance activities, and personnel commuting to and from the site would continue in a similar manner to the current license term. Vehicle use would occur primarily in areas where federally listed avian species would be less likely to frequent, such as along established county and State roads or within the industrial-use areas of the St. Lucie site. Accordingly, the NRC staff finds the likelihood of federally protected avian collisions with vehicles during the proposed subsequent license renewal term to be extremely unlikely and, therefore, is not considered further.

Conclusion for the Crested Caracara, Everglade Snail Kite, and Piping Plover

All potential effects on the crested caracara, everglade snail kite, and piping plover would be insignificant or discountable during the proposed subsequent license renewal term. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the crested caracara, everglade snail kite, and piping plover. Following the issuance of the draft EIS, the NRC staff will seek FWS's concurrence with this finding.

### *C.3.3.2 Eastern Black Rail (FT) and Wood Stork (FT)*

In Section C.3.2, the NRC staff concludes that the eastern black rail may occur in the action area year-round throughout the undeveloped portions of the St. Lucie site, which include onsite marshes, wetlands, and the intercoastal habitat consisting of both salt, brackish, and freshwater environments. Eastern black rails limit flight during breeding and wintering seasons and rarely flush (FWS 2019-TN12348).

In Section C.3.2, the NRC staff concludes that the wood stork may occur in the action area from late November through early March throughout the undeveloped portions of the St. Lucie site and nearby wetlands and mangroves that could provide suitable feeding and foraging habitat. Wood storks have been observed onsite and on Hutchinson Island (FPL 2021-TN12166).

The primary drivers identified by FWS as affecting the health of the eastern black rail and wood stork are (1) habitat fragmentation, degradation, and modification; (2) behavioral changes resulting from human disturbance near nesting, roosting, and forage sites; and (3) altered hydrology, drainage modifications, and impounded wetland management (FWS 2019-TN12348).

Habitat Fragmentation, Degradation, and Modification

For the same reasons explained in Section C.3.3.1, the NRC staff finds the likelihood of adverse effects of habitat fragmentation, degradation, and modification on the eastern black rail and wood stork during the proposed subsequent license renewal term to be extremely unlikely, and therefore, is not considered further.

Behavioral Changes Resulting from Human Disturbance near Nesting, Roosting, and Forage Sites

As part of FPL's Avian Protection Plan, there is an established nest buffer for active wood stork nests of 500–1,500 ft (152–457 m) (FPL 2022-TN12263). For the same reasons explained in Section C.3.3.1, the NRC staff finds the likelihood of human disturbance resulting in behavioral changes on the eastern black rail and wood stork during the proposed subsequent license renewal term to be extremely unlikely, and therefore, is not considered further.

Altered Hydrology, Drainage Modification, and Impounded Wetland Management

St. Lucie contains an Open Marsh Water Management (OMWM) area that is located directly between the intake and discharge canal where woody and emergent wetlands are located (FPL 2021-TN12166). FPL coordinates directly with County officials on management of the water levels in the wetland management area. At the discretion of county officials, FPL staff can raise or lower the water levels of the OMWM area with water from the intake canal through an internal outfall from within the intake canal. FPL uses this outfall on an "as-required" basis. The water levels are raised and lowered to enhance growth of mangroves and assist in mosquito control

(FPL 2021-TN12166). This operation would continue through the proposed subsequent license renewal term. As described by FWS:

> Open Marsh Water Management (OMWM) to address mosquito populations in marshes while ameliorating the negative impacts of ditching has been developed in the last few decades. This approach creates ponded areas of the marsh and also plugs previously constructed ditches in order to maintain access to potential mosquito larvae by fish. This approach is not entirely accepted by wetland experts and land managers due to altering, fragmenting, and converting of pristine marshes to create ponded areas, compacting emergency marsh from heavy equipment and activities on the surface, changing vegetation community and allowing invasion of shrubs and non-native species due to elevation changes, and losing salt marsh habitats used by wetland species (FWS 2019-TN12348).

Potential beneficial effects of OMWM in altered marshes are increased forage base and feeding habitats for waterbirds, restoration of hydrology by plugging ditches, and addition of perching and nesting substrate for wetland birds. The effects of OMWM on the eastern black rail and wood stork have not been evaluated.

In addition to OMWM areas, any alteration to hydrology may affect the eastern black rail and wood stork. During the proposed subsequent license renewal term, FPL would not modify any wetland habitat or alter any hydrology outside of the operation of the OMWM. The NRC staff concludes that protected avian species have acclimated to the associated OMWM area and that FPL would continue to operate the OMWM as it has during the current license term. Additionally, any operation of the outfall corresponding to management of the OMWM would continue to be conducted with the guidance of County officials. Accordingly, the NRC staff finds the likelihood of adverse effects of altered hydrology, drainage modification, and impounded wetland management on the eastern black rail and wood stork during the proposed subsequent license renewal term to be extremely unlikely, and therefore, is not considered further.

Conclusion for the Eastern Black Rail and Wood Stork

All potential effects on the eastern black rail and wood stork would be insignificant or discountable during the proposed subsequent license renewal term. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the eastern black rail and wood stork. Following the issuance of the draft EIS, the NRC staff will seek FWS's concurrence with this finding.

#### *C.3.3.3 Green Sea Turtle (FT) and Green Sea Turtle Proposed Critical Habitat (Proposed for Federal Designation [FPD])*

In Section C.3.2, the NRC staff concludes that the green sea turtle is present throughout the aquatic portion of the action area as well as along the eastern beaches of Hutchinson Island. The green sea turtle is managed jointly by NMFS and FWS. FWS jurisdiction regarding this species is the terrestrial environment, which includes nesting habitat. Within Florida, green sea turtles nest between June and September. Males mate each year; however, females only nest every 1 to 3 years. FPL has identified the presence of green sea turtle individuals within the action area as well as nesting habitat along the beaches in the action area. FPL's contractor, Inwater Research, holds an ESA Section 10 Marine Turtle Permit to conduct nesting surveys, stranding/salvage activities, nest relocation, net capture, and turtle tagging on protected turtles from 0.15 mi (0.24 km) south of Blue Heron Beach Park to 449 ft (137 m) north of Normandy

Beach Access (FFWCC 2025-TN12354). For details regarding the biology of the species, refer to the published rule found on the species Environmental Conservation Online System profile maintained by FWS (81 FR 20058-TN10270), which is incorporated by reference herein.

On July 19, 2023, FWS proposed (88 FR 46376-TN12361) listing the North Atlantic distinct population segment (DPS) of green sea turtle habitat as critical habitat. Proposed critical habitat Unit No. 5, FL-05 Hutchinson Island, is within the action area. Unit FL-05 is a high-density nesting area that contains more than one of the physical and biological features (PBFs) essential to the conservation and recovery of the species. For details regarding the PBFs of Unit FL-05 of the proposed critical habitat for the green sea turtle, refer to the proposed rule found on the species Environmental Conservation Online System profile maintained by FWS (88 FR 46376-TN12361), which is incorporated by reference herein. Table C-8 includes the NRC staff ESA effect determination for each of the green sea turtle proposed critical habitat PBFs.

For the proposed action (St. Lucie subsequent license renewal), the NRC staff reviewed known threats to the green sea turtle. The primary drivers commonly affecting the health of green sea turtles identified by FWS are (1) habitat loss, degradation, and modification of nesting beach habitat; (2) marine debris and pollution; and (3) artificial beachfront lighting (88 FR 46376-TN12361).

Habitat Loss, Degradation, and Modification of Nesting Beach Habitat

Green sea turtles require specific PBFs for their nesting habitat (Table C-8). FPL's contractor, Inwater Research, holds an ESA Section 10 permit, which authorizes them to conduct various activities related to green sea turtles and their nesting habitats. These activities include nesting surveys, stranding and salvage operations, nest relocation, hatch success evaluations, post-hatch nest content evaluations, net and hand capture, turtle tagging, necropsies, boat transect surveys, blood and skin biopsies, and night surveys (FFWCC 2025-TN12354). All individuals operating under this permit must adhere to the guidelines outlined in the Marine Turtle Conservation Handbook, developed by FWS and the Florida Fish and Wildlife Conservation Commission (FWC) (FFWCC 2016-TN12368).

Additionally, within the action area, FPL leases a portion of its land to St. Lucie County, which has established the Walton Rocks Beach Dog Park. To protect the green sea turtle nesting areas, FPL is committed to installing signs to inform dog owners that dogs should not travel north of the designated dog beach onto its property and into turtle nesting areas (FPL 2025-TN12349). These signs may reduce incidents of dogs disturbing nesting turtles. FPL also will collaborate with local authorities to ensure regular monitoring and enforcement of these guidelines to deter noncompliance, as needed.

To date, FPL has not identified the need for refurbishment, additional land clearing, development, or construction activities during the proposed subsequent license renewal term, including within suitable green sea turtle habitat (FPL 2025-TN12167). Accordingly, the NRC staff finds the likelihood of adverse effects of habitat loss, degradation, and modification of nesting beach habitat on the green sea turtle during the proposed subsequent license renewal term to be extremely unlikely, and therefore, is not considered further.

Marine Debris and Pollution

Marine debris and pollution present significant threats to green sea turtles, particularly due to the ingestion of marine debris. Green sea turtles often mistake plastic bags, balloons, and other debris for food, such as jellyfish. Ingesting these materials can lead to intestinal blockages, malnutrition, and even death. Additionally, the ingestion of microplastics can introduce toxic substances into their bodies, further compromising their health. Entanglement in marine debris is another threat. Fishing nets, lines, and other debris can entangle green sea turtles, restricting their movement and ability to surface for air, which can result in drowning. Entanglement also can cause severe injuries, such as cuts and amputations, leading to infections and long-term disabilities. Pollution, particularly chemical pollutants, poses additional risks. Runoff from agricultural and industrial activities introduces harmful substances into marine environments. These pollutants can accumulate in the tissues of green sea turtles, leading to various health issues, including weakened immune systems, reproductive problems, and developmental abnormalities. Furthermore, pollution can degrade the quality of nesting beaches and foraging habitats. Oil spills, for example, can contaminate beaches, making them unsuitable for nesting. Contaminated foraging areas can reduce the availability of healthy food sources, impacting the overall fitness and survival of green sea turtles. FPL maintains, and would continue to maintain during the proposed subsequent license renewal term, a stormwater pollution prevention plan that is expected to minimize the potential for pollutants to enter the environment through runoff (FPL 2025-TN12167). Additionally, Inwater Research maintains, and would continue to maintain during the proposed subsequent license renewal term, the beach habitat for green sea turtles in accordance with its ESA Section 10 permit (FFWCC 2025-TN12354). Accordingly, the NRC staff finds the likelihood of adverse effects of marine debris and pollution on the nesting beach habitat of the green sea turtle during the proposed subsequent license renewal term to be extremely unlikely, and therefore, is not considered further.

Artificial Beachfront Lighting

Artificial beachfront lighting poses significant threats to green sea turtles (88 FR 46376-TN12361). Hatchlings, which naturally orient themselves towards the brightest horizon to find the ocean, are frequently disoriented by artificial lights from beachfront developments. This misorientation often results in hatchlings moving inland, leading to increased mortality due to dehydration, predation, and other hazards. Furthermore, adult female green sea turtles exhibit a preference for dark, undisturbed beaches when selecting nesting sites. The presence of artificial lighting can deter these females from coming ashore to nest, thereby reducing the number of successful nesting events. Additionally, if a nesting female is disturbed by artificial lights, she may abandon her nesting attempt and return to the sea—a phenomenon known as a “false crawl.” Conservation efforts to protect nesting habitats from artificial lighting are essential for the survival and recovery of green sea turtle populations. These efforts include measures such as shielding lights, installing motion sensors, and planting vegetation to obstruct light from reaching the beach.

The suitable green sea turtle nesting habitat within the action area is approximately 1,312 ft (400 m) east from the disturbed portion of the St. Lucie site. This area includes a road and wetland habitat buffer. Two disturbed areas connect directly to the beach; these areas are the intake canal and discharge canal. FPL maintains shielded lighting with red coverings at all locations near suitable turtle beach nesting areas. In May 2025, a lighting study was conducted and confirmed that there is no visible light observable on the beach (FPL 2025-TN12486). Additionally, Inwater Research holds an ESA Section 10 permit to conduct research on nesting sea turtles, and this permit outlines several conservation measures to ensure the conservation

of the species and nesting habitat. Accordingly, the NRC staff finds the likelihood of adverse effects of artificial beachfront lighting on the green sea turtle and its nesting habitat during the proposed subsequent license renewal term to be extremely unlikely, and therefore, is not considered further.

**Table C-8 ESA Effect Determinations for the Physical and Biological Features of the Proposed Green Sea Turtle Critical Habitat (FL-05)**

| PBF | ESA Effect Determination[(a)] | Description | Analysis |
|---|---|---|---|
| PBF 1: Sufficient extra-tidal or dry sandy beaches from the mean high-water line | NLAA | Relatively unimpeded wet and dry sand or nearshore access areas to and from the ocean and beach for nesting females. Drier sand areas located above the mean high water in the supralittoral zone to avoid being inundated. Sand substrate that allows for suitable nest construction, facilitates gas diffusion for embryo development, maintains temperatures for embryo development, and allows for emergence of hatchlings. | **Present**. Green sea turtles have been observed and recorded by FPL and its contractor, Inwater Research, using the beach on the eastern side of the action area as nesting habitat. Because Inwater Research holds an ESA Section 10 permit regarding listed sea turtles and their habitat, the NRC staff concludes that appropriate conservation measures are in place to ensure the conservation of the green sea turtle and its nesting habitat. Potential impacts to PBFs associated with the proposed SLR are captured under the ESA Section 10 permit. If Inwater Research does not apply for a timely renewal of its ESA Section 10 permit or decides to no longer conduct research, FPL will notify the NRC. For these reasons, the NRC staff concludes that the proposed SLR may affect but is not likely to adversely affect PBF 1 of the green sea turtle proposed critical habitat. |
| PBF 2: Nesting Beach Habitat with Sufficient Darkness | NLAA | Sufficient darkness such that nesting turtles are not deterred from emerging onto the beach and hatchling post-nesting females can orient to sea. | **Present**. See PBF 1 analysis. |
| PBF 3: Natural Coastal Processes or Suitable Artificial Habitat | NLAA | Includes natural and artificial habitat types described in PBF 1 and 2 above for beach access, nest site selection, nest construction, egg disposition and incubation, and hatchling emergence and movement to sea. | **Present**. See PBF 1 analysis. |
| PBF 4: Basking Habitat | NLAA | Basking habitat that includes access to natural and artificial coastlines with gradually sloping beaches, emergent sandy lands, sand spits, low shelving reef rocks, as well as | **Present**. See PBF 1 analysis. |

| PBF | ESA Effect Determination[(a)] | Description | Analysis |
|---|---|---|---|
| | | unimpeded nearshore access from the ocean to the beach. | |

ESA = Endangered Species Act; FPL = Florida Power & Light Company; FWS = U.S. Fish and Wildlife Service; Inwater Research = Inwater Research Group, Inc.; NLAA = may affect but is not likely to adversely affect; NRC = U.S. Nuclear Regulatory Commission; PBF = physical and biological feature; SLR = subsequent license renewal.

(a) The NRC staff makes its effect determinations in accordance with the language and definitions specified in the FWS and NMFS Endangered Species Consultation Handbook (FWS and NMFS 1998-TN1031).

Sources: NRC 2021-TN12261, FPL 2025-TN12167, FWS 2025-TN12341, 88 FR 46376-TN12361.

Conclusion for the Green Sea Turtle and Green Sea Turtle Proposed Critical Habitat, Unit FL-05

All potential effects on the green sea turtle and green sea turtle proposed critical habitat (Unit FL-05) would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the green sea turtle and green sea turtle proposed critical habitat. Following the issuance of the draft EIS, the NRC staff will seek FWS's concurrence with this finding.

### *C.3.3.4 Loggerhead Sea Turtle (FT) and Loggerhead Sea Turtle Critical Habitat (Federally Designated [FD])*

In Section C.3.2, the NRC staff concludes that the loggerhead sea turtle is present throughout the aquatic portion of the action area as well as along the beaches of Hutchinson Island. The loggerhead sea turtle is managed jointly by the Services. FWS jurisdiction regarding this species is the terrestrial environment to include nesting habitat. As previously described in Appendix C.3.3.3, FPL's contractor, Inwater Research, holds an ESA Section 10 permit regarding sea turtle management.

On July 10, 2014, FWS designated the Northwest Atlantic DPS of loggerhead sea turtle habitat as critical habitat (79 FR 39856-TN12355). Within the action area, critical habitat Unit No. LOGG-N-18 exists. Unit LOGG-N-18 is occupied by the species and contains reproductive habitat areas. For details regarding the PBFs of Unit LOGG-N-18 of the critical habitat for the loggerhead sea turtle, refer to the rule found on the species Environmental Conservation Online System profile maintained by FWS (FWS 2025-TN12369), which is incorporated by reference herein. Table C-9 includes the NRC staff ESA effect determination for each of the loggerhead sea turtle critical habitat PBFs.

For the proposed action (St. Lucie subsequent license renewal), the NRC staff reviewed known threats to loggerhead sea turtles. The primary drivers identified by FWS as commonly affecting the health of loggerhead sea turtles are (1) habitat loss, degradation, and modification of nesting beach habitat; (2) marine debris and pollution; and (3) artificial beachfront lighting (76 FR 58868-TN10617).

**Table C-9 ESA Effect Determinations for the Physical and Biological Features of the Loggerhead Sea Turtle Critical Habitat (LOGG-N-18)**

| PBF | ESA Effect Determination[(a)] | Description | Analysis |
|---|---|---|---|
| PBF 1: Suitable Nesting Beach Habitat | NLAA | Relatively unimpeded nearshore access from the ocean to the beach for nesting females and from the beach to the ocean for both post-nesting females and hatchlings. Located above mean high water to avoid being inundated frequently by high tides. | **Present**. For the same reasons listed in Table C-8, the NRC staff concludes that the proposed SLR may affect but is not likely to adversely affect PBF 1 of the loggerhead sea turtle critical habitat. |
| PBF 2: Suitable Sand Habitat | NLAA | Allows for suitable nest construction; is suitable for facilitating gas diffusion conducive to embryo development; is able to develop and maintain temperatures and a moisture content conducive to embryo development. | **Present**. See PBF 1 analysis. |
| PBF 3: Suitable nesting beach habitat with sufficient darkness | NLAA | To ensure that nesting turtles are not deterred from emerging onto the beach and hatchlings and post-nesting females orient to the sea. | **Present**. See PBF 1 analysis. |
| PBF 4: Natural coastal processes or artificially created or maintained habitat mimicking natural conditions | NLAA | Includes artificial habitat types that mimic natural conditions. Includes suitable conditions for beach access, nest site selection, nest construction, egg disposition and incubation, and hatchling emergence and transfer and erosion and accretion of sediments along the ocean shoreline. | **Present**. See PBF 1 analysis. |

ESA = Endangered Species Act; FWS = U.S. Fish and Wildlife Service; NLAA = may affect but is not likely to adversely affect; NRC = U.S. Nuclear Regulatory Commission; PBF = physical and biological feature; SLR = subsequent license renewal.

(a) The NRC staff makes its effect determinations in accordance with the language and definitions specified in the FWS and NMFS Endangered Species Consultation Handbook (FWS and NMFS 1998-TN1031).

Sources: NRC 2021-TN12261; FPL 2025-TN12167; FWS 2025-TN12341; 79 FR 39756-TN12370.

Conclusion for the Loggerhead Sea Turtle and Loggerhead Sea Turtle Critical Habitat, Unit LOGG-N-18

For the same reasons explained in Section C.3.3.3, all potential effects on the loggerhead sea turtle and the loggerhead sea turtle critical habitat (Unit LOGG-N-18) would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the loggerhead sea turtle and loggerhead sea turtle critical habitat. Following the issuance of the draft EIS, the NRC staff will seek FWS's concurrence with this finding.

### *C.3.3.5 Leatherback Sea Turtle (FE)*

In Section C.3.2, the NRC staff concludes that the leatherback sea turtle is present throughout the aquatic portion of the action area as well as along the beaches of Hutchinson Island. The leatherback sea turtle is managed jointly by the Services. FWS jurisdiction regarding this species is the terrestrial environment to include nesting habitat. As previously described in Section C.3.3.3, FPL's contractor, Inwater Research, holds an ESA Section 10 permit regarding sea turtle management.

For the proposed action (St. Lucie subsequent license renewal), the NRC staff reviewed known threats to leatherback sea turtles. The primary drivers identified by FWS as commonly affecting the health of leatherback sea turtles are the same as those affecting the green sea turtle and are (1) habitat loss, degradation, and modification of nesting beach habitat; (2) marine debris and pollution; and (3) artificial beachfront lighting (64 FR 14052-TN12379).

Conclusion for the Leatherback Sea Turtle

For the same reasons explained in Section C.3.3.3, all potential effects on the leatherback sea turtle would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the leatherback sea turtle. Following the issuance of the draft EIS, the NRC staff will seek FWS's concurrence with this finding.

### *C.3.3.6 Eastern Indigo Snake (FT)*

In Section C.3.2, the NRC staff concludes that the eastern indigo snake may occur in the action area throughout the undeveloped portions of the St. Lucie site, including pinewood flats, hardwood forests, moist hammocks, marshes, and areas surrounding cypress swamp. The eastern indigo snake relies heavily on gopher tortoise burrows as part of its habitat requirements (FFWCC 2025-TN12371). FPL has not observed any eastern indigo snakes within the action area, though they have been observed on Hutchinson Island (FPL 2021-TN12166).

For the proposed action (St. Lucie subsequent license renewal), the NRC staff reviewed known threats to the eastern indigo snake. The primary drivers identified by FWS as commonly affecting the health of the eastern indigo snake are (1) habitat loss, degradation, and modification; (2) road mortality; and (3) pesticide and contaminant exposure (43 FR 4026 4029-TN12382).

Habitat Loss, Degradation, and Modification

It is estimated that approximately 5 percent of eastern indigo snake habitat is lost annually in Florida (FFWCC 2025-TN12371). Eastern indigo snakes move seasonally between upland and lowland habitats. Snakes use underground shelters for refuge, breeding, feeding, and nesting. In Florida, eastern indigo snakes are often found in gopher tortoise burrows. Adult eastern indigo snakes travel long distances over areas covering hundreds to thousands of acres (FWS 2025-TN12372).

To date, FPL has not identified the need for refurbishment, additional land clearing, development, or construction activities during the proposed subsequent license renewal term (FPL 2025-TN12167). Any land disturbing activities, such as maintenance of roadways, piping, fencing, and other infrastructure, and mowing would take place within the previously disturbed

industrialized area. Accordingly, the NRC staff finds the likelihood of adverse effects of habitat loss, degradation, and modification on the eastern indigo snake during the proposed subsequent license renewal term to be extremely unlikely, and therefore, is not considered further.

Road Mortality

Because the eastern indigo snake is known to travel within large home ranges, snakes may be killed or injured by vehicle traffic when crossing roadways within the action area. As previously stated, FPL has not identified the need for refurbishment or additional land clearing activities during the proposed subsequent license renewal term and there is no planned increase of vehicular traffic within the action area. To date, there have been no reported mortalities of the eastern indigo snake due to vehicular collisions. Accordingly, the NRC staff finds the likelihood of adverse effects of road mortality on the eastern indigo snake during the proposed subsequent license renewal term to be discountable and therefore, is not considered further.

Pesticide and Contaminant Exposure

During the proposed subsequent license renewal term, FPL would continue to apply pesticides according to labelled instructions with certified applicators. Pesticides would only be used in previously disturbed areas and would not be applied to native vegetation. FPL does not maintain a site-specific pesticide management plan but does maintain a stormwater pollution prevention plan. Accordingly, the NRC staff finds the likelihood of adverse effects of pesticide and contaminant exposure on the eastern indigo snake during the proposed subsequent license renewal term to be discountable, and therefore, is not considered further.

Conclusion for the Eastern Indigo Snake

All potential effects on the eastern indigo snake would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the eastern indigo snake. Following the issuance of the draft EIS, the NRC staff will seek FWS's concurrence with this finding.

### *C.3.3.7 Southeastern Beach Mouse (FT)*

In Section C.3.2, the NRC staff concludes that the southeastern beach mouse is likely extirpated from the action area but may occur in pocketed areas of suitable habitat. Table C-7 describes the suitable habitat for this species. FPL reports no occurrences of the southeastern beach mouse at the St. Lucie site. Additional information pertaining to this species may be found on its Environmental Conservation Online System species profile (FWS 2025-TN12376), which is incorporated by reference herein. The primary drivers identified by FWS as commonly affecting the health of the southeastern beach mouse are habitat loss, degradation, and modification.

Habitat Loss, Degradation, and Modification

In the 2019 southeastern beach mouse 5-year review, FWS concluded that the mouse is likely extirpated on Hutchinson Island (FWS 2019-TN12377). Coastal dune projects pose the greatest threat to the existence of this species. The southeastern beach mouse occupies both frontal and scrub dunes permanently on Florida east-coast beaches. Additionally, FWS stated that most of the suitable habitat in St. Lucie County has been lost to coastal development.

FPL has identified suitable dune habitat within the action area. However, there are no activities planned during the proposed subsequent license renewal term that would impact suitable dune habitat. Because of the low probability of the species' occurrence within the action area and the lack of land disturbing activities within potentially suitable habitat, the NRC staff finds the likelihood of adverse effects of habitat loss, degradation, and modification on the southeastern beach mouse during the proposed subsequent license renewal term to be discountable, and therefore, is not considered further.

Conclusion for the Southeastern Beach Mouse

Because FPL has no plans to conduct coastal development or to disturb dunes during the subsequent license renewal term and because FWS has found that the southeastern beach mouse is likely extirpated from South Hutchinson Island, the NRC staff conservatively concludes that the proposed action *may affect but is not likely to adversely affect* the southeastern beach mouse. Following the issuance of the draft EIS, the NRC staff will seek FWS's concurrence with this finding.

### *C.3.3.8 Monarch Butterfly (Proposed for Federal Listing as Threatened [FPT])*

In Section C.3.2, the NRC staff concludes that the monarch butterfly may occur in the action area year-round. The primary drivers identified by FWS as commonly affecting the health of the monarch butterfly are (1) habitat loss, degradation, and modification and (2) insecticide exposure (FWS 2024-TN11177).

Habitat Loss, Degradation, and Modification

Land use resulting in conversion of suitable habitat to other uses is the primary risk factor affecting the status of the monarch butterfly. Conversion of suitable habitat reduces the amount, availability, connectedness, size, and quality of habitat. While the primary cause of conversion throughout the species' range is agricultural activities, any development activity may reduce suitable habitat. This includes activities such as road construction, housing and commercial development, and energy projects. FPL has not proposed any activities that would result in habitat loss, land disturbance, or other activities that would degrade existing natural areas or potential habitats for butterflies during the proposed subsequent license renewal term. Milkweed, which is essential for the monarch life cycle, is not known to exist on the St. Lucie site, though the presence of invasive tropical milkweed is apparent throughout Florida. Onsite mowing is restricted to the industrialized area where the presence of monarch would be minimal. Continued preservation and enhancement of natural areas onsite would benefit monarch butterflies. Invasive plant species and woody plant encroachment degrade monarch habitat quality and quantity. There are no activities proposed during the proposed subsequent license renewal term that would increase the prevalence of invasive plants. Accordingly, the NRC staff finds the likelihood of adverse effects of habitat loss, degradation, and modification on the monarch butterfly during the proposed subsequent license renewal term to be discountable, and therefore, is not considered further.

Insecticide Exposure

Most insecticides are nonspecific and broad-spectrum in nature. Furthermore, the larvae of many Lepidopterans are considered major pest species, and insecticides are specifically tested on this taxon to ensure that they will effectively kill individuals at the labelled application rates (FWS 2024-TN11177). Insecticide use is most often associated with agricultural production.

Studies looking specifically at the dose response of monarchs to neonicotinoids, organophosphates, and pyrethroids have demonstrated monarch toxicity (e.g., Krischik et al. 2015-TN8596; James 2019-TN8595; Krishnan et al. 2020-TN8597; Bagar et al. 2020-TN8594). Moreover, the magnitude of risk posed by insecticides may be underestimated, as research usually examines the effects of the active ingredient alone, while many of the formulated products contain more than one active insecticide.

During the proposed subsequent license renewal term, FPL would continue to apply herbicides as needed and according to labelled uses but has no plans to apply herbicides in natural areas. Continued herbicide application could directly affect butterflies in the action area by injuring or killing individuals exposed to these chemicals. Certain herbicides such as glyphosate (e.g., Round Up™) can kill milkweed, which could affect the ability of the species to lay eggs and the availability of larval food sources. Continued herbicide application could affect butterflies in the action area by indirect exposure to these chemicals. However, all herbicide applications would be targeted and, therefore, unlikely to result in hazardous levels of contaminant exposure. Accordingly, the NRC staff finds the likelihood of adverse effects of insecticides on the monarch butterfly during the proposed subsequent license renewal term to be discountable, and therefore, is not considered further.

Conclusion for the Monarch Butterfly

All potential effects on the monarch butterfly would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the monarch butterfly. Following the issuance of the draft EIS, the NRC staff will seek FWS's concurrence with this finding.

### *C.3.3.9 West Indian Manatee (FT) and West Indian Manatee Critical Habitat (FD)*

In Section C.3.2, the NRC staff concludes that the West Indian manatee is present in the aquatic portion of the action area, including portions of the Indian River Lagoon/Big Mud Creek and the Atlantic Ocean. Table C-7 describes suitable habitat for this species. Additionally, the NRC staff determined that the West Indian manatee critical habitat is present within the action area within Indian River Lagoon and Big Mud Creek to the west of Hutchinson Island (89 FR 92881-TN12380). Table C-10 provides the NRC staff ESA effect determination for each of the West Indian manatee critical habitat PBFs.

For the proposed action (St. Lucie subsequent license renewal), the NRC staff reviewed known threats to the West Indian manatee. The primary drivers identified by FWS as commonly affecting the health of the West Indian manatee are (1) watercraft collisions, (2) habitat loss and modification, (3) pollution, (4) human interaction and disturbance, (5) cold stress and loss of warm-water refugia, (6) entanglement by fishing gear and marine debris, and (7) entrapment in water control structures (90 FR 3131-TN12220; 32 FR 4001-TN2750).

**Table C-10 ESA Effect Determinations for the Physical and Biological Features of the West Indian Manatee Designated Critical Habitat—Indian River Lagoon/Big Mud Creek**

| PBF | ESA Effect Determination[(a)] | Description | Analysis |
|---|---|---|---|
| PBF 1: Areas of water warmed by natural processes (e.g., spring discharges, passive thermal basins) | NLAA | Reliable thermal quality throughout the winter which consists of water temperatures that stay at or above:<br>• 72°F during mild weather<br>• 68°F during cold weather, and<br>• 64°F during severe cold weather; or<br>• Established manatee use throughout the winter each year | **Present**. For the same reasons discussed in the "Habitat Loss and Modification" section, the NRC staff concludes that the proposed action may affect but is not likely to adversely affect the critical habitat of the West Indian Manatee. |
| PBF 2: Areas supporting submerged, emergent, or floating aquatic vegetation | NLAA | Within 18.6 mi of:<br>• Natural warm-water sources, or<br>• Other established winter manatee aggregation areas (i.e., power plants with established manatee use) | **Present**. See above. |

ESA = Endangered Species Act; FWS = U.S. Fish and Wildlife Service; NLAA = may affect but is not likely to adversely affect; NRC = U.S. Nuclear Regulatory Commission; PBF = physical and biological feature.

(a) The NRC staff makes its effect determinations in accordance with the language and definitions specified in the FWS and NMFS Endangered Species Consultation Handbook (FWS and NMFS 1998-TN1031).

Sources: NRC 2021-TN12261, FPL 2025-TN12167, FWS 2025-TN12341, 42 FR 47840-TN5355, 89 FR 78198-TN12436.

Watercraft Collisions

Watercraft-related collisions result in direct impacts to manatees in the form of lethal and sublethal injuries. Ninety-six percent of Florida manatees have scars from at least one watercraft collision, and 25 percent have scars from at least 10 watercraft collisions. Watercraft collisions are the primary cause of mortality for manatees (90 FR 3131-TN12220). Recreational boating occurs in the Indian River Lagoon. Additionally, FPL uses a boat for daily intake canal maintenance activities that include removing floating debris and repairing holes at or near the water surface (FPL 2025-TN12167).

The Indian River Lagoon contains several mandated protection measures for manatees, including a seasonal motorboat prohibition and no entry zones (FFWCC 2020-TN12385). The St. Lucie County Manatee Protection Plan outlines several protection measures for manatees, including boating speed limits (St. Lucie County 2002-TN12388). Manatees are present in the area known as Big Mud Creek within the St. Lucie site. This area has been closed to public access due to NRC security concerns. Additionally, Big Mud Creek has a year-round idle zone restriction as dictated by the Florida Manatee Sanctuary Act (Fla. Stat. 68C-22-TN12391). To date, there have been no mortalities of manatees as a result of FPL boating operations. Accordingly, the NRC staff finds the likelihood of adverse effects of watercraft collisions on the West Indian manatee during the proposed subsequent license renewal term to be discountable, and therefore, is not considered further.

Habitat Loss and Modification

The West Indian manatee primarily inhabits the Indian River Lagoon and less commonly the Atlantic coastal waters off Hutchinson Island. Preferred habitats are in the Indian River Lagoon and other inland waterways where food sources are abundant and the water is warmer; however, manatees may travel up and down the coast near shore transiting between suitable habitats. Manatees rely heavily on seagrass, macroalgae, salt marsh, and freshwater vegetation as foraging habitat. Human activities such as dredging, filling, boating, eutrophication, and coastal development all contribute to a loss of aquatic vegetation as a food source (90 FR 3131-TN12220).

FPL stated that no dredging in Big Mud Creek is anticipated during the proposed subsequent license renewal term (FPL 2025-TN12264). Additionally, as described in Section C.3.3.3, FPL maintains a stormwater pollution prevention plan to minimize polluted runoff and would be subject to the conditions of its NPDES permit (FPL 2025-TN12167). Finally, FPL has no coastal development planned during the proposed subsequent license renewal term. Accordingly, the NRC staff finds the likelihood of adverse effects of habitat loss and modification on the West Indian manatee during the proposed subsequent license renewal term to be discountable, and therefore, is not considered further.

Pollution

For the same reasons provided in Section C.3.3.3, the NRC staff finds the likelihood of adverse effects of pollution on the West Indian manatee during the proposed subsequent license renewal term to be extremely unlikely, and therefore, is not considered further.

Human Interaction and Disturbance

Harassment from humans as a result of recreational activities is widespread throughout Florida and is one of the main threats to the species (90 FR 3131-TN12220). The St. Lucie site is not a known recreation site and FPL staff members do not intentionally interact with manatees via boating or swimming. Additionally, plant water withdrawals generally occur on the Atlantic Ocean side of the action area. The emergency intake is located in Big Mud Creek and is operated quarterly and controlled through the site's NPDES permit. The emergency intake is discussed further in the "water control systems" section. Accordingly, the NRC staff finds the likelihood of adverse effects of human interaction and disturbance on the West Indian manatee during the proposed subsequent license renewal term to be discountable, and therefore, is not considered further.

Cold Stress and Loss of Warm-Water Refugia

Manatees are known to congregate in warm-water effluents of power plants during winter months. They are characterized as having low metabolism and poor insulation, which inhibits their ability to retain heat and thermoregulate (90 FR 3131-TN12220). The magnitude of the threat of cold stress varies annually depending on how cold winter gets. In Florida, in addition to warm springs, manatees are known to use warm-water industrial sites for thermoregulation during winter (90 FR 3131-TN12220).

As discussed in the NRC's 2003 EIS for St. Lucie initial license renewal:

> In addition to potential impacts from the water intake system, the attraction to or contact with the warm waters discharged from the plant need to be considered. The discharge canal transports the heated cooling water to two discharge pipes. The pipes transport water beneath the beach and dune system back to the Atlantic Ocean. The pipes extend about 460 m (1500 ft) and 1040 m (3400 ft) offshore and terminate in a Y-port and a multiport diffuser. The discharge of heated water through the Y-port and multiport diffusers ensures distribution over a wide area and rapid and efficient mixing with ambient waters. Modeling studies presented by the U.S. Atomic Energy Commission (AEC) and the NRC in the operating stage of FESs indicate that the areas of the thermal plumes to the 1.1°C (2°F) isotherm from the St. Lucie Units 1 and 2 diffusers under typical conditions would be about 73 ha (180 ac) and 71 ha (175 ac), respectively. Considering that some of the manatee captures have occurred during summer months, there seems to be no compelling evidence to infer that manatees congregate at, or are attracted to, the warm-water discharges from St. Lucie Units 1 and 2 (NRC 2003-TN3152).

Additional sources, such as the St. Lucie County Manatee Protection Plan, also describe the discountable effects of the St. Lucie discharge thermal effluent on manatees. The St. Lucie County Manatee Protection Plan states:

> The St. Lucie Plant discharges heated effluent into the Atlantic Ocean through a buried pipe. Water is jetted into the surrounding water in approximately 20 to 39 feet of water about 1510 to 3380 feet offshore through a series of diffusers that enhance mixing. Because of the effectiveness of these diffusers, ocean temperature increases associated with plant operation are relatively small in terms of both absolute value and spatial scale. Furthermore, due to water depth, currents, and the moderating influence of the nearby Gulf Stream, seasonal fluctuations in ocean temperature are much less dramatic than those in the adjacent Indian River Lagoon, where shallow depths permit more rapid heat exchange between the air and water. Minimum ocean temperatures are typically recorded in January and only reach about 65°F. Due to a combination of the infrequent use of ocean waters by manatees, the relatively small spatial extent of warm water, and the lack of substantive food resources in the general area, it does not appear that discharges from the St. Lucie Plant act to any appreciable degree as an attractant for manatees. There are no known reports of manatees congregating near the plant discharges, even during the winter (St. Lucie County 2002-TN12388).

Accordingly, the NRC staff finds the likelihood of adverse effects of cold stress and loss of warm-water refugia on the West Indian manatee during the proposed subsequent license renewal term to be discountable and insignificant, and therefore, is not discussed further.

Entrapment in Water Control Structures

Historically, water control systems have posed a significant threat to manatees. FWS states that due to improvements in the safety of water control structures these features are no longer viewed as a significant threat to the Florida manatee. Many of the existing water control structures likely to affect manatees have been upgraded with protection systems—such as mesh barriers—and are operated under established standard procedures designed to minimize impacts on the species. In Florida, most structures known to have contributed to manatee mortality have now been retrofitted with protection systems, such as acoustic detection arrays

and piezoelectric sensors that halt and reopen lock gates when a manatee is detected. Mesh exclusion barriers also are employed to prevent manatees from entering recessed lock areas. These retrofit efforts, coupled with standardized operating procedures developed by the South Florida Water Management Districts and the U.S. Army Corps of Engineers (USACE), have substantially reduced manatee deaths to an average of 4.2 per year between 2000 and 2019 (90 FR 3131-TN12220).

To date, there have been 13 manatees entrapped within the St. Lucie intake canal since plant operations began in 1976 as shown in Table C-11. On average, St. Lucie entraps 0.26 manatees per year, or approximately 1 every 4 years, though there are longer periods where no manatees are entrapped such as the span between 2010 and 2024 (14 years).

As previously described, an NMFS Biological Opinion is in place for the current operations of St. Lucie. A requirement of that Biological Opinion is for FPL to design, test, build, and install deterrent devices to reduce the number of sea turtles, giant manta rays, and Smalltooth sawfish entering the intake canal by at least 40 percent. These deterrents must not harm any ESA-listed species (IRG 2025-TN12351). In prior testing, FPL had implemented physical barriers to deter sea turtles. The results of this testing concluded that sea turtles may become impinged on the physical barrier leading to mortality. Therefore, physical barriers were removed from potential deterrent testing. Currently, FPL is planning to test a double-bubble curtain to deter sea turtles. Testing is set to commence in 2028. FPL is additionally committed to monitoring manatees entering the intake canal and coordinating with FWS and FWC for their safe removal and relocation.

FPL also operates an emergency intake system, located on Big Mud Creek, during quarterly safety testing as required by St. Lucie's technical specifications and would also operate this system if plant conditions were to require such operation. Currently, there is no grating, screens, or other methods for preventing biota from entering the intake canal. FPL's NPDES permit limits water flow/withdrawal from Big Mud Creek to 4 million gallons per year (FPL 2025-TN12264). The average operating time during quarterly testing is under 2 minutes in duration. In coordination with FWS, FPL has committed to physically or remotely observing Big Mud Creek for biota entering the canal while quarterly emergency cooling intake testing occurs (FPL 2025-TN12349).

Because the NRC staff cannot determine that entrapment of manatees in water control structures at St. Lucie during the proposed subsequent license renewal term would have discountable or insignificant adverse effects, the NRC staff concludes that West Indian manatee incidental take may occur during the proposed subsequent license renewal term.

**Table C-11 History of the Take of West Indian Manatees at the St. Lucie Plant**

| Date | FPL Report[(a)] | Take Classification | Take Notes |
|---|---|---|---|
| February, 1991 | ML17223B123 | Harass/Harm (Entrapment) | Alive 566 kg, 310 cm female which was in good condition. |
| August, 1991 | ML17223B267 | Harass/Harm (Entrapment) | Alive 367 kg, 260 cm female which had traumatic lacerations. |
| December, 1995 | N/A[(b)] | Harass/Harm (Entrapment) | Alive 109 kg, 180 cm female with multiple abrasions, cold stress, and trauma. |
| September, 1996 | ML17229A065 | Harass/Harm (Entrapment) | Alive 431 kg, 297 cm female which was released into Big Mud Creek. |

| Date | FPL Report[(a)] | Take Classification | Take Notes |
|---|---|---|---|
| December, 1997 | ML17229A582 | Harass/Harm (Entrapment) | Alive 205 kg, 240 cm male which was healthy and released. |
| May, 2003 | ML031690132 | Harass/Harm (Entrapment) | Alive 278 cm male which was moved to open water and released. |
| June, 2006 | ML062010208 | Harass/Harm (Entrapment) | Alive 212 cm male which was moved and released. |
| December, 2006 | ML070090495 | Harass/Harm (Entrapment) | Alive 280 cm male which was moved and released. |
| January, 2008 | ML080660336 | Harass/Harm (Entrapment) | Alive 235 cm male with minor scratches which was moved and released. |
| November, 2008 | ML083659357 | Harass/Harm (Entrapment) | Alive 238 cm female which was moved and released. |
| January, 2010 | ML100490060 | Harass/Harm (Entrapment) | Alive (at capture) 169 kg, 201 cm female with a scraped body. Manatee died in transit to rehab center. Necropsy report inconclusive whether mortality was incidental to entrapment or a result of the 2010 Florida cold weather event and was labelled as “undetermined, other” by FWC (FFWCC 2011-TN12392). |
| June, 2024 | ML24192A215 | Harass/Harm (Entrapment) | Alive 321 kg, 262 cm female. |
| May, 2025 | ML25176A160 | Harass/Harm (Entrapment) | Alive 412 kg, 287 cm male which was captured and released into the Indian River. |

FWC = Florida Wildlife Commission.
(a) Access these documents through the NRC’s Agencywide Documents Access and Management System (ADAMS) at https://adams-search.nrc.gov/home.
(b) The NRC does not have a report of this incident; however, FWS (NRC 2025-TN12381) and St. Lucie County (St. Lucie County 2002-TN12388) records indicate that a take occurred at this time.
Sources: NRC 2025-TN12381; FPL 2025-TN12264.

Entanglement by Fishing Gear and Marine Debris

Fishing gear and nets can kill or injure manatees through entanglement, ingestion, or incidental capture. Entanglement can lead to death through secondary infection, drowning, and by being tethered to an immovable object (90 FR 3131-TN12220).

FPL has a history of entrapping manatees within the intake canal at St. Lucie. To date, there have been a total of 13 manatees entrapped within the intake canal since plant operations began (NRC 2025-TN12381). These manatees have the potential to be entangled by fishing gear as follows. Under an NMFS Biological Opinion, FPL is required to capture listed sea turtles within the intake canal and does this through its contractor, Inwater Research, which holds an ESA Section 10 permit to remove NMFS-listed species from the intake canal (FFWCC 2025-TN12354). To aid in these removals, Inwater Research generally uses tangle nets in the intake canal. However, after the two most recent entrapments of manatees in the intake canal in 2024 and 2025, FPL and Inwater Research have coordinated with FWC and FWS and decided to modify the current methods of removing entrapped turtles from the intake canal. Specifically, FPL committed to removing the tangle nets used for the turtles if a manatee is spotted within the intake canal so as to minimize the potential adverse effects relating to manatee entanglement by fishing gear (FPL 2025-TN12486). Accordingly, the NRC staff finds the likelihood of adverse

effects of entanglement by fishing gear and marine debris on the West Indian manatee during the proposed subsequent license renewal term to be discountable, and therefore, is not discussed further.

Conclusion for the West Indian Manatee and West Indian Manatee Critical Habitat (FD)

All potential effects on the West Indian manatee critical habitat would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the West Indian manatee critical habitat within the action area. Following the issuance of the draft EIS, the NRC staff will seek FWS's concurrence with this finding.

Throughout the entire operation of St. Lucie (i.e., from 1976 to present), a total of 13 manatees have been entrapped in the intake canal with the two most recent entrapments occurring in 2024 and 2025. Accordingly, the NRC staff finds that the likelihood of adverse effects of entrapment in water control structures on the West Indian manatee during the proposed subsequent license renewal term is not discountable or insignificant and concludes that the proposed action *may affect and is likely to adversely affect* the West Indian manatee. Manatees are protected under two Federal statutes (the ESA and the Marine Mammal Protection Act [MMPA]), both of which prohibit their "take" without appropriate FWS authorization. Moreover, authorization of incidental takes via a biological opinion under the ESA may not be issued until take is authorized under the MMPA. Therefore, to ensure the prerequisite of compliance with the MMPA, the NRC staff intends to include as a condition of any subsequent renewed licenses that may be issue that FPL petition for an MMPA Incidental Take Regulation and request a Letter of Authorization from FWS prior to the subsequent license renewal term. Once take is authorized under the MMPA in this manner, then the NRC staff will seek, under the ESA, FWS's concurrence with its finding regarding the West Indian manatee.

### C.3.4 ESA: Cumulative Effects Analysis

Cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02) (TN4312). When formulating biological opinions during formal ESA Section 7 consultation, the Services consider cumulative effects when determining the likelihood of jeopardy or adverse modification. During informal consultation, a Federal agency need only consider cumulative effects under the ESA in the biological assessment if listed species would be adversely affected by the proposed action and formal Section 7 consultation is necessary. Because the NRC staff concluded earlier that the proposed action (St. Lucie subsequent license renewal) is likely to adversely affect the West Indian manatee, consideration of cumulative effects is required.

Current activities in the action area, such as recreational boating and fishing, land leases to St. Lucie County, and research conducted by Inwater Research, are expected to continue at present levels of intensity. These ongoing non-Federal activities may contribute to cumulative effects on listed species, particularly the West Indian manatee (*Trichechus manatus*), sea turtles (including *Caretta caretta*, *Chelonia mydas*, and *Dermochelys coriacea*), and smalltooth sawfish (*Pristis pectinata*). Recreational boating poses a continued risk of vessel strikes, particularly to manatees, while fishing activities may result in the incidental capture or entanglement of sea turtles and sawfish. However, these activities are regulated under State and local guidelines intended to minimize harm to protected species. The land leases to St. Lucie County are not anticipated to result in significant habitat modification or degradation, as current land use

practices are not expected to change. Similarly, research activities by Inwater Research are conducted under appropriate permits and are designed to minimize disturbance to listed species.

Although the above activities are not federally authorized, they may contribute incrementally to the overall risk profile for listed species in the action area. However, when considered in combination with the proposed Federal action, these cumulative effects do not rise to a level that would be expected to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of any designated critical habitat.

## C.3.5 Chronology of Endangered Species Act Section 7 Consultation

### *C.3.5.1 Endangered Species Act Section 7 Consultation with the U.S. Fish and Wildlife Service*

Following the issuance of this draft EIS, the NRC staff will seek FWS's concurrence for the species for which the NRC staff determined that the proposed action (St. Lucie subsequent license renewal) *may affect but is not likely to adversely affect* (see Table C-5) in accordance with 50 CFR 402.13(c) (TN4312). Table C-12 lists the correspondence between the NRC and FWS pursuant to ESA Section 7 that has transpired to date.

**Table C-12 Endangered Species Act Section 7 Consultation Correspondence with the U.S. Fish and Wildlife Service for St. Lucie Plant Subsequent License Renewal**

| Date | Description | ADAMS Accession No.[(a)] |
|---|---|---|
| August 19, 2025 | Florida Ecological Services Field Office (FWS) to M. Dehmer (NRC), List of threatened and endangered species for proposed St. Lucie SLR. | ML25231A090 |

SLR = subsequent license renewal.
(a) Access these documents through the NRC's Agencywide Documents Access and Management System (ADAMS) at https://adams-search.nrc.gov/home.

### *C.3.5.2 Endangered Species Act Section 7 Consultation with the National Marine Fisheries Service*

The NRC staff initiated formal ESA Section 7 consultation with NMFS on July 16, 2025. Consultation is ongoing. Table C-13 lists the correspondence between the NRC and NMFS pursuant to this consultation that has transpired to date.

**Table C-13 Endangered Species Act Section 7 Consultation Correspondence with the National Marine Fisheries Service for St. Lucie Plant Subsequent License Renewal**

| Date | Description | ADAMS Accession No.[(a)] |
|---|---|---|
| July 9, 2025 | Biological Assessment for Species Under Jurisdiction of NOAA's National Marine Fisheries Service St. Lucie Nuclear Power Plant, Units 1 and 2, prepared by Inwater Research Group. | ML25190A668 |
| July 16, 2025 | NRC to NMFS, Request to reinitiate ESA consultation for St. Lucie continued operations and SLR. | ML25190A672 |

ESA = Endangered Species Act; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; NRC = U.S. Nuclear Regulatory Commission; SLR = subsequent license renewal.
(a) Access these documents through the NRC's Agencywide Documents Access and Management System (ADAMS) at https://adams-search.nrc.gov/home.

## C.4 Magnuson-Stevens Act Essential Fish Habitat Consultation

The NRC must comply with the MSA (TN9966) for any actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that may adversely affect any essential fish habitat (EFH) identified under the MSA. The sections below consist of the NRC staff's EFH assessment and effect determinations relevant to the proposed action (St. Lucie subsequent license renewal).

### C.4.1 Magnuson–Stevens Act: Essential Fish Habitat Considered

To determine the relevant EFH species for the NRC staff's subsequent license renewal review, the NRC staff queried the NMFS's EFH Mapper, an online mapping application. The EFH Mapper identified 20 species or taxa groups for which EFH may occur near the St. Lucie site and 4 habitat areas of particular concern (HAPCs) that may occur near the St. Lucie site. The EFH Mapper also identified an additional 10 species or taxa groups that may have EFH in the area and three HAPCs that may exist in the area but for which spatial data does not currently exist (NMFS Undated-TN12447). The NRC staff also queried the South Atlantic Fisheries Management Council's (SAFMC) EFH mapping application to obtain additional spatial data (SAFMC 2024-TN12446). For each of the identified species and their relevant life stages, the NRC staff reviewed habitat characteristics documented in scientific literature, EFH descriptions contained in relevant fishery management plans, and FPL's EFH analysis contained in the ER (FPL 2021-TN12166).

In addition to designated EFH for managed species, HAPCs exist within the Atlantic Ocean portion of the site and within the Big Mud Creek portion of the site. The EFH managed species that are supported by these HAPCs are presented in Table C-16.

The NRC last evaluated effects to EFH for this site in 2012 as a result of an extended power uprate (EPU) license amendment request (NRC 2012-TN3155). This analysis included species or taxa groups from the coral, highly migratory coastal pelagics, shrimp, and snapper grouper fishery management plans and concluded that the EPU would have minimal adverse effects on the federally managed EFH. NMFS concurred with the NRC's determinations with the note that Spanish mackerel, cobia, king mackerel, and spiny lobster EFH may also experience minimal adverse effects (NRC 2012-TN12390). Accordingly, the Spanish mackerel, king mackerel, cobia, and spiny lobster have been included in the analysis for this subsequent license renewal in addition to the species identified in the NMFS EFH Mapper and the SAFMC EFH Mapper.

The NRC staff considered all EFH species identified in the NMFS EFH Mapper (NMFS Undated-TN12447), the SAFMC EFH Mapper (SAFMC 2024-TN12446), the NRC's 2012 EFH Assessment (NRC 2012-TN3155), and the NMFS's 2012 concurrence (NRC 2012-TN12390). Based on the habitat requirements and EFH designations of the species, the NRC staff eliminated from analysis 19 EFH species or HAPCs that were highly unlikely to inhabit waters near St. Lucie (Table C-14). In total, 27 species or taxa groups and 6 HAPCs are relevant to the EFH analysis (Table C-15 and Table C-16. Table C-17 summarizes the EFH species and relevant life stages that were assessed in the NRC staff's evaluation, including the habitat characteristics, descriptions of designated EFH, and diet summaries for each of the relevant EFH species and life stages.

**Table C-14 Essential Fish Habitat Species and Habitat Area of Particular Concerns Excluded from the Proposed St. Lucie Plant Subsequent License Renewal Analysis**

| FMP | EFH Species and HAPC | Identified in NMFS or SAFMC EFH Mapper | Assessed in NRC's 2012 EFH Analysis | Rationale for Exclusion |
|---|---|---|---|---|
| Coral | stony coral | - | X | EFH extends from Palm Beach County south through the Florida reef tract (SAFMC 2025-TN12393). The St. Lucie site is located north of Palm Beach County, beyond the boundary of the designated EFH. |
| Golden Crab | golden crab EFH and HPAC | X | - | EFH includes deep-water habitat that is not present in Big Mud Creek or the nearshore shallow ocean waters in the vicinity of St. Lucie. (SAFMC 1998-TN12396) |
| Sargassum | sargassum EFH and HAPC | X | - | EFH is bounded by the Gulf Stream, which is not present in Big Mud Creek or the nearshore shallow ocean waters in the vicinity of St. Lucie. (SAFMC 2025-TN12393) |
| Shrimp | royal red shrimp | X | - | EFH includes the Gulf Stream and deep-water habitat, neither of which are present in Big Mud Creek or nearshore shallow ocean waters in the vicinity of St. Lucie. (SAFMC 1998-TN12396) |
| Shrimp | rock shrimp | - | X | EFH includes the Gulf Stream and offshore habitat between 59 ft to 597 ft in depth. The nearshore shallow ocean waters in the vicinity of St. Lucie do not provide EFH for this species. (SAFMC 1998-TN12396) |
| Atlantic Highly Migratory Species | swordfish | - | X | EFH includes offshore, deep-water habitat that is not present in Big Mud Creek or the nearshore shallow ocean waters in the vicinity of St. Lucie. (NOAA 2017-TN12407) |
| Atlantic Highly Migratory Species | longbill spearfish | - | X | EFH in the Atlantic Ocean occurs in depths greater than 656 ft (NOAA 2017-TN12407). Waters in the vicinity of St. Lucie are too shallow to contain EFH. |
| Atlantic Highly Migratory Species | bigeye sand tiger shark | X | - | EFH not defined. Rare deep-water species. (NOAA 2017-TN12407) |
| Atlantic Highly Migratory Species | bigeye sixgill shark | X | - | EFH not defined. Rare deep-water species. (NOAA 2017-TN12407) |
| Atlantic Highly Migratory Species | caribbean sharpnose shark | X | - | EFH not defined. Outside the latitudinal range of the species. (NOAA 2017-TN12407) |
| Atlantic Highly | dusky shark | - | X | EFH includes Atlantic Ocean waters from New England to Georgia and waters within the Gulf |

| FMP | EFH Species and HAPC | Identified in NMFS or SAFMC EFH Mapper | Assessed in NRC's 2012 EFH Analysis | Rationale for Exclusion |
|---|---|---|---|---|
| Migratory Species | | | | (NOAA 2017-TN12407). EFH does not extend into the Atlantic Ocean waters of Florida in the vicinity of St. Lucie. |
| Atlantic Highly Migratory Species | finetooth shark | - | X | EFH boundaries were reduced to a core area between Myrtle Beach, South Carolina and Cape Canaveral, Florida in Amendment 10 (NOAA 2017-TN12407). The St. Lucie site is located approximately 75 miles south of Cape Canaveral, Florida. |
| Atlantic Highly Migratory Species | galapagos shark | X | - | EFH not defined. Outside the known range of the species. Seldom seen in U.S. waters. (NOAA 2017-TN12407) |
| Atlantic Highly Migratory Species | narrowtooth shark | X | - | EFH not defined. Outside of known range. (NOAA 2017-TN12407) |
| Atlantic Highly Migratory Species | sevengill shark | X | - | EFH not defined. Deep-water species. (NOAA 2017-TN12407) |
| Atlantic Highly Migratory Species | sixgill shark | X | - | EFH not defined. Deep-water species. (NOAA 2017-TN12407) |
| Atlantic Highly Migratory Species | silky shark | - | X | EFH includes offshore waters off the east coast of Florida (NOAA 2017-TN12407). The nearshore waters in the vicinity of St. Lucie would not contain EFH. |
| Atlantic Highly Migratory Species | smalltail shark | X | - | EFH not defined. Outside of known range. (NOAA 2017-TN12407) |
| Atlantic Highly Migratory Species | white shark | - | X | EFH extends from Cape Cod, Massachusetts to Cape Canaveral, Florida (NOAA 2017-TN12407). The St. Lucie site is located approximately 75 mi south of Cape Canaveral, Florida. |

1 EFH = essential fish habitat; FMP = Fisheries Management Plan; HAPC = habitat area of particular concern;
2 NMFS = National Marine Fisheries Service; NRC = U.S. Nuclear Regulatory Commission; SAFMC = South Atlantic
3 Fisheries Management Council; X = identified in NMFS or SAFMC EFH Mapper or assessed in NRC's 2012 EFH
4 Analysis; - = not identified in NMFS or SAFMC EFH Mapper or not assessed in NRC's 2012 EFH Analysis.

**Table C-15 Summary of Essential Fish Habitat Species and Life Stages Relevant to the Proposed St. Lucie Plant Subsequent License Renewal**

| Species | Common Name | EFH Mapper Results in Atlantic Ocean[a,b] | EFH Mapper Results in Big Mud Creek[a,b] |
|---|---|---|---|
| *Pomatomus saltatrix* | bluefish | E, L, J, A | A |
| *Penaeus aztecus* | brown shrimp | All | All |
| *Penaeus duorarum* | pink shrimp | All | All |
| *Penaeus setiferus* | white shrimp | All | All |
| *Panulirus argus* and *Scyllarides nodifer* | spiny lobster | All | All |
| *Paralichthys dentatus* | summer flounder | L, J, A | L, J, A |
| *Scomberomorus cavalla* | king mackerel | - | - |
| *Scomberomorus maculatus* | Spanish mackerel | - | - |
| *Rachycentron canadum* | cobia | - | - |
| *Istiophorus platypterus* | sailfish | J, A | A |
| *Katsuwonus pelamis* | skipjack tuna | A | A |
| Order Alcyonacea | octocorals | - | - |
| *Rhizoprionodon terraenovae* | Atlantic sharpnose shark (Atlantic stock) | N, J, A | - |
| *Carcharhinus acronotus* | blacknose shark (Atlantic stock) | J, A | - |
| *Carcharhinus limbatus* | blacktip shark (Atlantic stock) | J, A | - |
| *Sphyrna tiburo* | bonnethead shark (Atlantic stock) | J, A | - |
| Carcharhinus leucas | bull shark | J, A | J, A |
| *Carcharhinus perezii* | Caribbean reef shark | All | All |
| *Sphyrna mokarran* | great hammerhead shark | All | - |
| *Negaprion brevirostris* | lemon shark | All | - |
| *Ginglymostoma cirratum* | nurse shark | J, A | - |
| *Carcharhinus plumbeus* | sandbar shark | A | - |
| *Sphyrna lewini* | scalloped hammerhead shark | J, A | - |
| *Sphyrna zygaena* | smooth hammerhead shark | -[c] | -[c] |
| *Carcharhinus brevipinna* | spinner shark | J, A | - |
| *Galeocerdo cuvier* | tiger shark | N, J, A | J, A |
| multiple species[d] | snapper grouper complex | All | All |

EFH = essential fish habitat.

(a) S = spawning; E = eggs; L = larvae; J = juveniles; N = neonates (of sharks); A = adult; - = not identified in mapper.

(b) Source: NMFS 2024-TN10304

(c) Spatial data for this species is unavailable and EFH for this species is undescribed.

(d) This complex includes 20 species of sea basses and groupers (Serranidae), 10 snappers (Lutjanidae), 7 porgies (Sparidae), 5 grunts (Haemulidae), 5 jacks (Carangidae), 3 tilefish (Malacanthidae), 2 tiggerfish (Balistidae), wreckfish (Polyprion americanus), hogfish (Lachnolaimus maximus), and Atlantic spadefish (Chaetodipterus faber). The full species list is available at SAFMC 2025-TN12394.

**Table C-16 Summary of Habitat Area of Particular Concerns for Managed Species in the Vicinity of the St. Lucie Plant Site**

| EFH Managed Species | Coastal Inlets, Big Mud Creek | Mangroves, Big Mud Creek | Submerged Aquatic Vegetation, Big Mud Creek | Nearshore Hardbottom, Atlantic Ocean | Nearshore Migratory Corridor[(a)], Atlantic Ocean | Phragmatopoma (Worm Reefs), Atlantic Ocean |
|---|---|---|---|---|---|---|
| Corals | - | - | - | X | - | X |
| Coastal Migratory Pelagics | - | - | - | X | - | X |
| Shrimp | X | - | - | - | - | - |
| Snapper Grouper | X | X | - | X | - | - |
| Spiny Lobster | - | - | - | X | - | - |
| Summer Flounder | - | - | X | - | - | - |
| Lemon Shark | - | - | - | - | X | - |

EFH = essential fish habitat.
"-" denotes not present, and "X" denotes present.
(a) HAPC for lemon shark includes the migratory corridor between Cape Canaveral and Jupiter Inlet in Florida extending 12 km from shore (NOAA 2017-TN12407)
Source: SAFMC 2024-TN12446

**Table C-17 Description of Essential Fish Habitat Species and Life Stages Relevant to the Proposed St. Lucie Plant Subsequent License Renewal**

| Common Name | Life History Characteristic | Description |
|---|---|---|
| bluefish (*Pomatomus saltatrix*)—all life stages | Distribution and habitat characteristics | Bluefish are a migratory, pelagic species found throughout the world in most temperate coastal regions, except the eastern Pacific. Bluefish migrate seasonally, moving north in spring and summer as water temperatures rise and moving south in autumn and winter to the South Atlantic Bight. During the summer, concentrations of bluefish are found in waters from Maine to Cape Hatteras, North Carolina. During the winter, bluefish tend to inhabit offshore waters between Cape Hatteras, North Carolina, and Florida. Bluefish generally school by size, with schools covering up to tens of square miles (ASMFC 2025-TN12395). |
| bluefish (*Pomatomus saltatrix*)—all life stages | Designated EFH | Eggs: EFH includes all pelagic waters south of Cape Hatteras, North Carolina, over the continental shelf (from the coast out to the eastern wall of the Gulf Stream) through Key West, Florida, at mid-shelf depths. Generally, bluefish eggs are collected from April through August in temperatures greater than 64°F and normal shelf salinities (i.e., greater than 31 ppt) (MAFMC 1998-TN12401). |

| Common Name | Life History Characteristic | Description |
|---|---|---|
| | | Larvae: EFH includes all pelagic waters south of Cape Hatteras greater than 49 ft over the continental shelf through Key West and the "slope sea" and Gulf Stream between latitudes 29° 00 N and 40° 00 N. Generally, bluefish larvae are collected from April through September in temperatures greater than 64°F in shelf salinities greater than 30 ppt (MAFMC 1998-TN12401).<br>Juveniles: EFH includes the areas described above for larvae as well as all major estuaries between Penobscot Bay, Maine, and St. Johns River, Florida. Generally, juvenile bluefish occur in North Atlantic estuaries from June through October, Mid-Atlantic estuaries from May through October, and South Atlantic estuaries March through December, within the mixing and seawater zones. Distribution of juveniles by temperature, salinity, and depth over the continental shelf is undescribed (MAFMC 1998-TN12401).<br>Adults: EFH includes the same areas described above for juveniles. Adult bluefish are found in North Atlantic estuaries from June through October, Mid-Atlantic estuaries from April through October, and in South Atlantic estuaries from May through January in the mixing and seawater zones. Adults are highly migratory, and distribution varies seasonally and according to the size of the individuals comprising the schools. Adults generally occupy waters with salinities greater than 25 ppt (MAFMC 1998-TN12401).<br>Summary: Based on the EFH descriptions above, EFH for juveniles and adults is relevant to the proposed St. Lucie SLR. Waters in the vicinity of the plant are not deep enough to contain EFH for eggs or larvae. |
| bluefish (*Pomatomus saltatrix*)—all life stages | Diet | Bluefish are opportunistic predators and feed on almost any prey they can capture. Over 70 species of fish have been found in their stomach contents, including butterfish (*Peprilus triacanthus*), mackerel, menhaden, silversides, squid, and lobster (ASMFC 2025-TN12395). |
| brown, pink, and white shrimp (*Penaeus aztecus, P. duorarum,* and *P. setiferus*)—all life stages | Distribution and habitat characteristics | The three penaeid shrimp species are restricted to the Atlantic Coast of the United States and the Gulf White shrimp prefer muddy or peaty bottoms rich in organic matter and decaying vegetation when in inshore waters. Offshore, the species is most abundant on soft, muddy bottoms. Brown shrimp prefer a similar bottom type and, as adults, may also be found in areas where the bottom consists of mud, sand, and shell. Pink shrimp inhabit hard sand and calcareous shell bottom. Both brown and pink shrimp are generally buried |

| Common Name | Life History Characteristic | Description |
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| | | in the substrate during daylight and are active at night (SAFMC 1998-TN12396).<br>Penaeid shrimp spawn in offshore, deeper waters and spend the initial larval stages offshore. Then, post-larvae, they migrate, possibly via shoreward countercurrents, to estuaries where they occupy nursery areas over the winter. In the South Atlantic, these areas are generally dominated by the saltmarsh cordgrass (*Spartina alterniflora*) (SAFMC 1998-TN12396).<br>On the Atlantic Coast, brown shrimp occur from Martha's Vineyard, Massachusetts, to the Florida Keys. Breeding populations do not range north of North Carolina. The species may occur in waters as deep as 361 ft, but they are most abundant in water less than 180 ft (SAFMC 1998-TN12396).<br>On the Atlantic Coast, pink shrimp occur from southern Chesapeake Bay to the Florida Keys. Pink shrimp are most abundant in waters of 36 to 121 ft, although in some areas, they may be abundant in waters as deep as 213 ft. Pink shrimp are common in the estuaries and shallow marine waters surrounding southern Florida and into deep waters southeast of the Keys (SAFMC 1998-TN12396).<br>White shrimp range from Fire Island, New York to St. Lucie Inlet on the Atlantic Coast of Florida. White shrimp are generally concentrated in waters of 89 ft or less, although occasionally found much deeper (SAFMC 1998-TN12396). |
| brown, pink, and white shrimp (*Penaeus aztecus, P. duorarum,* and *P. setiferus*)—all life stages | Designated EFH | EFH for penaeid shrimp includes inshore estuarine nursery areas, offshore marine habitats used for spawning and growth to maturity, and all interconnecting water bodies. Inshore nursery areas include tidal freshwater (palustrine), estuarine, and marine emergent wetlands (e.g., intertidal marshes); tidal palustrine forested areas; mangroves; tidal freshwater, estuarine, and marine submerged aquatic vegetation (e.g., seagrass); and subtidal and intertidal non-vegetated flats. This applies from North Carolina through the Florida Keys (SAFMC 2009-TN12397). |
| brown, pink, and white shrimp (*Penaeus aztecus, P. duorarum,* and *P. setiferus*)—all life stages | Diet | Juveniles and adults are omnivorous bottom feeders that consume polychaetes, amphipods, nematodes, caridean shrimps, mysids, copepods, isopods, amphipods, ostracods, mollusks, foraminiferans, chironomid larvae, and various types of organic debris (SAFMC 1998-TN12396). |
| spiny lobster (*Panulirusargus* and *Scyllarides nodifer*)—all life stages | Distribution and habitat characteristics | Spiny lobsters occur in tropical and subtropical waters of the Atlantic Ocean, Caribbean Sea, and Gulf. Adults inhabit protected crevices and caverns of coral reefs, sponge flats, and other hard-bottomed areas. Larvae drift into shallow |

| Common Name | Life History Characteristic | Description |
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| | | nearshore seagrass and algae beds once they detach from the female (FFWCC 2025-TN12398). |
| spiny lobster (*Panulirus argus* and *Scyllarides nodifer*)—all life stages | Designated EFH | EFH for spiny lobster includes nearshore shelf and oceanic waters; shallow subtidal bottom; seagrass habitat; unconsolidated bottom (soft sediments); coral and live/hard bottom habitat; sponges; algal communities (*Laurencia*); and mangrove habitat (prop roots). In addition, the Gulf Stream is EFH because it provides a mechanism to disperse spiny lobster larvae (SAFMC 1998-TN12396). |
| spiny lobster (*Panulirus argus* and *Scyllarides nodifer*)—all life stages | Diet | Spiny lobsters primarily consume snails, clams, crabs, and urchins, although they will eat a wide variety of aquatic prey (FFWCC 2025-TN12398). |
| summer flounder (*Paralichthys dentatus*)—larvae, juveniles, adults | Distribution and habitat characteristics | Summer flounder are found in the Atlantic Ocean from Nova Scotia south to the east coast of Florida. In U.S. waters, summer flounder are most common in the mid-Atlantic region from Cape Cod, Massachusetts, to Cape Fear, North Carolina. They inhabit areas with sandy or silty substrate that they can burrow into to wait for prey (NOAA 2025-TN12399). |
| summer flounder (*Paralichthys dentatus*)—larvae, juveniles, adults | Designated EFH | Larvae: Inshore EFH includes all the estuaries where summer flounder are present, including mixing zone (0.5 to 25.0 ppt) and seawater (greater than 25.0 ppt) salinity zones. In general, summer flounder larvae are most abundant nearshore (12 to 50 mi from shore) at depths of 30 to 230 ft. They are most frequently found in the northern part of the Mid-Atlantic Bight from September to February and in the southern part from November to May. Offshore larval EFH is not relevant to this review (MAFMC 1998-TN12400).<br>Juveniles: Inshore EFH includes the areas described above for larvae; offshore EFH is not relevant to this review. In general, juveniles use several estuarine habitats as nursery areas, including salt marsh creeks, seagrass beds, mudflats, and open bay areas in waters greater than 37°F and salinities ranging from 10 to 30 ppt (MAFMC 1998-TN12400).<br>Adults: EFH includes the areas described above for larvae; offshore EFH is not relevant to this review. Generally, adults inhabit shallow coastal and estuarine waters during warmer months and move offshore on the outer continental shelf at depths of 500 ft in colder months (MAFMC 1998-TN12400). |
| summer flounder (*Paralichthys dentatus*)—larvae, juveniles, adults | Diet | Summer flounder eat a mixed diet of fish and invertebrates throughout their life. Larval and post-larval flounder feed on zooplankton and small crustaceans. Juveniles eat crustaceans and fish. Adults are opportunistic and feed on small fish, |

| Common Name | Life History Characteristic | Description |
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| | | squid, sea worms, shrimp, and other crustaceans (NOAA 2025-TN12399). |
| king mackerel (*Scomberomorus cavalla*)—all life stages | Distribution and habitat characteristics | The king mackerel prefers outer reefs and coastal waters. Resident populations are found in northeastern Brazil, Louisiana, and south Florida waters. King mackerels occur in depths between 75.5 ft to 111.5 ft (Florida Museum 2025-TN12402). |
| king mackerel (*Scomberomorus cavalla*)—all life stages | Designated EFH | King mackerel are a coastal migratory pelagic species. EFH for coastal migratory pelagic species includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, and from the Gulf Stream shoreward, including sargassum (SAFMC 1998-TN12396). |
| king mackerel (*Scomberomorus cavalla*)—all life stages | Diet | King mackerel primarily feed on schooling fishes, including jack mackerels, snappers, grunts, and halfbeaks, although they also occasionally consume crustaceans and mollusks (Florida Museum 2025-TN12402). |
| Spanish mackerel (*Scomberomorus maculatus*)—all life stages | Distribution and habitat characteristics | Spanish mackerel are epipelagic, residing at depths ranging from 33 to 115 ft. They are often found in very large schools near the surface of the water and frequent barrier islands. This species rarely occupies low salinity waters. Spanish mackerel larvae occur mostly offshore, while juvenile mackerels are found both offshore and in the beach surf (Florida Museum 2025-TN12403). |
| Spanish mackerel (*Scomberomorus maculatus*)—all life stages | Designated EFH | Spanish mackerel are a coastal migratory pelagic species. EFH for coastal migratory pelagic species includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, and from the Gulf Stream shoreward, including sargassum (SAFMC 1998-TN12396). |
| Spanish mackerel (*Scomberomorus maculatus*)—all life stages | Diet | Adult Spanish mackerel primarily consume smaller fish, such as herrings, jacks, and sardines. This species also feeds in lesser quantities on shrimp and cephalopods (Florida Museum 2025-TN12403). |
| cobia (*Rachycentron canadum*)—all life stages | Distribution and habitat characteristics | Cobia are found in inshore and nearshore habitats, including inlets, bays, and mangroves. They frequent areas around buoys, pilings, and wrecks. Spawning occurs from late June to mid-August in the southeastern United States (SAFMC 2025-TN12404). |
| cobia (*Rachycentron canadum*)—all life stages | Designated EFH | Cobia are a coastal migratory pelagic species. EFH for coastal migratory pelagic species includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, and |

| Common Name | Life History Characteristic | Description |
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| | | from the Gulf Stream shoreward, including sargassum (SAFMC 1998-TN12396). |
| cobia (*Rachycentron canadum*)—all life stages | Diet | Cobia primarily consume crustaceans but also can eat fishes (SAFMC 2025-TN12404). |
| sailfish (*Istiophorus platypterus*)—juveniles, adults | Distribution and habitat characteristics | Sailfish are mainly oceanic but migrate into shallower waters. Individuals usually occupy waters above the thermocline at a temperature range of 69.8 to 82.4°F, but may occasionally dive into deeper, colder water. In the winter, sailfish form small schools around the Florida Keys and off eastern Florida, in the Caribbean, and in offshore waters throughout the Gulf of Mexico. In the summer, they diffuse along the U.S. coast as far north as the coast of Maine, although there is a population off Florida's east coast all year long. During summer, some sailfish also move north along the inside edge of the Gulf Stream. After the arrival of the northerlies in the winter, sailfish regroup off the Florida coast (NOAA 2009-TN12405). |
| sailfish (*Istiophorus platypterus*)—juveniles, adults | Designated EFH | Juveniles: EFH includes the Atlantic east coast from the Florida Keys north to the mid-coast of South Carolina, the Outer Banks of North Carolina, and Maryland (see Figure 5 in NOAA 2009-TN12405).<br>Adults: EFH includes the Atlantic east coast from the Florida Keys to northern Florida, off Georgia, and Cape Hatteras, North Carolina (see Figure 5.24 in NOAA 2009-TN12405). |
| sailfish (*Istiophorus platypterus*)—juveniles, adults | Diet | Adult and juvenile sailfish in Florida waters prey on pelagic fishes, such as little thunny (*Euthynnus alletteratus*), halfbeaks (*Hemiramphus* spp.), cutlassfish (*Trichiurus lepturus*), rudderfish (*Strongylura notatus*), jacks (*Caranx ruber*), pinfish (*Lagodon rhomboides*), and squids, including *Argonauta argo* and *Ommastrephes bartrami*. Sailfish are opportunistic feeders and may also feed on sea robin (*Prionotus* spp.), cephalopods, and gastropods found in deep water (NOAA 2009-TN12405). |
| skipjack tuna (*Katsuwonus pelamis*)—adults | Distribution and habitat characteristics | Skipjack tuna occupy tropical and warm-temperate waters within the 59°F isotherm around the globe. Skipjack tuna are a schooling, epipelagic and oceanic species that may dive to a depth of 853 ft during the day. The species spawns in subtropical waters from spring to early fall and larvae have been collected off the east coast of Florida from October to December (NOAA 2017-TN12407). |
| skipjack tuna (*Katsuwonus pelamis*)—adults | Designated EFH | Adults: EFH in the Atlantic Ocean includes coastal and offshore habitats between Massachusetts and Cape Lookout, North Carolina, and localized areas in the Atlantic off South Carolina and Georgia, and |

| Common Name | Life History Characteristic | Description |
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| | | the northern east coast of Florida. EFH in the Atlantic Ocean also is located on the Blake Plateau and in the Florida Straits through the Florida Keys (NOAA 2017-TN12407). |
| skipjack tuna (*Katsuwonus pelamis*)—adults | Diet | Skipjack tuna are opportunistic feeders that prey upon fishes, cephalopods, and crustaceans within surface waters (NOAA 2017-TN12407). |
| octocorals (Order Alcyonacea) | Distribution and habitat characteristics | Octocorals are colonial animals with a polyp as the individual building unit. They do not secrete a calcium carbonate skeleton and therefore do not contribute to reef framework, but they do contribute greatly to reef complexity and diversity. They are primarily found in the Florida Keys region but can occupy hard bottom habitat as far north as North Carolina. They have both sexual and asexual reproductive modes (SAFMC 2011-TN12406). |
| octocorals (Order Alcyonacea) | Designated EFH | EFH includes rough, hard, exposed, stable substrate in subtidal to outer shelf depths (SAFMC 2011-TN12406). |
| octocorals (Order Alcyonacea) | Diet | Octocorals derive energy by photosynthesis or by consuming zooplankton, detritus, and dissolved organics (SAFMC 2011-TN12406). |
| Atlantic sharpnose shark (*Rhizoprionodon terraenovae*) Atlantic Stock—neonates, juveniles, adults | Distribution and habitat characteristics | Atlantic sharpnose sharks occur in a variety of coastal habitats and substrates, including silt, sand, mud, and seagrass. Habitat use reflects seasonal onshore-offshore migration patterns. The species is a year-round resident along the coasts of South Carolina, Florida, and in the Gulf of Mexico and an abundant summer migrant off coastal Virginia and the Chesapeake Bay. Important nursery habitats for juveniles, neonates, and YOY include inshore and nearshore waters from Cape Hatteras to Holden Beach, North Carolina; and estuarine and nearshore waters of South Carolina, and estuarine and coastal waters of Georgia. YOY and juveniles are found in temperatures of 71.2 to 89.0°F, salinities of 29.0 to 37.2 ppt, and dissolved oxygen levels of 2.7 to 6.9 mL/L. Habitat associations for YOY include mud, sand, and seagrass. Juveniles are associated with sand, seagrass, and mud (NOAA 2017-TN12407). |
| Atlantic sharpnose shark (*Rhizoprionodon terraenovae*) Atlantic Stock—neonates, juveniles, adults | Designated EFH | Neonates and YOY: EFH includes the areas between the mid-coast of Florida and Cape Hatteras, including inshore and nearshore waters from the northeastern coast of Florida to Cape Canaveral, which is an important nursery area. Found in waters with temperatures of 65.1 to 87.3°F, salinities of 21.6 to 36.4 ppt, and depths of 8.9 to 43.0 ft (NOAA 2017-TN12407).<br>Juveniles: EFH extends from portions of the lower Chesapeake Bay in Virginia to the mid-coast of |

| Common Name | Life History Characteristic | Description |
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| | | Florida, with seasonal summer distribution in the northern part of the range. Offshore depth extent of EFH for this life stage is 590 ft. No waters in Florida are specifically identified as important juvenile nursery areas (NOAA 2017-TN12407). Adults: EFH extends from portions of the Delaware Bay and Cape May, New Jersey to the mid-coast of Florida, including portions of the Chesapeake Bay, with seasonal summer distribution in the northern part of the range. Offshore depth extent of EFH for this life stage is 590 ft (NOAA 2017-TN12407). |
| Atlantic sharpnose shark (*Rhizoprionodon terraenovae*) Atlantic Stock—neonates, juveniles, adults | Diet | Atlantic sharpnose sharks are pelagic, generalist predators with fish-dominated diets. They eat menhaden, eels, silversides, wrasses, jacks, toadfish, and filefish. In addition to fish, they also eat worms, shrimp, crabs, and mollusks (NOAA 2017-TN12407). |
| blacknose shark (*Carcharhinus acronotus*) Atlantic Stock—juveniles, adults | Distribution and habitat characteristics | Blacknose shark is an inshore species, and individuals reside in waters of continental shelves over sandy and coral bottoms. Juveniles are typically found in shallow water, while adults are located at greater depths. Annual reproduction of the Atlantic stock appears to take place off northeastern Brazil, although the species is found throughout the year off Florida, which suggests that part of the population may be non-migratory and that nursery areas may exist in Florida as well (NOAA 2017-TN12407). |
| blacknose shark (*Carcharhinus acronotus*) Atlantic Stock—juveniles, adults | Designated EFH | Juveniles and Adults: EFH includes coastal areas within 295 ft from shore along the Atlantic east coast from Cape Hatteras to the mid-coast of Florida (NOAA 2017-TN12407). |
| blacknose shark (*Carcharhinus acronotus*) Atlantic Stock—juveniles, adults | Diet | The blacknose shark feeds on small fishes including pinfish, croakers, porgies, anchovies, spiny boxfishes, porcupine fish, and octopus (NOAA 2017-TN12407). |
| blacktip shark (*Carcharhinus limbatus*) Atlantic Stock—juveniles, adults | Distribution and habitat characteristics | The blacktip shark is circumtropical in shallow coastal waters and offshore surface waters of the continental shelves. In the southeastern United States, it ranges from Virginia to Florida and the Gulf of Mexico. Blacktip sharks are associated with warmer temperatures, slightly lowered dissolved oxygen, and mid to deeper water with a salinity of 30 ppt or greater. Adults are typically found further offshore than juveniles. In the Atlantic, nurseries are on the seaward side of coastal islands of the Carolinas (NOAA 2017-TN12407). |
| blacktip shark (*Carcharhinus limbatus*) Atlantic Stock—juveniles, adults | Designated EFH | Juveniles and Adults: EFH is in Atlantic coastal areas from Florida to the Maryland/Virginia line, including the mouth of Chesapeake Bay and |

| Common Name | Life History Characteristic | Description |
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| | | adjacent coastal areas along the Delmarva Peninsula (NOAA 2017-TN12407). |
| blacktip shark (*Carcharhinus limbatus*) Atlantic Stock—juveniles, adults | Diet | Blacktip sharks feed on small schooling fishes such as herring, sardines, menhaden, mullet, and anchovies, but also consumes catfishes, groupers, jacks, snook, porgies, grunts, croakers, flatfishes, triggerfish, and porcupine fish. They are known to feed on other elasmobranch species such as dogfishes, sharpnose sharks, young dusky sharks, skates, and stingrays. Crustaceans and squids are also prey (NOAA 2017-TN12407). |
| bonnethead shark (*Sphyrna tiburo*) Atlantic Stock—juveniles, adults | Distribution and habitat characteristics | Bonnethead sharks inhabit shallow coastal waters with sandy or muddy bottoms. Seasonal nursery habitat for juvenile Atlantic bonnethead includes coastal waters from the tip of Georgia to Cape Canaveral, Florida. In the northern Gulf of Mexico, the species has shown a bias toward higher temperature (higher than 86°F) and mid-salinity (30–35 ppt). Individuals do not appear to exhibit long distance migratory behavior and thus, little or no mixing of populations occurs (NOAA 2017-TN12407). |
| bonnethead shark (*Sphyrna tiburo*) Atlantic Stock—juveniles, adults | Designated EFH | Juveniles and Adults: EFH includes the Atlantic east coast inshore and nearshore waters from Georgia to Cape Canaveral, Florida (NOAA 2017-TN12407). |
| bonnethead shark (*Sphyrna tiburo*) Atlantic Stock—juveniles, adults | Diet | Bonnethead sharks feed mainly on benthic prey such as crustaceans and mollusks (NOAA 2017-TN12407). |
| bull shark (*Carcharhinus leucas*)—juveniles, adults | Distribution and habitat characteristics | The bull shark is a large, shallow water shark that is cosmopolitan in warm seas and estuaries. It often enters fresh water and is the only shark species known to be physiologically capable of spending extended periods in freshwater in the United States. Adults are usually found in higher salinities than juveniles and neonate/YOY sharks. Adults are also often distributed out to the shelf edge but are not in slope waters. On the east coast of Florida, juvenile bull sharks often occupy areas from northern Cape Canaveral south to the Jupiter Island area in waters of 9.8 to 36 ft (NOAA 2017-TN12407). |
| bull shark (*Carcharhinus leucas*)—juveniles, adults | Designated EFH | Juveniles and Adults: EFH includes Atlantic coastal areas between South Carolina and the Florida Keys. From the mid-east coast of Florida, including northern Cape Canaveral south to the Jupiter Island area, EFH includes areas of water depths 9.8 to 36 ft, freshwater creeks, ocean inlets, and seagrass habitats; temperatures ranging as low as 61.5°F; salinities ranging between 1.7 to 41.1 ppt; and dissolved oxygen concentrations ranging between 4 and 7 mg/L (NOAA 2017-TN12407). |

| Common Name | Life History Characteristic | Description |
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| bull shark (*Carcharhinus leucas*)—juveniles, adults | Diet | Bull sharks prey on a very wide variety of animals. Bony fishes and small sharks make up the vast majority of the bull shark's diet. They commonly feed on mullet, tarpon, catfishes, menhaden, gar, snook, jacks, mackerel, snappers, and other schooling fish. They also consume stingrays and juvenile sharks, including small individuals of their own species in their inshore nursery habitats. Other food items occasionally include sea turtles, dolphins, crabs, shrimp, sea birds, and squid (NOAA 2017-TN12407). |
| Caribbean reef shark (*Carcharhinus perezii*)—all life stages | Distribution and habitat characteristics | The Caribbean reef shark is a poorly known, bottom-dwelling species that inhabits shallow coastal waters, usually around coral reefs. It ranges from North Carolina, Bermuda, and the east coast of Florida to southern Brazil, including the northern Gulf of Mexico and the Antilles (NOAA 2017-TN12407). |
| Caribbean reef shark (*Carcharhinus perezii*)—all life stages | Designated EFH | EFH for all life stages is considered the same and includes Atlantic coastal areas along the southern Florida coast (NOAA 2017-TN12407). |
| Caribbean reef shark (*Carcharhinus perezii*)—all life stages | Diet | Caribbean reef sharks consume a variety of ray-finned fishes (NOAA 2017-TN12407). |
| great hammerhead shark (*Sphyrna mokarran*)—all life stages | Distribution and habitat characteristics | The great hammerhead shark is circumtropical in warm waters and is found in both the open ocean and shallow coastal waters. In U.S. waters, the great hammerhead uses shallow inshore waters along Florida's Gulf Coast as nursery areas throughout the warm months, although the location of their pupping grounds in this area is uncertain, as no neonates have been documented (NOAA 2017-TN12407). |
| great hammerhead shark (*Sphyrna mokarran*)—all life stages | Designated EFH | EFH for all life stages is considered the same and includes Atlantic Ocean coastal areas on the central east coast of Florida (NOAA 2017-TN12407). |
| great hammerhead shark (*Sphyrna mokarran*)—all life stages | Diet | Great hammerheads primarily consume benthic prey, such as stingrays, cephalopods (octopus and squid), crustaceans, and other sharks (NOAA 2017-TN12407). |
| lemon shark (*Negaprion brevirostris*)—all life stages | Distribution and habitat characteristics | The lemon shark is common in shallow coastal waters of the American tropics. It is widely distributed throughout the western Atlantic from North Carolina to Brazil, the Gulf of Mexico, Caribbean Sea, and tropical eastern Atlantic and eastern Pacific and is an apex predator in nearshore habitats and coral reefs. The primary population in continental U.S. waters is found off south Florida, although adults travel north to the Carolinas and Virginia in the summer. Tagged sharks showed a high degree of wintertime site |

| Common Name | Life History Characteristic | Description |
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| | | fidelity to the Cape Canaveral region except under extreme decreases in-water temperature when sharks would be displaced to the south (NOAA 2017-TN12407). |
| lemon shark (*Negaprion brevirostris*)—all life stages | Designated EFH | Neonate and YOY: EFH is found inshore of the 50 ft bathymetric line in the Atlantic, including coastal areas of eastern Florida between the Florida/Georgia border and the Florida Keys (NOAA 2017-TN12407).<br>Juveniles and Adults: EFH includes waters to the 656 ft bathymetric line from South Carolina through the Florida Keys (NOAA 2017-TN12407). |
| lemon shark (*Negaprion brevirostris*)—all life stages | Diet | Lemon sharks consume catfish, mullet, jacks, croakers, porcupine fish, cowfish, guitarfish, stingrays, eagle rays, crabs and crayfish. In addition, this species will eat sea birds and smaller sharks (NOAA 2017-TN12407). |
| nurse shark (*Ginglymostoma cirratum*)—juveniles, adults | Distribution and habitat characteristics | The nurse shark is a shallow water species, often found lying motionless on the bottom under coral reefs or rocks. It often congregates in large numbers in shallow water. Individuals typically spend their entire life cycle within a few hundred square kilometers. Nursery areas are in shallow turtle grass beds and shallow coral reefs. Juveniles are often found around mangrove islands in south Florida. The nurse shark inhabits littoral waters in both sides of the tropical and subtropical Atlantic, ranging from tropical West Africa and the Cape Verde Islands in the east, and from Cape Hatteras, North Carolina to Brazil in the west (NOAA 2017-TN12407). |
| nurse shark (*Ginglymostoma cirratum*)—juveniles, adults | Designated EFH | Juveniles and Adults: EFH in the Atlantic Ocean includes coastal areas from Cape Canaveral to the Florida Keys (NOAA 2017-TN12407). |
| nurse shark (*Ginglymostoma cirratum*)—juveniles, adults | Diet | The nurse shark is a nocturnal predator that feeds mainly on fish, stingrays, mollusks, and crustaceans. Algae and corals are occasionally found in their stomachs, as well (NOAA 2017-TN12407). |
| sandbar shark (*Carcharhinus plumbeus*)—adults | Distribution and habitat characteristics | The sandbar shark is a subtropical, warm-temperate species commonly found in many coastal habitats. The North American population ranges from Cape Cod to the western Gulf. Individuals migrate seasonally and segregate by sex during much of the year. This species is bottom-dwelling and most commonly occupies depths of 66 to 180 ft but can be found at depths of up to 660 ft (NOAA 2017-TN12407). |

| Common Name | Life History Characteristic | Description |
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| sandbar shark (*Carcharhinus plumbeus*)—adults | Designated EFH | Adults: EFH in the Atlantic Ocean includes coastal areas from southern New England to the Florida Keys, ranging from inland waters of Delaware Bay and the mouth of Chesapeake Bay to the continental shelf break (NOAA 2017-TN12407). |
| sandbar shark (*Carcharhinus plumbeus*)—adults | Diet | Adult sandbar sharks prey on small bony fishes like menhaden, croaker, and snapper, as well as crabs, shrimp, and other crustaceans (NOAA 2017-TN12407). |
| scalloped hammerhead shark (*Sphyrna lewini*)—juveniles, adults | Distribution and habitat characteristics | The scalloped hammerhead is a large, schooling, warm-water species. Although widely distributed in offshore oceanic habitat, the species do not roam across large distances and populations rely upon discrete coastal nursery areas. Juveniles reside within nursery habitats for extended periods of time (at least 1-year post-parturition). YOY scalloped hammerheads are present in bays and nearshore nurseries during the summer months in the Florida areas of Yankeetown, Tampa Bay, and Charlotte Harbor, as well as along the beaches of the lower Texas coast. Older juvenile scalloped hammerheads occasionally are seen in the Tampa Bay area (NOAA 2017-TN12407). |
| scalloped hammerhead shark (*Sphyrna lewini*)—juveniles, adults | Designated EFH | Juveniles and Adults: EFH in the Atlantic Ocean ranges from North Carolina to the Florida Keys, including Florida Bay and the Dry Tortugas (NOAA 2017-TN12407). |
| scalloped hammerhead shark (*Sphyrna lewini*)—juveniles, adults | Diet | Juveniles and adults prey on mackerel, herring, sardines, other fish, stingrays, and cephalopods. Adults will also consume smaller sharks (NOAA 2017-TN12407). |
| smooth hammerhead shark (*Sphyrna zygaena*)—adults | Distribution and habitat characteristics | Smooth hammerhead sharks inhabit temperate waters worldwide. This species is semi-oceanic and is found in inshore and shallow waters over continental and insular shelves to well offshore. It inhabits depths from the surface to at least 660 ft. In the northwestern Atlantic Ocean, it has been recorded from Nova Scotia to the Florida Keys (NOAA 2017-TN12407). |
| smooth hammerhead shark (*Sphyrna zygaena*)—adults | Designated EFH | Currently, insufficient information is available to describe and identify EFH for this species (NOAA 2017-TN12407). |
| smooth hammerhead shark (*Sphyrna zygaena*)—adults | Diet | Adults prey on herring, menhaden, skates, other sharks, stingrays, shrimp and other crustaceans, and cephalopods (NOAA 2017-TN12407). |
| spinner shark (*Carcharhinus brevipinna*)—juveniles, adults | Distribution and habitat characteristics | Spinner sharks are coastal-pelagic, warm-temperate, and tropical sharks that inhabit continental and insular shelves. Individuals typically occupy waters of less than 100 ft deep but can inhabit waters of at least 500 ft offshore. The species often swims in schools. It is a |

| Common Name | Life History Characteristic | Description |
|---|---|---|
| | | migratory species, but its patterns are poorly known (NOAA 2017-TN12407). |
| spinner shark (*Carcharhinus brevipinna*)—juveniles, adults | Designated EFH | Juveniles and Adults: EFH in the Atlantic Ocean includes coastal areas between North Carolina and Florida. Juvenile spinner shark EFH is associated with temperatures of 71.4 to 86.2°F, salinities of 21.0 to 36.2 ppt, and dissolved oxygen levels ranging from 3.5 to 5.0 mL/L (NOAA 2017-TN12407). |
| spinner shark (*Carcharhinus brevipinna*)—juveniles, adults | Diet | Juveniles and adults feed primarily on small pelagic teleosts including ten-pounders, sardines, herrings, anchovies, sea catfish, lizardfish, mullet, bluefish, tunas, bonito, and croakers (NOAA 2017-TN12407). |
| tiger shark (*Galeocerdo cuvier*)—neonate, juveniles, adults | Distribution and habitat characteristics | Tiger sharks inhabit warm waters in both deep oceanic and shallow coastal regions. In the North Atlantic, the species is rarely encountered north of the Mid-Atlantic Bight. Individuals typically occupy the upper 160 ft of the water column but make dives to depths of more than 660 ft. Juveniles prefer seagrass flats (NOAA 2017-TN12407). |
| tiger shark (*Galeocerdo cuvier*)—neonate, juveniles, adults | Designated EFH | Neonate: EFH in the Atlantic Ocean includes coastal areas from the North Carolina/Virginia border to the Florida Keys. (NOAA 2017-TN12407) Juveniles and Adults: EFH in the Atlantic Ocean extends from offshore pelagic habitats associated with the continental shelf break at the seaward extent of the U.S. Exclusive Economic Zone boundary south of Georges Bank, off Massachusetts, to the Florida Keys, inclusive of offshore portions of the Blake Plateau (NOAA 2017-TN12407). |
| tiger shark (*Galeocerdo cuvier*)—neonate, juveniles, adults | Diet | Tiger sharks consume crabs, shellfish, lobsters, squid, bony fish, small sharks, skates, rays, porpoises, turtles, marine birds, and mammals (NOAA 2017-TN12407). |
| snapper grouper complex—all life stages | Distribution and habitat characteristics | The fish community referred to as the snapper grouper complex includes 55 species of demersal tropical and subtropical species that occupy the same type of habitat. These include snappers, groupers, porgys, triggerfish, jacks, tilefishes, grunts, spadefishes, wrasses, and sea basses. The complex ranges from the North Carolina/Virginia border to the end of the Florida Keys. Certain species within the complex also occupy areas north of this region. Important shallow water snapper fisheries occur in Florida and include yellowtail (*Ocyurus chrysurus*), gray (*Lutjanus griseus*), and mutton (*L. analis*) snapper. Grunts are common from Cape Hatteras to Key West. Snapper grouper complex species inhabit shallow live-bottom and shelf-edge habitat and, to |

| Common Name | Life History Characteristic | Description |
|---|---|---|
| | | a lesser extent, lower-shelf habitat in waters ranging from 52 to 80°F (SAFMC 1983-TN12408). |
| snapper grouper complex—all life stages | Designated EFH | EFH for snapper grouper species includes coral reefs, live/hardbottom, submerged aquatic vegetation, artificial reefs and medium to high profile outcroppings on and around the shelf break zone from shore to at least 600 ft (but to at least 2,000 ft for wreckfish [*Polyprion americanus*]) where the annual water temperature range is sufficiently warm to maintain adult populations of members of this largely tropical fish complex. EFH includes the spawning area in the water column above the adult habitat and the additional pelagic environment, including sargassum, required for survival of larvae and growth up to and including settlement. In addition, the Gulf Stream is also EFH because it provides a mechanism to disperse snapper grouper larvae (SAFMC 2011-TN12406). For specific life stages of estuarine dependent and near shore snapper grouper species, EFH includes areas inshore of the 100 ft contour, such as attached macroalgae; submerged rooted vascular plants (seagrasses); estuarine emergent vegetated wetlands (saltmarshes, brackish marsh); tidal creeks; estuarine scrub/shrub (mangrove fringe); oyster reefs and shell banks; unconsolidated bottom (soft sediments); artificial reefs; and coral reefs and live/hardbottom habitats (SAFMC 2011-TN12406). |
| snapper grouper complex—all life stages | Diet | Fish within the snapper grouper complex eat a wide variety of aquatic prey, including other fish, octopuses, and crustaceans. |

EFH = essential fish habitat; SLR = subsequent license renewal; St. Lucie = St. Lucie Plant; YOY = young-of-the-year.

### C.4.2 Magnuson–Stevens Act: Potential Impacts to Essential Fish Habitat

In the previous section, the NRC staff established that 27 EFH species or taxa groups and 6 HAPCs may occur within the vicinity of the St. Lucie site. In this section, the NRC staff analyzes the potential impacts of the proposed action (St. Lucie subsequent license renewal) on the EFH and prey of these species. Table C-18 identifies the NRC staff's MSA conclusions for each of the EFH species, and Table C-19 summarizes the NRC staff's MSA conclusions for each HAPC followed by a detailed analysis of impacts.

**Table C-18 Effect Determinations for Essential Fish Habitat Species and Life Stages for St. Lucie Plant Subsequent License Renewal**

| Species or Management Unit and Relevant Life Stages[(a)] | EFH Effect Determination[(b)] |
|---|---|
| bluefish—J, A | Minimal adverse effects |
| brown shrimp—All life stages | Minimal adverse effects |
| pink shrimp—All life stages | Minimal adverse effects |
| white shrimp—All life stages | Minimal adverse effects |
| spiny lobster—All life stages | Minimal adverse effects |
| summer flounder—L, J, A | Minimal adverse effects |
| king mackerel—All life stages | Minimal adverse effects |
| Spanish mackerel—All life stages | Minimal adverse effects |
| cobia—All life stages | Minimal adverse effects |
| sailfish—J, A | Minimal adverse effects |
| skipjack tuna—A | Minimal adverse effects |
| octocorals—All life stages | Minimal adverse effects |
| Atlantic sharpnose shark (Atlantic stock)—N, J, A | Minimal adverse effects |
| blacknose shark (Atlantic stock)—J, A | Minimal adverse effects |
| blacktip shark (Atlantic stock)—J, A | Minimal adverse effects |
| bonnethead shark (Atlantic stock)—J, A | Minimal adverse effects |
| bull shark—J, A | Minimal adverse effects |
| Caribbean reef shark—All life stages | Minimal adverse effects |
| great hammerhead shark—All life stages | Minimal adverse effects |
| lemon shark—J, A | Minimal adverse effects |
| nurse shark—J, A | Minimal adverse effects |
| sandbar shark—A | Minimal adverse effects |
| scalloped hammerhead shark—J, A | Minimal adverse effects |
| smooth hammerhead shark—All life stages | Minimal adverse effects |
| spinner shark—J, A | Minimal adverse effects |
| tiger shark—N, J, A | Minimal adverse effects |
| snapper grouper complex—All life stages | Minimal adverse effects |

(a) E = eggs; L = larvae; J = juveniles; N = neonatal; and A = adults.
(b) The NRC staff makes its EFH effect determinations in accordance with the language and definitions specified in the EFH regulations at 50 CFR Part 600 (TN1342) and the NMFS's guidance for Federal action agencies (NOAA 2004-TN1344); MAE = minimal adverse effects.

The NMFS defines adverse effect under the MSA in 50 CFR 600.810 (TN1342) and further describes adverse effects to EFH resulting from prey loss in 50 CFR 600.815(a)(7).

The proposed action (St. Lucie subsequent license renewal) has the potential to cause the following (generic) adverse effects on EFH in the area: (1) physical removal of habitat through cooling water withdrawals; (2) physical alteration of habitat through heated effluent discharges; (3) chemical alteration of habitat through radionuclides and other contaminants in heated effluent discharges; (4) physical removal of habitat through maintenance dredging; and (5) reduction in prey base of the habitat. In the sections below, the NRC staff evaluates each potential adverse effect as it relates to the proposed action.

*Physical Removal of Habitat Through Cooling Water Withdrawals*

St. Lucie continuously withdraws Atlantic Ocean water to cool the reactor cores and to serve other auxiliary functions. All water withdrawals represent a loss of fish habitat because withdrawal physically removes the water (habitat) from the ocean. However, most losses are temporary because St. Lucie's once-through cooling system returns most of the water it withdraws through offshore discharge pipes that lie roughly 0.5 mi (0.7 km) north of the intake. Between 2020 and 2024, the St. Lucie once-through cooling system withdrew an average of approximately 1,400 MGD (5,300 MLD) from the Atlantic Ocean (FPL 2025-TN12167, FPL 2025-TN12264; NRC 2022-TN12267). Thermoelectric plant once-through cooling systems return most of their withdrawn water to the environment, with evaporative losses of approximately 1 percent (Dieter et al. 2018-TN6681). Although some water is lost to evaporation, most is returned to the ocean. Thus, St. Lucie cooling water intake system withdrawals represent a very small percentage of the local ocean habitat.

St. Lucie also occasionally withdraws water from Big Mud Creek to conduct tests of the emergency intake cooling system. These tests occur four times per year, and the intake is only open for a maximum of 2 minutes per test (FPL 2025-TN12264). The site certification authorizes a maximum of 4 million gallons (15 million liters) per year to be withdrawn from Big Mud Creek for routine testing purposes (FDEP 2025-TN12409). Outside of quarterly testing, this system would only be used in an emergency situation where the primary cooling water from the Atlantic Ocean is unavailable. St. Lucie has never withdrawn water from Big Mud Creek for emergency cooling during its operating history, and it is extremely unlikely that this intake will have to be used beyond quarterly testing during the proposed subsequent license renewal term. Section 2.2.3.1 of FPL's ER (FPL 2021-TN12166) contains greater detail on the emergency intake cooling system. Any water withdrawn from Big Mud Creek is circulated through the St. Lucie site cooling system and discharged into the Atlantic Ocean. As such, water withdrawn from Big Mud Creek would constitute a permanent removal of habitat for EFH. However, the quarterly removal of habitat that occurs during the 2-minute-long tests represents a very small percentage of the habitat within Big Mud Creek.

Researchers have collected EFH species in St. Lucie aquatic studies including brown shrimp (*Farfantepenaeus aztecus*) and pink shrimp (*Farfantepenaeus duorarum*). These species appeared in both years of entrainment studies (2006–2007 and 2017–2018) and in the 2006–2007 biological characterization study, in which researchers sampled three nearshore environments via otter trawl. Penaeid shrimp were collected in the 1976–1978 impingement study, although taxa were not identified to the species. Researchers have also collected Spanish mackerel, king mackerel, bluefish, and cobia during baseline fish sampling efforts at nearshore and offshore locations and in the intake canal. Section C.2 discusses St. Lucie aquatic studies in more detail. Additionally, two scalloped hammerhead sharks have been captured within the intake canal, once in 1997 and once in 2012 (FPL 2021-TN12166: Section 3.7.8.1.1).

The appearance of EFH species in aquatic studies indicates that the physical removal of habitat through cooling water withdrawal affects the habitat of these species. However, because St. Lucie consumes a small percentage of ocean water, these temporary habitat losses would have negligible impacts on the quality and quantity of fish habitat. Accordingly, the NRC staff concludes that this potential impact would result in *no more than minimal adverse effects* on the habitat of any EFH species and life stage in the Atlantic Ocean and Big Mud Creek near St. Lucie.

*Physical Alteration of Habitat Through Heated Effluent Discharges*

St. Lucie continuously discharges heated effluent offshore to the Atlantic Ocean following its use for cooling and other auxiliary functions at the plant. Because discharges are of higher temperatures than the ambient ocean water, discharges represent a physical alteration to fish habitat. Section 3.4.3.4 describes the characteristics of the thermal plume, which varies with currents and generally occurs at the top of the water column. This section also describes thermal studies conducted before and after the EPU that concluded that the change did not have a measurable effect on the benthic community, water column fish assemblages, planktonic stages of fish and invertebrates, or sea turtles using nearshore hardbottom habitat in the vicinity of St. Lucie.

Many of the relevant EFH species do not occupy the epipelagic region of the water column where effects of the thermal plume could be experienced. Thus, most EFH species would not encounter the thermal plume, and the continued discharge of heated effluent would not affect the quality and quantity of these species' habitats. Some EFH species, such as coastal migratory pelagic species, sailfish, species within the snapper grouper complex, and coastal shark species, occupy nearshore, epipelagic areas where individuals could experience increased water temperatures resulting from St. Lucie's thermal effluent. However, these species are agile and can easily avoid areas of heated water. Additionally, the relatively small area affected by the thermal plume would not meaningfully affect the available habitat for these species. Accordingly, the NRC staff concludes that this potential impact would result in *no more than minimal adverse effects* on EFH in the affected area of the Atlantic Ocean. There would be no discharge of thermal effluent into Big Mud Creek, and, therefore, there would be *no adverse effects* on EFH in this area.

*Chemical Alteration of Habitat Through Radionuclides and Other Contaminants in Heated Effluent Discharges*

With heated effluent, St. Lucie discharges certain nonradiological chemical pollutants. The Florida Department of Environmental Protection limits the allowable concentrations of these pollutants through the site's NPDES permit. The NPDES permit establishes allowable pollutant discharge concentration limits for total residual chlorine, pH, total phosphorus, fecal coliform, total organic carbon, and total petroleum hydrocarbons at levels at or below the EPA (2024-TN10276) national recommended aquatic life criteria for acute (short-term) and chronic (long-term) exposure. Under these criteria, the EPA considers "Unacceptable Acute Effects" to be those effects that are lethal or immobilize an organism during short-term exposure to a pollutant. "Unacceptable Chronic Effects" are those effects that will impair growth, survival, and reproduction of an organism following long-term exposure to a pollutant. Thus, the EPA aquatic life criteria are designed to ensure that aquatic species exposed to pollutants in compliance with these levels will not experience any impairment of growth, survival, or reproduction. The NRC staff assumes that because nonradiological pollutants that are discharged at levels at or below the EPA aquatic life criteria would not impair the ability of fish to carry out essential life functions, such discharges would also not impair the quality or quantity of the habitat itself. Accordingly, the NRC staff concludes that nonradiological pollutant discharges would result in *no more than minimal adverse effects* on EFH in the affected area. There would be no discharges into Big Mud Creek and, as such, there would be *no adverse effects* of nonradiological pollutant discharges on EFH within Big Mud Creek.

With respect to the potential impacts of radiological contaminants on fish habitat, the primary radionuclide of concern is tritium. During operations, St. Lucie may discharge tritium through

one of two pathways: (1) as liquid through effluent releases to the Atlantic Ocean or (2) as gas through the air. As there would be no discharges into Big Mud Creek, the only potential pathway of tritium exposure in this area would be as gas through the air. FPL has not detected tritium or any other radionuclides attributable to St. Lucie in aquatic exposure pathway samples based on the NRC staff's review of annual reports on FPL's Radiological Environmental Monitoring Program from 2018 through 2024 (FPL 2019-TN12383, FPL 2021-TN12384, FPL 2023-TN12386, FPL 2023-TN12387, FPL 2024-TN12389, FPL 2025-TN12480). These samples include surface water stations at multiple monitoring locations, shoreline sediment samples along Atlantic Ocean public beaches and near the south end of Hutchinson Island, fish and invertebrates, and broad leaf vegetation. Thus, the quality of fish habitat in the area is extremely unlikely to be affected by radiological contamination. Accordingly, the NRC staff concludes that radionuclide discharges would result in *no more than minimal adverse effects* on EFH in the affected area of the Atlantic Ocean and Big Mud Creek.

*Physical Removal of Habitat Through Maintenance Dredging*

Dredging results in the direct removal of bottom habitats along with infaunal and epifaunal organisms of limited mobility inhabiting the affected substrates. Dredging also creates sediment plumes that increase water turbidity. Thus, dredging affects both the quantity and quality of fish habitat. The direct removal of substrates, sediments, and benthic organisms represent effects to habitat quantity. The resulting short-term reductions in biomass of benthic organisms and increased water turbidity represent effects on habitat quality.

FPL periodically assesses the need for dredging of the intake canal to remove sediment build-up. FPL surveys critical canal areas, intake wells, and Big Mud Creek areas on a 2-year frequency, and non-critical areas like the intake headwall and discharge canal on a 4-year frequency. FPL uses the results of these surveys to determine what and when maintenance activities are required. The most recent dredging event occurred in 2019, following Hurricane Dorian. Dredging removed sediment that had built up on the barrier and corrected the sediment angle to ensure proper flow rates to the intake canal system.

FPL will plan future dredging events on an as-needed basis and obtain CWA Section 404 permits from the USACE prior to conducting dredging, as appropriate (NRC 2021-TN12261). FPL has no plans to conduct dredging within Big Mud Creek during the proposed subsequent license renewal term (FPL 2025-TN12264). Any impacts to EFH associated with dredging would be evaluated during the USACE permitting review, and any adverse effects identified would be addressed through a separate consultation. Therefore, this issue is not evaluated further in this EIS.

*Reduction in the Prey Base of the Habitat*

Reduction in the prey base, or loss of prey, represents a potential impact to the quality of fish habitat. Sections 3.4.2 and 3.4.3 address the impacts of impingement, entrainment, and thermal discharges at the resource-wide level. In those sections, the NRC staff does not identify significant impacts to the prey of the relevant EFH species and, therefore, the NRC staff does not expect impingement, entrainment, or thermal effluent discharges to noticeably alter the availability of prey of EFH species.

All other potential impacts to the prey base of EFH species, such as physical and chemical alteration of the aquatic environment from effluent discharges, have already been addressed

previously in this section. The NRC staff did not identify any unique impacts of these effects that would affect the prey of EFH species but not the EFH itself.

Accordingly, the NRC staff concludes that the reduction in the prey base of the habitat resulting from the proposed action (St. Lucie subsequent license renewal) would result *in no more than minimal adverse effects* on EFH in the affected area.

*Conclusion for Essential Fish Habitat*

The NRC staff concludes that the proposed action (St. Lucie subsequent license renewal) would result in *no more than minimal adverse effects* on the EFH of the federally managed species and life stages identified in Table C-19. This level of impact would primarily be experienced by species that occupy nearshore, epipelagic areas where individuals could encounter increased water temperatures resulting from St. Lucie's thermal effluent. These species include coastal migratory pelagic species, sailfish, species within the snapper grouper complex, and coastal shark species. The EFH of all species and life stages would experience chemical alteration of habitat through radionuclides and other contaminants in heated effluent discharge into the Atlantic Ocean. However, FPL has not detected tritium or any other radionuclides attributable to St. Lucie in aquatic exposure pathway samples since the plant began operating, and the EPA and the State regulate nonradiological contaminants in effluent discharges through the site's NPDES permit to ensure protection of the aquatic environment.

The NRC staff will engage in EFH consultation with NMFS regarding this determination following the issuance of this draft EIS.

**Table C-19 Summary of Effects to Habitat Areas of Particular Concern in the Vicinity of the St. Lucie Plant Site**

| Effect | Coastal Inlets, Mangroves, and Submerged Aquatic Vegetation | Nearshore Hardbottom, Phragmatopoma, and Nearshore Migratory Corridor |
|---|---|---|
| Physical removal of habitat through withdrawals | **Minimal adverse effects.** Withdrawal of water from Big Mud Creek occurs on a quarterly basis for a maximum of 2 minutes per test (FPL 2025-TN12264). Aside from quarterly tests, water would only be withdrawn from Big Mud Creek in an emergency situation where cooling water from the Atlantic Ocean is unable to be used. No emergencies requiring Big Mud Creek withdrawals have occurred during St. Lucie's operating history, and it is extremely unlikely that any withdrawals from Big Mud Creek, beyond the minimal volume required for quarterly testing, will occur during the proposed SLR. | **Minimal adverse effects.** St. Lucie withdraws water continuously from the Atlantic Ocean. A small amount of water is lost to cooling, but the majority of water is returned to the Atlantic Ocean. The consumptive water use represents a small portion of the local ocean habitat. These temporary habitat losses would have negligible impacts on the quality or quantity of fish habitat. |
| Physical alteration of habitat through discharges | **No adverse effects.** There would be no discharges into these HAPCs. | **Minimal adverse effects.** St. Lucie continuously discharges heated effluent offshore to the Atlantic Ocean. The thermal plume created by the discharge may affect habitat for epipelagic species that use these HAPCs. However, EFH species that would be present in these areas would be motile and able to avoid the areas of heated water. |

| Effect | Coastal Inlets, Mangroves, and Submerged Aquatic Vegetation | Nearshore Hardbottom, Phragmatopoma, and Nearshore Migratory Corridor |
|---|---|---|
| | | The thermal plume would affect a relatively small area and would not meaningfully affect the available habitat. |
| Chemical alteration of habitat through discharges | **Minimal adverse effects.** There would be no discharges into these HAPCs. However, there is potential for tritium to enter the aquatic environment as gas through the air. Radiological monitoring in the area has not detected tritium, or other radionuclides, attributable to St. Lucie and the presence of radionuclides within the HAPCs of Big Mud Creek is considered extremely unlikely. | **Minimal adverse effects.** St. Lucie discharges certain nonradiological chemical pollutants in accordance with NPDES permit limitations established by the FDEP. These discharges are monitored and the quality of HAPCs in the area is extremely unlikely to be affected by nonradiological contamination. FPL monitors radioactive contaminants under its Radiological Environmental Monitoring Program, which has not detected measurable levels of radiological isotopes attributable to St. Lucie operations in ocean substrates, plants, or animals. |
| Maintenance dredging | **Not applicable.** Dredging is not anticipated to occur during the SLR. However, if it were to occur, any adverse effects associated with dredging would be addressed during the USACE permitting review and a separate consultation. Therefore, this issue is not evaluated here. | **Not applicable.** Dredging is not anticipated to occur during the SLR. However, if it were to occur, any adverse effects associated with dredging would be addressed during the USACE permitting review and a separate consultation. Therefore, this issue is not evaluated here. |
| Reduction in prey base | **Minimal adverse effects.** There is potential for the prey base of EFH species to be impacted by the quarterly withdrawal of water from Big Mud Creek. However, this minimal withdrawal is not expected to noticeably alter the availability of prey within these HAPCs. | **Minimal adverse effects.** Continuous withdrawal and discharge of ocean water for cooling have the potential to impact the prey base of EFH species that use HAPCs within the Atlantic Ocean through impingement, entrainment, or exposure to thermal effluent discharges. However, these impacts are not expected to noticeably alter the availability of prey within these HAPCs. |

EFH = essential fish habitat; FDEP = Florida Department of Environmental Protection; FPL = Florida Power & Light Company; HAPC = habitat area of particular concern; NPDES = National Pollutant Discharge Elimination System; SLR = subsequent license renewal; USACE = U.S. Army Corps of Engineers; St. Lucie = St. Lucie Plant.
The NRC staff makes its EFH effect determinations in accordance with the language and definitions specified in the EFH regulations at 50 CFR Part 600 (TN1342) and the NMFS's guidance for Federal action agencies (NOAA 2004-TN1344).

### C.4.3 Chronology of Magnuson–Stevens Act Essential Fish Habitat Consultation

In Section 3.5.3, the NRC staff concludes that the proposed action (St. Lucie subsequent license renewal) will have minimal adverse effects on EFH and HAPCs in the vicinity of the St. Lucie site. The NRC staff will engage in EFH consultation with NMFS regarding this determination following the issuance of this draft EIS and will include relevant correspondence between the NRC and NMFS pursuant to this consultation in the final EIS.

## C.5 National Marine Sanctuaries Act Consultation

The NMSA (TN4482) authorizes the Secretary of Commerce to designate and protect areas of the marine environment with special national significance due to their conservation, recreational,

ecological, historical, scientific, cultural, archaeological, educational, or aesthetic qualities as national marine sanctuaries. Under Section 304(d) of the NMSA, Federal agencies must consult with NOAA's Office of National Marine Sanctuaries if a Federal action is likely to destroy, cause the loss of, or injure any sanctuary resources.

In Section 3.5.4, the NRC staff concludes that no national marine sanctuaries occur near St. Lucie and that subsequent license renewal would have no effect on sanctuary resources. Thus, the NMSA does not require the NRC to consult with NOAA for the proposed action.

## C.6 References


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# APPENDIX D

# NATIONAL HISTORIC PRESERVATION ACT SECTION 106 CONSULTATION AND CORRESPONDENCE

The National Historic Preservation Act of 1966, as amended (NHPA) (TN4157), requires Federal agencies to consider the effects of their undertakings on historic properties and consult with applicable Federal and State agencies, Indian Tribes, individuals, and organizations with a demonstrated interest in the undertaking before taking an action. Historic properties are defined as resources that are eligible for listing on the National Register of Historic Places. The NHPA Section 106 (TN4839) review process is outlined in regulations issued by the Advisory Council on Historic Preservation in Title 36 of the *Code of Federal Regulations* (36 CFR) Part 800, "Protection of Historic Properties" (TN513). In accordance with 36 CFR 800.8(c), "Use of the NEPA Process for Section 106 Purposes," the U.S. Nuclear Regulatory Commission or the Commission (NRC, the Commission) has elected to use the National Environmental Policy Act of 1969, as amended, process to comply with its obligations under Section 106 of the NHPA. Table D-1 lists the chronology of consultation and consultation documents related to the NRC's NHPA Section 106 review of the proposed St. Lucie Plant, Units 1 and 2, subsequent license renewal. The NRC staff is required to consult with the noted agencies and organizations in accordance with the statutes listed above.

**Table D-1 National Historic Preservation Act Section 106 Correspondence**

| Date | Description | ADAMS Accession No.[(a)] |
|---|---|---|
| 10/22/2021 | Letter from R. Elliot, NRC to R. Nelson, ACHP – request for scoping comments; notification of Section 106 review | ML21286A622 |
| 10/22/2021 | Letter from R. Elliot, NRC to T. Parsons, FL SHPO – request for scoping comments; initiation of Section 106 review | ML21287A113 |
| 10/22/2021 | Letter from R. Elliot, NRC to B. Cypress, Chairman, Miccosukee Tribe of Indians – request for scoping comments; initiation of Section 106 review | ML21287A094 |
| 10/22/2021 | Letter from R. Elliot, NRC to C. Ben, Chief, Mississippi Band of Choctaw Indians – request for scoping comments; initiation of Section 106 review | ML21287A094 |
| 10/22/2021 | Letter from R. Elliot, NRC to D. Hill, Principal Chief, Muscogee (Creek) Nation – request for scoping comments; initiation of Section 106 review | ML21287A094 |
| 10/22/2021 | Letter from R. Elliot, NRC to S. Bryan, Tribal Chair, Poarch Band of Creek Indians – request for scoping comments; initiation of Section 106 review | ML21287A094 |
| 10/22/2021 | Letter from R. Elliot, NRC to L. Johnson, Chief, Seminole Nation of Oklahoma – request for scoping comments; initiation of Section 106 review | ML21287A094 |
| 10/22/2021 | Letter from R. Elliot, NRC to M. Osceola Jr., Chairman, Seminole Tribe of Florida – request for scoping comments; initiation of Section 106 review | ML21287A094 |
| 02/14/2022 | Letter from T. Parsons, FL SHPO to R. Elliot, NRC – unlikely to adversely affect historic properties | ML22045A458 |

ACHP = Advisory Council on Historic Preservation; ADAMS = Agencywide Documents Access and Management System; SHPO = State Historic Preservation Office; NRC = U.S. Nuclear Regulatory Commission.
(a) Access these documents through the NRC's ADAMS at https://adams-search.nrc.gov/home.

## D.1 References

36 CFR Part 800. *Code of Federal Regulations*, Title 36, *Parks, Forests, and Public Property*, Part 800, “Protection of Historic Properties.” TN513.

54 U.S.C. § 306108 et seq. National Historic Preservation Act Section 106, “Effect of Undertaking on Historic Property.” TN4839.

National Historic Preservation Act. 54 U.S.C. § 300101 et seq. TN4157.

# APPENDIX E

# CHRONOLOGY OF ENVIRONMENTAL REVIEW CORRESPONDENCE

This appendix contains a chronological listing of correspondence between the U.S. Nuclear Regulatory Commission (NRC, the Commission) and external parties as part of the agency's environmental review of the St. Lucie Plant, Units 1 and 2 (St. Lucie), subsequent license renewal application. This appendix does not include consultation correspondence or comments received during the scoping process. For a list and discussion of consultation correspondence, see Appendix C and Appendix D. For scoping comments, see Appendix A and the NRC's scoping summary report (NRC 2022-TN12268). All documents are available electronically from the NRC's Public Electronic Reading Room found at: http://www.nrc.gov/reading-rm.html. From this site, the public can gain access to the NRC's Agencywide Documents Access and Management System (ADAMS), which provides text and image files of the NRC's public documents. The ADAMS accession number for each document if it is available in ADAMS is included in the following table.

## E.1 Environmental Review Correspondence

Table E-1 lists the environmental review correspondence, by date, beginning with the request by Florida Power & Light Company to subsequently renew the renewed licenses for St. Lucie.

**Table E-1 Environmental Review Correspondence**

| Date | Correspondence Description | ADAMS Accession Number[(a)] or *Federal Register* Citation |
|---|---|---|
| 08/03/2021 | St. Lucie Units 1 and 2 Application for Subsequent Renewed Facility Operating Licenses | ML21215A314 |
| 09/24/2021 | St. Lucie Units 1 and 2 – Receipt and Availability of the Subsequent License Renewal Application | ML21246A091 |
| 09/24/2021 | St. Lucie Units 1 and 2 – License Renewal Application Online Reference Portal | ML21246A131 |
| 09/29/2021 | Florida Power & Light Company; NextEra Energy; St. Lucie Plant, Unit Nos. 1 and 2 | 86 FR 53986 |
| 10/06/2021 | Letter to Robert Coffey – St. Lucie Units 1 and 2, Request for Withholding from Public Disclosure Regarding Subsequent Renewal Application | ML21271A138 |
| 10/10/2021 | Notice of Intent to Conduct Scoping Process and Prepare Environmental Impact Statement; Florida Power & Light Co.; St. Lucie Plant Units 1 and 2 | 86 FR 58701 |
| 10/14/2021 | Letter to Robert Coffey – St. Lucie Units 1 and 2, Notice of Intent to Prepare an Environmental Impact Statement and Conduct a Scoping Process | ML21272A264 |
| 11/03/2021 | Public Meeting Announcement - Environmental Scoping Meeting Related to the St. Lucie Plant, Units 1 and 2, Subsequent License Renewal Application | ML21292A195 |
| 11/03/2021 | St. Lucie Plant Units 1 and 2, Subsequent License Renewal Application Environmental Scoping Public Meeting Slides | ML21302A079 |
| 12/13/2021 | Memo to Robert Elliott – Summary: Public Scoping Meetings for the Environmental Review of the Subsequent License Renewal Application for St. Lucie Plant, Unites 1 and 2 | ML21337A196 |

| Date | Correspondence Description | ADAMS Accession Number[a] or *Federal Register* Citation |
|---|---|---|
| 12/13/2021 | Environmental Scoping Meeting Related to the St. Lucie Plant, Units 1 and 2, Subsequent License Renewal Application | ML21337A206 |
| 12/13/2021 | Transcript of Environmental Scoping Meeting Related to the St. Lucie Plant Units 1 and 2 Subsequent License Renewal Application, Afternoon Transcript | ML21337A214 |
| 12/13/2021 | Transcript of Environmental Scoping Meeting Related to the St. Lucie Plant Units 1 and 2 Subsequent License Renewal Application, Evening Transcript | ML21337A211 |
| 02/09/2022 | Letter to Robert Coffey – St. Lucie Plant, Units 1 and 2, License Renewal Regulatory Audit Regarding the Environmental Review of the Subsequent License Renewal Application | ML22039A196 |
| 04/25/2022 | Letter to Robert Coffey – St. Lucie Plant, Units 1 and 2, Summary of the Environmental Remote Audit Related to the Review of the Subsequent License Renewal Application | ML22101A227 |
| 05/04/2022 | St. Lucie Plant, Units 1 and 2 – Subsequent License Renewal Environmental Scoping Report | ML22124A011 |
| 06/14/2022 | St. Lucie Plant, Units 1 and 2, Subsequent License Renewal Application – Environmental Audit Requests for Clarification of/Additional Information (RCI/RAI) Responses | ML22165A180 |
| 08/26/2022 | Letter to Dan DeBoer – Transmittal of the National Marine Services August 8, 2022, Biological Opinion SERO-2019-03494 for Continued Operation of St. Lucie Plant, Unit Nos. 1 and 2 | ML22227A119 |
| 04/30/2023 | Letter to Robert Coffey – St. Lucie Plant, Unites 1 and 2, Schedule Revision for the Subsequent License Renewal Application Review | ML23109A113 |
| 02/03/2025 | St. Lucie Plant, Units 1 and 2 – Supplement to Subsequent License Renewal Application Environmental Report | ML25034A029 |
| 03/03/2025 | Letter to Kenneth A. Mack - St. Lucie Plant, Units 1 and 2, Schedule Revision for the Subsequent License Renewal Application Review | ML25007A222 |
| 04/02/2025 | Letter to Robert Coffey – St. Lucie Plant, Units 1 and 2, License Renewal Regulatory Audit Regarding the Environmental Review of the Subsequent License Renewal Application Supplement | ML25078A071 |
| 06/10/2025 | Letter to Robert Coffey – St. Lucie Plant, Units 1 and 2, Summary of the April and May 2025 Supplemental Environmental Audit | ML25148A200 |
| 07/08/2025 | St. Lucie Plant, Units 1 and 2, Subsequent License Renewal Application Environmental Review Supplemental Audit Response to Requests for Confirmation of Information and Requests for Additional Information | ML25190A290 |
| 07/16/2025 | Email to Dennis Klemm – Request to Reinitiate Endangered Species Act Consultation for Continued Operation and Subsequent License Renewal of St. Lucie Plant, Unit Nos. 1 and 2, in St. Lucie County, Florida | ML25190A672 |

(a) Access these documents through the U.S. Nuclear Regulatory Commission's Agencywide Documents Access and Management System (ADAMS) at https://adams-search.nrc.gov/home.

# APPENDIX F

# AGENCIES, ORGANIZATIONS, INDIAN TRIBES, AND INDIVIDUALS CONTACTED

The U.S. Nuclear Regulatory Commission staff contacted the Federal, State, regional, and local agencies and Indian Tribes listed in Table F-1 during its environmental review of the St. Lucie Plant, Units 1 and 2 subsequent license renewal application.

**Table F-1 List of Agencies, Organizations, Indian Tribes, and Individuals Contacted**

| Name | Affiliation |
|---|---|
| Jaime Loichinger | Advisory Council on Historic Preservation |
| Alissa Slade Lotane | Florida State Historic Preservation Office |
| Talbert Cypress, Chairman | Miccosukee Tribe of Florida |
| Cyrus Ben, Chief | Mississippi Band of Choctaw Indians |
| David Hill, Principal Chief | Muscogee Nation |
| Stephanie A. Bryan, Chairwoman | Poarch Band of Creek Indians |
| Lewis J. Johnson, Chief | Seminole Nation of Oklahoma |
| Marcellus W. Osceola, Jr., Chairman | Seminole Tribe of Florida |
| Lindsay Needs, Jose Rivera, Teresa Calleson, Charles Calleson, Caroline Walker | U.S. Fish and Wildlife Service |
| Audra Livergood, Brandon Howard, Pace Wilber, PhD | National Marine Fisheries Service |