



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Southeast Regional Office  
263 13<sup>th</sup> Avenue South  
St. Petersburg, Florida 33701-5505  
<https://www.fisheries.noaa.gov/region/southeast>

F/SER31:DMB  
SERO-2020-01357  
<https://doi.org/10.25923/d85x-ee38>

John Policarpo  
Chief, Fort Myers Permits Section  
Jacksonville District Corps of Engineers  
Department of the Army  
701 San Marco Boulevard  
Jacksonville, Florida 32207-8915

Ref: City of Punta Gorda, Ponce de Leon Boardwalk and Fishing Pier Renovations, SAJ-2020-00525, Punta Gorda, Charlotte County, Florida

Dear John Policarpo,

The enclosed Biological Opinion (Opinion) was prepared by the National Marine Fisheries Service (NMFS), pursuant to Section 7(a)(2) of the Endangered Species Act. The Opinion considers the effects of a proposal by the United States Army Corps of Engineers (USACE) to authorize renovations to an existing fishing pier. We base this Opinion on project-specific information provided in the consultation package, NMFS's review of published literature, and the best available data. This Opinion analyzes the potential for the projects to affect the following: green sea turtle (North Atlantic and South Atlantic distinct population segments [DPSs]), Kemp's ridley sea turtle, loggerhead sea turtle (Northwest Atlantic DPS), Gulf sturgeon, smalltooth sawfish (United States DPS), and giant manta ray.

We look forward to further cooperation with the USACE on other projects to ensure the conservation and recovery of our threatened and endangered marine species. This project has been assigned the tracking number SERO-2020-01357 in our NMFS Environmental Consultation Organizer (ECO). Please refer to the ECO number in all future inquiries regarding this consultation. If you have any questions regarding this consultation, please contact Dana M. Bethea, Consultation Biologist, by phone at 727-209-5974, or by email at [Dana.Bethea@noaa.gov](mailto:Dana.Bethea@noaa.gov).

Sincerely,

Andrew J. Strelcheck  
Regional Administrator

Enclosure: Biological Opinion  
File: 1514-22.f



**Endangered Species Act - Section 7 Consultation  
Biological Opinion**

**Action Agency:** United States Army Corps of Engineers

**Applicant:** City of Punta Gorda

**Activity:** Ponce de Leon Boardwalk and Fishing Pier Renovations  
SAJ-2020-00525 (NW-SJR)

**Consulting Agency:** National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, Protected Resources Division, St. Petersburg, Florida

Tracking Number: SERO-2020-01357  
<https://doi.org/10.25923/d85x-ee38>

**Approved by:** \_\_\_\_\_  
Andrew J. Strelcheck, Regional Administrator  
NMFS, Southeast Regional Office  
St. Petersburg, Florida

**Date Issued:** \_\_\_\_\_

## Table of Contents

1.	CONSULTATION HISTORY.....	6
2.	DESCRIPTION OF THE PROPOSED ACTION.....	6
3.	STATUS OF THE SPECIES AND CRITICAL HABITAT.....	11
4.	ENVIRONMENTAL BASELINE.....	19
5.	EFFECTS OF THE ACTION ON ESA-LISTED SPECIES.....	22
6	CUMULATIVE EFFECTS.....	25
7	JEOPARDY ANALYSIS.....	26
8	CONCLUSION.....	28
9	INCIDENTAL TAKE STATEMENT (ITS).....	28
10	CONSERVATION RECOMMENDATIONS.....	32
11	REINITIATION OF CONSULTATION.....	32
12	LITERATURE CITED.....	33

## List of Tables

Table 1. Effects Determinations for ESA-Listed Species that May Be Affected by the Proposed Action.....	11
Table 2. Effects Determinations for Designated Critical Habitat that May Be Affected by the Proposed Action.....	11
Table 3. Summary of Expected Captures of Smalltooth Sawfish.....	25
Table 4. Incidental Take Limits by Species for Any Consecutive 3-Year Period.....	29

## List of Figures

Figure 1. Top: Satellite showing Ponce de Leon Park (©2021 Google Earth). Bottom: The existing boardwalk and fishing pier to be renovated in the same footprint (image supplied by USACE).....	10
--	----

## Acronyms and Abbreviations

ADA	Americans with Disabilities Act
CFR	Code of Federal Regulations
CHEU	The Charlotte Harbor Estuary Unit of smalltooth sawfish designated critical habitat
CR	Conservation Recommendations
DO	Dissolved Oxygen
DPS	Distinct Population Segment
E	An Endangered listing under the ESA
ECO	NMFS Environmental Consultation Organizer
ESA	Endangered Species Act
FDEP	Florida Department of Environmental Protection
FR	Federal Register
FWC	Florida Fish and Wildlife Conservation Commission
IPCC	Intergovernmental Panel on Climate Change
ITS	Incidental Take Statement
LAA	Likely to Adversely Affect
MHW	Mean High Water
MLLW	Mean Lower Low Water

MMF	Marine Megafauna Foundation
NGMRU	Northern Gulf of Mexico Recovery Unit
NLAA	Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
Opinion	Biological Opinion
PRD	NMFS Protected Resources Division
PRM	Post-release mortality
RPMs	Reasonable and Prudent Measures
SAV	Submerged Aquatic Vegetation
SERO	NMFS Southeast Regional Office
SSRIT	Smalltooth Sawfish Recovery Implementation Team
STSSN	Sea Turtle Stranding and Salvage Network
T	A Threatened listing under the ESA
T&Cs	Terms and Conditions
U.S.	United States of America
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

#### **Units of Measure**

---

ac	Acres
°C	Degrees Celsius
cm	Centimeter(s)
ft	Foot/feet
ft <sup>2</sup>	Square foot/feet
in	Inch(es)
m	Meter(s)
m <sup>2</sup>	Square meter(s)
mi	Mile(s)

## Introduction

---

Section 7(a)(2) of the ESA of 1973, as amended (16 U.S.C. §1531 et seq.), requires that each federal agency ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of those species. When the action of a federal agency may affect a protected species or its critical habitat, that agency is required to consult with either the NMFS or the USFWS, depending upon the protected species or critical habitat that may be affected.

Consultations on most listed marine species and their designated critical habitat are conducted between the action agency and NMFS. Consultations are concluded after NMFS determines the action is not likely to adversely affect listed species or critical habitats, or issues a Biological Opinion (Opinion) that determines whether a proposed action is likely to jeopardize the continued existence of a federally listed species, or destroy or adversely modify federally designated critical habitat. The Opinion also states the amount or extent of listed species incidental take that may occur and develops nondiscretionary measures that the action agency must take to reduce the effects of the anticipated take. The Opinion may also recommend discretionary conservation measures. No incidental destruction or adverse modification of critical habitat may be authorized. The issuance of an Opinion detailing NMFS's findings concludes ESA Section 7 consultation.

This document represents NMFS's Opinion based on our review of effects associated with the USACE proposed action to permit the renovation of the Ponce de Leon Boardwalk and Fishing Pier in Punta Gorda, Charlotte County, Florida. This Opinion analyzes the proposed actions' effects on threatened and endangered species and designated critical habitat in accordance with Section 7 of the ESA. We based our Opinion on information provided by the USACE, the STSSN, the SSRIT encounter database, the MMF, and the published literature cited herein.

## **1. CONSULTATION HISTORY**

---

The following is the consultation history for NMFS ECO tracking number SERO-2020-01357 Ponce de Leon Boardwalk Fishing Pier.

On May 13, 2020, NMFS received a request for consultation under Section 7 of the ESA from the USACE in a letter dated the same day.

On June 3, 2020, NMFS requested additional information from the USACE. We received response on August 19, 2020.

On June 24, 2021, the consultation biologist was reassigned. USACE was informed of the reassignment on July 27, 2021.

On July 27, 2021, NMFS provided USACE with a draft of Section 2. USACE supplied edits on July 28, 2021.

On August 12, 2021, NMFS conferred internally regarding the SSRIT data.

On August 19, 2021, NMFS requested additional information from the USACE. We received a response on August 19, 2021, and initiated consultation that day.

On October 5, 2021, NMFS requested additional information during our internal review process. NMFS received response on October 5, 2021.

## **2. DESCRIPTION OF THE PROPOSED ACTION**

---

### **2.1 Proposed Action**

The USACE seeks to authorize the City of Punta Gorda (the City) to remove and replace the Ponce de Leon Boardwalk and repair the associated fishing pier.

The City proposes to remove a total of 198 pilings along with 4,083 ft<sup>2</sup> of elevated boardwalk that runs through a mangrove forest, install 155 new pilings to support a new boardwalk in approximately the same footprint, and normalize the boardwalk from an average width of 4-ft 11-in to 5-ft to be compliance with the ADA guidelines. The replacement of the boardwalk piles will be done with a hand-held auger and no heavy machinery will be utilized.

Additionally there will be repairs to the fishing pier at the end of the elevated boardwalk that will increase the existing overwater structure by 17.5 ft<sup>2</sup>. Concrete work to the fishing pier will occur above the MHW line. A barge and turbidity curtains will be deployed. There is no fishing cleaning station associated with the current fishing pier and none is planned for the renovation.

All debris will be taken to the uplands for proper disposal. Barge work is expected to take 30 days, during daylight hours only. Access to the existing red mangroves in shallow, euryhaline

water will not be restricted. Further, no red mangroves will be removed by the proposed action; however, some light trimming of branches may occur.

### 2.1.1 Construction Conditions

The applicant will comply with the NMFS's [\*Protected Species Construction Conditions\*](#). Floating turbidity curtains with weighted skirts extending to the bottom will be installed around the work zone to enclose all construction. The turbidity curtains will remain in place until construction is complete and turbidity levels within the action area are compliant with Florida state standards.

To minimize potential impacts to ESA-listed species, USACE will add the following conditions to the permit to be followed during construction (adapted from the JAXBO<sup>1</sup>):

- The existing parking lot will be used for delivery and storage of the majority of construction material and equipment.
- Prior to the onset of construction activities, the applicant, or designated agent, will conduct a meeting with all construction staff to discuss field identification of sea turtles, marine mammals, and sturgeon, their protected status, what to do if any are observed within the project area, and applicable penalties that may be imposed if State or Federal regulations are violated. All personnel shall be made aware that there are civil and criminal penalties for harming, harassing, or killing ESA-listed species or marine mammals.
- Mangrove trimming is regulated by FDEP. Consistent with that authority, mangrove trimming in this Opinion refers to the removal (using hand equipment such as chain saws and/or machetes) of lateral branches (i.e., no alteration of the trunk of the tree) in a manner that ensures survival of the tree. This Opinion does not limit or supersede any restrictions on mangrove removal required under any federal, state, or local law.
  - Mangrove trimming will occur waterward of MHW and (1) is within the area where the authorized structures are placed or will be placed (e.g., removal of branches that overhang a dock), (2) is necessary to provide temporary construction access, and (3) will be conducted in a manner that avoids any unnecessary trimming.
- When in-water project construction takes place from floating equipment (e.g., barge), prop or wheel-washing is prohibited.
- All construction personnel must watch for and avoid collision with ESA-listed species. Vessel operators must avoid potential interactions with protected species and operate in accordance with the following protective measures:

---

<sup>1</sup> Biological Opinion on the Authorization of Minor In-Water Activities throughout the Geographic Area of Jurisdiction of the U.S. Army Corps of Engineers Jacksonville District, including Florida and the U.S. Caribbean (SER-2015-17616), issued November 20, 2017.

- All vessels associated with the construction project shall operate at “Idle Speed/ No Wake” at all times while operating in water depths where the draft of the vessel provides less than a 4-ft clearance from the bottom, and in all depths after a protected species has been observed in and has departed the area.
  - All vessels will follow marked channels and routes using the maximum water depth whenever possible.
  - Operation of any mechanical construction equipment, including vessels, shall cease immediately if a listed species is observed within a 50-ft radius of construction equipment and shall not resume until the species has departed the area of its own volition.
  - If the detection of species is not possible during certain weather conditions (e.g., fog, rain, wind), then in-water operations will cease until weather conditions improve and detection is again feasible.
- Any collision(s) with or injury to any ESA-listed species occurring during the construction shall be reported immediately to NMFS’s Protected Resources Division (PRD) at (1-727-824-5312) or by email to [takereport.nmfsser@noaa.gov](mailto:takereport.nmfsser@noaa.gov).

### **2.1.2 Best Management Practices**

To minimize potential impacts to ESA-listed species upon completion of the project, USACE will add the following best management practices to the permit to be followed by the applicant post-construction:

- The applicant will coordinate an agreement with the Florida STSSN, as needed, for the rehabilitation of recreational hook-and-line sea turtle captures. Contact information for the Florida Coordinator for the STSSN is found at the following website: <https://www.fisheries.noaa.gov/state-coordinators-sea-turtle-stranding-and-salvage-network>
- Fishing line recycling receptacles and trash receptacles with lids will be maintained in order to prevent fishing lines from being disposed of in the ocean or on the beaches. Receptacles will be clearly marked and will be emptied regularly to ensure they do not overflow and that fishing lines are disposed of properly.
- Upon completion of the reconfiguration, updated educational signs must be posted in visible locations on the south and north sides, alerting users of listed species in the area. The applicant will replace the current signs with the “Save Dolphins, Sea Turtles, Sawfish, and Manta Rays” sign and the “Save Sawfish” sign, which are available for download at the following website: <https://www.fisheries.noaa.gov/southeast/consultations/protected-species-educational-signs>.
- Upon completion of the reconfiguration, the applicant will post and maintain signage that instructs anglers not to dispose of fishing line or debris in the water.

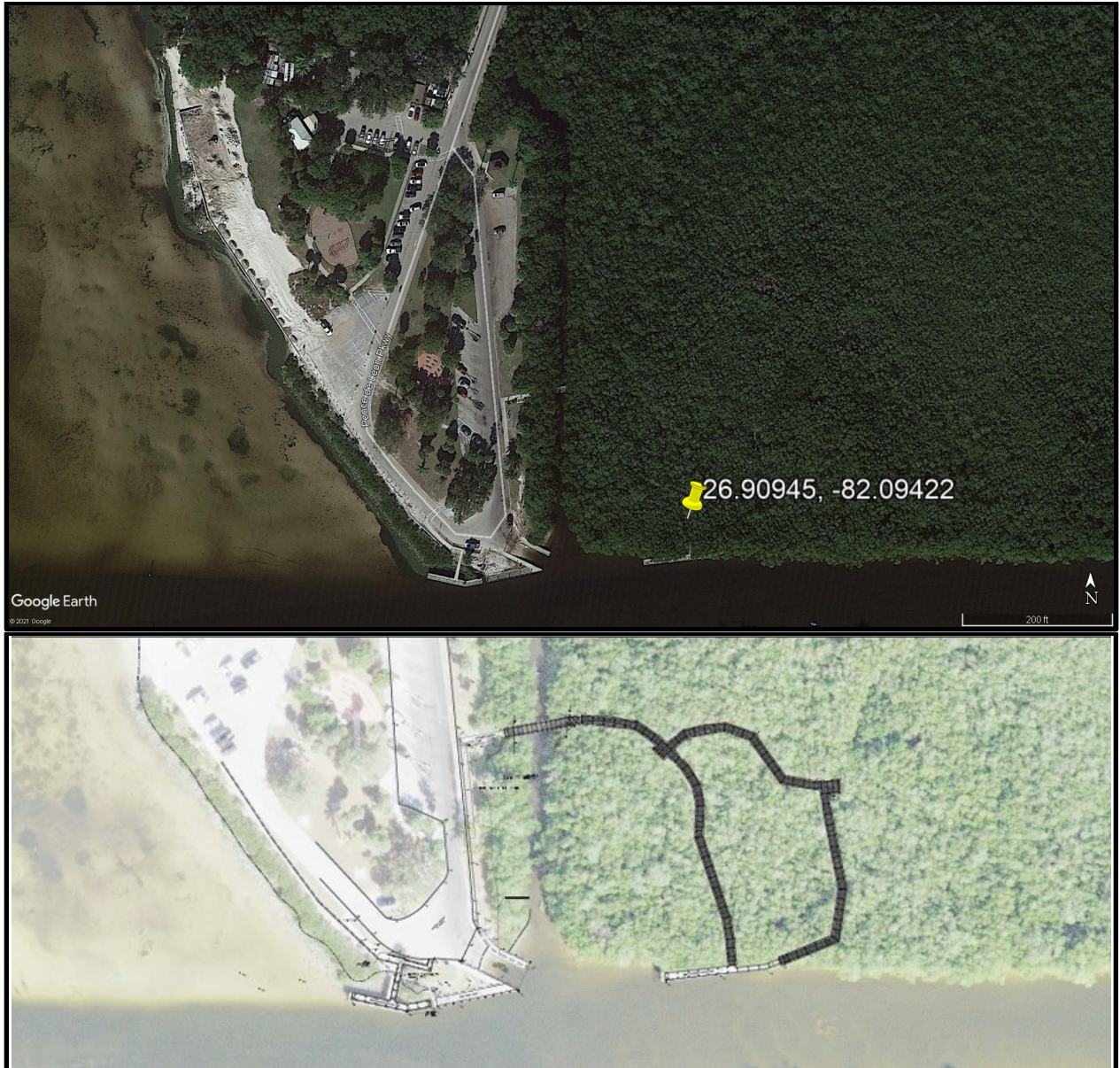


- The applicant will conduct in-water cleanup around the fishing pier on an as-needed basis. A contact has been added to the T&Cs (Section 9.4) of this Opinion and can help guide the applicant in coordinating future clean up events.

## **2.2 Proposed Action Area**

The Ponce de Leon Boardwalk and Fishing Pier is located at 3400 Ponce de Leon Parkway in Punta Gorda, Charlotte County, Florida (Latitude 26.90945, Longitude -82.09422) southwest of the U.S. 41 Bridge approximately 9.5 miles from the nearest opening to the Gulf of Mexico. The park in which the boardwalk and pier are located consists of paved parking areas, basic amenities, including restrooms and showers, and paved walkways providing access to a public beach, bait shop, and the boardwalk and fishing pier (**Figure 1**). There is an existing boat ramp and small beach located adjacent to the boardwalk and pier.

The City estimates that 20 anglers per day, on average, use the fishing pier, depending on weather, tide, and fishing conditions. The pier is open to the public 7 days a week, 7:00 A.M. to 9 P.M. The boardwalk and fishing pier has never had an attendant and no attendant is proposed upon the completion of renovations. The boardwalk and fishing pier have existed for approximately 22-24 years; however, records were lost during Hurricane Charley (2004). The boardwalk and pier were damaged during Hurricane Irma in 2017, but remain open at present (S. Rabney, USACE, pers. comm. to J. Cavanaugh, NMFS, August 11, 2020). No benthic survey has been conducted.



**Figure 1. Top: Satellite showing Ponce de Leon Park (©2021 Google Earth). Bottom: The existing boardwalk and fishing pier to be renovated in the same footprint (image supplied by USACE)**

The action area is defined by regulation as all areas to be affected by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area for the Ponce de Leon Boardwalk Fishing Pier includes the old boardwalk and pier's physical footprint, the new boardwalk and pier's physical footprint, and the surrounding water accessible to recreational anglers upon completion of the proposed action (i.e., casting distance or approximately 200-ft). Water depth in the action area is greater than 3 ft at MLLW. Given the surrounding habitat, the action area is likely void of corals and SAV.

The action area is located within the boundary of the CHEU of smalltooth sawfish designated critical habitat. The existing elevated boardwalk runs through a mangrove forest above the MHW

line. Additionally, there are red mangroves along the shoreline where the fishing pier is located; however, the proposed action will not remove or restrict access to any existing red mangroves in shallow, euryhaline waters.

### 3. STATUS OF THE SPECIES AND CRITICAL HABITAT

**Table 1** provides the effect determinations for species the USACE and NMFS believe may be affected by the proposed action.

**Table 1. Effects Determinations for ESA-Listed Species that May Be Affected by the Proposed Action**

Species	ESA Listing Status	Action Agency Effect Determination	NMFS Effect Determination
<b>Sea Turtles</b>			
Green (North Atlantic DPS)	T	NLAA	NLAA
Green (South Atlantic DPS)	T	NLAA	NLAA
Kemp's ridley	E	NLAA	NLAA
Loggerhead (Northwest Atlantic DPS)	T	NLAA	NLAA
<b>Fish</b>			
Smalltooth sawfish (U.S. DPS)	E	LAA	LAA
Giant manta ray	T	NLAA	NLAA

**Table 2** provides the effects determinations for designated critical habitat occurring within the action area that the USACE and NMFS believe may be affected by the proposed action.

**Table 2. Effects Determinations for Designated Critical Habitat that May Be Affected by the Proposed Action**

Species	Unit	Action Agency Effect Determination	NMFS Effect Determination
Smalltooth sawfish (U.S. DPS)	CHEU	NE	NLAA

#### 3.1 Potential Routes of Effect Not Likely To Adversely Affect ESA-Listed Species

Sea turtles, smalltooth sawfish, and giant manta ray may be injured if struck by equipment or materials during construction activities. However, we believe that such a route of effect is extremely unlikely to occur. These species are expected to exhibit avoidance behavior by moving away from physical disturbances. The applicants' implementation of NMFS's *Protected Species Construction Conditions* will further reduce the risk to these species. If at any point, an ESA-listed species is observed within 50 ft of the work site, all construction or operation of any mechanical equipment will cease until the listed species has departed the project area on its own volition.

Green, Kemp's ridley, and loggerhead sea turtles, smalltooth sawfish, and giant manta ray may also be injured due to entanglement in improperly discarded fishing gear upon completion of the proposed action. We believe this route of effect is extremely unlikely to occur. The City will maintain fishing line recycling receptacles and trash cans with lids to keep debris out of the water when the public fishing structure is open for use by the public, and we expect that anglers will appropriately dispose of fishing gear using these bins in the future. The receptacles will be clearly marked and will be emptied regularly to ensure they are not overfilled and that fishing lines are disposed of properly. The City will also post and maintain signage that instructs anglers not to dispose of fishing line or debris in the water.

The action area contains habitat that may be used by Green, Kemp's ridley, and loggerhead sea turtles, smalltooth sawfish, and giant manta ray. These species may be affected by their inability to access the action area due to their avoidance of construction activities and physical exclusion from the project area due to blockage by turbidity curtains. We believe the effect of temporary loss of habitat access will be insignificant, given the availability of similar habitat nearby, the abundance of habitat outside of the action area, and the temporary nature of the project (i.e., overwater, barge work is expected to take 30 days, during daylight hours only).

Green, Kemp's ridley, and loggerhead sea turtles are prone to capture by recreational fishing gear used at fishing structures, leading to injury or death. However, we believe the capture of these species by recreational fishing gear is extremely unlikely to occur. The Ponce de Leon Boardwalk and Fishing Pier is located in the inshore waters (i.e., it is not ocean-facing) of Zone 4, a statistical subarea used when reporting commercial fishing data. We reviewed the available inshore STSSN data for Zone 4 in Florida (i.e., stranding data in Zone 4 for all areas inside protected waters, 2007-2016). Zones 4 extend from 26° to 25° North latitude (approximately Manasota Key Beach in Lee County south to Little Marco Island in Collier County) along the west coast of Florida. We believe the historic data from STSSN for Zone 4 are the best available data on past reported recreational hook-and-line captures of sea turtles at this pier because the pier specific data are not available. Further, all the fishing with reported captures structures in Zone 4 are in a similar habitat and location as the Ponce de Leon Boardwalk and Fishing Pier (i.e., inshore, coastal Charlotte County), we assume sea turtle behavior and density are the same at all locations. Because the fishing structures are of a similar size, they likely have similar angler effort. Finally, we assume anglers fishing these structures use similar baits, equipment, and fishing techniques. There is only 1 reported recreational hook-and-line capture of a sea turtle from an inshore public fishing structure in the STSSN dataset for Zone 4 (1 Kemp's ridley sea turtle). It was not captured at the Ponce de Leon Parkway Boardwalk Fishing Pier, but, rather at Matlacha Pass, which is much closer to Charlotte Harbor's openings with the Gulf of Mexico. The STSSN data contain number and location of sea turtle recreational hook-and-line captures that were reported; they do not provide the total number of potential public fishing structures available in a particular Zone, and NMFS does not have that information. To the best of our knowledge, there has never been a reported capture of any sea turtle species at the Ponce de Leon Parkway Boardwalk Fishing Pier in its 20+ years of operation.

Giant manta ray are prone to foul-hooking by recreational fishing gear used at fishing structures that are ocean-facing or located in or near inlets, leading to injury. We believe the risk of foul-hooking by recreational fishing gear to this species is extremely unlikely to occur. The Ponce de

Leon Boardwalk and Fishing Pier is not ocean-facing; it is located approximately 9.5 mi from the nearest inlet to the Gulf of Mexico. To the best of our knowledge, there has never been a reported capture of a giant manta ray at the Ponce de Leon Parkway Boardwalk Fishing Pier in its 20+ years of operation.

Updated NMFS educational signs “Save the Dolphins, Sea Turtles, Sawfish, and Manta Ray” and “Save Sawfish” will be installed in a visible location(s) upon completion of the renovation. We believe the placement of educational signs is a beneficial effect to Green, Kemp’s ridley, and loggerhead sea turtles, smalltooth sawfish, and giant manta ray. The signs will provide information to the public on how to avoid and minimize encounters with these species as well as proper handling techniques. The signs will also encourage anglers to report sightings and interactions, thus providing valuable distribution and abundance data to researchers and resource managers. Accurate distribution and abundance data allows management to evaluate the status of the species and refine conservation and recovery measures.

### **3.2 Potential Routes of Effect Not Likely to Adversely Affect Critical Habitat**

The proposed action area occurs within the boundary of the CHEU of smalltooth sawfish designated critical habitat. The physical and biological features essential to the conservation of the U.S. DPS of smalltooth sawfish, which provide nursery area functions, are: (1) shallow, euryhaline habitats characterized by water depths between MHW and 3 ft (0.9 m) measured at MLLW, and (2) red mangroves. We believe only the red mangrove essential feature may be affected by the proposed action.

Because the proposed action will occur at or above the MHW line, there are no potential routes of adverse effects to the shallow, euryhaline essential feature of smalltooth sawfish designated critical habitat. In addition, there are no other potential indirect routes of effect to the shallow, euryhaline essential feature.

The proposed action will trim, but not remove or restrict access to any existing red mangroves. We believe the effect of trimming on the red mangrove essential feature will be insignificant, given no prop roots will be removed and the applicant will follow FDEP guidelines for mangrove trimming.

### **3.3 Potential Routes of Effect Likely To Adversely Affect ESA-Listed Species**

Smalltooth sawfish are documented throughout the state of Florida; the majority of encounters occur in Lee, Charlotte, and Monroe counties. As discussed above, the subject fishing pier is located within the boundary of the CHEU of smalltooth sawfish critical habitat. According to a review of the available SSRIT data since the species was listed (2003-2020), there are 62 reported captures of smalltooth sawfish at public fishing structures in Charlotte County. The dataset contains no reported recreational hook-and-line captures at the consultation pier. Due to pier location and available encounter data, NMFS determined that recreational hook-and-line interactions from the completed pier is likely to adversely affect smalltooth sawfish. We provide greater detail on the potential effects of entanglement, hooking, and trailing line to smalltooth sawfish in the Effects of the Action below (Section 5.1).

### **3.4 Status of Smalltooth Sawfish**

The U.S. DPS of smalltooth sawfish was listed as endangered under the ESA effective May 1, 2003 (68 FR 15674; April 1, 2003).

#### **3.4.1 Species Description and Distribution**

The smalltooth sawfish is a tropical marine and estuarine elasmobranch. It is a batoid with a long, narrow, flattened, rostral blade (rostrum) lined with a series of transverse teeth along either edge. In general, smalltooth sawfish inhabit shallow coastal waters of the Atlantic Ocean (Dulvy et al. 2016) and feed on a variety of fish (e.g., mullet, jacks, and ladyfish)(Poulakis et al. 2017; Simpfendorfer 2001).

Although this species is reported throughout the tropical Atlantic, NMFS identified smalltooth sawfish from the Southeast United States as a DPS, due to the physical isolation of this population from others, the differences in international management of the species, and the significance of the U.S. population in relation to the global range of the species (see 68 FR15674). Within the United States, smalltooth sawfish have historically been captured in estuarine and coastal waters from North Carolina southward through Texas, although peninsular Florida has been the region of the United States with the largest number of recorded captures (NMFS 2018). Recent records indicate there is a resident reproducing population of smalltooth sawfish in south and southwest Florida from Charlotte Harbor through the Florida Keys, which is also the last U.S. stronghold for the species (Poulakis and Seitz 2004; Seitz and Poulakis 2002; Simpfendorfer and Wiley 2005). Water temperatures (no lower than 8-12°C) and the availability of appropriate coastal habitat (shallow, euryhaline waters and red mangroves) are the major environmental constraints limiting the northern movements of smalltooth sawfish in the western North Atlantic. Most specimens captured along the Atlantic coast north of Florida are large juveniles or adults (over 10 ft) that likely represent seasonal migrants, wanderers, or colonizers from a historical Florida core population to the south, rather than being members of a continuous, even-density population (Bigelow and Schroeder 1953).

#### **3.4.2 Life History Information**

Smalltooth sawfish mate in the spring and early summer (Grubbs unpubl. data; Poulakis unpubl. data). Fertilization is internal and females give birth to live young. Evidence suggests a gestation period of approximately 12 months and females produce litters of 7-14 young (Feldheim et al. 2017)(Gelsleichter unpub. data). Females have a biennial reproductive cycle (Feldheim et al. 2017) and parturition (act of giving birth) occurs nearly year round though peaking in spring and early summer (March – July) (Poulakis et al. 2011)(Carlson unpubl. data). Smalltooth sawfish are approximately 26-31 in (64-80 cm) at birth (Bethea et al. 2012; Poulakis et al. 2011) and may grow to a maximum length of approximately 16 ft (500 cm) (Grubbs unpubl. Data) (Brame et al. 2019). Simpfendorfer et al. (2008) report rapid juvenile growth for smalltooth sawfish for the first 2 years after birth, with stretched total length increasing by an average of 25-33 in (65-85 cm) in the first year and an average of 19-27 in (48-68 cm) in the second year. Uncertainty remains in estimating post-juvenile growth rates and age at maturity; yet, recent advances

indicate maturity at 7-11 years (Carlson and Simpfendorfer 2015) at lengths of approximately 340 cm for males and 350-370 cm for females (Gelsleichter unpub data).

There are distinct differences in habitat use based on life history stage as the species shifts use through ontogeny. Juvenile smalltooth sawfish less than 220 cm, inhabit the shallow euryhaline waters (i.e., variable salinity) of estuaries and can be found in sheltered bays, dredged canals, along banks and sandbars, and in rivers (NMFS 2000). These juveniles are often closely associated with muddy or sandy substrates, and shorelines containing red mangroves, *Rhizophora mangle* (Hollensead et al. 2016; Hollensead et al. 2018; Poulakis et al. 2011; Poulakis et al. 2013; Simpfendorfer 2001; Simpfendorfer 2003; Simpfendorfer et al. 2010). (Simpfendorfer et al. 2010) indicated the smallest juveniles (young-of-the-year juveniles measuring < 100 cm in length) generally used the shallowest water (depths less than 0.5 m (1.64 ft)), had small home ranges (4,264-4,557 m<sup>2</sup>), and exhibited high levels of site fidelity. Although small juveniles exhibit high levels of site fidelity for specific nursery habitats for periods of time lasting up to 3 months (Wiley and Simpfendorfer 2007), they do undergo small movements coinciding with changing tidal stages. These movements often involve moving from shallow sandbars at low tide to within red mangrove prop roots at higher tides (Simpfendorfer et al. 2010)—behavior likely to reduce the risk of predation (Simpfendorfer 2006). As juveniles increase in size, they begin to expand their home ranges (Simpfendorfer et al. 2010; Simpfendorfer et al. 2011), eventually moving to more offshore habitats where they likely feed on larger prey as they continue to mature.

Researchers have identified several areas within the Charlotte Harbor Estuary that are disproportionately more important to juvenile smalltooth sawfish, based on intra- or inter-annual (within or between year) capture rates during random sampling events within the estuary (Poulakis et al. 2011; Poulakis 2012). These high-use areas were termed “hotspots” and also correspond with areas where public encounters are most frequently reported. Use of these “hotspots” can vary within and among years based on the amount and timing of freshwater inflow. Juvenile smalltooth sawfish use hotspots further upriver during high salinity conditions (drought) and areas closer to the mouth of the Caloosahatchee River during times of high freshwater inflow (Poulakis et al. 2011). At this time, researchers are unsure what specific biotic or abiotic factors influence this habitat use, but they believe a variety of conditions in addition to salinity, such as temperature, DO, water depth, shoreline vegetation, and food availability, may influence habitat selection (Poulakis et al. 2011).

The juvenile “hotspots” may be of further significance following the findings of female philopatry (Feldheim et al. 2017). More specifically, Feldheim et al. (2017) found that female sawfish return to the same parturition (birthing) sites over multiple years (parturition site fidelity). NMFS expects that these parturition sites align closely with the juvenile “hotspots” given the high fidelity shown by the smallest size/age classes of sawfish to specific nursery areas. Therefore, disturbance of these nursery areas could have wide-ranging effects on the sawfish population if it were to disrupt future parturition.

While adult smalltooth sawfish may also use the estuarine habitats used by juveniles, they are commonly observed in deeper waters along the coasts. Poulakis and Seitz (2004) noted that nearly half of the encounters with adult-sized smalltooth sawfish in Florida Bay and the Florida

Keys occurred in depths from 200-400 ft (70-122 m) of water. Similarly, Simpfendorfer and Wiley (2005) reported encounters in deeper waters off the Florida Keys, and observations from both commercial longline fishing vessels and fishery-independent sampling in the Florida Straits report large smalltooth sawfish in depths up to 130 ft (~40 m)(ISED 2014). Yet, current field studies show adult smalltooth sawfish also use shallow estuarine habitats within Florida Bay and the Everglades (Grubbs unpub. data). Further, NMFS expects that females return to shallow estuaries during parturition (when adult females return to shallow estuaries to give birth).

### 3.4.3 Status and Population Dynamics

Based on the contraction of the species' geographic range, we expect that the population to be a small fraction of its historical size. However, few long-term abundance data exist for the smalltooth sawfish, making it very difficult to estimate the current population size. Despite the lack of scientific data, recent encounters with young-of-the-year, older juveniles, and sexually mature smalltooth sawfish indicate that the U.S. population is currently reproducing (Feldheim et al. 2017; Seitz and Poulakis 2002; Simpfendorfer 2003). The abundance of juveniles publically encountered by anglers and boaters, including very small individuals, suggests that the population remains viable (Simpfendorfer and Wiley 2004), and data analyzed from Everglades National Park as part of an established fisheries-dependent monitoring program (angler interviews) indicated a slightly increasing trend in juvenile abundance within the park over the past decade (Carlson and Osborne 2012; Carlson et al. 2007). Similarly, preliminary results of juvenile smalltooth sawfish sampling programs in both ENP and Charlotte Harbor indicate the juvenile population is at least stable and possibly increasing (Poulakis unpubl. data, Carlson unpubl. data).

Using a demographic approach and life history data for smalltooth sawfish and similar species from the literature, (Simpfendorfer 2000) estimated intrinsic rates of natural population increase for the species at 0.08-0.13 per year and population doubling times from 5.4-8.5 years. These low intrinsic rates<sup>2</sup> of population increase, suggest that the species is particularly vulnerable to excessive mortality and rapid population declines, after which recovery may take decades. Carlson and Simpfendorfer (2015) constructed an age-structured Leslie matrix model for the U.S. population of smalltooth sawfish, using updated life history information, to determine the species' ability to recover under scenarios of variable life history inputs and the effects of bycatch mortality and catastrophes. As expected, population growth was highest ( $\lambda=1.237$  yr<sup>-1</sup>) when age-at-maturity was 7 yr and decreased to 1.150 yr<sup>-1</sup> when age-at-maturity was 11 yr. Despite a high level of variability throughout the model runs, in the absence of fishing mortality or catastrophic climate effects, the population grew at a relatively rapid rate approaching carrying capacity in 40 years when the initial population was set at 2,250 females or 50 years with an initial population of 600 females. Carlson and Simpfendorfer (2015) concluded that smalltooth sawfish in U.S. waters appear to have the ability to recover within the foreseeable future based on a model relying upon optimistic estimates of population size, lower age-at-maturity and the lower level of fisheries-related mortality. Another analysis was less optimistic based on lower estimates of breeding females in the Caloosahatchee River nursery (Chapman unpubl. data). Assuming similar numbers of females among the 5 known nurseries, that study would suggest an initial breeding population of only 140-390 females, essentially half of the

---

<sup>2</sup> The rate at which a population increases in size if there are no density-dependent forces regulating the population



initial population considered by Carlson and Simpfendorfer (2015). A smaller initial breeding population would extend the time to reach carrying capacity.

### **3.4.4 Threats**

Past literature indicates smalltooth sawfish were once abundant along both coasts of Florida and quite common along the shores of Texas and the northern Gulf coast (NMFS 2010) and citations therein). Based on recent comparisons with these historical reports, the U.S. DPS of smalltooth sawfish has declined over the past century (Simpfendorfer 2001; Simpfendorfer 2002). The decline in smalltooth sawfish abundance has been attributed to several factors including bycatch mortality in fisheries, habitat loss, and life history limitations of the species (NMFS 2010).

#### **3.4.4.1 Bycatch Mortality**

Bycatch mortality is cited as the primary cause for the decline in smalltooth sawfish in the United States (NMFS 2010). While there has never been a large-scale directed fishery, smalltooth sawfish easily become entangled in fishing gears (gill nets, otter trawls, trammel nets, and seines) directed at other commercial species, often resulting in serious injury or death (NMFS 2009). This has historically been reported in Florida (Snelson and Williams 1981), Louisiana (Simpfendorfer 2002), and Texas (Baughman 1943). For instance, one fisherman interviewed by Evermann and Bean (1897) reported taking an estimated 300 smalltooth sawfish in just one netting season in the Indian River Lagoon, Florida. In another example, smalltooth sawfish landings data gathered by Louisiana shrimp trawlers from 1945-1978, which contained both landings data and crude information on effort (number of vessels, vessel tonnage, number of gear units), indicated declines in smalltooth sawfish landings from a high of 34,900 lbs in 1949 to less than 1,500 lbs in most years after 1967. The Florida net ban passed in 1995 has led to a reduction in the number of smalltooth sawfish incidentally captured, "...by prohibiting the use of gill and other entangling nets in all Florida waters, and prohibiting the use of other nets larger than 500 square feet in mesh area in nearshore and inshore Florida waters"<sup>3</sup> (FLA. CONST. art. X, § 16). However, the threat of bycatch currently remains in commercial fisheries (e.g., South Atlantic shrimp fishery, Gulf of Mexico shrimp fishery, federal shark fisheries of the South Atlantic, and the Gulf of Mexico reef fish fishery), though anecdotal information collected by NMFS port agents suggest smalltooth sawfish captures are now rare.

In addition to incidental bycatch in commercial fisheries, smalltooth sawfish have historically been and continue to be captured by recreational anglers. Encounter data (ISED 2014) and past research (Caldwell 1990) document that rostra are sometimes removed from smalltooth sawfish caught by recreational anglers, thereby reducing their chances of survival. While the current threat of mortality associated with recreational fisheries is expected to be low given that possession of the species in Florida has been prohibited since 1992, bycatch in recreational fisheries remains a potential threat to the species.

---

<sup>3</sup> "nearshore and inshore Florida waters" means all Florida waters inside a line 3 mi seaward of the coastline along the Gulf of Mexico and inside a line 1 mi seaward of the coastline along the Atlantic Ocean.

#### **3.4.4.2 Habitat Loss**

Modification and loss of smalltooth sawfish habitat, especially nursery habitat, is another contributing factor in the decline of the species. Activities such as agricultural and urban development, commercial activities, dredge-and-fill operations, boating, erosion, and diversions of freshwater runoff contribute to these losses (SAFMC 1998). Large areas of coastal habitat were modified or lost between the mid-1970s and mid-1980s within the United States (Dahl and Johnson 1991). Since then, rates of loss have decreased, but habitat loss continues. From 1998-2004, approximately 64,560 ac of coastal wetlands were lost along the Atlantic and Gulf coasts of the United States, of which approximately 2,450 ac were intertidal wetlands consisting of mangroves or other estuarine shrubs (Steadman and Dahl 2008). Further, Orlando et al. (1994) analyzed 18 major southeastern estuaries and recorded over 703 mi of navigation channels and 9,844 mi of shoreline with modifications. In Florida, coastal development often involves the removal of mangroves and the armoring of shorelines through seawall construction. Changes to the natural freshwater flows into estuarine and marine waters through construction of canals and other water control devices have had other impacts: altered the temperature, salinity, and nutrient regimes; reduced both wetlands and submerged aquatic vegetation; and degraded vast areas of coastal habitat utilized by smalltooth sawfish (Gilmore 1995; Reddering 1988; Whitfield and Bruton 1989). While these modifications of habitat are not the primary reason for the decline of smalltooth sawfish abundance, it is likely a contributing factor and almost certainly hampers the recovery of the species. Juvenile sawfish and their nursery habitats are particularly likely to be affected by these kinds of habitat losses or alternations, due to their affinity for shallow, estuarine systems. Prohaska et al. (2018) showed that juvenile smalltooth sawfish within the anthropogenically altered Charlotte Harbor estuary have higher metabolic stress compared to those collected from more pristine nurseries in the Everglades. Although many forms of habitat modification are currently regulated, some permitted direct and/or indirect damage to habitat from increased urbanization still occurs and is expected to continue to threaten survival and recovery of the species in the future.

#### **3.4.4.3 Life History Limitations**

The smalltooth sawfish is also limited by its life history characteristics as a relatively slow-growing, late-maturing, and long-lived species. Animals using this life history strategy are usually successful in maintaining small, persistent population sizes in constant environments, but are particularly vulnerable to increases in mortality or rapid environmental change (NMFS 2000). The combined characteristics of this life history strategy result in a very low intrinsic rate of population increase (Musick 1999) that make it slow to recover from any significant population decline (Simpfendorfer 2000).

#### **3.4.4.4 Stochastic Events**

Although stochastic events such as aperiodic extreme weather and harmful algal blooms are expected to affect smalltooth, we are currently unsure of their impact. A strong and prolonged cold weather event in January 2010 resulted in the mortality of at least 15 juvenile and 1 adult sawfish (Poulakis et al. 2011; Scharer et al. 2012), and led to far fewer catches in directed research throughout the remainder of the year (Bethea et al. 2011). Another less severe cold front

in 2011 did not result in any known mortality but did alter the typical habitat use patterns of juvenile sawfish within the Caloosahatchee River. Since surveys began, 2 hurricanes have made direct landfall within the core range of US sawfish. While these storms denuded mangroves along the shoreline and created hypoxic water conditions, we are unaware of any direct effects to sawfish. Just prior to the passage of the most recent hurricane (Hurricane Irma), acoustically tagged sawfish moved away from their normal shallow nurseries and then returned within a few days (Poulakis unpubl. data; Carlson unpubl. data). Harmful algal blooms have occurred within the core range of smalltooth sawfish and affected a variety of fauna including sea turtles, fish, and marine mammals, but to date no sawfish mortalities have been reported.

#### **3.4.4.5 Current Threats**

The 3 major factors that led to the current status of the U.S. DPS of smalltooth sawfish – bycatch mortality, habitat loss, and life history limitations – continue to be the greatest threats today. All the same, other threats such as the illegal commercial trade of smalltooth sawfish or their body parts, predation, and marine pollution and debris may also affect the population and recovery of smalltooth sawfish on smaller scales (NMFS 2010). We anticipate that all of these threats will continue to affect the rate of recovery for the U.S. DPS of smalltooth sawfish.

In addition to the anthropogenic effects mentioned previously, changes to the global climate are likely to be a threat to smalltooth sawfish and the habitats they use. The IPCC has stated that global climate change is unequivocal and its impacts to coastal resources may be significant (IPCC 2007; IPCC 2013). Some of the likely effects commonly mentioned are sea level rise, increased frequency of severe weather events, changes in the amount and timing of precipitation, and changes in air and water temperatures (EPA 2012; NOAA 2012). The impacts to smalltooth sawfish cannot, for the most part, currently be predicted with any degree of certainty, but we can project some effects to the coastal habitats where they reside. Red mangroves and shallow, euryhaline waters will be directly impacted by climate change through sea level rise, which is expected to increase 0.45 to 0.75 m by 2100 (IPCC 2013). Sea level rise will impact mangrove resources, as sediment surface elevations for mangroves will not keep pace with conservative projected rates of elevation in sea level (Gilman et al. 2008). Sea level increases will also affect the amount of shallow water available for juvenile smalltooth sawfish nursery habitat, especially in areas where there is shoreline armoring (e.g., seawalls). Further, the changes in precipitation coupled with sea level rise may also alter salinities of coastal habitats, reducing the amount of available smalltooth sawfish nursery habitat.

## **4. ENVIRONMENTAL BASELINE**

---

By regulation (50 CFR 402.02), the environmental baseline for an Opinion refers to the condition of the listed species in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to the

listed species from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

Focusing on the impacts of the activities in the action area specifically allows us to assess the prior experience and state (or condition) of the endangered and threatened individuals. This consideration is important because in some states or life history stages, or areas of their ranges, listed individuals will commonly exhibit, or be more susceptible to, adverse responses to stressors than they would be in other states, stages, or areas within their distributions. These localized stress responses or stressed baseline conditions may increase the severity of the adverse effects expected from the proposed action.

#### **4.1 Status of Species within the Action Area**

The Ponce de Leon Boardwalk and Fishing Pier currently has sawfish educational signs posted in visible locations and the applicant has agreed to update these signs upon completion of construction. As stated above, there are 62 reported recreational hook-and-line captures of smalltooth sawfish at public fishing structures in Charlotte County (SSRIT data 2003-2020). NMFS believes that no individual smalltooth sawfish is likely to be a permanent resident of the action area. Further, because the action area is located within the boundary of the CHEU of smalltooth sawfish designated critical habitat and the red mangrove shoreline essential feature is present, some individuals may be present at any given time and may be adversely affected by recreational fishing that will occur at the pier upon completion of the reconfiguration. These same individuals will migrate into coastal and offshore waters of the Gulf of Mexico and potentially areas of the North Atlantic Ocean, and thus may be affected by activities occurring there. Therefore, the status of smalltooth sawfish in the action area is considered to be the same as those discussed in Section 3.4.

#### **4.2 Factors Affecting Species within the Action Area**

##### **4.2.1 Federal Actions**

We have consulted on several USACE shoreline stabilization and overwater construction projects in the greater area where the project is located. However, other than the proposed action, no other federally permitted projects are known to have occurred or have had effects to smalltooth sawfish as per a review of the NMFS Protected Resources Division's completed consultation database by the consulting biologist on August 19, 2021.

##### **4.2.2 State or Private Actions**

###### **4.2.2.1 Recreational Fishing**

Recreational fishing as regulated by the State of Florida can affect smalltooth sawfish within the action area. Pressure from recreational fishing in and adjacent to the action area is likely to continue.

The Ponce de Leon Boardwalk and Fishing Pier has existed for approximately 22-24 years; however, records were lost during Hurricane Charley (2004). The boardwalk and pier were damaged during Hurricane Irma in 2017, but it remains open. The City estimates that 20 anglers per day, on average, use the fishing pier, depending on weather, tide, and fishing conditions. The pier is currently open to the public 7 days a week, 7:00 A.M. to 9 P.M. The boardwalk and fishing pier have never had an attendant and no attendant is proposed upon the completion of renovations.

As stated above, the SSRIT data (2003-2020) contains 62 reported recreational fishing captures of smalltooth sawfish from public fishing structures in Charlotte County; none of those occurred at the Ponce de Leon Boardwalk and Fishing Pier. We have no way of knowing how many unreported captures of smalltooth sawfish may have occurred at the pier in the past. However, because the proposed action is a repair of an existing fishing pier, recreational fishing and any associated take (reported or unreported) of smalltooth sawfish is part of the baseline. That is, accidental captures of smalltooth sawfish due to recreational fishing has likely been occurring in the past while the abundance trend of this species has also been increasing. Though anglers are not targeting smalltooth sawfish, but instead capturing them incidentally, recreational fishing is currently a major activity that directly interacts with smalltooth sawfish throughout most of its range, including Tampa Bay. Smalltooth sawfish occur as bycatch in the recreational hook-and-line fishery, mostly by shark, red drum (*Sciaenops ocellatus*), snook (*Centropomus undecimalis*), and tarpon (*Megalops atlanticus*) fishers (Wiley and Simpfendorfer 2010), which may operate within the action area.

#### **4.2.3 Marine Debris and Acoustic Impacts**

A number of activities that may affect smalltooth sawfish in the action area include anthropogenic marine debris and acoustic effects. The effects from these activities are difficult to measure. Where possible, conservation actions are being implemented to monitor or study the effects to these species from these sources.

#### **4.2.4 Marine Pollution and Environmental Contamination**

Sources of pollutants along the coast that may affect smalltooth sawfish include PCB loading, stormwater runoff from coastal towns and cities into rivers and canals emptying into bays and the ocean, and groundwater and other discharge. Although pathological effects of oil spills have been documented in laboratory studies of marine mammals and sea turtles (Vargo et al. 1986), the impacts of those and many other anthropogenic toxins have not been investigated in smalltooth sawfish. In addition, marina and dock construction, dredging, aquaculture, oil and gas exploration and extraction, and boat traffic can degrade marine habitats used by smalltooth sawfish. An increase in the number of docks built increases boat and vessel traffic. Fueling facilities at marinas can sometimes discharge oil, gas, and sewage into sensitive estuarine and coastal habitats.

#### **4.2.5 Stochastic Events**

Stochastic (i.e., random) events, such as hurricanes or cold snaps, occur in Florida and can affect smalltooth sawfish. These events are unpredictable and their effect on the recovery of smalltooth sawfish is unknown; yet, they have the potential to directly impede recovery if animals die as a result or indirectly if important habitats are damaged. In 2017, Hurricane Irma likely damaged habitat, including mangroves, which are an essential feature of smalltooth sawfish critical habitat, in and around the action area.

## **5. EFFECTS OF THE ACTION ON ESA-LISTED SPECIES**

---

Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.02).

As discussed above in Section 3, we believe hook-and-line gear commonly used by recreational anglers fishing from the subject fishing pier may adversely affect smalltooth sawfish. In Sections 5.1.1-5.1.3, we provide more detail on the potential effects of entanglement, hooking, and trailing line to smalltooth sawfish from hook-and-line gear. Section 5.2 addresses how we estimate future captures of smalltooth sawfish.

### **5.1 Effects of the Action on the Species**

#### **5.1.1 Entanglement**

Due to their toothed rostra, smalltooth sawfish can become entangled in fishing gears such as gill nets, otter trawls, trammel nets, cast nets and seines that are directed at other species (NMFS 2009). Entanglement in recreational fishing line can cause effects to smalltooth sawfish including injury to fins and rostra (FWC unpublished data).

#### **5.1.2 Hooking**

At present, the SSRIT contains several recreational hook-and-line captures of smalltooth sawfish from fishing structures within their core range (i.e., Lee, Charlotte, and Monroe counties; A. Brame, NOAA NMFS SERO PRD, to consulting biologist on August 12, 2021). Based on this data, smalltooth sawfish do not appear to be actively attracted to recreational fishing structures or to habituate near recreational fishing structures as a forage source. We believe smalltooth sawfish captures are largely a function of co-occurrence in space and time rather than triggered by the presence of a recreational fishing structure. While hooking interactions within the recreational fishery are numerous, the level of mortality is likely low when smalltooth sawfish are handled and released properly. Further, the threat of mortality associated with recreational fisheries in Florida is expected to be low given that possession of the species in Florida has been prohibited since 1992. Longer fights on recreational hook-and-line gear as opposed to commercial bottom longlines may elevate lactate and HCO<sub>3</sub> levels (Prohaska et al. (2018)); however, smalltooth sawfish appear resilient and, when considered in conjunction with

information from ongoing tagging and telemetry studies, post-release survival is expected to be high (Brame et al. 2019).

### **5.1.3 Trailing Line**

The effects to smalltooth sawfish from trailing line are the same as those discussed above under Entanglements.

## **5.2 Smalltooth Sawfish**

### **5.2.1 Estimating Reported Captures of Smalltooth Sawfish**

We believe the best available data to estimate future reported recreational hook-and-line captures of smalltooth sawfish at a public fishing structure comes from the historic reported captures at similar structures within the same County obtained from SSRIT data and any additional information regarding captures at the structure under consultation. The SSRIT data contain number and location of smalltooth sawfish recreational hook-and-line captures that were reported; they do not provide the total number of potential public fishing structures available in a particular County, and NMFS does not have that information. Below, we discuss why this is the best available information to estimate the expected annual number of reported recreational hook-and-line captures of smalltooth sawfish at the Ponce de Leon Boardwalk and Fishing Pier in the future.

As previously stated, the Ponce de Leon Boardwalk and Fishing Pier is located in Charlotte County, Florida, within the boundary of the CHEU of smalltooth sawfish designated critical habitat. The SSRIT data 2003-2020 contains 62 reported captures of smalltooth sawfish at 12 public fishing structures in Charlotte County. None of those reports occurred at the Ponce de Leon Boardwalk and Fishing Pier. Because these 12 fishing structures are in a similar habitat and location as the Ponce de Leon Boardwalk and Fishing Pier (i.e., inshore, coastal Charlotte County), we assume smalltooth sawfish behavior and density are the same at all locations. Because the fishing structures are of a similar size, they likely have similar angler effort. Further, we assume anglers fishing these structures use similar baits, equipment, and fishing techniques. Therefore, even though the historic reported hook-and-line captures are different between these structures, the potential for interactions with smalltooth sawfish is likely the same at all locations.

Whether those interactions with smalltooth sawfish are reported varies depending on a number of factors, including whether there are educational signs encouraging reporting and angler behavior; sometimes anglers do not report encounters with ESA-listed species due to concerns over their personal liability or public perception at the time of the capture even if there are posted signs. Given this variability, it is difficult to estimate reporting behavior. However, we assume that similar fishing structures within the same area (in this case, inshore, coastal Charlotte County) would have similar reporting rates. Because they are in similar geographic locations, we assume public perception about reporting and angler reporting behavior is likely the same. Therefore, even though the historic reported hook-and-line captures are different between these structures, the potential for reported captures is the same at both locations.

Thus, we believe the best available data to estimate the number of future reported recreational hook-and-line captures of smalltooth sawfish at the Ponce de Leon Boardwalk and Fishing Pier can be determined by taking the average of the historic reported recreational hook-and-line captures at the 12 similar fishing structures in the inshore, coastal Charlotte County SSRIT dataset and the absence of reported captures at the Ponce de Leon Boardwalk and Fishing Pier (i.e., 13 total locations). Averaging the data in this way helps smooth variability in both the potential for interactions and in reporting behavior among the locations and over time, providing for a more accurate overall estimate of future reported captures at the consultation pier. There is no additional information that can be used to estimate potential reported interactions.

To calculate the average number of reported hook-and-line captures at these similar fishing structures in inshore, coastal Charlotte County, we use available SSRIT data and the following equation:

$$\begin{aligned} & \textit{Average Reported Captures Per Structure in 18 years} \\ & = \textit{Sum of Reported Captures in 18 years} \div 13 \textit{ Locations} \\ & = (62 + 0) \div 13 \\ & = 4.7692 \textit{ per structure in 18 years} \end{aligned}$$

To calculate the estimated expected annual number of reported recreational hook-and-line captures of smalltooth sawfish at the Ponce de Leon Boardwalk and Fishing Pier, we refer to the information on the similar structures above and use the following equation:

$$\begin{aligned} & \textit{Expected Annual Reported Captures} \\ & = \textit{Average Reported Captures Per Structure in 18 years} \div 18 \textit{ years} \\ & = 4.7692 \div 18 \\ & = 0.2650 \textit{ per structure per year (Table 3, Line 1)} \end{aligned}$$

### **5.2.2 Estimating Unreported Captures of Smalltooth Sawfish**

While we believe the best available information for estimating expected reported captures at the Ponce de Leon Boardwalk and Fishing Pier is the average of the historic reported recreational hook-and-line captures at the similar fishing structures in the inshore, coastal Charlotte County SSRIT dataset and the absence of reported captures at the Ponce de Leon Boardwalk and Fishing Pier, we also recognize the need to account for unreported captures. In the following section, we use the best available data to estimate the number of unreported recreational hook-and-line captures that may occur. To the best of our knowledge, only 1 fishing pier survey aimed at collecting data regarding unreported recreational hook-and-line captures of smalltooth sawfish has been conducted in the Southeast.

Hill (2013) conducted a survey at 26 fishing piers in Charlotte Harbor, Florida, in smalltooth sawfish critical habitat. During the survey, 93 anglers were asked a series of open-ended questions regarding captures of sea turtles, smalltooth sawfish, and dolphins, including whether or not they knew these encounters were required to be reported and if they did report encounters. The interviewer also noted conditions about the pier including if educational signs regarding



reporting of hook-and-line captures were present at the pier. (Hill 2013) found that only 12% of anglers would have reported a smalltooth sawfish hook-and-line capture (i.e., 88% of anglers would not have reported a smalltooth sawfish capture).

Below, we will address unreported captures by assuming that the expected annual reported captures of 0.2475 smalltooth sawfish per year represents 12% of the actual captures and 88% of captures will be unreported. We believe it is most conservative to use the unreported rate in the Hill (2013) fishing pier study to estimate the future unreported captures. The study is in a similar location (i.e., Charlotte Harbor), and is a reasonable proxy for reporting behavior at the Ponce de Leon Boardwalk and Fishing Pier. In addition, in the absence of additional information on factors that might affect angler reporting behavior, such as similarity of outreach and education, signage, or culture, we will err on the side of the species and assume fewer interactions were reported, as this will result in a higher total expected interactions. Reinitiation may be required if information reveals changes in reporting behavior.

Therefore, to calculate the expected annual number of unreported recreational hook-and-line captures of smalltooth sawfish, we use the equation:

$$\begin{aligned}
 & \textit{Expected Annual Unreported Captures} \\
 & = (\textit{Expected Annual Reported Captures} \div 12\%) \times 88\% \\
 & = (0.2650 \div 0.12) \times 0.88 \\
 & = 1.9433 \textit{ per structure per year (Table 3, Line 2)}
 \end{aligned}$$

### 5.2.3 Calculating Total Captures of Smalltooth Sawfish

As previously discussed, we believe using a 3-year period is appropriate for meaningful monitoring. **Table 3** presents the estimated smalltooth sawfish captures at the Ponce de Leon Boardwalk and Fishing Pier for any 3-year consecutive period based on the expected annual reported and unreported captures calculated above.

**Table 3. Summary of Expected Captures of Smalltooth Sawfish**

Captures	Total
1. Expected Annual Reported	0.2650
2. Expected Annual Unreported	1.9433
<b>Annual Total</b>	2.2083
<b>Triennial (3-year) Total</b>	6.6249

We round 6.6249 up to 7 to account for the capture of whole animals in our Jeopardy analysis. Therefore, we estimate that up to 7 smalltooth sawfish could be caught at the Ponce de Leon Boardwalk and Fishing Pier during any consecutive 3-year period. As previously stated, we believe that all captures of smalltooth sawfish will be non-lethal with no associated PRM.

## 6 CUMULATIVE EFFECTS

---

ESA Section 7 regulations require NMFS to consider cumulative effects in formulating its Opinions (50 CFR 402.14). Cumulative effects include the effects of future state, tribal, local, or

private actions that are reasonably certain to occur in the action area considered in this Opinion (50 CFR 402.02).

At this time, we are not aware of any non-federal actions, beyond those discussed in the Environmental Baseline section, being planned or under development in the action area which would have effects to smalltooth sawfish. Within the action area, major future changes are not anticipated in these ongoing human activities. The present, major human uses of the action area are expected to continue at the present levels of intensity in the near future.

Many threats to smalltooth sawfish are expected to be exacerbated by the effects of global climate change. These threats are the same as those previously discussed in Section 3.4.

## **7        JEOPARDY ANALYSIS**

---

The analyses conducted in the previous sections of this Opinion serve to provide a basis to determine whether the proposed action is likely to jeopardize the continued existence of smalltooth sawfish (U.S. DPS). In the Effects of the Action, we outlined how the proposed action would affect these species at the individual level and the extent of those effects in terms of the number of associated interactions, captures, and mortalities of each species to the extent possible based on the best available data. Now we assess each of these species' responses to this impact, in terms of overall population effects, and whether those effects of the proposed actions, when considered in the context of the Status of the Species, the Environmental Baseline, and the Cumulative Effects, are likely to jeopardize the continued existence of ESA-listed species in the wild. To "jeopardize the continued existence of" means to "engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and the recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Thus, in making this determination for each species, we must look at whether the proposed actions directly or indirectly reduce the reproduction, numbers, or distribution of a listed species. Then, if there is a reduction in 1 or more of these elements, we evaluate whether it would be expected to cause an appreciable reduction in the likelihood of both the survival and the recovery of the species.

The NMFS and USFWS's ESA Section 7 Handbook (USFWS and NMFS 1998) defines survival and recovery, as they apply to the ESA's jeopardy standard. Survival means "the species' persistence . . . beyond the conditions leading to its endangerment, with sufficient resilience to allow recovery from endangerment." Survival is the condition in which a species continues to exist into the future while retaining the potential for recovery. This condition is characterized by a sufficiently large population, represented by all necessary age classes, genetic heterogeneity, and number of sexually mature individuals producing viable offspring, which exists in an environment providing all requirements for completion of the species' entire life cycle, including reproduction, sustenance, and shelter. Recovery means "improvement in the status of a listed species to the point at which listing is no longer appropriate under the criteria set out in Section 4(a)(1) of the Act." Recovery is the process by which species' ecosystems are restored and/or threats to the species are removed so self-sustaining and self-regulating populations of listed species can be supported as persistent members of native biotic communities.

The status of each listed species likely to be adversely affected by the proposed action is reviewed in the Status of the Species. For any species listed globally, a jeopardy determination must find that the proposed actions will appreciably reduce the likelihood of survival and recovery at the global species range (i.e., in the wild). For any species listed as DPSs, a jeopardy determination must find that the proposed actions will appreciably reduce the likelihood of survival and recovery of that DPS.

## **7.1 U.S. DPS of Smalltooth Sawfish**

The proposed action is expected to result in the capture of up to 7 smalltooth sawfish over any consecutive 3-year period. We expect all captures to be non-lethal with no associated PRM.

### **7.1.1 Survival**

The potential non-lethal capture of smalltooth sawfish over any consecutive 3-year period is not expected to have any measurable impact on the reproduction, numbers, or distribution of this species. The individuals captured are expected to fully recover such that no reductions in reproduction or numbers of this species are anticipated. Since these captures may occur in the small, discrete action area and would be released within the general area where caught, no change in the distribution of smalltooth sawfish is anticipated.

### **7.1.2 Recovery**

The following analysis considers the effects of non-lethal capture on the likelihood of recovery in the wild. The recovery plan for the smalltooth sawfish (NMFS 2009) lists 3 main objectives as recovery criteria for the species. The 2 objectives and the associated sub-objectives relevant to the proposed action are:

*Objective - Minimize Human Interactions and Associated Injury and Mortality*

*Sub-objective:*

- *Minimize human interactions and resulting injury and mortality of smalltooth sawfish through public education and outreach targeted at groups that are most likely to interact with sawfish (e.g., fishermen, divers, boaters).*
- *Develop and seek adoption of guidelines for safe handling and release of smalltooth sawfish to reduce injury and mortality associated with fishing.*
- *Minimize injury and mortality in all commercial and recreational fisheries.*

*Objective - Ensure Smalltooth Sawfish Abundance Increases Substantially and the Species Reoccupies Areas from which it had Previously Been Extirpated*

*Sub-objective:*

- *Sufficient numbers of juvenile smalltooth sawfish inhabit several nursery areas across a diverse geographic area to ensure survivorship and growth and to protect against the negative effects of stochastic events within parts of their range.*
- *Adult smalltooth sawfish (> 340 cm) are distributed throughout the historic core of the species' range (both the Gulf of Mexico and Atlantic coasts of Florida). Numbers of adult smalltooth sawfish in both the Atlantic Ocean and Gulf of Mexico are*

- sufficiently large that there is no significant risk of extirpation (i.e., local extinction) on either coast.*
- *Historic occurrence and/or seasonal migration of adult smalltooth sawfish are reestablished or maintained both along the Florida peninsula into the South-Atlantic Bight, and west of Florida into the northern and/or western Gulf of Mexico.*

NMFS is currently funding several actions identified in the Recovery Plan for smalltooth sawfish: adult satellite tagging studies, the SSRIT data, and monitoring take in commercial fisheries to name a few. Additionally, NMFS has developed safe-handling guidelines for the species. Despite the ongoing threats from recreational fishing, we have seen a stable or slightly increasing trend in the population of this species. Thus, the proposed action is not likely to impede the recovery objectives above and will not result in an appreciable reduction in the likelihood of the U.S. DPS of smalltooth sawfish's recovery in the wild. NMFS must continue to monitor the status of the population to ensure the species continues to recover.

The potential non-lethal capture of smalltooth sawfish will not affect the population of reproductive adult females. Thus, the recreational fishing effects from the consultation pier will not result in an appreciable reduction in the likelihood of smalltooth sawfish recovery in the wild.

### **7.1.3 Conclusion**

The potential non-lethal capture of smalltooth sawfish is not expected to have any measurable impact on the reproduction, numbers, or distribution of this species. Because the proposed action will not affect the population of reproductive adult females, we do not expect it to affect Recovery Objective #3, above, which focuses on ensuring abundance increases. The proposed action also will not interfere with Recovery Objective #1. Mortalities are not expected, and the proposed action furthers outreach efforts by ensuring signs are maintained at the pier to educate anglers about safe handling and reporting interactions with the species. Thus, the recreational fishing effects from the proposed pier will not result in an appreciable reduction in the likelihood of smalltooth sawfish U.S. DPS recovery in the wild.

## **8 CONCLUSION**

---

After reviewing the Status of the Species, the Environmental Baseline, the Effects of the Action, and the Cumulative Effects using the best available data, it is NMFS's Opinion that the proposed action are not likely to jeopardize the continued existence of the U.S. DPS of smalltooth sawfish.

## **9 INCIDENTAL TAKE STATEMENT (ITS)**

---

Section 9 of the ESA and protective regulations issued pursuant to Section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption.

*Take* is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. *Incidental take* is defined as take that is incidental to, and

not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that would otherwise be considered prohibited under Section 9 or Section 4(d), but which is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA, provided that such taking is in compliance with the reasonable and prudent measures and the terms and conditions of the ITS of the Opinion.

### 9.1 Anticipated Amount or Extent of Incidental Take

The take limits prescribed in this Opinion that will trigger the requirement to reinitiate consultation are based on the amount of take that we expect *to be reported* as it is not possible to directly monitor the incidents that go unreported. The best available information for estimating the amount of future take of smalltooth sawfish that will be reported at the Ponce de Leon Boardwalk and Fishing Pier is described in Section 5.

In Section 5.2, we developed an estimate of the total number of smalltooth sawfish captures expected to be reported annually (0.2650; **Table 3**, Line 1). We take that number and multiply by 3 to get the 3-year total estimate of reported smalltooth sawfish captures ( $0.2650 \times 3 = 0.7950$ ). We round 0.7950 to 1 to reach a whole number that can be used as the take limit. The anticipated, unreported smalltooth sawfish takes are not directly monitored but can be estimated from reported takes using the process described in Section 5.2.2. Based on the data collected from the Hill (2013) fishing pier study, we anticipate 88% of smalltooth sawfish take will go unreported.

Therefore, the take limits shown in **Table 4** are our best estimates of the amount of smalltooth sawfish take expected to be reported over any consecutive 3-year period.

**Table 4. Incidental Take Limits by Species for Any Consecutive 3-Year Period**

Species	Total Estimated Reported Captures	Incidental Take Limits that will Trigger Reinitiation
Smalltooth sawfish (U.S. DPS)	$0.2650 \times 3 = 0.7950$ , rounded up to 1	No more than 1 reported capture

Again, we expect all interactions with smalltooth sawfish (reported and unreported) to be non-lethal with no associated PRM.

### 9.2 Effect of Take

NMFS has determined that the anticipated incidental take is not likely to jeopardize the continued existence of the smalltooth sawfish (U.S. DPS).

### 9.3 Reasonable and Prudent Measures (RPMs)

Section 7(b)(4) of the ESA requires NMFS to issue a statement specifying the impact of any incidental take on a ESA-listed species, which results from an agency action otherwise found to

comply with Section 7(a)(2) of the ESA. It also states that the RPMs necessary to minimize the impacts of take and the T&Cs to implement those measures must be provided and must be followed to minimize those impacts. Only incidental taking by the federal action agency or applicant that complies with the specified T&Cs is authorized.

The RPMs and T&Cs are specified as required by 50 CFR 402.14(i)(1)(ii) and (iv) to document the incidental take by the proposed action and to minimize the impact of that take ESA-listed species. These RPMs and T&C must be implemented by the federal action agency in order for the protection of Section 7(o)(2) to apply. If the applicant fails to adhere to the T&Cs of this ITS through enforceable terms, and/or fails to retain oversight to ensure compliance with these T&Cs, the protective coverage of Section 7(o)(2) may lapse. To monitor the impact of the incidental take, the applicant must report the progress of the action and its impact on the species to NMFS as specified in this ITS [50 CFR 402.14(i)(3)].

NMFS has determined that the following RPMs and associated T&Cs are necessary and appropriate to minimize impacts of the incidental take of ESA-listed species related to the proposed action:

1. The federal action agency must ensure that the applicant provides take reports regarding all interactions with ESA-listed species at the fishing pier(s).
2. The federal action agency must ensure that the applicant minimizes the likelihood of injury or mortality to ESA-listed species resulting from hook-and-line capture or entanglement by activities at the fishing pier(s).
3. The federal action agency must ensure that the applicant reduces the impacts to incidentally captured ESA-listed species.
4. The federal action agency must ensure that the applicant coordinates periodic fishing line removal (i.e., cleanup) events with non-governmental or other local organizations.

#### **9.4 Terms and Conditions (T&Cs)**

The following T&Cs implement the above RPMs:

1. To implement RPM 1, the federal action agency must ensure that the applicant reports all known angler-reported hook-and-line captures of ESA-listed species and any other takes of ESA-listed species to the NMFS SERO PRD.
  - a. If and when the applicant becomes aware of any known reported capture, entanglement, stranding, or other take, the applicant must notify NMFS SERO PRD by email: [takereport.nmfs@noaa.gov](mailto:takereport.nmfs@noaa.gov).
    - i. Emails must reference this Opinion by the NMFS tracking number (SERO-2020-01357 Ponce de Leon Boardwalk and Fishing Pier) and date of issuance.
    - ii. The email must state the species, date and time of the incident, general location and activity resulting in capture (e.g., fishing from the pier by hook-and-line), condition of the species (i.e., alive, dead, sent to rehabilitation), size of the individual, behavior, identifying features (i.e.,

- presence of tags, scars, or distinguishing marks), and any photos that may have been taken.
- b. Every year, the applicant must submit a summary report of capture, entanglement, stranding, or other take of ESA-listed species to NMFS SERO PRD by email: [nmfs.ser.esa.consultations@noaa.gov](mailto:nmfs.ser.esa.consultations@noaa.gov).
    - i. Emails and reports must reference this Opinion by the NMFS tracking number (SERO-2020-01357 Ponce de Leon Boardwalk and Fishing Pier) and date of issuance.
    - ii. The report will contain the following information: the total number of ESA-listed species captures, entanglements, strandings, or other take that was reported at or adjacent to the piers included in this Opinion.
    - iii. The report will contain all information for any sea turtles taken to a rehabilitation facility holding an appropriate USFWS Native Endangered and Threatened Species Recovery permit. This information can be obtained from the appropriate State Coordinator for the STSSN (<https://www.fisheries.noaa.gov/state-coordinators-sea-turtle-stranding-and-salvage-network>)
    - iv. The first report will be submitted by January 31, 2022, and will cover the time period from pier opening until December 31, 2021. The second report will be submitted by January 31, 2023, and will cover calendar year 2022 and the information in the first report. The third report will be submitted by January 31, 2024, and will cover the prior two calendar years (calendar years 2023 and 2022) and the information from the first report. The next report will be submitted by January 31, 2025, and will cover the prior three calendar years (calendar years 2024, 2023, and 2022). Thereafter, reports will be prepared every year, covering the prior rolling three-year time period, and emailed no later than January 31 of any year.
    - v. Reports will include current photographs of signs and bins required in T&Cs 2, below, and records of the clean-ups required in T&C 3 below.
2. To implement RPMs 2 and 3, the federal action agency must ensure that the applicant must:
- a. Install and maintain the following NMFS Protected Species Educational Sign: ‘Save Dolphins, Sea Turtles, Sawfish, and Manta Ray.’
    - i. Signs will be posted at least at the entrance to and terminal end of the pier.
    - ii. Signs will be installed prior to opening the pier for public use.
    - iii. Photographs of the installed signs will be emailed to NMFS’s Southeast Regional Office ([nmfs.ser.esa.consultations@noaa.gov](mailto:nmfs.ser.esa.consultations@noaa.gov)) with the NMFS tracking number (SERO-2020-01357 Ponce de Leon Boardwalk and Fishing Pier) and date of issuance.
    - iv. Sign designs and installation methods are provided at the following website: <https://www.fisheries.noaa.gov/southeast/consultations/protected-species-educational-signs>.
    - v. Current photographs of the signs will be included in each report required by T&C 1, above.
  - b. Install and maintain monofilament recycling bins and trash receptacles at the piers to reduce the probability of trash and debris entering the water.

- i. Monofilament recycling bins and trash receptacles will be installed prior to opening the pier for public use.
  - ii. Photographs of the installed bins will be emailed to NMFS's Southeast Regional Office by email ([nmfs.ser.esa.consultations@noaa.gov](mailto:nmfs.ser.esa.consultations@noaa.gov)) with the NMFS tracking number for this Opinion (SERO-2020-01357 Ponce de Leon Boardwalk and Fishing Pier) and date of issuance.
  - iii. The applicant must regularly empty the bins and trash receptacles and make sure they are functional and upright.
  - iv. Additionally, current photographs of the bins will be included in each report required by T&C 1, above.
3. To implement RPMs 2, 3, and 4, the federal action agency must ensure that the applicant must:
  - a. Perform at least 1 annual underwater cleanup to remove derelict fishing line and associated gear from around the pier structure. The applicant may contact the following organization for assistance: Elizabeth Staugler, Florida Sea Grant, [staugler@ufl.edu](mailto:staugler@ufl.edu), (941) 979-6328.
  - b. Submit a record of each cleaning event in the report required by T&C 1 above.

## **10 CONSERVATION RECOMMENDATIONS**

---

Section 7(a)(1) of the ESA directs federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation Recommendations (CRs) are designed to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

NMFS believes the following CRs further the conservation of the listed species that will be affected by the proposed action. NMFS strongly recommends that these measures be considered and implemented by the federal action agency:

Smalltooth sawfish:

- Conduct or fund outreach designed to increase the public's knowledge and awareness of smalltooth sawfish.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, NMFS requests notification of the implementation of any of these or additional conservation recommendations.

## **11 REINITIATION OF CONSULTATION**

---

As provided in 50 CFR Section 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if (1) the amount or extent of take specified in the ITS is exceeded, (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, (3) the identified action is subsequently



modified in a manner that causes an effect to listed species or critical habitat that was not considered in the Opinion, or (4) a new species is listed or critical habitat designated that may be affected by the identified action.

## 12 LITERATURE CITED

---

- Baughman, J. L. 1943. Notes on sawfish, *Pristis perotteti* Müller and Henle, not previously reported from the waters of the United States. *Copeia* 1943(1):43-48.
- Bethea, D. M., K. L. Smith, and J. K. Carlson. 2012. Relative abundance and essential fish habitat studies for smalltooth sawfish, *Pristis pectinata*, in southwest Florida, USA. NOAA Fisheries Southeast Fisheries Science Center, Panama City, FL.
- Bethea, D. M., K. L. Smith, L. D. Hollensead, and J. K. Carlson. 2011. Relative abundance and essential fish habitat studies for smalltooth sawfish, *Pristis pectinata*, in southwest Florida, USA. NOAA Fisheries, Southeast Fisheries Science Center, Panama City, FL.
- Bigelow, S. F., and W. C. Schroeder. 1953. Sharks, sawfishes, guitarfishes, skates, rays, and chimaeroids. Pages 1-514 in J. Tee-Van, C. M. Breder, F. F. Hildebrand, A. E. Parr, and W. E. Schroeder, editors. *Fishes of the Western North Atlantic, Part 2*. Sears Foundation of Marine Research, Yale University, New Haven, CT.
- Brame, A. B., and coauthors. 2019. Biology, ecology, and status of the smalltooth sawfish *Pristis pectinata* in the USA. *Endangered Species Research* 39:9-23.
- Caldwell, S. 1990. Texas sawfish: Which way did they go? *Tide* Jan-Feb:16-19.
- Carlson, J. K., and J. Osborne. 2012. Relative abundance of smalltooth sawfish (*Pristis pectinata*) based on the Everglades National Park Creel Survey. NOAA National Marine Fisheries Service, NMFS-SEFSC-626, Panama City, FL.
- Carlson, J. K., J. Osborne, and T. W. Schmidt. 2007. Monitoring the recovery of smalltooth sawfish, *Pristis pectinata*, using standardized relative indices of abundance. *Biological Conservation* 136(2):195-202.
- Carlson, J. K., and C. A. Simpfendorfer. 2015. Recovery potential of smalltooth sawfish, *Pristis pectinata*, in the United States determined using population viability models. *Aquatic Conservation: Marine and Freshwater Ecosystems* 25(2):187-200.
- Dahl, T. E., and C. E. Johnson. 1991. Status and trends of wetlands in the conterminous United States, mid-1970s to mid-1980s. U.S. Fish and Wildlife Service, Washington, D.C.
- Dulvy, N. K., and coauthors. 2016. Ghosts of the coast: global extinction risk and conservation of sawfishes. *Aquatic Conservation: Marine and Freshwater Ecosystems* 26(1):134-153.
- EPA. 2012. Climate Change. [www.epa.gov/climatechange/index.html](http://www.epa.gov/climatechange/index.html).
- Evermann, B. W., and B. A. Bean. 1897. Report on the Fisheries of Indian River, Florida. United States Commission of Fish and Fisheries, Washington D.C.
- Feldheim, K. A., A. T. Fields, D. D. Chapman, R. M. Scharer, and G. R. Poulakis. 2017. Insights into reproduction and behavior of the smalltooth sawfish *Pristis pectinata*. *Endangered Species Research* 34:463-471.
- Gilman, E. L., J. Ellison, N. C. Duke, and C. Field. 2008. Threats to mangroves from climate change and adaptation options: A review. *Aquatic Botany* 89(2):237-250.
- Gilmore, G. R. 1995. Environmental and Biogeographic Factors Influencing Ichthyofaunal Diversity: Indian River Lagoon. *Bulletin of Marine Science* 57(1):153-170.

- Hill, A. 2013. Rough Draft of Fishing Piers and Protected Species: An Assessment of the Presence and Effectiveness of Conservation Measures in Charlotte and Lee County, Florida. Pages 50 *in*. University of Miami, Rosenstiel School of Marine and Atmospheric Science.
- Hollensead, L. D., R. D. Grubbs, J. K. Carlson, and D. M. Bethea. 2016. Analysis of fine-scale daily movement patterns of juvenile *Pristis pectinata* within a nursery habitat. *Aquatic Conservation: Marine and Freshwater Ecosystems* 26(3):492-505.
- Hollensead, L. D., R. D. Grubbs, J. K. Carlson, and D. M. Bethea. 2018. Assessing residency time and habitat use of juvenile smalltooth sawfish using acoustic monitoring in a nursery habitat. *Endangered Species Research* 37:119-131.
- IPCC. 2007. Summary for Policymakers. Pages 18 *in* S. Solomon, and coeditors, editors. *Climate Change 2007: the physical science basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK and New York, NY.
- IPCC. 2013. Summary for Policymakers. Pages SPM-1 - 36 *in* T. F. Stocker, and coeditors, editors. *Climate Change 2013: the physical science basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom; New York, NY, USA.
- ISED. 2014. International Sawfish Encounter Database. Florida Museum of Natural History, Gainesville, Florida. <http://www.flmnh.ufl.edu/fish/sharks/sawfish/sawfishdatabase.html>.
- Musick, J. A. 1999. Ecology and conservation of long-lived marine animals. *American Fisheries Society Symposium* 23:1-10.
- NMFS. 2000. Status review of smalltooth sawfish, *Pristis pectinata*. NOAA Fisheries, Southeast Regional Office, St. Petersburg, FL.
- NMFS. 2009. Smalltooth sawfish recovery plan (*Pristis pectinata*). NOAA Fisheries, Silver Spring, MD.
- NMFS. 2010. Smalltooth sawfish 5-year review: summary and evaluation. NOAA Fisheries, Southeast Regional Office, St. Petersburg, FL.
- NMFS. 2018. Smalltooth sawfish 5-year review: summary and evaluation. NOAA Fisheries, Southeast Regional Office  
St. Petersburg, FL.
- NOAA. 2012. Understanding Climate. <http://www.climate.gov/#understandingClimate>.
- Orlando, S. P., Jr. , and coauthors. 1994. Salinity Characteristics of South Atlantic Estuaries. NOAA, Office of Ocean Resources Conservation and Assessment, Silver Spring, MD.
- Poulakis, G., P. Stevens, A. A. Timmers, T. R. Wiley, and C. Simpfendorfer. 2011. Abiotic affinities and spatiotemporal distribution of the endangered smalltooth sawfish, *Pristis pectinata*, in a south-western Florida nursery. *Marine and Freshwater Research* 62:1165-1177.
- Poulakis, G. R. 2012. Distribution, habitat use, and movements of juvenile smalltooth sawfish, *Pristis pectinata*, in the Charlotte Harbor estuarine system, Florida. Dissertation. Florida Institute of Technology, Melbourne, FL.
- Poulakis, G. R., and J. C. Seitz. 2004. Recent occurrence of the smalltooth sawfish, *Pristis pectinata* (Elasmobranchiomorpha: Pristidae), in Florida Bay and the Florida Keys, with comments on sawfish ecology. *Florida Scientist* 67(1):27-35.
- Poulakis, G. R., P. W. Stevens, A. A. Timmers, C. J. Stafford, and C. A. Simpfendorfer. 2013. Movements of juvenile endangered smalltooth sawfish, *Pristis pectinata*, in an estuarine

- river system: use of non-main-stem river habitats and lagged responses to freshwater inflow-related changes. *Environmental Biology of Fishes* 96(6):763-778.
- Poulakis, G. R., and coauthors. 2017. Sympatric elasmobranchs and fecal samples provide insight into the trophic ecology of the smalltooth sawfish. *Endangered Species Research* 32:491-506.
- Prohaska, B. K., and coauthors. 2018. Physiological stress in the smalltooth sawfish: effects of ontogeny, capture method, and habitat quality. *Endangered Species Research* 36:121-135.
- Reddering, J. S. V. 1988. Prediction of the effects of reduced river discharge on estuaries of the south-eastern Cape Province, South Africa. *South African Journal of Science* 84:726-730.
- SAFMC. 1998. Final habitat plan for the South Atlantic region: Essential fish habitat requirements for fishery management plans of the South Atlantic Fishery Management Council. South Atlantic Fishery Management Council, Charleston, South Carolina.
- Scharer, R. M., W. F. Patterson III, J. K. Carlson, and G. R. Poulakis. 2012. Age and growth of endangered smalltooth sawfish (*Pristis pectinata*) verified with LA-ICP-MS analysis of vertebrae. *PloS one* 7:e47850.
- Seitz, J. C., and G. R. Poulakis. 2002. Recent occurrence of sawfishes (Elasmobranchiomorphi: Pristidae) along the southwest coast of Florida (USA). *Florida Scientist* 65(4):256-266.
- Simpfendorfer, C., G. Poulakis, P. M. O'Donnell, and T. R. Wiley. 2008. Growth rates of juvenile smalltooth sawfish *Pristis pectinata* Latham in the Western Atlantic. *Journal of Fish Biology* 72:711-723.
- Simpfendorfer, C. A. 2000. Predicting population recovery rates for endangered western Atlantic sawfishes using demographic analysis. *Environmental Biology of Fishes* 58(4):371-377.
- Simpfendorfer, C. A. 2001. Essential habitat of the smalltooth sawfish, *Pristis pectinata*. Mote Marine Laboratory, Technical Report 786, Sarasota, FL.
- Simpfendorfer, C. A. 2002. Smalltooth sawfish: The USA's first endangered elasmobranch? *Endangered Species Update* 19(3):53-57.
- Simpfendorfer, C. A. 2003. Abundance, movement and habitat use of the smalltooth sawfish. Final Report. Mote Marine Laboratory Mote Technical Report No. 929, Sarasota, FL.
- Simpfendorfer, C. A. 2006. Movement and habitat use of smalltooth sawfish. Final Report. Mote Marine Laboratory, Mote Marine Laboratory Technical Report 1070, Sarasota, FL.
- Simpfendorfer, C. A., and T. R. Wiley. 2004. Determination of the distribution of Florida's remnant sawfish population, and identification of areas critical to their conservation. Mote Marine Laboratory, Sarasota, Florida.
- Simpfendorfer, C. A., and T. R. Wiley. 2005. Identification of priority areas for smalltooth sawfish conservation. Final report to the National Fish and Wildlife Foundation for Grant # 2003-0041-000. Mote Marine Laboratory.
- Simpfendorfer, C. A., T. R. Wiley, and B. G. Yeiser. 2010. Improving conservation planning for an endangered sawfish using data from acoustic telemetry. *Biological Conservation* 143(6):1460-1469.
- Simpfendorfer, C. A., and coauthors. 2011. Environmental influences on the spatial ecology of juvenile smalltooth sawfish (*Pristis pectinata*): results from acoustic monitoring. *PloS one* 6(2):e16918.
- Snelson, F., and S. Williams. 1981. Notes on the occurrence, distribution, and biology of *elasmobranch* fishes in the Indian River lagoon system, Florida. *Estuaries and Coasts* 4(2):110-120.

- Steadman, S., and T. E. Dahl. 2008. Status and trends of wetlands in the coastal watersheds of the Eastern United States 1998 to 2004. Pages 32 *in* N. M. F. S. a. U. S. D. o. t. National Oceanic and Atmospheric Administration, and F. a. W. S. Interior, editors.
- USFWS and NMFS. 1998. Endangered Species Act consultation handbook. Procedures for Conducting Section 7 Consultations and Conferences. U.S. Fish and Wildlife, National Marine Fisheries Service.
- Vargo, S., P. Lutz, D. Odell, E. V. Vleet, and G. Bossart. 1986. Study of the effects of oil on marine turtles. U.S. Department of the Interior, Minerals Management Service, Vienna, Virginia.
- Whitfield, A. K., and M. N. Bruton. 1989. Some biological implications of reduced freshwater inflow into eastern Cape estuaries: a preliminary assessment. *South African Journal of Science* 85:691-694.
- Wiley, T. R., and C. A. Simpfendorfer. 2007. Site fidelity/residency patterns/habitat modeling. Final Report to the National Marine Fisheries Service, Grant number WC133F-06-SE-2976. Mote Marine Laboratory.
- Wiley, T. R., and C. A. Simpfendorfer. 2010. Using public encounter data to direct recovery efforts for the endangered smalltooth sawfish, *Pristis pectinata*. *Endangered Species Research* 12:179-191.