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

03/29/2024

F/SER46:DR
SERO-2024-00355

Katlin Kuhn-Hendricks
Project Delivery Coordinator
Florida Department of Transportation
Office of Environmental Management
605 Suwannee Street
Tallahassee, Florida 32399-6544

Ref.: Financial Management Number 434965-2-32-01, Harborview Road widening from Melbourne Street to I-75, Port Charlotte, Charlotte County, Florida

Dear Katlin Kuhn-Hendricks,

The enclosed Biological Opinion responds to your request for consultation with us, the National Marine Fisheries Service (NMFS), pursuant to Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.) for the above referenced action. The Opinion has been given the NMFS tracking number SERO-2024-00355. Please use the NMFS tracking number in all future correspondence related to this action. The Florida Department of Transportation (FDOT) has received National Environmental Policy Act assignment authority from the Federal Highway Administration and is acting as their representative for this ESA Section 7 consultation.

The Opinion considers the effects of the FDOT's proposal to carry out the widening of Harborview Road from Melbourne Street to I-75 in Port Charlotte, Charlotte County, Florida on the following listed species and critical habitat: green sea turtle (North Atlantic Distinct Population Segment [DPS]), Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle (Northwest Atlantic DPS), and smalltooth sawfish (U.S. DPS) and its designated critical habitat. The Opinion is based on information provided by the FDOT, and the published literature cited within. NMFS concludes that the proposed action will have no effect on leatherback sea turtle. NMFS concludes that the proposed action is not likely to adversely affect green sea turtle (North Atlantic DPS), Kemp's ridley sea turtle, loggerhead sea turtle (Northwest Atlantic DPS), and smalltooth sawfish. NMFS concludes that the proposed action is likely to adversely affect, but is not likely to result in the destruction or adverse modification of designated critical habitat (Charlotte Harbor Estuary Unit) for smalltooth sawfish.

We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and critical habitat. If you have any questions on

this consultation, please contact Dr. Dave Rydene, Consultation Biologist, at (727) 824-5379 or by email at David.Rydene@noaa.gov.

Sincerely,

AMENDOLA.KIMBERLY.BARBARA.1365830769 Digitally signed by AMENDOLA.KIMBERLY.BARBARA.1365830769 Date: 2024.03.29 15:11:00 -04'00'

for Andrew J. Strelcheck
Regional Administrator

Enclosure:
NMFS Biological Opinion SERO-2024-00355
cc: Ryan.Ellis@dot.state,fl.us
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File: 1514-22.l.4

Endangered Species Act - Section 7 Consultation
Biological Opinion

Action Agency:	Florida Department of Transportation on behalf of the Federal Highways Administration Financial Management Number 434965-2-32-01
Applicant:	Florida Department of Transportation
Activity:	Harborview Road widening from Melbourne Street to I-75
Location:	Port Charlotte, Charlotte County, Florida
Consulting Agency:	National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, Protected Resources Division, St. Petersburg, Florida NMFS Tracking Number: SERO-2024-00355
Approved by:	for AMENDOLA.KIMBERLY.BARBARA.1365830769 Digitally signed by AMENDOLA.KIMBERLY.BARBARA.1365830769 Date: 2024.03.29 15:11:29 -04'00' Andrew J. Strelcheck, Regional Administrator NMFS, Southeast Regional Office St. Petersburg, Florida
Date Issued:	03/29/2024

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ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASURE

ac	acre(s)
°C	degrees Celsius
CFR	Code of Federal Regulations
CHEU	Charlotte Harbor Estuary Unit
cm	centimeter(s)
CO_2	Carbon Dioxide
DPS	Distinct Population Segment
ECO	Environmental Consultation Organizer
EFH	Essential Fish Habitat
ESA	Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.)
°F	degrees Fahrenheit
FDEP	Florida Department of Environmental Protection
ft	foot/feet
FR	Federal Register
ft^2	square foot/feet
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	Florida Fish and Wildlife Research Institute
FR	Federal Register
in	inch(es)

IPCC	Intergovernmental Panel on Climate Change
km	kilometer(s)
lin ft	linear foot/feet
m	meter(s)
MHW	Mean High Water
mi	mile(s)
mi^2	square mile(s)
MIT	Massachusetts Institute of Technology
MLLW	Mean Lower Low Water
MMPA	Marine Mammal Protection Act
MMF	Marine Megafauna Foundation
MSA	Magnuson-Stevens Fishery Conservation and Management Act
N/A	not applicable
NAD 83	North American Datum of 1983
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
Opinion	Biological Opinion, Conference Biological Opinion, or Draft Biological Opinion
PK	Peak Pressure injury threshold
PTS	Permanent Threshold Shift
SERO PRD	NMFS Southeast Regional Office, Protected Resources Division
SAV	Submerged Aquatic Vegetation
SELcum	Cumulative Sound Exposure Level injury threshold
SSRIT	Smalltooth Sawfish Recovery Implementation Team
STSSN	Sea Turtle Stranding and Salvage Network
TTIEU	Ten Thousand Islands/Everglades Unit
U.S.	United States of America
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
YOY	young-of-the-year

1 INTRODUCTION

1.1 Overview

Section 7(a)(2) of the ESA, requires that each federal agency ensure that any action authorized, funded, or carried out by such 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 such species. Section 7(a)(2) requires federal agencies to consult with the appropriate Secretary in carrying out these responsibilities. The NMFS and the USFWS share responsibilities for administering the ESA. Consultations on most ESA-listed marine species and their critical habitat are conducted between the federal action agency and NMFS (hereafter, may also be referred to as we, us, or our).

Consultation is required when a federal action agency determines that a proposed action "may affect" ESA-listed species or critical habitat and can be conducted informally or formally. Informal consultation is concluded after NMFS issues a Letter of Concurrence that concludes that the action is "not likely to adversely affect" ESA-listed species or critical habitat. Formal consultation is concluded after we issue a Biological Opinion (hereafter, referred to as an/the Opinion) that identifies whether a proposed action is "likely to jeopardize the continued existence of an ESA-listed species" or "destroy or adversely modify critical habitat," in which case Reasonable and Prudent Alternatives to the action as proposed must be identified to avoid these outcomes. An Opinion often states the amount or extent of anticipated incidental take of ESA-listed species that may occur, develops Reasonable and Prudent Measures necessary to minimize the impacts, i.e., amount or extent, of the anticipated incidental take, and lists the Terms and Conditions to implement those measures. An Opinion may also develop Conservation Recommendations that help benefit ESA-listed species.

This document represents NMFS's Opinion based on our review of potential effects of the FDOT's proposal to carry out the widening of Harborview Road from Melbourne Street to I-75 in Port Charlotte, Charlotte County, Florida on the following listed species and critical habitat: green sea turtle (North Atlantic Distinct Population Segment [DPS]), Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle (Northwest Atlantic DPS), and smalltooth sawfish (U.S. DPS) and its designated critical habitat. Our Opinion is based on information provided by the FDOT, and the published literature cited within.

On July 5, 2022, the U.S. District Court for the Northern District of California issued an order vacating the 2019 regulations that were revised or added to 50 CFR part 402 in 2019 ("2019 Regulations," see 84 FR 44976, August 27, 2019) without making a finding on the merits. On September 21, 2022, the U.S. Court of Appeals for the Ninth Circuit granted a temporary stay of the district court's July 5 order. On November 14, 2022, the Northern District of California issued an order granting the government's request for voluntary remand without vacating the 2019 regulations. The District Court issued a slightly amended order two days later on November 16, 2022. As a result, the 2019 regulations remain in effect, and we are applying the 2019 regulations here. For purposes of this consultation and in an abundance of caution, we considered whether the substantive analysis and conclusions articulated in the Opinion and

Incidental Take Statement would be any different under the pre-2019 regulations. We have determined that our analysis and conclusions would not be any different.

1.2 Consultation History

The following is the consultation history for the NMFS ECO tracking number SERO-2024-00355, Harborview Road Widening.

We received a request for formal consultation under Section 7 of the ESA from the FDOT to carry out the widening of Harborview Road from Melbourne Street to I-75 in Port Charlotte, Charlotte County, Florida, in a letter dated February 22, 2024. We initiated formal consultation that day.

2 PROPOSED ACTION

2.1 Project Details

2.1.1 Project Description

The FDOT proposes widening Harborview Road from Melbourne Street to I-75 in Charlotte County, Florida. The road would be widened from 2 lanes to 4 lanes, and the project includes the replacement of a small box culvert bridge (10 ft by 7 ft) that spans an unnamed salt creek that connects to the Peace River and lies at the boundary of designated critical habitat for smalltooth sawfish (Charlotte Harbor Estuary Unit). The overall project is expected to take approximately 4 years to complete, starting during November 2025 and ending in 2029. However, the box culvert bridge portion of the project (where the NMFS has concerns) will only take 6 to 8 months to complete.

The culvert replacement will require the temporary installation of steel sheet pile cofferdams on each side of the culvert. These cofferdams will be dewatered once they are in place. A total of 78 in-water sheet piles will be installed by vibratory hammer. Approximately 10 to 15 sheet piles will be installed each day. During the blockage period, pumps will be used to maintain water exchange between the creek and the river.

The cofferdams will block ingress and egress into and out of the creek for 2 weeks, but blockage will not be allowed during the sawfish pupping season from March 1 through July 31. Prior to cofferdam installation, staff from the FWC will be notified to allow them to sweep the creek with nets and remove any sawfish that may be in the creek. This will prevent any sawfish from being trapped in the creek during the 2-week closure period. Except for the 2-week blockage, the project will proceed with a staged construction approach to maintain an unobstructed connection between the salt creek and the Peace River. Up to 400 ft^2 (60 lin ft) of riprap may be placed at the base of the new culvert.

The demolition of the existing culvert may require the use of jack hammers and/or saw-cuts to mechanically dismantle it. A ramp-up technique will be used at the onset to allow animals time to leave the area before work proceeds at full volume. Demolition debris will be removed and

disposed of at an off-site location. No blasting is proposed as part of the demolition.

In-water work will only occur during daylight hours, and best management practices and turbidity controls will be implemented to maintain water quality surrounding the project area. Water depths at the project site will not be altered due to the project. No dredging is proposed and no work boats or barges will be used.

2.1.2 Mitigation Measures

FDOT agrees to adhere to NMFS Southeast Region's *Protected Species Construction Conditions*. In-water pile driving will only occur during daylight hours. The contractor will use a "ramp up" or "soft-start" technique at the onset of each day's demolition activities (jack hammering or saw cutting), using low force blows or sawing initially and gradually increasing to full force blows or sawing. Best Management Practices, including turbidity curtains and sediment control devices, will be employed to prevent erosion and contain turbidity. Turbidity curtains will not be removed until turbidity levels have returned to background levels. Blockage of the unnamed creek by cofferdams will not be allowed during the sawfish pupping season from March 1 through July 31, and the creek will only be blocked for a 2-week period outside of the pupping season. Prior to cofferdam installation, staff from the FWC will be notified to allow them to sweep the creek with nets and remove any sawfish that may be in the creek, and prevent their entrapment in the creek. Installation of cofferdam sheet piles may only be accomplished by the vibratory hammer method.

2.1.3 Best Practices

The applicant will report all future sightings of smalltooth sawfish at the property to the FWC via E-mail: Sawfish@MyFWC.com, or telephone: 844-472-9347 (1-844-4SAWFISH).

2.2 Action Area

The project site is located at 26.972016ºN and 82.032762ºW (NAD 83) in Port Charlotte, Charlotte County, Florida. The project site is located adjacent to the shoreline of the Peace River and crosses an unnamed salt creek connected to the Peace River. The salt creek is tidally-influenced and connects with the Peace River near the river's mouth in Port Charlotte, Florida. The bottom type at the project location is sand, and water depths at the box culvert bridge are approximately 4 ft at MLLW. The project is expected to have direct impacts to 62 lin ft of red mangrove shoreline that lies within the boundaries of smalltooth sawfish designated critical habitat. The project will also impact 166 lin ft of red mangrove shoreline that lies outside of the sawfish critical habitat boundary.

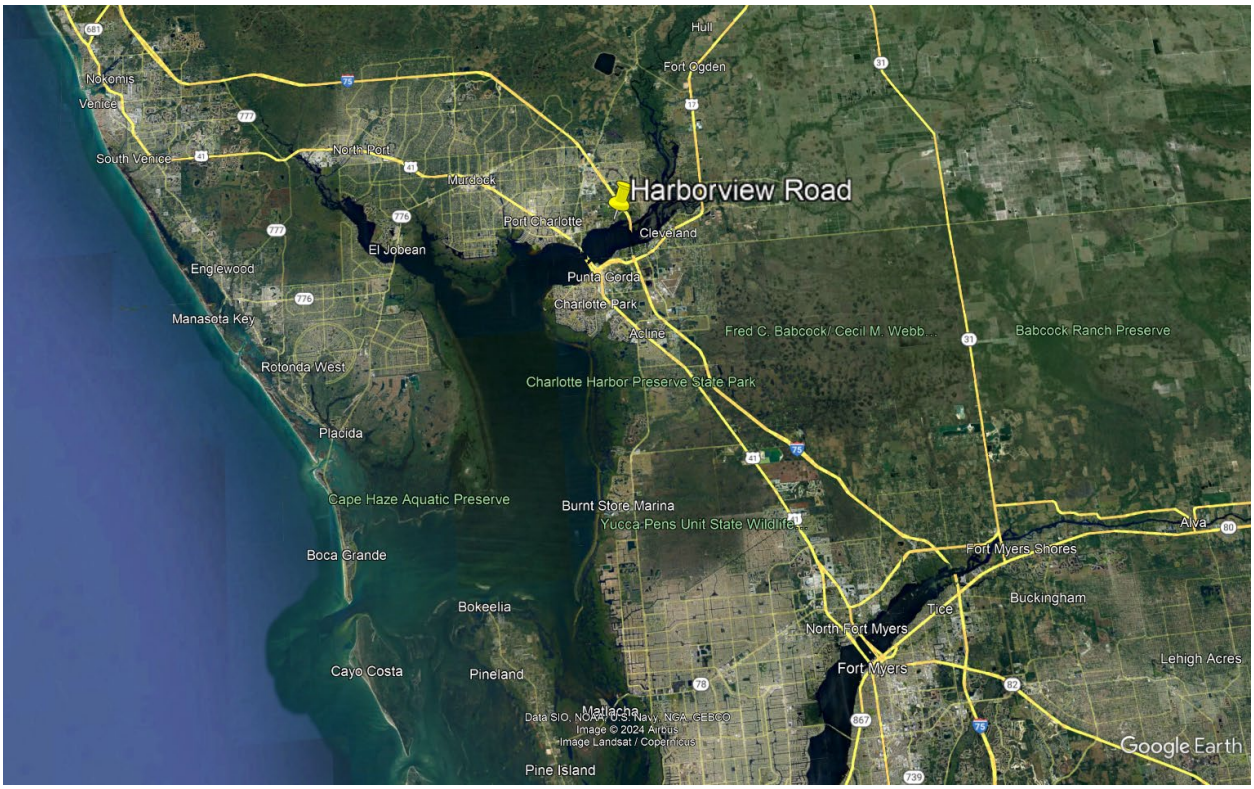

Figure 1.
The project site at Harborview Road in relation to the Peace River and the greater Charlotte Harbor System (©2024 Google).

The action area is defined by regulation as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). For the purposes of this federal action, the action area includes the sandy bottom of the unnamed creek and associated shoreline mangroves. For this project, the action area includes a zone extending 241.4 ft from box culvert bridge construction activities (due to potential behavioral disturbance effects from in-water vibratory pile-driving noise). The bridge is located at approximately 26.972016ºN and 82.032762ºW (North American Datum 1983). There are no corals or SAV within the action area. A portion of the action area is within the boundary of smalltooth sawfish designated critical habitat (Charlotte Harbor Estuary Unit).

Figure 2.
The project site at Harborview Road, showing the location of the box culvert bridge crossing an unnamed salt creek (©2024 Google).

3 EFFECTS DETERMINATIONS

Please note the following abbreviations are only used in **Table 1** and **Table 2** and are not, therefore, included in the list of acronyms: E = endangered; T = threatened; LAA = likely to adversely affect; NLAA = may affect, not likely to adversely affect; NE = no effect.

3.1 Effects Determinations for ESA-Listed Species

3.1.1 Agency Effects Determinations

We have assessed the ESA-listed species that may be present in the action area and our determination of the project's potential effects is shown in **Table 1** below.

Table 1. ESA-listed Species in the Action Area and Effect Determinations

Species (DPS)	ESA Listing Status	Listing Rule/Date	Most Recent Recovery Plan (or Outline) Date	Action Agency Effect Determination	NMFS Effect Determination
Sea Turtles					

Species (DPS)	ESA Listing Status	Listing Rule/Date	Most Recent Recovery Plan (or Outline) Date	Action Agency Effect Determination	NMFS Effect Determination
Green sea turtle (North Atlantic DPS)	T	81 FR 20057/ April 6, 2016	October 1991	NLAA	NLAA
Kemp's ridley sea turtle	E	35 FR 18319/ December 2, 1970	September 2011	NLAA	NLAA
Leatherback sea turtle	E	35 FR 8491/ June 2, 1970	April 1992	NLAA	NE
Loggerhead sea turtle (Northwest Atlantic DPS)	T	76 FR 58868/ September 22, 2011	December 2008	NLAA	NLAA
Fishes					
Smalltooth sawfish (U.S. DPS)	E	68 FR 15674/ April 1, 2003	January 2009	NLAA	NLAA

We believe the project will have no effect on leatherback sea turtles due to the species' very specific life history strategies, which are not supported in the action area. Leatherback sea turtles have pelagic, deepwater life history, where they forage primarily on jellyfish. The action area occurs inshore.

3.1.2 Effects Analysis for ESA-Listed Species Not Likely to be Adversely Affected by the Proposed Action

Effects to ESA-listed species include the risk of injury from direct impact by construction machinery and associated activities (e.g., heavy equipment operation, pile-driving operations). We believe this will be extremely unlikely to occur because ESA-listed species are likely to exhibit avoidance behavior and move away from the project site. The applicant's compliance with NMFS Southeast Region's *Protected Species Construction Conditions* will provide an additional measure of protection by requiring in-water construction activities to stop if ESA-listed species are spotted within 150 ft of operations.

The project will result in the permanent loss of a total 228 lin ft of red mangrove shoreline (62 lin ft of which are within the CHEU of critical habitat for smalltooth sawfish). Smalltooth sawfish and sea turtles may be affected by the permanent removal of these resources, which these species may use as habitat for sheltering and foraging for prey. We believe the effects on smalltooth sawfish and sea turtles caused by this loss of habitat will be insignificant because similar red mangrove habitat is highly abundant in the vicinity of the project area.

The installation of the temporary cofferdam will prevent the movement of ESA-listed species between the salt creek and the Peace River for a 2-week period outside of the smalltooth sawfish pupping season. We consider this effect to be insignificant as FWC sawfish researchers will be given the opportunity to sweep the creek to capture and relocate animals that may be in the creek before the cofferdams are put in place (to prevent entrapment). Additionally, the closure period is short in duration.

Of the 3 types of noise-producing activities proposed (jack hammering of the existing box culvert, saw-cutting of the existing box culvert, and vibratory hammer installation of steel sheet piles for temporary cofferdams), the vibratory hammer installation of steel sheet piles for temporary cofferdams creates the greatest amount of in-water noise and has the most potential to impact ESA-listed species under the NMFS's purview. Therefore, the vibratory hammer installation of steel sheet piles for temporary cofferdams will be analyzed as the scenario with the most potential for extensive in-water noise effects.

Noise created by pile driving activities can physically injure animals or change animal behavior in the affected areas. Injurious effects can occur in two ways. First, immediate adverse effects can occur if a single noise event exceeds the threshold for direct physical injury. Second, effects can result from prolonged exposure to noise levels that exceed the daily cumulative sound exposure level (SELcum) threshold for the animals, and these can constitute adverse effects if animals are exposed to the noise levels for sufficient periods. Behavioral effects can be adverse if such effects interfere with an animal's behavior such as migrating, feeding, resting, or reproducing. The noise analysis in this consultation evaluates effects to ESA-listed fish and sea turtles, identified by FDOT that may be affected by the proposed action. NMFS uses the U.S. Navy Phase III criteria (U.S. Department of the Navy, 2017) as the thresholds for vibratory pile driving listed below. Root Mean Square (RMS) sound pressure is referenced to dB 1 µPA. Sound Exposure Level (SEL) and SELcum are referenced to dB 1 μPA^2-second. For vibratory hammer pile driving, the behavioral disturbance threshold for ESA-listed fishes is 150 dB RMS. For vibratory pile driving, the SELcum injury threshold for sea turtles based on a potential Permanent Threshold Shift (i.e., hearing loss or PTS) is 220 dB SELcum, while the behavioral disturbance threshold for sea turtles is 175 dB RMS.

According to the NMFS Multi-Species Pile Driving Tool (2021), the installation of up to 15 steel sheet piles per day by vibratory hammer (480 minutes total vibratory driving per day) may cause SELcum injurious noise effects to ESA-listed sea turtles at a radius of up to 4.9 ft away from the pile-driving operations. The proposed pile installation will not result in any SELcum injurious noise effects to ESA-listed fishes. We believe SELcum injurious noise effects (i.e., PTS) are extremely unlikely to occur because this distance is well within the 150 ft "stop-work" radius defined in SERO's *Protected Species Construction Conditions* (2021). Movement away from the injurious sound radius is a behavioral response, which is discussed below.

According to the NMFS Multi-Species Pile Driving Tool (2021), the installation of up to 15 steel sheet piles per day by vibratory hammer (480 minutes total vibratory driving per day) could result in behavioral noise effects to ESA-listed fishes at a radius of up to 241.4 ft from the pile driving operations, and sea turtles at a radius of up to 5.2 ft from the pile driving operations. We believe behavioral noise effects will be insignificant due to the mobility of these species and the similarity of nearby habitat in this open-water environment. If an individual chooses to remain

within the behavioral response zone, it could be exposed to behavioral noise effects during sheet pile installations. Since in-water pile installations will occur intermittently during daylight hours only, these species will be able to resume normal activities during quiet periods between pile installations and at night.

3.1.3 ESA-Listed Species Likely to be Adversely Affected by the Proposed Action

We have determined that none of the species that appear in Table 1 are likely to be adversely affected by the proposed action and thus do not require further analysis.

3.2 Effects Determination for Critical Habitat

3.2.1 Agency Effects Determination

We have assessed the critical habitat that overlaps with the action area and our determination of the project's potential effects is shown in **Table 2** below.

Table 2. Critical Habitat in the Action Area and Effect Determinations

Species (DPS)	Critical Habitat Unit in the Action Area	Critical Habitat Rule/Date	Action Agency Effect Determination	NMFS Effect Determination (Critical Habitat)
Fishes				
Smalltooth sawfish (U.S. DPS)	Charlotte Harbor Estuary Unit	74 FR 45353/ September 2, 2009	NLAA	LAA

3.2.2 Critical Habitat Likely to be Adversely Affected by the Proposed Action

The project is located within the boundary of smalltooth sawfish critical habitat (CHEU). The following physical or biological features essential for the conservation of the species ("essential features") are present in the CHEU:

1. Red mangroves; and,
2. shallow, euryhaline habitats characterized by water depths between the MHW line and 3 ft (0.9 m) measured at MLLW.

Due to permanent impacts to the red mangrove shoreline essential feature, we have determined that smalltooth sawfish critical habitat (CHEU) is likely to be adversely affected by the proposed action and thus requires further analysis. We provide greater detail on the potential effects to critical habitat from the proposed action in the Effects of the Action (Section 6.2) and whether those effects, when considered in the context of the Status of the Critical Habitat (Section 4.2), the Environmental Baseline (Section 5), and the Cumulative Effects (Section 7), are likely to cause destruction or adverse modification of critical habitat.

4 STATUS OF CRITICAL HABITAT CONSIDERED FOR FURTHER ANALYSIS

Smalltooth Sawfish Critical Habitat

The U.S. DPS of smalltooth sawfish was listed as endangered on April 1, 2003; however, at that time, NMFS was unable to determine critical habitat. After funding additional studies necessary for the identification of specific habitats and environmental features important for the conservation of the species, establishing a smalltooth sawfish recovery team, and reviewing the best scientific data available, NMFS issued a Final Rule (74 FR 45353; see also 50 CFR 226.218) to designate critical habitat for the U.S. DPS of smalltooth sawfish on September 2, 2009. Through the additional studies, researchers identified 2 primary nursery areas in southwest Florida and centered the critical habitat designations around these nurseries. The critical habitat consists of 2 units located along the southwestern coast of Florida: the CHEU, which is comprised of approximately 221,459 ac (346 mi²) of coastal habitat, and the Ten Thousand Islands/Everglades Unit (TTIEU), which is comprised of approximately 619,013 ac (967 mi^2) of coastal habitat.

Critical Habitat Unit Affected by this Action

This consultation focuses on an activity occurring in the CHEU, which encompasses portions of Charlotte and Lee Counties (Figure 3). The CHEU is comprised of Charlotte Harbor, Gasparilla Sound, Matlacha Pass, Pine Island Sound, San Carlos Bay, and Estero Bay. The unit is fed by the Myakka and Peace Rivers to the north and the Caloosahatchee River to the east. A series of passes between barrier islands connect the CHEU with the Gulf of Mexico. The CHEU is a relatively shallow estuary with large areas of submerged aquatic vegetation (SAV), oyster bars, saltwater marsh, freshwater wetlands, and mangroves. Freshwater flows from the Caloosahatchee River are controlled by the Franklin Lock and Dam, which periodically releases water, which thereby affects downstream salinity regimes. The CHEU boundaries are defined in detail in the Final Rule (74 FR 45353; see also 50 CFR 226.218).

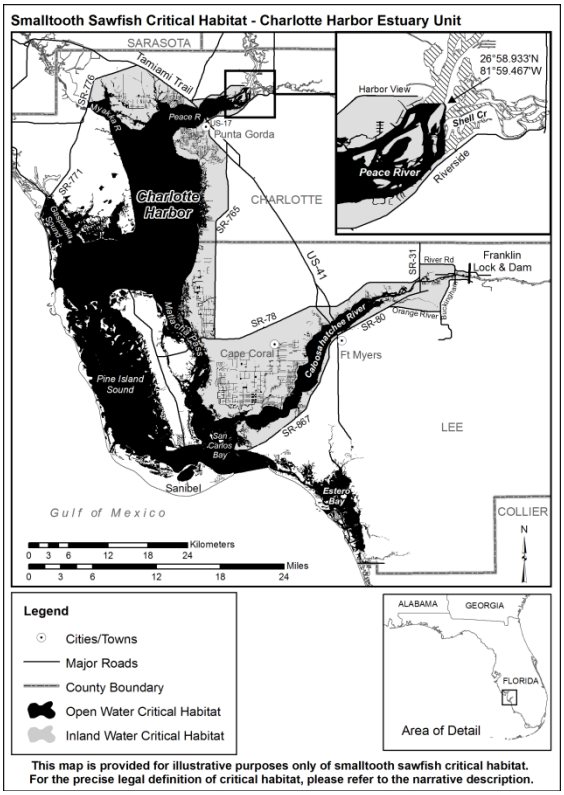

Figure 3.
Map of smalltooth sawfish critical habitat – Charlotte Harbor Estuary Unit

Essential Features of Critical Habitat

The recovery plan developed for the smalltooth sawfish, which represents NMFS's best judgment about the objectives and actions necessary for the species' recovery, identified a need to increase the number of juvenile smalltooth sawfish developing into adulthood by protecting or restoring nursery habitat (NMFS 2009). NMFS determined that without sufficient habitat, the population was unlikely to increase to a level associated with low extinction risk and de-listing. Therefore, within the 2 critical habitat units NMFS identified 2 habitat features essential for the conservation of this species: (1) red mangroves, and (2) shallow, euryhaline habitats characterized by water depths between the MHW line and 3 ft (0.9 m) measured at MLLW (Final Rule, 74 FR 45353). These essential features of critical habitat provide juveniles refuge from predation and forage opportunities within their nursery habitat. One or both of these essential features must be present in an action area for it to function as critical habitat for smalltooth sawfish.

Habitat Use

Juvenile smalltooth sawfish, identified as those up to 3 years of age or approximately 8 ft (2.4 m) in length (Simpfendorfer et al. 2008), inhabit the shallow waters of estuaries and can be found in sheltered bays, dredged canals, along banks and sandbars, and in rivers (NMFS 2000). Juvenile smalltooth sawfish occur in euryhaline waters (i.e., waters with a wide range of salinities) and are often closely associated with muddy or sandy substrates, and shorelines containing red mangroves (Simpfendorfer 2001; 2003). The structural complexity of red mangrove prop roots creates a unique habitat used by a variety of fish, invertebrates, and birds. Juvenile smalltooth sawfish, particularly YOY (measuring less than 39.4 in [100 cm in length), use these areas as both refuge from predators and forage grounds, taking advantage of the large number of fish and invertebrates found there.

Tracking data from the Caloosahatchee River in Florida indicate very shallow depths and specific salinity ranges are important abiotic factors influencing juvenile smalltooth sawfish movement patterns, habitat use, and distribution (Simpfendorfer et al. 2011). An acoustic tagging study in a developed region of Charlotte Harbor, Florida, identified the importance of mangroves in close proximity to shallow-water habitat for juvenile smalltooth sawfish, stating that juveniles generally occur in shallow water within 328 ft (100 m) of mangrove shorelines (Simpfendorfer et al. 2010). Juvenile smalltooth sawfish spend the majority of their time in waters shallower than 13 ft (4 m) deep (Simpfendorfer et al. 2010) and are seldom found deeper than 32 ft (10 m) (Poulakis and Seitz 2004). Simpfendorfer et al. (2010) also indicated the following developmental differences in habitat use: the smallest YOY juveniles generally used water shallower than 1.6 ft (0.5 m), had small home ranges, 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 undergo small movements coinciding with changing tidal stages. These movements often involve moving from shallow sandbars at low tide and among 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 and eventually reach sexual maturity.

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 capture rates during random sampling events within the estuary (Poulakis 2012; Poulakis et al. 2011). The areas, which were termed “hotspots” in Poulakis et al. (2011), correspond with areas where public encounters are most frequently reported. Use of these “hotspots” can be variable within and among years based on the amount and timing of freshwater inflow. Smalltooth sawfish use “hotspots” further upriver during drought (i.e., high salinity) conditions 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 (e.g., presence or absence of predators and prey) or abiotic factors (e.g., flow rate, water temperature, etc.) influence this habitat selection. Still, they believe a variety of conditions in addition to salinity, such as temperature, dissolved oxygen, water depth, shoreline vegetation, and food availability, may influence smalltooth sawfish habitat selection (Poulakis et al. 2011).

Status and Threats to Critical Habitat

Modification and loss of smalltooth sawfish critical habitat is an ongoing threat contributing to the current status 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 (South Atlantic Fishery Management Council 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; USFWS 1999). Since then, rates of loss have decreased even though habitat loss continues. Between 1998 and 2004, approximately 2,450 ac (3.8 mi^2) of intertidal wetlands consisting of mangroves or other estuarine shrubs were lost along the Atlantic and Gulf coasts of the United States (Stedman and Dahl 2008). In another study, Orlando Jr. et al. (1994) analyzed 18 major southeastern estuaries and recorded over 703 mi (1,131 km) of navigation channels and 9,844 mi (15,842 km) of shoreline with modifications. Additionally, changes to the natural freshwater flows into estuarine and marine waters through construction of canals and other water-control devices have altered the temperature, salinity, and nutrient regimes, reduced both wetlands and SAV coverage, and degraded vast areas of coastal habitat utilized by smalltooth sawfish (Gilmore 1995; Quigley and Flannery 2002; Reddering 1988; Whitfield and Bruton 1989). Juvenile sawfish and their critical habitat are particularly vulnerable to these kinds of habitat losses or alterations due to the juveniles' affinity for (and developmental need of) shallow, estuarine systems. 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 in the future.

In Florida, coastal development often involves the removal of mangroves, the armoring of shorelines through seawall construction, and the dredging of canals. This is especially apparent in master plan communities such as Cape Coral and Punta Gorda, which are located within the Charlotte Harbor Estuary. These communities were created through dredge-and-fill projects to increase the amount of waterfront property available for development, but in doing so, developers removed the majority of red mangrove habitat from the area. The canals created by these communities require periodic dredging for boat access, further affecting the shallow, euryhaline essential feature of critical habitat. Development continues along the shorelines of Charlotte Harbor in the form of docks, boat ramps, shoreline armoring, utility projects, and navigation channel dredging.

To protect critical habitat, federal agencies must ensure that their activities are not likely to result in the destruction or adverse modification of the physical and biological features that are essential to the conservation of sawfish, or the species' ability to access and use these features (ESA Section 7(a)(2); see also 50 CFR 424.12(b) [discussing essential features]). Therefore, proposed actions that may impact critical habitat require an analysis of potential impacts to each essential feature. As mentioned previously, there are 2 essential features of smalltooth sawfish critical habitat: (1) red mangroves; and (2) shallow, euryhaline habitats characterized by water depths between the MHW line and 3 ft (0.9 m) measured at MLLW. The USACE oversees the permitting process for residential and commercial marine development in the CHEU. The Florida Department of Environmental Protection (FDEP) and their designated authorities also regulate mangrove removal in Florida. All red mangrove removal permit requests within

smalltooth sawfish critical habitat necessitate ESA Section 7 consultation. NMFS Protected Resources Division tracks the loss of these essential features of smalltooth sawfish critical habitat.

Threats to Critical Habitat

Dock and Boat Ramp Construction

The USACE recommends that applicants construct docks in accordance with the NMFS-USACE *Dock Construction Guidelines in Florida for Docks or Other Minor Structures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh, or Mangrove Habitat* ("Dock Construction Guidelines") when possible. The current dock construction guidelines allow for some amount of mangrove removal; however, it is typically restricted to either (1) trimming to facilitate a dock, or (2) complete removal up to the width of the dock extending toward open water, which the guidelines define as a width of 4 ft.

Installation or replacement of boat ramps is often part of larger projects such as marinas, bridge approaches, and causeways where natural and previously created deepwater habitat access channels already exist. Boat ramps can result in the permanent loss of both the red mangrove and the shallow, euryhaline habitat features of critical habitat for smalltooth sawfish.

Marina Construction

Marinas have the potential to adversely affect aquatic habitats. Marinas are typically designed to be deeper than 3 ft MLLW to accommodate vessel traffic; therefore, most existing marinas lacking essential features are unlikely to function as critical habitat for smalltooth sawfish. The expansion of existing marinas and creation of new marinas can result in the permanent loss of large areas of this nursery habitat.

Bulkhead and Seawall Construction

Bulkheads and other shoreline stabilization structures are used to protect adjacent shorelines from wave and current action and to enhance water access. These projects may adversely impact critical habitat for smalltooth sawfish by removal of the essential features through direct filling and dredging to construct vertical or riprap seawalls. Generally, vegetation plantings, sloping riprap, or gabions are environmentally-preferred shoreline stabilization methods instead of vertical seawalls because they provide better quality fish and wildlife habitat. Nevertheless, placement of riprap material removes more of the shallow euryhaline essential feature than a vertical seawall. Also, many seawalls built along unconsolidated shorelines require the removal of red mangroves to accommodate the seawalls.

Cable, Pipeline, and Transmission Line Construction

While not as common as other activities, excavation of submerged lands is sometimes required for installing cables, pipelines, and transmission lines. Construction may also require temporary or permanent filling of submerged habitats. Open-cut trenching and installation of aerial

transmission line footers are activities that have the ability to temporarily or permanently impact critical habitat for smalltooth sawfish.

Transportation Infrastructure Construction

Potential adverse effects from federal transportation projects in smalltooth sawfish critical habitat (CHEU) include operations of the Federal Highway Administration, USACE, and the Federal Emergency Management Agency. Construction of road improvement projects typically follow the existing alignments and expand to compensate for the increase in public use. Transportation projects may impact critical habitat for smalltooth sawfish through installation of bridge footers, fenders, piles, and abutment armoring, or through removal of existing bridge materials by blasting or mechanical efforts.

Dredging

Riverine, nearshore, and offshore areas are dredged for navigation, construction of infrastructure, and marine mining. An analysis of 18 major southeastern estuaries conducted in 1993-1994 demonstrated that over 7,000 km of navigation channels have already been dredged (Orlando Jr. et al. 1994). Habitat effects of dredging include the loss of submerged habitats by disposal of excavated materials, turbidity and siltation effects, contaminant release, alteration of hydrodynamic regimes, and fragmentation of physical habitats (Gulf of Mexico Fishery Management Council 1998; Gulf of Mexico Fishery Management Council 2005; South Atlantic Fishery Management Council 1998). In the CHEU, dredging to maintain canals and channels constructed prior to the critical habitat designation, limits the amount of available shallow, euryhaline essential feature to the edges of waterways and these dredging activities can disturb juveniles that are using these areas. At the time of critical habitat designation, many previously dredged channels and canals existed within the boundaries of the critical habitat units; however, we are unsure which of those contained the shallow-water essential feature at that time. It is likely that many of these channels and canals were originally dredged deeper than 3 ft MLLW, but they have since shoaled in and now contain the essential feature of shallow, euryhaline habitat. Therefore, maintenance dredging impacts are counted as a loss to this essential feature, even though the areas may or may not have contained the essential feature at time of designation (see Figure 4, Diagrams A and B).

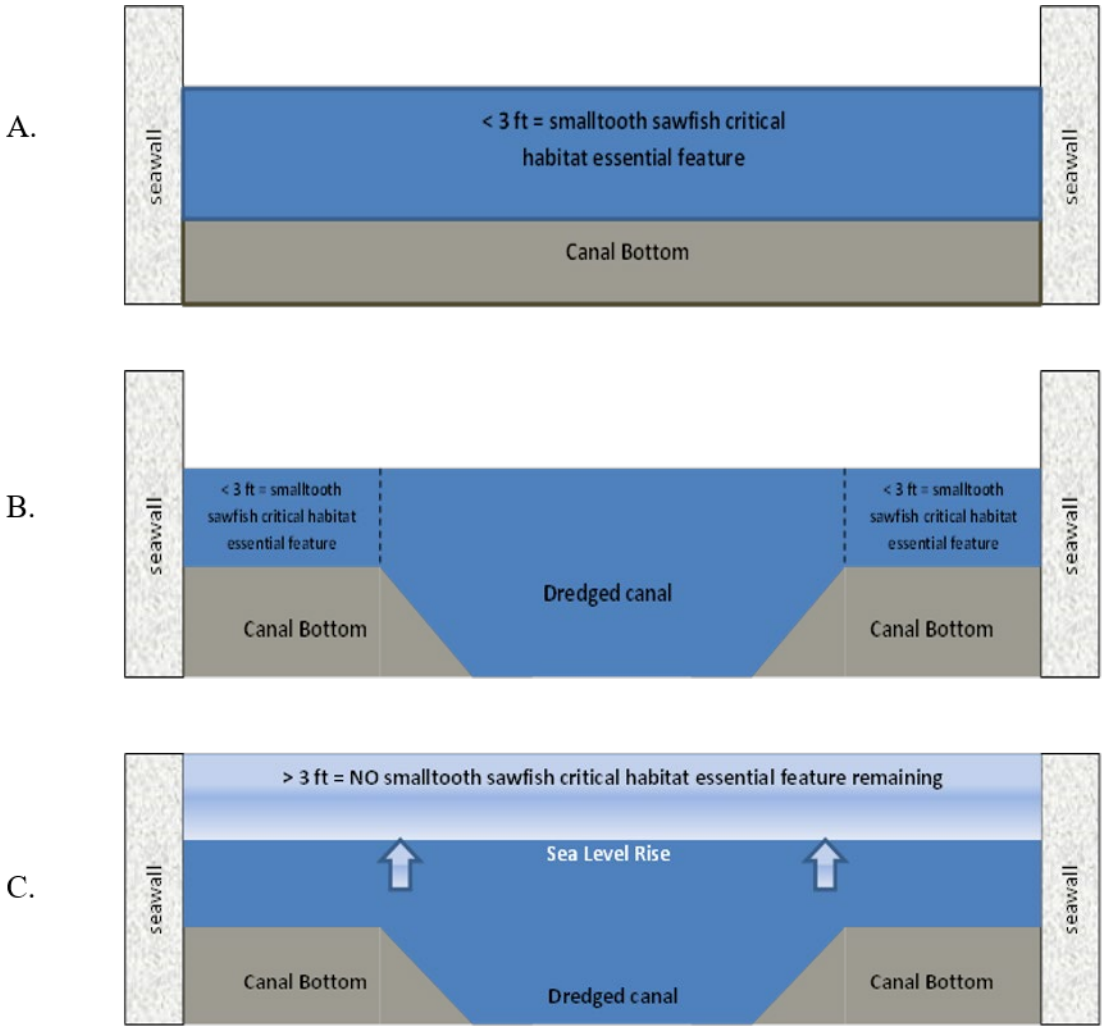

Figure 4. Diagram A depicts a cross section of a historically dredged channel/canal within the boundaries of the critical habitat units that has not been maintained. Diagram B depicts the typical cross section of a maintenance-dredged channel/canal. Diagram C depicts a cross section of a maintained dredged channel/canal after sea level rise of > 1 ft.

Construction, Operations and Maintenance of Impoundments and Other Water Level Controls

Federal agencies such as the USACE have historically been involved in large water control projects in Florida. Agencies sometimes propose impounding rivers and tributaries for such purposes as flood control, salt water intrusion prevention, or creation of industrial, municipal, and agricultural water supplies. Projects to repair or replace water control structures may affect smalltooth sawfish critical habitat by limiting sufficient freshwater discharge, which could alter the salinity of estuaries. The ability of an estuary to function as a nursery depends upon the quantity, timing, and input location of freshwater inflows (Garmestani and Percival 2005; Norton et al. 2012; USEPA 1994). Estuarine ecosystems are vulnerable to the following man-made disturbances: (1) decreases in seasonal inflow caused by the removal of freshwater upstream for agricultural, industrial, and domestic purposes; (2) contamination by industrial and sewage discharges; (3) agricultural runoff carrying pesticides, herbicides, and other toxic pollutants; and (4) eutrophication (e.g., influx of nutrients such as nitrates and phosphates most often from

fertilizer runoff and sewage) caused by excessive nutrient inputs from a variety of nonpoint and point sources. Additionally, rivers and their tributaries are susceptible to natural disturbances, such as floods and droughts, whose effects can be exacerbated by these man-made disturbances.

As stated above, smalltooth sawfish show an affinity for a particular salinity range, moving downriver during wetter months and upriver during drier months to remain within that range (Simpfendorfer et al. 2011). Therefore, water management decisions that affect salinity regimes may impact the functionality of critical habitat. This may result in smalltooth sawfish following specific salinity gradients into less advantageous habitats (e.g., areas with less shallow-water or red mangrove habitat). Furthermore, large changes in water flow over short durations would likely escalate movement patterns for smalltooth sawfish, thereby increasing predation risk and energy output. Researchers are currently looking into the effects of large-scale freshwater discharges on smalltooth sawfish and their designated critical habitat. The most vulnerable portion of the juvenile sawfish population to water-management outfall projects appears to be smalltooth sawfish in their first year of life. Newborn smalltooth sawfish remain in smaller areas irrespective of salinity, which potentially exposes them to greater osmotic stress (a sudden change in the solute concentration around a cell, causing a rapid change in the movement of water across its cell membrane), and impacts the nursery functions of sawfish critical habitat (Poulakis et al. 2013; Simpfendorfer et al. 2011).

Climate Change Threats

The IPCC has stated that global climate change is unequivocal and its impacts to coastal resources may be significant (Intergovernmental Panel on Climate Change 2007). There is a large and growing body of literature on past, present, and future impacts of global climate change induced by human activities (i.e., global warming mostly driven by the burning of fossil fuels). The latest report by the Intergovernmental Panel on Climate Change (2013) is more explicit, stating that, "science now shows with 95% certainty that human activity is the dominant cause of observed warming since the mid-twentieth century." Some of the anticipated outcomes are sea level rise, increased frequency of severe weather events, and changes in air and water temperatures. NOAA's climate change web portal provides information on the climate-related variability and changes that are exacerbated by human activities (http://www.climate.gov/#understandingClimate).

Though the impacts on smalltooth sawfish cannot, for the most part, be predicted with any degree of certainty, we can project some effects to sawfish critical habitat. We know that both essential features (red mangroves and shallow, euryhaline waters less than 3 ft deep at MLLW will be impacted by climate change. Sea level rise is expected to exceed 3.3 ft (1 m) globally by 2100, according to the most recent publications, exceeding the estimates of the Fourth Assessment of the IPCC (Meehl et al. 2007; Pfeffer et al. 2008; Rahmstorf et al. 2007). Mean sea level rise projections have increased since the Fourth Assessment because of the improved physical understanding of the components of sea level, the improved agreement of process-based models with observations, and the inclusion of ice-sheet dynamical changes (Intergovernmental Panel on Climate Change 2013). A 1-m sea level rise in the state of Florida is within the range of recent estimates by 2080 (Pfeffer et al. 2008; Rahmstorf et al. 2007).

Sea level increases would affect the shallow-water essential feature of smalltooth sawfish critical habitat within the CHEU. A 2010 climate change study by the Massachusetts Institute of Technology (MIT) forecasted sea level rise in a study area with significant overlap with the CHEU (Vargas-Moreno and Flaxman 2010). The study investigated possible trajectories of future transformation in Florida's Greater Everglades landscape relative to 4 main drivers: climate change, shifts in planning approaches and regulations, population change, and variations in financial resources. MIT used (Intergovernmental Panel on Climate Change 2007) sea level modeling data to forecast a range of sea level rise trajectories from low, to moderate, to high predictions (Figure 5). The effects of sea level rise on available shallow-water habitat for smalltooth sawfish would be exacerbated in areas where there is shoreline armoring (e.g., seawalls). This is especially true in canals where the centerlines are maintenance-dredged deeper than 3 ft (0.9 m) for boat accessibility. In these areas, the areas that currently contain the essential feature depth (less than 3 ft at MLLW) will be reduced along the edges of the canals as sea level rises (see previous Figure 4, Diagram C).

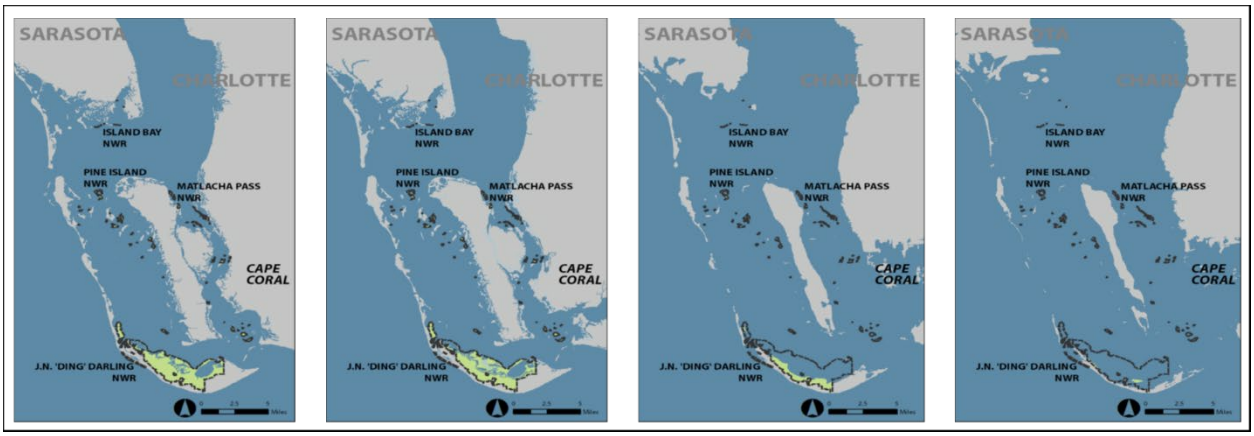

Figure 5. From left to right: current shoreline, + 3.5 in (+ 9 cm); + 18.5 in (+ 47 cm); and + 38.97 in (+ 99 cm) sea level rise by 2060. Adapted from Vargas-Moreno, J. C., and M. Flaxman. 2010. Addressing the challenges of climate change in the greater everglades landscape. Massachusetts Institute of Technology, Deparment of Urban Studies and Planning. Project Sheet November, 2010, Cambridge, MA.

Along the Gulf Coast of Florida, and south Florida in particular, rises in sea level will impact mangrove resources. As sea levels rise, mangroves will be forced landward in order to remain at a preferred water inundation level and sediment surface elevation, which is necessary for successful growth. This retreat landward will not keep pace with conservative projected rates of elevation in sea level (Gilman et al. 2008). This forced landward progression poses the greatest threat to mangroves in areas where there is limited or no room for landward or lateral migration (Semeniuk 1994). Such is the case in areas of the CHEU where landward mangrove growth is restricted by shoreline armoring and coastal development. This man-made barrier will prohibit mangroves from moving landward and will result in the loss of the mangrove essential feature.

Other threats to mangroves result from climate change: fluctuations in precipitation amounts and distribution, seawater temperature, carbon dioxide (CO_2) levels, and damage to mangroves from increasingly severe storms and hurricanes (McLeod and Salm 2006). A 25% increase in precipitation globally is predicted by 2050 (McLeod and Salm 2006), but the specific geographic

distribution will vary, leading to increases and decreases in precipitation at the regional level. Changes in precipitation patterns caused by climate change may adversely affect the growth of mangroves and their distribution (Field 1995; Snedaker 1995). Decreases in precipitation will increase salinity and inhibit mangrove productivity, growth, seedling survival, and spatial coverage (Burchett et al. 1984). Decreases in precipitation may also change mangrove species composition, favoring more salt-tolerant types (Ellison 2010). Increases in precipitation may benefit some species of mangroves, increasing spatial coverage and allowing them to out-compete other salt marsh vegetation (Harty 2004). Even so, potential mangrove expansion requires suitable habitat for mangroves to increase their range, which depends to a great extent on patterns and intensity of coastal development (i.e., bulkhead and seawall construction).

Seawater temperature changes will have potential adverse effects on mangroves as well. Many species of mangroves show an optimal shoot density in sediment temperatures between 59-77 degrees Fahrenheit (°F) (15-25 °C) (Hutchings and Saenger 1987). Yet, at temperatures between 77-95°F (25-35°C), many species begin to show a decline in leaf structure and root and leaf formation rates (Saenger and Moverley 1985). Temperatures above 95°F lead to adverse effects on root structure and survivability of seedlings (UNESCO 1991) and temperatures above 100.4°F (38°C) lead to a cessation of photosynthesis and mangrove mortality (Andrews et al. 1984). Although impossible to forecast precisely, sea surface ocean temperatures are predicted to increase 1.8-3.6°F (1-2°C) by 2060 (Chapter 11 (Intergovernmental Panel on Climate Change 2013)), which will in turn impact underlying sediment temperatures along the coast. If mangroves shift pole-ward in response to temperature increases, they will at some point be limited by temperatures at the lower end of their optimal range and available recruitment area. This is especially true when considering already armored shorelines in residential communities such as those within and surrounding the CHEU of critical habitat for smalltooth sawfish.

As atmospheric CO_2 levels increase, mostly resulting from manmade causes (e.g., burning of fossil fuels), the world's oceans will absorb much of this CO_2, causing potential increases in photosynthesis and mangrove growth rates. This increase in growth rate, however, would be limited by lower salinities expected from CO_2 absorption in the oceans (Ball et al. 1997), and by the availability of undeveloped coastline for mangroves to expand their range. A secondary effect of increased CO_2 concentrations in the oceans is the deleterious effect on coral reefs' ability to absorb calcium carbonate (Hoegh-Guldberg et al. 2007), and subsequent reef erosion. Eroded reefs may not be able to buffer mangrove habitats from waves, especially during storm/hurricane events, causing additional physical effects.

Finally, the anticipated increase in the severity of storms and hurricanes may also impact mangroves. Tropical storms are expected to increase in intensity and/or frequency, which will directly impact existing mangroves that are already adversely impacted by increased seawater temperatures, CO_2, and changes in precipitation (Cahoon et al. 2003; Trenberth 2005). The combination of all of these factors may lead to reduced mangrove height (Ning et al. 2003). Further, intense storms could result in more severe storm surges and lead to potential changes in mangrove community composition, mortality, and recruitment (Gilman et al. 2006). Increased storm surges and flooding events could also affect mangroves' ability to photosynthesize (Gilman et al. 2006) and the oxygen concentrations in the mangrove lenticels (Ellison 2010).

5 ENVIRONMENTAL BASELINE

5.1 Overview

This section describes the effects of past and ongoing human and natural factors contributing to the current status of smalltooth sawfish, their habitats (including designated critical habitat), and ecosystem within the action area without the additional effects of the proposed action. In the case of ongoing actions, this section includes the effects that may contribute to the projected future status of the species, their habitats, and ecosystem. The environmental baseline describes the species' and critical habitat's health based on information available at the time of the consultation.

By regulation, the environmental baseline for an Opinion refers to the condition of the listed species or its designated critical habitat 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 listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR 402.02).

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 areas of critical habitat that occur in an action area, that will be exposed to effects from the action under consultation. This focus is important because, in some states or life history stages, or areas of their ranges, or critical habitat features 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.

5.2 Baseline Status of Critical Habitat Considered for Further Analysis

As stated in Section 2.2 (Action Area), the proposed action is located within the boundaries of the CHEU of smalltooth sawfish designated critical habitat located at 26.9720167ºN and 82.032762ºW (NAD 83) in Port Charlotte, Charlotte County, Florida. The project site is an existing box culvert bridge that crosses an unnamed salt creek connected to the Peace River. Water depths at the project site are approximately 4 ft at MLLW. The action area is void of corals or SAV. The project is expected to have direct impacts to 62 lin ft of red mangrove shoreline that lies within the boundary of smalltooth sawfish designated critical habitat.

The status of this species' critical habitat in the action area is supported by the species' critical habitat account in Section 4.

5.3 Additional Factors Affecting the Baseline Status of Critical Habitat Considered for Further Analysis

5.3.1 Federal Actions

We have consulted on several USACE shoreline stabilization in and around the greater residential canal system adjacent to where the project is located since the effective date of critical habitat designation (i.e., October 2, 2009). However, other than the proposed action, only 2 other federal actions (SERO-2018-02209 and SERO-2019-00231) are known to have occurred or have had effects to smalltooth sawfish designated critical habitat within the action area, as per a review of our Protected Resources Division's completed consultation database by the consulting biologist on February 22, 2024.

5.3.2 State and Private Actions

Examples of nonfederal activities that may adversely affect designated critical habitat for smalltooth sawfish in the action area include residential in-water activities that do not require federal permits or otherwise have a federal nexus. The direct and indirect impacts from these activities are difficult to quantify but may include loss or degradation of red mangroves or shallow, euryhaline habitat from unauthorized mangrove trimming, shoreline stabilization, or in-water construction. NMFS does not have any knowledge of state or private actions occurring in the action area that would not also require a federal permit; the likelihood of a project occurring in the action area that does not require a federal permit for in-water construction work is very small. Where possible, conservation actions in ESA Section 10 permits, ESA Section 6 cooperative agreements, and state permitting programs are being implemented or investigated to monitor or study impacts from these sources.

5.3.3 Habitat Modification and Degradation

Smalltooth sawfish habitat, in general, and designated critical habitat, specifically, have been degraded or modified throughout the southeastern U.S. from agriculture, urban development, commercial activities, channel dredging, boating activities, and the diversion of freshwater runoff. The habitat within the CHEU will likely continue to experience the same types of actions described in Section 4 (Status of Critical Habitat Considered for Further Analysis).

5.3.4 Stochastic Events

Seasonal stochastic events, such as hurricanes, are common throughout the range of smalltooth sawfish, especially in the current core of its range (i.e., south and southwest Florida). These events are by nature unpredictable and their effect on the survival and recovery of the species and on critical habitat are unknown; however, they have the potential to impede the survival and recovery directly if animals die as a result of them, or indirectly if habitat, especially critical habitat, is damaged as a result of these disturbances. Hurricane Ian likely damaged habitat, including mangroves, in and around the action area in 2022.

5.3.5 Climate Change

Many threats to smalltooth sawfish critical habitat are expected to be exacerbated by the effects of global climate change. Potential increases in sea level may impact the availability of nursery habitat, particularly shallow, euryhaline habitat and red mangrove lined, low-lying coastal shorelines (Intergovernmental Panel on Climate Change 2014; Wanless et al. 2005). For example, nursery habitat could be negatively affected by increased temperatures, salinities, and acidification of coastal waters (Snedaker 1995), (Wanless et al. 2005), (Scavia et al. 2002), as well as increased runoff and erosion due to the expected increase in extreme storm events (Intergovernmental Panel on Climate Change 2014; Wanless et al. 2005). These alterations of the marine environment due to global climate change could affect the distribution of shallow, euryhaline habitat, which would ultimately affect the distribution, physiology, and growth rates of red mangroves. These alterations could potentially eliminate red mangroves from particular areas. The magnitude of the effects of global climate change on smalltooth sawfish critical habitat are difficult to predict, yet, when combined with the cyclical loss of habitat from extreme storm events, a decrease in the red mangrove essential feature of smalltooth sawfish critical habitat is likely (Norton et al. 2012; Scavia et al. 2002). However, the proposed action is of such a small scale, scope, and limited period that it is not very likely to contribute to, or be affected cumulatively by, climate change.

5.3.6 Conservation and Recovery Actions Shaping the Environmental Baseline

Federal EFH consultation requirements pursuant to the MSA can minimize and mitigate for losses of wetland and preserve valuable foraging and developmental habitat that is used by juvenile smalltooth sawfish, including areas that have been designated as smalltooth sawfish critical habitat. NMFS has designated mangrove and estuarine habitats as EFH as recommended by the Gulf of Mexico Fishery Management Council. Both essential features are critical components of areas designated as EFH and receive a basic level of protection under the MSA to the extent that the MSA requires minimization of impacts to EFH resources.

6 EFFECTS OF THE ACTION

6.1 Overview

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 the effect would not occur but for the proposed action and the effect 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).

In this section of our Opinion, we assess the effects of the action on critical habitat that are likely to be adversely affected. The analysis in this section forms the foundation for our destruction or adverse modification analysis in Section 8. The quantitative and qualitative analyses in this section are based upon the best available commercial and scientific data on species biology and the effects of the action. Data are limited, so we are often forced to make assumptions to

overcome the limits in our knowledge. Sometimes, the best available information may include a range of values for a particular aspect under consideration, or different analytical approaches may be applied to the same data set. In those cases, the uncertainty is resolved in favor of the species. NMFS generally selects the value that would lead to conclusions of higher, rather than lower risk to endangered or threatened species.

6.2 Effects of the Proposed Action on Critical Habitat Considered for Further Analysis

The proposed action area is within the boundary of the CHEU of critical habitat for smalltooth sawfish. The following essential features are present in the CHEU: (1) red mangroves, and (2) shallow, euryhaline habitats characterized by water depths between the MHW line and 3 ft (0.9 m) measured at MLLW (Final Rule, 74 FR 45353).

We believe the proposed action may affect the red mangrove essential feature of smalltooth sawfish critical habitat as outlined below. Some of those pathways are not likely to adversely affect the critical habitat and some are likely to result in adverse effects. We describe these routes of effect and the consequences to the red mangrove essential feature of smalltooth sawfish critical habitat in the following sections.

We believe that the project will have no effect on the shallow, euryhaline habitats essential feature (characterized by water depths between MHW line and 3 ft (0.9 m) measured at MLLW). None of the project effects will alter water depths or change the salinity regime within the project area. At present, water depths reported at the culvert replacement location are 4 ft at MLLW, which exceeds the 3 ft limit of the shallow, euryhaline essential feature.

6.2.1 Routes of Effect that Are Likely to Adversely Affect Critical Habitat

We believe the proposed action is likely to adversely affect smalltooth sawfish designated critical habitat due to the permanent removal of 62 lin ft of the red mangrove essential feature, which provides forage, shelter, or other nursery habitat functions for juvenile smalltooth sawfish. Typically, USACE reports project effects to red mangroves in both linear feet (denoting the amount of shoreline) and square feet (denoting the magnitude of the area). We use linear feet when calculating and tracking losses to the red mangrove essential feature of critical habitat. During the development of the smalltooth sawfish recovery plan (NMFS 2009), we estimated the amount of red mangrove shoreline in linear feet because we assumed that juvenile smalltooth sawfish were typically only able to access the waterward edges of red mangrove stands. Therefore, in the analyses below, losses to red mangroves will be reported in linear feet only. Using remote sensing data acquired from the FWC FWRI, we were able to compile information relating to the total area of this essential feature within smalltooth sawfish critical habitat. Based on that information, we estimated that the total amount of red mangrove shoreline in the CHEU at the effective date of species listing (May 1, 2003) was approximately 5,512,320 lin ft. While the available red mangrove essential feature in the CHEU will be diminished, the proposed action is not severing or preventing juvenile smalltooth sawfish access to alternate habitat with this essential feature in the surrounding area. Still, some ecological function provided to juvenile smalltooth sawfish in terms of the red mangrove essential feature will be lost; therefore, we believe the project is likely to adversely affect critical habitat in the CHEU.

7 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 or private actions, not involving federal activities, that are reasonably certain to occur within the action area considered in this Opinion (50 CFR 402.02). NMFS is not aware of any future projects that may contribute to cumulative effects. Within the action area, the ongoing activities and processes described in the environmental baseline are expected to continue and NMFS did not identify any additional sources of potential cumulative effect. Although the present human uses of the action area are expected to continue, some may occur at increased levels, frequency, or intensity in the near future as described in the environmental baseline.

8 DESTRUCTION OR ADVERSE MODIFICATION ANALYSIS

NMFS's regulations define *destruction or adverse modification* to mean "a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species" (50 CFR 402.02). Alterations that may destroy or adversely modify critical habitat may include impacts to the area itself, such as those that would impede access to or use of the essential features. NMFS will generally conclude that a federal action is likely to "destroy or adversely modify" critical habitat if the action results in an alteration of the quantity or quality of the essential physical or biological features of critical habitat and if the effect of the alteration is to appreciably diminish the value of critical habitat as a whole for the conservation of the species.

This analysis takes into account the geographic and temporal scope of the proposed action, recognizing that "functionality" of critical habitat necessarily means that the critical habitat must now and must continue in the future to support the conservation of the species and progress toward recovery. The analysis takes into account any changes in amount, distribution, or characteristics of the critical habitat that will be required over time to support the successful recovery of the species. Destruction or adverse modification does not depend strictly on the size or proportion of the area adversely affected, but rather on the role the action area and the affected critical habitat serves with regard to the function of the overall critical habitat designation, and how that role is affected by the action.

8.1 Protect and Restore Smalltooth Sawfish Habitat (Recovery Objective #2)

In establishing Recovery Objective #2, we recognized that recovery and conservation of smalltooth sawfish depends on the availability and quality of nursery habitats. Historically, juvenile sawfish were documented in mangrove and non-mangrove habitat in the southeastern United States. Due to the protections provided by the Ten Thousand Islands National Wildlife Refuge, Everglades National Park, and the Florida Keys National Marine Sanctuary, much of the historic juvenile smalltooth sawfish habitat in southwest Florida has remained high-quality juvenile habitat. Recovery Regions G, H, and I in southwest Florida extend from the Manatee River on the west coast of Florida, south through Everglades National Park and the Florida Keys to Caesar Creek on the southeast coast of Florida. The CHEU is in Recovery Region G. While

much of the CHEU is protected by the CHPSP system and the Estero Bay Aquatic Preserve, it is also highly anthropomorphically influenced.

The recovery plan states that for the 3 recovery regions with remaining high-quality habitats (i.e., Recovery Regions G, H, and I), juvenile habitats "must be maintained over the long term at or above 95% of the acreage available at the time of listing" (NMFS, 2009). To ensure that a proposed action will not impede Recovery Objective #2, we determine whether the critical habitat unit will be able to maintain 95% of the areas containing each essential feature after taking into account project impacts in the context of the status of the critical habitat, the environmental baseline, and cumulative effects. While the CHEU is only a part of the larger Recovery Region G, and the 95% protection threshold applies across not just Recovery Region G, but also Recovery Regions H and I, the threshold is still useful for evaluating the impacts at the individual recovery region level and for sub-units of the recovery regions. The CHEU contains the only known nursery areas within Recovery Region G; thus, we believe it is appropriate to evaluate impacts at the level of the unit. In addition, functioning critical habitat contains either one or both of the essential features, and the essential features were selected based on their role in facilitating recruitment of juvenile animals into the adult population, which the recovery plan likewise seeks to conserve and protect. Consequently, we also believe it is appropriate to consider whether 95% of each of the essential features of critical habitat in the CHEU is maintained. Therefore, below we estimate the percent impact the proposed action will have on the red mangrove habitat essential feature in the CHEU. As stated above, the proposed action will not affect the shallow, euryhaline essential feature of smalltooth sawfish critical habitat.

8.1.1 Red Mangrove Essential Feature Impacts

Remote sensing data from FWC FWRI indicated that approximately 5,512,320 lin feet of red mangrove shoreline (abbreviated RM throughout this section) was available in the CHEU at the effective date of species listing (i.e., May 1, 2003) (**Table 4**, Line 1). As described above, we must determine whether project impacts will interfere with long-term maintenance of this essential feature at or above 95% of the linear feet of habitat available at the time of listing; however, loss of critical habitat was not formally monitored until the effective date of critical habitat designation (i.e., October 2, 2009). Therefore, we must estimate habitat loss that occurred during the period between the effective date of species listing and the effective date of critical habitat designation (i.e., May 1, 2003 – October 2, 2009).

To do this, we use an 84-month dataset of our completed Section 7 consultations (October 3, 2009 – September 30, 2016), including yearly losses due to programmatic consultations, to generate a rate of loss that can then be used to back-calculate the loss of RM between the effective date of species listing and the effective date of critical habitat designation. We rely on this dataset because using approximately 7 years of information helps avoid over- or under-estimating the rate of habitat loss due to any potential inter-annual variability associated with economic growth and contraction that may have occurred in that time. Our consultations completed during this time indicate that 9,142.50 lin ft of RM in CHEU was lost due to federal agency actions.

Based on these losses, we estimate a monthly loss rate of RM using the following equation:

$$\begin{gathered} Monthly\ loss\ rate\ of\ RM\ (CHEU) \\ = RM\ lost\ through\ federal\ agency\ actions \div 84\ months \\ = 9{,}142.50\ lin\ ft \div 84\ months \\ = 108.84\ lin\ ft\ per\ month \end{gathered}$$

Assuming the same monthly loss rates, we back-calculate the loss of RM in the 77 months between the effective date of species listing and the effective date of critical habitat designation (i.e., May 1, 2003 – October 2, 2009) in the CHEU using the following equation:

$$\begin{gathered} RM\ loss\ prior\ to\ critical\ habitat\ designation\ (CHEU) \\ = 108.84\ lin\ ft\ per\ month \times 77\ months \\ = 8{,}380.68\ lin\ ft \end{gathered}$$

Next, we determine the loss of RM since the effective date of critical habitat designation. Due to the high frequency of relatively small projects affecting smalltooth sawfish critical habitat, we update the losses to the red mangrove essential feature from federal actions every 12 months (i.e., July 1). From the effective date of critical habitat designation through June 30, 2023, 28,650.17 lin ft of RM in the CHEU has been lost due to federal agency actions (**Table 4**, Line 3). While this amount of loss only takes into account projects with a federal nexus requiring ESA Section 7 consultation, there are very few projects without a federal nexus that could affect red mangrove shoreline in the CHEU, as most in-water construction projects require federal authorization.

Using this information, we calculate the RM currently available in the CHEU using the following equation:

$$\begin{gathered} RM\ currently\ available\ (CHEU) \\ = RM\ at\ time\ of\ species\ listing - (RM\ loss\ prior\ to\ critical\ habitat\ designation \\ + RM\ loss\ since\ critical\ habitat\ designation) \\ = 5{,}512{,}320\ lin\ ft - (8{,}380.68\ lin\ ft + 28{,}650.17 lin\ ft) \\ = 5{,}475{,}289.15\ lin\ ft \end{gathered}$$

We calculate the amount of RM that must be maintained in the CHEU using the following equation:

$$\begin{gathered} RM\ that\ must\ be\ maintained\ (CHEU) \\ = RM\ at\ time\ of\ species\ listing \times 95\% \\ = 5{,}512{,}320\ lin\ ft \times 0.95 \\ = 5{,}236{,}704\ lin\ ft \end{gathered}$$

The proposed action would result in the loss of 62 lin ft of RM (**Table 4**, Line 6). Using the above results, we estimate the total amount of RM lost in the CHEU since species listing, including losses from the proposed action using the following equation:

$$\%\ RM\ lost\ in\ CHEU\ since\ species\ listing$$
$$= [(RM\ loss\ due\ to\ this\ project + \ RM\ lost\ prior\ to\ critical\ habitat\ designation + RM\ lost\ since\ critical\ habitat\ designation) \div Total\ RM\ in\ CHEU\ at\ time\ of\ species\ listing] \times 100$$
$$= [62\ lin\ ft + 8{,}380.68\ lin\ ft + 28{,}650.17\ lin\ ft) \div 5{,}512{,}320\ lin\ ft] \times 100$$
$$= (37{,}092.85\ lin\ ft\ \div 5{,}512{,}320\ lin\ ft) \times 100$$
$$= 0.6729\%$$

Thus, we estimate the percent of RM remaining within the CHEU as:

$$\%\ RM\ remaining\ (CHEU)$$
$$= 100\% - \%\ RM\ lost\ since\ species\ listing\ (CHEU)$$
$$= 100\% - 0.6729\%$$
$$= 99.3271\%$$

Table 4. Summary of Impacts to the Red Mangrove Essential Feature

Red Mangrove Shoreline in the CHEU	Linear Feet
1. Available at the time of species listing	5,512,320
2. Losses prior to critical habitat designation	8,380.68
3. Losses since critical habitat designation	28,650.17
4. Available as of July 1, 2023	5,475,289.15
5. Linear feet that must be maintained per Recovery Plan	5,236,704 (95% of 5,512,320)
6. Affected by the proposed action	62
7. Affected since species listing (including the proposed action)	37,092.85 (0.6729% of 5,512,320)
8. Remaining	5,475,227.2 (99.3271% of 5,512,320)

1.1.1 Summary of Impacts to the Essential Features

Very small percentages of the essential features of smalltooth sawfish designated critical habitat have been affected by federal agency actions since the effective date of species listing. Including losses from the proposed action, 99.3271% of the RM essential feature available at the time of species listing remain in the CHEU. Thus, the loss of the RM essential feature associated with the proposed action, in combination with losses since we listed the species, does not provide any impediment to effectively protecting 95% of juvenile habitat in the CHEU available at the effective date of species listing, and therefore will not be an impediment to Recovery Objective #2.

8.1.2 Ensure Smalltooth Sawfish Abundance Increases (Recovery Objective #3)

In establishing Recovery Objective #3, we recognized that it was important that sufficient numbers of juvenile 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. To meet this objective, Recovery Region G (i.e., CHEU) must support sufficiently large numbers of juvenile sawfish to ensure that the species is viable in the long-term and can maintain genetic diversity. Recovery Objective #3 requires that the relative abundance of small juvenile sawfish (< 200 cm) either increases at an average annual rate of at least 5% over a 27-year period, or juvenile abundance is at greater than 80% of the carrying capacity of the recovery region.

Assessing the effect of the proposed action on small juvenile abundance is made difficult by the state of available data. Since the designation of critical habitat and the release of the recovery plan in 2009, ongoing studies have been in place to monitor the U.S. DPS of smalltooth sawfish. FWC FWRI is conducting a study in the CHEU that is supported primarily with funding provided by NMFS through the ESA Section 6 Species Recovery Grants Program, while Florida State University and the NOAA NMFS Southeast Fisheries Science Center Panama City Laboratory have focused studies in the TTIEU. The intent of these studies is to determine the abundance, distribution, habitat use, and movement of smalltooth sawfish. Early indications are that juvenile sawfish are at least stable and likely increasing in the CHEU, due in large part to ESA-listing of the species and designation of critical habitat. While it may be too early to state definitively that juveniles within CHEU are surviving to adulthood, researchers consistently capture newborn smalltooth sawfish, particularly within "hotspots," indicating adult smalltooth sawfish are pupping within Recovery Region G. Available data from the adjacent Recovery Region H (i.e., TTIEU) indicate that adult smalltooth sawfish are also reproducing within this recovery region and that the juvenile population trend is at least stable and possibly increasing – though variability is high (Carlson and Osborne 2012; Carlson et al. 2007). With no other data to consider, the abundance trend in the TTIEU represents the best data available for assessing the population trends in the CHEU. Therefore, we do not believe the loss of habitat associated with the proposed action, in combination with the losses to date, will impede the 5% annual growth objective for the juvenile population within Recovery Region G.

9 CONCLUSION

We reviewed the Status of the Species, the Status of the Critical Habitat, the Environmental Baseline, the Effects of the Action, and the Cumulative Effects using the best available data.

We conclude that the permanent loss of 62 lin ft due to the proposed action will not interfere with achieving the relevant habitat-based recovery objectives for smalltooth sawfish and will not impede the critical habitat's ability as a whole to support the conservation of smalltooth sawfish, despite permanent adverse effects. Therefore, given the nature of the proposed action and the information provided above, we conclude that the action, as proposed, is not likely to destroy or adversely modify the critical habitat of smalltooth sawfish.

10 INCIDENTAL TAKE STATEMENT

10.1 Overview

NMFS does not anticipate that the proposed action will incidentally take any ESA-listed species under our purview and no take is authorized in this Opinion. Nonetheless, as soon as the Florida

Department of Transportation becomes aware of any take of an ESA-listed species under NMFS's purview that occurs during the proposed action, the Florida Department of Transportation shall report the take to NMFS SERO PRD via the NMFS SERO Endangered Species Take Report Form (https://forms.gle/85fP2da4Ds9jEL829). This form shall be completed for each individual known reported capture, entanglement, stranding, or other take incident. Information provided via this form shall include the title, Harborview Road widening, the issuance date, and ECO tracking number, SERO-2024-00355, for this Opinion; the species name; the date and time of the incident; the general location and activity resulting in capture; 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. At that time, consultation may need to be reinitiated.

Section 7(b)(4)(c) of the ESA specifies that to provide an Incidental Take Statement for an endangered or threatened species of marine mammal, the taking must be authorized under Section 101(a)(5) of the MMPA. Since no incidental take of listed marine mammals is anticipated as a result of the proposed action, no statement on incidental take of protected marine mammals is provided and no take is authorized. Nevertheless, the FDOT must immediately notify (within 24 hours, if communication is possible) our Office of Protected Resources if a take of a listed marine mammal occurs.

11 CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authority to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation Recommendations identified in Opinions can assist action agencies in implementing their responsibilities under Section 7(a)(1). Conservation recommendations are discretionary activities designed to minimize or avoid adverse effects of a proposed action on ESA-listed species or critical habitat, to help implement recovery plans, or to develop information. The following conservation recommendations are discretionary measures that NMFS believes are consistent with this obligation and therefore should be carried out by the federal action agency:

1. Continue public outreach and education on smalltooth sawfish and smalltooth sawfish critical habitat in an effort to minimize interactions, injury, and mortality.

2. Provide funding to conduct directed research on smalltooth sawfish that will help further our understanding about the species (e.g., implement a relative abundance monitoring program which will help define how spatial and temporal variability in the physical and biological environment influence smalltooth sawfish) in an effort to predict long-term changes in smalltooth sawfish distribution, abundance, extent, and timing of movements.

3. Fund surveys of detailed bathymetry and mangrove coverage within smalltooth sawfish critical habitat. Lee County and the USACE recently funded such surveys within the Cape Coral municipality. Data is needed from other municipalities within the CHEU to establish a

more accurate baseline assessment of both critical habitat features (red mangroves and shallow-water areas).

4. Fund and support restoration efforts that rehabilitate and create shallow, euryhaline and mangrove fringe habitats within the range of smalltooth sawfish.

To stay abreast of actions that minimize or avoiding adverse effects or benefit listed species or their habitat, we request notification of the implementation of any conservation recommendations.

12 REINITIATION OF CONSULTATION

This concludes formal consultation on the proposed action. As provided in 50 CFR 402.16, reinitiation of formal consultation is required and shall be requested by Florida Department of Transportation or by the Service, where discretionary federal action agency involvement or control over the action has been retained, or is authorized by law, and if: (a) the amount or extent of incidental take specified in the Incidental Take Statement is exceeded, (b) new information reveals effects of the action on listed species or critical habitat in a manner or to an extent not considered in this Opinion, (c) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion, or (d) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the FDOT must immediately request reinitiation of formal consultation and project activities may only resume if the FDOT establishes that such continuation will not violate Sections 7(a)(2) and 7(d) of the ESA.

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