



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

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F/SER31: AL

JUL 19 2017

Chief, Miami Section
Jacksonville District Corps of Engineers
Department of the Army
9900 Southwest 107 Avenue, Suite 203
Miami, Florida 33176

Dear Sir or Madam:

Enclosed is the National Marine Fisheries Service's (NMFS) Biological Opinion on the U.S. Army Corps of Engineers, Jacksonville District's (USACE) proposed issuance of regulatory permits to Mr. Andre Radandt to construct a 494-square-foot dock, 22 Star Island LLC to construct a 456-square-foot dock, Mr. Sergio Artiguez to construct a 246-square-foot dock, and Mr. Eric Sheldon to repair an existing seawall and construct a 500-square-foot dock. All 4 projects are located in Miami-Dade County, Florida.

This Opinion analyzes the potential for the projects to affect sea turtles (loggerhead, Kemp's ridley, hawksbill, and green), smalltooth sawfish, and designated critical habitat for Johnson's seagrass in accordance with Section 7 of the Endangered Species Act. This analysis is based on project-specific information provided by USACE and project consultants, and NMFS's review of published literature. We conclude that the projects are likely to adversely affect, but are not likely to destroy or adversely modify Johnson's seagrass critical habitat. The Opinion includes conservation recommendations for your consideration.

We look forward to further cooperation with you on other USACE projects to ensure the conservation and recovery of our threatened and endangered marine species. If you have any questions regarding this consultation, please contact Audra Livergood, Consultation Biologist, at (786) 351-2225, or by email at Audra.Livergood@noaa.gov.

Sincerely,

Roy E. Crabtree, Ph.D.
Regional Administrator

Enc.: Biological Opinion

File: 1514-22.F.4
Endangered Species Act - Section 7 Consultation



Biological Opinion

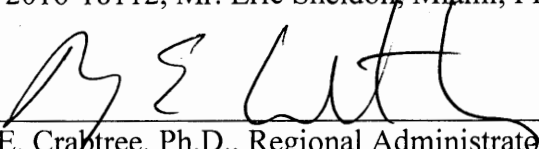
Agency: United States Army Corps of Engineers (USACE), Jacksonville District

Activity: Proposed USACE issuance of 4 regulatory permits in Miami-Dade County, Florida (SAJ-2015-2850, SAJ-2016-1179, SAJ-2016-462, and SAJ-2016-1537) to construct docks

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

SER-2016-17781, Mr. Andre Radandt, Miami, FL
SER-2016-18084, Mr. Sergio Artiguez, Northbay Village, FL
SER-2016-18094, 22 Star Island LLC, Miami Beach, FL
SER-2016-18112, Mr. Eric Sheldon, Miami, FL

Approved By:



Roy E. Crabtree, Ph.D., Regional Administrator
NMFS, Southeast Regional Office
St. Petersburg, Florida

Date Issued

July 19, 2017

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Glossary of Commonly Used Acronyms

cSEL	cumulative Sound Exposure Level
ESA	Endangered Species Act
NMFS	National Marine Fisheries Service
USACE	U.S. Army Corps of Engineers

Units of Measurement

Length and Area

ac	acres
ft	foot/feet
ft ²	square feet
km	kilometer
lin ft	linear feet
m	meter

Background

Section 7(a)(2) of the Endangered Species Act (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 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 on any such action. NMFS and the U.S. Fish and Wildlife Service share responsibilities for administering the ESA.

Consultation is required when a federal action agency determines that a proposed action “may affect” listed species or designated critical habitat. Consultation concludes after NMFS determines that the action is not likely to adversely affect listed species or critical habitat or issues a Biological Opinion (“Opinion”) that identifies whether a proposed action is likely to jeopardize the continued existence of a listed species, or destroy or adversely modify critical habitat.

This document represents NMFS’s Opinion based on our review of impacts associated with the proposed actions to issue permits for in-water construction activities. This Opinion analyzes the projects’ effects to listed species and critical habitat, in accordance with Section 7 of the ESA and is based on project information provided by USACE and other sources of information including the published literature cited herein.

1 CONSULTATION HISTORY

Table 1. Projects in this Batched Opinion

Project Name	NMFS Project Number	USACE Permit Number
Andre Radandt	SER-2016-17781	SAJ-2015-2850
Sergio Artiguez	SER-2016-18084	SAJ-2016-1179
Twenty Two Star Island	SER-2016-18094	SAJ-2016-462
Eric Sheldon	SER-2016-18112	SAJ-2016-1537

Andre Radandt: NMFS received a request from the USACE on February 22, 2016. NMFS requested additional information on March 7 and August 2, 2016, to which the USACE responded on March 9 and August 3, 2016, respectively. We initiated consultation on August 3, 2016.

Sergio Artiguez: NMFS received a request from the USACE on July 11, 2016, and we initiated consultation the same day.

22 Star Island: NMFS received a request from the USACE on July 13, 2016. We requested additional information on September 12, 2016. The USACE responded to our request on September 14, 2016, and we initiated consultation that day.

Eric Sheldon: NMFS received a request from the USACE on August 1, 2016, and we initiated consultation the same day. On February 15, 2017, we received a revised Section 7 Checklist and revised plans (proposing a smaller dock).

The USACE's and NMFS's determinations on the projects' effects to listed species and critical habitat that the USACE or NMFS believes may be affected by the proposed actions are listed in Table 1, below.

2 DESCRIPTION OF THE PROPOSED ACTIONS AND ACTION AREAS

2.1 Existing Site Conditions and the Proposed Actions

Andre Radandt: The project site is located on Biscayne Bay in Miami, Florida (Figure 1). The site consists of an existing seawall and an existing dock. A benthic survey was conducted in the project area on August 18, 2015. Paddle grass is present at the project site; however, no Johnson's seagrass was observed. Stony corals (*Siderastrea* spp. and *Oculina* spp.) were observed at the site, but no ESA-listed species of coral were observed in the project area. Other resources identified include algae, sponges, oysters, and barnacles. No mangroves are present. Water depths at the project site range from about 3 feet (ft) to about 5.5 ft, according to the benthic survey.

The applicant proposes to remove the existing 481-square-foot dock (ft²) dock and replace it with a 494-ft² dock with grated decking in generally the same footprint. Both docks are marginal docks with an access walkway and supporting mooring piles, though it is unclear how much of the two structures overlap from the drawings so we are counting the full 494 ft² of the new dock as producing shading impacts. The new dock would be elevated 6.45 ft above the mean high water (MHW) line, and supported by 24, 12-inch-diameter concrete piles. In addition, the applicant proposes to (1) install a 28,000-pound capacity boatlift supported by 4, 12-inch diameter wood piles; and (2) install a 3-pile cluster wood dolphin pile (for a total of 7 piles that will not be located under the dock). All piles will be installed by a barge-mounted impact hammer, and no more than 6 piles will be installed per day. No new vessel slips are proposed.

In-water work will take approximately 1 month to complete and will be conducted during daylight hours only. Prior to the start of construction, turbidity curtains will be deployed at the project site. The applicant will be required to follow NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions* (revised March 23, 2006), which requires work to stop if sea turtles or sawfish are observed within 50 ft of operating or moving construction equipment.



Figure 1. Andre Radandt project site (©2017 Google).

Sergio Artiguez: The project site is located on Biscayne Bay in Northbay Village, Florida (Figure 2). The site consists of an existing seawall. A benthic survey was conducted in the project area on August 18, 2015. Manatee grass, paddle grass, and shoal grass are present at the project site; however, no Johnson’s seagrass was observed. Stony corals (*Siderastrea* spp.) were observed at the site, but no ESA-listed species of coral were observed in the project area. Other resources identified include oysters, barnacles, and algae. No mangroves are present. Water depths at the project site range from about 1.8 ft to about 2.8 ft, according to the benthic survey.

The applicant proposes to construct a 246-ft² L-shaped wood dock. The new dock would be elevated 3.25 ft above the MHW line. There will be 9, 12-inch diameter wood piles installed by a crane-mounted impact hammer, and no more than 5 piles will be installed per day. One new vessel slip is proposed (300 ft²).

In-water work will take approximately 2 days to complete and will be conducted during daylight hours only. Prior to the start of construction, turbidity curtains will be deployed at the project site. The applicant will be required to follow NMFS’s *Sea Turtle and Smalltooth Sawfish Construction Conditions* (revised March 23, 2006).



Figure 2. Sergio Artiguez project site (©2017 Google).

22 Star Island: The project site is located on Biscayne Bay in Miami Beach, Florida (Figure 3). The site consists of an existing seawall, concrete cap, and batter piles. A benthic survey was conducted in the project area on March 1, 2016. Paddle grass and shoal grass are present at the project site; however, no Johnson’s seagrass was observed. Stony corals (*Siderastrea* spp.) were observed at the project site, but no ESA-listed species of coral were observed in the project area. Other resources identified include algae, sponges, and sea fans. No mangroves are present. Water depths at the project site range from about 4.1 ft to about 5.2 ft, according to the benthic survey.

The applicant proposes to construct a 456-ft² wood-framed dock with grated decking. The dock would be elevated 3.75 ft above the MHW line, and supported by 15, 12-inch-diameter wood piles (no more than 6 piles will be driven per day). The project also includes 3, 12-inch-diameter wood mooring piles. All piles will be installed via impact hammer from a barge-mounted crane. Two new vessel slips are proposed (slip 1 = 1,020 ft² and slip 2 = 300 ft² for a total of 1,320 ft²).

In-water work will take approximately 3 weeks to complete and will be conducted during daylight hours only. Prior to the start of construction, turbidity curtains will be deployed at the project site. The applicant will be required to follow NMFS’s *Sea Turtle and Smalltooth Sawfish Construction Conditions* (revised March 23, 2006).



Figure 3. 22 Star Island project site (©2017 Google).

Eric Sheldon: The project site is located on Biscayne Bay in Miami, Florida (Figure 4). The site consists of an existing seawall and wood dock. A benthic survey was conducted in the project area on June 14, 2016. Paddle grass was observed; however, no Johnson’s seagrass was observed. Stony corals (*Siderastrea* spp.) were observed in the project area, but no ESA-listed coral species were observed. Other resources identified include sponges and algae. No mangroves are present. Water depths at the project site range from about 2.4 ft to about 3.7 ft, according to the benthic survey.

The applicant proposes to construct an 8-inch concrete seawall cap that would be added to the existing seawall and supported by 12, 12-inch diameter concrete king and batter piles. We estimate the footprint of the seawall cap is 1 ft² (i.e., 8 inches rounded up to 12 inches, or 1 ft; the area = 1 ft long x 1 ft wide = 1 ft²). In addition, the applicant proposes to remove the existing 276 ft² wood dock and construct a 499-ft² concrete-framed dock with wood decking. The original dock was a traditional dock extending from the shoreline and the new dock is a marginal dock. Since we do not know how much area of overlap occurs between the 2 structures, we are considering the full 499-ft² new dock as producing shading impacts. The dock would be elevated 4.5 ft above the MHW line and supported by 35, 12-inch diameter concrete piles. The project also includes 2 wood mooring piles and 7 wood fender piles (all 12-inch diameter), for a total of 9 piles that would not be located under the dock or seawall. All piles will be installed via a barge-mounted impact hammer, and no more than 6 piles will be installed per day. No new vessel slips are proposed.



Figure 4. Eric Sheldon project site (©2017 Google).

In-water work will take approximately 4 weeks to complete, and will be conducted during daylight hours only. Prior to the start of construction, turbidity curtains will be deployed at the project site. The applicant will be required to follow NMFS’s *Sea Turtle and Smalltooth Sawfish Construction Conditions* (revised March 23, 2006).

2.2 Action Areas

50 CFR 404.02 defines action area as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action.” The action areas for these projects include the waters and submerged lands within, and in the immediate vicinity of, the project sites. For the purposes of this Opinion, the “immediate vicinity” includes the behavioral response zone in which animals may be affected by noise from pile-driving activities. For all of the projects, the applicants propose pile installation via an impact hammer. This method of installation has a maximum behavioral response zone of 705 ft from the pile-driving activities.

All 4 projects are located in Miami-Dade County, Florida, and within Biscayne Bay, an open-water environment, and Johnson’s seagrass critical habitat (Northern Biscayne Bay, Unit J) (Table 2).

Table 2. Project Locations

Project Name	Project Address	North American Datum 1983 [NAD 83]
Andre Radandt	1429 North Venetian Way, Miami, FL	25.79089 N, 80.16619 W
Sergio Artiguez	7800 Miami View Drive, Northbay Village, FL	25.847647 N, 80.160183 W
22 Star Island	22 Star Island Drive, Miami Beach, FL	25.781081 N, 80.150492 W
Eric Sheldon	5625 North Bayshore Drive, Miami, FL	25.828432 N, 80.179779 W

3 STATUS OF LISTED SPECIES AND CRITICAL HABITAT

With the exception of leatherback sea turtles, we believe the species listed in Table 1 may be present within the action areas.

Table 3. Listing Status and Effects Determinations for Species and Critical Habitat in or Near the Action Areas that Either the Action Agency or NMFS Believes May Be Affected by the Proposed Actions

Species	ESA Listing Status	Action Agency Effect Determinations	NMFS Effect Determinations
Sea Turtles			
Green (North and South Atlantic distinct population segment [DPS])	T	NLAA	NLAA
Kemp's ridley	E	NLAA	NLAA
Leatherback	E	NLAA	NE
Loggerhead (Northwest Atlantic Ocean DPSs)	T	NLAA	NLAA
Hawksbill	E	NLAA	NLAA
Fish			
Smalltooth sawfish (U.S. DPS)	E	NLAA	NLAA
Critical Habitat			
Johnson's seagrass Unit J	NLAA (Radandt and Artiguez projects) "May Affect" (22 Star Island and Sheldon projects)		LAA; no DAM (all 4 projects)
E = endangered; T = threatened; NLAA = may affect, not likely to adversely affect; NE = no effect; LAA = likely to adversely affect; DAM = destruction or adverse modification			

Based on the results of the benthic surveys, the USACE indicated Johnson's seagrass is not present at any of the project sites; thus, we believe the proposed actions will have no effect on Johnson's seagrass. In addition, we would not expect leatherback sea turtles to be present due to their very specific life history requirements, which are not supported at or near the project sites. Leatherback sea turtles prefer open, deepwater habitat where they forage primarily on jellyfish.

3.1 Species Not Likely to be Adversely Affected

We believe that sea turtles (green, loggerhead, hawksbill, and Kemp's ridley), and smalltooth sawfish may be found in or near the action areas and may be affected by the projects covered in this Opinion. We have identified the following potential adverse effects to these species and concluded that they are not likely to be adversely affected by the proposed actions for the reasons described below.

Sea turtles and smalltooth sawfish

3.1.1 Direct Physical Effects

Direct physical injury to sea turtles and smalltooth sawfish is not expected from construction machinery or materials because these species have the ability to detect and move away from the types of construction activities that will be implemented for these projects. Additionally, required turbidity curtains act as a physical barrier to species presence during construction. The projects will adhere to NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions*, which will provide additional protection by requiring construction equipment to stop if a listed species is observed within 50 ft of operating machinery. Thus, direct physical impacts are considered extremely unlikely to occur and the risk of adverse effects is discountable.

3.1.2 Foraging and Refuge

Sea turtles and smalltooth sawfish may be temporarily unable to use the project areas as foraging and refuge habitat because of construction activities, related noise, and physical exclusion by turbidity curtains. However, we believe these effects will be insignificant given that turbidity curtains will only block potential use of the area by enclosing a small portion of the project area at any time and will be removed after construction. In addition, if sea turtles or smalltooth sawfish leave the area during construction, there is available habitat nearby. Because construction will only occur during daylight hours, these animals will be able to return to the area in the evenings. Therefore, we believe any effects on sea turtles and smalltooth sawfish from short-term displacement or exclusion from the project area will be insignificant.

Green sea turtles may be affected by the potential permanent loss of seagrass habitat from shading caused by the dock installations and vessel mooring activities. Seagrass habitat provides foraging opportunities for adult green sea turtles. In addition, adult hawksbill sea turtles, which forage on sponges, may be affected (sponges were identified at 3 of the 4 project sites). The combined shading impact from all 4 projects is 3,315 ft² (see Table 5). However, based on the fact that there are undisturbed areas of similar foraging habitat nearby for green and hawksbill sea turtles, we believe this effect is insignificant.

3.1.3 Risk of Vessel Strike

The Artiguez project proposes the addition of 1 boat slip and 22 Star Island proposes the addition of 2 boat slips (total for both projects is 3 new slips). The addition of 3 new slips to this area will not necessarily introduce new vessels or increase vessel traffic in the area, as it may relocate existing vessels or provide slips for vessels that were previously trailered. Still, even if 3 new vessels are introduced to the area, we conclude, based on a recent NMFS analysis,¹ that potential effects on sea turtles resulting from increased vessel traffic associated with the proposed projects are discountable. Smalltooth sawfish is a demersal (i.e., bottom-dwelling) species; therefore, we do not expect there to be an increased risk of vessel strike for smalltooth sawfish.

3.1.4 Pile Driving and Noise Effects

Effects to listed species as a result of noise created by construction activities can be physically injurious to animals in the affected areas, or result in behavioral changes by animals in the

¹ Barnette, M. 2013. Threats and Effects Analysis for Protected Resources on Vessel Traffic Associated with Dock and Marina Construction. NMFS SERO PRD Memorandum. April 18, 2013.

affected areas. Injurious effects can occur in 2 ways. First, effects can result from a single noise event's exceeding the threshold for direct physical injury to animals, and these constitute an immediate adverse effect on affected animals. Second, effects can result from prolonged exposure to noise levels that exceed the daily cumulative exposure 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 depending on the circumstances in which they occur (i.e., if such effects interfere with animals' feeding, resting, or reproducing). Our evaluation of effects to listed species as a result of noise created by construction activities is based on the analysis prepared in support of the Opinion for SAJ-82.² The noise analysis in this consultation evaluates effects to smalltooth sawfish and sea turtles (see species list in Table 1).

Based on our noise calculations, the installation of less than 10, 12-inch diameter wood piles per day by impact hammer (all 4 projects) will not cause single-strike or peak-pressure injury to sea turtles or smalltooth sawfish. The daily cumulative sound exposure level (cSEL) of multiple pile strikes over the course of a day may cause injury to smalltooth sawfish and sea turtles at a radius of up to 30 ft (9 meters). Due to the mobility of sea turtles and smalltooth sawfish, we expect them to move away from noise disturbances. Because we anticipate the animal will move away, we believe that an animal suffering physical injury from noise is extremely unlikely to occur. Even in the unlikely event an animal does not vacate the daily cumulative injurious impact zone, the radius of that area is smaller than the 50-ft radius that construction personnel will be visually monitoring for listed species and they will cease construction activities if an animal is sighted per NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions*. Thus, we believe the risk of any injurious cSEL effects occurring is discountable. An animal's movement away from the injurious impact zone is a behavioral response, with the same effects discussed below.

Based on our noise calculations, impact hammer pile installation could also cause behavioral effects at radii of 151 ft (46 m) for sea turtles and 705 ft (215 m) for smalltooth sawfish. Due to the mobility of sea turtles and smalltooth sawfish, we expect them to move away from noise disturbances. Given the type of habitat in the action areas of these projects, sawfish or sea turtles that might be present would be passing through or foraging. Because there is similar habitat nearby, we believe behavioral effects will be insignificant. If an individual chooses to remain within the behavioral response zone, it could be exposed to behavioral noise impacts during pile installation. Since installation will occur only during the day, these species will be able to resume normal activities during quiet periods between pile installations and at night. Therefore, we anticipate any effects will be insignificant.

Based on our noise calculations, the installation of less than 10, 12-inch diameter concrete piles per day by impact hammer (Radandt and Sheldon) will not cause single-strike or peak-pressure injurious noise effects. The cumulative sound exposure level of multiple pile strikes over the course of a day, however, may cause injury to smalltooth sawfish and sea turtles up to 72 ft (22 m) away from the pile. Due to the mobility of sea turtles and smalltooth sawfish and because the projects occur in open water, we expect them to move away from noise disturbances. Because we anticipate the animal will move away, we believe that an animal's suffering physical injury from noise is extremely unlikely to occur and is therefore discountable. An animal's movement

² NMFS. Biological Opinion on Regional General Permit SAJ-82 (SAJ-2007-1590), Florida Keys, Monroe County, Florida. June 10, 2014.

away from the injurious sound radius is a behavioral response, with the same effects discussed below.

The installation of piles using an impact hammer could also result in behavioral effects at radii of 705 ft (215 m) for smalltooth sawfish and 151 ft (46 m) for sea turtles. Due to the mobility of sea turtles and smalltooth sawfish, we expect them to move away from noise disturbances in this open-water environment. Again, because sawfish or sea turtles that might be present in these project areas would be passing through or foraging, and because there is similar habitat nearby, we believe behavioral effects will be insignificant. If an individual chooses to remain within the behavioral response zone, it could be exposed to behavioral noise impacts during pile installation. Since installation will occur only during the day, these species will be able to resume normal activities during quiet periods between pile installations and at night. Therefore, we anticipate any behavioral effects will be insignificant.

3.2 Status of Critical Habitat Likely to be Adversely Affected

3.2.1 Johnson's Seagrass Critical Habitat

The term "critical habitat" is defined in Section 3(5)(A) of the ESA as (i) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (1) essential to the conservation of the species and (2) that may require special management considerations or protection; and (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. "Conservation" is defined in Section 3(3) of the ESA as "...the use of all methods and procedures that are necessary to bring any endangered or threatened species to the point at which listing under the ESA is no longer necessary."

NMFS designated Johnson's seagrass critical habitat on April 5, 2000 (65 FR 17786; see also, 50 CFR 226.213). The specific areas occupied by Johnson's seagrass and designated by NMFS as critical habitat are those with 1 or more of the following criteria:

1. Locations with populations that have persisted for 10 years
2. Locations with persistent flowering populations
3. Locations at the northern and southern range limits of the species
4. Locations with unique genetic diversity
5. Locations with a documented high abundance of Johnson's seagrass compared to other areas in the species' range

Ten areas (Units) within the range of Johnson's seagrass (approximately 200 kilometers of coastline from Sebastian Inlet to northern Biscayne Bay, Florida) are designated as Johnson's seagrass critical habitat (Table 4). The total range-wide acreage of critical habitat for Johnson's seagrass is roughly 22,574 acre (ac) (NMFS 2002).

Table 4. Designated Critical Habitat Units for Johnson’s Seagrass

Unit A	A portion of the Indian River, Florida, north of the Sebastian Inlet Channel
Unit B	A portion of the Indian River, Florida, south of the Sebastian Inlet Channel
Unit C	A portion of the Indian River Lagoon, Florida, in the vicinity of the Fort Pierce Inlet
Unit D	A portion of the Indian River Lagoon, Florida, north of the St. Lucie Inlet
Unit E	A portion of Hobe Sound, Florida, excluding the federally marked navigation channel of the Intracoastal Waterway
Unit F	A portion of the south side of Jupiter Inlet, Florida
Unit G	A portion of Lake Worth, Florida, north of Bingham Island
Unit H	A portion of Lake Worth Lagoon, Florida, located just north of the Boynton Inlet
Unit I	A portion of northeast Lake Wyman, Boca Raton, Florida, excluding the federally marked navigation channel of the Intracoastal Waterway
Unit J	A portion of northern Biscayne Bay, Florida, including all parts of the Biscayne Bay Aquatic Preserve excluding the Oleta River, Miami River, and Little River beyond their mouths, the federally marked navigation channel of the Intracoastal Waterway, and all existing federally authorized navigation channels, basins, and berths at the Port of Miami to the currently documented southernmost range of Johnson’s seagrass, Central Key Biscayne

The physical habitat that supports Johnson’s seagrass includes both shallow intertidal and deeper subtidal zones. The species thrives either in water that is clear and deep (2-5 m) or in water that is shallow and turbid. In tidal channels, it inhabits coarse sand substrates. The spread of the species into new areas is limited by its reproductive potential. Johnson’s seagrass possesses only female flowers; thus vegetative propagation, most likely through asexual branching, appears to be its only means of reproduction and dispersal. If an established community is disturbed, regrowth and reestablishment are extremely unlikely. This species’ method of reproduction impedes the ability to increase distribution as establishment of new vegetation requires considerable stability in environmental conditions and protection from human-induced disturbances.

Essential Features of Critical Habitat

NMFS identified 4 habitat features essential for the conservation of Johnson’s seagrass: (1) adequate water quality, defined as being free from nutrient over-enrichment by inorganic and organic nitrogen and phosphorous or other inputs that create low oxygen conditions; (2) adequate salinity levels, indicating a lack of very frequent or constant discharges of fresh or low-salinity waters; (3) adequate water transparency, which would allow sunlight necessary for photosynthesis; and (4) stable, unconsolidated sediments that are free from physical disturbance. All 4 essential features must be present in an area for it to function as critical habitat for Johnson’s seagrass.

Status and Threats

A wide range of activities, many funded authorized or carried out by federal agencies, have and will continue to affect the essential habitat requirements of Johnson’s seagrass. These are generally the same activities that may affect the species itself, and include: (1) vessel traffic and the resulting propeller dredging; (2) dredge and fill projects; (3) dock, marina, and bridge

construction; (4) water pollution; and (5) land use practices (shoreline development, agriculture, and aquaculture).

Vessel traffic has the potential to affect Johnson's seagrass critical habitat by reducing water transparency. Operation of vessels in shallow water environments often leads to the suspension of sediments due to the spinning of propellers on or close to the bottom. Suspended sediments reduce water transparency and the depth to which sunlight penetrates the water column. Populations of Johnson's seagrass that inhabit shallow water and water close to inlets where vessel traffic is concentrated are likely to be most affected. This effect is expected to worsen with increases in boating activity.

The dredging of bottom sediments to maintain, or in some cases create, inlets, canals, and navigation channels can directly affect essential features of Johnson's seagrass critical habitat. Dredging results in turbidity through the suspension of sediments. As discussed previously, the suspension of sediments reduces water transparency and the depth to which sunlight can penetrate the water column. The suspension of sediments from dredging can also resuspend nutrients, which could result in over-enrichment and/or reduce dissolved oxygen levels. Further, dredging can destabilize sediments and alter both the shape and depth of the bottom within the dredged footprint. This may affect the ability of the critical habitat to function through the removal or modification of essential features.

Dock, marina, and bridge construction leads to loss of habitat via construction impacts (e.g., pile installation) and shading. Similar to dredging, installation of piles for docks or bridges can result in increased turbidity that can negatively impact water transparency over short durations. Additionally, installed piles also replace the stable, unconsolidated bottom sediments essential for the species. Completed structures can have long-term effects on critical habitat in the surrounding area because of the shade they produce. While shading does not affect water transparency directly, it does affect the amount and/or duration of sunlight that can reach the bottom. The threat posed by dock, marina, and bridge construction is especially apparent in coastal areas where Johnson's seagrass is found.

Other threats include inputs from water pollution and adjacent land use. Johnson's seagrass critical habitat located in proximity to rivers, canal mouths, or other discharge structures is affected by land use within the watershed. Waters with low salinity that are highly colored and often polluted are discharged to the estuarine environment. This can impact salinity, water quality, and water transparency, all essential features of Johnson's seagrass critical habitat. Frequent pulses of freshwater discharge to an estuarine area may decrease salinity of the habitat and provoke physiological stress to the species. Nutrient over-enrichment, caused by inorganic and organic nitrogen and phosphorous loading via urban and agricultural land run-off, stimulates increased algal growth, decreased water transparency, and diminished oxygen content within the water. Low oxygen conditions have a demonstrated negative impact on seagrasses and associated communities. Discharges can also contain colored waters stained by upland vegetation or pollutants. Colored waters released into these areas reduce the amount of sunlight available for photosynthesis by rapidly reducing the amount of shorter wavelength light that reaches the bottom. In general, threats from adjacent land use will be ongoing, randomly occurring events that follow storm events.

4 ENVIRONMENTAL BASELINE

This section is a description of the past and ongoing human and natural factors leading to the current status of the species and its designated critical habitat within the action area. The environmental baseline includes state, tribal, local, and private actions already affecting the species and its critical habitat that will occur contemporaneously with the consultation in progress. Unrelated federal actions affecting Johnson's seagrass and its designated critical habitat that have completed formal or informal consultation are also part of the environmental baseline, as are federal and other actions within the action area that may benefit the species or its critical habitat. This Opinion describes these activities in the sections below.

Status of Johnson's Seagrass Critical Habitat within the Action Area

As discussed above, this consultation focuses on activities occurring in Unit J, which encompasses the northern portion of Biscayne Bay from North East 163rd Street south to Central Key Biscayne at 25°45'N. This portion of Biscayne Bay is bounded by heavy residential and commercial development, though a few areas of mangrove shoreline remain. Dredge-and-fill projects have resulted in a number of spoil islands and channels too deep for seagrass growth. Biscayne Bay supports a diversity of biological communities including intertidal wetlands, seagrasses, hard bottom, assemblages, and open water. Unit J is wholly within the Biscayne Bay Aquatic Preserve.

4.1 Factors Affecting Johnson's Seagrass Critical Habitat in the Action Area

Federal Actions

According to NMFS's Public Consultation Tracking System database, none of the project areas has had an ESA Section 7 consultation completed on activities with the potential to affect Johnson's seagrass designated critical habitat within the action areas.

Private Recreational Vessel Traffic

Marina and dock construction increases recreational vessel traffic within areas of Johnson's seagrass critical habitat, which increases suspended sediments from propellers and could result in propeller dredging. As mentioned above, suspended sediments are known to adversely affect Johnson's seagrass critical habitat by reducing the water transparency essential feature. Shading from dock structures and vessel mooring also affects the water transparency essential feature of the designated critical habitat. Propeller dredging and installation of piles and bridge support structures permanently removes the unconsolidated sediments essential feature of the critical habitat.

Marine Pollution and Environmental Contamination

The projects are located in highly developed coastal areas with extensive canal systems. This can lead to freshwater discharges and nutrient over-enrichment due to coastal runoff and canal discharges into the Bay. Freshwater discharge affects the salinity essential feature of the designated critical habitat while excess nutrients can lead to decreased water transparency and decreased dissolved oxygen content in the water.

State and Federal Activities That May Benefit Johnson's Seagrass Critical Habitat in the Action Area

State and federal conservation measures exist to protect Johnson's seagrass and its habitat under an umbrella of management and conservation programs that address seagrasses in general (Kenworthy et al. 2006). These conservation measures must be continually monitored and assessed to determine if they will ensure the long-term protection of the species and the maintenance of environmental conditions suitable for its continued existence throughout its geographic distribution.

In terms of federal activities, NMFS and the USACE have developed protocols to encourage the use of light-transmitting materials in future construction of docks constructed in or over submerged aquatic vegetation (SAV), marsh or mangrove habitat, namely the *Construction Guidelines in Florida for Minor Piling-Supported Structures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat*, and for docks within the range of Johnson's seagrass, namely NMFS and USACE's *Key for Construction Conditions for Docks or Other Minor Structures Constructed in or over Johnson's Seagrass (Halophila johnsonii)*.

Even if all new docks are constructed in full compliance with the NMFS and USACE's guidance, NMFS acknowledges that shading impacts (and thus, impacts to the water transparency essential feature) to Johnson's seagrass will continue via dock construction. As NMFS and the USACE continue to encourage permit applicants to design and construct new docks in full compliance with the construction guidelines discussed above, and the recommendations in Landry et al. (2008) and Shafer et al. (2008), NMFS believes that shading impacts to Johnson's seagrass will be reduced in the short- and long-term. Moreover, even with some shading from grated construction materials, researchers have found all 4 essential features necessary for Johnson's seagrass to persist under docks constructed of grated decking (Landry et al. 2008).

5 EFFECTS OF THE ACTIONS

All 4 projects are located within Johnson's seagrass critical habitat Unit J. We believe that 2 of the 4 essential features required for functional Johnson's seagrass critical habitat will not be affected by the projects. The proposed activities will not affect water quality by increasing nutrient enrichment, nor will they affect salinity levels in the project areas.

We believe the proposed activities will adversely affect the adequate water transparency essential feature and the stable, unconsolidated sediments essential feature. The former will be adversely affected by shading from the new docks and the vessels, and the latter will be adversely affected by 114 new piles (combined for all 4 projects). Loss of either of the essential features from a project site would prevent the area from functioning as Johnson's seagrass critical habitat. Because 95 of the piles are included in the overall footprint of the proposed docks (and the seawall, in the case of Mr. Sheldon's project) and to avoid double counting the impacts, we did not count structure and pile impacts separately for these projects. In addition, 3 of the 4 projects include piles that are not part of the proposed docks. We will calculate the impact from these 19 piles separately, and add it to the overall impact calculation.

The following effects to the adequate water transparency essential feature are expected from structures creating shading:

- Mr. Radandt: We believe the project will result in the loss of 494 ft² of critical habitat due to shading (from the dock only; no new slips will be added, so we do not anticipate additional shading from vessels).
- Mr. Artiguez: We believe the project will result in the loss of 246 ft² of critical habitat due to shading from the dock and 300 ft² of critical habitat due to shading from the vessels.
- 22 Star Island: We believe the project will result in the loss of 456 ft² of critical habitat from the dock and 1,320 ft² of critical habitat due to shading from the vessels.
- Mr. Sheldon: We believe the project will result in the loss of 499 ft² of critical habitat (from the dock only; no new slips will be added, so we do not anticipate additional shading from vessels).

The following effects to the stable, unconsolidated sediments that are free from physical disturbance essential feature are expected from the placement of piles not located under shaded structures, and from the seawall cap (Mr. Sheldon only):

- Mr. Radandt: The installation of 4, 12-inch diameter wood piles (to support a boatlift) and a 3-pile cluster wood dolphin pile (for a total of 7 piles that will not be located under the dock) will result in the loss of 5.53 ft² of the stable, unconsolidated sediments essential feature³.
- 22 Star Island: The installation of 3, 12-inch-diameter wood mooring piles will result in the loss of 2.37 ft² of the stable, unconsolidated sediments essential feature.
- Mr. Sheldon: The installation of 2 wood mooring piles and 7 wood fender piles (all 12-inch diameters) will result in the loss of 7.11 ft² of the stable, unconsolidated sediments essential feature. In addition, the proposed seawall cap will result in the loss of 1 ft² of the stable, unconsolidated sediments essential feature.

Table 5 provides a summary of the anticipated impacts to Johnson’s seagrass critical habitat from the proposed projects’ activities.

Table 5. Impacts to Johnson’s Seagrass Critical Habitat

Project Number	Project Name	Critical habitat shade impacts from new docks and vessels (ft ²)	Critical habitat impacts from new piles that are not for dock support (ft ²)	Critical habitat impacts from seawall cap (Mr. Sheldon)	Total critical habitat impacted (ft ²)
1	Mr. Radandt	494	5.53	0	499.53
2	Mr. Artiguez	546	0	0	546.00
3	22 Star Island	1,776	2.37	0	1,778.37
4	Mr. Sheldon	499	7.11	1	507.11
Total		3,315	15.01	1	3,331.01

³ The area of each pile = .79 ft² x 7 piles = 5.53 ft².

The installation of the piles will have a temporary effect on Johnson's seagrass critical habitat by increasing turbidity (i.e., it will affect water transparency), but this effect is expected to be contained to the immediate areas by the placement of turbidity curtains that will remain in place until construction is complete and water transparency has returned to pre-construction conditions.

Combined, we believe the 4 projects will adversely affect 3,331 ft² of Johnson's seagrass critical habitat.

6 CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, or local private actions that are reasonably certain to occur in the action areas considered in this Opinion. Future federal actions that are unrelated to the proposed actions are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA.

No categories of effects beyond those already described are expected in the action areas, and we did not identify any other future state, tribal, or private actions that are reasonably certain to occur in the action areas of this Opinion. Dock and marina construction will likely continue at current rates, with associated loss and degradation of seagrass habitat, including Johnson's seagrass critical habitat. Because these activities are subject to USACE permitting and thus, the ESA Section 7 consultation requirement, they do not lead to cumulative non-federal effects to be discussed in this section.

Upland development and associated runoff will continue to degrade the water quality essential feature necessary for Johnson's seagrass critical habitat. Flood control and imprudent water management practices will continue to result in freshwater inputs into estuarine systems, thereby degrading and altering the water quality and salinity essential features of Johnson's seagrass critical habitat.

Increased recreational vessel traffic will continue to result in damage to Johnson's seagrass and its designated critical habitat by improper anchoring, propeller scarring, and accidental groundings. Nonetheless, we expect that ongoing boater education programs and posted signage about the dangers to seagrass habitat from propeller scarring and improper anchoring may reduce impacts to Johnson's seagrass designated critical habitat, including that in Unit J.

7 DESTRUCTION/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 for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (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. We intend the phrase "significant delay" in development of essential features to encompass a delay that interrupts the likely natural

trajectory of the development of physical and biological features in the designated critical habitat to support the species' recovery. NMFS will generally conclude that a Federal action is likely to "destroy or adversely modify" designated critical habitat if the action results in an alteration of the quantity or quality of the essential physical or biological features of designated critical habitat, or that precludes or significantly delays the capacity of that habitat to develop those features over time, and if the effect of the alteration is to appreciably diminish the value of critical habitat 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 it must now and must continue in the future to support the conservation of the species and progress toward recovery. 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 serves with regard to the function of the overall designation, and how that role is affected by the action.

Recovery for Johnson's seagrass as set forth in the final recovery plan (NMFS 2002), will be achieved when the following recovery objectives are met: (1) the species' present geographic range remains stable for at least 10 years, or increases; (2) self-sustaining populations are present throughout the range at distances less than or equal to the maximum dispersal distance to allow for stable vegetative recruitment and genetic diversity; and (3) populations and supporting habitat in its geographic range have long-term protection (through regulatory action or purchase acquisition). We evaluated the projects' expected impacts on critical habitat to determine whether it will be able to continue to provide its intended functions in achieving these recovery objectives and supporting the conservation of the species.

The first recovery criterion for Johnson's seagrass is for its present range to remain stable for 10 years or to increase during that time. NMFS's 5-year review (2007) of the status of the species concluded that the first recovery objective had been achieved as of 2007. In fact, the range had increased slightly northward at that time and we have no information indicating range stability has decreased since then. NMFS has determined that the 4 projects will adversely affect a total of 3,331 ft² of Johnson's seagrass critical habitat due to shading and pile installation. But the action areas are not at a boundary of the species' range, the areas that will be impacted are very small, and the loss of these potential areas for colonization will not affect the stability of the species' range now or in the future. Thus, we believe the proposed actions' effects will not impact the critical habitat's ability to contribute to range stability for Johnson's seagrass.

The second recovery criterion for Johnson's seagrass requires that self-sustaining populations be present throughout the range at distances less than or equal to the maximum dispersal distance for the species. Due to its asexual reproductive mode, self-sustaining populations are present throughout the range of species. As discussed in Section 3.2.2, there are approximately 22,574 ac of Johnson's seagrass critical habitat in Unit J. The loss of 3,331 ft² (0.076 ac) of designated critical habitat for Johnson's seagrass in Unit J would equate to a loss of 0.0003% of Johnson's seagrass critical habitat (0.076 ac x 100/22,574 ac). This loss will not affect the conservation value of available critical habitat to an extent that it would impact Johnson's seagrass self-sustaining populations by adversely affecting the availability of suitable habitat in which the species can spread/flow in the future. Drifting fragments of Johnson's seagrass can remain viable in the water column for 4-8 days (Hall et al. 2006), and can travel several kilometers

under the influence of wind, tides, and waves. Because of this, we believe that the removal of 3,331 ft² of critical habitat for these projects will not appreciably diminish the conservation value of critical habitat in supporting self-sustaining populations.

The final recovery criterion is for populations and supporting habitat in the geographic range of Johnson's seagrass to have long-term protection (through regulatory action or purchase acquisition). Though the affected portions of the project sites will not be available for the long-term, thousands of acres of designated critical habitat are still available for long-term protection, which would include areas surrounding the action areas.

Therefore, we conclude that the proposed actions' adverse effects on Johnson's seagrass critical habitat will not impede achieving the recovery objectives listed above and will, therefore, not appreciably diminish the value of critical habitat for the conservation of the species.

8 CONCLUSION

We have analyzed the best available data, the current status of Johnson's seagrass critical habitat, the environmental baseline, effects of the proposed actions, and cumulative effects to determine whether the proposed actions are likely to destroy or adversely modify Johnson's seagrass critical habitat. It is our Opinion that the proposed actions are likely to adversely affect, but are not likely to destroy or adversely modify Johnson's seagrass critical habitat.

9 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 are discretionary agency activities 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 conservation recommendations are reasonable, necessary, and appropriate to conserve and recover Johnson's seagrass. NMFS strongly recommends that these measures be considered and adopted.

1. NMFS recommends that the USACE, in coordination with seagrass researchers and industry, support ongoing research on light requirements and transplanting techniques to preserve and restore Johnson's seagrass, and on collection of plants for genetics research, tissue culture, and tissue banking.
2. NMFS recommends that the USACE continue promoting the use of the October 2002 *Key for Construction Conditions for Docks or other Minor Structures Constructed in or over Johnson's Seagrass* as the standard construction methodology for proposed docks located in the range of Johnson's seagrass.
3. NMFS recommends that the USACE review and implement the recommendations in the July 2008 report, *The Effects of Docks on Seagrasses, With Particular Emphasis on the Threatened Seagrass, Halophila johnsonii* (Landry et al. 2008).

4. NMFS recommends that the USACE review and implement the Conclusions and Recommendations in the October 2008 report, *Evaluation of Regulatory Guidelines to Minimize Impacts to Seagrasses from Single-family Residential Dock Structures in Florida and Puerto Rico* (Shafer et al. 2008).
5. NMFS recommends that a report of all current and proposed USACE projects in the range of Johnson's seagrass be prepared and used by the USACE to assess impacts on the species from these projects, to assess cumulative impacts, and to assist in early consultation that will avoid and/or minimize impacts to Johnson's seagrass and its critical habitat. Information in this report should include location and scope of each project and identify the federal lead agency for each project. The information should be made available to NMFS.
6. NMFS recommends that the USACE conduct and support research to assess trends in the distribution and abundance of Johnson's seagrass. Data collected should be contributed to the Florida Fish and Wildlife Conservation Commission's Florida Wildlife Research Institute to support ongoing geographic information system mapping of Johnson's seagrass and other seagrass distribution.
7. NMFS recommends that the USACE prepare an assessment of the effects of other actions under its purview on Johnson's seagrass for consideration in future consultations.

10 REINITIATION OF CONSULTATION

As provided in 50 CFR 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 taking specified in the proposed actions is exceeded, (2) new information reveals effects of the actions that may affect listed species or critical habitat in a manner or to an extent not previously considered, (3) the identified actions are subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the Biological Opinion, or (4) a new species is listed or critical habitat designated that may be affected by the identified actions.

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