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NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
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St. Petersburg, Florida 33701-5505
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JUL 21 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 action to issue a regulatory permit to Mr. Karim Masri to remove an existing dock, construct a 472-square-foot dock, and install a 20,000 pound boat lift. The project is located in Miami-Dade County, Florida.

This Opinion analyzes the potential for the projects to affect sea turtles (loggerhead, leatherback, Kemp's ridley, hawksbill, and green), smalltooth sawfish, and 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, the consultant, and NMFS's review of published literature. We conclude that sea turtles (green, loggerhead, hawksbill, and Kemp's ridley), and smalltooth sawfish are not likely to be adversely affected by the proposed actions and there will no effect to leatherback sea turtles. Also, we conclude that the project is 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 Melissa Alvarez, Consultation Biologist, at (954) 262-3772, or by email at melissa.alvarez@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 a regulatory permit in Miami-Dade County, Florida (SAJ-2016-00350)
Consulting Agency:	National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), Southeast Regional Office, Protected Resources Division, St. Petersburg, Florida
	SER-2016-18002
Approved By:	Roy E. Crabtree, Ph.D., Regional Administrator NMFS, Southeast Regional Office St. Petersburg, Florida
Date Issued	July 21, 2017

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Glossary of Commonly Used Acronyms

ESA	Endangered Species Act
NMFS	National Marine Fisheries Service
USACE	U.S. Army Corps of Engineers

List of Tables

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 a permit 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

NMFS received a request from the USACE on June 6, 2016. NMFS requested additional information on October 20, 2016, to which the USACE responded on October 20, 2016. Additionally, we requested further information on February 13, 2017, to which the USACE responded on February 14, 2017. We initiated consultation that same day.

The USACE's and NMFS's determinations on the project's 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 Proposed Action

The site of the proposed project consists of a residential lot and adjacent waterway located in Biscayne Bay Aquatic Preserve. The shoreline consists of a concrete seawall and an existing irregular shaped dock (482.9-square-foot (ft^2)), which will be removed. According to a benthic survey conducted on August 9, 2015, by Miami-Dade County, the area is mostly barren sand/silt mixture except for a small 344 ft^2 section of non-ESA-listed seagrasses including 20% coverage of paddle grass and less than 5% coverage of turtle grass. The project has been designed to completely avoid this area of non-listed seagrasses. Other organisms identified during the survey included sponges, barnacles, and red algae. No ESA-listed seagrass was identified during the survey. No corals or mangroves were observed on-site.

The applicant proposes to remove the old dock and construct a new 456-ft^2 dock comprised of an 8-ft wide by 26.6-ft long marginal portion and a 6-ft wide by 40-ft long finger pier in the same footprint. The new dock is 26.9- ft^2 smaller than the original dock. The project does not conform to the Dock Construction Guidelines because there will be no grated decking, no spacing between the deck boards, and the structure does not meet the height requirements of those guidelines. The applicant will also install a 20,000-pound capacity boatlift and the installation of 60 linear feet of vertical concrete retaining wall and cap (105 ft² overhanging the water) with concrete vertical king and batter piles (under the concrete cap). In total, the project includes 18 new 12-in-diameter concrete piles that would be installed via impact hammer, 7 new 12-in-diameter wood piles that would be installed via impact hammer, and 2 new 12-in-diameter metal I-beams that would be installed via vibratory hammer. The work will be conducted using a barge-mounted crane.

The proposed action will include the addition of 1 vessel slip (2 slips total). As explained below in Section 5, this project will result in 390 ft² of new shading impacts (105 ft² from the concrete cap, and 280 ft² from the vessel), and 5 ft² of impacts to sediment from the metal I-beams and piles not located under the dock. In-water work will take approximately 5 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. They will remain in place until all construction-induced turbidity has subsided and water quality has returned to pre-construction conditions. Additionally, the applicant will comply with 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.

2.2 Action Area

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 area for this project includes the waters and submerged lands within, and in the immediate vicinity of, the project site. For the purposes of this Opinion, the "immediate vicinity" includes the behavioral response zone in which animals may be affected by pile-driving activities. The applicant proposes pile installation via an impact hammer and a vibratory hammer. The impact hammer method of installation has a behavioral response zone of 705 ft from the pile-driving activities. The vibratory hammer method of installation has a behavioral response zone of 72 ft from the pile-driving activities.

The project is located in Miami-Dade County, Florida, and within Biscayne Bay, an open-water environment (Figure 1) and Johnson's seagrass critical habitat (Northern Biscayne Bay, Unit J). The project site is located at 25.792005°N, 80.160179°W (North American Datum 1983 [NAD 83]) at 508 W Dilido Drive, Miami Beach, on Biscayne Bay approximately 2.10 miles west of the Atlantic Ocean.

3 STATUS OF LISTED SPECIES AND CRITICAL HABITAT

The USACE believes the species listed in Table 1 may be present within the action area.

Table 1. Effects Determinations and Status 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		LAA	LAA; no DAM
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			

We would not expect leatherback sea turtles to be present at the site due to their very specific life history requirements which are not supported at or near the project site. Leatherback sea turtles prefer open, deepwater habitat where they forage primarily on jellyfish. The action area is also within the boundary of Johnson's seagrass Critical Habitat Unit J, but Johnson's seagrass does not occur within the action area.

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 area and may be affected by the project covered in this Opinion. We have identified the following potential effects to these species and concluded that they are not likely to be adversely affected by the proposed actions for the reasons described below.

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 project will adhere to NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions*, dated March 23, 2006, 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, making the risk of adverse effects discountable.

3.1.2 Foraging and Refuge

Sea turtles and smalltooth sawfish may be temporarily unable to use the project area as foraging 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 and smalltooth sawfish leave the area during construction, there is available habitat nearby. Because construction will only occur during daylight hours and of short duration (5 days), these animals will be able to return to the area in the evenings and after the completion of the project. Further, the project areas do not contain mangroves, which are used as refuge habitat by smalltooth sawfish; therefore, the projects will not affect the sheltering behavior of the smalltooth sawfish. Therefore, we believe any effects on sea turtles and smalltooth sawfish from short-term displacement or exclusion from the project area will be insignificant.

3.1.3 Risk of Vessel Strike

The project proposes the addition of 1 new wet-slip. The addition of 1 new slip 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 1 new vessel is 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 project 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 physically injure animals in the affected areas or change animal behavior in the affected areas. Injurious effects can occur in 2 ways. First, immediate physical injury can occur to listed species 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 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 if such effects prevent animals from migrating, feeding, resting, or reproducing, for example. 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 ESA-listed fish and sea turtles identified by NMFS as potentially affected in the table above.

[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.
[2] NMFS. Biological Opinion on Regional General Permit SAJ-82 (SAJ-2007-01590), Florida Keys, Monroe County, Florida. June 10, 2014.

Based on our noise calculations, installation of concrete piles by impact hammer will not cause single-strike or peak-pressure injurious noise effects. The daily cumulative sound exposure level (cSEL) 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 meters (m)) away from the pile. Due to the mobility of sea turtles and smalltooth sawfish and because the project occurs 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 away from the injurious sound radius is a behavioral response, with the same effects discussed below.

The installation of concrete piles using an impact hammer could also result in behavioral effects at radii 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. 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.

Based on our noise calculations, the installation of wood piles by impact hammer 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 m). Due to the mobility of sea turtles and smalltooth sawfish and because the project occurs 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 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 of wood piles 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. 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, installation of metal boatlift I-beam using a vibratory hammer will not result in injurious noise effects or behavioral noise effects.

3.2 Johnson's Seagrass Critical Habitat Likely to be Adversely Affected

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 km 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 2. 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.

Critical Habitat Unit Impacted by the Proposed Actions

This consultation focuses on activities that occur in Unit J, which encompasses the northern portion of Biscayne Bay from Northeast 163rd Street south to Central Key Biscayne at 25º45´N (Figure 1). This portion of Biscayne Bay is bound 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 diverse biological communities including intertidal wetlands, seagrasses, hard bottom, and open water. Unit J is wholly within the Biscayne Bay Aquatic Preserve.

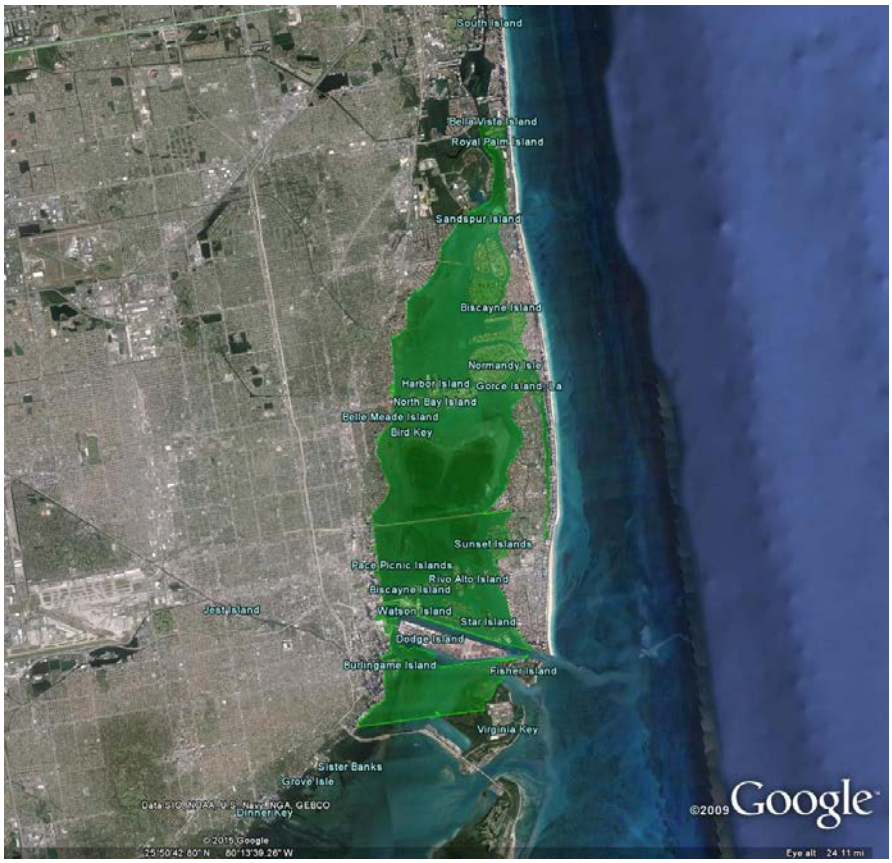

Figure 1. Johnson's seagrass critical habitat Unit J (©2015 Google, Data SIO, NOAA, U.S. Navy, NGA, GEBCO)

Threats to Johnson's Seagrass Designated Critical Habitat

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 the 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

re-suspend 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 are 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 critical habitat within the action area. The environmental baseline is a "snapshot" of the action area at a specified point in time and includes the past and present impacts of state, tribal, local, and private actions on the species and its critical habitat, and the impacts of state, tribal, local, and private actions that will occur during the same time period as the consultation in progress. Unrelated federal actions affecting Johnson's seagrass critical habitat that have completed formal or early consultation are also part of the environmental baseline, as are federal and other actions within the action area that may benefit the critical habitat. This Opinion describes the effects of these activities in the sections below.

4.1 Status of Johnson's Seagrass Critical Habitat within the Action Areas

This consultation focuses on activities occurring in Unit J, which encompasses the northern portion of Biscayne Bay from NE 163rd Street south to Central Key Biscayne at 25º45´N (Figure 1). This portion of Biscayne Bay is bound 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 diverse biological communities including intertidal wetlands, seagrasses, hard bottom, and open water. Unit J is wholly within the Biscayne Bay Aquatic Preserve.

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

4.2.1 Federal Actions

A wide range of activities funded, authorized, or carried out by federal agencies may affect the essential features of Johnson's seagrass critical habitat. These include actions permitted or implemented by the USACE such as dredging, dock/marina construction, bridge/highway construction, residential construction, shoreline stabilization, breakwaters, and the installation of subaqueous lines or pipelines. Other federal activities that may affect Johnson's seagrass critical habitat include actions by the Environmental Protection Agency and the USACE to manage freshwater discharges into waterways; management of National Parks; regulation of vessel traffic to minimize propeller dredging and turbidity; and other activities by the U.S. Coast Guard and U.S. Navy. Although these actions have probably affected Johnson's seagrass critical habitat, none of these past actions have destroyed or adversely modified Johnson's seagrass critical habitat.

According to NMFS's Public Consultation Tracking System database, there has been only 1 ESA Section 7 consultation completed on activities with the potential to affect Johnson's seagrass critical habitat within the action area.

4.2.2 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 docks and vessels also affects the water transparency essential feature of the designated critical habitat. Propeller dredging and installation of piles and bridge support structures may adversely affect Johnson's seagrass and permanently removes the unconsolidated sediments essential feature of the critical habitat.

4.2.3 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.

4.2.4 Natural Disturbances

Large-scale weather events, such as tropical storms and hurricanes, while they often generate runoff conditions that decrease water quality, also produce conditions (wind setup and abrupt water elevation changes) that can increase flushing rates. The effects of storms can be complex. Specifically documented storm effects on healthy seagrass meadows have been relatively minor: (1) scouring and erosion of sediments; (2) erosion of seeds and plants by waves, currents, and surge; (3) burial by shifting sand; (4) turbidity; and (5) discharge of freshwater, including inorganic and organic constituents in the effluents (Oppenheimer 1963; Steward et al. 2006; van Tussenbroek 1994; Whitfield et al. 2002). Storm effects may be chronic (e.g., due to seasonal weather cycles), or acute, such as the effects of strong thunderstorms or tropical cyclones. Studies have demonstrated that healthy, intact seagrass meadows are generally resistant to physical degradation from severe storms, whereas damaged seagrass beds may not be as resilient (Fonseca et al. 2000; Whitfield et al. 2002).

In the late summer and early fall of 2004, 4 hurricanes (with wind strengths at landfall from < 39-120 miles per hour) passed directly over the northern range of Johnson's seagrass in the Indian River Lagoon (approximately 160 miles north of the project area). A post-hurricane random survey in the area of the Indian River Lagoon affected by the 4 hurricanes indicated the presence of Johnson's seagrass was similar to that reported by the St. Johns River Water Management District transect surveys prior to the storms. This indicates that while the species may temporarily decline, under the right conditions, it can recover quickly (Virnstein and Morris 2007). Furthermore, despite evidence of longer-term reductions in salinity, increased water turbidity, and increased water color associated with higher than average precipitation in the spring of 2005, there was no evidence of long-term chronic impacts to seagrasses and no direct evidence of damage to Johnson's seagrass that could be considered a threat to the survival of the species (Steward et al. 2006).

4.2.5 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.

5 EFFECTS OF THE ACTIONS

Effects of the action include direct and indirect effects of the action under consultation. Indirect effects are those that result from the proposed action, occur later in time (i.e., after the proposed action is complete), but are still reasonably certain to occur.

Effects of the proposed action also include effects of other activities that are interrelated or interdependent with the proposed action. Interrelated actions are those that are part of a larger action and depend on that larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Thus these actions

are also described and their effects on critical habitat are evaluated as effects of the proposed action. We have identified no interrelated or interdependent actions relative to the proposed action.

The project is located within Johnson's seagrass critical habitat. 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.

The installation of the piles will also have a temporary effect on Johnson's seagrass critical habitat by increasing turbidity (i.e., affect water transparency). 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.

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 concrete cap, and the vessels, and the latter will be adversely affected by 27 new piles. No new shading is occurring from the dock as the square footage has been reduced by 26.9 ft²Because the piles are included in the overall footprint of the proposed dock and concrete cap (batter and king piles), to avoid double counting the impacts, we decided not to use two separate impact calculations, except for the 2 boat lift I-beams not located under a shaded structure and 6 piles partially out of the footprint. Therefore, the impact calculations include impacts from shading and pile installation for the project site.

We believe this project will permanently, adversely affect by the loss 390 ft² (, 105 ft² from the concrete cap, 5 ft² from the metal I-beams and piles, and 280 ft² from the vessel) of Johnson's seagrass critical habitat.

6 CUMMULATIVE 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 area, and we are not aware of any other future state, tribal or local private actions that are reasonably certain to occur within the action area.

Dock and marina construction will likely continue at current rates, with concomitant loss and degradation of seagrass habitat, including Johnson's seagrass. However, 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. Furthermore, NMFS and the USACE have developed protocols to encourage the use of light-transmitting materials in future construction of docks within the range of Johnson's seagrass. However, even if all new

docks are constructed in full compliance with the NMFS and USACE's *Construction Guidelines for Minor Piling-Supported Structures in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat*, the NMFS and USACE's *Key for Construction Conditions for Docks or Other Minor Structures Constructed in or Over Johnson's seagrass (Halophila johnsonii),* , there will still be shading impacts to (i.e., light transparency essential feature) to Johnson's seagrass critical habitat from new docks, although shading impacts will be reduced if guidelines are followed. As previously stated, Landry et al. (2008) found that all 4 essential features necessary for Johnson's seagrass to persist were available under docks constructed of grated decking versus non-grated decking. Although it was reduced in frequency under grated docks, Johnson's seagrass was observed in higher densities under grated versus non-grated docks. In summary, NMFS acknowledges that shading impacts to Johnson's seagrass critical habitat will continue via dock construction. NMFS and the USACE continue to encourage permit applicants to design and construct new docks in full compliance with NMFS and USACE's *Construction Guidelines for Minor Piling-Supported Structures in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat*, the NMFS and USACE's *Key for Construction Conditions for Docks or Other Minor Structures Constructed in or Over Johnson's seagrass (Halophila johnsonii),* and the recommendations in Landry et al. (2008) and Shafer et al. (2008). By following these recommendations, NMFS believes that shading impacts to Johnson's seagrass will be reduced in the short- and long-term.

Upland development and associated runoff will continue to affect the water quality and water clarity essential features of Johnson's seagrass critical habitat. Flood control and imprudent water management practices will continue to result in freshwater inputs into estuarine systems, thereby degrading water quality and altering salinity. Long-term, large-scale reduction in salinity has been identified as a potentially significant threat to Johnson's seagrass and may lead to the destruction or adverse modification of Johnson's seagrass critical habitat.

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 project's 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 project will adversely affect a total of 857 ft² of Johnson's seagrass critical habitat due to shading and pile installation. But the action area is not at a boundary of the species' range, the area that will be impacted is 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. The loss of 390 ft² (0.009 ac) of designated critical habitat for Johnson's seagrass in Unit J would equate to a loss of 0.0000006% of Johnson's seagrass critical habitat (0.009 ac /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 390 ft^2 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 portion of the project site 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 the species, environmental baseline, effects of the proposed actions, and cumulative effects to determine whether the proposed actions are likely destroy or adversely modify Johnson's seagrass critical habitat. Because the proposed action will not appreciably diminish the value of the critical habitat for the conservation of Johnson's seagrass, it is our Opinion that the proposed actions are likely to adversely affect, but 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 action is exceeded, (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the Biological Opinion, or (4) a new species is listed or critical habitat designated that may be affected by the identified action.

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