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National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
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NOV 15 2016

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Jacksonville District Corps of Engineers
Department of the Army
1520 Royal Palm Square Boulevard, Suite 310
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Jacksonville District Corps of Engineers
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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. Sergey Novov to construct a 500-square-foot dock, Mr. Thomas Danluck to construct a 312-square-foot dock, and Coastal Towers Condominium Association to repair and replace dock structures within an existing 33-slip marina. All 3 projects are 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, Johnson's seagrass, 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, the consultant, 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. Moreover, we conclude that the Sergey Novov project is likely to adversely affect, but is not likely to jeopardize, the continued existence of Johnson's seagrass. 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,

for 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 3 regulatory permits in Miami-Dade County, Florida (SAJ-1992-30169, SAJ-2014-02685, and SAJ-2016-00243)
Consulting Agency:	National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), Southeast Regional Office, Protected Resources Division, St. Petersburg, Florida
	SER-2015-16287 SER-2016-17809 SER-2016-17928
Approved By:	for Roy E. Crabtree, Ph.D., Regional Administrator NMFS, Southeast Regional Office St. Petersburg, Florida
Date Issued	NOV 15 2016

Table of Contents

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
lin ft	linear feet

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

Sergey Novov: NMFS received a request from the USACE on February 19, 2015. NMFS requested additional information on May 11, 2015, to which the USACE responded on May 12, 2015. We initiated consultation the same day. The project was then re-assigned twice. The second project re-assignment occurred on May 6, 2016.

Thomas Danluck: NMFS received a request from the USACE on April 29, 2016. NMFS requested additional information on July 13, 2016. The USACE responded the same day, and we initiated consultation.

Coastal Towers: NMFS received a request from the USACE on March 4, 2016. We received revised plans via email on July 28, 2016. We requested additional information via email on August 22 and 23, 2016. We contacted the consultant via telephone on August 25, 2016. The consultant answered our remaining questions, and we initiated consultation that day.

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 Proposed Actions

Sergey Novov: The site consists of a seawall, concrete piles, batter piles, and riprap extending approximately 8 feet (ft) waterward of the seawall. The applicant proposes to construct a 500-square-foot (ft^2) marginal dock comprised of wooden deckboards (1/8-inch [in] spacing between deckboards) and elevated 2.7 ft above mean high water (MHW), install a 20,000-pound (lb) capacity boatlift, and install a personal watercraft lift. The project includes 6 new 12-in-diameter wooden piles that would be installed via a vibratory hammer. The work will be conducted using a barge-mounted crane. The proposed action will result in the addition of 2 vessel slips (1 slip is for a 360-ft^2 vessel and the other is for a wave runner).

A seagrass survey was conducted on July 7, 2014. The report states that Johnson's seagrass and paddle grass were documented at the site (approximately 5% coverage). No corals or mangroves were observed on-site. In-water work will take approximately 2 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. 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.

Thomas Danluck: The site consists of a concrete dock and 1 boat slip. The applicant proposes to remove the existing dock and construct a 312-ft^2 wooden dock (with no space between the deckboards) elevated 2.58 ft above MHW. The project includes 13 new 12-in-diameter wooden piles. Piles will be driven with an impact hammer via a barge-mounted crane. The site currently provides 1 vessel slip, and no new slips will be added.

A seagrass survey was conducted on November 2, 2015. The report states that no Johnson's seagrass is present; however, paddle grass, shoal grass, and manatee grass were documented at the site (approximately 5-20% cover). Two species of stony corals were documented at the site (*Siderastrea* spp. and *Solenastrea* spp.); however, no ESA-listed coral species were found at the site, nor were any mangroves observed. In-water work will take approximately 5 days and will be conducted during daylight hours only. Turbidity curtains will be required, and the applicant will comply with NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions.*

Coastal Towers: The site consists of a seawall, concrete slabs, an over-water viewing platform, concrete docks, and 33 wet slips on the north and south sides of the property. The applicant proposes to replace 2 sections of seawall, repair/replace the pool deck and support piles, and replace the existing docks with 33 new slips. The new docks will have 1-in spacing between the deckboards and will be elevated 3.16 ft above MHW. The project includes 179 new 12-in-diameter concrete piles and 50 new 12-in-diameter wood piles that will be installed via impact hammer. The maximum number of piles to be installed per day is 10. The site currently provides 33 vessel slips, and no new slips will be added.

A seagrass survey was conducted on August 28, 2015. The report states that no Johnson's seagrass is present; however, paddle grass and shoal grass were documented at the site (5-20% cover of the former and 30% cover of the latter). One species of stony coral (*Siderastrea siderea)* was observed at the site (10-12 colonies); however, no impacts are expected to these colonies because they are not in the construction footprint. No mangroves or ESA-listed coral species or were observed at the site. In-water work is expected to take 10-12 months and will be conducted during daylight hours only. Turbidity curtains will be required, and the applicant will comply with NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions.*

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 this project include 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. For the Novov project, the applicant proposes pile installation with a vibratory hammer. This method of installation has a behavioral response zone of 72 ft from the pile-driving activities. For the Danluck and Coastal Towers projects, the applicants propose pile installation via an impact hammer. This method of installation has a behavioral response zone of 705 ft from the pile-driving activities.

All 3 projects are 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 Novov project site is located at 25.949839°N, 80.126104°W (North American Datum 1983 [NAD 83]) at 18820 North Bay Road, Sunny Isles Beach, on Dumbfounding Bay approximately 0.4 miles west of the Atlantic Ocean. The Danluck project site is located at 25.846725°N, 80.132381°W (NAD 83) at 34 La Gorce Circle, Miami Beach, approximately 0.8 miles west of the Atlantic Ocean. The Coastal Towers project site is located at 25.923461°N, 80.128439°W (NAD 83) at 400 Kings Point Drive, Sunny Isles Beach, between Dumbfounding Bay and Biscayne Bay approximately 0.5 miles west of the Atlantic Ocean.

3 STATUS OF LISTED SPECIES AND CRITICAL HABITAT

We believe the species listed in Table 1 may be present within the action areas.

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

Species	ESA Listing Status	Action Agency Effect Determinations	NMFS Effect Determinations
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
Seagrass			
Johnson's seagrass	T	LAA (Novov only)	LAA; no jeopardy (Novov only)
Critical Habitat			
Johnson's seagrass Unit J		No determination made (Novov) "May Affect" (Danluck and Coastal Towers)	LAA; no DAM (all 3 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			

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.

All 3 projects are located within Johnson's seagrass critical habitat (Unit J - Northern Biscayne Bay), and Johnson's seagrass is present at the Novov project site.

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 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 affected by being temporarily unable to use the site for foraging or refuge due to avoidance of construction activities and physical exclusion from areas blocked by turbidity curtains. Yet we find these effects to be insignificant given their limited impact on foraging and sheltering behavior. 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 effects to sea turtles and smalltooth sawfish from temporary exclusion will be insignificant.

Green sea turtles may be affected by the potential permanent loss of seagrass habitat from shading caused by the dock installation and vessel mooring activities. Seagrass habitat provides foraging opportunities for adult green sea turtles. Two of the 3 projects are dock installations replacing existing docks and no new boat slips are being added. The third project (Novov) is a marginal dock adding 1 boat slip and 1 wave runner slip located in an area with less than 5% seagrass coverage. Based on these types of project conditions and that there are undisturbed areas of similar foraging habitat available nearby for green sea turtles, we believe this effect is insignificant.

3.1.3 Risk of Vessel Strike

The Novov project proposes the addition of 2 vessel slips. The addition of 2 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 2 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 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 be physically injurious to animals in the affected areas, or result in behavioral changes by animals in the 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

[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.

periods. Behavioral effects can be adverse depending on the circumstances in which they occur (i.e., if such effects prevent animals from 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 wood piles (Novov) by vibratory hammer will not result in any form of injurious noise effects. In the analysis in SAJ-82 (SAJ-82, Appendix B, Table 11 footnote), the noise source level used for this analysis was based on the vibratory installation of a 13-in steel pipe pile as a surrogate for the vibratory installation of a wood pile. This is a very conservative approach since the installation of a 13-in steel pipe pile would be considerably louder than a similar-sized wood or concrete pile or vinyl sheet pile. This installation method could result in behavioral effects at radii of up to 16 ft (5 m) for sea turtles and up to 72 ft (22 m) for smalltooth sawfish. Given the mobility of sea turtles and sawfish, we expect them to move away from noise disturbances. Because there is similar habitat nearby, we believe this effect will be insignificant. If an individual chooses to remain in the behavioral response zone, it could be exposed to behavioral noise impacts during pile installation. Since installation will only occur 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 (Coastal Towers and Danluck) 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, 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. 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.

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

Based on our noise calculations, installation of concrete piles by impact hammer (Coastal Towers) 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 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 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.

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

3.2.1 Johnson's Seagrass

NMFS listed Johnson's seagrass as threatened under the ESA on September 14, 1998. Kenworthy (1993, 1997, 2000) and NMFS (2002, 2007) discuss the results of numerous field studies and summarize an extensive literature review regarding the status of Johnson's seagrass. In addition to the published literature, the Johnson's Seagrass Recovery Implementation Team (Recovery Team) is in the process of updating the 2002 Recovery Plan for Johnson's Seagrass. The updated Recovery Plan will contain the latest information concerning the status of this species and potential threats to its persistence and recovery. The following discussion summarizes those findings relevant to our evaluation of the proposed action.

Life History and Population Biology
Based on the current knowledge of the species, Johnson's seagrass reproduction is believed to be entirely asexual, and dispersal is by vegetative fragmentation. Sexual reproduction in Johnson's seagrass has not been documented. Female flowers have been found; however, dedicated surveys in the Indian River Lagoon have not discovered male flowers, fertilized ovaries, fruits, or seeds, either in the field or under laboratory conditions (Jewett-Smith et al. 1997, NMFS 2007, Hammerstrom and Kenworthy 2002). Searches throughout the range of Johnson's seagrass have produced the same results, suggesting either that the species does not reproduce sexually or that the male flowers are difficult to observe or describe, as noted for other *Halophila* species (Kenworthy 1997). Surveys to date indicate that the incidence of female flowers appears to be much higher near the inlets leading to the Atlantic Ocean.

Throughout its range, Johnson's seagrass occurs in dynamic and disjunctive patches. It spreads rapidly, growing horizontally from dense apical meristems with leaf pairs having short life spans

(Kenworthy 1997). Kenworthy suggested that the observed horizontal spreading, rapid growth patterns, and high biomass turnover could explain the dynamic patches observed in distribution studies of this species. While patches may colonize quickly, they may also disappear rapidly. Sometimes they will disappear for several years and then re-establish, a process referred to as "pulsating patches" (Heidelbaugh et al. 2000; Virnstein and Morris 2007; Virnstein et al. 2009). Mortality, or the disappearance of patches, can be caused by a number of processes, including burial from bioturbation and sediment deposition (Heidelbaugh et al. 2000), erosion, herbivory, desiccation, and turbidity. In the absence of sexual reproduction, one possible explanation for the pulsating patches is dispersal and re-establishment of vegetative fragments, a process that commonly occurs in aquatic plants and has been demonstrated in other seagrasses (Philbrick and Les 1996; DiCarlo et al. 2005), and was also recently confirmed by experimental mesocosm[3] studies with Johnson's seagrass (Hall et al. 2006).

Johnson's seagrass is a shallow-rooted species and vulnerable to uprooting by wind, waves, storm events, tidal currents, bioturbation, and motor vessels. It is also vulnerable to burial by sand movement and siltation (Heidelbaugh et al. 2000). Having a canopy of only 2-5 cm, it may be easily covered by sediments transported during storms or redistributed by macrofaunal bioturbation during the feeding activities of benthic organisms. Mesocosm experiments indicate that clonal fragments can only survive burial for up to a period of 12 days (W.J. Kenworthy, CCFHR, NOAA, Beaufort, North Carolina, 1997 unpublished). Mechanisms capable of disturbing patches may create clonal fragments that become dispersed. Hall et al. (2006) showed that drifting fragments of Johnson's seagrass can remain viable for 4-8 days, during which time they can settle, root, and grow. The process of asexual fragmentation can occur year-round. Fragments could drift several kilometers under the influence of wind and tidally driven circulation, providing potential recruits for dispersal and new patch formation. In the absence of sexual reproduction, these are likely to be the most common forms of dispersal and patch maintenance.

Population Status and Distribution

Johnson's seagrass occurs in a variety of habitat types, including on intertidal wave-washed sandy shoals, on flood deltas near inlets, in deep water, in soft mud, and near the mouths of canals and rivers, where presumably water quality is sometimes poor and where salinity fluctuates widely. It is an opportunistic plant that occurs in a patchy, disjunctive distribution from the intertidal zone to depths of approximately 2-3 meters in a wide range of sediment types, salinities, and in variable water quality conditions (NMFS 2007).

Johnson's seagrass exhibits a narrow geographical range of distribution and has only been found growing along approximately 200 kilometers (km) of coastline in southeastern Florida north of Sebastian Inlet, Indian River County, south to Virginia Key in northern Biscayne Bay, Miami-Dade County. This apparent endemism suggests that Johnson's seagrass has the most limited geographic distribution of any seagrass in the world. Kenworthy (1997; 1999) confirmed its limited geographic distribution in patchy and vertically disjunctive areas throughout its range. Two survey programs regularly monitor the presence and abundance of Johnson's seagrass within this range. One program, conducted by the St. Johns River Water Management District

[3] A mesocosm is an experimental tool that brings a small part of the natural environment under controlled conditions.

(SJRWMD) since 1994, covers the northern section of the species' geographic range between Sebastian Inlet and Jupiter Inlet (Virnstein and Morris 2007; Virnstein et al. 2009). The second more recently initiated survey (2006) is of the southern range of the species between Jupiter Inlet and Virginia Key in Biscayne Bay (Kunzelman 2007). Since the last status review (NMFS 2007), there have not been any reported reductions in the geographic range of the species. In fact, the SJRWMD observed Johnson's seagrass approximately 21 km north of the Sebastian Inlet mouth on the western shore of the Indian River Lagoon-a discovery that slightly extends the species' known northern range (Virnstein and Hall 2009).

Johnson's seagrass is a perennial species (meaning it lasts for greater than 2 growing seasons), showing no consistent seasonal or year-to-year pattern based on the northern transect surveys, but has exhibited some winter decline (NMFS 2007). However, during exceptionally mild winters, Johnson's seagrass can maintain or even increase in abundance from summer to winter. In the surveys conducted between 1994 and 2007, it occurred in 7.1% of the l m^2 quadrats in the northern range. Depth of occurrence within these surveys ranged from 0.03 to 2.5 m. Where it does occur, its distribution is patchy, both spatially and temporally. It frequently disappeared from transects only to reappear several months or several years later (NMFS 2007).

Based on the results of the southern transect sampling, it appears there is a relatively continuous, although patchy, distribution of the species from Jupiter Inlet to Virginia Key (NMFS 2007). The largest reported contiguous patch of Johnson's seagrass in the southern range was observed in Lake Worth Lagoon and was estimated to be 30 acres (Kenworthy 1997). Eiseman and McMillan (1980) documented Johnson's seagrass in the vicinity of Virginia Key (latitude 25.75°N); this location is considered the southern limit of the species' range. There have been no reports of this species further south of the currently known southern distribution. The presence of Johnson's seagrass in northern Biscayne Bay (north of Virginia Key) is well documented. In addition to localized surveys, the presence of Johnson's seagrass has been documented by various field experiences and observations of the area by federal, state, and county entities. Johnson's seagrass has been documented in various USACE and U.S. Coast Guard (USCG) permit applications reviewed by NMFS. Findings from the southern transect sampling (Summer 2006 and Winter 2007) show little difference in the species' frequency or abundance between the summer and winter sampling period. The lower frequencies of Johnson's seagrass occurred at those sites where larger-bodied seagrasses (e.g., turtle grass, *Thalassia testudinum,* and manatee grass, *Syringodium filiforme*) were more abundant (NMFS 2007). The southern range transect data support some of the conclusions drawn from previous studies and other surveys. This is a rare species; however, it can be found in relatively high abundance where it does occur. Based on the results of the southern transect sampling, it appears that, although it is disjunctively distributed and patchy, there is some continuity in the southern distribution, at least during periods of relatively good environmental conditions and no significant large-scale disturbances (NMFS 2007).

Information on the species' distribution and results of limited experimental work suggest that Johnson's seagrass has a wider tolerance range for salinity, temperature, and optical water quality conditions than other species such as paddle grass, *Halophila decipiens* (Dawes et al. 1989; Kenworthy and Haunert 1991; Gallegos and Kenworthy 1996; Kenworthy and Fonseca 1996; Durako et al. 2003; Torquemada et al. 2005). Johnson's seagrass has been observed near

the mouths of freshwater discharge canals (Gallegos and Kenworthy 1996), in deeper turbid waters of the interior portion of the Indian River Lagoon (Kenworthy 2000; Virnstein and Morris 2007), and in clear water associated with the high energy environments and flood deltas inside ocean inlets (Kenworthy 1993; Kenworthy 1997; Virnstein et al. 1997; Heidelbaugh et al. 2000; Virnstein and Morris 2007). It can colonize and persist in high-tidal energy environments and has been observed where tidal velocities approach the threshold of motion for unconsolidated sediments (35-40 cm s^{-1}). The persistent presence of high-density, elevated patches of Johnson's seagrass on flood tidal deltas near inlets suggests that it is capable of sediment stabilization. Intertidal populations of Johnson's seagrass may be completely exposed at low tides, suggesting high tolerance to desiccation and wide temperature tolerance.

In Virnstein's study areas within the Indian River Lagoon, Johnson's seagrass was found associated with other seagrass species or growing alone in the intertidal, and, more commonly, at the deep edge of some transects in water depths down to 180 cm. In areas in which long-term poor water and sediment quality have existed until recently, Johnson's seagrass appears to occur in relatively higher abundance, perhaps due to the inability of the larger species to thrive. Johnson's seagrass appears to be out-competed in seagrass habitats where environmental conditions permit the larger seagrass species to thrive (Kenworthy 1997; Virnstein et al. 1997). When the larger, canopy-forming species are absent, Johnson's seagrass can grow throughout the full seagrass depth range of the Indian River Lagoon (NMFS 2007; Virnstein et al. 2009).

Observations by researchers have suggested that Johnson's seagrass exploits unstable environments or newly created unvegetated patches by exhibiting fast growth and support for all local ramets in order to exploit areas in which it could not otherwise compete. It may quickly recruit to locally uninhabited patches through prolific lateral branching and fast horizontal growth. While these attributes may allow it to compete effectively in periodically disturbed areas, if the distribution of this species becomes limited to stable areas it may eventually be outcompeted by more stable-selected plants represented by the larger-bodied seagrasses (Durako et al. 2003). In addition, the physiological attributes of Johnson's seagrass may limit growth (i.e., spreading) over large areas of substrate if the substrate is somehow altered (e.g., dredged to a depth that would preclude future recruitment of Johnson's seagrass); therefore, its ability to recover from widespread habitat loss may be limited. The clonal and reproductive growth characteristics of Johnson's sea grass result in its distribution being patchy, non-contiguous, and temporally fluctuating. These attributes suggest that colonization between broadly disjunctive areas is likely difficult and that the species is vulnerable to becoming endangered if it is removed from large areas within its range by natural or anthropogenic means. A number of anthropogenic activities that have the potential to harm Johnson's seagrass and its designated critical habitat are discussed below (please see Threats to Johnson's Seagrass and its Designated Critical Habitat).

Based on the results of 14 years of monitoring in the species' northern range (1994-2007) and three years of monitoring in the species' southern range (2006-2009), there has been no significant change in the northern or southern range limits of Johnson's seagrass (NMFS 2007). It appears that the populations in the northern range are stable and capable of sustaining themselves despite stochastic events related to severe storms (Steward et al. 2006) and fluctuating climatology. Longer-term monitoring data are needed to confirm the stability of the southern distribution of the species (NMFS 2007). But based on the results of the southern transect sampling, it appears there is a relatively continuous, although patchy, distribution of

Johnson's seagrass from Jupiter Inlet to Virginia Key, at least during periods of relatively good environmental conditions and no significant large-scale disturbances. Larger seagrasses, predominantly turtle grass *(Thalassia testudinum),* begin to out-compete Johnson's seagrass in the southern range. While there has been a slight extension in the known northern range (Virnstein and Hall 2009), the limit of the southern range in the vicinity of Virginia Key (latitude 25.75°N) appears to be stable. There have been no reports of this species further south of the currently known southern distribution.

3.2.2 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 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.

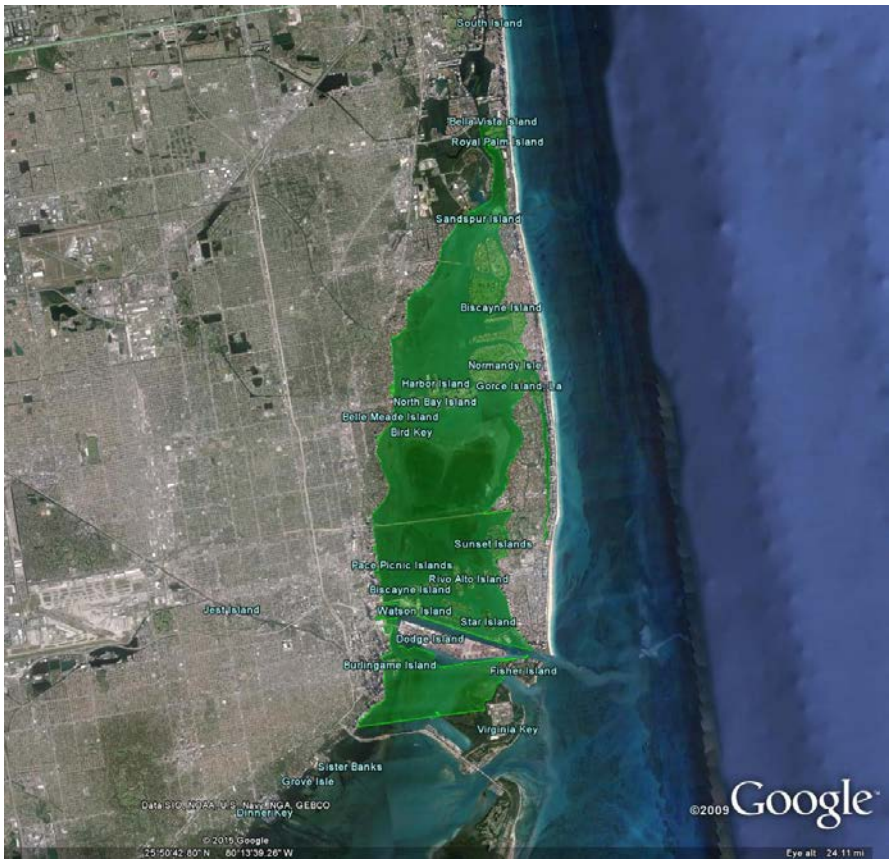

Figure 1. Johnson's seagrass critical habitat Unit J (©2015 Google, Data SIO, NOAA, U.S. Navy, NGA, GEBCO)

Threats to Johnson's Seagrass and its Designated Critical Habitat

A wide range of activities, many funded, authorized, or carried out by federal agencies, have and will continue to affect Johnson's seagrass and its designated critical habitat. These activities 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 and its 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 Johnson's seagrass and its 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 and its 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 the species and its designated 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 and its designated 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 areas that may benefit the species or its 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 and its Designated Critical Habitat in the Action Areas

Federal Actions
A wide range of activities funded, authorized, or carried out by federal agencies may affect Johnson's seagrass and its designated 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. All 3 projects are located in Miami-Dade County. The Miami-Dade programmatic (SAJ-42) authorizes docks that may affect Johnson's seagrass and its designated critical habitat. NMFS issued an Opinion concerning the Programmatic General Permit on February 10, 2011, and the USACE issued the permit on April 29, 2013.

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.

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).

State and Federal Activities That May Benefit Johnson's Seagrass
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

5.1 Johnson's Seagrass Critical Habitat

All 3 projects are 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.

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 248 new piles (combined for all 3 projects). Because the piles are included in the overall footprint of the proposed docks and to avoid double counting the impacts, we decided not to use two separate impact calculations. Therefore, the impact calculations include impacts from shading and pile installation for each project site.

We believe the Novov project will adversely affect 860 ft^2 of critical habitat (500 ft^2 from the dock and 360 ft^2 from the vessel). We believe the Danluck project will adversely affect 312 ft^2 of critical habitat (from the dock only; no new slips will be added, so we do not anticipate additional shading from vessels). We believe the Coastal Towers project will adversely affect 1,245 ft^2 of critical habitat (from the docks only; no new slips will be added, so we do not

anticipate additional shading from the vessels). Combined, we believe the 3 projects will adversely affect 2,417 ft² of Johnson's seagrass critical habitat.

5.2 Johnson's Seagrass

Only 1 of the projects (Novov) has Johnson's seagrass present at the site. The dock was sited to avoid shading of Johnson's seagrass; however, the boatlift will be located over a 360-ft ² area that supports Johnson's seagrass and paddle grass (approximately 5% cover). Based on the percent-cover estimate, we believe the vessel will shade approximately 18 ft² of Johnson's seagrass (360 ft² x 0.05 = 18 ft²).

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, these activities are subject to USACE permitting and thus the ESA Section 7 consultation requirement. 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*, 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 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 three projects will adversely affect a

total of 2,417 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. The loss of 2,417 ft² (0.06 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 (0.06 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 2,417 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 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 JEOPARDY ANALYSIS

The analyses conducted in the previous sections of this Opinion serve to provide a basis to determine whether the proposed action (the Novov project only) would be likely to jeopardize the continued existence of Johnson's seagrass. In Section 5, we outlined how the proposed action would affect Johnson's seagrass. Now, we turn to an assessment of the species' response to these impacts, in terms of overall population effects, and whether those effects of the proposed action, when considered in the context of the status of the species (Section 3), the environmental baseline (Section 4), and the cumulative effects (Section 6), will jeopardize the continued existence of Johnson's seagrass.

"To jeopardize the continued existence of" means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and the recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution

of that species" (50 CFR 402.02). Thus in making this determination, we must first determine whether there will be a reduction in the reproduction, numbers, or distribution. Then, if there is a reduction in one or more of these elements, we evaluate whether it will cause an appreciable reduction in the likelihood of both the survival and the recovery of the species.

As noted in Section 5.2, we believe Johnson's seagrass will be adversely affected due to shading from the vessel. We must now determine if the proposed action would reasonably be expected to appreciably reduce, either directly or indirectly, the likelihood of Johnson's seagrass survival and recovery in the wild. In 2 steps, the following sections provide our rationale for why we believe the Novov project is not likely to appreciably reduce the likelihood of Johnson's seagrass survival and recovery in the wild. First, we evaluate whether the anticipated loss of 18 ft^2 of the species will result in any reduction in distribution, reproduction, or areal coverage (numbers) that may appreciably reduce the species' likelihood of survival in the wild. Second, we consider how the anticipated loss of the species is likely to affect the species' recovery in the wild.

Based on our current knowledge of the species, Johnson's seagrass reproduction is entirely asexual, is presumed to occur by fragmentation, and its growth appears to be rapid. Johnson's seagrass occurs in dynamic and disjunctive patches throughout its range.

Reproduction will be minimally reduced by the anticipated loss of 18 ft^2 of the species, but NMFS believes this reproductive loss does not appreciably reduce the likelihood of survival of Johnson's seagrass in the wild because adjacent areas where Johnson's seagrass is present will continue to reproduce and spread. The proposed action will not disturb Johnson's seagrass outside the action area; therefore, the reproductive potential of the species adjacent to the action area, and in this portion of its range, will persist.

Moreover, the proposed action will not result in a reduction of Johnson's seagrass distribution. Johnson's seagrass will continue to exist in areas in and surrounding the action area and throughout its 200-km range. The loss of approximately 18 ft^2 of Johnson's seagrass (due to shading from the vessel) will not result in a significant reduction of Johnson's seagrass distribution within the species range because it will not impact any of the other Johnson's seagrass outside of the direct footprint of the project. Likewise, this potential loss of Johnson's seagrass will not cause a fragmentation of the range because some Johnson's seagrass patches will likely still remain in the action area and would be capable of spreading via asexual fragmentation. Based on the preceding, NMFS concludes that the proposed action will not appreciably reduce the likelihood of survival of Johnson's seagrass in the wild.

Recovery for Johnson's seagrass, as described in the recovery plan, 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).

NMFS believes that the proposed action will not appreciably reduce the likelihood of recovery for Johnson's seagrass in the wild. NMFS's 5-year review of the status of the species from 2007

concluded that the first recovery objective has been achieved. In fact, the range has increased slightly northward. The proposed action will not impact the status of this objective. Self-sustaining populations are present throughout the range and surrounding the project's action area. The species' overall reproductive capacity will be only minimally reduced by the potential loss of 18ft^2 of Johnson's seagrass. The proposed action is small enough in nature and impact that it will not lead to separation of self-sustaining Johnson's seagrass patches to the extent that might lead to adverse effects to one or more of these patches. Similarly, the availability of habitat in which the species can spread/flow in the future will not be adversely affected by the proposed action. While additional individual impacts may occur, and will likely continue to occur, over the last decade the species has not demonstrated any declining trends. Thus, the current rate of Johnson's seagrass loss from individual project impacts appears to be sustainable at the current rate that projects are permitted, even when considered cumulatively.

Since the proposed action will not disturb all of the Johnson's seagrass estimated to occur inside the action area, or any occurring outside the action area, the potential for a self-sustaining population is not removed from this portion of the range. Based on this information, the proposed action will not reduce or destabilize the present range of Johnson's seagrass. The proposed action will not have an adverse effect on the long-term protection of the species. Therefore, the Novov project will not appreciably reduce the likelihood of recovery of Johnson's seagrass in the wild.

9 CONCLUSION

We have analyzed the best available data, the current status of the species and the critical habitat, 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 and to determine whether the proposed action (Novov project only) is likely to jeopardize the continued existence of Johnson's seagrass. 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. It is also our Opinion that the proposed action (Novov) is likely to adversely affect, but is not likely to jeopardize the continued existence of Johnson's seagrass.

10 CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations 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.

11 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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