UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
http://sero.nmfs.noaa.gov

F/SER31:MET

APR 2 5 2017

MEMORANDUM FOR: F/HC3 – Leslie Craig

FROM: F/SE – Roy E. Crabtree, Ph.D.

SUBJECT: Deepwater Horizon-Early Restoration Plan Phase V, Endangered Species Act Section 7 Consultations for 4 public park/fishing pier projects on the Gulf Coast of northwest Florida

Enclosed is the National Marine Fisheries Service's (NMFS) Biological Opinion issued in accordance with Section 7 of the Endangered Species Act (ESA) of 1973. The National Oceanic and Atmospheric Administration Restoration Center (NOAA RC), on behalf of *Deepwater Horizon* Trustees, proposes to create 4 new public parks along the Gulf coast in Escambia, Okaloosa, Franklin, and Bay Counties, Florida. Each park will include 1 or more public fishing piers, among other recreational amenities. The applicant for the project is the Florida Department of Environmental Protection (FDEP). Portions of this project will take place within Gulf sturgeon critical habitat.

Applicant	SER Numbers	Project Type
Florida Department of Environmental Protection	SER-2015-17623 SER-2015-17625 SER-2015-17626 SER-2015-17627	Public Park Creation/Restoration

The Biological Opinion ("Opinion") analyzes the project's effects on 3 species of sea turtles, smalltooth sawfish, Gulf sturgeon, and Gulf sturgeon critical habitat. This Opinion is based on project-specific information provided by the NOAA RC, the FDEP, and our review of published literature. It is NMFS' Opinion that the action, as proposed, will not affect leatherback or hawksbill sea turtles, and may affect, but is not likely to adversely affect smalltooth sawfish, Gulf sturgeon, or Gulf sturgeon critical habitat. It is also our Opinion that the action is likely to adversely affect loggerhead, green and Kemp's ridley sea turtles, but is not likely to jeopardize the continued existence of these species.

No taking of marine mammals, whether listed under the ESA or not, is authorized. Incidental taking of marine mammals must be authorized under Section 101(a)(5)(E) of the Marine Mammal Protection Act (MMPA). If NOAA RC believes marine mammals may be taken by their proposed action or wishes to discuss requirements for obtaining MMPA take authorization, NOAA RC should contact the Office of Protected Resources, at (301) 427-8400.

We look forward to further cooperation with you on other NOAA RC projects to ensure the conservation and recovery of our threatened and endangered marine species. If you have any questions regarding this consultation, please contact Mike Tucker, Consultation Biologist, at (727) 209-5981, or by email at michael.tucker@noaa.gov.

Sincerely,

for Roy E. Crabtree, Ph.D.
Regional Administrator

Enc.:
1. *Sea Turtle and Smalltooth Sawfish Construction Conditions* (Revised March 23, 2006)
2. *Construction Guidelines in Florida for Minor Piling-Supported Structures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat,* (August, 2011)
3. *PCTS Access and Additional Considerations for ESA Section 7 Consultations* (Revised June 11, 2013)

File: 1514-22.C

Endangered Species Act - Section 7 Consultation
Biological Opinion

Action Agency:	NOAA Restoration Center, on behalf of *Deepwater Horizon* Trustees
Activity:	Development of 4 new public parks on the northern Florida Gulf coast.
Consulting Agency:	National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), Southeast Regional Office, Protected Resources Division, St. Petersburg, Florida Consultation Numbers SER-2015-17623, SER-2015-17625, SER-2015-17626, and SER-2015-17627
Approved by:	For Roy E. Crabtree, Ph.D., Regional Administrator NMFS, Southeast Regional Office St. Petersburg, Florida
Date Issued:	April 25, 2017

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Acronyms and Abbreviations

BMP	Best management practice
CFR	Code of Federal Regulations
CPUE	Catch Per Unit Effort
cSEL	Cumulative Sound Exposure Level
DPS	Distinct Population Segment
DWH	*Deepwater Horizon*
DTRU	Dry Tortugas Recovery Unit
ESA	Endangered Species Act
FDEP	Florida Department of Environmental Protection
FP	Fibropapillomatosis disease
FWRI	Fish and Wildlife Research Institute
GADNR	Georgia Department of Natural Resources
GCRU	Greater Caribbean Recovery Unit
IMMS	Institute of Marine Mammal Studies
ITS	Incidental Take Statement
NA	North Atlantic
NMFS	National Marine Fisheries Service
NCWRC	North Carolina Wildlife Resources Commission
NGMRU	Northern Gulf of Mexico Recovery Unit
NOAA	National Oceanic and Atmospheric Association
NRU	Northern Recovery Unit
NWA	Northwest Atlantic
PCB	Polychlorinated biphenyls
PRM	Post-release mortality
RC	Restoration Center
RPMs	Reasonable and Prudent Measures
SA	South Atlantic
SAV	Submerged aquatic vegetation
SCDNR	South Carolina Department of Natural Resources
SCL	Straight carapace length
SEFSC	Southeast Fisheries Science Center
STSSN	Sea Turtle Stranding and Salvage Network
TEDs	Turtle Exclusion Devices
TEWG	Turtle Expert Working Group
USFWS	U.S. Fish and Wildlife Service

Units of Measurement

°C	Degrees Celsius
°F	Degrees Fahrenheit
cm	Centimeter(s)
ft	Feet
lin ft	Linear feet
ft^2	Square feet
in	Inch(es)
g	Grams
kg	Kilograms
lb	Pound(s)
mi	Mile(s)
mi^2	Square mile(s)

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 shall 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 action that "may affect" listed species or designated critical habitat. The National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) share responsibilities for administering the ESA. Consultations on most listed marine species and their designated critical habitat are conducted between the action agency and NMFS.

Consultation is concluded after NMFS determines the proposed action is not likely to adversely affect listed species or their 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. The Opinion states the amount or extent of incidental take of the listed species that may occur and recommends conservation measures to further conserve the species.

This document represents NMFS's Opinion based on our review of impacts associated with the creation of 4 new public parks along the Gulf coast in Escambia, Okaloosa, Franklin, and Bay Counties, Florida. This Opinion analyzes project effects on sea turtles, smalltooth sawfish, Gulf sturgeon, and Gulf sturgeon critical habitat in accordance with Section 7 of the ESA. This Opinion is based on project information provided by the NOAA Restoration Center (RC), the applicant Florida Department of Environmental Protection (FDEP), and other sources of information including published literature cited herein.

BIOLOGICAL OPINION

1 CONSULTATION HISTORY

- NMFS received initial draft Biological Evaluation (BE) forms describing the proposed projects via email on December 14, 2015.
- Final draft BE forms were formally submitted for consultation on December 18, 2015.
- NMFS provided initial comments and questions on the projects to the RC in a meeting held on April 13, 2016. RC passed those comments on to the FDEP.
- NMFS received responses to initial comments via email on May 11, 2016.
- NMFS provided a request for additional information via email on May 27, 2016.
- NMFS received responses to our request for additional information via email on June 15, 2016.
- The RC hosted a teleconference between NMFS, RC and FDEP on June 27, 2016 to discuss NMFS comments and effects determinations.
- All major issues were resolved and formal consultation was initiated on June 27, 2016.

2 DESCRIPTION OF THE PROPOSED ACTION AND ACTION AREA

This section describes the 4 proposed parks and fishing piers. During all in-water activities, workers will adhere to NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions*, dated March 23, 2006 (attached). If pre-construction site surveys identify submerged aquatic vegetation (SAV) in the proposed pier footprint for any of the parks, the conditions in the U. S. Army Corps of Engineers/NMFS's *Construction Guidelines in Florida for Minor Piling-Supported Structures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat*, dated August 2011 (attached), will be implemented. Fixed signs that are consistent with NOAA's and the state of Florida's guidelines on what to do in the event of hooking a listed species (e.g., sea turtle) will be placed at the entrance to the fishing piers and maintained throughout the life of the project. Monofilament recycling bins will be installed on the piers. These will be emptied regularly as part of the project maintenance activities, and the fishing line recycled.

2.1 Innerarity Point Park

The majority of the property at the Innerarity Point Park site is unimproved and consists of lawn area with mature live oaks and coastal vegetation along the shoreline. Much of the shoreline, as well as inland vegetation, is currently being maintained by mowing. Specific elements of the proposed Innerarity Point Park conceptual site plan relevant to aquatic and shoreline habitats include the following (Figure 3):

1. New Fishing Dock with Kayak Launch. The proposed action includes construction of a fishing pier and boardwalk (442 ft by 5 ft, approximately 2,210 ft^2), and dock platforms (790 ft^2) for paddle craft water access. The dock will not be used for motorized vessels. The entire dock including the platforms would cover an area of approximately 3,000 ft^2 (2,210 + 790). Pier construction would include placement of approximately 80 new 8-inch wood or composite piles.

Piles will be installed by a barge with a drill rig and partially jetted into place and finished with a vibratory or impact pile driver. The barge will also be used during the installation of the primary and secondary stringers. Once the stringers are installed, the remaining portions of the pier construction will be completed from the pier itself using shallow conventional floating construction platforms (approx. 2 ft deep). The main branch of the pier would extend from the shore, near the center of the parcel where there is a break in the SAV along the shoreline, and be oriented approximately north to south. A perpendicular section of pier is proposed at the end of the main branch. This perpendicular section would be oriented approximately east to west and would be built out past the SAV to minimize impacts to SAV.

2. Expanded Beach Area. The beach area would be expanded by removing a portion (approximately 3,500 ft^2) of the vegetation landward of the shoreline, which is a mixture of native and invasive vegetation including *Spartina* and morning glory, some of which is currently being regularly mowed. All proposed beach expansion efforts would take place on land above the mean high water line.

3. Beach Access for Paddle Craft. The boardwalk would include access directly to the beach on the western portion of the property. A small area of vegetation (likely a combination of some native and some invasive species) may need to be removed to provide this access.

4. Shoreline Restoration. Currently a mixture of native and invasive species exists along the shoreline. An area (approximately 2,500 ft^2) on the landward side of the beach would undergo invasive species removal and subsequent planting with native shoreline vegetation.

Significant additional upland infrastructure such as picnic pavilions, playgrounds, bathrooms and a parking lot would also be constructed on the property. Erosion control measures and other best management practices (BMPs) will be implemented to ensure that upland construction activities do not result in impacts to aquatic habitats/resources. Installation of the proposed site improvements is estimated to take 9-12 months.

The expected level of fishing activity at this site has not been determined and is likely to vary with fishing seasons. Parking at the site will be limited to approximately 50 spaces and the perpendicular section of pier (the area most likely to be used for fishing) will be approximately 250 ft long. Given these two parameters, we estimate a maximum of 50 fishers using the pier at any given time (1 fisher per vehicle and/or 1 fisher every 5 ft along the perpendicular section of the pier).

Figure 1. Innerarity Point Park Proposed Conceptual Master Plan (Figure 10 in FDEP Biological Evaluation for Innerarity Point Park, Attachment A)

2.2 Leonard Destin Park

The proposed Leonard Destin Park property is approximately 3.42 acres and includes 280 linear feet (lin ft) of frontage on Choctawhatchee Bay. The vegetation at this parcel consists of maritime oak, with minimal understory primarily consisting of grasses. At the shoreline, little vegetation occurs; there are no wetlands on-site. There are seagrasses at this site in the vicinity of the existing dock. The aquatic habitat along the proposed park site is designated as critical habitat for Gulf Sturgeon (Unit 12). The proposed park would be a daytime use park (i.e., sunrise to sunset). Specific elements of the Leonard Destin Park proposed conceptual site plan relevant to aquatic and shoreline habitats include the following (Figure 2):

1. Expanded Dock. An existing dock would be modified by expanding the width to make it ADA compliant. The existing dock has a platform deck at the end of it which will be maintained.

The applicant anticipates that the existing piles will need to be replaced or supplemented as they are not treated timber piles and therefore have a reduced expected remaining life. If all piles are replaced, approximately 25 new 8-inch wood or composite piles would need to be driven. A barge with a drill rig mounted to it will be required to install the new piles. The piles will be partially jetted into place and finished with a vibratory or impact pile driver. Once the framework is in place, the rest of the pier will be constructed from the pier itself using shallow conventional floating construction platforms (approximately 2 ft deep). The first approximately 20 ft of piles will be placed from the shore. The total area of the expanded dock would be 3,550 ft^2. The new decking and the other structural features would be comprised of natural (i.e., wood) material and/or durable composite materials. Updated SAV surveys would occur prior to construction, as SAV bed continuity, extent, and density are subject to change over time. If the SAV surveys find that SAV near the dock location would be adversely affected by the widening of the dock, appropriate steps would be taken (e.g., incorporating the use of composite grated materials that would allow light through) to avoid or minimize adverse effects.

2. **Expanded Beach Area**. The current beach area on the site is approximately 0.3 acres and is sparsely vegetated with primarily non-native grasses. This beach area would be shaped and slightly expanded landward to create approximately 0.5 acres of beach area. Shoreline stabilization efforts such as planting native grasses at the perimeter may be undertaken. Sand may also be imported to the site to supplement the beach area. All beach expansion efforts would take place landward of the mean high water line.

3. Expanded Boardwalk and Deck. A raised wooden deck would replace existing structures along the shoreline on the north side of the parcel and would be expanded to include 2,725 ft^2 of water access, pending additional SAV surveys and consultations.

4. Kayak Launch from Deck. The expanded boardwalk would include a kayak launch that would likely be partially submerged at high tide.

Significant additional upland infrastructure such as a picnic pavilion, playground, bathrooms and a parking lot would also be constructed on the property. Erosion control measures and other BMPs will be implemented to ensure that upland construction activities do not result in impacts to aquatic habitats/resources. Installation of the proposed site improvements is estimated to take 9-12 months.

The expected level of fishing activity at this site has not been determined and is likely to vary with fishing seasons. Parking at the site will be limited to approximately 30 spaces and the platform deck at the end of the dock (the area likely to be used for fishing) has a perimeter length of approximately 150 ft. Given these two parameters, we estimate a maximum of 30 fishers using the pier at any given time (1 fisher per vehicle and/or 1 fisher every 5 ft along the perimeter of the platform deck).

Figure 2. Leonard Destin Park proposed conceptual master plan (Figure 10 in FDEP Biological Evaluation for Leonard Destin Park, Attachment A)

2.3 Island View Park

The proposed Island View Park site is a 7.13-acre tract of land that is currently owned by and located within Franklin County, Florida. The property is divided by U.S. 98, with an inland northwestern parcel (“inland parcel”) that is 4 acres and a southeastern waterfront parcel (“waterfront parcel”) that is 3.13 acres (Figure 3). The waterfront parcel of the property includes 884 lin ft of frontage along St. George Sound, which lies between 2 state-designated aquatic preserves and is adjacent to the Apalachicola National Estuarine Research Reserve. All previously developed structures and surface improvements were razed and most debris removed after 2011. The only remaining structures are 2 fishing piers and a dilapidated concrete boat ramp. At the shoreline, emergent marsh grasses occur but have been disturbed by regular mowing. There are seagrasses in the water near the fishing piers at this site. The aquatic habitat along the proposed park site is designated as critical habitat for Gulf Sturgeon (Unit 13). The proposed park would be a daytime use park (i.e., sunrise to sunset). Specific elements of the Island View Park proposed conceptual site plan relevant to aquatic and shoreline habitats include the following (Figure 3):

1. Expanded Docks with Fishing Platforms. The decking on 2 existing docks would be replaced and widened to make the docks ADA compliant. Load testing to determine the capacity of the existing piles will be conducted from a barge similar to the one described above for the

Destin site. Alternatively, the applicant may install new piles between the existing piles to avoid mobilizing the barge twice (testing and construction). There is no way to determine exactly how many new piles may need to be driven, but if all piles need to be replaced (worst case scenario), approximately 95 new 8-inch wood or composite piles would need to be driven for the 2 docks. Any new piles would be installed by a barge with a drill rig. The piles would be partially jetted into place and finished with a vibratory or impact pile driver. Once the framework is in place, the rest of the pier will be constructed from the pier itself using shallow conventional floating construction platforms (approximately 2 ft deep). The existing planks on the piers would be removed and replaced to create a pier approximately 6 ft wide with railings. The square footage of Dock 1 and Dock 2 would be approximately 2,140 ft^2 and 1,400 ft^2, respectively. The design of the expanded docks would incorporate the use of durable composite grated material for the decking. Seagrasses are apparent adjacent to the docks in aerial photos from 2014. Updated SAV surveys would occur prior to construction, as SAV bed continuity, extent, and density are subject to change over time. If the SAV surveys find that SAV near the dock location would be adversely affected by the widening of the dock, appropriate steps would be taken (i.e. adhering to the U. S. Army Corps of Engineers/NMFS's Construction Guidelines in Florida for Minor Piling-Supported S*tructures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat*, dated August 2011 (attached)) to avoid or minimize adverse effects.

2. Boardwalk. The proposed boardwalk along the waterfront would be a raised boardwalk made of wood or composite material. The proposed dimensions are 510 ft long and 6 ft wide, covering approximately 3,060 ft^2. Final boardwalk height would be determined based on environmental and safety concerns. No piles will be driven below the mean high water line for the boardwalk.

3. Deck Overlook with Seating and Interpretive Sign. The proposed action includes construction of a wood overlook deck that would be approximately 35 ft by 50 ft, pending additional SAV surveys and consultations, and would contain interior bench seating. This structure would be constructed along the boardwalk, at the base of the northernmost pier. No piles will be driven below the mean high water line for the overlook.

4. Beach Access for Paddle Craft. The boardwalk would include access directly to the beach on the eastern portion of the property. The existing dilapidated concrete boat ramp would be removed to provide this beach access, and some vegetation removal may be required. The beach area would encompass approximately 1,350 ft^2.

5. Habitat Restoration.

(A) Maritime Hammock Restoration on the waterfront parcel. Maritime hammock restoration is proposed on the waterfront parcel with a possible extent of restoration comprising up to one third of the waterfront parcel. Restoration may include planting of native vegetation and fencing of existing trees for protection during restoration (up to 1,000 ft of fencing); and

(B) Shoreline Vegetation Restoration on the waterfront parcel. This activity will include restoration of marsh grass along the shoreline. General vegetation restoration would include existing tree protection and fencing, hardwood tree maintenance, fine grading and bed preparation for all sodded and seeded areas, soil amendments (excluding naturalized areas), planting of large and small trees, shrubs, grasses, groundcovers, sod and mulching. Revegetation would include only native plantings, and to the extent possible would be low-maintenance, drought-resistant plants to reduce long-term maintenance

Additional upland infrastructure such as a central plaza and a parking lot would also be constructed on the waterfront parcel. Erosion control measures and other BMPs will be implemented to ensure that upland construction activities do not result in impacts to aquatic habitats/resources. Installation of the proposed site improvements is estimated to take 7-9 months.

The expected level of fishing activity at this site has not been determined and is likely to vary with fishing seasons. Parking at the site will be limited to approximately 32 spaces and the fishing platforms on the 2 docks (the areas likely to be used for fishing) have perimeter lengths that total approximately 200 ft. Given these two parameters, we estimate a maximum of 30 to 40 fishers using the piers at any given time (1 fisher per vehicle or 1 fisher every 5 ft along the perimeter of the platforms).

Figure 3. Island View Park proposed conceptual master plan (Figure 10 in FDEP Biological Evaluation for Island View Park, Attachment A)

2.4 Lynn Haven Park

The proposed Lynn Haven Preserve and Park site is an approximately 90.7 acre undeveloped tract of land located within Bay County. The property includes 1,650 lin ft of frontage on North Bay (marine environment) and 3,570 lin ft of frontage along McKitchen's Bayou (brackish) and its unnamed source creek. There is currently no public access to the site and a gate bars entrance to the property's dirt road. The site owner currently maintains the site through regular mowing of many areas. The proposed park would be a daytime use park (i.e., sunrise to sunset). Specific elements of the Lynn Haven Preserve and Park proposed conceptual site plan relevant to aquatic and shoreline habitats include the following (Figure 4):

1. Motorized Boat Dock. The conceptual plan includes construction of a wooden boat dock for motorized boats that would be 5 ft wide and have wooden handrails. The dock would be approximately 525 ft long, with 2 bays, pending further surveys for SAV. Overwater area of the dock is expected to be approximately 2,625 ft^2. Dock construction would include placement of approximately 112 new 8-inch wood or composite piles installed from a barge with a drill rig. The piles would be partially jetted into place and finished with a vibratory or impact pile driver. Once the framework is in place, the rest of the pier will be constructed from the pier itself using shallow conventional floating construction platforms (approximately 2 ft deep).

2. Limited Bay Shoreline Access. The project may include some beach improvements such as vegetation clearing to allow shoreline access. This plan does not include creating a recreational beach area. Any shoreline improvements would be contingent on maintaining and preserving wetland water quality.

3. Fishing Dock with Paddle Craft Launch. On the bay shore, a wooden fishing/paddle launch dock would be constructed of approximately 200 ft in length. Final location and dimensions will be determined pending additional SAV surveys. Overwater area of the dock is approximately 1,000 ft^2. Dock construction would include placement of approximately 40 new 8-inch wood or composite piles installed from a barge with a drill rig. The piles would be partially jetted into place and finished with a vibratory or impact pile driver. Once the framework is in place, the rest of the pier will be constructed from the pier itself using shallow conventional floating construction platforms (approximately 2 ft deep).

4. Bayou Boardwalk. Along McKitchen's Bayou, approximately 300 lin ft of wooden boardwalk would be constructed on the northwest edge of the property, piles used to support the boardwalk would not be driven in wetlands or in water.

5. Bayou Fishing Dock. Within McKitchen's Bayou, a small fishing dock would be constructed. The fishing dock would be approximately 120 ft long, with a platform of approximately 20 ft by 20 ft at its waterward terminus. Overwater area of the dock is approximately 1,000 ft^2 (including the 400 ft^2 platform). Dock construction would include placement of approximately 28 new 8-inch wood or composite piles installed from a barge with a drill rig. The piles would be partially jetted into place and finished with a vibratory or impact pile driver. Once the framework is in place, the rest of the pier will be constructed from the pier itself using shallow conventional floating construction platforms (approximately 2 ft deep).

6. Bayou Dock with Paddle Craft Access. On McKitchen's Bayou, a floating wooden fishing/paddle launch dock would be constructed of approximately 100 ft in length. Final location and dimensions will be determined pending additional SAV surveys. The proposed overwater area of the dock is approximately 500 ft^2. Dock construction would include placement of approximately 20 new 8-inch wood or composite piles installed from a barge with a drill rig. The piles would be partially jetted into place and finished with a vibratory or impact pile driver.

Once the framework is in place, the rest of the pier will be constructed from the pier itself using shallow conventional floating construction platforms (approximately 2 ft deep).

Significant additional upland infrastructure such as picnic pavilions, bathrooms, parking lots and a maintenance building would also be constructed on the property. Erosion control measures and other BMPs will be implemented to ensure that upland construction activities do not result in impacts to aquatic habitats/resources. Installation of the proposed site improvements is estimated to take 12-15 months.

Figure 4. Lynn Haven Preserve and Park proposed conceptual master plan (Figure 4 in FDEP Biological Evaluation for Lynn Haven Preserve and Park, Attachment A)

2.5 Action Area

The action area is defined by regulation as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action" (50 CFR 402.02). The proposed action is not expected to produce any direct or indirect effects on aquatic species or habitats outside of the nearshore areas immediately adjacent to the parks themselves. Therefore, the action areas at each park site include the nearshore areas in which construction will take place and the areas within a 705 ft (215 m) radius surrounding the proposed piers and shoreline structures where behavioral effects may occur (see noise analyses in Section 3.1).

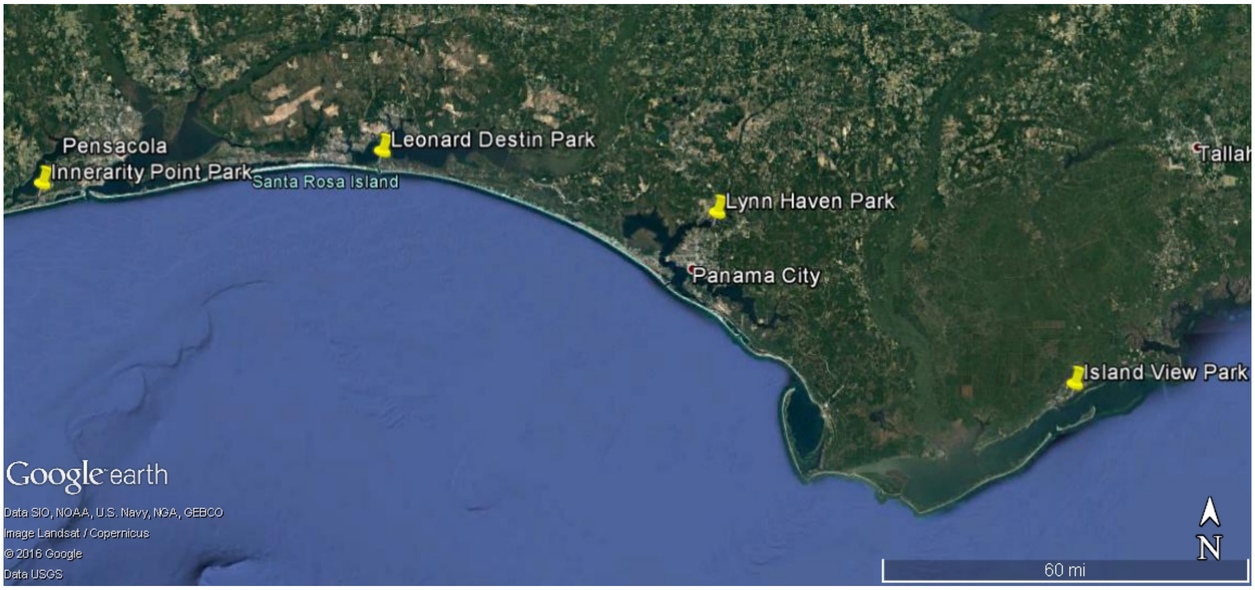

Figure 5. Location of all 4 proposed parks and the surrounding areas (©2016 Google)

Innerarity Point Park

The proposed Innerarity Point Park site lies within Escambia County at 5806 Bob O Link Road, Pensacola, Florida (30.314315°N, 87.443024°W, World Geodetic System 1984 (WGS84)). The 3.38 acre site includes 265 lin ft of frontage along the Old River, a heavily used waterway which flows between Innerarity Point and Perdido Key out to Perdido Bay. Based on available information, there is SAV (e.g. seagrasses) within the action area. However, the exact extent of the SAV will be confirmed as part of assessments prior to construction. Perdido Bay is relatively small in size, making it vulnerable to water quality impairments during rainfall events, winds, and tides. Stormwater run-off in the lower watershed and agriculture and silviculture in the upper watershed are particular contributors to water quality impacts. The Perdido River is designated as an "Outstanding Florida Water" by the State of Florida. However, much of Perdido Bay has been included on the list of impaired waters under Section 303(d) of the Clean Water Act, due to high nutrients and low dissolved oxygen. Lower Perdido Bay is listed as a 303d impaired waterbody for mercury in fish.

Leonard Destin Park

The proposed Leonard Destin Park site is located within Okaloosa County at 101 Calhoun Avenue, Destin, Florida (30.398127°N, 86.513329°W WGS84). The property is located on a peninsula separating the Gulf of Mexico from Choctawhatchee Bay, and includes 280 lin ft of frontage on Choctawhatchee Bay. This area falls within Unit 12 of Gulf sturgeon critical habitat. Historically, the watershed has seen high amounts of agriculture, timber harvesting, and development. Development has contributed to water quality impacts from stormwater runoff, erosion, and sedimentation. Contaminants of concern include polycyclic aromatic hydrocarbons, polychlorinated biphenyls (PCBs), lead, and mercury. Choctawhatchee—St. Andrew is listed as a 303d impaired waterbody for mercury in fish tissue, fecal coliform, and bacteria in shellfish and for beach advisory. Additional contributors to water quality degradation in this bay are agriculture and timber harvesting, influencing increased nutrients, algal blooms, and low dissolved oxygen conditions.

Island View Park

The proposed Island View Park site is located east of Carrabelle on the St. George Sound (29.853397°N, 84.636493°W WGS84). The waterfront includes 884 lin ft of frontage along St. George Sound, which lies between two State-designated aquatic preserves. This area falls within Unit 13 of Gulf sturgeon critical habitat. There are 2 fishing docks and a dilapidated concrete boat ramp on the site. At the shoreline, emergent marsh grasses occur but have been disturbed by regular mowing. There are seagrasses in the water near the piers at this site. St. George sound is created by barrier islands, which shelter the mainland from the Gulf of Mexico. Water quality in St. George Sound has degraded due to coastal development and excessive stormwater runoff and is listed on the state's 303d list of impaired waterbodies for mercury in fish tissue and bacteria in shellfish and beach advisories.

Lynn Haven Park

The proposed Lynn Haven Park site is located along the eastern shore of North Bay (in St. Andrew Bay), south of Route 77A (30.257436°N, 85.605229°W WGS84). The property includes 1,650 lin ft of frontage on North Bay (marine environment) and 3,570 lin ft of frontage along McKitchen's Bayou (brackish) and its unnamed source creek. Per a recent wetlands survey, the property includes approximately 59 acres of upland habitat and 32 acres of wetlands. There are no seagrasses in the water at this site. The eastern shore of North Bay is highly urbanized, specifically in the proposed Lynn Haven Preserve and Park area. The northern segment of St. Andrew Bay is listed as a 303d impaired waterbody for mercury in fish tissue, bacteria in shellfish, dissolved oxygen (nutrients, biological oxygen demand), and fecal coliform. Water quality impairments result from urban runoff and historical wastewater treatment outfalls.

3 STATUS OF LISTED SPECIES

The following endangered (E) and threatened (T) species under the jurisdiction of NMFS may occur in or near the action area.

Table 1. Effects Determinations for Species NOAA RC Believes May be Affected by the Proposed Action and NMFS's Effects Determinations

Species	ESA Listing Status	FDEP Effect Determination	NMFS Effect Determination
Sea Turtles			
Leatherback	E	NLAA	NE
Hawksbill	E	NLAA	NE
Green (North Atlantic Distinct Population Segment [DPS])	T	NLAA	LAA
Green (South Atlantic DPS)	T	NLAA	LAA
Kemp's ridley	E	NLAA	LAA
Loggerhead (Northwest Atlantic Ocean [NWA] DPS)	T	NLAA	LAA
Fish			

Species	ESA Listing Status	FDEP Effect Determination	NMFS Effect Determination
Gulf sturgeon (Atlantic sturgeon, Gulf subspecies)	T	NLAA	NLAA
Smalltooth Sawfish (U.S. DPS)	E	NE	NLAA
Critical Habitat			
Gulf Sturgeon Critical Habitat (Units 12 & 13)		NLAA	NLAA
E = endangered; T = threatened; LAA = likely to adversely affect; NLAA = may affect, not likely to adversely affect; NE = No Effect			

We believe the project will have no effect on hawksbill and leatherback sea turtles, due to the species' very specific life history strategies, which are not supported at the project sites. Leatherback sea turtles have a pelagic, deepwater life history, where they forage primarily on jellyfish. Hawksbill sea turtles typically inhabit inshore reef and hard bottom areas (not present at these sites) where they forage primarily on encrusting sponges. We found no documented incidences of either species being hooked or entangled at any fishing piers in any of the 4 counties where the proposed action will take place.

Additionally, we do not believe that any of the activities associated with the construction or operation of the proposed Lynn Haven Park will affect any of the listed sea turtle species. This park is proposed in an area far from the open Gulf, in the upper estuarine area of Econfina Creek. We found no documented evidence of sea turtles in this area and do not believe they will occur here.

3.1 Project Elements Not Likely to Adversely Affect Listed Species and Critical Habitat

Three species of sea turtles (loggerhead, green, and Kemp's ridley), smalltooth sawfish, and Gulf sturgeon can be found in or near the action area and may be affected by the proposed action.

Potential effects to the identified sea turtles, smalltooth sawfish, and Gulf sturgeon include the risk of injury from being struck by construction vessels, machinery and materials (e.g., barge movement, anchoring, and construction equipment operation) during in-water construction activities. Due to the species' mobility and natural avoidance behaviors, and the applicant's compliance with NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions*, dated March 2006, the injury through direct impact from construction vessels, machinery and materials is extremely unlikely to occur, and, therefore, discountable.

Sawfish, sea turtles and Gulf sturgeon may be temporarily unable to use the project sites for forage and shelter habitat due to avoidance of construction activities including placement of pier piles and related turbidity. However, we believe any potential effects will be insignificant considering the projects are located in open-water, unconfined areas surrounded by large expanses of similar habitats (see images above) which would allow individuals avoiding the construction sites to forage and shelter throughout the surrounding area.

Sawfish, sea turtles, and Gulf sturgeon may be affected by noise associated with the impact driving of piles for dock construction. 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 these animals. Second, effects can result from prolonged exposure to noise levels that exceed the daily cumulative exposure threshold for the animals, and these can constitute adverse effects if animals are exposed to the noise levels for sufficient periods. Behavioral effects can be adverse 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 Biological Opinion for SAJ-82.[1] The noise analysis in this consultation evaluates effects to ESA-listed fish and sea turtles identified by NMFS as potentially affected in Table 1, above.

With regard to the proposed use of water jetting to create pilot holes and install the pier piles, based on our noise calculations, the use of water jetting will not result in injurious noise effects or behavioral noise effects. With regards to potential use of an impact hammer to "finish" pile installation, based on our noise calculations, the installation of wood or composite piles by impact hammer will not cause single-strike or peak-pressure injury to sea turtles, gulf sturgeon, or smalltooth sawfish. The cumulative sound exposure level (cSEL) of multiple pile strikes over the course of a day may cause injury to these species at a radius of up to 30 ft (9 meters [m]). Due to the mobility of these species, we expect them to move away from any 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. Even in the unlikely event an animal chooses not to vacate the cumulative injurious impact zone over the course of an entire day, the radius of that area is smaller than the 50-ft radius that will be visually monitored for listed species per NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions.* Per these conditions, construction personnel are required to cease construction activities if a listed animal is sighted within a 50-ft radius of in-water construction activities. Thus, we believe the likelihood of any injurious cSEL effects is discountable. An animal's movement away from the injurious impact zone is a behavioral response, with the same types of 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 and Gulf sturgeon. Due to the mobility of these species, we expect them to move away from noise disturbances. Because this will involve only normal physical movement by the animals (will not prevent the animals from migrating, feeding, resting, or reproducing) and there is abundant similar habitat surrounding the construction zones, we believe any behavioral effects would be insignificant.

The proposed Lyn Haven Park includes plans for a motorized boat dock to allow visitors to access the park via motor boat. Vessels utilizing this dock have the potential to strike sea turtles in the surrounding areas, leading to injury or death. Because the proposed dock would be built in an area where sea turtles are not expected to occur, and would not facilitate a net increase in vessel access to the area, the way a new boat ramp or marina might, we believe vessel strike impacts to sea turtles from construction and future use of this dock are extremely unlikely to occur, and, therefore, discountable.[2]

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

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

Fishing piers can threaten sea turtles, smalltooth sawfish, and Gulf sturgeon via incidental hooking and entanglement either by actively fished lines, discarded, remnant, or broken-off fishing lines, and/or other debris.

There are no documented hook-and-line takes of Gulf sturgeon associated with fishing piers in Florida. The feeding anatomy and ecology of Gulf sturgeon makes the hooking of this species by standard hook-and-line anglers highly unlikely. Therefore, NMFS concludes that Gulf sturgeon are not likely to be adversely affected by angling activities associated with the proposed fishing piers as the likelihood of any incidental hooking is considered discountable.

The likelihood that smalltooth sawfish will be present in the project areas is low because smalltooth sawfish are extremely rare in the Florida Panhandle. The highest densities of smalltooth sawfish in the Gulf of Mexico occur from Charlotte Harbor southward. Data from the International Sawfish Encounter Database for 2000-2015 (unpublished data) include only a single documented incidental take of a sawfish by hook-and-line from a fishing pier throughout the 4 counties where the proposed fishing piers would be constructed/renovated. This single incident occurred in Bay County in 2004, from a large Gulf-side pier (Russell-Fields Pier) off Panama City Beach. This is also the only documented take of a sawfish associated with a fishing pier in the entire Florida Panhandle region. Due to the extremely low densities of smalltooth sawfish in the Florida Panhandle region, and the fact that there have been no documented captures from interior (bay-side) fishing piers in this area, NMFS concludes that smalltooth sawfish are not likely to be adversely affected by angling activities associated with the proposed fishing piers as the likelihood of any incidental hooking is considered discountable.

The potential take of sea turtles due to angling activities will be discussed in Section 5.

3.1.1 Assessment of Potential Effects of the Proposed Action on the Essential Features of Gulf Sturgeon Critical Habitat

Gulf sturgeon critical habitat was jointly designated by NMFS and USFWS on April 18, 2003 (50 CFR 226.214). Fourteen areas (units) are designated as Gulf sturgeon critical habitat. One component of the proposed action (Leonard Destin Park) is located in Unit 12, and another (Island View Park) is located in Unit 13.

Within Units 12 &13, the following 4 essential features are present and may be affected by the proposed action: (1) abundant prey items; (2) water quality necessary for normal behavior, growth, and viability of all life stages; (3) sediment quality necessary for normal behavior, growth, and viability of all life stages; and (4) safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats. NMFS expects the proposed action will have only insignificant effects on these essential features.

Prey Items

Prey items have the potential to be affected by the sedimentation and physical displacement associated from project activities. The potential for loss of benthic prey due to sedimentation caused by project activities will be minimal because the proposed activities are not expected to disrupt or mobilize enough sediment to harm benthic prey species upon resettling of the sediments. Additionally, turbidity curtains will surround these activities during construction, limiting the area that may be impacted. Even if individual prey species are impacted within the confined construction areas, these areas would be quickly recolonized by the surrounding prey populations following the completion of construction activities (within weeks). Studies of the effects of human-generated noise on aquatic invertebrates have found little to no impacts on invertebrates (Popper and Hastings 2009).

The proposed action will permanently impact a small area of the benthos through the installation of approximately 120 new 8-inch piles (95 piles in critical habitat Unit 13 and 25 piles in Unit 12). The placement of the 120 total piles will impact 42 ft^2 (0.001 acre) of subaqueous substrate that could serve as foraging habitat for Gulf sturgeon. The loss of this small area of shallow water habitat will have an insignificant effect on the overall abundance of Gulf sturgeon prey species, particularly given that the surrounding areas contain similar sediment types occupied by the same prey organisms in the same densities as the areas displaced by the piles.

Water Quality

Water quality in the action areas may be affected by sediment disturbance associated with the installation of piles and other in-water activities. These types of construction activities have been shown to increase turbidity and re-suspend both nutrients and pollutants that are trapped in the sediments. Turbidity curtains will be installed around in-water construction activities and will not be removed until turbidity levels have returned to background levels. Any effects to water quality are expected to be temporary in nature and spatially confined. Effects would likely be similar to those resulting from natural tidal fluctuations and storm events, which can also result in temporary disturbance of sediments and increased turbidity. Additionally, we expect no changes in temperature, salinity, pH, hardness, or other chemical characteristics as a result of this project. Therefore, NMFS only expects insignificant effects to water quality features of Gulf sturgeon critical habitat resulting from this project.

Sediment Quality

NMFS does not expect any adverse changes to the sediment quality essential feature from the proposed action. The disturbance of surface sediments by the installation of piles and other in-water construction activities will occur in a relatively small area and sediments will quickly re-settle around the structures. Tidal currents and wind-driven waves will reincorporate these sediments into the substrate in a matter of days or weeks. Therefore, any effects to sediment quality from these disturbances would be spatially limited and temporary and therefore insignificant. The proposed action will permanently impact a small area of sediment through the installation of approximately 120 new 8-inch piles (95 piles in critical habitat Unit 13 and 25 piles in Unit 12). The placement of the 120 total piles will impact 42 ft^2 (0.001 acre) of subaqueous substrate that could serve as habitat for Gulf sturgeon. The loss of this small area of shallow water habitat will have an insignificant effect on the overall sediment quality in these critical habitat units, particularly given that the surrounding areas contain similar sediment types that serve the same physical and biological functions for the species.

Migratory Pathways

NMFS believes that any effects to Gulf sturgeon migratory pathways will also be insignificant. The placement of turbidity curtains and the noise generated by pile driving may temporarily alter the behavior of Gulf sturgeon in localized areas around proposed construction zones. However, the activities will occur in unconfined, open water areas surrounded by extensive suitable migratory habitat. Suitable migratory corridors at noise levels below the 150 dB RMS behavioral disturbance threshold will always be available surrounding the construction zones (see pile driving noise analysis in Section 3.1). Therefore, project effects will not limit Gulf sturgeon ability to migrate through the critical habitat areas and any effects to their migratory pathways will be insignificant.

3.2 Project Elements Likely to Adversely Affect Listed Species

Angling Associated with Proposed Fishing Piers

Fishing piers can threaten sea turtles via incidental hooking and entanglement either by actively fished lines, discarded, remnant, or broken-off fishing lines, and/or other debris. Data from the NOAA Southeast Fisheries Science Center's (SEFSC) Sea Turtle Stranding and Salvage Network (STSSN) for 2007-2016 (https://grunt.sefsc.noaa.gov/stssnrep/SeaTurtleReportII.do?action=reportIIqueryp) show that reported incidental takes of Kemp's ridley, loggerhead and green sea turtles by hook-and-line fishing occurred at fishing piers in Okaloosa, Franklin and Escambia Counties, Florida (the counties where fishing piers are proposed to be built/restored in areas where sea turtles are known to occur). These data indicate that during this 10 year period, 6 Kemp's ridley sea turtles, 3 loggerhead sea turtles and 1 green sea turtle were reported incidentally taken by hook-and-line fishing at public fishing piers in Okaloosa, Franklin and Escambia Counties.

3.3 General Threats Faced by All Sea Turtle Species

Sea turtles face numerous natural and man-made threats that shape their status and affect their ability to recover. Many of the threats are either the same or similar in nature for all listed sea turtle species, those identified in this section are discussed in a general sense for all sea turtles. Threat information specific to a particular species are then discussed in the corresponding status sections where appropriate.

Fisheries

Incidental bycatch in commercial fisheries is identified as a major contributor to past declines, and threat to future recovery, for all of the sea turtle species (NMFS and USFWS 1991; NMFS and USFWS 1992; NMFS and USFWS 1993; NMFS and USFWS 2008; NMFS et al. 2011). Domestic fisheries often capture, injure, and kill sea turtles at various life stages. Sea turtles in the pelagic environment are exposed to U.S. Atlantic pelagic longline fisheries. Sea turtles in the benthic environment in waters off the coastal United States are exposed to a suite of other fisheries in federal and state waters. These fishing methods include trawls, gillnets, purse seines, hook-and-line gear (including bottom longlines and vertical lines [e.g., bandit gear, handlines, and rod-reel]), pound nets, and trap fisheries. Refer to the Environmental Baseline section of this opinion for more specific information regarding federal and state managed fisheries affecting sea turtles within the action area). The Southeast U.S. shrimp fisheries have historically been the largest fishery threat to benthic sea turtles in the southeastern United States, and continue to interact with and kill large numbers of sea turtles each year.

In addition to domestic fisheries, sea turtles are subject to direct as well as incidental capture in numerous foreign fisheries, further impeding the ability of sea turtles to survive and recover on a global scale. For example, pelagic stage sea turtles, especially loggerheads and leatherbacks, circumnavigating the Atlantic are susceptible to international longline fisheries including the

Azorean, Spanish, and various other fleets (Aguilar et al. 1994; Bolten et al. 1994). Bottom longlines and gillnet fishing is known to occur in many foreign waters, including (but not limited to) the northwest Atlantic, western Mediterranean, South America, West Africa, Central America, and the Caribbean. Shrimp trawl fisheries are also occurring off the shores of numerous foreign countries and pose a significant threat to sea turtles similar to the impacts seen in U.S. waters. Many unreported takes or incomplete records by foreign fleets make it difficult to characterize the total impact that international fishing pressure is having on listed sea turtles. Nevertheless, international fisheries represent a continuing threat to sea turtle survival and recovery throughout their respective ranges.

Non-Fishery In-Water Activities

There are also many non-fishery impacts affecting the status of sea turtle species, both in the ocean and on land. In nearshore waters of the United States, the construction and maintenance of federal navigation channels has been identified as a source of sea turtle mortality. Hopper dredges, which are frequently used in ocean bar channels and sometimes in harbor channels and offshore borrow areas, move relatively rapidly and can entrain and kill sea turtles (NMFS 1997). Sea turtles entering coastal or inshore areas have also been affected by entrainment in the cooling-water systems of electrical generating plants. Other nearshore threats include harassment and/or injury resulting from private and commercial vessel operations, military detonations and training exercises, in-water construction activities, and scientific research activities.

Coastal Development and Erosion Control

Coastal development can deter or interfere with nesting, affect nesting success, and degrade nesting habitats for sea turtles. Structural impacts to nesting habitat include the construction of buildings and pilings, beach armoring and renourishment, and sand extraction (Bouchard et al. 1998; Lutcavage et al. 1997). These factors may decrease the amount and/or quality of nesting habitat available to females and change the natural behaviors of both adults and hatchlings, directly or indirectly, through loss of beach habitat or changing thermal profiles and increasing erosion, respectively (Ackerman 1997; Witherington et al. 2003; Witherington et al. 2007). In addition, coastal development is usually accompanied by artificial lighting which can alter the behavior of nesting adults (Witherington 1992) and is often fatal to emerging hatchlings that are drawn away from the water (Witherington and Bjorndal 1991). In-water erosion control structures such as breakwaters, groins, and jetties can impact nesting females and hatchling as they approach and leave the surf zone or head out to sea by creating physical blockage, concentrating predators, creating longshore currents, and disrupting of wave patterns.

Environmental Contamination

Multiple municipal, industrial, and household sources, as well as atmospheric transport, introduce various pollutants such as pesticides, hydrocarbons, organochlorides (e.g., dichlorodiphenyltrichloroethane, PCB, and perfluorinated chemicals), and others that may cause adverse health effects to sea turtles (Garrett 2004; Grant and Ross 2002; Hartwell 2004; Iwata et al. 1993). Acute exposure to hydrocarbons from petroleum products released into the environment via oil spills and other discharges may directly injure individuals through skin contact with oils (Geraci 1990), inhalation at the water’s surface, and ingesting compounds while feeding (Matkin and Saulitis 1997). Hydrocarbons also have the potential to impact prey populations, and therefore may affect listed species indirectly by reducing food availability in the action area.

The April 20, 2010, explosion of the *Deepwater Horizon* (DWH) oil rig affected sea turtles in the Gulf of Mexico. An assessment has been completed on the injury to Gulf of Mexico marine life, including sea turtles, resulting from the spill (DWH Trustees 2015). Following the spill, juvenile Kemp's ridley, green, and loggerhead sea turtles were found in *Sargassum* algae mats in the convergence zones, where currents meet and oil collected. Sea turtles found in these areas were often coated in oil and/or had ingested oil. The spill resulted in the direct mortality of many sea turtles and may have had sublethal effects or caused environmental damage that will impact other sea turtles into the future. Information on the spill impacts to individual sea turtle species is presented in the Status of the Species sections for each species.

Marine debris is a continuing problem for sea turtles. Sea turtles living in the pelagic environment commonly eat or become entangled in marine debris (e.g., tar balls, plastic bags/pellets, balloons, and ghost fishing gear) as they feed along oceanographic fronts where debris and their natural food items converge. This is especially problematic for sea turtles that spend all or significant portions of their life cycle in the pelagic environment (i.e., leatherbacks, juvenile loggerheads, and juvenile green turtles).

Climate Change

There is a large and growing body of literature on past, present, and future impacts of global climate change, exacerbated and accelerated by human activities. Some of the likely effects commonly mentioned are sea level rise, increased frequency of severe weather events, and change in air and water temperatures. NOAA's climate information portal provides basic background information on these and other measured or anticipated effects (see http://www.climate.gov).

Climate change impacts on sea turtles currently cannot be predicted with any degree of certainty; however, significant impacts to the hatchling sex ratios of sea turtles may result (NMFS and USFWS 2007a). In sea turtles, sex is determined by the ambient sand temperature (during the middle third of incubation) with female offspring produced at higher temperatures and males at lower temperatures within a thermal tolerance range of 25°-35°C (Ackerman 1997). Increases in global temperature could potentially skew future sex ratios toward higher numbers of females (NMFS and USFWS 2007a).

The effects from increased temperatures may be intensified on developed nesting beaches where shoreline armoring and construction have denuded vegetation. Erosion control structures could potentially result in the permanent loss of nesting beach habitat or deter nesting females (NRC 1990). These impacts will be exacerbated by sea level rise. If females nest on the seaward side of the erosion control structures, nests may be exposed to repeated tidal overwash (NMFS and USFWS 2007b). Sea level rise from global climate change is also a potential problem for areas with low-lying beaches where sand depth is a limiting factor, as the sea may inundate nesting sites and decrease available nesting habitat (Baker et al. 2006; Daniels et al. 1993; Fish et al. 2005). The loss of habitat as a result of climate change could be accelerated due to a combination of other environmental and oceanographic changes such as an increase in the frequency of storms and/or changes in prevailing currents, both of which could lead to increased beach loss via erosion (Antonelis et al. 2006; Baker et al. 2006).

Other changes in the marine ecosystem caused by global climate change (e.g., ocean acidification, salinity, oceanic currents, dissolved oxygen levels, nutrient distribution) could influence the distribution and abundance of lower trophic levels (e.g., phytoplankton, zooplankton, SAV, crustaceans, mollusks, forage fish) which could ultimately affect the primary foraging areas of sea turtles.

Other Threats
Predation by various land predators is a threat to developing nests and emerging hatchlings. The major natural predators of sea turtle nests are mammals, including raccoons, dogs, pigs, skunks, and badgers. Emergent hatchlings are preyed upon by these mammals as well as ghost crabs, laughing gulls, and the exotic South American fire ant (*Solenopsis invicta*). In addition to natural predation, direct harvest of eggs and adults from beaches in foreign countries continues to be a problem for various sea turtle species throughout their ranges (NMFS and USFWS 2008).

Diseases, toxic blooms from algae and other microorganisms, and cold stunning events are additional sources of mortality that can range from local and limited to wide-scale and impacting hundreds or thousands of animals.

3.4 Loggerhead Sea Turtle – Northwest Atlantic DPS

The loggerhead sea turtle was listed as a threatened species throughout its global range on July 28, 1978. NMFS and USFWS published a Final Rule which designated 9 DPSs for loggerhead sea turtles (76 FR 58868, September 22, 2011, and effective October 24, 2011). This rule listed the following DPSs: (1) Northwest Atlantic Ocean (threatened), (2) Northeast Atlantic Ocean (endangered), (3) South Atlantic Ocean (threatened), (4) Mediterranean Sea (endangered), (5) North Pacific Ocean (endangered), (6) South Pacific Ocean (endangered), (7) North Indian Ocean (endangered), (8) Southeast Indo-Pacific Ocean (endangered), and (9) Southwest Indian Ocean (threatened). The Northwest Atlantic (NWA) DPS is the only one that occurs within the action area, and, therefore, it is the only one considered in this Opinion.

Species Description and Distribution
Loggerheads are large sea turtles. Adults in the southeast United States average about 3 ft (92 cm) long, measured as a straight carapace length (SCL), and weigh approximately 255 lb (116 kg) (Ehrhart and Yoder 1978). Adult and subadult loggerhead sea turtles typically have a light yellow plastron and a reddish brown carapace covered by non-overlapping scutes that meet along seam lines. They typically have 11 or 12 pairs of marginal scutes, 5 pairs of costals, 5 vertebrals, and a nuchal (precentral) scute that is in contact with the first pair of costal scutes (Dodd Jr. 1988).

The loggerhead sea turtle inhabits continental shelf and estuarine environments throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans (Dodd Jr. 1988). Habitat uses within these areas vary by life stage. Juveniles are omnivorous and forage on crabs, mollusks, jellyfish, and vegetation at or near the surface (Dodd Jr. 1988). Subadult and adult loggerheads are primarily found in coastal waters and eat benthic invertebrates such as mollusks and decapod crustaceans in hard bottom habitats.

The majority of loggerhead nesting occurs at the western rims of the Atlantic and Indian Oceans concentrated in the north and south temperate zones and subtropics (NRC 1990). For the NWA DPS, most nesting occurs along the coast of the United States, from southern Virginia to Alabama. Additional nesting beaches for this DPS are found along the northern and western Gulf of Mexico, eastern Yucatán Peninsula, at Cay Sal Bank in the eastern Bahamas (Addison 1997; Addison and Morford 1996), off the southwestern coast of Cuba (Moncada Gavilan 2001), and along the coasts of Central America, Colombia, Venezuela, and the eastern Caribbean Islands.

Non-nesting, adult female loggerheads are reported throughout the U.S. Atlantic, Gulf of Mexico, and Caribbean Sea. Little is known about the distribution of adult males who are seasonally abundant near nesting beaches. Aerial surveys suggest that loggerheads as a whole are distributed in U.S. waters as follows: 54% off the southeast U.S. coast, 29% off the northeast U.S. coast, 12% in the eastern Gulf of Mexico, and 5% in the western Gulf of Mexico (TEWG 1998).

Within the NWA DPS, most loggerhead sea turtles nest from North Carolina to Florida and along the Gulf Coast of Florida. Previous Section 7 analyses have recognized at least 5 western Atlantic subpopulations, divided geographically as follows: (1) a Northern nesting subpopulation, occurring from North Carolina to northeast Florida at about 29ºN; (2) a South Florida nesting subpopulation, occurring from 29°N on the east coast of the state to Sarasota on the west coast; (3) a Florida Panhandle nesting subpopulation, occurring at Eglin Air Force Base and the beaches near Panama City, Florida; (4) a Yucatán nesting subpopulation, occurring on the eastern Yucatán Peninsula, Mexico (Márquez M. 1990; TEWG 2000); and (5) a Dry Tortugas nesting subpopulation, occurring in the islands of the Dry Tortugas, near Key West, Florida (NMFS 2001).

The recovery plan for the Northwest Atlantic population of loggerhead sea turtles concluded that there is no genetic distinction between loggerheads nesting on adjacent beaches along the Florida Peninsula. It also concluded that specific boundaries for subpopulations could not be designated based on genetic differences alone. Thus, the recovery plan uses a combination of geographic distribution of nesting densities, geographic separation, and geopolitical boundaries, in addition to genetic differences, to identify recovery units. The recovery units are as follows: (1) the Northern Recovery Unit (Florida/Georgia border north through southern Virginia), (2) the Peninsular Florida Recovery Unit (Florida/Georgia border through Pinellas County, Florida), (3) the Dry Tortugas Recovery Unit (islands located west of Key West, Florida), (4) the Northern Gulf of Mexico Recovery Unit (Franklin County, Florida, through Texas), and (5) the Greater Caribbean Recovery Unit (Mexico through French Guiana, the Bahamas, Lesser Antilles, and Greater Antilles) (NMFS and USFWS 2008). The recovery plan concluded that all recovery units are essential to the recovery of the species. Although the recovery plan was written prior to the listing of the NWA DPS, the recovery units for what was then termed the Northwest Atlantic population apply to the NWA DPS.

Life History Information

The Northwest Atlantic Loggerhead Recovery Team defined the following 8 life stages for the loggerhead life cycle, which include the ecosystems those stages generally use: (1) egg (terrestrial zone), (2) hatchling stage (terrestrial zone), (3) hatchling swim frenzy and transitional stage (neritic zone[3]), (4) juvenile stage (oceanic zone), (5) juvenile stage (neritic zone), (6) adult stage (oceanic zone), (7) adult stage (neritic zone), and (8) nesting female (terrestrial zone) (NMFS and USFWS 2008). Loggerheads are long-lived animals. They reach sexual maturity between 20-38 years of age, although age of maturity varies widely among populations (Frazer and Ehrhart 1985; NMFS 2001). The annual mating season occurs from late March to early June, and female turtles lay eggs throughout the summer months. Females deposit an average of 4.1 nests within a nesting season (Murphy and Hopkins 1984), but an individual female only nests every 3.7 years on average (Tucker 2010). Each nest contains an average of 100-126 eggs (Dodd Jr. 1988) which incubate for 42-75 days before hatching (NMFS and USFWS 2008). Loggerhead hatchlings are 1.5-2 inches long and weigh about 0.7 oz (20 g).

As post-hatchlings, loggerheads hatched on U.S. beaches enter the "oceanic juvenile" life stage, migrating offshore and becoming associated with *Sargassum* habitats, driftlines, and other convergence zones (Carr 1986; Conant et al. 2009; Witherington 2002). Oceanic juveniles grow at rates of 1-2 inches (2.9-5.4 cm) per year (Bjorndal et al. 2003; Snover 2002) over a period as long as 7-12 years (Bolten et al. 1998) before moving to more coastal habitats. Studies have suggested that not all loggerhead sea turtles follow the model of circumnavigating the North Atlantic Gyre as pelagic juveniles, followed by permanent settlement into benthic environments (Bolten and Witherington 2003; Laurent et al. 1998). These studies suggest some turtles may either remain in the oceanic habitat in the North Atlantic longer than hypothesized, or they move back and forth between oceanic and coastal habitats interchangeably (Witzell 2002). Stranding records indicate that when immature loggerheads reach 15-24 in (40-60 cm) SCL, they begin to reside in coastal inshore waters of the continental shelf throughout the U.S. Atlantic and Gulf of Mexico (Witzell 2002).

After departing the oceanic zone, neritic juvenile loggerheads in the Northwest Atlantic inhabit continental shelf waters from Cape Cod Bay, Massachusetts, south through Florida, The Bahamas, Cuba, and the Gulf of Mexico. Estuarine waters of the United States, including areas such as Long Island Sound, Chesapeake Bay, Pamlico and Core Sounds, Mosquito and Indian River Lagoons, Biscayne Bay, Florida Bay, as well as numerous embayments fringing the Gulf of Mexico, comprise important inshore habitat. Along the Atlantic and Gulf of Mexico shoreline, essentially all shelf waters are inhabited by loggerheads (Conant et al. 2009).

Like juveniles, non-nesting adult loggerheads also use the neritic zone. However, these adult loggerheads do not use the relatively enclosed shallow-water estuarine habitats with limited ocean access as frequently as juveniles. Areas such as Pamlico Sound, North Carolina, and the Indian River Lagoon, Florida, are regularly used by juveniles but not by adult loggerheads. Adult loggerheads do tend to use estuarine areas with more open ocean access, such as the Chesapeake Bay in the U.S. mid-Atlantic. Shallow-water habitats with large expanses of open ocean access, such as Florida Bay, provide year-round resident foraging areas for significant numbers of male and female adult loggerheads (Conant et al. 2009).

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3 Neritic refers to the nearshore marine environment from the surface to the sea floor where water depths do not exceed 200 meters.

Offshore, adults primarily inhabit continental shelf waters, from New York south through Florida, The Bahamas, Cuba, and the Gulf of Mexico. Seasonal use of mid-Atlantic shelf waters, especially offshore New Jersey, Delaware, and Virginia during summer months, and offshore shelf waters, such as Onslow Bay (off the North Carolina coast), during winter months has also been documented (Hawkes et al. 2007; Georgia Department of Natural Resources, unpublished data; South Carolina Department of Natural Resources, unpublished data). Satellite telemetry has identified the shelf waters along the west Florida coast, The Bahamas, Cuba, and the Yucatán Peninsula as important resident areas for adult female loggerheads that nest in Florida (Foley et al. 2008; Girard et al. 2009; Hart et al. 2012). The southern edge of the Grand Bahama Bank is important habitat for loggerheads nesting on the Cay Sal Bank in The Bahamas, but nesting females are also resident in the bights of Eleuthera, Long Island, and Ragged Islands. They also reside in Florida Bay in the United States, and along the north coast of Cuba (A. Bolten and K. Bjorndal, University of Florida, unpublished data). Moncada et al. (2010) report the recapture of 5 adult female loggerheads in Cuban waters originally flipper-tagged in Quintana Roo, Mexico, which indicates that Cuban shelf waters likely also provide foraging habitat for adult females that nest in Mexico.

Status and Population Dynamics

A number of stock assessments and similar reviews (Conant et al. 2009; Heppell et al. 2003; NMFS-SEFSC 2009; NMFS 2001; NMFS and USFWS 2008; TEWG 1998; TEWG 2000; TEWG 2009) have examined the stock status of loggerheads in the Atlantic Ocean, but none have been able to develop a reliable estimate of absolute population size.

Numbers of nests and nesting females can vary widely from year to year. Nesting beach surveys, though, can provide a reliable assessment of trends in the adult female population, due to the strong nest site fidelity of female loggerhead sea turtles, as long as such studies are sufficiently long and survey effort and methods are standardized (e.g., NMFS and USFWS 2008). NMFS and USFWS (2008) concluded that the lack of change in 2 important demographic parameters of loggerheads, remigration interval and clutch frequency, indicate that time series on numbers of nests can provide reliable information on trends in the female population.

<u>Peninsular Florida Recovery Unit</u>

The Peninsular Florida Recovery Unit is the largest loggerhead nesting assemblage in the Northwest Atlantic. A near-complete nest census (all beaches including index nesting beaches) undertaken from 1989 to 2007 showed an average of 64,513 loggerhead nests per year, representing approximately 15,735 nesting females per year (NMFS and USFWS 2008). The statewide estimated total for 2015 was 89,295 nests (Florida Fish and Wildlife Research Institute (FWRI) nesting database).

In addition to the total nest count estimates, the FWRI uses an index nesting beach survey method. The index survey uses standardized data-collection criteria to measure seasonal nesting and allow accurate comparisons between beaches and between years (Figure 6). This provides a better tool for understanding the nesting trends. FWRI performed a detailed analysis of the long-term loggerhead index nesting data (1989-2016; http://myfwc.com/research/wildlife/sea-turtles/nesting/loggerhead-trend/). Over that time period, 3 distinct trends were identified. From 1989-1998, there was a 24% increase that was followed by a sharp decline over the subsequent 9 years. A large increase in loggerhead nesting has occurred since, as indicated by the 71% increase in nesting over the 10-year period from 2007 and 2016. Nesting in 2016 also represents a new record for loggerheads on the core index beaches. FWRI examined the trend from the 1998 nesting high through 2016 and found that the decade-long post-1998 decline was replaced with a slight but nonsignificant increasing trend. Looking at the data from 1989 through 2016, FWRI concluded that there was an overall positive change in the nest counts although it was not statistically significant due to the wide variability between 2012-2016 resulting in widening confidence intervals (http://myfwc.com/research/wildlife/sea-turtles/nesting/loggerhead-trend/).

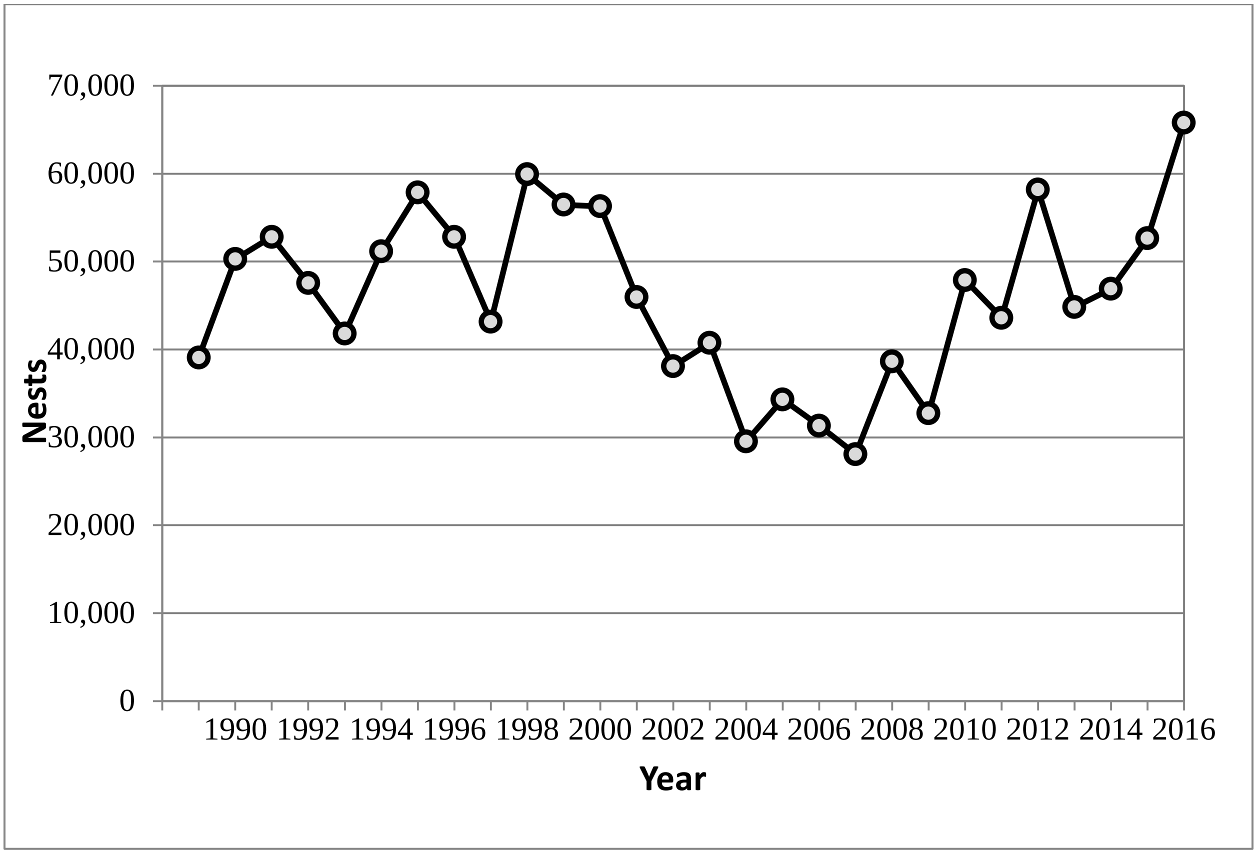

Figure 6. Loggerhead sea turtle nesting at Florida index beaches since 1989

<u>Northern Recovery Unit</u>

Annual nest totals from beaches within the Northern Recovery Unit (NRU) averaged 5,215 nests from 1989-2008, a period of near-complete surveys of NRU nesting beaches (Georgia Department of Natural Resources [GADNR] unpublished data, North Carolina Wildlife Resources Commission [NCWRC] unpublished data, South Carolina Department of Natural Resources [SCDNR] unpublished data), and represent approximately 1,272 nesting females per year, assuming 4.1 nests per female (Murphy and Hopkins 1984). The loggerhead nesting trend from daily beach surveys showed a significant decline of 1.3% annually from 1989-2008. Nest totals from aerial surveys conducted by SCDNR showed a 1.9% annual decline in nesting in South Carolina from 1980-2008. Overall, there are strong statistical data to suggest the NRU had experienced a long-term decline over that period of time.

Data collected since that analysis (Table 2) are showing improved nesting numbers and a departure from the declining trend. Georgia nesting has rebounded to show the first statistically significant increasing trend since comprehensive nesting surveys began in 1989 (Mark Dodd, GADNR press release, http://www.georgiawildlife.com/node/3139). South Carolina and North Carolina nesting have also begun to shift away from the past declining trend. Loggerhead nesting in Georgia, South Carolina, and North Carolina all broke records in 2015 and then topped those records again in 2016.

Table 2. Total Number of NRU Loggerhead Nests (GADNR, SCDNR, and NCWRC nesting datasets compiled at Seaturtle.org)

Nests Recorded	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Georgia	1,649	998	1,760	1,992	2,241	2,289	1,196	2,319	3,265
South Carolina	4,500	2,182	3,141	4,015	4,615	5,193	2,083	5,104	6,443
North Carolina	841	302	856	950	1,074	1,260	542	1,254	1,612
Total	**6,990**	**3,472**	**5,757**	**6,957**	**7,930**	**8,742**	**3,821**	**8,677**	**11,320**

South Carolina also conducts an index beach nesting survey similar to the one described for Florida. Although the survey only includes a subset of nesting, the standardized effort and locations allow for a better representation of the nesting trend over time. Increases in nesting were seen for the period from 2009-2012, and 2012 shows the highest index nesting total since the start of the program (Figure 7).

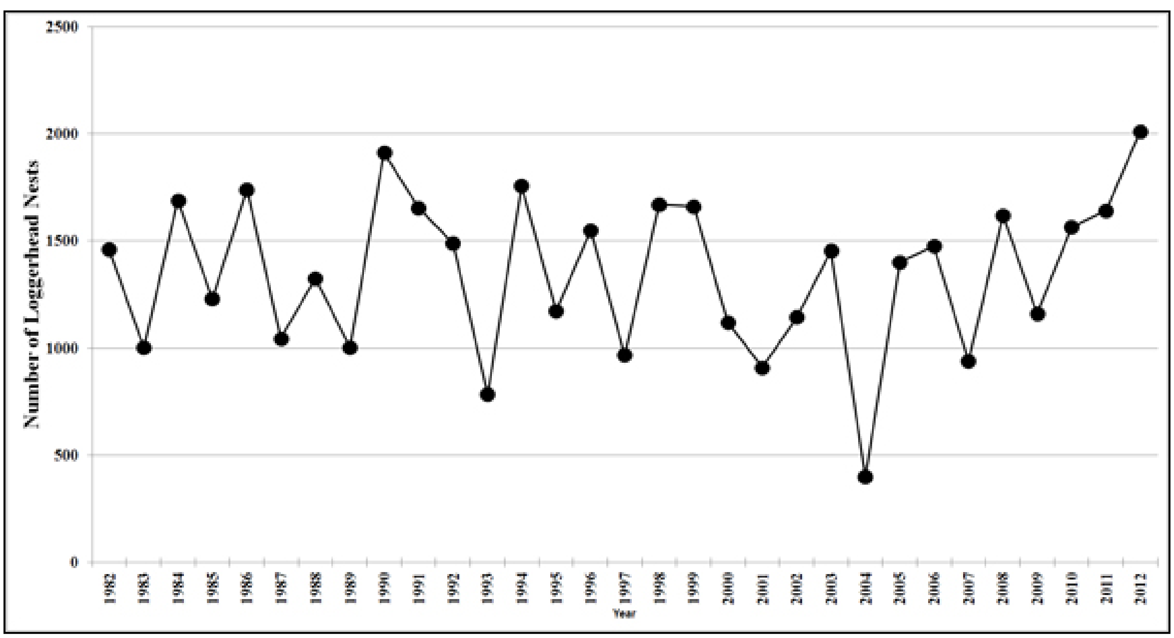

Figure 7. South Carolina index nesting beach counts for loggerhead sea turtles (from the SCDNR website: http://www.dnr.sc.gov/seaturtle/nest.htm)

<u>Other Northwest Atlantic DPS Recovery Units</u>

The remaining 3 recovery units—Dry Tortugas (DTRU), Northern Gulf of Mexico (NGMRU), and Greater Caribbean (GCRU)—are much smaller nesting assemblages, but they are still considered essential to the continued existence of the species. Nesting surveys for the DTRU are conducted as part of Florida's statewide survey program. Survey effort was relatively stable during the 9-year period from 1995-2004, although the 2002 year was missed. Nest counts ranged from 168-270, with a mean of 246, but there was no detectable trend during this period (NMFS and USFWS 2008). Nest counts for the NGMRU are focused on index beaches rather than all beaches where nesting occurs. Analysis of the 12-year dataset (1997-2008) of index nesting beaches in the area shows a statistically significant declining trend of 4.7% annually. Nesting on the Florida Panhandle index beaches, which represents the majority of NGMRU nesting, had shown a large increase in 2008, but then declined again in 2009 and 2010 before rising back to a level similar to the 2003-2007 average in 2011. Nesting survey effort has been inconsistent among the GCRU nesting beaches, and no trend can be determined for this subpopulation (NMFS and USFWS 2008). Zurita et al. (2003) found a statistically significant increase in the number of nests on 7 of the beaches on Quintana Roo, Mexico, from 1987-2001, where survey effort was consistent during the period. Nonetheless, nesting has declined since 2001, and the previously reported increasing trend appears to not have been sustained (NMFS and USFWS 2008).

In-water Trends

Nesting data are the best current indicator of sea turtle population trends, but in-water data also provide some insight. In-water research suggests the abundance of neritic juvenile loggerheads is steady or increasing. Although Ehrhart et al. (2007) found no significant regression-line trend in a long-term dataset, researchers have observed notable increases in catch per unit effort (CPUE) (Arendt et al. 2009; Ehrhart et al. 2007; Epperly et al. 2007). Researchers believe that this increase in CPUE is likely linked to an increase in juvenile abundance, although it is unclear whether this increase in abundance represents a true population increase among juveniles or merely a shift in spatial occurrence. Bjorndal et al. (2005), cited in NMFS and USFWS (2008), caution about extrapolating localized in-water trends to the broader population and relating localized trends in neritic sites to population trends at nesting beaches. The apparent overall increase in the abundance of neritic loggerheads in the southeastern United States may be due to increased abundance of the largest oceanic/neritic juveniles (historically referred to as small benthic juveniles), which could indicate a relatively large number of individuals around the same age may mature in the near future (TEWG 2009). In-water studies throughout the eastern United States, however, indicate a substantial decrease in the abundance of the smallest oceanic/neritic juvenile loggerheads, a pattern corroborated by stranding data (TEWG 2009).

Population Estimate

The NMFS Southeast Fisheries Science Center developed a preliminary stage/age demographic model to help determine the estimated impacts of mortality reductions on loggerhead sea turtle population dynamics (NMFS-SEFSC 2009). The model uses the range of published information for the various parameters including mortality by stage, stage duration (years in a stage), and fecundity parameters such as eggs per nest, nests per nesting female, hatchling emergence success, sex ratio, and remigration interval. Resulting trajectories of model runs for each individual recovery unit, and the western North Atlantic population as a whole, were found to be very similar. The model run estimates from the adult female population size for the western North Atlantic (from the 2004-2008 time frame), suggest the adult female population size is approximately 20,000-40,000 individuals, with a low likelihood of females' numbering up to 70,000 (NMFS-SEFSC 2009). A less robust estimate for total benthic females in the western North Atlantic was also obtained, yielding approximately 30,000-300,000 individuals, up to less than 1 million (NMFS-SEFSC 2009). A preliminary regional abundance survey of loggerheads within the northwestern Atlantic continental shelf for positively identified loggerhead in all strata estimated about 588,000 loggerheads (interquartile range of 382,000-817,000). When correcting for unidentified turtles in proportion to the ratio of identified turtles, the estimate increased to about 801,000 loggerheads (interquartile range of 521,000-1,111,000) (NMFS-NEFSC 2011).

Threats (Specific to Loggerhead Sea Turtles)
The threats faced by loggerhead sea turtles are well summarized in the general discussion of threats in Section 3.3. Yet the impact of fishery interactions is a point of further emphasis for this species. The joint NMFS and USFWS Loggerhead Biological Review Team determined that the greatest threats to the NWA DPS of loggerheads result from cumulative fishery bycatch in neritic and oceanic habitats (Conant et al. 2009).

Regarding the impacts of pollution, loggerheads may be particularly affected by organochlorine contaminants; they have the highest organochlorine concentrations (Storelli et al. 2008) and metal loads (D'Ilio et al. 2011) in sampled tissues among the sea turtle species. It is thought that dietary preferences were likely to be the main differentiating factor among sea turtle species. Storelli et al. (2008) analyzed tissues from stranded loggerhead sea turtles and found that mercury accumulates in sea turtle livers while cadmium accumulates in their kidneys, as has been reported for other marine organisms like dolphins, seals, and porpoises (Law et al. 1991).

While oil spill impacts are discussed generally for all species in Section 3.3, specific impacts of the DWH oil spill event on loggerhead sea turtles are considered here. Impacts to loggerhead sea turtles occurred to offshore small juveniles as well as large juveniles and adults. A total of 30,800 small juvenile loggerheads (7.3% of the total small juvenile sea turtle exposures to oil from the spill) were estimated to have been exposed to oil. Of those exposed, 10,700 small juveniles are estimated to have died as a result of the exposure. In contrast to small juveniles, loggerheads represented a large proportion of the adults and large juveniles exposed to and killed by the oil. There were 30,000 exposures (almost 52% of all exposures for those age/size classes) and 3,600 estimated mortalities. A total of 265 nests (27,618 eggs) were also translocated during response efforts, with 14,216 hatchlings released, the fate of which is unknown (DWH Trustees 2015). Additional unquantified effects may have included inhalation of volatile compounds, disruption of foraging or migratory movements due to surface or subsurface oil, ingestion of prey species contaminated with oil and/or dispersants, and loss of foraging resources which could lead to compromised growth and/or reproductive potential. There is no information currently available to determine the extent of those impacts, if they occurred.

Unlike Kemp's ridleys, the majority of nesting for the Northwest Atlantic Ocean loggerhead DPS occurs on the Atlantic coast, and thus loggerheads were impacted to a relatively lesser degree. However, it is likely that impacts to the NGMRU of the NWA loggerhead DPS would be proportionally much greater than the impacts occurring to other recovery units. Impacts to nesting and oiling effects on a large proportion of the NGMRU recovery unit, especially mating and nesting adults likely had an impact on the NGMRU. Based on the response injury evaluations for Florida Panhandle and Alabama nesting beaches (which fall under the NFMRU), the Trustees estimated that approximately 20,000 loggerhead hatchlings were lost due to DWH oil spill response activities on nesting beaches. Although the long-term effects remain unknown, the DWH oil spill event impacts to the Northern Gulf of Mexico Recovery Unit may result in some nesting declines in the future due to a large reduction of oceanic age classes during the DWH oil spill event. Although adverse impacts occurred to loggerheads, the proportion of the population that is expected to have been exposed to and directly impacted by the DWH oil spill event is relatively low. Thus, we do not believe a population-level impact occurred due to the widespread distribution and nesting location outside of the Gulf of Mexico for this species.

Specific information regarding potential climate change impacts on loggerheads is also available. Modeling suggests an increase of 2°C in air temperature would result in a sex ratio of over 80% female offspring for loggerheads nesting near Southport, North Carolina. The same increase in air temperatures at nesting beaches in Cape Canaveral, Florida, would result in close to 100% female offspring. Such highly skewed sex ratios could undermine the reproductive capacity of the species. More ominously, an air temperature increase of 3°C is likely to exceed the thermal threshold of most nests, leading to egg mortality (Hawkes et al. 2007). Warmer sea surface temperatures have also been correlated with an earlier onset of loggerhead nesting in the spring (Hawkes et al. 2007; Weishampel et al. 2004), short inter-nesting intervals (Hays et al. 2002), and shorter nesting seasons (Pike et al. 2006).

3.5 **Green Sea Turtle** (Information Relevant to All DPSs)

The green sea turtle was originally listed as threatened under the ESA on July 28, 1978, except for the Florida and Pacific coast of Mexico breeding populations, which were listed as endangered. On April 6, 2016, the original listing was replaced with the listing of 11 distinct population segments (DPSs) (81 FR 20057 2016). The Mediterranean, Central West Pacific, and Central South Pacific DPSs were listed as endangered. The North Atlantic, South Atlantic, Southwest Indian, North Indian, East Indian-West Pacific, Southwest Pacific, Central North Pacific, and East Pacific were listed as threatened. For the purposes of this consultation, only the South Atlantic DPS (SA DPS) and North Atlantic DPS (NA DPS) will be considered, as they are the only two DPSs with individuals occurring in the Atlantic and Gulf of Mexico waters of the United States.

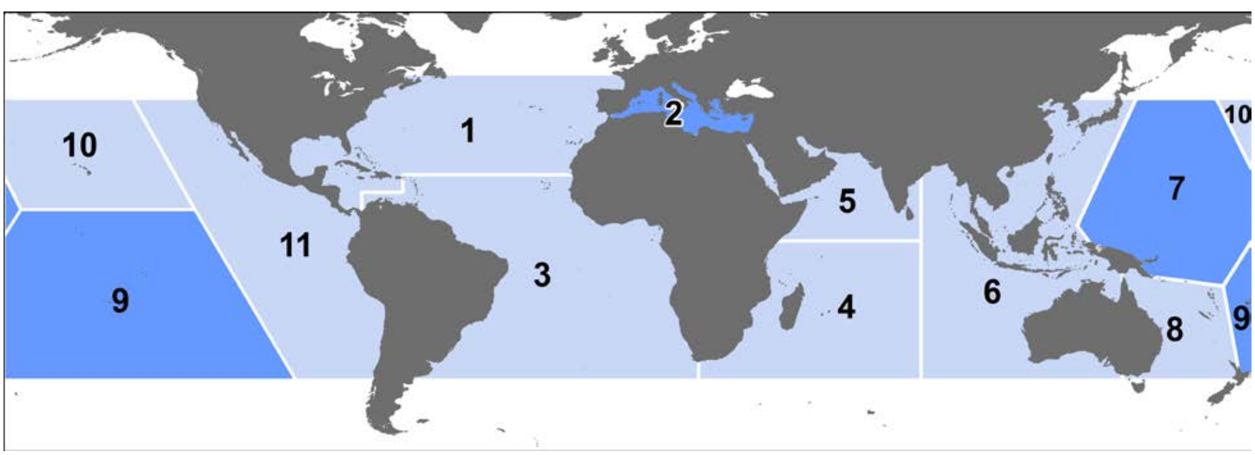

Figure 8. Threatened (light) and endangered (dark) green turtle DPSs: 1. North Atlantic, 2. Mediterranean, 3. South Atlantic, 4. Southwest Indian, 5. North Indian, 6. East Indian-West Pacific, 7. Central West Pacific, 8. Southwest Pacific, 9. Central South Pacific, 10. Central North Pacific, and 11. East Pacific.

Life History Information
Green sea turtles reproduce sexually, and mating occurs in the waters off nesting beaches and along migratory routes. Mature females return to their natal beaches (i.e., the same beaches where they were born) to lay eggs (Balazs 1982; Frazer and Ehrhart 1985) every 2-4 years while males are known to reproduce every year (Balazs 1983). In the southeastern United States, females generally nest between June and September, and peak nesting occurs in June and July (Witherington and Ehrhart 1989b). During the nesting season, females nest at approximately 2-week intervals, laying an average of 3-4 clutches (Johnson and Ehrhart 1996). Clutch size often varies among subpopulations, but mean clutch size is approximately 110-115 eggs. In Florida, green sea turtle nests contain an average of 136 eggs (Witherington and Ehrhart 1989b). Eggs incubate for approximately 2 months before hatching. Hatchling green sea turtles are approximately 2 inches (5 cm) in length and weigh approximately 0.9 ounces (25 g). Survivorship at any particular nesting site is greatly influenced by the level of man-made stressors, with the more pristine and less disturbed nesting sites (e.g., along the Great Barrier Reef in Australia) showing higher survivorship values than nesting sites known to be highly disturbed (e.g., Nicaragua) (Campell and Lagueux 2005; Chaloupka and Limpus 2005).

After emerging from the nest, hatchlings swim to offshore areas and go through a post-hatchling pelagic stage where they are believed to live for several years. During this life stage, green sea turtles feed close to the surface on a variety of marine algae and other life associated with drift lines and debris. This early oceanic phase remains one of the most poorly understood aspects of green sea turtle life history (NMFS and USFWS 2007). Green sea turtles exhibit particularly slow growth rates of about 0.4-2 inches (1-5 cm) per year (Green 1993), which may be attributed to their largely herbivorous, low-net energy diet (Bjorndal 1982). At approximately 8-10 inches (20-25 cm) carapace length, juveniles leave the pelagic environment and enter nearshore developmental habitats such as protected lagoons and open coastal areas rich in sea grass and marine algae. Growth studies using skeletochronology indicate that green sea turtles in the western Atlantic shift from the oceanic phase to nearshore developmental habitats after approximately 5-6 years (Bresette et al. 2006; Zug and Glor 1998). Within the developmental habitats, juveniles begin the switch to a more herbivorous diet, and by adulthood feed almost exclusively on seagrasses and algae (Rebel 1974), although some populations are known to also feed heavily on invertebrates (Carballo et al. 2002). Green sea turtles mature slowly, requiring 20-50 years to reach sexual maturity (Chaloupka and Musick 1997; Hirth 1997).

While in coastal habitats, green sea turtles exhibit site fidelity to specific foraging and nesting grounds, and it is clear they are capable of “homing in” on these sites if displaced (McMichael et al. 2003). Reproductive migrations of Florida green sea turtles have been identified through flipper tagging and/or satellite telemetry. Based on these studies, the majority of adult female Florida green sea turtles are believed to reside in nearshore foraging areas throughout the Florida Keys and in the waters southwest of Cape Sable, and some post-nesting turtles also reside in Bahamian waters as well (NMFS and USFWS 2007).

Species Description and Distribution

The green sea turtle is the largest of the hardshell marine turtles, growing to a weight of 350 lb (159 kg) with a straight carapace length of greater than 3.3 ft (1 m). Green sea turtles have a smooth carapace with 4 pairs of lateral (or costal) scutes and a single pair of elongated prefrontal scales between the eyes. They typically have a black dorsal surface and a white ventral surface, although the carapace of green sea turtles in the Atlantic Ocean has been known to change in color from solid black to a variety of shades of grey, green, or brown and black in starburst or irregular patterns (Lagueux 2001).

With the exception of post-hatchlings, green sea turtles live in nearshore tropical and subtropical waters where they generally feed on marine algae and seagrasses. They have specific foraging grounds and may make large migrations between these forage sites and natal beaches for nesting (Hays et al. 2001). Green sea turtles nest on sandy beaches of mainland shores, barrier islands, coral islands, and volcanic islands in more than 80 countries worldwide (Hirth 1997). The 2 largest nesting populations are found at Tortuguero, on the Caribbean coast of Costa Rica (part of the NA DPS), and Raine Island, on the Pacific coast of Australia along the Great Barrier Reef.

Differences in mitochondrial DNA properties of green sea turtles from different nesting regions indicate there are genetic subpopulations (Bowen et al. 1992; FitzSimmons et al. 2006). Despite the genetic differences, sea turtles from separate nesting origins are commonly found mixed together on foraging grounds throughout the species' range. Within U.S. waters individuals from both the NA and SA DPSs can be found on foraging grounds. While there are currently no in-depth studies available to determine the percent of NA and SA DPS individuals in any given location, two small-scale studies provide an insight into the degree of mixing on the foraging grounds. An analysis of cold-stunned green turtles in St. Joseph Bay, Florida (northern Gulf of Mexico) found approximately 4% of individuals came from nesting stocks in the SA DPS (specifically Suriname, Aves Island, Brazil, Ascension Island, and Guinea Bissau) (Foley et al. 2007). On the Atlantic coast of Florida, a study on the foraging grounds off Hutchinson Island found that approximately 5% of the turtles sampled came from the Aves Island/Suriname nesting assemblage, which is part of the SA DPS (Bass and Witzell 2000). All of the individuals in both studies were benthic juveniles. Available information on green turtle migratory behavior indicates that long distance dispersal is only seen for juvenile turtles. This suggests that larger adult-sized turtles return to forage within the region of their natal rookeries, thereby limiting the potential for gene flow across larger scales (Monzón-Argüello et al. 2010). While all of the mainland U.S. nesting individuals are part of the NA DPS, the U.S. Caribbean nesting assemblages are split between the NA and SA DPS. Nesters in Puerto Rico are part of the NA DPS, while those in the U.S. Virgin Islands are part of the SA DPS. We do not currently have information on what percent of individuals on the U.S. Caribbean foraging grounds come from which DPS.

North Atlantic DPS Distribution

The NA DPS boundary is illustrated in Figure 8. Four regions support nesting concentrations of particular interest in the NA DPS: Costa Rica (Tortuguero), Mexico (Campeche, Yucatan, and Quintana Roo), U.S. (Florida), and Cuba. By far the most important nesting concentration for green turtles in this DPS is Tortuguero, Costa Rica. Nesting also occurs in the Bahamas, Belize, Cayman Islands, Dominican Republic, Haiti, Honduras, Jamaica, Nicaragua, Panama, Puerto Rico, Turks and Caicos Islands, and North Carolina, South Carolina, Georgia, and Texas, U.S.A. In the eastern North Atlantic, nesting has been reported in Mauritania (Fretey 2001).

The complete nesting range of NA DPS green sea turtles within the southeastern United States includes sandy beaches between Texas and North Carolina, as well as Puerto Rico (Dow et al. 2007; NMFS and USFWS 1991). The vast majority of green sea turtle nesting within the southeastern United States occurs in Florida (Johnson and Ehrhart 1994; Meylan et al. 1995). Principal U.S. nesting areas for green sea turtles are in eastern Florida, predominantly Brevard south through Broward counties.

In U.S. Atlantic and Gulf of Mexico waters, green sea turtles are distributed throughout inshore and nearshore waters from Texas to Massachusetts. Principal benthic foraging areas in the southeastern United States include Aransas Bay, Matagorda Bay, Laguna Madre, and the Gulf inlets of Texas (Doughty 1984; Hildebrand 1982; Shaver 1994), the Gulf of Mexico off Florida from Yankeetown to Tarpon Springs (Caldwell and Carr 1957), Florida Bay and the Florida Keys (Schroeder and Foley 1995), the Indian River Lagoon system in Florida (Ehrhart 1983), and the Atlantic Ocean off Florida from Brevard through Broward Counties (Guseman and Ehrhart 1992; Wershoven and Wershoven 1992). The summer developmental habitat for green sea turtles also encompasses estuarine and coastal waters from North Carolina to as far north as Long Island Sound (Musick and Limpus 1997). Additional important foraging areas in the western Atlantic include the Culebra archipelago and other Puerto Rico coastal waters, the south coast of Cuba, the Mosquito Coast of Nicaragua, the Caribbean coast of Panama, scattered areas along Colombia and Brazil (Hirth 1971), and the northwestern coast of the Yucatán Peninsula.

South Atlantic DPS Distribution

The SA DPS boundary is shown in Figure 8, and includes the U.S. Virgin Islands in the Caribbean. The SA DPS nesting sites can be roughly divided into four regions: western Africa, Ascension Island, Brazil, and the South Atlantic Caribbean (including Colombia, the Guianas, and Aves Island in addition to the numerous small, island nesting sites).

The in-water range of the SA DPS is widespread. In the eastern South Atlantic, significant sea turtle habitats have been identified, including green turtle feeding grounds in Corisco Bay, Equatorial Guinea/Gabon (Formia 1999); Congo; Mussulo Bay, Angola (Carr and Carr 1991); as well as Principe Island. Juvenile and adult green turtles utilize foraging areas throughout the Caribbean areas of the South Atlantic, often resulting in interactions with fisheries occurring in those same waters (Dow et al. 2007). Juvenile green turtles from multiple rookeries also frequently utilize the nearshore waters off Brazil as foraging grounds as evidenced from the frequent captures by fisheries (Lima et al. 2010; López-Barrera et al. 2012; Marcovaldi et al. 2009). Genetic analysis of green turtles on the foraging grounds off Ubatuba and Almofala, Brazil show mixed stocks coming primarily from Ascension, Suriname and Trindade as a secondary source, but also Aves, and even sometimes Costa Rica (North Atlantic DPS)(Naro-Maciel et al. 2007; Naro-Maciel et al. 2012). While no nesting occurs as far south as Uruguay and Argentina, both have important foraging grounds for South Atlantic green turtles (Gonzalez Carman et al. 2011; Lezama 2009; López-Mendilaharsu et al. 2006; Prosdocimi et al. 2012; Rivas-Zinno 2012).

Status and Population Dynamics

Accurate population estimates for marine turtles do not exist because of the difficulty in sampling turtles over their geographic ranges and within their marine environments. Nonetheless, researchers have used nesting data to study trends in reproducing sea turtles over time. A summary of nesting trends and nester abundance is provided in the most recent status review for the species (Seminoff et al. 2015), with information for each of the DPSs.

North Atlantic DPS

The NA DPS is the largest of the 11 green turtle DPSs, with an estimated nester abundance of over 167,000 adult females from 73 nesting sites. Overall this DPS is also the most data rich. Eight of the sites have high levels of abundance (i.e., <1000 nesters), located in Costa Rica, Cuba, Mexico, and Florida. All major nesting populations demonstrate long-term increases in abundance (Seminoff et al. 2015).

Tortuguero, Costa Rica is by far the predominant nesting site, accounting for an estimated 79% of nesting for the DPS (Seminoff et al. 2015). Nesting at Tortuguero appears to have been increasing since the 1970's, when monitoring began. For instance, from 1971-1975 there were approximately 41,250 average annual emergences documented and this number increased to an average of 72,200 emergences from 1992-1996 (Bjorndal et al. 1999). Troëng and Rankin (2005) collected nest counts from 1999-2003 and also reported increasing trends in the population consistent with the earlier studies, with nest count data suggesting 17,402-37,290 nesting females per year (NMFS and USFWS 2007). Modeling by Chaloupka et al. (2008) using data sets of 25 years or more resulted in an estimate of the Tortuguero, Costa Rica population's growing at 4.9% annually.

In the continental United States, green sea turtle nesting occurs along the Atlantic coast, primarily along the central and southeast coast of Florida where an estimated 200-1,100 females nest each year (Meylan et al. 1994; Weishampel et al. 2003). Occasional nesting has also been documented along the Gulf Coast of Florida (Meylan et al. 1995). Green sea turtle nesting is documented annually on beaches of North Carolina, South Carolina, and Georgia, though nesting is found in low quantities (nesting databases maintained on www.seaturtle.org).

In Florida, index beaches were established to standardize data collection methods and effort on key nesting beaches. Since establishment of the index beaches in 1989, the pattern of green sea turtle nesting has generally shown biennial peaks in abundance with a positive trend during the 10 years of regular monitoring (Figure 9). According to data collected from Florida's index nesting beach survey from 1989-2015, green sea turtle nest counts across Florida have increased approximately ten-fold from a low of 267 in the early 1990s to a high of 27,975 in 2015. Two consecutive years of nesting declines in 2008 and 2009 caused some concern, but this was followed by increases in 2010 and 2011, and a return to the trend of biennial peaks in abundance thereafter (Figure 9). Modeling by Chaloupka et al. (2008) using data sets of 25 years or more has resulted in an estimate of the Florida nesting stock at the Archie Carr National Wildlife Refuge growing at an annual rate of 13.9%.

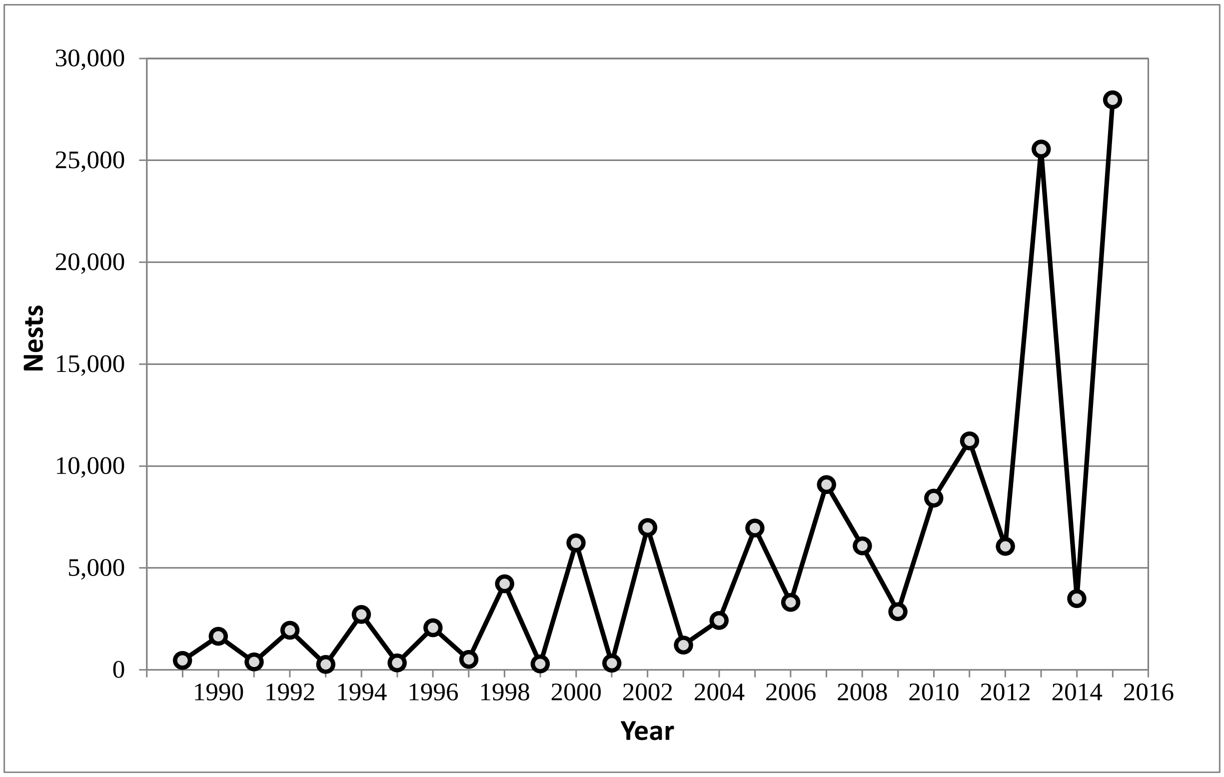

Figure 9. Green sea turtle nesting at Florida index beaches since 1989

Similar to the nesting trend found in Florida, in-water studies in Florida have also recorded increases in green turtle captures at the Indian River Lagoon site, with a 661 percent increase over 24 years (Ehrhart et al. 2007), and the St Lucie Power Plant site, with a significant increase in the annual rate of capture of immature green turtles (SCL<90 cm) from 1977 to 2002 or 26 years (3,557 green turtles total; M. Bressette, Inwater Research Group, unpubl. data; (Witherington et al. 2006).

South Atlantic DPS

The SA DPS is large, estimated at over 63,000 nesters, but data availability is poor. More than half of the 51 identified nesting sites (37) did not have sufficient data to estimate number of nesters or trends (Seminoff et al. 2015). This includes some sites, such as beaches in French Guiana, which are suspected to have large numbers of nesters. Therefore, while the estimated number of nesters may be substantially underestimated, we also do not know the population trends at those data-poor beaches. However, while the lack of data was a concern due to increased uncertainty, the overall trend of the SA DPS was not considered to be a major concern as some of the largest nesting beaches such as Ascension Island, Aves Island (Venezuela), and Galibi (Suriname) appear to be increasing. Others such as Trindade (Brazil), Atol das Rocas (Brazil), and Poilão and the rest of Guinea-Bissau seem to be stable or do not have sufficient data to make a determination. Bioko (Equatorial Guinea) appears to be in decline but has less nesting than the other primary sites (Seminoff et al. 2015).

In the U.S., nesting of SA DPS green turtles occurs on the beaches of the U.S. Virgin Islands, primarily on Buck Island. There is insufficient data to determine a trend for Buck Island nesting, and it is a smaller rookery, with approximately 63 total nesters utilizing the beach (Seminoff et al. 2015).

Threats

The principal cause of past declines and extirpations of green sea turtle assemblages has been the overexploitation of the species for food and other products. Although intentional take of green sea turtles and their eggs is not extensive within the southeastern United States, green sea turtles that nest and forage in the region may spend large portions of their life history outside the region and outside U.S. jurisdiction, where exploitation is still a threat. Green sea turtles also face many of the same threats as other sea turtle species, including destruction of nesting habitat from storm events, oceanic events such as cold-stunning, pollution (e.g., plastics, petroleum products, petrochemicals), ecosystem alterations (e.g., nesting beach development, beach nourishment and shoreline stabilization, vegetation changes), poaching, global climate change, fisheries interactions, natural predation, and disease. A discussion on general sea turtle threats can be found in Section 3.3.

In addition to general threats, green sea turtles are susceptible to natural mortality from Fibropapillomatosis (FP) disease. FP results in the growth of tumors on soft external tissues (flippers, neck, tail, etc.), the carapace, the eyes, the mouth, and internal organs (gastrointestinal tract, heart, lungs, etc.) of turtles (Aguirre et al. 2002; Herbst 1994; Jacobson et al. 1989). These tumors range in size from 0.04 inches (0.1 cm) to greater than 11.81 inches (30 cm) in diameter and may affect swimming, vision, feeding, and organ function (Aguirre et al. 2002; Herbst 1994; Jacobson et al. 1989). Presently, scientists are unsure of the exact mechanism causing this disease, though it is believed to be related to both an infectious agent, such as a virus (Herbst et al. 1995), and environmental conditions (e.g., habitat degradation, pollution, low wave energy, and shallow water (Foley et al. 2005). FP is cosmopolitan, but it has been found to affect large numbers of animals in specific areas, including Hawaii and Florida (Herbst 1994; Jacobson 1990; Jacobson et al. 1991).

Cold-stunning is another natural threat to green sea turtles. Although it is not considered a major source of mortality in most cases, as temperatures fall below 46.4°-50°F (8°-10°C) turtles may lose their ability to swim and dive, often floating to the surface. The rate of cooling that precipitates cold-stunning appears to be the primary threat, rather than the water temperature itself (Milton and Lutz 2003). Sea turtles that overwinter in inshore waters are most susceptible to cold-stunning because temperature changes are most rapid in shallow water (Witherington and Ehrhart 1989a). During January 2010, an unusually large cold-stunning event in the southeastern United States resulted in around 4,600 sea turtles, mostly greens, found cold-stunned, and hundreds found dead or dying. A large cold-stunning event occurred in the western Gulf of Mexico in February 2011, resulting in approximately 1,650 green sea turtles found cold-stunned in Texas. Of these, approximately 620 were found dead or died after stranding, while approximately 1,030 turtles were rehabilitated and released. During this same time frame, approximately 340 green sea turtles were found cold-stunned in Mexico, though approximately 300 of those were subsequently rehabilitated and released.

Whereas oil spill impacts are discussed generally for all species in Section 3.3, specific impacts of the DWH spill on green sea turtles are considered here. Impacts to green sea turtles occurred to offshore small juveniles only. A total of 154,000 small juvenile greens (36.6% of the total small juvenile sea turtle exposures to oil from the spill) were estimated to have been exposed to oil. A large number of small juveniles were removed from the population, as 57,300 small juveniles greens are estimated to have died as a result of the exposure. A total of 4 nests (580 eggs) were also translocated during response efforts, with 455 hatchlings released (the fate of which is unknown) (DWH Trustees 2015). Additional unquantified effects may have included inhalation of volatile compounds, disruption of foraging or migratory movements due to surface or subsurface oil, ingestion of prey species contaminated with oil and/or dispersants, and loss of foraging resources which could lead to compromised growth and/or reproductive potential. There is no information currently available to determine the extent of those impacts, if they occurred.

While green turtles regularly use the northern Gulf of Mexico, they have a widespread distribution throughout the entire Gulf of Mexico, Caribbean, and Atlantic, and the proportion of the population using the northern Gulf of Mexico at any given time is relatively low. Although it is known that adverse impacts occurred and numbers of animals in the Gulf of Mexico were reduced as a result of the Deepwater Horizon oil spill of 2010 (DWH), the relative proportion of the population that is expected to have been exposed to and directly impacted by the DWH event, as well as the impacts being primarily to smaller juveniles (lower reproductive value than adults and large juveniles), reduces the impact to the overall population. It is unclear what impact these losses may have caused on a population level, but it is not expected to have had a large impact on the population trajectory moving forward. However, recovery of green turtle numbers equivalent to what was lost in the northern Gulf of Mexico as a result of the spill will likely take decades of sustained efforts to reduce the existing threats and enhance survivorship of multiple life stages (DWH Trustees 2015).

3.6 Kemp's Ridley Sea Turtle

The Kemp's ridley sea turtle was listed as endangered on December 2, 1970, under the Endangered Species Conservation Act of 1969, a precursor to the ESA. Internationally, the Kemp's ridley is considered the most endangered sea turtle (Groombridge 1982; TEWG 2000; Zwinenberg 1977).

Species Description and Distribution

The Kemp's ridley sea turtle is the smallest of all sea turtles. Adults generally weigh less than 100 lb (45 kg) and have a carapace length of around 2.1 ft (65 cm). Adult Kemp's ridley shells are almost as wide as they are long. Coloration changes significantly during development from the grey-black dorsum and plastron of hatchlings, a grey-black dorsum with a yellowish-white plastron as post-pelagic juveniles, and then to the lighter grey-olive carapace and cream-white or yellowish plastron of adults. There are 2 pairs of prefrontal scales on the head, 5 vertebral scutes, usually 5 pairs of costal scutes, and generally 12 pairs of marginal scutes on the carapace. In each bridge adjoining the plastron to the carapace, there are 4 scutes, each of which is perforated by a pore.

Kemp's ridley habitat largely consists of sandy and muddy areas in shallow, nearshore waters less than 120 ft (37 m) deep, although they can also be found in deeper offshore waters. These areas support the primary prey species of the Kemp's ridley sea turtle, which consist of swimming crabs, but may also include fish, jellyfish, and an array of mollusks.

The primary range of Kemp's ridley sea turtles is within the Gulf of Mexico basin, though they also occur in coastal and offshore waters of the U.S. Atlantic Ocean. Juvenile Kemp's ridley sea turtles, possibly carried by oceanic currents, have been recorded as far north as Nova Scotia. Historic records indicate a nesting range from Mustang Island, Texas, in the north to Veracruz, Mexico, in the south. Kemp's ridley sea turtles have recently been nesting along the Atlantic Coast of the United States, with nests recorded from beaches in Florida, Georgia, and the Carolinas. In 2012, the first Kemp's ridley sea turtle nest was recorded in Virginia. The Kemp's ridley nesting population had been exponentially increasing prior to the recent low nesting years, which may indicate that the population had been experiencing a similar increase. Additional nesting data in the coming years will be required to determine what the recent nesting decline means for the population trajectory.

Life History Information

Kemp's ridley sea turtles share a general life history pattern similar to other sea turtles. Females lay their eggs on coastal beaches where the eggs incubate in sandy nests. After 45-58 days of embryonic development, the hatchlings emerge and swim offshore into deeper, ocean water where they feed and grow until returning at a larger size. Hatchlings generally range from 1.65-1.89 in (42-48 mm) straight carapace length (SCL), 1.26-1.73 in (32-44 mm) in width, and 0.3-0.4 lb (15-20 g) in weight. Their return to nearshore coastal habitats typically occurs around 2 years of age (Ogren 1989), although the time spent in the oceanic zone may vary from 1-4 years or perhaps more (TEWG 2000). Juvenile Kemp's ridley sea turtles use these nearshore coastal habitats from April through November, but they move towards more suitable overwintering habitat in deeper offshore waters (or more southern waters along the Atlantic coast) as water temperature drops.

The average rates of growth may vary by location, but generally fall within 2.2-2.9 ± 2.4 in per year (5.5-7.5 ± 6.2 cm/year) (Schmid and Barichivich 2006; Schmid and Woodhead 2000). Age to sexual maturity ranges greatly from 5-16 years, though NMFS et al. (2011) determined the best estimate of age to maturity for Kemp's ridley sea turtles was 12 years. It is unlikely that most adults grow very much after maturity. While some sea turtles nest annually, the weighted mean remigration rate for Kemp's ridley sea turtles is approximately 2 years. Nesting generally occurs from April to July. Females lay approximately 2.5 nests per season with each nest containing approximately 100 eggs (Márquez M. 1994).

Population Dynamics

Of the 7 species of sea turtles in the world, the Kemp's ridley has declined to the lowest population level. Most of the population of adult females nest on the beaches of Rancho Nuevo, Mexico (Pritchard 1969). When nesting aggregations at Rancho Nuevo were discovered in 1947, adult female populations were estimated to be in excess of 40,000 individuals (Hildebrand 1963). By the mid-1980s, however, nesting numbers from Rancho Nuevo and adjacent Mexican beaches were below 1,000, with a low of 702 nests in 1985. Yet, nesting steadily increased through the 1990s, and then accelerated during the first decade of the twenty-first century (Figure 10), which indicates the species is recovering.

It is worth noting that when the Bi-National Kemp's Ridley Sea Turtle Population Restoration Project was initiated in 1978, only Rancho Nuevo nests were recorded. In 1988, nesting data from southern beaches at Playa Dos and Barra del Tordo were added. In 1989, data from the northern beaches of Barra Ostionales and Tepehuajes were added, and most recently in 1996, data from La Pesca and Altamira beaches were recorded. Currently, nesting at Rancho Nuevo accounts for just over 81% of all recorded Kemp's ridley nests in Mexico. Following a significant, unexplained 1-year decline in 2010, Kemp's ridley nests in Mexico reached a record high of 21,797 in 2012 (Gladys Porter Zoo 2013). From 2013 through 2014, there was a second significant decline, as only 16,385 and 11,279 nests were recorded, respectively. In 2015, nesting in Mexico improved to 14,006 recorded nests (J. Pena, Gladys Porter Zoo, pers. comm. to M. Barnette, NMFS PRD, October 19, 2015). At this time, it is unclear if future nesting will steadily and continuously increase, similar to what occurred from 1990-2009, or if nesting will continue to exhibit sporadic declines and increases as recorded in the past 5 years.

A small nesting population is also emerging in the United States, primarily in Texas, rising from 6 nests in 1996 to 42 in 2004, to a record high of 209 nests in 2012 (National Park Service data, http://www.nps.gov/pais/naturescience/strp.htm, http://www.nps.gov/pais/naturescience/current-season.htm). It is worth noting that nesting in Texas has paralleled the trends observed in Mexico, with a significant decline in 2010 followed by a second decline in 2013-2014. Nesting rebounded in 2015, as 159 nests were documented along the Texas coast (D. Shaver, National Park Service, pers. comm. to M. Barnette, NMFS PRD, October 28, 2015).

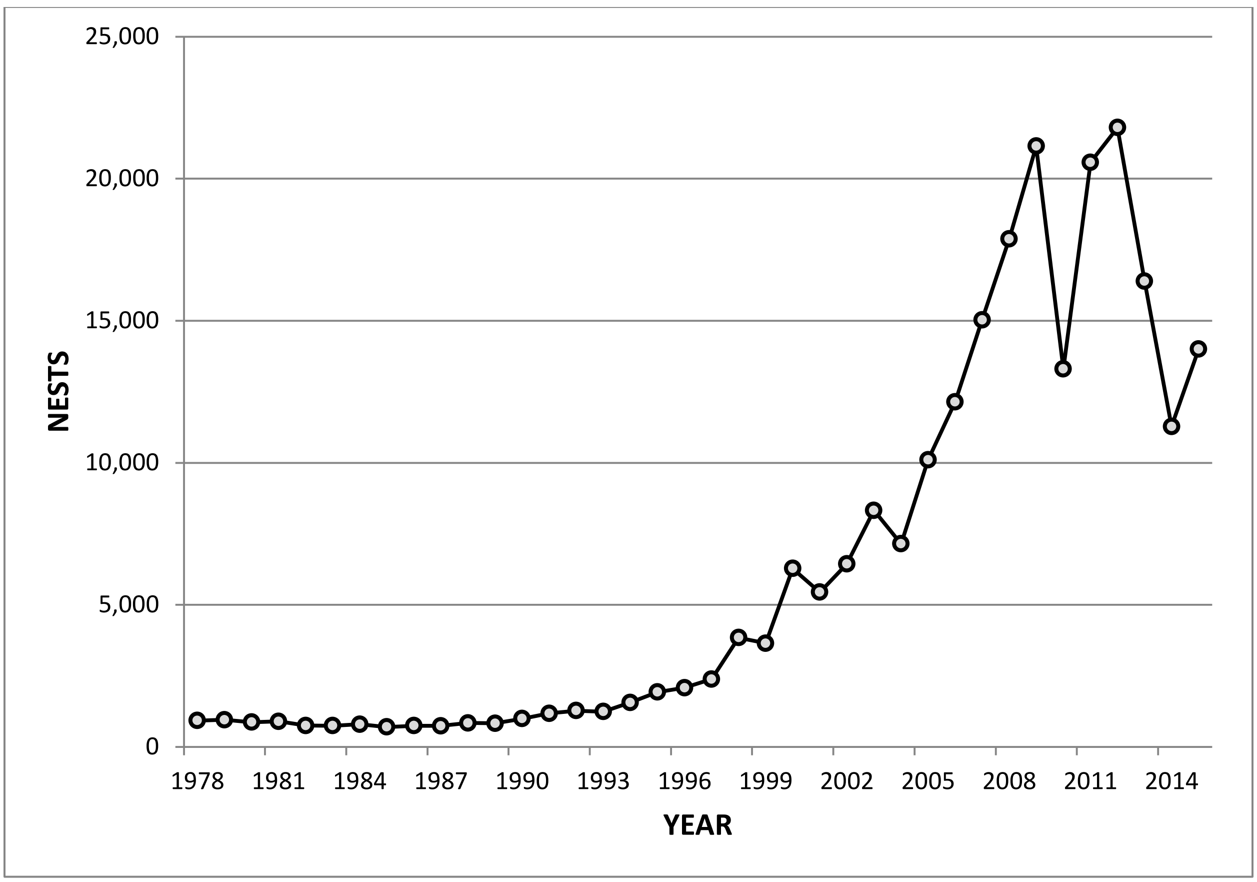

Figure 10. Kemp's ridley nest totals from Mexican beaches (Gladys Porter Zoo nesting database 2015)

Through modelling, Heppell et al. (2005) predicted the population is expected to increase at least 12-16% per year and could reach at least 10,000 females nesting on Mexico beaches by 2015. NMFS et al. (2011) produced an updated model that predicted the population to increase 19% per year and to attain at least 10,000 females nesting on Mexico beaches by 2011. Approximately 25,000 nests would be needed for an estimate of 10,000 nesters on the beach, based on an average 2.5 nests/nesting female. While counts did not reach 25,000 nests by 2015, it is clear that the population has increased over the long term. The increases in Kemp's ridley sea turtle nesting over the last 2 decades is likely due to a combination of management measures including elimination of direct harvest, nest protection, the use of turtle exclusion devices (TEDs), reduced trawling effort in Mexico and the United States, and possibly other changes in vital rates (TEWG 1998; TEWG 2000). While these results are encouraging, the species' limited range as well as low global abundance makes it particularly vulnerable to new sources of mortality as well as demographic and environmental randomness, all factors which are often difficult to predict with any certainty. Additionally, the significant nesting declines observed in 2010 and 2013-2014 potentially indicate a serious population-level impact, and there is cause for concern regarding the ongoing recovery trajectory.

Threats

Kemp's ridley sea turtles face many of the same threats as other sea turtle species, including destruction of nesting habitat from storm events, oceanic events such as cold-stunning, pollution (plastics, petroleum products, petrochemicals, etc.), ecosystem alterations (nesting beach development, beach nourishment and shoreline stabilization, vegetation changes, etc.), poaching, global climate change, fisheries interactions, natural predation, and disease. A discussion on general sea turtle threats can be found in Section 3.3; the remainder of this section will expand on a few of the aforementioned threats and how they may specifically impact Kemp's ridley sea turtles.

As Kemp's ridley sea turtles continue to recover and nesting arribadas[4] are increasingly established, bacterial and fungal pathogens in nests are also likely to increase. Bacterial and fungal pathogen impacts have been well documented in the large arribadas of the olive ridley at Nancite in Costa Rica (Mo 1988). In some years, and on some sections of the beach, the hatching success can be as low as 5% (Mo 1988). As the Kemp's ridley nest density at Rancho Nuevo and adjacent beaches continues to increase, appropriate monitoring of emergence success will be necessary to determine if there are any density-dependent effects.

Over the past 6 years, NMFS has documented (via the Sea Turtle Stranding and Salvage Network data, http://www.sefsc.noaa.gov/species/turtles/strandings.htm) elevated sea turtle strandings in the Northern Gulf of Mexico, particularly throughout the Mississippi Sound area. In the first 3 weeks of June 2010, over 120 sea turtle strandings were reported from Mississippi and Alabama waters, none of which exhibited any signs of external oiling to indicate effects associated with the DWH oil spill event. A total of 644 sea turtle strandings were reported in 2010 from Louisiana, Mississippi, and Alabama waters, 561 (87%) of which were Kemp's ridley sea turtles. During March through May of 2011, 267 sea turtle strandings were reported from Mississippi and Alabama waters alone. A total of 525 sea turtle strandings were reported in

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4 Arribada is the Spanish word for "arrival" and is the term used for massive synchronized nesting within the genus *Lepidochelys.*

2011 from Louisiana, Mississippi, and Alabama waters, with the majority (455) having occurred from March through July, 390 (86%) of which were Kemp's ridley sea turtles. During 2012, a total of 384 sea turtles were reported from Louisiana, Mississippi, and Alabama waters. Of these reported strandings, 343 (89%) were Kemp's ridley sea turtles. During 2014, a total of 285 sea turtles were reported from Louisiana, Mississippi, and Alabama waters, though the data is incomplete. Of these reported strandings, 229 (80%) were Kemp's ridley sea turtles. These stranding numbers are significantly greater than reported in past years; Louisiana, Mississippi, and Alabama waters reported 42 and 73 sea turtle strandings for 2008 and 2009, respectively. It should be noted that stranding coverage has increased considerably due to the DWH oil spill event.

Nonetheless, considering that strandings typically represent only a small fraction of actual mortality, these stranding events potentially represent a serious impact to the recovery and survival of the local sea turtle populations. While a definitive cause for these strandings has not been identified, necropsy results indicate a significant number of stranded turtles from these events likely perished due to forced submergence, which is commonly associated with fishery interactions (B. Stacy, NMFS, pers. comm. to M. Barnette, NMFS PRD, March 2012). Yet, available information indicates fishery effort was extremely limited during the stranding events. The fact that 80% or more of all Louisiana, Mississippi, and Alabama stranded sea turtles in the past 5 years were Kemp's ridleys is notable; however, this could simply be a function of the species' preference for shallow, inshore waters coupled with increased population abundance, as reflected in recent Kemp's ridley nesting increases.

In response to these strandings, and due to speculation that fishery interactions may be the cause, fishery observer effort was shifted to evaluate the inshore skimmer trawl fishery during the summer of 2012. During May-July of that year, observers reported 24 sea turtle interactions in the skimmer trawl fishery. All but a single sea turtle were identified as Kemp's ridleys (1 sea turtle was an unidentified hardshell turtle). Encountered sea turtles were all very small juvenile specimens, ranging from 7.6-19.0 in (19.4-48.3 cm) curved carapace length (CCL). All sea turtles were released alive. The small average size of encountered Kemp's ridleys introduces a potential conservation issue, as over 50% of these reported sea turtles could potentially pass through the maximum 4-in bar spacing of TEDs currently required in the shrimp fishery. Due to this issue, a proposed 2012 rule to require TEDs in the skimmer trawl fishery (77 FR 27411) was not implemented. Based on anecdotal information, these interactions were a relatively new issue for the inshore skimmer trawl fishery. Given the nesting trends and habitat utilization of Kemp's ridley sea turtles, it is likely that fishery interactions in the Northern Gulf of Mexico may continue to be an issue of concern for the species, and one that may potentially slow the rate of recovery for Kemp's ridley sea turtles.

While oil spill impacts are discussed generally for all species in Section 3.3, specific impacts of the DWH oil spill event on Kemp's ridley sea turtles are considered here. Kemp's ridleys experienced the greatest negative impact stemming from the DWH oil spill event of any sea turtle species. Impacts to Kemp's ridley sea turtles occurred to offshore small juveniles, as well as large juveniles and adults. Loss of hatchling production resulting from injury to adult turtles was also estimated for this species. Injuries to adult turtles of other species, such as loggerheads, certainly would have resulted in unrealized nests and hatchlings to those species as well. Yet, the calculation of unrealized nests and hatchlings was limited to Kemp's ridleys for several reasons. All Kemp's ridleys in the Gulf belong to the same population (NMFS et al. 2011), so total population abundance could be calculated based on numbers of hatchlings because all individuals that enter the population could reasonably be expected to inhabit the northern Gulf of Mexico throughout their lives (DWH Trustees 2015).

A total of 217,000 small juvenile Kemp's ridleys (51.5% of the total small juvenile sea turtle exposures to oil from the spill) were estimated to have been exposed to oil. That means approximately half of all small juvenile Kemp's ridleys from the total population estimate of 430,000 oceanic small juveniles were exposed to oil. Furthermore, a large number of small juveniles were removed from the population, as up to 90,300 small juveniles Kemp's ridleys are estimated to have died as a direct result of the exposure. Therefore, as much as 20% of the small oceanic juveniles of this species were killed during that year. Impacts to large juveniles (>3 years old) and adults were also high. An estimated 21,990 such individuals were exposed to oil (about 22% of the total estimated population for those age classes); of those, 3,110 mortalities were estimated (or 3% of the population for those age classes). The loss of near-reproductive and reproductive-stage females would have contributed to some extent to the decline in total nesting abundance observed between 2011 and 2014. The estimated number of unrealized Kemp's ridley nests is between 1,300 and 2,000, which translates to between approximately 65,000 and 95,000 unrealized hatchlings (DWH Trustees 2015). This is a minimum estimate, however, because the sublethal effects of the DWH oil spill event on turtles, their prey, and their habitats might have delayed or reduced reproduction in subsequent years, which may have contributed substantially to additional nesting deficits observed following the DWH oil spill event. These sublethal effects could have slowed growth and maturation rates, increased remigration intervals, and decreased clutch frequency (number of nests per female per nesting season). The nature of the DWH oil spill event effect on reduced Kemp's ridley nesting abundance and associated hatchling production after 2010 requires further evaluation. It is clear that the DWH oil spill event resulted in large losses to the Kemp's ridley population across various age classes, and likely had an important population-level effect on the species. Still, we do not have a clear understanding of those impacts on the population trajectory for the species into the future.

4 ENVIRONMENTAL BASELINE

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

By regulation (50 CFR 402.02), environmental baselines for Biological Opinions include the past and present impacts of all state, federal, or private actions and other human activities in, or having effects in, the action area. We identify the anticipated impacts of all proposed federal actions in the specific action area of the consultation at issue that have already undergone formal or early Section 7 consultation (as defined in 50 CFR 402.11), as well as the impact of state or private actions, or the impacts of natural phenomena, which are concurrent with the consultation in process (50 CFR 402.02).

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

4.1 Status of Sea Turtles within the Action Area

Based on the information discussed above, and their habitat and eating preferences, loggerhead, green, and Kemp's ridley sea turtles may be located in the action area and be affected by the proposed recreational fishing activities. All of these species are migratory, traveling for foraging or reproduction purposes. The nearshore waters of Okaloosa, Franklin, and Escambia Counties may be used by these sea turtles as post-hatchling developmental habitat or foraging habitat. NMFS believes that no individual sea turtles are likely to be permanent residents of the nearshore waters in these areas, although some individuals may be present at any given time. These same individuals will migrate into offshore waters, as well as other areas of the Gulf of Mexico, Caribbean Sea, and North Atlantic Ocean at certain times of the year, and thus may be impacted by activities occurring there; therefore, threats to turtles in the action area are considered to include those discussed in Section 3. All 3 species are known to nest on the Gulf-facing beaches of all 3 counties. Loggerheads are by far the most abundant nesters in these counties, creating hundreds of nests along these beaches in recent years. Greens and Kemp's ridley sea turtles are only occasional nesters in these counties, generally producing only a few nests per year.

4.2 Factors Affecting the Species and Environment within the Action Area

<u>Federal Actions</u>
A search of NMFS records, found no projects in the action areas that have undergone Section 7 consultation. However, periodic dredging of the boating channels around the project sites may occur and could affect sea turtles through increased turbidity, temporary avoidance of active dredging zones, and potential direct impacts from dredging equipment (depending on the type of equipment used).

<u>State or Private Actions</u>
Recreational boating and fishing as regulated by the state of Florida can affect protected species or their habitats within the action area. Recreational boating in the shallow waters of the action area can damage sea grass beds, increase turbidity, and directly impact sea turtles through vessel strikes. Recreational fishing can threaten sea turtles via incidental hooking and entanglement either by actively fished lines, discarded, remnant, or broken-off fishing lines, and/or other debris. Pressure from recreational boating and fishing around the action area is likely to continue at levels that are difficult to quantify.

Other Potential Sources of Impacts in the Environmental Baseline

Stochastic events

Stochastic (i.e., random) events, such as hurricanes and cold snaps, occur in Florida and can affect the action area. These events are by nature unpredictable, and their effect on the recovery of the species is unquantifiable. Stochastic events have the potential to impede recovery if animals are injured or killed as a direct result of the event, or if important habitats are damaged.

Marine Pollution and Environmental Contamination

Coastal runoff, dredging, and contaminant spills can degrade nearshore habitats used by sea turtles (Colburn et al. 1996). Public and private facilities such as marinas can sometimes discharge oil, gas, and sewage into sensitive estuarine and coastal habitats. Although these contaminant concentrations are unknown in the action area, all of the water bodies that make up the action area are listed as a 303d impaired waterbodies for contaminants such as mercury in fish tissue, fecal coliform, and bacteria in shellfish.

The Gulf of Mexico is an area of high-density offshore oil extraction with chronic, low-level spills and occasional massive spills (such as the DWH oil spill in 2010, the Ixtoc I oil well blowout and fire in the Bay of Campeche in 1979, and the explosion and destruction of the loaded supertanker, the Mega Borg, near Galveston in 1990). When large quantities of oil enter a body of water, chronic effects such as cancer, and direct mortality of wildlife becomes more likely (Lutcavage et al. 1997).

The accumulation of organic contaminants and trace metals has been studied in loggerhead, green, and leatherback sea turtles (Aguirre et al. 1994; Caurant et al. 1999; Corsolini et al. 2000) (McKenzie et al. 1999). Omnivorous loggerhead sea turtles had the highest organochlorine contaminant concentrations in all the tissues sampled, including those from green and leatherback turtles (Storelli et al. 2008). It is thought that dietary preferences were likely to be the main differentiating factor among species. Sakai et al. (1995) found the presence of metal residues occurring in loggerhead sea turtle organs and eggs. Storelli et al. (1998) analyzed tissues from 12 loggerhead sea turtles stranded along the Adriatic Sea (Italy) and found that characteristically, mercury accumulates in sea turtle livers while cadmium accumulates in their kidneys, as has been reported for other marine organisms like dolphins, seals, and porpoises (Law et al. 1991b). No information on detrimental threshold concentrations is available, and little is known about the consequences of exposure of organochlorine compounds to sea turtles. Research is needed on the short- and long-term health and fecundity effects of chlorobiphenyl, organochlorine, and heavy metal accumulation in sea turtles.

Conservation and Recovery Actions Shaping the Environmental Baseline

As discussed in Section 3, NMFS and cooperating states have established an extensive network of STSSN participants along the Atlantic and Gulf of Mexico coasts that not only collect data on dead sea turtles, but also rescue and rehabilitate live stranded sea turtles.

5. EFFECTS OF THE ACTION ON SEA TURTLES

5.1 Effects on Sea Turtles from Recreational Fishing at the Proposed Fishing Piers

Sea turtles may be adversely affected by recreational fishing activity through incidental hooking or entanglement in actively fished or discarded fishing line. Sea turtles have historically been captured in both recreational and commercial fisheries and are known to become entangled in fishing debris. Most sea turtle captures on rod-and-reel, as reported to the STSSN, have occurred during pier fishing. Fishing piers are suspected to attract sea turtles that learn to forage there for discarded bait and fish carcasses. Sea turtles are particularly prone to entanglement as a result of their body morphologies and behaviors. Records of stranded or entangled sea turtles reveal that fishing line can wrap around the neck, flipper, or body of a sea turtle and severely restrict swimming or feeding. If an individual sea turtle is entangled when young, the fishing line can become tighter and more constricting as the individual grows, cutting off blood flow and causing deep gashes, some severe enough to remove an appendage.

In this section, we will estimate the number of sea turtles anticipated to be captured at the proposed fishing piers based on available data regarding the number that have been reported caught during recreational fishing in the surrounding area, the estimated number of unreported hook-and-line captures, and the estimated survival rate of each species post capture.

5.1.1 Estimated Reporting of Hook-and-Line Captures at Fishing Piers

In 2013, a fishing pier survey was completed at 26 fishing piers in Charlotte Harbor on the west coast of Florida in smalltooth sawfish critical habitat (Hill 2013). During the survey, 93 fishers were asked a series of questions regarding captures of sea turtles, smalltooth sawfish, and dolphins including whether or not they knew these encounters were required to be reported and if they did report the encounter. The interviewer also noted conditions about the pier including if educational signs regarding reporting of hook-and-line captures were present at the pier. Interviewed fishers were asked open-ended questions about what they would do if they were to accidently capture a sea turtle or sawfish. Of those interviewed, 46% responded they would cut the line, while 28% would either cut the line or remove the hook depending on the situation, and 22% would try to remove the hook. It was reported that 88% did not know to report incidental captures of either sea turtles or sawfish and that only 12% stated that they would report an accidently hooked sawfish and only 8% would have reported an accidently hooked sea turtle. This demonstrates the high level of underreporting likely occurring, the lack of awareness regarding reporting, and the lack of educational signs regarding reporting at fishing piers.

5.1.2 Estimating Sea Turtle Take

While we believe the best available information for estimating future interactions at fishing piers are the documented incidental captures at public piers in the surrounding area, we also recognize the need to account for underreporting especially in areas where educational signs have not been present. We believe that it is reasonable to assume that the reporting level identified by the fishing pier survey discussed above is reasonable to apply to the proposed action as both are located in estuarine waters on the Gulf Coast of Florida. For the proposed action, we will use the data set from the Charlotte Harbor fishing piers to estimate underreporting. In the following sections, we describe how we derived our estimates for potential future takes. In those calculations we will address underreporting by assuming that the 10 sea turtles reported taken at fishing piers in Okaloosa, Franklin and Escambia Counties from 2007-2016 by the STSSN represents only 8% of the actual take, and that 92% of sea turtle take in those 3 counties went unreported during that time period.

The number of captures in any given year can be influenced by sea temperatures, species abundances in a given year, fluctuating salinity levels in estuarine habitats where piers may be located, and other factors that cannot be predicted. For these reasons, we believe basing our future incidental take estimate on a 1-year estimated take level is largely impractical. For these reasons, and based on our experience monitoring other fishing, we believe a 3-year time period is appropriate for meaningful monitoring. The triennial takes are set as 3-year running sums (total for any consecutive 3-year period) and not for static 3-year periods (i.e., 2017-2019, 2018-2020, 2019-2021 and so on, as opposed to 2017-2019, 2020-2022). This approach reduces the likelihood reinitiation of ESA consultation will be required unnecessarily because of inherent variability in take levels, while still allowing for an accurate assessment of how the proposed actions are performing versus our expectations.

Now we incorporate the data from the STSSN for incidental sea turtle take at fishing piers in Okaloosa, Franklin and Escambia Counties from 2007-2016 to estimate future captures at the proposed fishing piers. The STSSN reported a total of 10 sea turtles (6 Kemp's ridley, 3 loggerhead, and 1 green sea turtle) taken by hook-and-line at public fishing piers in the 3 counties over the 10-year period.

To be precautionary, we will assume that 92% of sea turtle captures were not reported during this period, as per the findings in Hill (2013). To determine the number of unreported sea turtle captures over the 10-year period (X) we use the equation:

Reported captures ÷ 8% = unreported captures ÷ 92%
$10 \div 8 = X \div 92$
$920 = 8X$
$X = 115$

Therefore, the total sea turtle captures estimated to have occurred from public fishing piers in these 3 counties, over the 10-year period, is 125 turtles, (10 reported and 115 unreported).

There are 47 public fishing piers across the 3 counties (19 in Okaloosa, 15 in Franklin, and 13 in Escambia). Assuming that the proposed new piers will have similar potential to experience sea turtle captures as the existing piers, we can estimate that each new pier will average 0.266 captures per year (125 captured turtles ÷ 47 piers ÷ 10 years = 0.266 turtles per year per pier), or approximately 2.4 captures across all 3 piers over any 3-year period (0.266 turtles * 3 piers * 3 years = 2.4 turtle captures). Based on the proportions of captured turtles reported for the three counties from 2007-2016 in the STSSN data, we expect that 60% of the turtles captured will be Kemp's ridley (6 Kemps ÷ 10 total captures = 60%), 30% will be loggerhead (3 loggerhead ÷ 10 total captures = 30%), and 10% will be green sea turtles (1 green ÷ 10 total captures = 10%).

5.1.3 Effects of Hook-and-Line Captures of Sea Turtles

Hook-and-line gear commonly used by recreational anglers fishing from piers can adversely affect sea turtles via entanglement, hooking, and trailing line. Sea turtles released alive may later succumb to injuries sustained at the time of capture or from exacerbated trauma from fishing hooks or lines that were ingested, entangled, or otherwise still attached when they were released. Of the sea turtles hooked or entangled that do not die from their wounds, some may suffer impaired swimming or foraging abilities, altered migratory behavior, and altered breeding or reproductive patterns.

The current understanding of the effects of hook-and-line gear on sea turtles is related primarily to the effects observed in association with commercial fisheries (particularly longline fisheries); few data exist on the effects of recreational fishing on sea turtles. Dead sea turtles found stranded with hooks in their digestive tract have been reported, though it is assumed that most sea turtles hooked by recreational fishers are released alive (Thompson 1991). Little information exists on the frequency of recreational fishing captures and the status of the sea turtles after they are caught. Regardless, effects that sea turtles are likely to experience as a result of interactions with recreational hook-and-line gear (i.e., entanglement, hooking, and trailing line) are expected to be the same as those that might occur in commercial fisheries. The following discussion summarizes in greater detail the available information on how individual sea turtles may be affected by interactions with hook-and-line gear.

Entanglement

Sea turtles are particularly prone to entanglement as a result of their body configuration and behavior. Records of stranded or entangled sea turtles reveal that hook-and-line gear can wrap around the neck, flipper, or body of a sea turtle and severely restrict swimming or feeding. If the sea turtle is entangled when young, the fishing line becomes tighter and more constricting as the sea turtle grows, cutting off blood flow and causing deep gashes, some severe enough to remove an appendage. Sea turtles have been found entangled in many different types of hook-and-line gear. Entangling gear can interfere with a sea turtle's ability to swim or impair its feeding, breeding, or migration. Entanglement may even prevent surfacing and cause drowning.

Hooking

In addition to being entangled in hook-and-line gear, sea turtles are also injured and killed by being hooked. Hooking can occur as a result of a variety of scenarios, some depend on the foraging strategies and diving and swimming behavior of the various species of sea turtles. Sea turtles are either hooked externally in the flippers, head, shoulders, armpits, or beak, or internally inside the mouth or further down the digestive track when the animal has swallowed the hook (Balazs et al. 1995). Observer data (specific to commercial fishing) indicate that internal hooking is the most common form of angling impact in hardshell sea turtles, especially loggerheads (NMFS unpublished data). Almost all interactions with loggerheads result from the turtle taking the bait and hook; only a very small percentage of loggerheads are foul-hooked externally or entangled.

Swallowed hooks are of the greatest concern. A sea turtle's esophagus (throat) is lined with strong conical papillae directed towards the stomach (White 1994). The presence of these papillae in combination with an S-shaped bend in the esophagus make it difficult to see hooks when looking through a sea turtle's mouth, especially if the hooks have been deeply ingested. Because of a sea turtle's digestive structure, deeply ingested hooks are also very difficult to remove without seriously injuring the turtle. A sea turtle's esophagus is also firmly attached to underlying tissue; thus, if a sea turtle swallows a hook and tries to free itself or is hauled on board a vessel, the hook can pierce the sea turtle's esophagus or stomach and can pull organs from its connective tissue. These injuries can cause the sea turtle to bleed internally or can result in infections, both of which can kill the sea turtle.

If a hook does not lodge into, or pierce, a sea turtle's digestive organs, it can pass through the digestive system entirely (Aguilar et al. 1995; Balazs et al. 1995) with little damage (Work 2000). For example, a study of loggerheads deeply hooked by the Spanish Mediterranean pelagic longline fleet found ingested hooks could be expelled after 53 to 285 days (average 118 days) (Aguilar et al. 1995). If a hook passes through a sea turtle's digestive tract without getting lodged, the hook probably has not harmed the turtle.

Trailing Line

Trailing line (i.e., line left on a sea turtle after it has been captured and released), particularly line trailing from a swallowed hook, poses a serious risk to sea turtles. Line trailing from a swallowed hook is also likely to be swallowed, which may irritate the lining of the digestive system. The line may cause the intestine to twist upon itself until it twists closed, creating a blockage ("torsion") or may cause a part of the intestine to slide into another part of intestine like a telescopic rod ("intussusception") which also leads to blockage. In both cases, death is a likely outcome (Watson et al. 2005). The line may also prevent or hamper foraging, eventually leading to death. Trailing line may also become caught on a floating or fixed object, further entangling a turtle and potentially slicing its appendages and affecting its ability to swim, feed, avoid predators, or reproduce. Sea turtles have been found trailing gear that has been snagged on the sea floor, or has the potential to snag, thus anchoring them in place (Balazs 1985). Long lengths of trailing gear are likely to entangle the sea turtle, eventually, leading to impaired movement, constriction wounds, and potentially death.

5.1.4 Estimating Injury and Post-Release Mortality Rates for Anticipated Future Takes

The injury to sea turtles from hook-and-line captures and ultimately the post-release mortality (PRM) will depend on numerous factors including how deeply the hook is embedded, whether it was swallowed or was an external hooking, whether the sea turtle was released with trailing line, how soon and how effectively the hooked sea turtle was de-hooked or otherwise cut loose and released, and other factors which are discussed in more detail below.

The preferred method to release a hooked sea turtle safely is to bring it ashore and de-hooked/disentangle it there and release it immediately. If that cannot be accomplished, the next preferred technique is to cut the line as close as possible to the sea turtle's mouth or hooking site, rather than attempt to pull the sea turtle up to the pier. Some incidentally captured sea turtles are likely to break free on their own and escape with embedded/ingested hooks and/or trailing line. We have no way of estimating how many will break free with trailing line and/or ingested or embedded hooks. Because of considerations such as current, pier height, and the weight and size of the hooked/entangled sea turtle, some will not be able to be de-hooked, and will be broken off or cut free by fishers. These sea turtles will escape with embedded or swallowed hooks, and/or trailing varying amounts of fishing line which may cause post-release injury or death.

In January 2004, NMFS convened a workshop of experts to develop criteria for estimating PRM of sea turtles caught in the pelagic longline fishery. In 2006, those criteria were revised and finalized (Ryder et al. 2006). In February 2012, the SEFSC updated the 2006 criteria by adding 3 additional hooking scenarios (Table 3). Overall mortality ratios are dependent upon the type of interaction (i.e., hooking, entanglement), the location of hooking if applicable (i.e., hooked externally, hooked in the mouth), and the amount/type of gear remaining on the animal at the time of release (i.e., hook remaining, amount of line remaining, entangled or not). Therefore, the experience, ability, and willingness of anglers to remove the gear, and the availability of gear-removal equipment, are very important factors that influence PRM. The new criteria also take into account differences in PRM between hardshell sea turtles and leatherback sea turtles, with slightly higher rates of PRM assigned to leatherbacks. While no specific analysis of PRM related to recreational hook-and-line gear are currently available, we believe that the commercial fishery information is a reasonable surrogate for recreational fishing as both techniques use similar gear (baited hooks attached to monofilament lines).

Table 3. Criteria for Assessing PRM, With Mortality Rates Shown as Percentages for Hardshell Sea Turtles (NMFS and SEFSC 2012)

Injury Category		Release Condition			
		(A) Released entangled (line is trailing or not trailing, turtle is entangled[5])	(B) Released with hook and with trailing line greater than or equal to half the length of the carapace (line is trailing, turtle is not entangled)	(C) Released with hook and with trailing line less than half the length of the carapace (line is trailing, turtle is not entangled)	(D) Released with all gear removed
I	Hooked externally with or without entanglement	55%	20%	10%	5%
II	Hooked in upper or lower jaw with or without entanglement—includes ramphotheca, but not any other jaw/mouth tissue parts (see Category III)	65%	30%	20%	10%
III	Hooked in cervical esophagus, glottis, jaw joint, soft palate, tongue, and/or other jaw/mouth tissue parts not categorized elsewhere, with or without entanglement—includes all events where the insertion point of the hook is visible when viewed through the mouth.	75%	45%	35%	25%
IV	Hooked in esophagus at or below level of the heart with or without entanglement—includes all events where the insertion point of the hook is not visible when viewed through the mouth	85%	60%	50%	75%[6]
V	Entangled only, no hook involved	Released Entangled 50%	n/a		Fully Disentangled 1%
VI	Comatose/resuscitated	n/a[7]		70%	60%

To estimate the expected release conditions of turtles captured at the proposed fishing piers, we consider that the applicants have agreed to post and maintain signage alerting anglers to the risk of hooking sea turtles, and the preferred method of release. We also look at the proposed size and elevation of the piers. Given the small sizes and low elevation off the water of the proposed

5 Length of line, as well as the presence or absence of the hook, is not relevant as turtle remains entangled at release.
6 Although per veterinary recommendations, hooks would not be removed if the insertion point of the hook is not visible when viewed through the open mouth, this has occurred and must be accounted for. We have interpolated the table's value to insert a value for this cell base on veterinary and expert opinion. Also, there are times when the hook location is unknown, but the hook-and-line are retrieved. Because these are coded in this row, we must also allow for the removal of all gear.
7 Assumes that the resuscitated turtle will always have the line cut to a length less than half the length of the carapace, even if the hook remains. Assumes that the turtle is not released entangled in the remaining line.

piers (approximately 3-5 ft above the mean high water line), it is likely that most anglers will be able to cut their line close to the hooking point on turtles that are able to be brought close to the pier, which would result in "Release Condition C" from Table 3 (Released with hook and with trailing line less than half the length of the carapace (line is trailing, turtle is not entangled)). It is also likely that some anglers will be able to completely unhook captured turtles (Release Condition D), and some will cut/break their line far from the turtle (Release Condition B). We believe that Release Condition A will be rare as most anglers will be using single lines with single baited hooks which are much less likely to result in immediate entanglement of sea turtles than the multi-hook long-line rigs used by commercial fishermen and analyzed in Ryder et al. (2006). We believe that most turtles will be released in Condition C, and the PRMs for those released in Conditions B and D would generally average out to the PRM for Condition C (if equal numbers are released in conditions B and D). Therefore, we will assume that on average, the turtles released from the proposed fishing piers will experience PRMs associated with Release Condition C (Table 3).

To estimate the likely "Injury Category" of turtles captured at the proposed fishing piers we believe the best available information that we have for the NMFS Southeast Region is reported by the Mississippi STSSN. In cooperation with Institute of Marine Mammal Studies (IMMS), the Mississippi STSSN have compiled extensive data on the hook-and-line captures of 924 sea turtles at fishing piers in Mississippi from 2010 to mid-2015 (Table 4). This data includes the location on the sea turtle's body where it was hooked. We looked at this data to determine the types of hooking injuries for sea turtles captured at fishing piers. The data provided includes 24.24% of turtle interactions that did not report the specific sea turtle hooking location. We believe that it is more accurate to estimate the future injury and post-release mortality by only analyzing the reported hook-and-line captures that also reported the hooking location because mortality rates differ depending on the hooking location, so no mortality rate can reliably be estimated from sea turtles that do not have the hooking location reported. Using this data, we estimate that 7% of turtles hooked at fishing piers will suffer a Category I injury defined in Table 3 above, followed by 4% of turtles that will suffer a Category II injury, 85% of turtles that will suffer a Category III injury, and 4% of turtles that will suffer a Category IV injury (Table 4).

Table 4. Category of Injury from Hook-and-Line Captures at Fishing Piers in Mississippi (January 1, 2010- June 10, 2013)

All Reporting Hook-and-Line Captures	Injury Category I	Injury Category II	Injury Category III	Injury Category IV	Unknown/ Blank/NA	Total - All
Records	52	26	596	26	224	924
Percent of Total	5.63%	2.81%	64.50%	2.81%	24.24%	100.00%
Hook-and-Line Captures with hooking location reported	**Injury Category I**	**Injury Category II**	**Injury Category III**	**Injury Category IV**	**Total - Known**	
Records	52	26	596	26	700	
Percent of Total	7.43%	3.71%	85.14%	3.71%	100.00%	

Injured sea turtles captured in Mississippi are sent to IMMS for rehabilitation. According to IMMS data provided by the STSSN, of 858 turtles sent to IMMS between 2010 and mid-2015, approximately 97% were released alive (either released immediately alive or rehabilitated and released alive), and the remaining 3% were removed from the population (either died or were deemed unreleasable).

There are several sea turtle rehabilitation facilities in the general vicinity of the proposed piers (in Destin, Fort Walton Beach, and Panama City Beach), and based on the reporting rates observed in Hill (2013), we assume that 8% of the sea turtles captured at these piers will be reported and sent to one of these facilities for rehabilitation (if needed), and therefore achieve the 97% survival rate described above, regardless of how they are hooked.

Estimating Post-Release Mortality Rates for Sea Turtles Captured at the Proposed Piers
To estimate the fate of the 92% of turtles expected to go unreported and therefore unrehabilitated, we use the Injury Categories calculated in Table 3 along with the PRMs for Category C Release Condition shown in Table 4 to calculate the weighted mortality rate expected for each injury category. We then sum the weighted mortality rates across all injury categories to determine the overall PRM Rate for these turtles (Table 5). For example, we anticipate 7% of captures are likely to result in Category I injuries, and 10% of those animals are likely to die as a result of that injury. Therefore, we expect 0.7% of unreported turtles (7% x 10%) would suffer PRM as a result of a Category I injury. By following this same approach for each injury category and its corresponding mortality rate, we establish the weighted mortality rates. By summing the weighted mortality rates we can estimate the overall mortality rate for all future turtles captured and released immediately from the piers (Table 5). This overall rate helps us account for the varying severity of future injuries and varying PRM rates associated with these injuries.

Table 5. Estimated Overall PRM Rate for Turtles Released Immediately from the Piers

<table>
<tr><th>Injury Category</th><th>Percentage of Total Captures in Each Injury Category from Table 4</th><th>PRM Rate per Category C from Table 3</th><th>Weighted Mortality Rate</th></tr>
<tr><td>I</td><td>7%</td><td>10%</td><td>0.7%</td></tr>
<tr><td>II</td><td>4%</td><td>20%</td><td>0.8%</td></tr>
<tr><td>III</td><td>85%</td><td>35%</td><td>29.8%</td></tr>
<tr><td>IV</td><td>4%</td><td>50%</td><td>2.0%</td></tr>
<tr><td colspan="3">Overall Post-Release Mortality Rate</td><td>33.6%*</td></tr>
<tr><td colspan="4">*Overall mortality rate = Percent of Total Captures in Each Injury Category x PRM Rate per Category = Weighted Mortality; Weighted Mortality Rate for Injury Category I + Weighted Mortality Rate for Injury Category II + Weighted Mortality Rate for Injury Category III + Weighted Mortality Rate for Injury Category IV = Overall mortality rate.</td></tr>
</table>

Based on the assumptions we have made about the percentage of turtles that will be released without rehabilitation, the likely hooking location on the turtles bodies, and the amount of fishing gear likely to remain on animals released immediately at a pier, we estimate a PRM rate of 33.6% for 92% of the turtles taken at the proposed piers. To get the overall mortality rate for all turtles taken at the proposed piers, we must add in the expected mortality rates for those turtles that are rescued and rehabilitated. The overall mortality rate for turtles taken at the proposed piers can be estimated through the following equation:

Mortality Rate = (PRM for turtles released at pier (from Table 5) * percent of turtles released at pier) **+** (mortality rate for rescued turtles (from IMMS data) * percent of turtles rescued)

Mortality Rate = (33.6% * 92%) + (3% * 8%)

Mortality Rate = 30.91% + 0.24% = **31.15%**

When this mortality rate is applied to the estimated total number of captures across all 3 piers over a 3-year period (2.4 turtles), we can predict that approximately 0.748 turtles are expected to die as a result of the proposed action (2.4 * 31.15% = 0.75) every 3 years (on average).

Estimated Captures and Mortality by Species

Data from the STSSN for 2007-2016 show that all reported incidental takes of sea turtles by hook-and-line fishing associated with fishing piers in Okaloosa, Franklin, and Escambia Counties were for Kemp's ridley, loggerhead and green sea turtles. During this 10 year period, 6 Kemp's ridley, 3 loggerhead, and 1 green sea turtle were taken by hook-and-line fishing from fishing piers in these counties. Therefore, we will assume the same species composition for future captures at the 3 new fishing piers; 60% Kemp's ridley sea turtles, 30% loggerhead sea turtles, and 10% green sea turtles. In order to derive meaningful numbers from our analysis (as it is difficult to analyze effects on fractions of turtles) we will expand the time period of the analysis out to a period of 30 years (a reasonable life expectancy for these fishing piers). Based on the analysis above, we would expect approximately 24 turtles would be captured from the 3 piers, over a 30-year period (0.266 captures per year *3 piers * 30 years = 24 captures over 30 years). We use this information to estimate the capture and mortality rate for each species of sea turtle in Table 6 below.

Table 6. Estimated Captures and Mortality by Species for a 30-Year Period

Turtle Species	Estimated Percent of all Turtles Captured	Estimated Captures Over any 30-Year Period by Species	Estimated Captures Resulting in Mortality	Estimated Mortalities Rounded up to be conservative
Kemp's ridley	60%	24 x 0.6 = 14.4	14.4 x 0.3115 = 4.49	5
Loggerhead	30%	24 x 0.3 = 7.2	7.2 x 0.3115 = 2.24	3
Green	10%	24 x 0.1 = 2.4	2.4 x 0.3115 = 0.75	1
Total	100%	24	7.5	9

6. CUMULATIVE EFFECTS

ESA Section 7 regulations require NMFS to consider cumulative effects in formulating their Biological Opinions (50 CFR 402.14). Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this Opinion. Within the action area, major future changes are not anticipated in the ongoing human activities described in the environmental baseline. The present, major human uses of the action area are expected to continue at the present levels of intensity in the near future.

7. JEOPARDY ANALYSIS

The analyses conducted in the previous sections of this Opinion provide a basis to determine whether the proposed action is likely to jeopardize the continued existence of Kemp's ridley, green, or loggerhead sea turtles, by identifying the nature and extent of adverse effects expected to impact each species. Next we consider how these species will be impacted by the proposed action in terms of overall population effects and whether those effects of the proposed action will jeopardize the continued existence of the species when considered in the context of the status of the species and their habitat (Section 3), the environmental baseline (Section 4), and cumulative effects (Section 6).

To jeopardize the continued existence of a species is defined as "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). The following jeopardy analysis first considers the effects of the action to determine if we would reasonably expect the action to result in reductions in reproduction, numbers, or distribution of these species. The analysis next considers whether any such reduction would in turn result in an appreciable reduction in the likelihood of survival of these species in the wild, and the likelihood of recovery of these species in the wild.

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

All life stages are important to the survival and recovery of a species; however, it is important to note that individuals of one life stage are not equivalent to those of other life stages. For example, the take of male juveniles may affect survivorship and recruitment rates into the reproductive population in any given year, and yet not significantly reduce the reproductive potential of the population. Yet, the death of mature, breeding females can have an immediate effect on the reproductive potential of a species. Sublethal effects on adult females may also reduce reproduction if, for example, foraging success is impacted, thus reducing energy reserves to the point that the female is unable to produce multiple clutches of eggs in a breeding year. Different age classes may be subject to relative rates of mortality, resilience, and overall effects of population dynamics. Ontogenetic shifts, or changes in location and habitat, have a major impact on where sea turtles occur and what human hazards they may encounter. Young juvenile sea turtles are generally not subject to hook-and-line capture because of their pelagic oceanic stage of life. Still, a shift in diet for all sea turtles occurs when juvenile sea turtles shift to a neritic habitat and benthic feeding, at which time they would become more susceptible to fishing impacts. For the proposed action, we would not expect early juvenile stage sea turtles of any of these species to be subject to take from any aspect of pier construction or continued use of the piers. However, later stage juveniles and adults of these species are more likely to be subject to incidental take as a result of foraging in the areas of increased fishing activity which would occur as a result of the proposed action.

7.1 NWA DPS of Loggerhead Sea Turtles

The proposed action is anticipated to result in the live capture of approximately 7 loggerhead sea turtles every 30 years (on average) due to fishing activities or entanglement in fishing gear associated with the proposed piers, of which 3 captures are expected to result in mortality. Injuries resulting from nonlethal takes have the potential to cause temporary impacts to the reproductive potential, fitness, or growth of the captured sea turtles, depending on the nature and severity of the injury. We expect these impacts to be temporary, as turtles with non-fatal injuries are likely to eventually recover and resume normal feeding and reproductive activities. For example, a mature female that is severely, but not fatally injured may be forced to forego nesting activities that year, but eventually an ingested hook would decompose or pass, wounds would heal, and the turtle would be able to resume normal feeding and reproductive activities.

The potential lethal take of 3 turtles may result in a reduction in reproduction as a result of lost reproductive potential, if either or both of the individuals are females who would have survived other threats and reproduced in the future. For example, an adult female loggerhead sea turtle can lay 3 or 4 clutches of eggs every 2-4 years, with 100-130 eggs per clutch. The loss of an adult female sea turtle could preclude the production of thousands of eggs and hatchlings of which a small percentage would be expected to survive to sexual maturity.

With regard to the potential for the effects of the proposed action to cause a reduction in the distribution of loggerhead sea turtles, this is an extremely wide ranging DPS with numerous, well established nesting beaches, each of which generally see dozens if not hundreds of females nesting each year. Therefore the small mortality rate expected to result from the proposed action is not likely to effect the overall distribution of this DPS.

Whether the reduction of 3 loggerhead sea turtles over a 30-year period would appreciably reduce the likelihood of survival for the DPS depends on what effect this reduction in numbers and potentially reproduction would have on overall population sizes and trends, i.e., whether the estimated reduction, when viewed within the context of the current status of the species and the environmental baseline, is of such magnitude that adverse effects on population dynamics are appreciable. In Section 3.4, we reviewed the status of the species in terms of nesting and female population trends and several recent assessments based on population modeling (e.g., Conant et al. 2009b; NMFS-SEFSC 2009). Below, we synthesize what that information means in general terms and also in the more specific context of the proposed action and the environmental baseline.

Loggerhead sea turtles are a slow growing, late-maturing species. Because of their longevity, loggerhead sea turtles require high survival rates throughout their life to maintain a population. In other words, late-maturing species cannot tolerate much anthropogenic mortality without going into decline. Conant et al. (2009b) concluded because loggerhead natural growth rates are low, natural survival needs to be high, and even low to moderate mortality can drive the population into decline. Because recruitment to the adult population is slow, population modeling studies suggest even small increases in mortality rates in adults and subadults could substantially impact population numbers and viability over the long term (Chaloupka and Musick 1997b; Crouse et al. 1987; Crowder et al. 1994; Heppell et al. 1995).

NOAA's SEFSC (2009) estimates the adult female population size for the NWA DPS is likely between 20,000 and 40,000 individuals, with a low likelihood of being up to 70,000 individuals. A more recent conservative estimate for the entire western North Atlantic population was a mean of 38,334 adult females using data from 2001-2010 (Richards et al. 2011). A much less robust estimate for total benthic females in the western North Atlantic was also obtained, with a likely range of approximately 30,000-300,000 individuals, up to nearly 1 million. Further insight into the numbers of loggerhead sea turtles along the U.S. coast is available in NMFS-NEFSC (2011), which reported a conservative estimate of 588,000 juvenile and adult loggerhead sea turtles present on the continental shelf from the mouth of the Gulf of St. Lawrence to Cape Canaveral, Florida, when using only positively identified loggerhead sightings from an aerial survey. A less conservative analysis from the same study resulted in an estimate of 801,000 loggerheads in the same geographic area when a proportion of the unidentified hardshell turtles were categorized as loggerheads. This study did not include Florida's east coast south of Cape Canaveral or the Gulf of Mexico, which are areas where large numbers of loggerheads occur.

A detailed analysis of Florida's long-term loggerhead nesting data (1989-2016) revealed 3 distinct annual trends (Figure 5). From 1989-1998 there was a 30% increase that was then followed by a sharp decline over the subsequent decade. Large increases in loggerhead nesting have occurred since then. FWRI examined the trend from the 1998 nesting high through 2013 and found the decade-long post-1998 decline had reversed and there was no longer a demonstrable trend. Looking at the data from 1989 through 2014 (an increase of over 32%), FWRI concluded that there was an overall positive change in the nest counts (http://myfwc.com/research/wildlife/sea-turtles/nesting/loggerhead-trends/).

We believe that the incidental take and resulting mortality of loggerhead sea turtles associated with the proposed action are not reasonably expected to cause an appreciable reduction in the likelihood of survival of the NWA DPS of loggerhead sea turtles. We believe the current population is comparatively large (i.e., several hundred thousand individuals) and is showing encouraging signs of stabilizing and possibly increasing. Over at least the next several decades, we expect the DPS to remain large (i.e., hundreds of thousands of individuals) and to retain the potential for recovery. We also expect that the proposed action will not cause the DPS to lose genetic heterogeneity, broad demographic representation, or successful reproduction.

The Services' recovery plan for the NWA population of the loggerhead sea turtle (NMFS and USFWS 2008b) which is the same population of sea turtles as the NWA DPS, anticipates that, with implementation of the plan, the western North Atlantic population will recover within 50-150 years, but notes that reaching recovery in only 50 years would require a rapid reversal of the then declining trends of the Northern, Peninsular Florida, and Northern Gulf of Mexico Recovery Units. The recovery plan provides additional explanation of the goals and vision for recovery for this population. The recovery objectives most pertinent to the threats posed by the proposed action are Numbers 1 and 2 (listed below):

1. Ensure that the number of nests in each recovery unit are increasing and that this increase corresponds to an increase in the number of nesting females.

2. Ensure the in-water abundance of juveniles in both neritic and oceanic habitats is increasing and is increasing at a greater rate than strandings of similar age classes.

Recovery Objective 1, "Ensure that the number of nests in each recovery unit is increasing…," is the plan's overarching objective and has associated demographic criteria. Currently, none of the plan's criteria are being met, but the plan acknowledges that it will take 50-150 years to do so. Further reduction of multiple threats throughout the North Atlantic, Gulf of Mexico, and Greater Caribbean will be needed for strong, positive population growth, following implementation of more of the plan's actions. Although any continuing mortality in what might be an already declining population can affect the potential for population growth, we believe the effects of the proposed actions would not impede or prevent achieving this recovery objective over the anticipated 50- to 150-year time frame.

Recovery Objective 2, "Ensure the in-water abundance of juveniles in both neritic and oceanic habitats is increasing and is increasing at a greater rate than strandings of similar age classes." Currently, there are not enough data to determine if this objective is being met. The NWA DPS nesting trend for loggerhead sea turtles remains slightly negative, although as mentioned above the trend has likely stabilized. Overall, loggerhead populations have a long way to go before the population decline is reversed and numerical increases in population meet the goals of the recovery plan. As with Recovery Objective 1 above, the level of mortality expected to result from the proposed actions would not appreciably impede or prevent achieving this recovery objective over the anticipated 50- to 150-year time frame.

The potential mortality of 3 loggerhead sea turtles over a 30–year period is not reasonably expected to cause an appreciable reduction in the likelihood of recovery of the NWA DPS of loggerheads. Recovery is the process of removing threats so self-sustaining populations persist in the wild. The effects of the proposed action would not appreciably impede progress on achieving the identified relevant recovery objectives or achieving the overall recovery strategy. The nonlethal takes of loggerhead sea turtles as discussed in this opinion would not affect population numbers or long-term reproductive success. Thus, the proposed action is not expected to impede the recovery objectives above and will not result in an appreciable reduction in the likelihood of the NWA DPS of loggerhead sea turtles' recovery in the wild.

7.2 Green Sea Turtles (North Atlantic and South Atlantic DPSs)

Mixed-stock analyses of foraging grounds show that green sea turtles from multiple nesting beaches commonly mix at feeding areas across the Caribbean and Gulf of Mexico, with higher contributions from nearby large nesting sites and some contribution estimated from nesting populations outside the DPS (Bass et al. 1998; Bass and Witzell 2000; Bjorndal and Bolten 2008; Bolker et al. 2007). In other words, the proportion of animals on the foraging grounds from a given nesting beach is proportional to the overall importance of that nesting beach to the entire DPS. For example, Tortuguero, Costa Rica, is by far the largest nesting beach in the NA DPS and the number of animals from that nesting beach on foraging grounds in the same area was much higher than from any other nesting beach within the NA DPS. However, in some foraging locations within the NA DPS closer to the border of the SA DPS, there may be significant mixing between the DPSs. More specifically, Lahanas et al. (1998) showed through genetic sampling that juvenile green sea turtles in The Bahamas originate mainly from the western Caribbean (Tortuguero, Costa Rica) (79.5%) (NA DPS) but that a significant proportion may be coming from the eastern Caribbean (Aves Island/Suriname; 12.9%) (SA DPS). In general, the proportion of individuals on a given foraging ground is roughly proportional to the numbers of individuals on nearby nesting beaches.

Flipper tagging studies provide additional information on the co-mingling of turtles from the NA DPS and SA DPS. Flipper tagging studies on foraging grounds and/or nesting beaches have been conducted in Bermuda (Meylan et al. 2011), Costa Rica (Troeng et al. 2005), Cuba (Moncada et al. 2006), Florida (Johnson and Ehrhart 1996; Kubis et al. 2009), Mexico (Zurita et al. 2003a; Zurita et al. 1994), Panama (Meylan et al. 2011), Puerto Rico (Collazo et al. 1992; Patricio et al. 2011), and Texas (Shaver 1994; Shaver 2002). Nesters have been satellite tracked from Florida, Cuba, Cayman Islands, Mexico, and Costa Rica. Troeng et al. (2005) report that while there is some crossover of adult female nesters from the NA DPS into the SA DPS foraging grounds, particularly in the equatorial region where the DPS boundaries are in closer proximity to each other, NA DPS nesters primarily use the foraging grounds within the NA DPS.

While there are currently no in-depth studies available to determine the percent of NA and SA DPS individuals in any given location, an analysis of cold-stunned green turtles in St. Joseph Bay, Florida (northern Gulf of Mexico) found approximately 4% of individuals came from nesting stocks in the SA DPS and that the remainder were from the NA DPS (Foley et al. 2007). On the Atlantic coast of Florida, a study on the foraging grounds off Hutchinson Island found that approximately 5% of the turtles sampled came from the SA DPS (Bass and Witzell 2000). All of the individuals in both studies were benthic juveniles.

Taken together, this information suggests that the vast majority of the anticipated captures in the Gulf of Mexico are likely to come from the NA DPS. However, it is possible that animals from the SA DPS could be captured as a result of the proposed action. Since the cold-stun study of the northern Gulf of Mexico (Foley et al. 2007) represents the best available data teasing out the NA and SA DPS distribution for greens in the action area, we will assume that 96% of animals captured as a result of the proposed action will be from the NA DPS, and the remaining 4% will be from the SA DPS, per the breakdown in the study. For these reasons, we will act conservatively and conduct jeopardy analyses on the assumption that both the NA DPS and the SA DPS will be captured as a result of the proposed action but that the vast majority (96%) will be from the NA DPS.

We estimate up to 3 green sea turtles (2.4 rounded up to be conservative) may be taken at the proposed piers over a 30-year period, 1 lethal and 2 nonlethal (Table 6). Because we are dealing with such small numbers, and in order to conservatively represent the SA DPS in the take estimate, we will assume that 1 of those takes will be a turtle from the SA DPS. However, because of the much lower probability that green sea turtles captured will be from the SA DPS, we will assume that the take from the SA DPS will be non-lethal (discussed further below).

NA DPS

The potential lethal take of 1 green sea turtle from the NA DPS over a 30-year period would reduce the number of green sea turtles, compared to their numbers in the absence of the proposed action, assuming all other variables remained the same. If that turtle were to be a female that would otherwise have survived to reproduce, this could result in a reduction in future reproduction. For example, a healthy green sea turtle can live for 80-100 years or more, and an adult female can lay 1-7 clutches (usually 2-3) of eggs every 2-4 years, with 110-115 eggs/nest, of which a small percentage is expected to survive to sexual maturity.

Injuries resulting from nonlethal takes have the potential to cause temporary impacts to the reproductive potential, fitness, or growth of the captured sea turtles, depending on the nature and severity of the injury. We expect these impacts to be temporary, as turtles with non-fatal injuries are likely to eventually recover and resume normal feeding and reproductive activities. For example, a mature female that is severely, but not fatally injured may be forced to forego nesting activities that year, but eventually an ingested hook would decompose or pass, wounds would heal, and the turtle would be able to resume normal feeding and reproductive activities.

With regard to the potential for the effects of the proposed action to cause a reduction in the distribution of green sea turtles, this is an extremely wide ranging species with numerous, well established nesting beaches, each of which generally see dozens if not hundreds or even thousands of females nesting each year. Therefore the small mortality rate expected to result from the proposed action is not likely to effect the overall distribution of the NA DPS.

Whether the reduction in numbers and reproduction of this species would appreciably reduce its likelihood of survival depends on the probable effect the changes in numbers and reproduction would have relative to current population sizes and trends. Seminoff et al. (2015) estimate there are greater than 167,000 nesting females in the NA DPS. The nesting at Tortuguero, Costa Rica, accounts for approximately 79% of that estimate (approximately 131,000 nesters), with Quintana Roo, Mexico (approximately 18,250 nesters; 11%), and Florida, USA (approximately 8,400 nesters; 5%) also accounting for a large portion of the overall nesting (Seminoff et al. 2015).

At Tortuguero, Costa Rica, the number of nests laid per year from 1999 to 2003, was approximately 104,411 nests/year, which corresponds to approximately 17,402-37,290 nesting females each year (Troëng and Rankin 2005). The number of nests laid per year increased to an estimated 180,310 nests during 2010, corresponding to 30,052-64,396 nesters. This increase occurred despite substantial human impacts to the population at the nesting beach and at foraging areas (Campell and Lagueux 2005; Troëng 1998; Troëng and Rankin 2005).

Nesting locations in Mexico along the Yucatan Peninsula also indicate the number of nests laid each year has increased (Seminoff et al. 2015). In the early 1980s, approximately 875 nests/year were deposited, but by the year 2000 this increased to over 1,500 nests/year (NMFS and USFWS 2007a). By 2012, more than 26,000 nests were counted in the Mexican state of Quintana Roo on the Yucatan Peninsula (J. Zurita, CIQROO, unpubl. data, 2013, in Seminoff et al. 2015)

In Florida, most nesting occurs along the Atlantic coast of eastern central Florida, where a mean of 5,055 nests were deposited each year from 2001 to 2005 (Meylan et al. 2006) and 10,377 each year from 2008 to 2012 (B. Witherington, Florida Fish and Wildlife Conservation Commission, pers. comm., 2013). As described in the Section 3.5, nesting has increased substantially over the last 20 years and peaked in 2015 with 27,975 nests statewide. In-water studies conducted over 24 years in the Indian River Lagoon, Florida, suggest similar increasing trends, with green sea turtle captures up 661% (Ehrhart et al. 2007b). Similar in-water work at the St. Lucie Power Plant site revealed a significant increase in the annual rate of capture of immature green sea turtles over 26 years (Witherington et al. 2006).

Seminoff et al. (2015) also conducted a population viability analysis for the Tortuguero, Costa Rica, and Florida, USA nesting sites (as well as 2 others: Isla Aguada, Mexico and Guanahacabibes, Cuba).[8] The population viability analysis evaluated the probabilities of nesting populations declining to 2 separate biological thresholds after 100 years: (1) a trend-based reference point where nesting populations decline by 50% and (2) the number of total adult females falls to 300 or fewer at these sites (Seminoff et al. 2015).[9] Seminoff et al. (2015) point out that population viability analyses do not fully incorporate spatial structure or threats. They

8 Not enough information was available to conduct a population viability analysis on the Quintana Roo, Mexico, nesting population.
9 Since green sea turtles are believed to nest every 3 years, the analysis evaluated the likelihood that the population would fall to 100 or fewer nesters annually (300 adult females ÷ nesting every 3 years = 100 adult female nesters annually).

also assume all environmental and man-made pressures will remain constant in the forecast period, while also relying solely on nesting data.

The Tortuguero, Costa Rica, population viability analysis indicated a 0.7% probability that this population will fall below the 50% decline threshold at the end of 100 years, and a 0% probability that this population will fall below the absolute abundance reference point of 100 nesting females per year at the end of 100 years (Seminoff et al. 2015). For the Florida, USA, population, the population viability analysis indicated there is a 0.3% probability that this population will fall below the 50% decline threshold at the end of 100 years, and a 0% probability this population falls below the absolute abundance threshold of 100 nesting females per year at the end of 100 years (Seminoff et al. 2015).

Since the abundance trend information for green sea turtles is clearly increasing, and the potential for significant declines over the next 100 years is extremely low (Seminoff et al. 2015), we believe the potential lethal take of 1 green sea turtle from the NA DPS over a 30-year period as a result of the proposed action will not have any measurable effect on that trend. Therefore, we believe the proposed action is not reasonably expected to cause an appreciable reduction in the likelihood of survival of the NA DPS of green sea turtle in the wild.

The NA DPS of green sea turtles did not have a recovery plan in place at the time of listing. However, an Atlantic Recovery Plan for the population of Atlantic green sea turtles (NMFS and USFWS 1991) does exist. Since the animals within the NA DPS all occur in the Atlantic Ocean and are subject to the recovery actions described in that plan, we believe it is appropriate to continue using that Recovery Plan as a guide until a new plan specific to the NA DPS is developed. The Atlantic Recovery Plan lists the following relevant recovery objectives over a period of 25 continuous years:

> *Objective: The level of nesting in Florida has increased to an average of 5,000 nests per year for at least 6 years.*
>
> *Objective: A reduction in stage class mortality is reflected in higher counts of individuals on foraging grounds.*

The effects of a single non-lethal take along with 1 lethal take of a green sea turtle from the NA DPS over a 30-year period is unlikely to have any detectable influence on the average annual nesting levels or the overall numbers of individuals on foraging grounds in Florida. Therefore, the proposed action will not impede achieving the recovery objectives above and will not result in an appreciable reduction in the likelihood of the NA DPS of green sea turtles' recovery in the wild.

SA DPS

The potential nonlethal take of 1 green sea turtle from the SA DPS over a 30-year period is not expected to have any measurable impact on the reproduction, numbers, or distribution of this DPS. The individual suffering nonlethal injury is expected to eventually recover such that no appreciable long-term reductions in reproduction or numbers of green sea turtles are anticipated. The take will occur anywhere in a small, discrete action area which in turn encompasses a tiny portion of the SA DPS of green sea turtles' overall range/distribution. Since any incidentally caught animal is likely to be released within the general area where caught, and the animal is expected to survive post-release, no change in the distribution of SA DPS green sea turtles is anticipated. Therefore, we do not expect the proposed action will impede the SA DPSs likelihood of survival or recovery.

7.3 Kemp's Ridley Sea Turtles

The proposed action is anticipated to result in the live capture of up to 15 Kemp's ridley sea turtles (14.4 rounded up to be conservative) over a 30-year period due to fishing activities associated with the proposed piers. Of these captures, up to 5 (4.5 rounded up to be conservative) are expected to result in mortality. Injuries resulting from nonlethal takes have the potential to cause temporary impacts to the reproductive potential, fitness, or growth of the captured sea turtles, depending on the nature and severity of the injury. We expect these impacts to be temporary, as turtles with non-fatal injuries are likely to eventually recover and resume normal feeding and reproductive activities. For example, a mature female that is severely, but not fatally injured may be forced to forego nesting activities that year, but eventually an ingested hook would decompose or pass, wounds would heal, and the turtle would be able to resume normal feeding and reproductive activities.

The potential lethal take of 5 Kemp's ridley sea turtles over a 30-year period would reduce the species' numbers compared to what would have been present in the absence of the proposed action, assuming all other variables remained the same. The Turtle Expert Working Group (TEWG 1998b) estimates age at maturity for Kemp's ridley sea turtles to be anywhere from 7-15 years. Females return to their nesting beach about every 2 years (TEWG 1998b). The mean clutch size for Kemp's ridleys is 100 eggs/nest, with an average of 2.5 nests/female/season. Lethal take could also result in a potential reduction in future reproduction, assuming at least 1 of these individuals would be female and would have survived to reproduce in the future. The loss of up to 5 adult female Kemp's ridley sea turtles could preclude the production of thousands of eggs and hatchlings, of which a fractional percentage would be expected to survive to sexual maturity. Thus, the death of any females would eliminate their contribution to future generations, and result in a proportionate reduction in Kemp's ridley sea turtle reproduction.

With regard to the potential for the effects of the proposed action to cause a reduction in the distribution of Kemp's ridley sea turtles, this is wide ranging species with numerous, well established nesting beaches, each of which generally see dozens if not hundreds of females nesting each year. Therefore the small mortality rate expected to result from the proposed action is not likely to effect the overall distribution of Kemp's ridley sea turtles.

In the absence of any total population estimates for Kemp's ridley sea turtles, nesting trends are the best proxy we have for estimating population changes (Figure 10). Heppell et al. (2005a) predicted in a population model that the Kemp's ridley sea turtle population is expected to increase at least 12-16% per year and that the population could attain at least 10,000 females nesting on Mexico beaches by 2015. Research by NMFS et al. (2011a) included an updated model, which predicted that the population was expected to increase 19% per year and that the population could attain at least 10,000 females nesting on Mexico beaches by 2011. Approximately 25,000 nests would be needed for an estimate of 10,000 nesting females on a beach, based on an average 2.5 nests/nesting female. While counts did not reach 25,000 nests by

2012, it is clear that the population is steadily increasing over the long term. Following a significant, unexplained 1-year decline in 2010, Kemp's ridley nests in Mexico reached a record high of 21,797 in 2012 (Gladys Porter Zoo nesting database 2013). In 2013 through 2014, there was a second significant decline, with only 16,385 and 11,279 nests recorded, respectively. A small nesting population is also emerging in the United States, primarily in Texas, rising from 6 nests in 1996 to 42 in 2004, to a record high of 209 nests in 2012 (National Park Service data, http://www.nps.gov/pais/naturescience/strp.htm, http://www.nps.gov/pais/naturescience/current-season.htm). Nesting numbers from 2013 indicate the number of nests decreased in 2013 to 153 nests in Texas (Gladys Porter Zoo nesting database 2013).

We believe this increasing trend in nesting is evidence of an increasing population, as well as a population that is maintaining (and potentially increasing) its genetic diversity. We also believe these nesting trends are indicative of a species with a significant number of sexually mature individuals. However, the significant nesting declines observed in 2010 and 2013-2014 potentially indicate a serious population-level impact, and there is cause for concern regarding the ongoing recovery trajectory. However, we do not believe the limited impacts anticipated for the proposed action will have a measurable effect on the increasing nesting trends for Kemp's ridley sea turtles seen over the last 2 decades (Figure 10). Furthermore, we have no reason to believe that the proposed action would disproportionately affect females from one nesting beach over another. Because the anticipated lethal takes could be individuals from any nesting beach, we do not believe the proposed action will have a measurable effect on the species' overall genetic diversity, particularly in light of the increasing population trends. Nor do we believe the anticipated takes will cause a change in the number of sexually mature individuals producing viable offspring to an extent that changes current population trends.

We do not anticipate the proposed action will have any detectable impact on the population overall, and the action will not cause the population to lose genetic diversity or the capacity to successfully reproduce. Therefore, we do not believe the proposed action will cause an appreciable reduction in the likelihood of survival of Kemp's ridley sea turtles.

The recovery plan for the Kemp's ridley sea turtle (NMFS et al. 2011a) lists the following relevant recovery objective:

- A population of at least 10,000 nesting females in a season (as measured by clutch frequency/female/season) distributed at the primary nesting beaches (Rancho Nuevo, Tepehuajes, and Playa Dos) in Mexico is attained. Methodology and capacity to implement and ensure accurate nesting female counts have been developed.

The recovery plan states the average number of nests per female is 2.5; it sets a recovery goal of 10,000 nesting females associated with 25,000 nests. The 2012 nesting season recorded approximately 22,000 nests. However, in 2013 through 2014, there was a second significant decline, with only 16,385 and 11,279 nests recorded, respectively.

The lethal take of up to 5 Kemp's ridley sea turtles as a result of the proposed action will result in a reduction in numbers, but it is unlikely to have any detectable influence on the nesting population trends noted above. The nonlethal takes of Kemp's ridley sea turtles as discussed in this opinion would not affect the adult female nesting population or long-term nesting levels.

Thus, we believe the proposed action will not have an appreciable effect on the recovery objective above, and it will not result in an appreciable reduction in the likelihood of Kemp's ridley sea turtles' recovery in the wild.

8. CONCLUSION

We have analyzed the best available data on the current status of the species, environmental baseline, effects of the proposed action, and cumulative effects to the species and determined that the proposed action is not likely to jeopardize the continued existence of the NA DPS or the SA DPS of green sea turtles, the NWA DPS of loggerhead sea turtles, or Kemp's ridley sea turtles.

9. INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulation pursuant to Section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Section 7(b)(4) and Section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA, if that action is performed in compliance with the terms and conditions of this incidental take statement.

9.1 Anticipated Amount or Extent of Incidental Take

Based on the above information and analyses, NMFS believes that the proposed action will adversely affect sea turtles (green, loggerhead, and Kemp's ridley). These effects will result from capture on hook-and-line and entanglement in fishing line or debris. NMFS anticipates the following incidental takes may occur in the future as a result of the proposed action. We anticipate these levels of take will occur over a 30-year period. These take estimates are shown in Table 7 below.

Table 7. Estimated Captures and Mortality by Species/DPS over a 30-Year Period

Sea Turtle Species/DPS	Total Estimated Captures	Estimated Captures that Survive	Lethal: Estimated Captures Resulting in Mortality
Kemp's ridley	15	10	5
Green (NA DPS)	2	1	1
Green (SA DPS)	1	1	0
Loggerhead (NWA DPS)	8	5	3

9.2 Effect of the Take

NMFS has determined the anticipated incidental take specified in Section 5.1.4 is not likely to jeopardize the continued existence of sea turtles (NA DPS of green, SA DPS of green, NWA DPS of loggerhead, and Kemp's ridley).

9.3 Reasonable and Prudent Measures (RPMs)

Section 7(b)(4) of the ESA requires NMFS to issue a statement specifying the impact of any incidental take on listed species, which results from an agency action otherwise found to comply with Section 7(a)(2) of the ESA. It also states that the RPMs necessary to minimize the impacts of take and the terms and conditions to implement those measures must be provided and must be followed to minimize those impacts. Only incidental taking by the federal agency or applicant that complies with the specified terms and conditions is authorized.

The RPMs and terms and conditions are specified as required by 50 CFR 402.14 (i)(1)(ii) and (iv) to document the incidental take by the proposed action and to minimize the impact of that take on sea turtles. These measures and terms and conditions are nondiscretionary, and must be implemented by the NOAA RC or the applicants (FDEP) in order for the protection of Section 7(o)(2) to apply. The NOAA RC has a continuing duty to regulate the activity covered by this incidental take statement. If the NOAA RC or the FDEP fail to adhere to the terms and conditions of this Incidental Take Statement (ITS) through enforceable terms, and/or fail to retain oversight to ensure compliance with these terms and conditions, the protective coverage of Section 7(o)(2) may lapse. To monitor the impact of the incidental take, the NOAA RC or the FDEP must report the progress of the action and its impact on the species to NMFS as specified in this ITS [50 CFR 402.14(i)(3)].

NMFS has determined that the following RPM is necessary and appropriate to minimize impacts of the incidental take of sea turtles related to the proposed action. The following RPM and associated terms and conditions are established to implement these measures, and to document incidental takes. Only incidental takes that occur while these measures are in full implementation are authorized. These restrictions remain valid until reinitiation and conclusion of any subsequent Section 7 consultation.

1. The NOAA RC must ensure that monofilament recycling bins and trash receptacles, along with educational signage are installed and maintained at all fishing piers included in the proposed action. The signs should be placed at the entrance to the piers where the view of these signs is unobstructed. These signs should contain information on the possibility of sea turtle captures by hook-and-line and what to do in the event of a capture.

9.4 Terms and Conditions

In order to be exempt from liability for take prohibited by Section 9 of the ESA, the NOAA RC must comply with the following terms and conditions, which implement the RPM described above. These terms and conditions are nondiscretionary.

The following terms and conditions (T&Cs) implement the above RPM:

1. The applicant stated that informational signs will be displayed and maintained on the fishing piers to educate the public on safe fishing practices that can reduce or prevent sea turtle injuries and information on who to notify in the event a dead, injured, or entangled sea turtle is encountered (see Section 2). To implement RPM No. 1, NOAA RC must

ensure that the applicant installs and maintains NMFS Protected Species Educational Signs including "Save the Sea Turtles, Sawfish, and Dolphins" signs at the entrance to all fishing piers. Sign designs and installation methods are provided on our website at: http://sero.nmfs.noaa.gov/protected_resources/section_7/protected_species_educational_signs/index.html.

2. The applicant has agreed to place and maintain monofilament recycling bins on the fishing piers (see Section 2). To implement RPM No. 1, NOAA RC must ensure that the applicant installs and maintains both monofilament recycling bins and trash receptacles at the piers to reduce the probability of trash and debris entering the water.

10. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authority to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species, to help implement recovery plans, or to develop information. NMFS believes the NOAA RC and the FDEP should implement the following conservation recommendations:

1. The NOAA RC and/or the FDEP are encouraged to conduct monitoring and research at the new fishing piers to help inform the frequency and type of encounters with listed species occurring at these types of piers.

2. The NOAA RC and/or the FDEP are encouraged to conduct research to develop deterrents to discourage turtles from using fishing piers as a habitualized food source.

3. The NOAA RC and/or the FDEP are encouraged to conduct annual underwater debris cleanups around fishing piers.

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

11. REINITIATION OF CONSULTATION

This concludes formal consultation on the creation of 4 new public parks along the Gulf coast in Escambia, Okaloosa, Franklin, and Bay Counties, Florida. 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 incidental take statement is exceeded, (2) new information reveals effects of the action 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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SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS

The permittee shall comply with the following protected species construction conditions:

a. The permittee shall instruct all personnel associated with the project of the potential presence of these species and the need to avoid collisions with sea turtles and smalltooth sawfish. All construction personnel are responsible for observing water-related activities for the presence of these species.

b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing sea turtles or smalltooth sawfish, which are protected under the Endangered Species Act of 1973.

c. Siltation barriers shall be made of material in which a sea turtle or smalltooth sawfish cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers may not block sea turtle or smalltooth sawfish entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service's Protected Resources Division, St. Petersburg, Florida.

d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes (e.g., marked channels) whenever possible.

e. If a sea turtle or smalltooth sawfish is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle or smalltooth sawfish. Operation of any mechanical construction equipment shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.

f. Any collision with and/or injury to a sea turtle or smalltooth sawfish shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.

g. Any special construction conditions, required of your specific project, outside these general conditions, if applicable, will be addressed in the primary consultation.

Revised: March 23, 2006

Dock Construction Guidelines in Florida for Docks or Other Minor Structures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat
U.S. Army Corps of Engineers/National Marine Fisheries Service
August 2001

Submerged Aquatic Vegetation:

1. Avoidance. The pier shall be aligned so as to minimize the size of the footprint over SAV beds.

2. The height of pier shall be a minimum of 5' above MHW/OHW as measured from the top surface of the decking.

3. The width of the pier is limited to a maximum of 4'. A turnaround area is allowed for piers greater than 200' in length. The turnaround is limited to a section of the pier no more than 10' in length and no more than 6' in width. The turnaround shall be located at the midpoint of the pier.

4. Over-SAV bed portions of the pier shall be oriented in a north-south orientation to the maximum extent that is practicable.

5. a. If possible, terminal platforms shall be placed in deep water, waterward of SAV beds or in an area devoid of SAV beds.

b. If a terminal platform is placed over SAV areas and constructed of grated decking, the total size of the platform shall be limited to 160 sq. ft. The grated deck material shall conform to the specifications stipulated below. The configuration of the platform shall be a maximum of 8' by 20'. A minimum of 5' by 20' shall conform to the 5' height requirement; a 3' by 20' section may be placed 3' above MHW to facilitate boat access. The long axis of the platform should be aligned in a north-south direction to the maximum extent that is practicable.

c. If the terminal platform is placed over SAV areas and constructed of planks, the total size of the platform shall be limited to 120 sq. ft. The configuration of the platform shall be a maximum of 6' by 20' of which a minimum 4' wide by 20' long section shall conform to the 5' height requirement. A section may be placed 3' above MHW to facilitate boat access. The 3' above MHW section shall be cantilevered. The long axis of the platform should be aligned in a north-south direction to the maximum extent that is practicable. If the 3' above MHW section is constructed with grating material, it may be 3' wide.

6. One uncovered boat lift area is allowed. A narrow catwalk (2' wide if planks are used, 3' wide if grating is used) may be added to facilitate boat maintenance along the outboard side of the boat lift and a 4' wide walkway may be added along the stern end of the boat lift, provided all such walkways are elevated 5' above MHW. The catwalk shall be cantilevered from the outboard mooring pilings (spaced no closer than 10' apart).

7. Pilings shall be installed in a manner which will not result in the formation of sedimentary deposits("donuts" or "halos") around the newly installed pilings. Pile driving is the preferred method of installation, but jetting with a low pressure pump may be used.

8. The spacing of pilings through SAV beds shall be a minimum of 10'.

9. The gaps between deckboards shall be a minimum of ½"..

Marsh:

1. The structure shall be aligned so as to have the smallest over-marsh footprint as practicable.

2. The over-marsh portion of the dock shall be elevated to at least 4' above the marsh floor.

3. The width of the dock is limited to a maximum of 4'. Any exceptions to the width must be accompanied by an equal increase in height requirement.

Mangroves.

1. The width of the dock is limited to a maximum of 4'.

2. Mangrove clearing is restricted to the width of the pier.

3. The location and alignment of the pier should be through the narrowest area of the mangrove fringe.

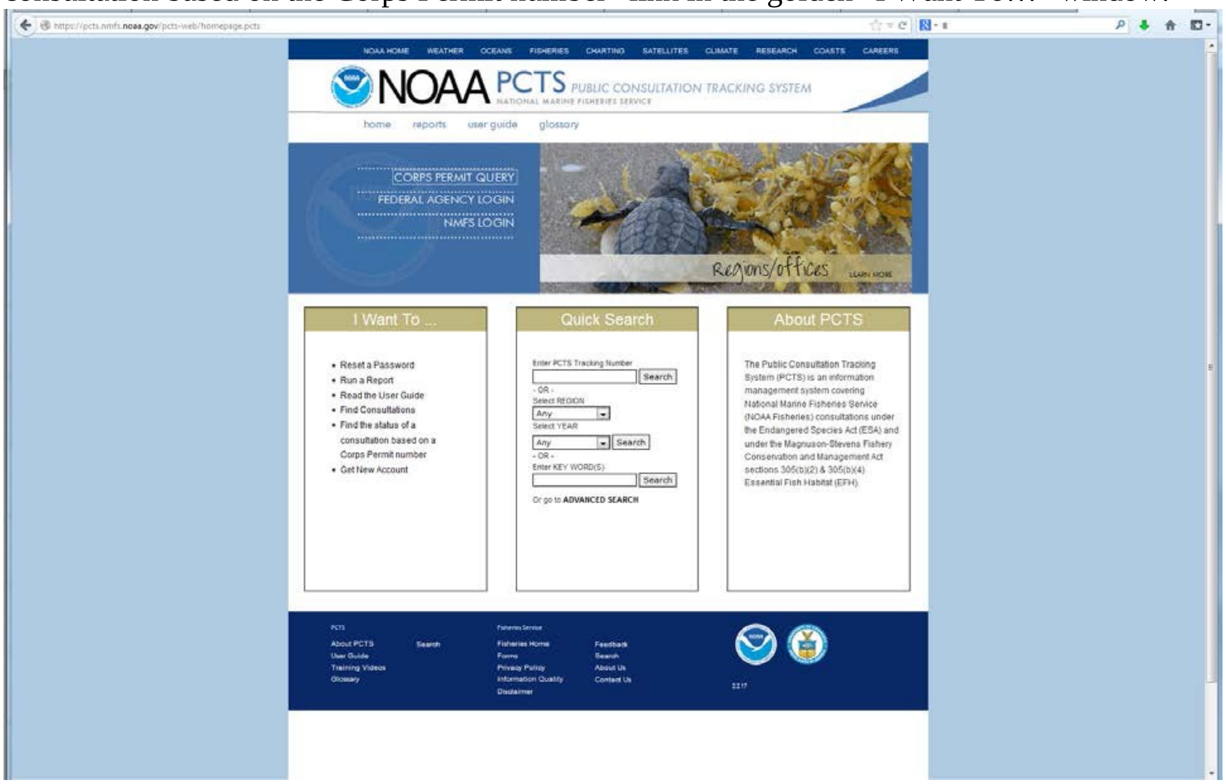
Grid Specifications and Suppliers

The following information does not constitute a U.S. Army Corps of Engineers endorsement or advertisement for any particular provider and is provided only as an example for those interested in obtaining these materials for dock construction. A type of fiberglass grate panel is manufactured by SeaSafe (Lafayette, LA; phone: 1-800-326-8842). Similar panels are also manufactured by ChemGrate (1-800-527-4043). Panels are available in a variety of sizes and thicknesses. For safety, the grate should contain an anti-slip texture which is integrally molded into the top surface. The manufacturer or local distributor should be consulted to ensure that the load-bearing capacity of the selected product is sufficient to support the intended purpose. Contact the manufacturer(s) for product specifications and a list of regional distributors.

PCTS Access and Additional Considerations for ESA Section 7 Consultations (Revised 03-10-2015)

Public Consultation Tracking System (PCTS) Guidance: PCTS is a Web-based query system at **https://pcts.nmfs.noaa.gov/** that allows all federal agencies (e.g., U.S. Army Corps of Engineers - USACE), project managers, permit applicants, consultants, and the general public to find the current status of NMFS's Endangered Species Act (ESA) and Essential Fish Habitat (EFH) consultations which are being conducted (or have been completed) pursuant to ESA Section 7 and the Magnuson-Stevens Fishery Conservation and Management Act's (MSA) Sections 305(b)2 and 305(b)(4). Basic information including access to documents is available to all.

The PCTS Home Page is shown below. For USACE-permitted projects, the easiest and quickest way to look up a project's status, or review completed ESA/EFH consultations, is to click on either the "Corps Permit Query" link (top left); or, below it, click the "Find the status of a consultation based on the Corps Permit number" link in the golden "I Want To…" window.



Then, from the "Corps District Office" list pick the appropriate USACE district. In the "Corps Permit #" box, type in the 9-digit USACE permit number identifier, with no hyphens or letters. Simply enter the year and the permit number, joined together, using preceding zeros if necessary after the year to obtain the necessary 9-digit (no more, no less) number. For example, the USACE Jacksonville District's issued permit number SAJ-2013-0235 (LP-CMW) must be typed in as 201300235 for PCTS to run a proper search and provide complete and accurate results. For querying permit applications submitted for ESA/EFH consultation by other USACE districts, the procedure is the same. For example, an inquiry on Mobile District's permit MVN201301412 is entered as 201301412 after selecting the Mobile District from the "Corps District Office" list. PCTS questions should be directed to Kelly Shotts at Kelly.Shotts@noaa.gov or (727) 551-5603.

EFH Recommendations: In addition to its protected species/critical habitat consultation requirements with NMFS' Protected Resources Division pursuant to Section 7 of the ESA, prior to proceeding with the proposed action the action agency must also consult with NMFS' Habitat Conservation Division (HCD) pursuant to the MSA requirements for EFH consultation (16 U.S.C. 1855 (b)(2) and 50 CFR 600.905-.930, subpart K). The action agency should also ensure that the applicant understands the ESA and EFH processes; that ESA and EFH consultations are separate, distinct, and guided by different statutes, goals, and time lines for responding to the action agency; and that the action agency will (and the applicant may) receive separate consultation correspondence on NMFS letterhead from HCD regarding their concerns and/or finalizing EFH consultation.

Marine Mammal Protection Act (MMPA) Recommendations: The ESA Section 7 process does not authorize incidental takes of listed or non-listed marine mammals. If such takes may occur an incidental take authorization under MMPA Section 101 (a)(5) is necessary. Please contact NMFS' Permits, Conservation, and Education Division at (301) 713-2322 for more information regarding MMPA permitting procedures.