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Appendix H - NOAA- NMFS Biological Assessment

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Biological Assessment for NOAA National Marine Fisheries Service Species

US 21 Bridge Replacement over Harbor River
(SCDOT Project ID P026862)

Beaufort County, South Carolina

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Revised

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1 Introduction

This biological assessment, prepared by HDR Inc. on behalf of the South Carolina Department of Transportation (SCDOT), addresses the proposed action in compliance with Section 7(c) of the Endangered Species Act (ESA) of 1973 (16 United States Code 1536 (c)), as amended. The biological assessment also follows standards established in Federal Highway Administration (FHWA) and SCDOT National Environmental Policy Act (NEPA) Guidance.

Section 7 of the ESA requires that, through consultation (or conferencing for proposed species) with the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS), federal actions do not jeopardize the continued existence of any threatened, endangered, or proposed species or result in the destruction or adverse modification of critical habitat.

This biological assessment evaluates the potential effects of the proposed US 21 bridge replacement project on species that are federally listed under the ESA and under the jurisdiction of NOAA-NMFS. A separate biological assessment has been prepared for species under the jurisdiction of the USFWS. Specific project design elements are identified that avoid or minimize adverse effects of the proposed project on listed species and/or critical habitat.

1.1 Project Description

The SCDOT proposes to replace the existing US 21 (Sea Island Parkway) Bridge over Harbor River, located in Beaufort County, South Carolina. The project involves the bridge replacement as well as the construction of a new roadway approach alignment. The purpose of the project is to correct structural and functional deficiencies of the US 21 Bridge over the Harbor River and to upgrade the bridge and its approaches to current design standards.

1.2 Project Area and Setting

US 21 is a two-lane roadway with earthen shoulders on a causeway connecting St. Helena Island with Harbor Island, Hunting Island, and Fripp Island. The project corridor terrain is flat with the surface runoff draining to the adjacent salt marsh or roadside ditches. The existing land use along the project boundaries is primarily tidal wetlands, with small areas of residential and commercial development.

The project study area consists of a corridor that is approximately two miles long and 600 feet wide, centered on the existing US 21 between St. Helena Island and Harbor Island (**Figure 1-1**). The study corridor begins 150 feet west of Gay Fish County Road on US 21, extends east across the bridge to Harbor Island, and ends 150 feet past the intersection of US 21 and Harbor Drive.

1.3 Consultation History

A Letter of Intent (LOI) was distributed on June 23, 2015 to stakeholders to notify them of the commencement of the proposed project. The LOI provided general project information and requested comments on potential environmental issues and concerns within the project study area.

1.3.1 USFWS Section 7 Consultation

The USFWS provided a response letter and species list on July 1, 2015 (**Appendix A**). The list includes species under the sole jurisdiction of NOAA-NMFS and shared jurisdiction between USFWS and NOAA-NMFS. The SCDOT submitted the *US 21 Bridge Replacement over Harbor River Biological Assessment for USFWS Species* to USFWS on January 15, 2016. The USFWS provided concurrence with the effect determinations prepared in the biological assessment, suggesting that SCDOT consult with NOAA-NMFS on project effects to sea turtles in the marine environment (**Appendix A**).

1.3.2 NOAA-NMFS Section 7 Consultation

On July 13, 2015, NOAA-NMFS biologists and representatives from SCDOT visited the project area. The NOAA-NMFS provided a response letter on August 7, 2015 outlining recommendations pursuant to the Fish and Wildlife Coordination Act (FWCA) and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (**Appendix B**). NOAA-NMFS identified areas of high quality tidal salt marsh habitat, specifically estuarine emergent wetlands, intertidal non-vegetated flats, tidal creeks, oyster reef/shell, and unconsolidated bottom. An Essential Fish Habitat (EFH) Assessment is being prepared as a separate technical report.

The SCDOT submitted the *US 21 Bridge Replacement over Harbor River Biological Assessment for NOAA-NMFS Species* to NOAA-NMFS on January 15, 2016. NOAA-NMFS Fish Biologist, David Rydene, Ph.D., provided comments on the Biological Assessment via email on February 29, 2016 (**Appendix B**). NOAA-NMFS suggested that the SCDOT conclusions for the green and Kemp's ridley sea turtles be revised from a "no effect" determination to a "may affect, not likely to adversely affect" determination for green and Kemp's ridley sea turtles. The SCDOT has re-examined these two species and agrees with NOAA-NMFS conclusion. Therefore, this biological assessment has been updated to reflect this conclusion. This biological assessment also incorporates more detailed information on the Proposed Action including construction logistics (e.g., piling types, sizes, and numbers; construction duration and intensity; Best Management Practices) and effects analyses in response to NOAA-NMFS comments.



Figure 1-1. Project Location Map

2 Federally Proposed and Listed Species and Designated Critical Habitat

A list of Federally-protected species within the project study area was obtained from the USFWS Information for Planning and Conservation (IPaC) website (**Appendix C**). Federally-endangered and threatened species under the exclusive or shared jurisdiction of NOAA-NMFS and considered in this document are identified in **Table 2-1**.

Table 2-1. NOAA NMFS Federally Threatened and Endangered Species

Common Name	Scientific Name	Federal ESA Designation	Critical Habitat Designated?
Atlantic sturgeon	<i>Acipenser oxyrinchus oxyrinchus</i>	Endangered	No
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	Endangered	No
Green sea turtle	<i>Chelonia mydas</i>	Threatened	Yes
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	Endangered	No
Leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered	Yes
Loggerhead sea turtle	<i>Caretta caretta</i>	Threatened	Yes

The NOAA-NMFS and the USFWS share jurisdictional responsibility for sea turtles under the ESA. The USFWS has responsibility in the terrestrial environment (e.g., nesting beaches), while the NOAA-NMFS has responsibility in the marine environment.

Although the project's IPaC report does not list North Atlantic right (*Eubalaena glacialis*), fin (*Balaenoptera physalus*), or humpback whales (*Megaptera novaeangliae*), these species were listed by USFWS as occurring in Beaufort County, South Carolina. Through email correspondence with NOAA-NMFS Fishery Biologist Jaclyn Daly-Fuchs (2015), it was determined that these whale species would not be impacted as a result of the proposed project (**Appendix B**). Therefore, these species are not considered further in this biological assessment.

No candidate species or other species of concern were identified within the project area. The project study area does not contain critical habitat for federally-listed species.

2.1 Sturgeon

2.1.1 Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)

In 2007, the NOAA-NMFS conducted a status review for the Atlantic sturgeon and determined at least three of the distinct population segments, including the Carolina Distinct Population Segment (DPS) and South Atlantic DPS which occurs in the project area, warranted listing under the ESA. In 2012, NOAA-NMFS issued the final rule to list the Carolina DPS and South Atlantic DPS as endangered.

The Atlantic sturgeon is considered a large fish, reaching up to 14 feet in length. It has a characteristic shovel-shaped snout with fleshy barbells. Adults spawn between February

and March in southern U.S. fresh waters, and then move into brackish and fully saline waters when not spawning. In salt water, adults have been documented migrating up to 1,500 miles to find spawning areas (NOAA-NMFS 2007). When in salt waters, they occupy benthic near shore habitats, feeding primarily on invertebrates and small fishes.

The NOAA-NMFS has not designated critical habitat for this species. In South Carolina, the Atlantic sturgeon has been found in the Edisto, Pee Dee, Savannah, Cooper, Congaree, Santee, Winyah, and Waccamaw Rivers (NatureServe 2014a). Atlantic sturgeon likely spawn in both the Edisto and Combahee Rivers (SCDNR 2015c). Based on tagging data provided by the South Carolina Department of Natural Resources (SCDNR), Atlantic sturgeon were identified in 2015 near the mouth of the Ashepoo and Combahee Rivers, approximately 6 and 8 miles away from the project area, respectively (SCDNR 2015b and **Appendix D**). The SCDNR tagging data did not identify any Atlantic sturgeon within St. Helena Sound or the project area.

2.1.2 Shortnose sturgeon (*Acipenser brevirostrum*)

The shortnose sturgeon was listed as endangered in 1967 and remained on the list with enactment of the ESA in 1974 when NOAA-NMFS assumed its jurisdiction. There are 19 DPS rangewide with 11 DPS occurring in the Southeastern U.S. A recovery plan exists for this species and was issued in 1998.

The shortnose sturgeon can reach up to 3.3 feet in length, has a heterocercal tail, a short shovel-shaped blunted snout, ventral mouth, and large bony scutes on the head, back, and sides. Adults feed at the freshwater/saltwater boundary in their southern range and swim upstream into freshwaters to spawn. Juvenile sturgeon inhabit primarily freshwater regions of rivers; as they mature, their tolerance to salinity increases (Dadswell et. Al. 1984). Spawning generally begins in late winter or early spring, lasts a few days to several weeks, and usually does not occur in consecutive years. Females can live up to 67 years and males up to 30 years (NOAA-NMFS 2007).

The NOAA-NMFS has not designated critical habitat for this species. The shortnose sturgeon's historic range is along the Atlantic Coast of North America from New Brunswick to the St. Johns River in Florida. The federal recovery plan (NOAA-NMFS 1998) identified 4 distinct populations in South Carolina: Winyah Bay, Santee River Basin, Cooper River, and the ACE Basin (NatureServe 2014b). The SCDNR Heritage Trust Database and GIS data indicates that a shortnose sturgeon was observed in 1990 in St. Helena Sound near Morgan Island, approximately 4 miles from the existing US 21 Bridge (SCDNR 2015a). Based on data provided by the SCDNR (2015b and **Appendix D**), shortnose sturgeon were identified in 2013 near the mouth of the Edisto River, across St. Helena Sound and approximately 8 miles from the project area. A shortnose sturgeon was identified in 2012 near the mouth of the Combahee River, also approximately 8 miles from the project area (SCDNR 2015b and **Appendix D**). The SCDNR tagging data did not identify any Shortnose sturgeon within St. Helena Sound or the project area.

2.2 Sea Turtles

Sea turtles are highly migratory, long-lived reptiles that occur throughout the open ocean and coastal regions of the world, generally within tropical to subtropical latitudes. Habitat

and distribution vary depending on species and life stages and are discussed further in the species profiles.

2.2.1 Green sea turtle (*Chelonia mydas*)

In 1978, the green turtle was listed under the ESA as a threatened species throughout its range except for the Florida and Mexican Pacific coast breeding populations, which were listed as endangered. A recovery plan exists for this species and was issued in 1991. This species is part of the NOAA-NMFS and USFWS 5-year review initiated in 2012 for four species of sea turtles. Currently, a public comment period is open to solicit input on a joint proposed rule to remove the range-wide listing and to list 11 DPS as threatened or endangered. NOAA-NMFS and USFWS are also requesting comments on designation of critical habitat for these DPS in the U.S.

The green sea turtle has a carapace that is predominantly brown with wavy dark blotches and has a mostly white plastron. Adults generally weigh between 250 and 650 lbs. and have carapace lengths between 3 and 4 feet. Adults migrate up to 1,850 miles between their breeding habitats on beaches and feeding habitats. Adults prefer shallow low energy waters with adequate submerged vegetation, mollusks, sponges, crustaceans, and jellyfish for feeding. Female reproductive maturity varies greatly with geographic location but is generally between 20 and 40 years of age. They lay between 1 and 8 clutches with 90 to 140 eggs in two week intervals, every 2 to 5 years. Eggs and hatchlings generally experience high mortality resulting from aquatic and terrestrial predators, tidal extremes, and beach erosion (NatureServe 2014c). In South Carolina, their nesting and hatching season would occur between early May and late October (USFWS 2015). Critical habitat is not located within the project area and has been designated for the green sea turtle in Puerto Rico.

2.2.2 Kemp's ridley sea turtle (*Lepidochelys kempii*)

The Kemp's ridley sea turtle was listed as endangered in 1970. A recovery plan exists for this species and was issued in 1984 and updated in 1992 and 2011. This species is part of the NOAA-NMFS and USFWS 5-year review initiated in 2012 for four species of sea turtles. NOAA-NMFS and USFWS published the 5-year review for Kemp's ridley in July 2015 and recommended the species remain classified as endangered.

Adult Kemp's ridley sea turtles have an olive green nearly circular carapace with a yellow colored plastron; juveniles have a gray colored carapace. Adults generally weigh between 80 and 100 lbs. with carapace lengths between 23 and 30 inches. Female reproductive maturity occurs between 10 and 17 years. They usually lay 3 clutches containing between 95 and 100 eggs in intervals ranging from 10 to 28 days, every 1 to 4 years. Eggs are laid during daylight hours unlike most sea turtles that lay their eggs in the dark. Eggs, hatchlings, and nesting turtles experience high mortality primarily due to coyote predation. Adults prefer shallow marine and estuarine waters in the Gulf of Mexico where crabs are plentiful. Juveniles feed primarily on *Sargassum* and mollusks. In addition to the Gulf, juvenile Kemp's ridley sea turtles also inhabit waters in the Long Island Sound, New England, and Nova Scotia. Approximately 60 percent of all nesting occurs at the Rancho Nuevo Beach in Tamaulipas, Mexico, although sporadic nesting has been documented on North Carolina beaches (NatureServe 2014d). In South

Carolina, their nesting and hatching season would occur between early May and late October (USFWS 2015). Critical habitat has not been designated for this species.

2.2.3 Leatherback sea turtle (*Dermochelys coriacea*)

The leatherback sea turtle was listed as endangered in 1970. A recovery plan exists for this species and was issued in 1992. This species is part of the NOAA-NMFS and USFWS 5-year review initiated in 2012 for four species of sea turtles. NOAA-NMFS and USFWS published the 5-year review for the leatherback sea turtle in November 2013 and recommended the species remain classified as endangered.

The leatherback is the largest of the sea turtles with a carapace length of 53 to 74 inches and weighs between 650 to 2,000 lbs. Their carapace is dark blue to blackish in color with seven prominent longitudinal ridges and no scutes. Female reproductive maturity varies greatly with geographic location, but 9 years is generally considered the minimum age used for conservation purposes. They can lay 10 or more clutches each containing 70 to 90 eggs at 1 to 2 week intervals, every 2 to 3 years. Eggs and hatchlings experience high mortality from predation whereas adult mortality is usually the result of commercial fishing gear or from eating floating debris (commonly plastic) (NatureServe 2014e). Critical habitat is not located in the project area and has been designated for the leatherback sea turtle in the US Virgin Islands.

Adults have been documented migrating between hundreds and thousands of miles between nesting and feeding waters. The leatherback sea turtle's preferred nesting habitat is on sloping continental beaches with the absence of a fringing reef, often near deep and/or rough ocean waters. Those leatherback sea turtles nesting in the Caribbean migrate north along the Atlantic Coast, reaching New England by late summer. In South Carolina, their nesting and hatching season is from early May to late October (USFWS 2015). Leatherback sea turtle nests have been documented on Hunting Island, Pritchards Island, and Fripp Island, South Carolina. Two leatherback sea turtle nests have been documented in South Carolina in 2015; one nest was located at Hunting Island State Park less than 5 miles from the project area (SCDNR 2015d). A "false crawl" was documented at Harbor Island, South Carolina, in 2012, but as the term indicates, no nesting took place (SCDNR 2015e).

Considered almost entirely pelagic, leatherback turtles move from the open ocean to the edge of continental shelves, and consistently make dives to depths of 4,200 feet. Their pelagic lifestyle limits their diet to primarily jellyfish, although some fish, invertebrates, and seaweed are also consumed (NatureServe 2014e). Leatherback sea turtles prefer the open ocean, particularly the warmer parts of the Atlantic Ocean; however, they occasionally forage in shallow bays, estuaries, and the mouths of rivers.

2.2.4 Loggerhead sea turtle (*Caretta caretta*)

The loggerhead sea turtle was listed as threatened in 1978. A recovery plan exists for this species and was issued in 1984 and updated in 1991 and 2008. In 2011, a final rule was issued to list four DPS as endangered and five DPS as threatened. The Northwest Atlantic Ocean DPS, which includes individuals in the project area, is designated as threatened.

The loggerhead sea turtle has a distinctively large head and a reddish-brown carapace measuring 28 to 49 inches in length and weighing between 155 to 500 lbs. In the southeastern U.S., female loggerheads reach reproductive maturity at 15 to 30 years and lay between 1 and 9 clutches of 45 to 200 eggs at 2 week intervals, every 2 to 3 years. In South Carolina, their nesting and hatching season is from early May to late October (USFWS 2015) on open sandy beaches above the high tide line. Egg and hatchling mortality is a result of predation (raccoons), tidal extremes, excessive rainfall, human disturbance, and disruption of nests by vegetation growth (NatureServe 2014f).

Some southeastern U.S. loggerhead sea turtles migrate north in the spring, and south at the beginning of fall. The NOAA-NMFS has determined that potential breeding habitat for the loggerhead sea turtle exists approximately 2,200 linear feet (seaward) from the southeastern boundary of the proposed project area. Adults are considered pelagic but generally remain near shore in bays, estuaries, lagoons, creeks, and mouths of rivers. Their diet is the most varied of the sea turtles consisting of several marine invertebrates, vegetation, and fish. Their U.S. nesting range is from southern Florida to North Carolina (NatureServe 2014f).

Critical habitat is not located within the project area; however, critical habitat for loggerhead sea turtles is located approximately 0.5 mile from the project area on the beaches of Harbor Island. Loggerhead sea turtles have been documented nesting on the sandy beaches of Harbor Island, near the confluence of Harbor River and St. Helena Sound (SCDNR 2014; SCDNR 2015e). Harbor Island has been part of the SCDNR's Sea Turtle Conservation Program since 1993 and averages just under 50 nests per year (SCDNR 2015e).

3 Environmental Baseline

The proposed project is in an estuarine setting within the outer coastal plain of South Carolina and contains tidal salt marshes, ponds, creeks, and the Harbor River. Current land use near the project area is rural because of the extensive tidal wetlands, floodplains, and zoning designations.

3.1 Harbor River

The existing US 21 bridge over Harbor River is approximately 0.88 mile from St. Helena Sound and the confluence of Harbor River and St. Helena Sound is approximately 1.9 miles from the Atlantic Ocean. The Harbor River is a saltwater river that experiences a 6.1-foot tidal range. The river is approximately 35 feet deep in the designated channel under the existing swing span at mean high tide. The waterway narrows from approximately 1,835 feet wide at mean high tide to 1,415 feet wide at mean low tide. As shown on **Figure 3-1**, Harbor River narrows to the south, or upstream, of the existing bridge. Approximately 3 river miles south of the existing bridge, the tidal tributaries to Harbor River intersect with tidal tributaries to the Story River. Depths in this area are 6 to 10 feet at mean high water and 4 to 5 feet at mean low water.



Figure 3-1. NOAA Navigation Chart

Harbor River generally consists of unconsolidated bottom with soft sediments mixed with some sand. The bottom provides nutrient and pollutant storage and supports benthic organisms. Salinity levels within the Harbor River and adjacent St. Helena Sound can be characterized as marine or euhaline environments, where salinity levels are greater than 30 parts per trillion (ppt). The SCDNR and the South Carolina Department of Health and Environmental Control (SCDHEC) monitor the condition of South Carolina's estuarine habitats through the Estuarine and Coastal Assessment Program (SCECAP). Monitoring station RO08351 is located in St. Helena Sound approximately 3 miles west of the US 21 bridge over Harbor River. The latest available SCECAP data tables from 2008 indicate salinity levels Station RO08351 between 34.0 and 36.1 ppt on the channel bottom (SCDNR 2008). Salinity on the water surface was 32.2 ppt.

3.2 Coastal Habitats

The salt marshes are estuaries of Harbor River, St. Helena Sound, and Ward Creek. Shell banks and oyster beds can be found along the Harbor River and its associated tidal creeks. Salt marsh vegetation includes bushy seaside tansy (*Borrchia frutescens*), smooth cordgrass (*Spartina alterniflora*), glasswort (*Salicornia virginica*) and black needlerush (*Juncus roemerianus*). Common macrobenthic species in the salt marsh include marsh fiddler crabs (*Uca pugnax*), ribbed mussels (*Geukensia demissa*), and periwinkle snails (*Littoria irrorata*). No freshwater wetlands were identified within the Project Study Area.

Terrestrial or upland habitats adjacent to the salt marsh primarily consist of the US 21 causeways, the Beaufort County boat ramp, and property surrounding Gay Seafood Company. In the eastern portion of the project study area, the Harbor Key residential community comprises most of the upland area. Upland hammocks and berms in the Harbor Key community are interspersed among tidal ponds and marsh. Vegetation observed on the uplands includes eastern baccharis (*Baccharis halimifolia*), red cedar (*Juniperus virginiana*), live oak (*Quercus virginiana*), and saw palmetto (*Serenoa repens*).

3.3 Water Quality

Stations monitored in the Harbor River between 1999 and 2010 indicate an overall good water quality, sediment quality, and biotic condition (R.F. Van Dolah 2013). Harbor River between St. Helena Sound and Fripp Inlet is classified by the SCDHEC as an Outstanding Resource Water (ORW) (SCDHEC 2012). Class ORW includes saltwaters that constitute an outstanding recreational or ecological resource. St. Helena Sound and Ward Creek are classified by SCDHEC as Shellfish Harvesting Waters (SFH), which are tidal saltwaters protected for shellfish harvesting (SCDHEC 2012).

SCDHEC monitors the Harbor River water quality at a shellfish monitoring station (16B-06) and an ambient water quality monitoring site (RO-11310) located approximately 2 miles south, or upstream of the US 21 bridge over Harbor River. Station RT-09099 is located in Ward Creek, just upstream of the Beaufort County boat ramp. Station RO-01163 is located in St. Helena Sound, in the closest proximity to the US 21 bridge over Harbor River. The SCDHEC water quality monitoring stations within Harbor River and Ward Creek are not listed for impairments. Station RO-01163 in St. Helena Sound was

listed in the 2014 edition of the 303(d) list for turbidity impairments that affect aquatic life use (SCDHEC 2014).

4 Proposed Action

SCDOT proposes to replace the existing US 21 Bridge over Harbor River in Beaufort County, South Carolina. The 2,851-foot long bridge over the Harbor River was constructed in 1939. The existing bridge includes a 170-foot long, 76-year-old metal truss swing span. The existing bridge deck consists of two 10-foot travel lanes, one in each direction, with a 1-foot curb and railing.

The SCDOT determined that the existing bridge no longer meets the state's safety and design requirements for its transportation system. The existing bridge was evaluated in terms of its structural integrity and functional efficiency and was found to be structurally deficient and functionally obsolete. The purpose of the project is to correct structural and functional deficiencies of the US 21 Bridge over the Harbor River and to upgrade the bridge and its approaches to current design standards.

4.1 Alternatives

The proposed bridge replacement is being developed for Design-Build procurement, where a single entity is contracted to deliver the design and construction. Conceptual design has been developed for five alternative locations (**Figure 4-1**), while final design will be completed by the Design-Build contractor. This biological assessment has been prepared using conceptual designs and typical construction methods, since each alternative alignment would have similar effects on protected species in the surrounding estuarine environment.

The SCDOT is considering a No-Build alternative as well as five reasonable build alternatives to constructing a fixed span bridge. The five alternatives differ based on construction locations (**Figure 4-1**). At this time, the preferred alternative is Alternative 1B, which involves construction of a new bridge approximately 65 feet to the north of the existing alignment. The length of the proposed bridge and roadway for Alternative 1B is 7,198 feet. Among other factors, Alternative 1B has the least amount of direct and indirect impacts to salt marsh habitat (5.9 acres) and direct impacts on EFH as compared to the other Build alternatives. The vertical clearance of a new fixed span bridge over the Harbor River's channel would be 65 feet above Mean High Water and is being determined through coordination with the US Coast Guard (USCG). The proposed two-lane bridge would have 12-foot-wide travel lanes with 10-foot-wide shoulders in each direction (**Figure 4-2**).

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Figure 4-1. Alternative Alignments of Proposed US 21 Bridge



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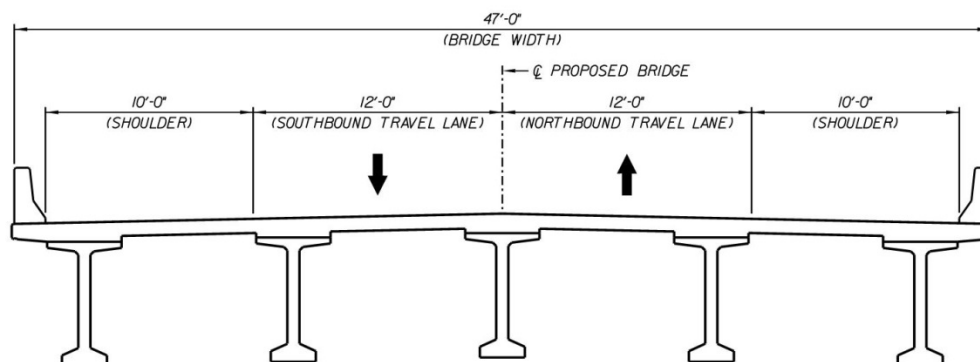


Figure 4-2. Typical Section of Proposed Bridge

The SCDOT considered other alternatives, including replacing the existing bridge with a new moveable-span bridge. A moveable-span bridge was eliminated from further review because of the higher construction, operation, and maintenance costs, and potential constructability issues.

The US 21 bridge over Harbor River provides the only vehicle access between St. Helena Island and Harbor Island, Hunting Island, and Fripp Island. US 21 is also a hurricane evacuation route for surrounding communities. Therefore, traffic must be maintained on the existing roadway during construction of the replacement bridge and approach roadway. Closing and abandoning the existing bridge and replacing the bridge on existing alignment were also found to be unfeasible and were eliminated from further review. The SCDOT also considered rehabilitating the existing bridge; however, this alternative would not address the substandard geometry of the bridge deck, including the width of travel lanes and shoulders.

The SCDOT also considered constructing a new causeway and bridge south of Ward Creek and connecting to either Hunting Island or Fripp Island. The existing causeway and bridge would be removed. This alternative would have allowed for a lower bridge height, since it was assumed that most shrimp boats travel between Ward Creek and the St. Helena Sound. However, the Navigation Study (Available upon Request) identified other maritime users in the Harbor River and on Fripp Island that would prevent the bridge from being built at a lower height. This alternative was also eliminated because it has the potential for extensive impacts to the salt marsh and natural environment, as well as higher cost.

In a letter dated July 1, 2015 (**Appendix A**), the USFWS recommended eliminating the use of fill for a causeway and instead constructing a bridge over the salt marsh between St. Helena Island and Harbor Island. The new bridge would be constructed parallel to the existing causeway and bridge, allowing US 21 to remain open to traffic during construction. Once the new bridge was opened, the SCDOT would remove the existing US 21 bridge and causeway and restore the underlying salt marsh. The SCDOT

considered this alternative, but it was eliminated because of higher design and construction costs.

4.2 Construction Methods

Construction is expected to occur between mid-2018 and mid-2020. Construction methods cannot be finalized because the project will be constructed through Design-Build procurement. However, each alternative would involve construction of a new bridge and its associated approaches in the tidal marshes and channel of Harbor River. The SCDOT has assumed the following construction scenario for the preferred alternative for the purposes of this biological assessment (**Table 4-1**). This scenario is based on conceptual plans and “worst-case” pile driving techniques to install bridge support structures and a temporary trestle. During final design and permitting, the Design-Build contractor would be responsible for coordinating with the USFWS and NOAA-NMFS regarding design changes that would alter the effect determination and the implementation of environmental commitments.

Table 4-1. Summary of Preferred Alternative Worst-Case Construction Scenario

	Installation Method	Diameter	Total Number Installed (Approximate Numbers)			Estimated Time per Unit	Total Estimated Pile Driving Timeframe
			Total	Open Water	Marsh		
Concrete Columns	Vibratory Hammer	8 Feet	56	20	36	2 Hours per Steel Casing	112 Hours
Flat Slab Concrete Piles	Impact Pile Driver	24 Inches	308	0	308	1 Hour per Pile	308 Hours
End Bents	Impact Pile Driver	14 Inches	16	0	0	1 Hour per Pile	16 Hours
Temporary Trestle	Vibratory Hammer	24 Inches	370	24	346	1 Hour per Steel Pile	740 Hours*

*Note: Installation and removal of trestle piles would each take 370 hours, for a total of 740 hours.

4.2.1 Permanent Impacts

Direct impacts to deep water habitats in the Harbor River would be limited to the construction of bridge support structures, such as drilled shafts for concrete columns. Areas of tidal wetlands may be filled as the new bridge connects to the existing causeway. Bridge construction methods would include a combination of drilling shafts and pile driving for the bridge support structures. For the preferred alternative, the proposed bridge would have approximately 56 8-foot-diameter concrete columns. The columns would be installed using drilled shaft construction, which typically includes the following process:

1. Install Steel Casing using vibratory hammer
2. Drill inside casing
3. Install rebar cage

4. Pour concrete inside casing

Typically, the steel casing would be installed in two hours using a vibratory hammer. Two casings typically would be installed within one day, with the remainder of the drilling and concrete process occurring over the following week. Approximately 20 columns would be installed within the Harbor River, while approximately 36 columns would be installed in salt marsh or intertidal flat areas.

If 30-foot-long flat slab spans were used over the marsh instead of new causeway fill, approximately 308 concrete piles would be needed to support the flat slab spans. For the purposes of this construction scenario, the concrete piles would be 24-inch-square and would be installed using an impact pile driver. It was assumed that each flat slab pile would take approximately 1 hour of pile driving. Several piles would likely be installed during the same day, with a subsequent lapse in pile driving as the bent is constructed.

Two end bents, one on each end of the proposed bridge, would be constructed. Each end bent would typically be supported by eight 14-inch-wide H-piles, which would be installed using an impact hammer. Pile driving would generally occur over one day for each end bent. The end bents would be constructed at the bridge approach in the new causeway fill material; therefore, pile driving for the end bents would not occur in deep water or estuarine habitats.

4.2.2 Temporary Impacts

Bridge construction access would be located in upland areas to the maximum extent practicable. However, the existing causeway must remain open during construction to provide access between St. Helena Island and Harbor Island. Work in deep water habitats is likely to occur from barges. Temporary work trestles may be installed over the tidal marsh to support cranes during the drilled shaft construction and load/unload barges in the Harbor River.

For the preferred alternative, temporary trestles, including spurs for bent construction, would be approximately 3,800 feet long and would require approximately 370 steel piles. The steel piles would be approximately 24-inches in diameter and would be installed using a vibratory hammer. Most of the temporary trestle would be constructed over the salt marsh; approximately 24 of the 370 piles would be installed in open water habitats. Total construction time for the temporary work trestles is expected to take four months. Two piles would be constructed at the beginning of each span; each span typically would take three days to construct. The vibratory hammer typically would take one hour to install one pile; therefore, two hours of pile installation would occur approximately every three days during construction of the temporary trestle. Removal of the piles typically would take one hour per pile.

Temporary clearing within the salt marsh may occur to install erosion and sediment control measures. Timber mats and/or barges may cause temporary impacts to salt marsh grasses during construction. However, the SCDOT would minimize these temporary impacts by regularly moving mats and barges to limit compaction of marsh soils and shading of marsh grasses.

4.2.3 Existing Causeway

Portions of the upland causeway may be used to install stormwater management features. The existing causeway would remain because it would be used for stormwater drainage and treatment and because of the substantial costs to remove, transport, and dispose of the fill material. If portions of the causeway were removed, the fill material would be disposed of in upland areas away from wetlands, waters, and/or other sensitive sites. The contractor would utilize SCDOT Best Management Practices for soil and erosion control, which may include seeding of slopes, silt fences, and sediment basins as appropriate, and prepare a spill prevention and pollution control plan to minimize the potential impact on adjacent wetlands.

4.2.4 Demolition

The existing bridge would be demolished upon completion of construction. The bridge would be demolished using standard practices to remove the existing piers and swing span. Concrete bridge decks and the existing swing span will likely be placed on barges and transported offsite for disposal and/or recycling. Standard deconstruction practices may include using vibratory methods to remove existing pilings. If explosives are used for demolition, the contractor would be responsible for evaluating the potential effect on protected species and obtaining concurrence from the USFWS and NOAA-NMFS. Future separate consultation on blasting would be required if the contractor would plan to use explosives. The contractor and SCDOT would reinitiate consultation to examine blasting and develop a blasting plan, which would include a marine wildlife watch plan.

4.3 Construction Noise

A general increase in in-air and underwater noise would be expected during construction. Construction noise is generally considered to generate impulsive or non-impulsive sounds, as defined below.

- Impulsive sounds are transient, brief (less than 1 second), and typically consist of high peak pressure with rapid rise time and rapid decline (ANSI 1986; NIOSH 1998; ANSI 2005). Examples of impulsive sounds include airguns or impact pile drivers.
- Non-impulsive sounds can be brief or prolonged and continuous or intermittent, but typically do not have a high peak pressure with rapid rise time (ANSI 1995; NIOSH 1998). Examples of non-impulsive activities include sonar and vibratory pile drivers.

Typical metrics used to evaluate construction noise impacts for impulsive or non-impulsive activities include peak sound pressure level (dB_{peak}), root mean square (RMS), and sound exposure level (SEL) (CalTrans 2015, Horwitz 2015). SEL can be expressed as a value for a single strike and for multiple strikes. The latter value is commonly referred to as the cumulative SEL or $\text{SEL}_{\text{CUMULATIVE}}$.

Appendix I (Compendium of Pile Driving Sound Data) from the California Department of Transportation (CalTrans) *Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish* (2015) was used to estimate underwater sound pressure levels caused by in-water pile driving during construction. CalTrans

(2015) compiled data from major and minor projects that used un-attenuated pile driving with varying pile size, pile type, and water depths. The expected pile sizes for the US 21 bridge replacement project do not directly correlate with the CalTrans (2015) guidance; therefore, the data was best fit or overestimated for the proposed project. The assumed pile sizes that were used to estimate the potential average sound pressure levels are noted below **Table 4-2**.

Noise levels are generally higher if impact pile driving is used, as compared to vibratory hammer driving or extraction. Impact pile driving creates an impulsive sound, while vibratory hammers generate a continuous, low-level noise that is generally considered non-impulsive. **Table 4-2** provides a summary of the potential un-attenuated sound pressure levels that may occur during the proposed bridge construction. The effects of construction noise are discussed by species in the following Effects Analysis (**Section 5**).

Table 4-2. Potential Average Sound Pressure Levels (dB)

	Installation Method	Diameter	Average Sound Pressure Level Measured in dB		
			dB _{peak}	RMS	SEL
Concrete Columns ¹	Vibratory Hammer	8 Feet	195	180	180
Concrete Piles ²	Impact Hammer	24 Inches	185	170	160
Temporary Trestle ³	Vibratory Hammer	24 Inches	180	170	170

Source: CalTrans 2015

¹Based on 72-inch (6-feet) steel pile pile (loudest measurement) at approximately 5-meter relative water depth

²Based on 24-inch concrete pile at approximately 5-meter relative water depth

³Based on 36-inch steel pile pile at approximately 5-meter relative water depth

The potential sound pressure levels in **Table 4-2** are for in-water work at approximately 5 meters deep. Steel casings, concrete piles, and the work trestle would be installed in open water and marsh environments (**Table 4-1**). Noise conditions below the mud line are not completely known; ground-radiated noise is typically dominated by low frequencies, which cannot propagate efficiently through shallow water (CalTrans 2015).

End bent construction, which would require impact pile driving of approximately 16 steel piles, was not analyzed for in-water sound effects. The end bents would be constructed at the bridge approach in the new, earthen causeway fill material; therefore, pile driving for the end bents would not occur in deep water or estuarine habitats.

4.4 Bridge Lighting

Roadway lighting requirements, as set forth in the latest edition of the American Association of State Highway and Transportation Officials (AASHTO) Roadway Lighting Design Guide, would be adhered to during the entire length of the proposed project. In an effort to avoid or minimize potential indirect impacts of bridge lighting to the movements of protected aquatic mammals, fish, and reptiles, no permanent lighting would be installed on the proposed bridge roadway. The proposed bridge would contain navigational lights in accordance with Part 118 of Title 33, Code of Federal Regulations (CFR) and as approved by the USCG.

4.5 Mitigation

Onsite mitigation for salt marsh habitat impacts is favored by the USFWS (**Appendix A**) and NOAA-NMFS (**Appendix B**). The SCDOT plans to purchase credits from an approved mitigation bank with available salt marsh credits in accordance with US Army Corps of Engineers (USACE) and the Environmental Protection Agency published regulations (33 CFR Parts 325 and 332) *Compensatory Mitigation for Losses of Aquatic Resources*. Multiple mitigation banks are available to provide mitigation services to the project area, including Congaree Carton Mitigation Bank (Charleston County), the SCDOT Huspa Creek Mitigation Bank (Beaufort County), and Clydesdale Club (Jasper County). Specific details of compensatory mitigation will be coordinated with the USACE during the permitting process. Mitigation for impacts to EFH will be addressed in the EFH Assessment, to be provided to NOAA-NMFS as a separate technical report.

5 Effects Analysis

5.1 Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and Shortnose sturgeon (*Acipenser brevirostrum*)

Atlantic and Shortnose sturgeon spawns in freshwater rivers and streams but return to marine waters outside of its spawning season. The Harbor River does not contain known spawning sites and does not provide suitable habitat for spawning because of the fine, muddy substrate and high salinity levels. Therefore, sturgeon spawning habitat would not be affected by construction and demolition.

The SCDNR (2015b and 2015c) has not identified migratory patterns in the Harbor River. As shown on **Figure 3-1**, Harbor River narrows to the south, or upstream, of the existing bridge and connects to the Story River by narrow, shallow tidal channels. There are no suitable freshwater spawning areas upstream of the project area on the Harbor River; therefore, it is unlikely that sturgeon would migrate through the Harbor River to reach freshwater spawning areas. There is a minimal possibility of affecting suitable migratory habitat for adult sturgeon traveling to and from freshwater spawning areas.

If sturgeon were present within the project area, potential impacts to sturgeon could result from direct strikes by construction equipment (piles, work barges) and from increases in noise levels and turbidity during construction. Construction could disturb the fish by generating a temporary increase in underwater noise. Loud levels of intermittent or continuous construction noise from drilled shaft installation and work trestle pile driving could harm sturgeon if they were close to the noise source for prolonged periods. Fish, such as Atlantic and Shortnose sturgeon, experience an auditory injury after a permanent threshold shift in hearing range. This auditory injury is defined as “harm” in the ESA. Sturgeon are considered generalist fish with an injury threshold of 206 dB at peak sound pressure levels and 187 dB for single-strike and cumulative SEL (**Table 5-1**).

Table 5-1. NOAA-NMFS In-Water Noise Thresholds for Generalist Fish > 2 grams

Effect	Metric	Noise Threshold in dB	Estimated Average Sound Pressure Level Measured in dB		
			8-foot-diameter drilled shaft concrete columns installed with a vibratory hammer	24-inch-diameter concrete piles installed with a impact hammer	24-inch-diameter temporary trestle piles installed with a vibratory hammer
Onset of physical injury	Peak Sound Pressure Levels	206	195	185	180
	Single-Strike SEL	187	180	170	170
	Cumulative SEL	187	180	170	170
Behavioral Disturbance	Root Mean Square Pressure	150	180	160	170

Source: NOAA-NMFS 2016.

Installation of the 8-foot-diameter steel casings for the bridge columns is expected to produce 195 dB_{peak} and 180 SEL. Installation of the 24-inch-diameter concrete piles to support flat slab bridge is expected to produce 185 dB_{peak} sound pressure levels and 170 SEL. Installation and removal of the 24-inch-diameter steel casings for the temporary work trestle is expected to produce 180 dB_{peak} sound pressure levels and 170 SEL. As shown in **Table 5-1**, construction of the drilled shafts, flat slab concrete piles, and temporary trestle is not expected to exceed dB_{peak} or SEL injury thresholds for sturgeon.

In addition to auditory injury, construction noise may cause behavioral changes for sturgeon. NOAA-NMFS and USFWS generally have used 150 dB as the threshold for behavioral disturbance to ESA-listed fish species, citing that sound pressure levels in excess of 150 dB can cause temporary behavioral changes, including startle and stress (CalTrans 2015, NOAA-NMFS 2016). Use of the vibratory hammer to install the bridge columns and temporary work trestle may exceed 150 dB and cause a behavioral disturbance. Noise from the vibratory hammer would be intermittent: installation typically takes one to two hours per pile, followed by several hours or days of work to complete the drilled shaft or trestle span. Sturgeon could avoid the construction area(s) if disturbed by the noise because there is habitat nearby in the Ashepoo and Combahee Rivers (SCDNR 2015b and **Appendix D**).

The SCDNR tagging data (2015b and **Appendix D**) does not identify Atlantic or Shortnose sturgeon within the Harbor River. While there are no suitable freshwater spawning areas upstream (or south) of the project area, there is a minimal possibility that sturgeon may be present in the project area during certain times of the year. If sturgeon were present during construction, the potential behavioral disturbance would be minimized by using “slow starts”, where pile-driving ramps up slowly in an effort to deter marine species from the work area (see **Section 6.1**). **Therefore, the proposed project may affect, but is not likely to adversely affect these species.**

5.2 Sea Turtles

Nesting habitat for loggerhead turtles and leatherback turtles occurs near the project area. Additionally, the project area may contain foraging habitat for non-nesting species.

5.2.1 Green sea turtle (*Chelonia mydas*)

There have been no recent or historic sightings of green sea turtles within the project area. In 2015, only two green sea turtle nests have been documented in South Carolina at Garden City Beach and North Island, located over 100 miles to the north of the project area (SCDNR 2015d). While the project study area does not contain critical habitat or suitable nesting habitat for green sea turtles, the species may use the estuarine waters of the Harbor River for foraging.

5.2.2 Kemp's ridley sea turtle (*Lepidochelys kempii*)

There have been no sightings or nesting activities of Kemp's ridley sea turtles documented near the proposed project area. In 2015, only one Kemp's ridley sea turtle nest has been documented in South Carolina at Lighthouse Island, located over 75 miles to the north of the project area (SCDNR 2015d). While the project study area does not contain suitable nesting habitat for Kemp's ridley sea turtles, the species may use the estuarine waters of the Harbor River for foraging.

5.2.3 Leatherback sea turtle (*Dermochelys coriacea*)

As discussed in **Section 2.2.3**, leatherback turtle nests have been found on Fripp, Hunting, and Pritchards Islands near the project area as recently as 2015. This species generally prefers deeper marine waters than what exists near the proposed project area. While the project study area does not contain suitable nesting habitat for the leatherback sea turtle, it may contain suitable foraging habitat.

5.2.4 Loggerhead sea turtle (*Caretta caretta*)

The project study area does not contain critical habitat or suitable nesting habitat for loggerhead sea turtles. The closest loggerhead critical habitat area is located 0.5 mile from the project study area and there would not be any direct or indirect effects from construction and demolition activities. Therefore, critical habitat would not be affected by the construction activities. However, the species is likely found in the estuarine waters of the Harbor River because of the close proximity of critical habitat and nesting habitat at Harbor Island (**see Section 2.2.4**).

5.2.5 Effects Analysis for Sea Turtles

Potential direct impacts to sea turtles associated with project are behavioral disturbances or physical injuries caused by pile driving noise and physical strikes during construction. Possible indirect impacts may include decreased water quality and lighting. No loss of nesting habitat is anticipated.

Noise

Sea turtle hearing is limited to low-frequency sounds, which may be used as guideposts during migration and to identify nesting beaches (Lenhardt et al. 1983). Possible effects of sound from pile driving range from behavioral disturbance such as startle reactions and behavioral changes to injurious effects such as temporary or permanent loss of hearing and damage to internal organs. The NOAA-NMFS thresholds for injury and behavioral disturbance to sea turtles are shown in **Table 5-2**.

Table 5-2. NOAA-NMFS In-Water Noise Thresholds for Sea Turtles

Effect	Disturbance	Noise Threshold	Estimated Average Sound Pressure Level Measured in dB		
			8-foot-diameter drilled shaft concrete columns installed with a vibratory hammer	24-inch-diameter concrete piles installed with a impact hammer	24-inch-diameter temporary trestle piles installed with a vibratory hammer
Onset of physical injury	Peak Sound Pressure Levels	206 dB	195	185	180
	Single-Strike SEL	187 dB	180	170	170
	Cumulative SEL	187 dB	180	170	170
Behavioral Disturbance	Root Mean Square Pressure	160 dB	180	160	170

Source: NOAA-NMFS 2016.

Installation of the 8-foot-diameter steel casings for the bridge columns is expected to produce 195 dB_{peak} sound pressure levels and 180 SEL. Installation of the 24-inch-diameter concrete piles to support flat slab bridge is expected to produce 185 dB_{peak} sound pressure levels and 170 SEL. Installation and removal of the 24-inch-diameter steel casings for the temporary work trestle is expected to produce 180 dB_{peak} sound pressure levels and 170 SEL. As shown in **Table 5-2**, construction of the drilled shafts, flat slab concrete piles, and temporary trestle is not expected to produce sound levels that would exceed peak or SEL injury thresholds for sea turtles.

In addition to auditory injury, construction noise may cause behavioral disturbance to sea turtles. NOAA-NMFS generally has used 160 dB as the threshold for behavioral disturbance, including startle and stress, to sea turtles (NOAA-NMFS 2016). Use of the vibratory and impact hammer to install the bridge support structures and temporary work trestle may exceed 160 dB and cause a behavioral disturbance. Noise from the hammer would be intermittent; installation typically takes one to two hours per pile, followed by several hours or days of work to complete the drilled shaft or trestle span.

The potential for impacts is greatest during the nesting and hatching season from early May to late October. During construction, the potential effects of underwater noise would also be minimized through the use of “slow starts”, where pile-driving ramps up slowly in an effort to deter turtles from the work area. Turtles may avoid the construction area(s) if

disturbed by the noise because there is habitat nearby in the St. Helena Sound. The contractor would follow NOAA-NMFS Sea Turtle Construction Conditions (**Appendix E**), ensuring that construction personnel are aware of the potential presence of sea turtles in the area and would monitor for turtles in the water during pile driving or drilled shaft installation. Moving equipment would be stopped if a sea turtle is observed within 50 feet of the equipment. If a dead, injured, or sick sea turtle is found, all in-water work would stop and the contractor would immediately contact the NOAA-NMFS Protected Resources Division, the USFWS South Carolina Field Office, and Harbor Island Sea Turtle Conservation Program.

Construction Vessel Strikes

Vessel movements have the potential to affect sea turtles directly by accidentally striking or disturbing individual animals. Behavioral changes in response to vessel presence include avoidance reactions, alarm/startle responses, and other behavioral and stress-related changes. Sea turtles in the Harbor River encounter vessel traffic associated with recreational and shrimping vessels; therefore, the turtles have likely habituated to existing levels of vessel activity. Construction vessel traffic would potentially pass near sea turtles on an incidental basis, but short-term behavioral reactions to vessels are not expected to result in long-term impacts, or to sea turtle populations in waters surrounding the project area. To avoid vessel strikes, the contractor would follow NOAA-NMFS Sea Turtle Construction Conditions (**Appendix E**). Construction vessels would operate at low speeds within the relatively limited project area. Construction personnel would be aware of the potential presence of sea turtles in the area and would monitor for turtles in the water to avoid a vessel strike.

Water Quality

Turbidity associated with construction would be limited to the placement of fill for bridge approaches and pile driving or construction of drilled shafts. Turbidity from pile driving may temporarily decrease water quality and the foraging efficacy of sea turtles, which are visual predators. The increased turbidity is expected to dissipate over a matter of hours and will not permanently degrade water quality or sea turtles' ability to forage.

Turbidity would be controlled through the use of SCDOT Best Management Practices, including seeding of slopes, silt fences, and sediment basins as appropriate. Drilling the shafts would occur within steel casings, which would minimize the contact between drilling equipment and aquatic habitats. These activities would occur in portions of the Harbor River and would not limit travel by sea turtles between ocean, river, and sound habitats. If siltation barriers are used, they will be made of a material in which a sea turtle cannot become entangled, will be properly secured, and will be regularly monitored by construction personnel to avoid protected species entrapment (see Sea Turtle Construction Conditions in **Appendix E**). Also, it is unlikely that highway runoff would have a negative affect on sea turtles. Stormwater runoff from bridges would be contained within a closed drainage system and filtered prior to discharging into the waters surrounding the Harbor River.

Lighting

The effects of lighting on sea turtles while they are in the aquatic environment would be minimal. The SCDOT would avoid or minimize potential indirect impacts from bridge lighting on sea turtles by eliminating permanent lighting on the bridge roadway and implementing protective measures for temporary lighting. As discussed in **Section 4.4**, the proposed bridge would contain navigational lights in accordance with Part 118 of Title 33, CFR and as approved by the USCG. Navigational lighting on the bridge is for use by mariners and therefore does not cast direct light onto the river surface. The existing swing span bridge contains navigational lighting; therefore, the likelihood of impact is reduced because sea turtles are accustomed to this type of lighting over the Harbor River.

Based on the information provided above, **the proposed project may affect, but is not likely to adversely affect green, Kemp's ridley, leatherback, or loggerhead sea turtles.**

5.3 Cumulative Effects

Cumulative effects are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR§1508.7).

The proposed project would not promote development on the surrounding islands that may affect marine habitats. The proposed US 21 Bridge would not include additional travel lanes or increase the capacity for additional vehicles on the roadway. Overall, there is a low potential for growth and development because of the extensive tidal wetlands, floodplains, and zoning designations. Neighborhood Mixed-use areas, such as Harbor Island, Harbor Key, and Fripp Island, are not expected to expand beyond their current boundaries (Beaufort County 2010). Beaufort County's Open Land Trust maintains conservation easements on the tidal marsh surrounding Harbor Key. Hunting Island is protected as a state park. St. Helena Island to the west is both zoned Rural and occurs within a Cultural Protection Overlay that discourages certain types of development including golf courses, resorts, and gated communities. Projects that impact marine habitats would be required to obtain permits from the USACE and undergo review by NOAA-NMFS and USFWS.

The proposed project is located approximately 0.5 mile from the beaches on Harbor Island, where a sand scraping project is proposed by the Harbor Island Owners Association. The USACE released a public notice on August 26, 2015 requesting comments on the project, which would impact approximately 2 acres of ocean front habitat. The proposed project is also located approximately 1 mile from the proposed Hunting Island beach restoration project. According to a public notice released on March 15, 2016, the proposed project would involve dredging, beach nourishment, and construction of two pile groins. These projects would require coordination with NOAA-NMFS and USFWS to identify potential impacts to federally-protected species. No other marine projects have been identified near the project area. Based on the information presented herein, and the conservation measures proposed in **Section 6.1**, the

proposed project would not have cumulative impacts on federally threatened or endangered species under the jurisdiction of NOAA-NMFS.

6 Conclusions and Effect Determination

As shown in **Table 6-1**, the proposed project may affect, but is not likely to adversely affect, the green sea turtle, Kemp's ridley sea turtle, loggerhead sea turtle, leatherback sea turtle, Shortnose sturgeon and Atlantic sturgeon. This biological assessment analyzes the proposed action to determine the potential adverse effects to these species as a result of bridge construction. Risk factors include being struck by construction equipment (piles, barges, trestles), construction-associated noise and turbidity, temporary or permanent loss of habitat, and temporary disruption of spawning/migratory behaviors.

Table 6-1. Effect Determination

Common Name	Scientific Name	Federal ESA Designation	Effect Determination	Justification
Atlantic sturgeon	<i>Acipenser oxyrinchus oxyrinchus</i>	Endangered	May Affect, Not Likely to Adversely Affect	Project area may contain migratory habitat. In-water construction noise may cause behavioral disturbances. Slow starts would minimize disturbances.
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	Endangered	May Affect, Not Likely to Adversely Affect	
Green sea turtle	<i>Chelonia mydas</i>	Threatened	May Affect, Not Likely to Adversely Affect	Project area contains suitable foraging habitat but does not contain suitable nesting habitat. In-water construction noise may cause behavioral disturbances. NOAA-NMFS Sea Turtle Construction Conditions would be followed to minimize impact to turtles in the aquatic environment.
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	Endangered	May Affect, Not Likely to Adversely Affect	
Leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered	May Affect, Not Likely to Adversely Affect	
Loggerhead sea turtle	<i>Caretta caretta</i>	Threatened	May Affect, Not Likely to Adversely Affect	

6.1 Conservation Measures

The SCDOT commits to implementing the following conservation measures, or actions, to minimize or compensate for effects to each species (**Table 6-2**). In general, the contractor would follow SCDOT Best Management Practices, such as seeding of slopes, silt fences, and sediment basins, during construction to avoid potential turbidity impacts within the Harbor River. Stormwater runoff from bridges would be contained within a closed drainage system and filtered prior to discharging into the waters surrounding Harbor River. A National Pollutant Discharge Elimination System (NPDES) permit pursuant to Section 402 of the Clean Water Act will be required for construction activities. The NPDES permit application will include a Stormwater Pollution Prevention Plan.

Equipment and materials used during the construction of the bridge would not obstruct or impede passage through more than 50 percent of the channel. The anticipated impact and vibratory pile driving is unlikely to cause more than non-injurious, insignificant behavioral effects to marine species. Noise from the hammer would be intermittent; installation typically takes one to two hours per pile, following by several hours or days of work to complete the drilled shaft or trestle span. During construction, the potential effect of noise impacts on sturgeon and turtles would be minimized through the use of “slow starts”, where pile-driving ramps up slowly in an effort to deter marine species from the work area.

The bridge would be demolished using standard practices to remove the existing piers and swing span. If explosives are used for demolition, the contractor would be responsible for evaluating the potential effect on protected species and reinitiating consultation with the USFWS and NOAA-NMFS. Future separate consultation on blasting would be required if the contractor would plan to use explosives. The contractor and SCDOT would reinitiate consultation to examine blasting and develop a blasting plan, which would include a marine wildlife watch plan.

6.1.1 Sea Turtles

To avoid vessel strikes, construction vessel personnel would operate at low speeds within the small project area. The contractor would follow NOAA-NMFS Sea Turtle Construction Conditions (**Appendix E**), ensuring that construction personnel are aware of the potential presence of sea turtles in the area and would monitor for turtles in the water during pile driving or drilled shaft installation. Moving equipment would be stopped if a sea turtle is observed within 50 feet of the equipment.

The contractor would restrict in-water work during nighttime between May and October (sea turtle nesting and hatching season), to the maximum extent practicable. Personnel would not be able to monitor for sea turtles in the water at night during pile driving activities and vessel operations. Therefore, suspension of operations at night would protect sea turtles when they could be most affected. Nighttime would be defined as 30-minutes after sunset to 30-minutes before sunrise. If a dead, injured, or sick sea turtle is found, all in-water work would stop and the contractor would immediately contact the NOAA-NMFS Protected Resources Division, the USFWS South Carolina Field Office, and Harbor Island Sea Turtle Conservation Program.

If siltation barriers are used during construction, the barrier would be made of material in which a sea turtle cannot become entangled, properly secured, and regularly monitored to avoid protected species entrapment.

In an effort to avoid or minimize potential indirect impacts of bridge lighting to the movements of sea turtles and their prey, no permanent lighting would be installed on the proposed bridge roadway. During the sea turtle nesting season (May 1 through October 31), the contractor would use the minimum number and lowest wattage of lights that are necessary for construction. Lights would be positioned to focus on the work area to minimize the amount of light on the water surface. The contractor would turn off all lights when not needed during construction.

Table 6-2. Conservation Measure Summary

Common Name	Scientific Name	Conservation Measure Section	Environmental Commitment
Atlantic Sturgeon, Shortnose Sturgeon, and Sea Turtles		Section 6.1	<ul style="list-style-type: none"> Follow SCDOT Best Management Practices during construction Contain and filter stormwater runoff from bridges within a closed drainage system Obtain NPDES permit and prepare a Stormwater Pollution Prevention Plan Ensure equipment does not obstruct or impede passage through more than 50 percent of the channel. Use of “slow starts” Prepare a blasting plan, including marine wildlife watch plan, and reinitiate consultation with USFWS and NOAA-NMFS if explosives are used for demolition.
Green sea turtle	<i>Chelonia mydas</i>	Section 6.1.1	<ul style="list-style-type: none"> Follow NOAA-NMFS Sea Turtle Construction Conditions (Appendix E) The contractor would restrict in-water work during nighttime between May and October, to the maximum extent practicable. No permanent roadway lighting Reduced or shielded construction lighting during nesting season (May 1 through October 31)
Kemp’s ridley sea turtle	<i>Lepidochelys kempii</i>		
Leatherback sea turtle	<i>Dermochelys coriacea</i>		
Loggerhead sea turtle	<i>Caretta caretta</i>		

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A

Appendix A - USFWS Coordination



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United States Department of the Interior

FISH AND WILDLIFE SERVICE

176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407



July 1, 2015

Mr. Chad Long
Archaeologist/NEPA Coordinator
South Carolina Department of Transportation
P.O. Box 191
Columbia, SC 29202-0191

Re: Letter of Intent, U.S. Highway 21 Bridge Replacement, Harbor River,
Beaufort County, SC, FWS Log No. 2015-CPA-0112

Dear Mr. Long:

The U.S. Fish and Wildlife Service (Service) has received your June 23, 2015, Letter of Intent (LOI) for the proposed replacement of the U.S. Highway 21 Bridge over Harbor River in Beaufort County, South Carolina. The South Carolina Department of Transportation (SCDOT) is proposing to replace U.S. Highway 21, which connects St. Helena Island to Harbor Island, Fripp Island, and Hunting Island State Park. The SCDOT is soliciting comments for consideration and incorporation into an Environmental Assessment (EA) which is being prepared pursuant to the National Environmental Policy Act of 1969, as amended (43 U.S.C. 4321 *et seq.*) (NEPA).

The Service believes it is imperative that the EA is designed to conserve local natural resources to the maximum extent possible. As such, we recommend that project planning efforts incorporate all possible means to avoid and/or minimize impacts wetlands along the corridor through a rigorous alternatives analysis. Analyses should include the consideration of a longer bridge span rather than a causeway to span the salt marsh critical area. Once a range of alternatives has been identified, we recommend that SCDOT schedule a multi-agency site visit in order to review each alternative.

The LOI stated that a threatened and endangered species survey was performed for the site in September 2014, and determined that the project area contains suitable habitat for several federally protected threatened and endangered (T&E) species. The Service recommends the project efforts continue to consider potential impact to these species as well as species that may be listed in the future. The Service has included with this letter a list of species that are currently protected under the Endangered Species Act of 1973 (ESA), species that are considered as a candidate for listing under the ESA, and those that have been petitioned for listing under the

ESA. The species which have been petitioned for listing are considered "At-Risk Species" (ARS) and may occur in Beaufort County, South Carolina. Although there are no Federal protections afforded to ARS, please consider including ARS in your survey efforts. Incorporating proactive measures to avoid or minimize harm to ARS may improve their status and assist with precluding the need to list these species. Additional information on ARS can be found at:

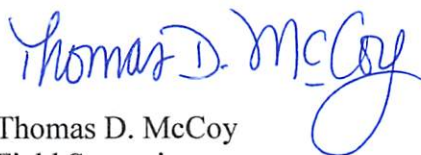
<http://www.fws.gov/southeast/candidateconservation>

The Service finds that this project is similar in nature to recent SCDOT projects where the subject corridor serves as the single access and egress route. Replacement of the Folly Road bridges leading to Folly Beach, South Carolina, and the US Hwy 701 bridges connecting Horry and Georgetown Counties are similar in that the roadways were or will be required to remain open during construction of the new, adjacent structures. Detouring traffic for these projects was not considered feasible, as they served as the sole transportation route in the project area. With this understanding we find that a new alignment is the most likely alternative for US 21.

Construction of U.S. Highway 21 on a new alignment presents an opportunity SCDOT to develop a Permittee Responsible Mitigation plan to minimize impacts while performing onsite restoration, thereby satisfying future mitigation requirements. The Service recommends SCDOT consider eliminating the use of fill for a causeway and bridge the entire span of salt marsh between St. Helena Island and Harbor Island for the new U.S. Highway 21 corridor. Once the new bridge is completed and traffic re-routed SCDOT could remove the abandoned U.S. Highway 21 Bridge and causeway and restore the underlying land to salt marsh wetlands. This onsite wetland restoration would serve as compensatory mitigation for impacts associated with the new bridge's construction.

The Service appreciates the opportunity to provide input at this early stage of the project's development. If you have any questions, please contact Mr. Mark Caldwell at (843) 727-4707 ext. 215, and reference FWS Log No. 2015-CPA-0112.

Sincerely,



Thomas D. McCoy
Field Supervisor

TDM/MAC

South Carolina List of At-Risk, Candidate, Endangered, and Threatened Species - Beaufort County

SCDOT Project ID P026862

CATEGORY	COMMON NAME/STATUS	SCIENTIFIC NAME	SURVEY WINDOW/ TIME PERIOD	COMMENTS
Amphibian	Frosted flatwoods salamander (T, CH)	<i>Ambystoma cingulatum</i>	January 1-April 30	Larvae present in breeding ponds
Bird	American wood stork (T)	<i>Mycteria americana</i>	February 15-September 1	Nesting season
	Bald eagle (BGEPA)	<i>Haliaeetus leucocephalus</i>	October 1-May 15	Nesting season
	Black rail (ARS)	<i>Laterallus jamaicensis</i>	May-July	
	MacGillivray's seaside sparrow (ARS)	<i>Ammodramus maritimus macgillivrayi</i>	May-June	
	Piping plover (T, CH)	<i>Charadrius melodus</i>	July 15-May 1	Migration and wintering
	Red-cockaded woodpecker (E)	<i>Picoides borealis</i>	April 1-July 31	Nesting season
	Red knot (T)	<i>Calidris canutus rufa</i>	August 1-May 31	Migration and wintering
Crustacean	None Found			
Fish	American eel (ARS)	<i>Anguilla rostrata</i>	March 1-May 30; October 1-December 15	Temperature dependent: normally (17-20°C); can be found between 13-25°C
	Atlantic sturgeon* (E)	<i>Acipenser oxyrinchus*</i>	February 1-April 30	Spawning migration
	Blueback herring (ARS)	<i>Alosa aestivalis</i>	Mid-January-mid May	Peak: March-April
	Shortnose sturgeon* (E)	<i>Acipenser brevirostrum*</i>	February 1-April 30	Spawning migration
Insect	Monarch butterfly (ARS)	<i>Danaus plexippus</i>	August-December	Overwinter population departs: March-April
	Rare skipper (ARS)	<i>Problema bulenta</i>	May; July-September	Two brood periods
Mammal	Finback whale* (E)	<i>Balaenoptera physalus*</i>	November 1-April 30	Off the coast
	Humpback whale * (E)	<i>Megaptera novaengliae</i>	January 1-March 31	Migration off the coast
	Rafinesque's big-eared bat (ARS)	<i>Corynorhinus rafinesquii</i>	Year round	Found in mines, caves, large hollow trees, buildings, and bat towers
	Right whale* (E)	<i>Balaena glacialis</i>	November 1-April 30	Off the coast
	Tri-colored bat (ARS*)	<i>Perimyotis subflavus</i>	Year round	Found in mines and caves in the winter
	West Indian manatee (E)	<i>Trichechus manatus</i>	May 15-October 15	In coastal waters
Mollusk	None Found			
Plant	Canby's dropwort (E)	<i>Oxypolis canbyi</i>	Mid-July-September	
	Carolina bishopweed (ARS)	<i>Ptilimnium ahlesii</i>	May-July	
	Godfrey's privet (ARS)	<i>Forestiera godfreyi</i>	April-June	
	Pondberry (E)	<i>Lindera melissifolia</i>	February-March	
	Raven's seedbox (ARS)	<i>Ludwigia ravenii</i>	June-October	
Reptile	Eastern diamondback rattlesnake (ARS)	<i>Crotalus adamanteus</i>	Most of the year	Peak: April-November
	Green sea turtle ** (T)	<i>Chelonia mydas **</i>	May 1-October 31	Nesting and hatching
	Kemp's ridley sea turtle ** (E)	<i>Lepidochelys kempii**</i>	May 1-October 31	In coastal waters
	Leatherback sea turtle ** (E)	<i>Dermochelys coriacea **</i>	May 1-October 31	Nesting and hatching
	Loggerhead sea turtle ** (T, CH)	<i>Caretta caretta **</i>	May 1-October 31	Nesting and hatching
	Southern hognose snake (ARS)	<i>Heterodon simus</i>	Most of the year	

** The U.S. Fish and Wildlife Service (FWS) and NMFS share jurisdiction of this species

ARS* Species that are either former Candidate Species or are emerging conservation priority species

C FWS or NMFS has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species

E Federally Endangered

S/A Federally protected due to similarity of appearance to a listed species

T Federally Threatened

These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated as deemed necessary and may differ from earlier lists.

For a list of State endangered, threatened, and species of concern, please visit <https://www.dnr.sc.gov/species/index.html>.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407



January 27, 2016

Ms. Nicole Riddle
Assistant NEPA Coordinator
South Carolina Department of Transportation
P.O. Box 191
Columbia, SC 29202-0191

Re: Biological Assessment, US 21 Bridge Replacement, Harbor River, Beaufort County, SC
FWS Log No. 2015-CPA-0112

Dear Ms. Riddle:

The U.S. Fish and Wildlife Service (Service) has received your January 15, 2016, Biological Assessment (BA) for the proposed replacement of the U.S. Highway 21 bridge over the Harbor River in Beaufort County, South Carolina. The South Carolina Department of Transportation (SCDOT) proposes to replace U.S. Highway 21 which connects St. Helena Island to Harbor Island, Fripp Island, and Hunting Island State Park. The SCDOT prepared the BA and is requesting the Service's consultation regarding potential impacts to species protected under the Endangered Species Act of 1973 (16 U.S.C. 1531-1543) (ESA). The BA will be incorporated into an Environmental Assessment which is being prepared pursuant to the National Environmental Policy Act of 1969, as amended (43 U.S.C. 4321 *et seq.*) (NEPA).

U.S. Highway 21 is a two-lane roadway with earthen shoulders on a causeway connecting St. Helena Island with Harbor Island, Hunting Island, and Fripp Island. The project corridor is approximately two miles long and 600 feet wide. Terrain in the corridor is flat with the surface runoff draining to the adjacent tidal wetlands through roadside ditches. Existing land uses along the corridor include small areas of residential and commercial development. The project involves the bridge replacement, the construction of a new roadway approach alignment to correct structural and functional deficiencies, and to upgrade the bridge and its approaches to current design standards.

The Services previously provided comments and recommendations to SCDOT, regarding the bridge replacement project on July 1, 2015. Our letter focused on measures to minimize impacts to resources as well as potential mitigation options. We also recommended that SCDOT perform a survey for threatened and endangered (T&E) species that may be in the project area. The BA provides SCDOT's assessment of T&E species, as well as designated critical habitat that may be

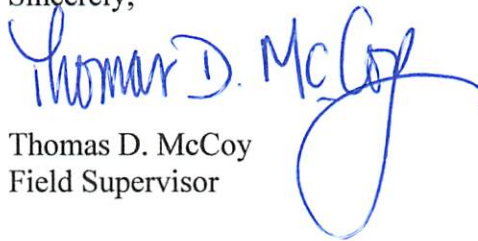
impacted by the bridge replacement project in Section 2. Table 2-1 lists each of the species that are known to occur within Beaufort County. The majority of the T&E species reviewed by SCDOT do not occur in the project area due to the lack of suitable habitat. Therefore, SCDOT concluded (Section 5 of the BA) that the proposed bridge replacement will have no effect upon those species. The ESA does not require section 7 consultation for no effect determinations; therefore, no further action is required regarding these species.

Of the T&E species that occur in Beaufort County, SCDOT determined that the project area contains suitable habitat for the American wood stork, piping plover, Rufa red knot, West Indian manatee, and four separate sea turtle species. An assessment was performed for each species to determine the project's potential impacts. Although no individuals of the above species were observed, SCDOT concluded that due to the presence of suitable habitat, the replacement of the U.S. Highway 21 bridge may affect, but is not likely to adversely affect, the wood stork, piping plover, red knot, or the West Indian manatee. The Service concurs with SCDOT's determination. No federally designated critical habitat for these species is present in the project area. Please contact the National Marine Fisheries Service – Protected Species Division for consultation requirements regarding sea turtles, as they maintain jurisdiction, while the turtles are in the marine environment.

Obligations under the ESA must be reconsidered if: (1) new information reveals impacts of this identified action may affect any listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner, which was not considered in this assessment; or (3) a new species is listed or critical habitat is designated that may be affected by the identified action.

The Service appreciates the opportunity to provide input at this early stage of the project's development. If you have any questions, please contact Mr. Mark Caldwell at (843) 727-4707 ext. 215, and reference FWS Log No. 2015-CPA-0112.

Sincerely,



Thomas D. McCoy
Field Supervisor

TDM/MAC

B

Appendix B – NOAA NOAA-NMFS Coordination



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**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>

August 7, 2015

F/SER47:KH/pw

(Sent via Electronic Mail)

Mr. Chad Long
Archaeologist/NEPA Coordinator
South Carolina Department of Transportation
P.O. Box 191
Columbia, South Carolina 29201

Attention: Nicole Riddle

Dear Mr. Long:

NOAA's National Marine Fisheries Service (NMFS) submits the following response to the request by the South Carolina Department of Transportation (SCDOT) and Federal Highway Administration (FHWA), dated June 23, 2015, for scoping comments on the draft Environmental Assessment (EA) for the proposed U.S. 21 (Sea Island Parkway) bridge replacement over Harbor River in Beaufort County (SCDOT PIN: P026862). Sea Island Parkway is a two-lane highway providing the only vehicle access from St. Helena Island to Harbor Island, Hunting Island State Park, and Fripp Island. The SCDOT views the bridge as structurally deficient and functionally obsolete. While the SCDOT and FHWA have not yet selected an alignment for the new bridge, it likely will parallel and be in close proximity to the existing bridge. As the nation's federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, the following comments and recommendations are provided pursuant to authorities of the Fish and Wildlife Coordination Act (FWCA) and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Essential Fish Habitat in the Project Area

On July 13, 2015, NMFS biologists and representatives from SCDOT visited the area of the proposed bridge. The area includes high quality tidal salt marsh habitat, specifically estuarine emergent wetlands, intertidal non-vegetated flats, tidal creeks, oyster reef/shell, and unconsolidated bottom. The fishery management plans from the South Atlantic Fishery Management Council (SAFMC) with EFH designations most applicable to this project are the plans for penaeid shrimp and the snapper-grouper complex. Also, please note the fishery management plan for the snapper-grouper complex includes oyster/shell habitat as a Habitat Area of Particular Concern (HAPC). HAPCs are a subset of EFH that are either rare, particularly susceptible to human-induced degradation, especially important ecologically, or located in an environmentally stressed area. The SAFMC provides additional information on EFH for federally managed species in Volume IV of the *Fishery Ecosystem Plan of the South Atlantic Region*¹.

¹ Available at <http://safmc.net/EcosystemLibrary/FEPVolumeIV>



The waters of the Harbor River, the tidal creeks connected to it, and the surrounding coastal marsh also serve as nursery and forage habitat for other species, such as red drum (*Sciaenops ocellatus*), black drum (*Pogonias cromis*), Atlantic menhaden (*Brevoortia tyrannus*), and blue crab (*Callinectes sapidus*). Many of these species are prey for other fish managed under the Magnuson-Stevens Act, such as mackerels, snappers, groupers, billfish, and sharks. Red drum is an important state-managed fishery, and estuarine wetlands within the project area provide habitat necessary for development and survival of several life stages of red drum. The NMFS recommends the EA address these species as well as those managed under the Magnuson-Stevens Act.

Comments on Potential Effects to EFH and Federally Managed Fisheries

The NMFS recommends SCDOT construct the new bridge in the same footprint as the existing bridge because this approach would require the least amount of new impacts to EFH. If this approach is proven impracticable, the NMFS recommends SCDOT construct the new bridge northward of the existing bridge. Marsh vegetation on the northern side of U.S. 21 is less dense than vegetation on the southern side, and intertidal flats on the northern side of the creek appear to contain debris and spoils from the construction of the original roadway. A northern alignment would also avoid impacts to the numerous small tidal creeks located south of the existing bridge and a large tidal creek on the eastern end of the project boundary. The project should avoid the oyster reef the South Carolina Department of Natural Resources (SCDNR) South Carolina Oyster Restoration and Enhancement (SCORE) program built north of the existing bridge. All oyster reefs should be spanned to the maximum extent practicable or relocated. Lastly, the NMFS requests the EA include a detailed alternatives analysis for the new bridge and for the analysis to include detailed information on the type, amount, and site-specific function of wetlands directly and/or indirectly impacted by each alternative.

The NMFS recommends SCDOT avoid construction practices that smother marsh vegetation. The NMFS has documented the impacts to salt marsh vegetation from barges and barge mats lasting longer than three years at Shem Creek Park and the Folly River Bridge. These and similar projects should be reviewed for adjusting best management practices to improve impact forecasts.

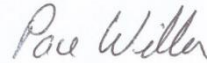
The NMFS prefers onsite mitigation and restoring existing bridge approach sections to salt marsh habitat could contribute to satisfying onsite mitigation. During the site visit, the NMFS and SCDOT discussed mitigating through the SCDNR SCORE program as one component of a larger mitigation plan, should there be unavoidable impacts to oyster reef/shell habitat. The NMFS would be happy to assist SCDOT and FHWA by providing preliminary reviews of the mitigation plan during its development.

The Magnuson-Stevens Act requires federal agencies to consult with NMFS regarding actions that may adversely affect EFH. Based on the information provided, NMFS believes adverse impacts to EFH are likely and the project requires a detailed EFH assessment. The level of detail should be commensurate with the complexity and magnitude of the potential adverse effects of the action. The SCDOT and FHWA may provide the EFH assessment as a stand-alone document or within an EA. In either case, the NMFS recommends communications occur during

development of the EFH assessment to ensure all issues are adequately covered and to avoid unnecessary delays in final evaluations.

The NMFS appreciates the opportunity to provide these comments. Please direct related questions or comments to the attention of Keith M. Hanson at our Charleston Area Office, 219 Fort Johnson Road, Charleston, South Carolina 29412-9110, Keith.Hanson@noaa.gov or by phone at (843)762-8622.

Sincerely,



/ for

Virginia M. Fay
Assistant Regional Administrator
Habitat Conservation Division

cc: SCDOT, LongCC@scdot.org, RiddleNL@scdot.org
DHEC, trumbumt@dhec.sc.gov
SCDNR, DavisS@dnr.sc.gov
EPA, Laycock.Kelly@epa.gov
FWS, Karen_Mcgee@fws.gov
F/SER4, David.Dale@noaa.gov
F/SER47, Jaclyn.Daly@noaa.gov, Keith.Hanson@noaa.gov

Wade, Blair

From: McMaster, Jason
Sent: Friday, December 18, 2015 2:46 PM
To: Wade, Blair
Subject: FW: MMPA

From: Jaclyn Daly - NOAA Federal [<mailto:jaclyn.daly@noaa.gov>]
Sent: Wednesday, September 02, 2015 1:46 PM
To: McMaster, Jason
Subject: Re: MMPA

Hi Jason,

All the species you listed are protected both under the MMPA and ESA. All ESA determinations should be submitted to our Protected Resources Office in St. Petersburg, FL. A list of ESA species that NMFS manages and could potentially occur within the action area can be obtained at http://sero.nmfs.noaa.gov/protected_resources/section_7/index.html. If this is for SCDOT's US21 project, I don't think you'll have an issue with large whales (humpbacks and fins tend to stay further offshore than right whales). However, you should also consider impacts to bottlenose dolphins which are protected under the MMPA but not the ESA. If you think the project (e.g., pile driving) could result in the take of bottlenose dolphins, you should submit a [MMPA Incidental Take Authorization application](#) to our Office of Protected Resources in Silver Spring.

Hope that helps. Let me know if you have any other questions.
Jaclyn

On Wed, Sep 2, 2015 at 12:54 PM, McMaster, Jason <Jason.McMaster@hdrinc.com> wrote:

Hello Jaclyn,

I'm preparing an EA for a bridge replacement project down on Harbor Island, in Beaufort County, SC. Part of our analysis is to determine compliance with the MMPA. Do you think we need to consider impacts to Right, Finback, and Humpback whales? I know that Rights tend to migrate somewhat close to the coast but I'm unfamiliar with the others migration patterns. Thank you.

Jason McMaster

Environmental Scientist

HDR

3955 Faber Place Drive, Suite 300
North Charleston SC
M [843-259-7046]
jason.mcmaster@hdrinc.com

hdrinc.com/follow-us

--

Jaclyn Daly-Fuchs
Fishery Biologist
NOAA's National Marine Fisheries Service
219 Fort Johnson Road
Charleston, SC 29412
(843) 762-8610

<http://sero.nmfs.noaa.gov>

Wade, Blair

From: Riddle, Nicole L. <RiddleNL@scdot.org>
Sent: Monday, February 29, 2016 3:05 PM
To: Wade, Blair
Cc: Long, Chad C.
Subject: FW: ESA Section 7 consultation for US 21 Harbor River Bridge

Hmm, I'm not entirely sure how we tackle all of these questions about construction given this is a design build project. Thoughts? Also please note the disagreement in effect calls at the bottom.

From: David Rydene - NOAA Federal [<mailto:david.rydene@noaa.gov>]
Sent: Monday, February 29, 2016 3:00 PM
To: Riddle, Nicole L.
Subject: ESA Section 7 consultation for US 21 Harbor River Bridge

Hi Nicole,

I have looked at the Biological Assessment (BA) for the US 21 Harbor River Bridge replacement. While I do not see any major issues with the project, there are some things that will need to be addressed before I can proceed with the Section 7 consultation.

While NMFS is not particularly concerned about which alignment alternative is chosen or whether the new bridge is fixed-span or moveable, there are a number of unknowns with regards to the construction specifics that NMFS would need in order to describe the project and analyze potential effects on ESA-listed species. The BA states that a combination of drilled shaft and pile driving will "probably" be used, but not much more detail is given beyond that. NMFS would have to know the types (materials) and sizes of piles and/or drilled shafts, how many would be installed in a day, and how long it would take to install each one in order to analyze in-water noise effects. At the minimum, SCDOT would have to provide a "worst case scenario" for NMFS to use in the analysis for one or both techniques.

In addition, while the use of barges seems highly probable, the use of temporary work trestles seems to be less certain. If work trestles will be used, NMFS would need information about the type, size, and number of piles required for the trestle and how they would be installed and removed (e.g., the maximum number installed per day and how long to install each trestle pile). This could also be presented as a "worst case" scenario.

NMFS would have to have a general idea of how any of the existing causeway would be removed and how the resulting spoil would be disposed of.

NMFS would also need commitments regarding construction specifics (e.g., Will NMFS's sea turtle construction conditions be followed, will work be limited to daylight hours, will noise abatement techniques be used during pile installation, what BMPs will be required for turbidity control, etc..).

Another unknown is whether or not explosive demolition will be used to take down any parts of the existing bridge structures. This could be dealt with 2 ways, either it is included in the consultation now with the caveat that a blast plan (including the marine wildlife watch plan) must be submitted and approved by NMFS once a blasting contractor is selected (at some point in the future), or the blast consultation is done as a separate consultation in the future.

With regards to in-water noise thresholds for injury and behavioral disturbance, NMFS Southeast Region is presently using the following:

Peak Pressure injury: 206 dB (for sea turtles and fishes)

Single-strike Sound Exposure Level injury: 187 dB (for sea turtles and fishes > 2g)

Cumulative Sound Exposure Level injury: 187 dB (for sea turtles and fishes)

Behavioral disturbance: 150 dB (for fishes only)

Behavioral disturbance: 160 dB (for sea turtles only)

Also, NMFS disagrees with the effects determination of "no effect" for green and Kemp's ridley sea turtles. While there may not be nests in the project vicinity, it is still entirely possible that both species may occur in the waters near the project area, as estuaries are known to be used as foraging areas, particularly by juveniles. NMFS suggests a "may affect, not likely to adversely affect" for green and Kemp's ridley sea turtles.

Thanks, Dave

--

David Rydene, Ph.D.
Fish Biologist
National Marine Fisheries Service
Habitat Conservation Division
263 13th Avenue South
St. Petersburg, FL 33701
Office (727) 824-5379

Cell (813) 992-5730

Fax (727) 824-5300

C

Appendix C - USFWS Information for Planning and Conservation (IPaC) Report



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US 21 Bridge Replacement over Harbor River

IPaC Trust Resource Report

Generated November 18, 2015 02:12 PM MST

This report is for informational purposes only and should not be used for planning or analyzing project-level impacts. For projects that require FWS review, please return to this project on the IPaC website and request an official species list from the Regulatory Documents page.



US Fish & Wildlife Service

IPaC Trust Resource Report



Project Description

NAME

US 21 Bridge Replacement over
Harbor River

PROJECT CODE

P7YUT-RJ5SN-FX3OS-N5JCL-KUNBTM

LOCATION

Beaufort County, South Carolina

DESCRIPTION

No description provided



U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

South Carolina Ecological Services

176 Croghan Spur Road, Suite 200

Charleston, SC 29407-7558

(843) 727-4707

Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the [Endangered Species Program](#) and should be considered as part of an effect analysis for this project.

This unofficial species list is for informational purposes only and does not fulfill the requirements under [Section 7](#) of the Endangered Species Act, which states that Federal agencies are required to "request of the Secretary of Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action." This requirement applies to projects which are conducted, permitted or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can be obtained by returning to this project on the IPaC website and requesting an official species list on the Regulatory Documents page.

Amphibians

Frosted Flatwoods Salamander *Ambystoma cingulatum*

Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D013>

Birds

Kirtland's Warbler *Setophaga kirtlandii* (= *Dendroica kirtlandii*) Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B03I>

Piping Plover *Charadrius melodus* Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B079>

Red Knot *Calidris canutus rufa* Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0DM>

Red-cockaded Woodpecker *Picoides borealis* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B04F>

Wood Stork *Mycteria americana* Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06O>

Fishes

Shortnose Sturgeon *Acipenser brevirostrum* Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E00B>

Flowering Plants

American Chaffseed *Schwalbea americana*

Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q2I4>

Canby's Dropwort *Oxypolis canbyi*

Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q2EL>

Pondberry *Lindera melissifolia*

Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q2CO>

Mammals

West Indian Manatee *Trichechus manatus*

Endangered

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A007>

Reptiles

Green Sea Turtle *Chelonia mydas*

Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C00S>

Kemp's Ridley Sea Turtle *Lepidochelys kempii*

Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C00O>

Leatherback Sea Turtle *Dermochelys coriacea*

Endangered

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C00F>

Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

There is no critical habitat within this project area

Migratory Birds

Birds are protected by the [Migratory Bird Treaty Act](#) and the [Bald and Golden Eagle Protection Act](#).

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service ([1](#)). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

You are responsible for complying with the appropriate regulations for the protection of birds as part of this project. This involves analyzing potential impacts and implementing appropriate conservation measures for all project activities.

American Kestrel *Falco sparverius paulus*

Year-round

Bird of conservation concern

American Oystercatcher *Haematopus palliatus*

Year-round

Bird of conservation concern

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0G8>

American Bittern *Botaurus lentiginosus*

Season: Wintering

Bird of conservation concern

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0F3>

Bachman's Sparrow *Aimophila aestivalis*

Year-round

Bird of conservation concern

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B07F>

Bald Eagle *Haliaeetus leucocephalus*

Year-round

Bird of conservation concern

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B008>

Black Rail *Laterallus jamaicensis*

Season: Breeding

Bird of conservation concern

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B09A>

Black Skimmer *Rynchops niger*

Year-round

Bird of conservation concern

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0EO>

Black-capped Petrel *Pterodroma hasitata*

Year-round

Bird of conservation concern

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0AS>

Brown-headed Nuthatch *Sitta pusilla*

Year-round

Bird of conservation concern

Chuck-will's-widow *Caprimulgus carolinensis*

Season: Breeding

Bird of conservation concern

Common Ground-dove *Columbina passerina exigua*

Year-round

Bird of conservation concern

Fox Sparrow *Passerella iliaca*

Season: Wintering

Bird of conservation concern

Gull-billed Tern *Gelochelidon nilotica*

Bird of conservation concern

Season: Breeding

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JV>**Henslow's Sparrow** *Ammodramus henslowii*

Bird of conservation concern

Season: Wintering

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B09D>**Le Conte's Sparrow** *Ammodramus leconteii*

Bird of conservation concern

Season: Wintering

Least Bittern *Ixobrychus exilis*

Bird of conservation concern

Season: Breeding

Least Tern *Sterna antillarum*

Bird of conservation concern

Season: Breeding

Lesser Yellowlegs *Tringa flavipes*

Bird of conservation concern

Season: Wintering

Loggerhead Shrike *Lanius ludovicianus*

Bird of conservation concern

Year-round

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FY>**Marbled Godwit** *Limosa fedoa*

Bird of conservation concern

Season: Wintering

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JL>**Mississippi Kite** *Ictinia mississippiensis*

Bird of conservation concern

Season: Breeding

Nelson's Sparrow *Ammodramus nelsoni*

Bird of conservation concern

Season: Wintering

Painted Bunting *Passerina ciris*

Bird of conservation concern

Season: Breeding

Peregrine Falcon *Falco peregrinus*

Bird of conservation concern

Season: Wintering

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FU>**Prairie Warbler** *Dendroica discolor*

Bird of conservation concern

Season: Breeding

Prothonotary Warbler *Protonotaria citrea*

Bird of conservation concern

Season: Breeding

Purple Sandpiper *Calidris maritima*

Bird of conservation concern

Season: Wintering

Red Knot *Calidris canutus rufa*

Bird of conservation concern

Season: Wintering

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0DM>**Red-headed Woodpecker** *Melanerpes erythrocephalus*

Bird of conservation concern

Year-round

Red-throated Loon *Gavia stellata*

Bird of conservation concern

Season: Wintering

Rusty Blackbird *Euphagus carolinus*

Bird of conservation concern

Season: Wintering

Saltmarsh Sparrow *Ammodramus caudacutus*

Bird of conservation concern

Season: Wintering

Seaside Sparrow *Ammodramus maritimus*

Year-round

Bird of conservation concern

Sedge Wren *Cistothorus platensis*

Season: Wintering

Bird of conservation concern

Short-billed Dowitcher *Limnodromus griseus*

Season: Wintering

Bird of conservation concern

Swainson's Warbler *Limnothlypis swainsonii*

Season: Breeding

Bird of conservation concern

Swallow-tailed Kite *Elanoides forficatus*

Season: Breeding

Bird of conservation concern

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0GB>**Whimbrel** *Numenius phaeopus*

Season: Wintering

Bird of conservation concern

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JN>**Wilson's Plover** *Charadrius wilsonia*

Season: Breeding

Bird of conservation concern

Wood Thrush *Hylocichla mustelina*

Season: Breeding

Bird of conservation concern

Worm Eating Warbler *Helmitheros vermivorum*

Season: Migrating

Bird of conservation concern

Yellow Rail *Coturnicops noveboracensis*

Season: Wintering

Bird of conservation concern

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JG>

Refuges

Any activity proposed on [National Wildlife Refuge](#) lands must undergo a 'Compatibility Determination' conducted by the Refuge. If your project overlaps or otherwise impacts a Refuge, please contact that Refuge to discuss the authorization process.

There are no refuges within this project area

Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

Project proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate [U.S. Army Corps of Engineers District](#).

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Wetland data is unavailable at this time.

D

Appendix D - Sturgeon Tagging Data from Bill Post (SCDNR)



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Data Received on November 12, 2015 from Bill Post (SCDNR) regarding tagged sturgeon near the US 21 Harbor River Project Area

Atlantic sturgeon registered at mouth of Ashepoo on 10/18/15 – 6.18 miles away.

Atlantic sturgeon registered at mouth of Combahee on 10/14/15 – 7.84 miles away.

Short nosed sturgeon registered at mouth of Combahee on 11/12/12, records go back to 3/18/11 with no other occurrence of SNS.

Receiver at mouth of Edisto was lost in April of 2013. Prior to that Atlantic sturgeon were registered on 4/5/13.

Short nosed sturgeon were registered at mouth of Edisto on 3/20/13, 3/11/13, 1/14/13 – Edisto receiver is 8.29 miles away

E

Appendix E - NOAA- NMFS Sea Turtle Construction Conditions



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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

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

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