Biological Assessment for US Fish and Wildlife Species

October 4, 2019

Contents

Tables

Figures

Appendices

1.0 Introduction

This biological assessment, prepared by HDR Inc. on behalf of Charleston County, 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.

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 transportation project on species that are federally listed under the ESA and under the jurisdiction of USFWS. A separate biological assessment has been prepared for species under the jurisdiction of the NOAA-NMFS

1.1 Project Description

To accommodate an increase in traffic volume, Charleston County, the Town of Mount Pleasant, and SCDOT are partnering to improve roadway capacity and ease traffic congestion along Highway 41. The study corridor includes the existing SC 41 roadway and bridges from US 17 in Charleston County, to approximately 300 feet south of the intersection of Bennington Drive, in Berkeley County, SC. The project includes improvements to the intersection of SC 41 and US 17 and completion of the tie in of Gregory Ferry Road to SC 41 near US 17. The study corridor also includes US 17 from the intersection with Hamlin Road to the entrance to Oakland Plantation and an expanded study area around Laurel Hill County Park and the Phillips Community between Bessemer Road and Dunes West Boulevard. The purpose of the expanded study area is to fully evaluate the potential project effects on the County Park, adjacent communities, and associated roadways. The study corridor also includes a 300-foot wide corridor on either side of the centerline on Dunes West Boulevard and Bessemer Road.

The study corridor also includes crossings of Horlbeck, Mill and Wagner Creeks and the Wando River. This section of SC 41 serves as a minor arterial that has experienced an increase in traffic due to regional growth, and currently sustains operations that exceed capacity and are projected to worsen over time. The existing two-lane roadway would be widened to four lanes, with a center median and multi-use pathway. No construction work would occur within the Wando River, as the recently-replaced SC 41 Bridge over the Wando River would accommodate the proposed improvements.

As a result of more detailed analysis, and public comment, two reasonable alternatives (Alternatives 1 and 7a) were identified that best meet the purpose and need while minimizing impacts to human and natural resources within the project study area. Field studies and surveys were conducted within 300 feet of each alternative for potential impacts to federally listed threatened and endangered species and critical habitat. These alternatives will be carried forward for public review and comment. The results of the surveys and recommended effects are listed in the following species descriptions. The study area surrounding Alternative 1 and Alternative 7a are included in **Error! Reference source not found.** through **Error! Reference source not found.**. A proposed alternative will be submitted to the U.S. Army Corps of Engineers as part of a Joint Clean Water Act Section 404 application.

1.2 Project Area and Setting

The project area is located in southern Berkeley County and central Charleston County in the Lower Coastal Plain of South Carolina. The project area is located within the Cooper River watershed (Hydrologic Unit Code, or HUC 03050201) and Sea Islands/Coastal Marsh Level IV ecoregion. Specifically, the proposed project lies in the Wando River sub-watershed. The land uses within the immediate vicinity of the project study area include incorporated areas, vacant/undeveloped areas, agriculture, estuarine and marine wetlands and deepwater, freshwater wetlands, residential, commercial, industrial, public/institutional, and parks/recreation/open space.

This area of Berkeley and Charleston counties is experiencing tremendous growth, primarily due to planned residential and commercial developments. The commercial growth is primarily located in the Charleston County portion of the study area, whereas, residential growth is primarily located in the Berkeley County portion of the study area, to the north of the Wando River in and around the Cainhoy community.

1.3 Consultation History

A Letter of Intent (LOI) was distributed on July 13, 2017, to stakeholder agencies 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. The USFWS has not provided a response letter or species list.

A biological assessment was completed for the SC 41 Bridge Replacement over the Wando River, which is within the study area, and is included as part of the SC 41 Bridge Environmental Assessment dated May 2010.

Figure 1. Overview of Project Location

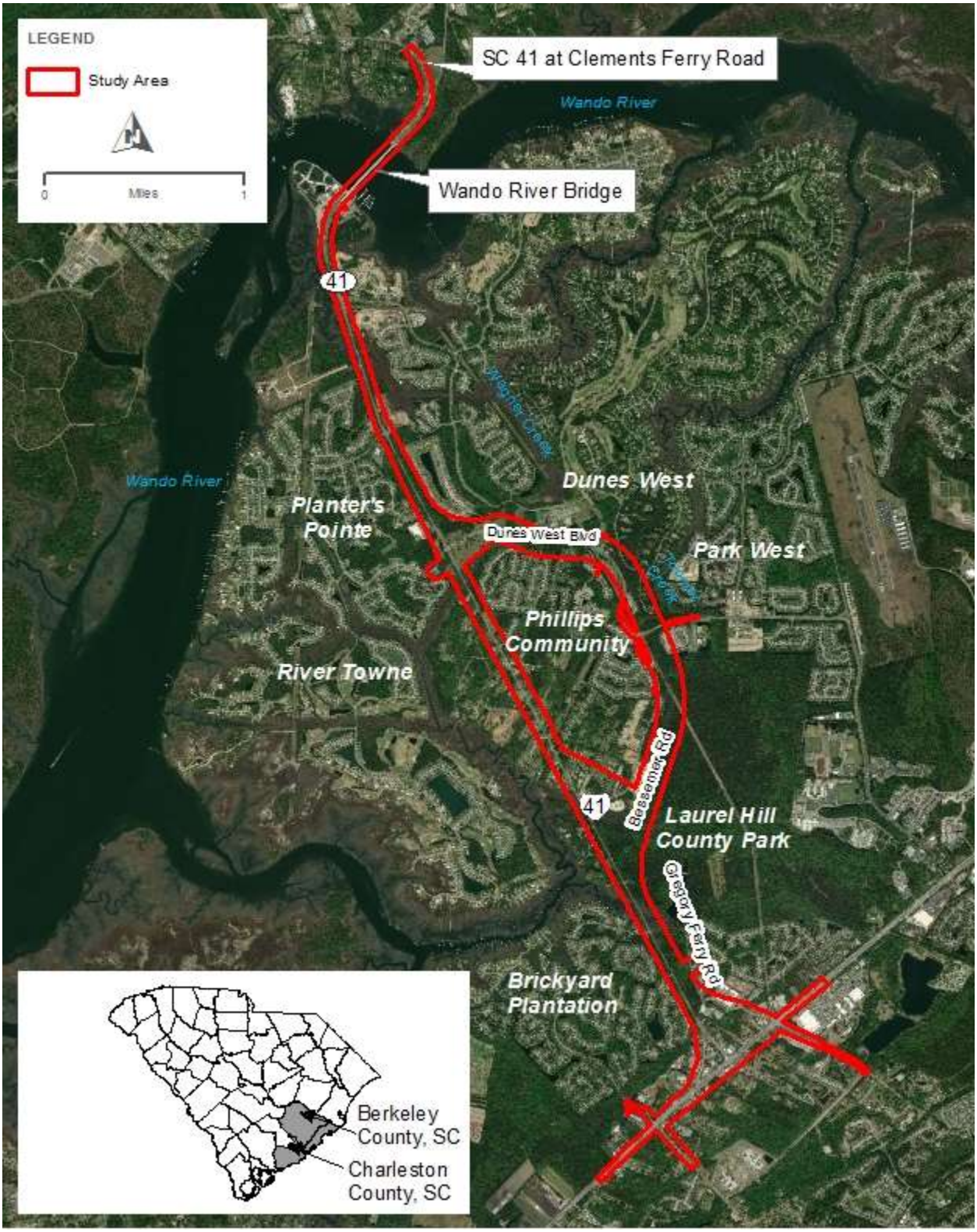


Figure 2. Detailed View of Project Location

2.0 Environmental Baseline

2.1 Coastal Habitats

The salt marshes are estuaries of Horlbeck Creek, Mill Creek, and the Wando River. The salt marsh throughout the surveyed project area is a mosaic of high marsh; dominated by sea oxeye (*Borrichia frutescens*) and black needlerush (*Juncus roemerieanus*) and fully inundated or low marsh; dominated by smooth cordgrass (*Spartina alterniflora*) and mud flats. Common macrobenthic species in the salt marsh include fiddler crabs (*Uca pugnax*), ribbed mussels (*Geukensia demissa*), and periwinkle snails (*Littoria irrorata*).

Freshwater wetlands identified within the project study area are characterized by a tree canopy consisting of laurel oak (*Quercus laurifolia*), sweet gum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and slash pine (*Pinus elliotti*). The shrub strata consists primarily of dwarf palm (*Sabal minor*), wax myrtle (*Morella cerifera*), Chinese privet (*Ligustrum sinense*), and sweet gum. The herbaceous strata is composed of bladder sedge (*Carex intumescens*), royal fern (*Osmunda regalis*), netted chain fern (*Woodwardia areolata*), and slender spike grass (*Chasmanthium laxum*).

Terrestrial or upland habitats adjacent to the salt marsh primarily consist of the Highway 41 roadway, along with residential and commercial developments. Upland habitats associated with the undeveloped forests include a tree stratum consisting of water oak (*Quercus nigra*), loblolly pine (*Pinus taeda*), sweet gum, and red maple with a shrub stratum of wax myrtle and Chinese privet. The herbaceous/woody vine stratum in these habitats is primarily composed of yellow jasmine (*Gelsemium sempervirens*), common green briar (*Smilax rotundifoila*), muscadine (*Vitis rotundifolia*), and Japanese honeysuckle (*Lonicera japonica*).

2.2 Water Quality

The project area is located within the Cooper River watershed (HUC 03050201) and the Wando River sub-watershed. The watershed is located in Berkeley and Charleston Counties and consists primarily of the Wando River and its tributaries. The watershed occupies 72,340 acres of the Coastal Zone region of South Carolina. Land use/land cover in the watershed includes: 33.1% forested land, 22.6% forested wetland, 17.0% non-forested wetland, 16.8% urban land, 7.7% water, 2.4% agricultural land, and 0.4% barren land (SCDHEC, 2017a).

The Wando River headwaters flow through I'on Swamp (Mayrants Reserve) and accepts drainage from Alston Creek, Darrell Creek, Deep Creek, Toomer Creek, and Wagner Creek before receiving Guerin Creek drainage (Lachicotte Creek, Old House Creek, Fogarty Creek) near Cat Island. I'on Swamp and Guerin Creek drainages flow through the Francis Marion National Forest. Johnfield Creek enters the river downstream followed by Horlbeck Creek, Boone Hall Creek, Foster Creek, Beresford Creek (Martin Creek, Sanders Creek, Hopewell Creek), Ralston Creek, Rathall Creek, Bermuda Creek, Hobcaw Creek, and Molasses Creek. The Wando River then drains into the Cooper River, which flows into the Charleston Harbor. There are a total of 46.3 stream miles, 38.7 acres of lake waters, and 5,408.6 acres of estuarine areas in this watershed (SCDHEC, 2017a).

SCDHEC has classified the Wando River at SC 41 as a Shellfish Harvesting Water (SFH). Class SFH waters are tidal saltwaters protected for shellfish harvesting and uses listed in Class SA and Class SB. Class SA and SB waters are suitable for primary and secondary contact recreation, crabbing, fishing, and

for the survival and propagation of a balanced indigenous aquatic community of marine fauna and flora. However, SCDHEC may designate prohibited areas where shellfish harvesting for market purposes or human consumption shall not be allowed (SCDHEC 2017a).

In addition to determining water quality classifications and standards, SCDHEC develops a priority list of water bodies that do not currently meet State water quality standards pursuant to Section 303(d) of the CWA and 40 CFR 130.7. This list is developed by SCDHEC on a biannual basis, and reviewed and approved by the U.S. Environmental Protection Agency (USEPA). It is commonly referred to as the 303(d) List of Impaired Waters and can be obtained from SCDHEC, Bureau of Water (SCDHEC 2017b).

To monitor the Wando River's water quality, SCDHEC has established 22 shellfish monitoring stations, 8 of which are located within 1.6 miles of the project study area, and 8 ambient water quality monitoring sites, 2 of which are located within 1 mile of the project study area (Table 1). Shellfish monitoring station 09B-03 and ambient water quality monitoring site (MD-115) are the closest, located on the Wando River at the SC 41 Bridge.

A TMDL addressing dissolved oxygen was developed for the Charleston Harbor, which covers the Charleston Harbor, Cooper River, Ashley River, and Wando River. A TMDL addressing fecal coliform was developed for the Wando River shellfish sites (SCDHEC 2017c).

Table 1. SCDHEC Monitoring Stations near the Project Area

Station #	Location	Distance from study area (mi)	Use	Impairment Status	Cause of Impairment
MD-115	Wando River at SC 41 Bridge	0 mi	Aquatic Life	Not Impaired	N/A
RT-052100	Boone Hall Creek, 1.5 mi WNW of Intersection of US 17 and SC 41	1.0 mi SW	Recreation	Impaired	Enterococci
09B-02	Wando River at Horlbeck Creek	1.6 mi SW	Shellfish Harvesting	Not Impaired	N/A
09B-03	Wando River at SC 41 Bridge	0 mi	Shellfish Harvesting	Not Impaired	N/A
09B-07	Boone Hall Creek, Opposite County Recreation Area	1.1 mi SW	Shellfish Harvesting	Impaired	Fecal Coliform
09B-08	Wando River at Marker #29	1.0 mi W	Shellfish Harvesting	Not Impaired	N/A
09B-11	Wando River at Guerin Creek	1.1 mi E	Shellfish Harvesting	Not Impaired	N/A
09B-17	Wando River Midway Between Stations 3 and 11 (at Old Dry Dock)	0.3 mi E	Shellfish Harvesting	Not Impaired	N/A
09B-21	Horlbeck Creek at Power Line Crossing	1.1 mi SW	Shellfish Harvesting	Not Impaired	N/A
09B-22	Wando River at Foster Creek	1.4 mi W	Shellfish Harvesting	Not Impaired	N/A

3.0 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 A). Federally-endangered and threatened species under the exclusive jurisdiction of USFWS and under shared jurisdiction with NOAA-NMFS considered in this document are identified in Table 2. No candidate species or USFWS-designated critical habitat for federally-listed species exists within the study area..

Table 2. ESA Federally Threatened and Endangered Species

Common Name	Scientific Name	Federal ESA Designation	Critical Habitat Designated?	Presence of Suitable Habitat Within Project Area	Effect Determination
American chaffseed	*Schwalbea americana*	Endangered	No	No	No Effect
Canby's dropwort	*Oxypolis canbyi*	Endangered	No	No	No Effect
Pondberry	*Lindera melisifolia*	Endangered	No	Yes	No Effect
Seabeach amaranth	*Amaranthus pumilus*	Threatened	No	No	No Effect
West Indian manatee	*Trichechus manatus*	Threatened	Yes	Yes	No Effect
Northern long-eared bat	*Myotis septentrionalis*	Threatened	No	No	No Effect
Frosted flatwoods salamander	*Ambystoma cingulatum*	Threatened	Yes	No	No Effect
Green sea turtle	*Chelonia mydas*	Threatened	Yes	No	No Effect
Kemp's Ridley sea turtle	*Lepidochelys kempii*	Endangered	No	No	No Effect
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	Yes	No	No Effect
Loggerhead sea turtle	*Caretta caretta*	Threatened	Yes	No	No Effect

Common Name	Scientific Name	Federal ESA Designation	Critical Habitat Designated?	Presence of Suitable Habitat Within Project Area	Effect Determination
Bachman's warbler	*Vermivora bachmani*	Endangered	No	Yes	No Effect
Eastern black rail	*Laterallus jamaicensis jamaicensis*	Proposed	No	Yes	No effect
Kirtland's warbler	*Setophago kirtlandii*	Endangered	No	Yes	No Effect
Piping plover	*Charadrius melodus*	Threatened	Yes	No	No Effect
Red-cockaded woodpecker	*Picoides borealis*	Endangered	No	No	No Effect
Rufa red knot	*Calidris canutus rufa*	Threatened	No	No	No Effect
Wood stork	*Mycteria americana*	Threatened	No	Yes	May Effect but Not Likely to Adversely Affect

Figures Figure 3 through Figure 6 are maps of potential suitable habitat within the project area. Figures 3 through 6 display several locations within the project area that contain potential habitat for the wood stork. These areas contain bottomland hardwood forests with a semi-open canopy and water up to 12 inches deep.

NOAA-NMFS and 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 for the marine environment. NOAA-NMFS has sole jurisdiction over the Shortnose sturgeon (*Acipenser brevirostrum*) and the Atlantic sturgeon (*Acipenser oxyrinchus*). Potential impacts to the shortnose sturgeon and the Atlantic sturgeon are discussed in a separate biological assessment specifically addressed to the NOAA-NMFS.

The Bald Eagle (*Haliaeetus leucocephalus*) is protected under the Bald and Golden Eagle Protection Act (BGEPA) and Migratory Bird Treaty Act (MBTA) and is discussed in this biological assessment.

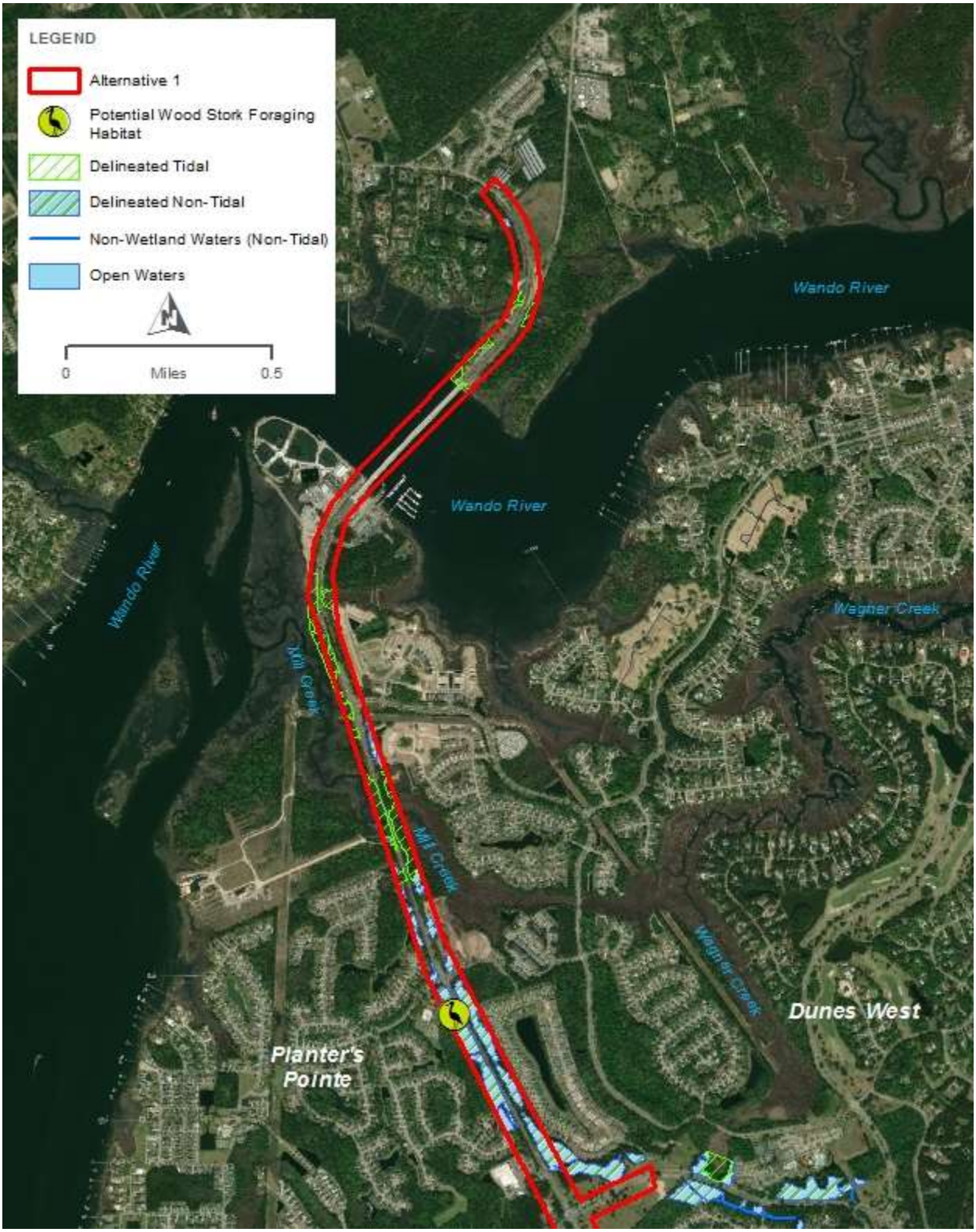


Figure 3. Potential Habitat for Threatened and Endangered Species, Alternative 1 (North)

Figure 4. Potential Habitat for Threatened and Endangered Species, Alternative 1 (South)

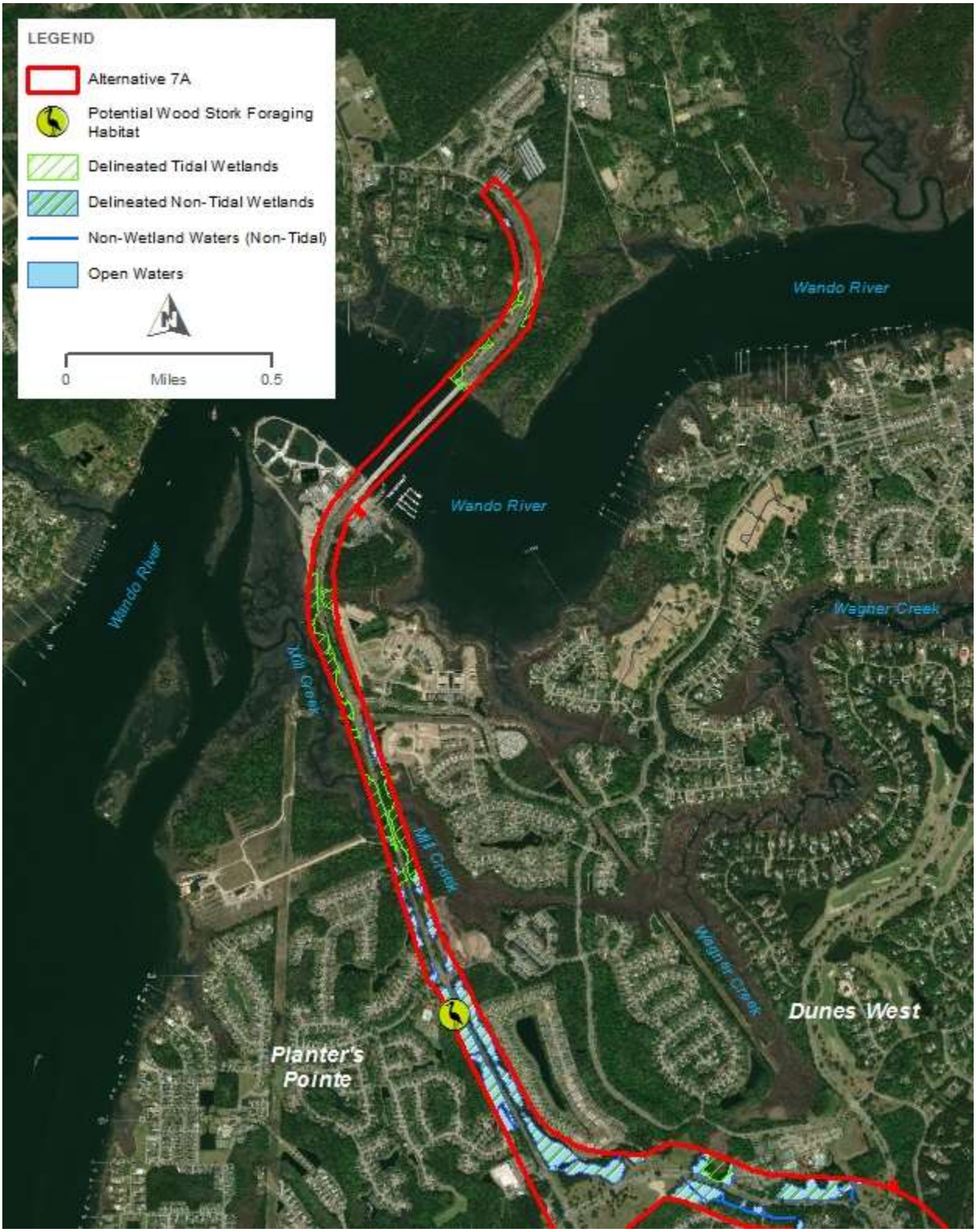


Figure 5. Potential Habitat for Threatened and Endangered Species, Alternative 7A (North)

Figure 6. Potential Habitat for Threatened and Endangered Species, Alternative 7A (South)

3.1 American chaffseed (*Schwalbea americana*)

American chaffseed was listed as an endangered species in 1992. American chaffseed is a perennial herb approximately 1 to 2 feet in height, with mostly unbranched stems. The 2-lipped flowers are yellow with purple highlights and bloom from April through June in its historical southern range. This plant is considered a parasite as it obtains nutrients directly from the roots of many other woody and herbaceous plants.

A recovery plan exists for this species and was issued in 1995 (USFWS 1995). American chaffseed is found primarily in the coastal plain along the Atlantic and Gulf Coasts. Its historic range is from Florida to Massachusetts and westward to east Texas. Currently, American chaffseed occurs in New Jersey, North Carolina, South Carolina, Georgia, and Florida (USFWS 2017). The USFWS has not designated critical habitat for this species.

Its preferred habitat is in open pine flatwoods, bogs, palustrine pine savannahs, and lowland pine forests; as it requires acidic-sandy or peaty soils. American chaffseed is dependent on factors such as fire, mowing, or fluctuating water tables to maintain the crucial open to partly-open conditions that it requires (USFWS 2017). The USFWS Recovery Plan (USFWS 1995) documented 42 occurrences of this species in South Carolina; including occurrences in both Berkeley and Charleston Counties. Threats to American chaffseed include habitat destruction and fire exclusion (USFWS 2017). A field survey was conducted by HDR biologists between August 7 and August 11, 2017 for Alternative 1 and July 18, 2019 for Alternative 7a during American chaffseed flowering season, with no plants being observed. As the proposed project does not include the required habitat, it is expected to have **"no effect"** on the American chaffseed.

3.2 Canby's dropwort (*Oxypolis canbyi*)

Canby's dropwort was listed as an endangered species in 1986. Canby's dropwort is a perennial plant found in the South Carolina Coastal Plain with erect stems and stands 2.6 to 3.9 feet tall (USFWS 2010). The leaves are slender, hollow and quill like, and the flowers are compound umbels with white petals that appear from mid-August to early October, giving off a slight dill odor. The flowers fruits are 4 to 6 millimeters (mm) in length, with prominent wings, and will split into multiple single seeded parts upon maturation. Canby's dropwort reproduces primarily via asexual means through rhizomes.

A recovery plan exists for this species and was issued in 1990. Canby's dropwort has been found in natural ponds dominated by pond cypress, grass-sedge dominated Carolina bays, wet pine savannas, shallow pineland ponds and cypress-pine swamps or sloughs Canby's dropwort has been documented in Delaware, Georgia, Maryland, North Carolina and South Carolina (USFWS 2011a). The USFWS has not designated critical habitat for this species.

Populations have been identified in the following South Carolina counties: Allendale, Bamberg, Barnwell, Berkeley, Clarendon, Colleton, Florence, Hampton, Richland, Sumter, and Williamsburg (NatureServe 2014a). Loss or degradation of wetlands is the primary threat to Canby's dropwort (USFWS 2011).

A field survey was conducted by HDR biologists between August 7 and August 11, 2017, for Alternative 1, during Canby's dropwort flowering season, with no plants being observed. Additionally, no habitat for Canby's dropwort was observed during the field survey. A survey of Canby's dropwort habitat in Alternative 7a occurred August 22, 2019, during the flowering season. No plants were found; therefore, the proposed project is expected to have **"no effect"** on the Canby's dropwort.

3.3 Pondberry (*Lindera melissifolia*)

Pondberry was listed as an endangered species in 1986. The USFWS prepared a recovery plan for this species in 1993. Pondberry is a dioecious deciduous shrub from 1.6 to 6.5 feet in height and usually grows in large clonal clumps. The small yellow flowers bloom from March to April and the fruits mature in early fall. When crushed, the leaves give off a lemony-sassafras odor.

The USFWS has not designated critical habitat for this species. Pondberry is known to occupy a variety of habitats from freshwater bogs, fens, and forested wetlands to hardwood forests, as long as its hydrological requirements are met. It's usually found in shaded areas but is able to tolerate full sun. The pondberry's range is primarily the Atlantic coastal plain from Florida to North Carolina and along the Gulf coastal plain from Alabama to Mississippi. South Carolina's documented populations have been found in Beaufort, Berkeley, and Colleton Counties (NatureServe 2014b). The major threat to the continued existence of pondberry is alteration or destruction of its habitat through land-clearing, drainage modification, or timber-harvesting.

Forested wetlands exist throughout the study area so suitable habitat is present. Field surveys were conducted within suitable habitat in the study area for Alternative 1 on February 13 and 14, 2018, which is within the USFWS designated survey window. No plants were observed. An additional survey was performed within the suitable habitat for each reasonable Alternative 7a on April 8, 2019 which is outside the optimal USFWS optimal survey period. No plants were identified during the survey. As such, the project is expected to have **"no effect"** on the Pondberry.

3.4 Seabeach amaranth (*Amaranthus pumilus*)

Seabeach amaranth is annual herb that grows on beach sand dunes along the Atlantic Coast of the United States. Its preferred habitat is barrier island beaches on overwash flats at the accreting ends of the islands, in the lower foredunes. The plant is intolerant of vegetation competition and therefore functions as a "fugitive species", seeking favorable habitat when immediately available. The seeds have been known to survive several years buried in the sand, germinating when brought to the surface by severe weather events (NatureServe 2017a). Although their flowers and fruits are relatively inconspicuous, the reddish colored leaves are dominated by diagnostic indented veins that are clustered near the tip of the stem. Once germination completes, the sprig begins to rapidly branch into a clump reaching 30 cm in diameter with 5 to 20 branches (USFWS 2011b). The USFWS has not designated critical habitat for this species. No suitable habitat for Seabeach amaranth exists within the study area. As the proposed project does not include the required habitat, it is expected to have **"no effect"** on Seabeach amaranth.

3.5 West Indian manatee (*Trichechus manatus*)

The West Indian manatee was listed as endangered in 1967 and critical habitat was designated in 1976. A recovery plan exists for this species and was issued in 1980 and updated in 1989 and 1996. In July 2014, the USFWS began a 5-year review and status review to reclassify the manatee as threatened.

The West Indian manatee (*Trichechus manatus*), is a large brown/gray herbivorous marine mammal reaching 10 to 13 feet in length and up to 1,000 pounds (lbs.) in weight. They are classified as sirenians, which are slow moving, herbivorous mammals found in coastal habitats. Manatees have large flattened tails and paddle-like forelimbs. Females reach breeding age from 7 to 9 years of age and males from 9 to 10 years of age with longevity extending more than 50 years. Manatees are usually solitary; however they sometimes cavort in large groups or can be found in mating herds.

Manatees are marine species, although they are attracted to freshwater outlets. They prefer slow moving waters 3 to 6 feet deep and feed on marsh grasses, floating vegetation, and algae. Manatees often inhabit areas with turbid and noisy conditions (FWC 2007). The most significant threat faced by manatees is death or serious injury from vessel collisions (USFWS 2003a, FWC 2007). Manatees cannot survive prolonged exposure to water temperatures below 18°C (65°F) (MMC 2015). The U.S populations appear to originate from Florida, but transient groups and individuals can be found in Alabama, Georgia, and South Carolina coastal waters during the summer months (NatureServe 2014c). The USFWS designated critical habitat for the West Indian manatee is limited to portions of coastal southern Georgia and Florida. The Wando River, located at the north end of the project area, contains suitable habitat for the West Indian manatee. However, no construction is expected to occur within the Wando River during this project. As such, the project is expected to have **"no effect"** on the West Indian manatee.

3.6 Northern long-eared bat (*Myotis septentrionalis*)

During the winter months, the northern long-eared bat (NLEB) can be found hibernating in caves and mines, known as hibernacula. NLEB use various sized caves or mines with constant temperatures, high humidity, and no air currents. During the summer months, NLEBs roost underneath bark, in cavities or in crevices of both live trees and dead trees. They have also been found rarely roosting in structures, like barns and sheds. Five individuals were found in the Francis Marion Forest (Charleston and Berkeley Counties) in 2017. Additionally, a lactating female was one of the five bats captured, which indicates that they are reproducing near the area of capture (SCDNR 2017a). No hibernacula or maternity roosting trees have been found near the study area. The USFWS has not designated critical habitat for this species. As the proposed project does not include the required habitat, it is expected to have **"no effect"** on the Northern long-eared bat.

3.7 Frosted flatwoods salamander (*Ambystoma cingulatum*)

The frosted flatwoods salamander was listed as a threatened species in 1999. The frosted flatwoods salamander has a black body with varying amounts of gray dorsal markings that create a net-like appearance. Adults reach lengths of 1 to 1.3 inches and can weigh up to 0.4 ounces. Adults migrate to breeding waters (at distances up to 1.0 mile) on wet evenings with low barometric pressure between October and January. Breeding habitats are usually ephemeral freshwater wetlands less than 20 inches deep dominated by pond cypress (*Taxodium ascendens*), black gum (*Nyssa sylvatica var. biflora*), and slash pine as well as red maple, loblolly bay (*Gordonia lasianthus*), sweetbay (*Magnolia virginiana*), and sweet gum. The preferred habitat for post larvals include longleaf pine and wiregrass flatwoods and savannas with poorly drained undersoils allowing pooling during seasonal rains (NatureServe 2014d).

A recovery plan does not exist for the frosted flatwoods salamander. Frosted flatwoods salamanders range includes the lower southeastern coastal plain of the U.S. from South Carolina to north-central Florida and westward into southern Georgia, and from there southward into northern Florida. Populations have been identified in Berkeley, Charleston, and Jasper Counties, South Carolina (NatureServe 2014d). USFWS critical habitat has been designated for the frosted flatwoods salamander. The closest critical habitat is to the project area is located approximately 1.94 miles north of the project area (USFWS, GIS Layer, 2017). Suitable habitat was identified for the frosted flatwoods salamander adjacent to the study area. A survey was performed within this habitat on April 29, 2019. No specimens were identified during the survey. As such, the project is expected to have **"no effect"** on the frosted flatwoods salamander.

3.8 Bachman's warbler (*Vermivora bachmanni*)

The Bachman's warbler is one of the smallest warblers in the U.S. with a total length of only approximately 4 inches, and is considered to be the rarest songbird native to the U.S. The male's nape and back are olive green, but the forehead, lores, eye ring are yellow. The male birds are also distinguished by a yellow chin, breast, shoulder patch, and belly, with a black crown and throat. The female's nape and back are similar to the males but lacks the black coloration and the yellow coloration around the lores, eye rings, and chin, and the female's eye rings are white in color. Eggs are laid between March and June with typical clutch sizes of 3 to 4 eggs. This species is vulnerable to nest parasitism by brown-headed cowbirds (*Molothrus ater*) (USFWS 2016).

Bachman's warblers preferred breeding habitat is wet woodlands and forested swamps but they are also adapted to wet canebreaks and bamboo thickets. They have been known to nest in gallberry bushes, blackberry vines, and switch cane. Considered to be an invertivore (feeding primarily on insects and other invertebrates), they may also seek nectar during the winter months as they are known to frequent flowers (NatureServe 2017b). A comprehensive search for the birds was performed throughout the State of South Carolina between 1975 and 1979 and no individuals were found. The last siting in the southeast was near Melbourne Florida in 1977 and the last siting in the entire country was in Louisiana in August of 1988 (USFWS 2016). The USFWS has not designated critical habitat for this species. Marginal habitat for migrating warblers may exist within the study area in thickets and forested wetlands. However, the species has not been observed in over 30 years. As such, the project would have "**no effect**" the Bachman's warbler.

3.9 Eastern Black Rail (Laterallus amaicensis spp.)

The black rail is the smallest North American rail with both males and females averaging 6 inches in length and weighing 1.1 oz. The male black rails are blackish gray on the head breast and upper abdomen with a brown nape patch and small white spots on the lower back, wings, rump, and tail. Females are noticeably lighter gray and have whitish throats (NatureServe, 2019). Both adult males and females are short billed and have scarlet red eyes – changing from their birth color of amber (USFWS, 2014)

Black rail nests are constructed in dense vegetation just a few inches above the ground surface (Harrison, 1979). The nest itself is constructed of woven dead and live vegetation and is covered by a dome arch of grass. The eggs are oval in shape and are white in color sprinkled with fine brown dots (Harrison, 1975). The black rail diet is diverse, consisting of aquatic plant seeds, insects, and isopods (Terres, 1980)

Black rail population estimates range from 5,000 – 50,000 individual birds, but are on the decline (NatureServe, 2019). Declining numbers are directly correlated with loss of ideal habitat – high marsh coastal wetlands. In South Carolina, the black rail makes its home primarily in the outer coastal plain, with scattered inland populations (USFWS, 2014).

The species is listed in South Carolina and is known to occur in the lowcountry in the summer during breeding months. Some habitat may exist within the project area, however, the proposed project and associated action is not anticipated to have any effects. As such, the project will have "**no effect"** on the eastern black rail.

3.10 Kirtland's warbler (*Setophaga kirtlandii*)

Kirtland's warbler was listed as an endangered species in 1967. A recovery plan exists for this species and was issued in 1985. The Kirtland's warbler is a coastal migrating songbird reaching 6 inches in length and 0.45 ounces in weight. They have blue-gray plumage with black streaks and a yellow underbelly. Eggs are usually laid between late May and June and chicks are fledged between 8 and 12 days after hatching. Nest mortality is generally a result of predation by American crows, blue jays, hognose and garter snakes, and squirrels (NatureServe 2014e).

The Kirtland's warbler's preferred breeding habitat is fire generated dense stands of jack pine with little or no hardwoods present. They also nest on the ground at the base of pine trees in their breeding ranges of upper Michigan, Wisconsin, and Ontario, Canada. Their diet primarily consists of berries, tree sap, and insects. Winter migration sightings occur along their route from their breeding habitats to their destination in the Bahamas, including areas of the southeastern coast of the U.S (NatureServe 2014e). The USFWS has not designated critical habitat for this species. Suitable habitat for Kirtland's warbler may exist within the study area during migration periods in spring and fall. Forested edges and thickets bordering salt marshes and freshwater wetlands may provide stopover feeding and resting areas for the warblers; however, impacts to these types of habitats would be minimal and alternate habitats are located within proximity to the project. As such, the project would have "**no effect**" the Kirtland's warbler.

3.11 Piping plover (*Charadrius melodus*)

The piping plover was listed as a threatened species in 1985. This species is part of the USFWS 5-year review initiated in 2014. A recovery plan exists for the Atlantic Coast population of this species and was issued in 1996.

The piping plover is considered small for a shorebird averaging approximately 6.5 to 7.0 inches in length and between 1.6 and 2.3 ounces in weight. They are mostly white in color with a dark band across the front of the crown and black shoulder patches. During breeding season, adult females arrive at the breeding area several weeks after the males have arrived and have established territories. Although monogamous during the breeding season, both males and females usually pick new mates every year. Nests are created on beaches in small depressions in sand with an average clutch size of 4 eggs. The hatchlings fledge 2 hours after hatching but can only run and swim and therefore usually remain within 200 meters (m) of the nest. Flight usually occurs about 18 days after hatching (NatureServe 2014f).

Piping plovers preferred foraging habitat consists of beach dunes, intertidal flats, and tidal pool edges where their diet is composed of worms, fly larvae, beetles, and marine invertebrates. U.S. breeding locations have been documented in the Great Plains, eastern Montana, Minnesota, the Dakotas, southeastern Colorado, Iowa, Nebraska, New York, New Jersey, Massachusetts, Virginia, and North and South Carolina. Wintering populations reside from Florida to North Carolina, and at various locations in the Gulf Coast States (NatureServe 2014f).

The USFWS has identified critical habitat for this species. The primary constituent elements for piping plover critical habitat are found in dynamic coastal areas that support intertidal beaches and flats and associated dune systems and flats above annual high tide (USFWS 2008). Intertidal flats may include sand and/or mud flats with no or very sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers. These habitat components are a result of the dynamic processes that occur on coastal landforms, including erosion, accretion, and storm events. Because of the ever-changing conditions, piping plovers are

dependent on a mosaic of sites distributed throughout the landscape (USFWS 2001). USFWS has identified critical habitat for piping plovers. The closest such habitat is approximately 7.13 miles east of the project area, on Capers Island, SC (USFWS, GIS Layer, 2017). The project area does not contain suitable nesting or foraging habitat for the piping plover. As the proposed project does not include the required habitat, it is expected to have **"no effect"** on the piping plover.

3.12 Red-cockaded woodpecker (*Picoides borealis*)

The red-cockaded woodpecker (RCW) was listed as an endangered species in 1970. The USFWS issued a recovery plan for this species in 2003. The RCW is approximately 7 to 8 inches in length with a 13.5 to 15 inch wingspan. It has a dull white breast with black spots, barred back feathers of black and white, black wings, a black cap, and a telltale large white patch on both cheeks. It gets its name from the distinctive red streaks or "cockades" on the sides of the head which are more visible on males and juveniles than on adult females (Chadwick 2003). RCWs lay their eggs between April and June and their offspring fledge between 26 and 29 days after hatching.

The USFWS has not designated critical habitat for this species. The RCW requires mature stands of longleaf and/or loblolly pine to excavate a living cavity and encircles the cavity with small holes to encourage the flow of tree sap which is believed to protect it from predators (USFWS 2003a). This habitat requires burning which eliminates scrub oaks and other hardwoods which discourage nesting of RCWs. The RCW's historic range extends from New Jersey to Texas and inland to Missouri, but its current range excludes New Jersey, Maryland, and Missouri (NatureServe 2017c). Populations have been identified in the Francis Marion National Forest, parts of which are located in both Charleston and Berkeley Counties (NatureServe 2017c). The project area does not contain suitable nesting or foraging habitat for the RCW. As the proposed project does not include the required habitat, it is expected to have **"no effect"** on the Red-cockaded woodpecker.

3.13 Rufa red knot (*Calidris canutus rufa*)

The rufa red knot (RRK) was listed as a threatened species in 2015. The USFWS has not issued a recovery plan or critical habitat for this species. The RRK is approximately 9 to 11 inches in length with an average wingspan of 22 inches. The RRK is about the size of a robin with a mottled pattern of black, gray, and rose colored feathers on its back and a rose underbelly reaching up through the throat and around the eyes (Fretwell 2014). They feed primarily on horseshoe crab eggs along their US Atlantic Coast seasonal migration route but have also been known to feed on mollusks and marine worms (USFWS 2010, NatureServe 2014g).

Delaware Bay and coastal Virginia remain their largest concentration areas during their spring and fall migrations, but overwintering populations have been observed on sandy beaches and in mud flats on the South Carolina coast. RRK nests are found on the ground in shallow depressions lined with leaves and lichens near water. Clutch size is between 3 and 4 eggs which are incubated for approximately 3 weeks. Chicks fledge between 18 and 20 days after hatching (SCDNR 2014). Threats to the RRK include loss of habitat caused by shoreline hardening and development and the loss of prey. The USFWS has not designated critical habitat for this species. The project area does not contain suitable nesting or foraging habitat for the RRK. As the proposed project does not include the required habitat, it is expected to have **"no effect"** on the Rufa red knot.

3.14 Wood stork (*Mycteria americana*)

The wood stork was listed as an endangered species in 1984. In 2014, the species was reclassified as threatened. The USFWS revised the recovery plan for the wood stork in 1997. Adult wood storks are one of the largest wading birds in North America with a wingspan of 59 to 65 inches and a head to tail length of 33 to 45 inches (Ogden 1996). They are all white in color except for the black primary and secondary wing and tail feathers, and a long thick black bill.

The USFWS has not designated critical habitat for this species. Their habitats consist of cypress swamps, bottom-land hardwood forests, tidally influenced freshwater wetlands, and abandoned rice fields maintained for water fowl, but also feed in saltwater marshes (Brooks 2007). Additionally, the "Habitat Management Guidelines for the Wood Stork in the Southeast Region", indicates that narrow tidal creeks also provide valuable feeding areas for wood storks (USFWS 1990). In estuarine environments, nesting and roosting sites may occur on islands surrounded by broad expanses of open water (USFWS 1990). Wood storks generally nest in colonies from February to April and lay eggs from March to late May. Hatchlings usually emerge from early May to mid-June and fledge in July or August.

The wood storks historic breeding range is from South Carolina and Florida to Mexico, Central America, Cuba, and Northern Argentina. Today's North American populations are increasing in South Carolina primarily due to migration from Florida as a result of decreasing habitat. SCDNR conducts a wood stork monitoring program aimed at improving habitats and encouraging yearlong residents as oppose to the transient populations that traditionally returned to Florida for breeding. During the late 1980's and early 1990's, South Carolina nesting pairs have increased from 11 pairs to 829 pairs and eventually increased to 2,010 pairs in 2006 (USFWS 2007). The wood stork species was recently reclassified to threatened (2014) when an average of 6,000 nesting pairs were recorded and more than 1.5 chicks per year reached fledgling age, over a 3 year period (USFWS 2014; Rodgers et al. 2008). Continuing threats for the wood stork include loss of wetland habitat, water management, predation, and human disturbance.

Figures 3 - 6 display locations within the two reasonable alternatives that contain potential foraging habitat for the wood stork. These areas contain bottomland hardwood forests with a semi-open canopy and water up to 12" deep. These areas are suitable for foraging but not breeding. Salt marshes and tidal creeks within the corridor also provide foraging habitat. No roosts or rookeries were observed during the survey. As such, the project "**may effect but not adversely affect**" the wood stork.

3.15 Bald Eagle (*Haliaeetus leucocephalus*)

Bald eagles were listed as endangered species in 1978. Bald eagles were removed from the endangered species list in August 2007 because their populations recovered sufficiently. Bald eagles are now protected under the MBTA and the BGEPA.

The bald eagle gets its name from the distinctive white head of mature adults (6 years of age). Adults' tails are also white but their remaining plumage is dark yet they have a bright yellow bill and yellow eyes. Bald eagles are found in all 48 contiguous US states as well as Alaska (NatureServe 2014n). Their body length ranges from 31 to 37 inches and wingspan from 70 to 90 inches (NGS 1983), weighing upwards of 14 pounds. Bald eagles in South Carolina are smaller than their northern brethren however, with a mean weight of 7.14 pounds and a mean wing span of 74 inches (SCDNR 2010). Bald eagle breeding habitat is generally within approximately 2.5 miles of water bodies including rivers, lakes, reservoirs, bays, and other coastal areas with abundant fish and/or waterfowl populations. Nesting areas usually occur in large tall trees able to support their 4 to 6-foot-wide nests, and may be used year after year or may be alternated with another

nest in successive years. Additionally, nesting sites are primarily chosen in areas with limited disturbance. Eggs are laid between October and March with clutch sizes of 1 to 3 eggs. Chicks usually fledge by 12 weeks but often remain in the same territory for an additional 6 weeks as they are still dependent on the adults for food (NatureServe 2017d).

The USFWS has not designated critical habitat for this species. No nests were observed during the field survey and SCDNR's Bald Eagle Google Earth dataset was consulted to determine if a bald eagle nests have been documented within 660 feet of the project area. As of December 31, 2018, no nests have been documented to exist within 660 feet of the project area (SCDNR 2018). The closest nest is Nest #941, located approximately 1 mile east of the project study area at 32°54'49.83"N, 79°49'40.02"W. The Wando River within the study area may provide suitable foraging habitat for the bald eagle; however, construction activities are not planned within the Wando River. As such, the project is expected to have **"no effect"** on the bald eagle.

3.16 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.

3.16.1 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 Distinct Population Segments (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 2014h). In South Carolina, their nesting and hatching season would occur between early May and late October (USFWS 2015). Critical habitat has been designated for the green sea turtle in Puerto Rico. The project area does not contain suitable habitat for the green sea turtle; therefore, the proposed project is expected to have **"no effect"** on this species.

3.16.2 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 2014i). 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. The project area does not contain suitable habitat for the Kemp's ridley sea turtle; therefore, the proposed project is expected to have **"no effect"** on this species.

3.16.3 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 2014j).

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. The 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. Twenty one leatherback sea turtle nests have been documented in South Carolina since 1996 (SCDNR 2015).

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 2014j). 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. Critical habitat has been designated for the leatherback sea turtle in the US Virgin Islands. The project area does not contain suitable habitat for the leatherback sea turtle; therefore, the proposed project is expected to have **"no effect"** on this species.

3.16.4 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 near 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 2014l).

Some southeastern U.S. loggerhead sea turtles migrate north in the spring, and south at the beginning of the 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 2014l). The closest critical habitat is located approximately 12.27 miles south west of the project area, at Folly Beach, SC (USFWS, GIS Layer, 2017). The project area does not contain suitable habitat for the loggerhead sea turtle; therefore, the proposed project is expected to have **"no effect"** on this species.

4.0 Migratory Bird Treaty Act

The federal MBTA 16 USC § 703-711, states that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to sell or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. The migratory bird species protected by the Act are listed in 50 CFR 10.13. The USFWS have statutory authority and responsibility for enforcing the MBTA (16 U.S.C. 703–712). Any activity which results in the take of migratory birds is prohibited unless authorized by the USFWS.

The USFWS IPaC online consultation program was used to identify potential migratory birds existing within the project area. Forty species of migratory birds were listed as "may" occur within the project area (Appendix A). The eBird website was used to determine if the migratory bird has been recently observed by others near the project area. Migratory birds observed within the project area during biologist's surveys are documented in Table 3.

Table 3. IPAC list of Migratory Birds that "may" occur in the Project Area

Common Name	Scientific Name	Season	Observed in or near Project Area? Yes [Y], No [N]	Source (within past 5 years)
American Kestrel	*Falco sparverius paulus*	Year-round	N	eBird

Common Name	Scientific Name	Season	Observed in or near Project Area? Yes [Y], No [N]	Source (within past 5 years)
American Oystercatcher	*Haematopus palliatus*	Year-round	N	eBird
Bachman's Sparrow	*Aimophila aestivalis*	Year-round	Y	eBird
Bald Eagle	*Haliaeetus leucocephalus*	Year-round	Y	eBird
Black Skimmer	*Rynchops niger*	Year-round	N	eBird
Clapper Rail	*Rallus crepitans*	Year - round	N	
Common ground dove	*Columbina passerine exigua*	Breeding	N	
Gull-billed Tern	*Gelochelidon nilotica*	Breeding	N	eBird
King Rail	*Rallus elegans*	Wintering	Y	eBird
Least Tern	*Sterna antillarum*	Breeding	N	eBird
Nelson's Sparrow	*Ammodramus nelsoni*	Wintering	N	eBird
Prairie Warbler	*Setophaga discolor*	Breeding	Y	eBird
Prothonotary Warbler	*Protonotaria citrea*	Breeding	N	eBird
Red-headed woodpecker	*Melanerpes erythrocephalus*	Breeding	Y	eBird
Red-throated loon	*Gavia stellata*	Wintering	Y	eBird
Ruddy turnstone	*Arenaria interpres morinella*	Year-round	N	
Seaside Sparrow	*Ammodramus maritimus*	Year-round	N	eBird
Semipalmated Sandpiper	*Calidris pusilla*	Summer – Fall	N	
Short-billed Dowitcher	*Limnodromus griseus*	Wintering	N	eBird
Swallow-tailed Kite	*Elanoides forficatus*	Breeding	Y	eBird
Whimbrel	*Numenius phaeopus*	Wintering	N	eBird
Willet	*Tringa semipalmata*	Year-round	Y	
Wilson's Plover	*Charadrius wilsonia*	Breeding	N	eBird
Wood Thrush	*Hylocichla mustelina*	Breeding	N	eBird

5.0 Conclusion

The review of the habitat requirements and previous records for the federally listed species for Berkeley and Charleston Counties, along with the field observations, conclude that there is very low potential for the presence of any federally protected species within the project area. However, the project area does include limited suitable habitat for several species, including; the wood stork, Kirtland's warbler, and Bachman's warbler. Based on the scope of the work and the limited available habitat, it was determined that the project "**may effect but not adversely affect**" the wood stork. In addition, it was determined that the project would have "**no effect"** on the remaining federally protected species listed for Berkeley and Charleston Counties.

6.0 References

Brooks, Bill. 2007. U.S. Fish and Wildlife Service 5-Year Review of Mycteria americana. U.S. Fish and Wildlife Service Southeast Region, Jacksonville Ecological Services Field Office, Jacksonville FL.

Chadwick, N. Red-cockaded Woodpecker. 2003. Picoides borealis. S.C. Dept. of Natural Resources. http://www.dnr.sc.gov/cwcs/pdf/Redcockadedwoodpecker.pdf.

Fretwell, Sammy. 2014. "Shorebird found in SC now protected by feds." The State.

FWC. 2007. Florida Manatee Management Plan. Florida Fish and Wildlife Conservation Commission.

Harrison, H.H. 1975. "A field guide to bird's nests in the U.S. east of the Mississippi River." Houghton Mifflin Company, Boston, Massachusetts. P. 257.

Harrison, H.H. 1979. "A field guide to western birds' nests." Houghton Mifflin Company, Boston, MA. P. 279.

MMC (Marine Mammal Commission). 2015. Florida Manatee. Retrieved October 15, 2015. http://www.mmc.gov/species/floridamanatee.shtml

NatureServe. 2014a. "Oxypolis Canbyi." NatureServe Explorer: An online Encyclopedia of Life. Accessed October 9, 2014. http://explorer.natureserve.org/servlet/NatureServe?searchName=Oxypolis+canbyi

NatureServe. 2014b. "Lindera melissifolia." NatureServe Explorer: An online Encyclopedia of Life. Accessed October 9, 2014. http://explorer.natureserve.org/servlet/NatureServe?searchName=Lindera+melissifolia

NatureServe. 2014c. "Trichechus manatus." NatureServe Explorer: An Online Encyclopedia of Life. Accessed October 3, 2014. http://explorer.natureserve.org/servlet/NatureServe?searchName=Trichechus+manatus

NatureServe. 2014d. "Ambystoma cingulatum." NatureServe Explorer: An online Encyclopedia of Life. Accessed October 9, 2014. http://explorer.natureserve.org/servlet/NatureServe?searchName=Ambystoma+cingulatum

NatureServe. 2014e. "Septophago kirtlandii." NatureServe Explorer: An online Encyclopedia of Life. Accessed October 9, 2014. http://explorer.natureserve.org/servlet/NatureServe?searchName=Septophaga+kirtlandii

NatureServe. 2014f. "Charadrius melodus." NatureServe Explorer: An online Encyclopedia of Life. Accessed October 9, 2014. http://explorer.natureserve.org/servlet/NatureServe?searchName=Charadrius+melodus

NatureServe. 2014g. "Calidris canutus rufa." NatureServe Explorer: An Online Encyclopedia of Life. Accessed October 12, 2014.

http://explorer.natureserve.org/servlet/NatureServe?searchSciOrCommonName=Calidris+canutus+rufa&x=0&y=0

NatureServe. 2014h. “Chelonia mydas.” NatureServe Explorer: An online Encyclopedia of Life. Accessed October 9, 2014. http://explorer.natureserve.org/servlet/NatureServe?searchName=Chelonia+mydas

NatureServe. 2014i. “Lepidochelys kempi.” NatureServe Explorer: An online Encyclopedia of Life. Accessed October 9, 2014. http://explorer.natureserve.org/servlet/NatureServe?searchName=Lepidochelys+kempi

NatureServe. 2014j. “Dermochelys coriace.” NatureServe Explorer: An online Encyclopedia of Life. Accessed October 9, 2014. http://explorer.natureserve.org/servlet/NatureServe?searchName=Dermochelys+coriacea

NatureServe. 2014k. “Caretta caretta.” NatureServe Explorer: An online Encyclopedia of Life. Accessed October 9, 2014.http://explorer.natureserve.org/servlet/NatureServe?searchName=Caretta+caretta

Natureserve. 2017a. “Amaranthus pumilus.” NatureServe Explorer: An online Encyclopedia of Life. Accessed November 1, 2017. http://explorer.natureserve.org/servlet/NatureServe?searchSciOrCommonName=amaranthus%20pumilus

NatureServe. 2017b. “Vermivora bachmanii.” NatureServe Explorer: An online Encyclopedia of Life. Accessed October 26, 2017. http://explorer.natureserve.org/servlet/NatureServe?searchSciOrCommonName=bachmans%20warbler

NatureServe. 2017c. “Picoides borealis.” NatureServe Explorer: An online Encyclopedia of Life. Accessed October 26, 2017. http://explorer.natureserve.org/servlet/NatureServe?searchSciOrCommonName=Picoides%20borealis

NatureServe. 2017d. “Haliaeetus leucocephalus.” NatureServe Explorer: An online Encyclopedia of Life. Accessed November 1, 2017. http://explorer.natureserve.org/servlet/NatureServe?searchSciOrCommonName=bald%20eagle

NatureServe. 2019. *Laterallus jamaicensis jamaicensis.* NatureServe Explorer: An Online Encyclopedia of Life. Available Online. Accessed July 7, 2019 http://explorer.natureserve.org/servlet/NatureServe?searchName=Laterallus+jamaicensis

NOAA. 2017. GIS Layer: Loggerhead Sea Turtle Critical Habitat. Accessed December 4, 2017.

Ogden, J.C. 1996. Wood Stork (Myceteria americana). Pp. 31-41 in J.A. Rodgers Jr., H.W. Kale II, and H.T. Smith (eds). 1996. Vol. V. Birds, Rare and Endangered Biota of Florida. Univ. Florida Press, Gainesville, FL. 688 pages.

Rodgers, J.A., Schwikert, S.T., Griffin, G.A., Brooks, W.B., Bear-Hull, D., Elliott, P.M., Ebersol, K.J., and Morris, J. 2008. Productivity of Wood Storks (Myceteria americana) in North and Central Florida. Waterbirds 31 (Special Publication 1): 25-34.

SCDNR. 2018. South Carolina's Bald Eagles – Nest Locations. Accessed December 27, 2017. http://www.dnr.sc.gov/wildlife/baldeagle/locations.html

SCDHEC. (2017a). Wando River Watershed. Retrieved from https://www.scdhec.gov/homeandenvironment/docs/03050201-04.pdf

SCDHEC. (2017b, June 22). 2016 303(d) List of Impaired Waters. Retrieved from http://www.scdhec.gov/HomeAndEnvironment/Docs/tmdl_16-303d.pdf

SCDHEC. (2017c). Approved TMDLs. Retrieved from http://www.scdhec.gov/HomeAndEnvironment/Water/ImpairedWaters/ApprovedTMDLs/

South Carolina Department of Natural Resources (SCDNR). 2017a. "Northern long-eared bats found in two new counties, and breeding, on South Carolina's Coastal Plain." DNR News.

SCDNR. 2015. Black Rail. Accessed September 4, 2019. http://www.dnr.sc.gov/wildlife/species/marsh/pdf/USFWSBlackRailFactSheet.pdf

SCDNR. 2015. Leatherback sea turtle. Supplemental Volume: Species of Conservation Concern. SC SWAP.

SCDNR. 2014. Red Knot. Accessed December 16, 2014. http://www.dnr.sc.gov/marine/mrri/acechar/specgal/knotred.htm

SCDNR. 2010. South Carolina's Bald Eagles – Biology. Accessed December 12, 2014. http://www.dnr.sc.gov/wildlife/baldeagle/biology.html

Terres, J. K. 1980. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York.

U.S. Fish and Wildlife Service (USFWS). 2017. "American Chaffseed." https://www.fws.gov/southeast/wildlife/plants/american-chaffseed/#historic-range-section

USFWS. 2016. "Kirtlands Warbler." https://www.fws.gov/midwest/endangered/birds/Kirtland/kiwafctsht.html

USFWS. 2015. Occurrences of Federally Threatened, Endangered, and Candidate Animal Species in South Carolina http://www.fws.gov/charleston/pdf/Regulatory/Survey_Windows_Animals.pd f

USFWS. 2014. Endangered and Threatened Wildlife and Plants; Reclassification of the U.S. Breeding Population of the Wood Stork from Endangered to Threatened. Department of the Interior. Federal Register/Vol. 79, No. 125.

USFWS. 2011a. "Canbys Dropwort." https://www.fws.gov/raleigh/species/es_canbys_dropwort.html

USFWS. 2011b. "Seabeach Amaranth". https://www.fws.gov/raleigh/species/es_seabeach_amaranth.html

USFWS. 2010. Canby's Dropwort (Oxypolis canbyi) 5 Year Review. Summary and Evaluation. p. 17. http://ecos.fws.gov/docs/five_year_review/doc3282.pdf.

USFWS. 2010. Red Knot (Calidris canutus rufa); Spotlight Species Action Plan. U.S. Fish and Wildlife Service, New Jersey Field Office. Pleasantville, New Jersey.

USFWS. 2008. "Piping Plover." https://www.fws.gov/raleigh/pdfs/20080000_PIPLCH_FactSheet.pdf

USFWS. 2007. "Wood Stork (Myceteria americana), 5 Year Review: Summary and Evaluation." Southeast Region Jacksonville Ecological Services Field Office, Jacksonville Florida.

USFWS. 2003a. USFWS's Guidelines for Avoiding Impacts to the West Indian Manatee: Precautionary Measures for Construction Activities in North Carolina Waters.

USFWS. 2003b. Recovery plan for the red-cockaded woodpecker (Picoides borealis): second revision. U.S. Fish and Wildlife Service, Atlanta GA. p. 296.

USFWS. Peters, Dana. 1995. Recovery Plan, American Chaffseed. Region Five, Hadley MA.

USFWS. Ogden, John, C. 1990. "Habitat Management Guidelines for the Wood Stork in the Southeast Region." Wildlife Research Everglades National Park.

This page intentionally left blank.

HIGHWAY 41 CORRIDOR IMPROVEMENTS

Appendix A - USFWS Information for Planning and Conservation Report

Charleston County
Transportation Development

4045 Bridge View Drive, Suite C204, North Charleston, SC 29405

www.hwy41sc.com

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 18, 2017 F/SER47:KH/pw

(Sent via Electronic Mail)

Cal Oyer, P.E.
Project Manager
Charleston County Transportation Development
4045 Bridge View Drive
North Charleston, SC 29405

Mr. Chad Long
Director of Environmental Services
South Carolina Department of Transportation
P.O. Box 191
Columbia, South Carolina 29201

Attention: Nicole Riddle and Mark Mohr

Dear Mr. Long:

NOAA's National Marine Fisheries Service (NMFS) reviewed the request by Charleston County, dated July 13, 2017, requesting input on the Letter of Intent and Exhibit for the proposed SC Highway 41 Corridor Improvements in Charleston and Berkeley Counties. Charleston County coordinated this request with the South Carolina Department of Transportation (SCDOT) and Federal Highway Administration (FHWA). Charleston County proposes to improve approximately 4.6 miles of SC 41 from US 17 in Mt. Pleasant across the new Wando River Bridge to Clements Ferry Road. While Charleston County, SCDOT, and FHWA have yet to identify all proposed improvements, the project will likely include widening the highway and realigning some intersections. As the nation's federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, the NMFS provides the following comments and recommendations pursuant to authorities of the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Essential Fish Habitat in the Project Area
The project study area (shown in Exhibit Figure 1) includes high quality tidal salt marsh with tidal creeks and oyster reef/shell. Additionally, tidal freshwater wetlands may be present. The South Atlantic Fishery Management Council (SAFMC) designates these habitats as essential fish habitat (EFH) within the fishery management 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].

The waters of the Wando River, Mill Creek, Horlbeck Creek, the tidal creeks connected to them, 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 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 project's environmental documentation address these species as well as those managed under the Magnuson-Stevens Act.

Comments on Potential Effects to EFH and Federally Managed Fisheries
While the County, SCDOT, and FHWA are at the early planning stages for many project elements, the NMFS anticipates temporary and permanent impacts to EFH from the proposed project based on the information provided. These impacts will result from clearing, grading, filling, and stabilizing the shoreline for roadway widening and bridge construction. Where the highway intersects or is in close proximity to tidally influenced waters or wetlands, the NMFS recommends use of bridges to the maximum extent practicable to avoid and minimize impacts to marsh habitat. On the northern end of the study area near Mill Creek, there are large sections of the roadway where marsh and tidal creek habitat occurs directly adjacent to the existing side slopes. This is also true on the southern side of the study area near Horlbeck Creek, though to a lesser extent. The NMFS recommends the environmental documentation include a detailed alternatives analysis for various bridging and widening options 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.

Generally, the NMFS recommends designing projects to affect the minimum amount of wetlands necessary to accomplish the project purpose. Activities that may adversely affects fishery habitat should be avoided when less environmentally harmful alternatives are available. For example, projects should avoid filling aquatic habitats, avoid temporary fills for construction purposes, and use only clean fill when filling is necessary. In many locations, permanent fill can be avoided or minimized by bridging aquatic areas. The project should also 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.

Comments on Potential Compensatory Mitigation
Compensatory mitigation may be necessary for the proposed project. The NMFS prefers onsite, in-kind mitigation for impacts to salt marsh habitat at this location. Should there be unavoidable impacts to oyster reef/shell habitat, mitigation could be coordinated with the South Carolina Department of Natural Resources South Carolina Oyster Restoration and Enhancement or Shellfish Research Section and may be one component of a larger mitigation plan. The NMFS

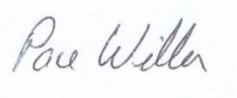
[1] Available at *http://safmc.net/EcosystemLibrary/FEPVolumeIV*

would be happy to assist Charleston County, SCDOT, and FHWA by providing preliminary reviews of any 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 this project will benefit from an EFH assessment. The level of detail in the EFH assessment 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 documents addressing obligation under the National Environmental Policy Act. In either case, the NMFS recommends coordination 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,
MohrAM@scdot.org
Charleston County, Coyer@charlestoncounty.org
FHWA, Jeffery.Belcher@dot.gov
F/SER47, Keith.Hanson@noaa.gov