BIOLOGICAL ASSESSMENT OF POTENTIAL IMPACTS TO THREATENED AND ENDANGERED SPECIES

SWG-2007-01475
GALVESTON COUNTY, TEXAS

U.S. Army Corps of Engineers
Galveston District
2000 Fort Point Road
Galveston, Texas 77550

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Contents

Acronyms and Abbreviations

AOU	American Ornithologist's Union
ATVs	all terrain vehicles
BA	Biological Assessment
BO	Biological Opinion
DA	Department of the Army
ESA	Endangered Species Act
FR	*Federal Register*
GLO	General Land Office
Gulf	Gulf of Mexico
MLLW	mean lower low water
MOU	Memorandum of Understanding
NFWL	National Fish and Wildlife Laboratories
NGO	non-governmental organization
NMFS	National Marine Fisheries Service
NPS	National Park Service
NRC	National Research Council
Applicant	Spoonbill Bay Holdings, L.P.
PCE	primary constituent element
TCESFO	Texas Coastal Ecological Services Field Office
TCEQ	Texas Commission on Environmental Quality
TED	turtle excluder device
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

1.1 PURPOSE OF THE BIOLOGICAL ASSESSMENT

This Biological Assessment (BA) has been prepared to fulfill the U.S. Army Corps of Engineers' (USACE), Galveston District requirements as outlined under Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended. The work is proposed pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. Nine (9) federally listed species of known or potential occurrence in the action area are addressed in this BA: Kemp's ridley sea turtle (*Lepidochelys kempii*), hawksbill sea turtle (*Eretmochelys imbricata*), and leatherback sea turtle (*Dermochelys coriacea*), Attwater's greater prairie chicken (*Tympanuchus cupido attwateri*), all federally listed as endangered, and the loggerhead sea turtle (*Caretta caretta*), green sea turtle (*Chelonia mydas*), West Indian manatee (*Trichechus manatus*), red knot (*Calidris canutus rufa*), piping plover (*Charadrius melodus*), and Eastern black rail (*Laterallus jamaicensis*), all federally listed as threatened (Table 1).

Table 1: Threatened and Endangered Species List

Common Name	Scientific Name	Federal Listing (Endangered / Threatened)	Found Within Proposed Action Area	Not Found Within Proposed Action Area
BIRDS				
Piping plover	*Charadrius melodus*	Threatened	X	
Red knot	*Calidris canutus rufa*	Threatened	X	
Attwater's Greater Prairie Chicken	*Tympanuchus cupido attwateri*	Endangered		X
Eastern Black Rail	*Laterallus jamaicensis*	Threatened	X	
REPTILES				
Green sea turtle	*Chelonia mydas*	Threatened		X
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered		X
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered		X
Leatherback sea turtle	*Dermochelys coriacea*	Endangered		X
Loggerhead sea turtle	*Caretta caretta*	Threatened		X
MAMMALS				
West Indian Manatee	*Trichechus manatus*	Threatened		X

1.2 DESCRIPTION OF THE PROPOSED ACTION

Spoonbill Bay Holdings, L.P. (Applicant) proposes to construct a waterfront canal residential development and associated marina and boat launch. The project would impact a total of 2.73 acres of Waters of the U.S. (Appendix B) within a 98.00-acre tract of land with direct access to Farm-to-Market Road (FM) 3005 and direct access to West Galveston Bay for recreational boating.

2.0 STATUS OF THE LISTED SPECIES

As noted above in Section 1.0, nine federally listed species of known or potential occurrence in the action area are addressed in this BA: Kemp's ridley sea turtle, hawksbill sea turtle, leatherback sea turtle, and the Attwater's prairie chicken, all federally listed as endangered, and the loggerhead sea turtle, green sea turtle, West Indian manatee, red knot, and piping plover, all federally listed as threatened.

2.1 KEMP'S RIDLEY SEA TURTLE

2.1.1 Reasons for Status

The Kemp's ridley sea turtle was federally listed as endangered throughout its range on December 2, 1970 (35 *Federal Register* [*FR*] 18320). Populations of this species have declined since 1947, when an estimated 42,000 females nested in 1 day (Hildebrand, 1963), to a total nesting population of approximately 1,000 in the mid-1980s. The decline of this species was primarily the result of human activities including collection of eggs, fishing for juveniles and adults, killing adults for meat and other products, and direct take for indigenous use. In addition to these sources of mortality, Kemp's ridleys have been subject to high levels of incidental take by shrimp trawlers (NMFS, USFWS, and SEMARNAT, 2011). The National Research Council (NRC) Committee on Sea Turtle Conservation estimated in 1990 that 86 percent of the human-caused deaths of juvenile and adult loggerheads and Kemp's ridleys resulted from shrimp trawling (Campbell, 1995). Before the implementation of turtle excluder devices (TEDs), estimates showed that the commercial shrimp fleet killed between 500 and 5,000 Kemp's ridleys each year (NRC, 1990). Kemp's ridleys have also been taken by pound nets, gill nets, hook and line, crab traps, and longlines.

The Kemp's ridley appears to be in the earliest stages of recovery. In 2011, 20,570 nests were recorded at Rancho Nuevo (Jones, 2012). Similarly, increased nesting activity has been recorded on the Texas beaches. From 1978-2014, 1,667 Kemp's ridley nests were documented in Texas, including 1,606 nests that were protected and 61 that incubated in situ. Of the 1,667 nests, 87.5% were found in south Texas, extending from Mustang Island to the U.S./Mexico border, and 12.5% in north Texas, extending from the upper Texas coast to San Jose Island. Some of these nests were from head-started ridleys (Shaver et al., 2016). In 2012, a record 209 Kemps' ridley nests were

recorded (NPS, 2013), although that number inexplicably dipped to 153 in 2013 and to 119 in 2014 (NPS, 2014).

2.1.2 Habitat

Kemp's ridleys inhabit shallow coastal and estuarine waters, usually over sand or mud bottoms. Adults are primarily shallow-water benthic feeders that specialize on crabs, especially portunid crabs, while juveniles feed on *Sargassum* and associated infauna, and other epipelagic species of the Gulf (NMFS, USFWS, and SEMARNAT, 2011). In some regions, the blue crab (*Callinectes sapidus*) is the most common food item of adults and juveniles. Other food items include shrimp, snails, bivalves, sea urchins, jellyfish, sea stars, fish, and occasional marine plants (Pritchard and Marquez, 1973; Campbell, 1995).

2.1.3 Range

Adults are primarily restricted to the Gulf, although juveniles may range throughout the Atlantic Ocean, as they have been observed as far north as Nova Scotia (Musick, 1979) and in coastal waters of Europe (Brongersma, 1972). Important foraging areas include Campeche Bay, Mexico, and Louisiana coastal waters.

Almost the entire population of Kemp's ridleys nests on an 11-mile stretch of coastline near Rancho Nuevo, Tamaulipas, Mexico, approximately 190 miles south of the Rio Grande. A secondary nesting area occurs at Tuxpan, Veracruz, and sporadic nesting has been reported from Mustang Island, Texas, southward to Isla Aquada, Campeche. Several scattered isolated nesting attempts have occurred from North Carolina southward to Colombia.

2.1.4 Distribution in Texas

The Kemp's ridley occurs in Texas in small numbers. They have nested sporadically in Texas in the last 50 years. Nests were found near Yarborough Pass in 1948 and 1950, and in 1960 a single nest was located at Port Aransas. The number of nestings, however, has increased in recent years: 1995 (4 nests); 1996 (6 nests); 1997 (9 nests); 1998 (13 nests); 1999 (16 nests); 2000 (12 nests); 2001 (8 nests); 2002 (38 nests); 2003 (19 nests); 2004 (42 nests); 2005 (51 nests); 2006 (102 nests); and 2007 (128 nests) (NPS, 2007, 2008). In 2012, a record 209 Kemp's ridley nests were recorded (NPS, 2013); however, that number dipped to 153 in 2013 and to 119 in 2014 (NPS, 2014). As noted above, some of these nests were from head-started ridleys. Such nestings, together with the proximity of the Rancho Nuevo rookery, probably account for the occurrence of hatchlings and subadults in Texas. According to Hildebrand (1982, 1987), sporadic ridley nesting in Texas has always been the case. This is in direct contradiction, however, to Lund (1974), who believed that Padre Island historically supported large numbers of nesting Kemp's ridleys, but that the population became extirpated because of excessive egg collection.

2.1.5 Presence in the Action Area

There have been no recorded Kemp's ridley turtle nesting within the designated boundary of the action area. Kemp's ridley turtle nesting has occurred annually on Galveston Island since nests were first documented in 2002. Seven of the 153 Kemp's ridley nests recorded along the Texas coast in 2013, and one of the 119 Kemp's ridley nests in 2014 were from Galveston Island (NPS, 2014). Three Kemp's ridley sea turtle nests were documented on Galveston Island in 2015 and no nests in 2016. Five Kemp's ridley's nests were reported on Galveston Island in 2017 and three in 2018 (Shaver, 2017; Steinhaus, 2018).

2.2 LOGGERHEAD SEA TURTLE

2.2.1 Reasons for Status

The loggerhead sea turtle was federally listed as threatened throughout its range on July 28, 1978 (43 *FR* 32808). The decline of the loggerhead is the result of overexploitation by man, inadvertent mortality associated with fishing and trawling activities, and natural predation. Continued threats include incidental capture in fishing gear, primarily in longlines and gillnets, but also in trawls, traps, and pots; legal and illegal harvest; vessel strikes; beach armoring; beach erosion; marine debris ingestion; oil pollution; light pollution; and predation by native and exotic species (NMFS and USFWS, 2008).

2.2.2 Habitat

The loggerhead sea turtle occurs in the open seas as far as 500 miles from shore, but mainly over the continental shelf, and in bays, estuaries, lagoons, and mouths of rivers. The species favors warm temperate and subtropical regions not far from shorelines. The adults occupy various habitats, from turbid bays to clear waters of reefs. Subadults occur mainly in nearshore and estuarine waters. Hatchlings move directly to sea after hatching and often float in masses of floating seaweeds in the genus *Sargassum*, where they may remain for an unknown period of time (NMFS and USFWS, 2008).

Loggerheads consume a wide variety of both benthic and pelagic food items, which they crush before swallowing. Conches, shellfish, horseshoe crabs, prawns and other crustacea, squid, sponges, jellyfish, basket stars, fish (carrion or slow-moving species), and even hatchling loggerheads have all been recorded as loggerhead prey (Hughes, 1974; Rebel, 1974; Mortimer, 1982). Adults forage primarily on the bottom, but also take jellyfish from the surface. The young feed on prey concentrated at the surface such as gastropods, fragments of crustaceans, and *Sargassum*.

Nesting occurs usually on open sandy beaches above the high-tide mark and seaward of well-developed dunes. They nest primarily on high-energy beaches on barrier islands adjacent to

continental land masses in warm-temperate and subtropical regions. Steeply sloped beaches with gradually sloped offshore approaches are favored. In Florida, nesting on urban beaches was strongly correlated with the presence of tall objects (trees or buildings), which apparently shield the beach from city lights (Salmon et al., 1995).

2.2.3 Range

The loggerhead is widely distributed in tropical and subtropical seas, being found in the Atlantic Ocean from Nova Scotia to Argentina, Gulf of Mexico, Indian and Pacific oceans (although it is rare in the eastern and central Pacific), and the Mediterranean Sea (Rebel, 1974; Ross, 1982; Iverson, 1986). In the continental U.S., loggerheads nest along the Atlantic coast from Florida to as far north as New Jersey (Musick, 1979) and sporadically along the Gulf Coast. In recent years, a few have nested on barrier islands along the Texas coast (NMFS and USFWS, 2008; NPS, 2014). The loggerhead is the most abundant sea turtle species in U.S. coastal waters (NMFS, 2014).

2.2.4 Distribution in Texas

The loggerhead is the most abundant turtle in Texas marine waters, preferring shallow inner continental shelf waters and occurring only very infrequently in the bays. It often occurs near offshore oil rig platforms, reefs, and jetties. Loggerheads are probably present year-round but are most noticeable in the spring when a favored food item, the Portuguese man-of-war (*Physalia physalis*), is abundant. Loggerheads constitute a major portion of the dead or moribund turtles washed ashore (stranded) on the Texas coast each year. A large proportion of these deaths are the result of accidental capture by shrimp trawlers, where caught turtles drown and their bodies are dumped overboard. Before 1977, no positive documentation of loggerhead nests in Texas existed (Hildebrand, 1982). Two loggerhead nests were recorded in 2006: one at Padre Island National Seashore and the other on South Padre Island, and six loggerhead nests, four at Padre Island National Seashore, and two at South Padre Island have been recorded on Texas beaches in 2007 (NPS, 2007). More recently, 13 loggerhead nests were recorded in Texas in 2013 (including 11 at Padre Island National Seashore); however, only two nests were recorded in Texas in 2014 (NPS, 2014). Like the worldwide population, the population of loggerheads in Texas has declined.

2.2.5 Presence in the Action Area

There have been no recorded loggerhead turtle nests recorded within the designated boundary of the action area. In 2017 there was only one recorded on the entirety of Galveston Island. No nests were recorded on the entirety of Galveston Island in 2016 (Seaturtle.org, 2018).

2.3 GREEN SEA TURTLE

2.3.1 Reasons for Status

The green turtle was federally listed on July 28, 1978 as threatened, except for in Florida and the Pacific Coast of Mexico (including the Gulf of California) where it was listed as endangered (43 *FR* 32808). The principal cause of the historical, worldwide decline of the green turtle is the long-term harvest of eggs and adults on nesting beaches, and juveniles and adults on feeding grounds. These harvests continue in some areas of the world and compromise efforts to recover this species.

2.3.2 Habitat

The green turtle primarily utilizes shallow habitats such as lagoons, bays, inlets, shoals, estuaries, and other areas with an abundance of marine algae and seagrasses. Individuals observed in the open ocean are believed to be migrants in route to feeding grounds or nesting beaches (Meylan, 1982). Hatchlings often float in masses of sea plants (e.g., *Sargassum* rafts) in convergence zones. Coral reefs and rocky outcrops near feeding pastures often are used as resting areas. The adults are primarily herbivorous, while the juveniles consume more invertebrates. Their diets include seagrasses, macroalgae and other marine plants, mollusks, sponges, crustaceans, and jellyfish (Mortimer, 1982).

Terrestrial habitat is typically limited to nesting activities, although in some areas, such as Hawaii and the Galápagos Islands, they will bask on beaches (Balazs, 1980; Green, 1998). They prefer high-energy beaches with deep sand, which may be coarse to fine, with little organic content. At least in some regions, they generally nest consistently at the same beach, which is apparently their natal beach (Meylan et al., 1990; Allard et al., 1994).

2.3.3 Range

The green turtle is a prevalent species in tropical and subtropical waters. In U.S. Atlantic waters, it occurs around the U.S. Virgin Islands, Puerto Rico, and from Massachusetts to Texas. Major nesting activity occurs on Ascension Island, Aves Island (Venezuela), Costa Rica, and in Surinam. Relatively small numbers nest in Florida, with even smaller numbers in Georgia, North Carolina, and Texas (NMFS and USFWS, 1991; Hirth, 1997).

2.3.4 Distribution in Texas

Green turtle nests are somewhat rare in Texas. Two green turtle nests were recorded each year at Padre Island National Seashore during 2006 and 2007 (NPS, 2007). More recently, 15 green turtle nests were recorded in Texas (13 on Padre Island National Seashore and two on South Padre Island); however, no green turtle nests were discovered in 2014 (NPS, 2014). Since 2014, five green turtle nests were recorded on Padre Island National Seashore in 2015, no nests in 2016, 28

in 2017 and 5 in 2018 (Steinhaus, 2018). Green turtles, however, nest more frequently in Florida and in Mexico. Since long migrations of green turtles from their nesting beaches to distant feedings grounds are well documented (Meylan, 1982; Green, 1984), the adult green turtles occurring in Texas may be either at their feeding grounds or in the process of migrating to or from their nesting beaches. The juveniles frequenting the seagrass meadows of the bay areas may remain there until they move to other feeding grounds or, perhaps, once having attained sexual maturity, return to their natal beaches outside of Texas to nest.

2.3.5 Presence in the Action Area

There have been no recorded green turtle nests recorded within the designated boundary of the action area. All the green turtle nests in Texas in the past 3 years have been located on South Padre Island, which is a great distance from the project site (Seaturtle.org, 2018).

2.4 HAWKSBILL SEA TURTLE

2.4.1 Reasons for Status

The hawksbill sea turtle was federally listed as endangered on June 2, 1970 (35 *FR* 8495) with critical habitat designated in Puerto Rico on May 24, 1978 (43 *FR* 22224). The greatest threat to this species is overharvest to supply the market for tortoiseshell and stuffed turtle curios (Meylan and Donnelly, 1999). Hawksbill shell (bekko) commands high prices. Japanese imports of raw bekko between 1970 and 1989 totaled 713,850 kilograms, representing more than 670,000 turtles. However, this market was closed in 1993 (Bräutigam and Eckert, 2006). The hawksbill is also used in the manufacture of leather, oil, perfume, and cosmetics (NMFS, 2014).

Other threats include destruction of breeding locations by beach development, incidental take in lobster and Caribbean reef fish fisheries, pollution by petroleum products (especially oil-tanker discharges), entanglement in persistent marine debris, and predation on eggs and hatchlings (Meylan, 1992). The USFWS (1998) provides detailed information on certain threats, including beach erosion, beach armoring, construction, sand mining, artificial lighting, beach cleaning, increased human presence, recreational beach equipment, predation, and poaching. In 1998, NMFS designated critical habitat near Isla Mona and Isla Monito, Puerto Rico, seaward to 5.6 kilometers (63 *FR* 46693–46701).

2.4.2 Habitat

Hawksbills generally inhabit coastal reefs, bays, rocky areas, passes, estuaries, and lagoons, where they occur at depths of less than 70 feet. Like some other sea turtle species, hatchlings are sometimes found floating in masses of marine plants (e.g., *Sargassum* rafts) in the open ocean (National Fish and Wildlife Laboratories [NFWL], 1980). Hawksbills re-enter coastal waters when they reach a carapace length of approximately 20 to 25 centimeters. Coral reefs are widely

recognized as the resident foraging habitat of juveniles, subadults, and adults. This habitat association is undoubtedly related to their diet of sponges, which need solid substrate for attachment. Hawksbills also occur around rocky outcrops and high-energy shoals, which are also optimal sites for sponge growth (NMFS, 2014).

Terrestrial habitat is typically limited to nesting activities. The hawksbill, which is typically a solitary nester, nests on undisturbed, deep-sand beaches, from high-energy ocean beaches to tiny pocket beaches several meters wide bounded by crevices of cliff walls. Typically, the sand beaches are low energy, with woody vegetation, such as sea grape (*Coccoloba uvifera*), near the waterline (NRC, 1990).

2.4.3 Range

The hawksbill is circumtropical, occurring in tropical and subtropical seas of the Atlantic, Pacific, and Indian oceans (Witzell, 1983). This species is probably the most tropical of all marine turtles, although it does occur in many temperate regions. The hawksbill sea turtle is widely distributed in the Caribbean Sea and western Atlantic Ocean, with representatives of at least some life history stages regularly occurring in southern Florida and the northern Gulf (especially Texas), south to Brazil (NMFS, 2014). In the continental U.S., the hawksbill largely nests in Florida where it is sporadic at best (NFWL, 1980). A major nesting beach exists on Mona Island, Puerto Rico. Elsewhere in the western Atlantic, hawksbills nest in small numbers along the Gulf Coast of Mexico, the West Indies, and along the Caribbean coasts of Central and South America (Musick, 1979).

2.4.4 Distribution in Texas

Texas is the only state outside of Florida where hawksbills are sighted with any regularity. Most of these sightings involve post-hatchlings and juveniles and are primarily associated with stone jetties. These small turtles are believed to originate from nesting beaches in Mexico (NMFS, 2014). On June 13, 1998, the first hawksbill nest recorded on the Texas coast was found at Padre Island National Seashore. This nest remains the only documented hawksbill nest on the Texas coast (NPS, 2014).

2.4.5 Presence in the Action Area

Hawksbills are rarely observed nesting on Texas beaches and there have been no observations of nesting individuals in the last 30 years in Texas (Steinhaus, 2018).

2.5 LEATHERBACK SEA TURTLE

2.5.1 Reasons for Status

The leatherback sea turtle was federally listed as endangered throughout its range on June 2, 1970 (35 *FR* 8495), with critical habitat designated in the U.S. Virgin Islands on September 26, 1978 and March 23, 1979 (43 *FR* 43688–43689 and 44 *FR* 17710–17712, respectively). In 1999, in a rule conforming and consolidating various regulations, NMFS amended and redesignated this habitat, while also establishing a "conservation zone" extending from Cape Canaveral to the Virginia-North Carolina border and including all inshore and offshore waters; this zone is subject to shrimping closures when high abundance of leatherbacks is documented (64 *FR* 14067, March 23, 1999).

The species' decline is attributable to overexploitation and incidental mortality, generally associated with commercial shrimping and fishing activities. Use of turtle meat for fish bait and the consumption of litter by turtles are also causes of mortality, the latter phenomenon apparently occurring when plastic is mistaken for jellyfish (Rebel, 1974). The greatest causes of decline and the continuing primary threats to leatherbacks worldwide are long-term harvest and incidental capture in fishing gear. Harvest of eggs and adults occurs on nesting beaches, while juveniles and adults are harvested on feeding grounds. Incidental capture primarily occurs in gillnets, but also in trawls, traps and pots, longlines, and dredges. Together these threats are serious ongoing sources of mortality that adversely affect the species' recovery (NMFS, 2014). Because leatherbacks nest in the tropics during hurricane season, a potential exists for storm-generated waves and wind to erode nesting beaches, resulting in nest loss (NMFS and USFWS, 1992). This species may be susceptible to drowning in shrimp trawlers equipped with TEDs, because adult leatherbacks are too large to pass through the TED exit opening. Mortality associated with the swordfish gillnet fisheries in Peru and Chile represents the single largest source of mortality for East Pacific leatherbacks (Eckert and Sarti, 1997).

2.5.2 Habitat

The leatherback sea turtle is mainly pelagic, inhabiting the open ocean, and seldom approaches land except for nesting. It is most often found in coastal waters only when nesting or when following concentrations of jellyfish, when it can be found in inshore waters, bays, and estuaries. It dives almost continuously, often to great depths (Eckert, 1992).

Despite their large size, the diet of leatherbacks consists largely of jellyfish and sea squirts. They also consume sea urchins, squid, crustaceans, fish, blue-green algae, and floating seaweed (NFWL, 1980). Leatherbacks typically nest on beaches with a deepwater approach (Pritchard, 1971) and are particularly attracted to dark beaches with no associated back lighting.

2.5.3 Range

The leatherback is probably the most wide-ranging of all sea turtle species. It occurs in the Atlantic, Pacific, and Indian oceans; as far north as British Columbia, Newfoundland, Great Britain, and Norway; as far south as Australia, Cape of Good Hope, and Argentina; and in other waterbodies such as the Mediterranean Sea (NFWL, 1980). Leatherbacks nest primarily in tropical regions; major nesting beaches include Malaysia, Mexico, French Guiana, Surinam, Costa Rica, and Trinidad (Ross, 1982). Leatherbacks nest only sporadically in some of the Atlantic and Gulf States of the continental U.S., with one nesting reported as far north as North Carolina (Schwartz, 1976). In the Atlantic and Caribbean, the largest nesting assemblages occur in the U.S. Virgin Islands, Puerto Rico, and Florida (NMFS, 2014).

The leatherback migrates farther and ventures into colder water more than any other marine reptile. Adults appear to engage in routine migrations between boreal, temperate, and tropical waters, presumably to optimize both foraging and nesting opportunities. The longest-known movement is that of an adult female that traveled 5,900 kilometers to Ghana, West Africa, after nesting in Surinam (NMFS and USFWS, 1992). During the summer, leatherbacks tend to occur along the east coast of the U.S. from the Gulf of Maine south to the middle of Florida.

2.5.4 Distribution in Texas

Apart from occasional feeding aggregations, such as the large one of 100 animals reported by Leary (1957) off Port Aransas in December 1956 or possible concentrations in the Brownsville Eddy in winter (Hildebrand, 1983), leatherbacks are rare along the Texas coast, tending to keep to deeper offshore waters where their primary food source, jellyfish, occurs. In the Gulf, the leatherback is often associated with two species of jellyfish: cabbagehead (*Stomolophus* sp.) and moon (*Aurelia* sp.) (NMFS and USFWS, 1992). According to the USFWS (1981), leatherbacks have never been common in Texas waters.

Leatherback nests in Texas are rare. One nest was located at Padre Island National Seashore in 2008 (NPS, 2014). This was the first nest recorded in 70 years. Prior to that, one nest was recorded from the late 1920s and one from the mid-1930s, both on Padre Island (Hildebrand, 1982), which later became Padre Island National Seashore. The Padre Island National Seashore is the only location in Texas where leatherback nests have been recorded (NPS, 2014).

2.5.5 Presence in the Action Area

No leatherback nests have been recorded within the action area. As noted above, only one leatherback nest has been reported in Texas since the mid-1930s.

2.6 PIPING PLOVER

2.6.1 Reasons for Status

The USFWS listed the piping plover as endangered and threatened on December 11, 1985 (50 *FR* 50726–50734). The piping plover is a federally listed endangered species in the Great Lakes watershed, while the birds breeding on the Atlantic Coast and northern Great Plains are federally listed as threatened. Piping plovers wintering in Texas and Louisiana are part of the northern Great Plains and Great Lakes populations.

Shorebird hunting during the early 1900s caused the first known major decline of piping plovers (Bent, 1929). Since then, loss or modification of habitat resulting from commercial, residential, and recreational developments, dune stabilization, damming and channelization of rivers (eliminating sandbars, encroachment of vegetation, and altering water flows), and wetland drainage have further contributed to the decline of the species. Additional threats include human disturbances through recreational use of habitat, and predation of individuals and eggs by feral pets (USFWS, 1995).

2.6.2 Habitat

Piping plovers typically inhabit shorelines of oceans, rivers, and inland lakes. Nest sites include sandy sparsely vegetated beaches; sandbars; causeways; bare areas on dredge-created and natural alluvial islands in rivers; riparian gravel pits; and sand, gravel, or pebbly mud on interior alkali lakes and ponds (American Ornithologists' Union [AOU], 1998; USFWS, 1995). On the wintering grounds, these birds use beaches, mudflats, sandflats, dunes, and offshore spoil islands (Haig and Elliott-Smith, 2004). Individual plovers tend to return to the same wintering sites year after year.

2.6.3 Range

The piping plover breeds on the northern Great Plains (Iowa, northwestern Minnesota, Montana, Nebraska, North and South Dakota, Alberta, Manitoba, and Saskatchewan), in the Great Lakes (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin, and Ontario), and along the Atlantic Coast from Newfoundland to Virginia and (formerly) North Carolina. It winters on the Atlantic and Gulf coasts from North Carolina to Mexico, including coastal Texas, and, less commonly, in the Bahamas and West Indies (AOU, 1998; 50 *FR* 50726, December 11, 1985). Migration occurs both through the interior of North America east of the Rocky Mountains (especially in the Mississippi Valley) and along the Atlantic Coast (AOU, 1998). Few data exist on the migration routes of this species.

2.6.4 Distribution in Texas

Approximately 35 percent of the known global population of piping plovers winters along the Texas Gulf Coast, where they spend 60 to 70 percent of the year (Campbell, 1995; Haig and Elliott-Smith, 2004). The species is a common migrant and rare to uncommon winter resident on the upper Texas coast (Lockwood and Freeman, 2004; Richardson et al., 1998). Piping plovers begin arriving on the wintering grounds in late July, with some late-nesting birds arriving in September. A few individuals can be found on the wintering grounds throughout the year, but sightings are rare in late May, June, and early July. Piping plover concentrations in Texas occur in the following counties: Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kleberg, Matagorda, Nueces, San Patricio, and Willacy (USFWS, 1988).

2.6.5 Critical Habitat

Critical habitat was designated for the piping plover along the Texas coast, on July 10, 2001 (66 *FR* 36038). It was modified on May 19, 2009, as a result of a challenge by the Texas General Land Office (GLO) in 2006 (74 *FR* 23475–23600). The primary constituent elements (PCEs) for piping plover wintering habitat are those habitat components that are essential for the primary biological needs of foraging, sheltering, and roosting, and the physical features necessary for maintaining the natural processes that support these habitat components. Only those areas containing these PCEs within the designated boundaries are considered critical habitat. The PCEs are found in geologically dynamic coastal areas that contain intertidal (i.e., between annual low tide and annual high tide), sand beaches, sand and mud flats, associated dune systems, and flats above annual high tide. Intertidal flats include sand and/or mud flats with no or very sparse emergent vegetation. In some cases, these flats may be covered or partially covered by a mat of blue-green algae. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers. Such sites may have debris and detritus (decaying organic matter) offering refuge from high winds and cold weather. Important components of the beach/dune ecosystem include surf-cast algae for feeding of prey, sparsely vegetated beach area above mean high tide for roosting and refuge during storms, spits (a small point of land, especially sand, running into water) for feeding and roosting, and washover areas for feeding and roosting. Washover areas are broad, unvegetated zones with little or no topographic relief that are formed and maintained by the action of hurricanes, storm surge, or other extreme wave action.

Currently, the subject property does not contain designated critical habitat for the piping plover.

2.6.6 Presence in the Action Area

In 2002, the National Audubon Society and the Cornell Lab of Ornithology launched eBird, a citizen-based bird observation network which records and verifies abundance and distribution of birds across the world. Though according to eBird, no Piping Plovers have been observed on the project site in recent years. Nearby Piping Plover sightings according to eBird consist of 2 in 2017 approximately 5,000 feet

to the north, 1 in 1993 approximately 10,000 feet to the north, and 1 in 1983 approximately 5,000 feet to the north. Nearby Rockport Beach (~5 miles east) also has a moderate amount of sightings in recent years. On Rockport Beach, the following Piping Plover observations have been made: 3 in 2016, 20 in 2015, 1 in 2014, 23 in 2013, 6 in 2012, 4 in 2011, and 4 in 2008. These data indicate that both suitable habitat and Piping Plover individuals do exist in the general vicinity of the project site, and the potential for Piping Plovers to be present within the proposed action area is high.

Piping Plover could occur as migrants and wintering birds arriving between late July and September, and may be expected to utilize the habitat to some extent throughout the winter period. Numbers may peak in October during migratory staging periods. The birds have generally vacated Texas beaches by mid-May.

2.7 RED KNOT

2.7.1 Reasons for Status

The USFWS listed the red knot as threatened on January 12, 2015 (79 *FR* 73705–73748). The red knot is a federally listed threatened species that occurs in the States and U.S. Territories from Montana to Maine, and Puerto Rico and the Virgin Islands. The *rufa* red knot is one of six recognized subspecies of *Calidris canutus*. Each subspecies has distinctive morphological traits, migration routes, and annual cycles (Clements, 2014).

The red knot is threatened due to a number of factors. The loss of habitat has reduced the resilience of the red knot, and can be attributed to sea level rise, shoreline hardening, and development. Prey availability, especially in Delaware Bay due to the commercial harvest of the horseshoe crab, is considered a primary causal factor in red knot population declines in the 2000s. Red knots consume horseshoe crab eggs during their stopover in Delaware Bay, and essentially double their body weight to continue their migration (79 *FR* 238, December 11, 2014). Additionally, red knots are threatened due to the disruption of natural predator cycles on the Arctic breeding grounds from climate change. When lemmings are abundant, predators focus on consuming lemmings, and shorebirds breed successfully, but when lemmings are in short supply, predators switch to shorebird eggs and chicks (Niles et al., 2008; Meltofte, 2007). The threat is that the natural 3- to 4-year rodent/predator cycles are being disrupted by climate change, which may increase predation rates on shorebirds over the long term (Fraser et al., 2013). Lastly, the red knot is facing increased timing mismatches during its migration and breeding range as a result of climate change and unknown causes. Successful migration is highly dependent on the timing of departures and arrivals to coincide with favorable food and weather conditions in stopover areas (79 *FR* 238, December 11, 2014).

2.7.2 Habitat

During migration and the winter season, red knots rarely occupy other habitat types outside large expanses of marine intertidal areas with stable sediments (Buehler et al., 2006). The anatomy of the red knot's bill allows the species to specialize on foraging for hard-shelled prey within soft sediments. Primary prey items include mollusks and crustaceans. Coastal roosting habitat consists typically of open beach habitat and sand bars that remain exposed during high tide.

2.7.3 Range

The red knot breeds in the Canadian Arctic, and their migration in the spring and fall is broken into roughly 1,500-mile segments of the 10,000-mile trek from the southern tip of South America (Niles et al., 2008). Migration stopover locations include Hudson Bay, upper Atlantic Coast, beach habitat along the lower Atlantic and Gulf of Mexico, Caribbean Islands, and the northern coast of South America. Primary wintering grounds are located along beaches and estuaries on the southeastern and Gulf coasts of the U.S., northern Brazil, and Tierra del Fuego, Argentina. Analysis of plumage and stable isotopes suggest wintering and migratory birds along the Gulf of Mexico consist of the *Calidris canutus rufa* and *C. c. roselaari* subspecies (Atkinson et al., 2005; Buehler et al., 2006).

2.7.4 Distribution in Texas

Due to the species' large size, proclivity for long migratory flights, and preference for marine habitat, inland records for the species are rare. Inland sightings reported to eBird (2018) are confined to spring and fall migration at large reservoirs and wetlands within close proximity to Dallas, Austin, and San Antonio. Similar migratory occurrence patterns are reflected by observational data from Oklahoma and Kansas.

Red knot is a rare to uncommon migratory and wintering shorebird along the entirety of the Texas Gulf Coast where the species utilizes beach and adjacent wetland habitats (eBird, 2018). Highest sighting frequencies are associated with migratory periods from mid-March to late May and from mid-September to late October. Based on observation data, the species appears to utilize the Texas coast in larger numbers during spring migration rather than fall migration (eBird, 2018).

2.7.5 Presence in the Action Area

According to eBird, there have been several red knots observed along the southern end of Galveston Island. However, there have been no recorded sightings of a red knot within the action area. The closest recorded observations of a red knot were approximately 1 kilometer to the south of the action area on the southern side of the island. Two specimens were recorded in 2010 at this approximate location, and an undetermined number were observed and recorded in 2016.

2.8 ATTWATER'S PRAIRIE CHICKEN

2.8.1 Reasons for Status

The Attwater's prairie chicken was listed as endangered in 1967 and gained protection under the ESA in 1973. The species was originally spread throughout much of the Gulf Coast prairie. Over time, fire suppression allowed woody brush species to dominate the grasslands. The sprawling growth of cities and towns, along with agricultural land use changes lead to the decline of the species. By 1919 the species was extinct in Louisiana and by 1937 approximately 8,700 remained in Texas (USFWS 2012). A 2005 census estimated 40 birds living in the wild. Habitat transitions and loss are considered to be the leading causes of declining populations.

2.8.2 Habitat

The historic habitat was grass prairies of the Gulf Coast region in Texas and Louisiana. The ideal Attwater's prairie chicken habitat will be found on coastal prairie that include grasses such as little bluestem, big bluestem, Indiangrass, and switchgrass. The birds require both short and tall grasses for their habitat. During the mating season they gather to choose a mate in the area of bare ground or short grass. Typically dense areas of grass are avoided but are used for shade during the summer months and for protection against inclement weather and predators. Dense grasses are critical though during nest seasons since hens build their nests in these areas.

2.8.3 Range

The historic range of the Attwater's prairie chicken spread across 6 million acres of the Gulf Coast. That range has been reduced to two parcels of habitat in Galveston and Colorado counties that total approximately 12,000 acres. No birds are known to be surviving off these refuges.

2.8.4 Distribution in Texas

The current range of the Attwater's prairie chicken has been reduced to two parcels of habitat in Galveston and Colorado counties (USFWS 2012).

2.8.5 Presence in the Action Area

According to e-Bird, no Attwater's prairie chickens have been observed on the project site at any point. It is unlikely that any specimens would find their way onto the property.

2.9 WEST INDIAN MANATEE

2.9.1 Reasons for Status

Manatees were historically hunted for their flesh, bones, oil, and hide. Hunting is attributed to the initial decline of the population numbers. Currently, the greatest threat for continued existence is collisions with boats, and in Florida, loss of warm water habitat. A large population of manatees rely on warm-water outfalls at electric plants as their habitat and as these aging plants are shut down or experience failures the amount of available habitat will decline which could lead to a large decline in population (USFWS 2008).

2.9.2 Habitat

Manatees prefer large, slow moving rivers, river mouths, and shallow coastal areas such as coves and bays. Preferred habitats include areas near the shore featuring underwater vegetation like seagrass and eelgrass. They typically feed along grass bed margins with access to deep water channels, where they can flee when threatened. Many manatees rely on warm water from natural springs and power plant outfalls. During the winter, they will congregate in large numbers around natural springs and power plants that discharge warm water in order to preserve energy needed to warm their bodies.

2.9.3 Range

West Indian manatees are found predominantly along the coast of Florida and in the Caribbean. The animals may travel great distances as they migrate between winter and summer grounds. They have little tolerance for cold water because of their low metabolism and lack of insulating body fat. During the summer months, they have been observed as far north as Virginia and Maryland (USFWS 2008).

2.9.4 Distribution in Texas

Manatee sightings in Texas are rare. Several confirmed sightings have occurred along the Texas coast including southeast Texas and even the Rio Grande River mouth (Gunter 1941).

2.9.5 Presence in the Action Area

No manatees have ever been observed within in the action area. There is minimal open water within the action area and manatees are unlikely to frequent the area except on rare occasions.

2.10 EASTERN BLACK RAIL

2.11 Reasons for status

The Eastern Black Rail was listed as threatened in 2020. The USFWS has not designated critical habitat for the species. Thus, USFWS is proposing to list the Eastern Black Rail as threatened with a Section 4(d) Rule. The 4(d) Rule contains species-specific conservation measures for the Eastern Black Rail. These measures will include seasonal fire restrictions and seasonal agricultural restrictions in wetlands where Eastern Black Rails are present. .

2.12 Habitat

The Eastern Black Rail is a reclusive bird, preferring to live in dense vegetation in and around wetlands of various salinities. This species is often nocturnal, and during the day has a preference to walk hidden in tall grasses instead of fly and rarely makes a call. Preferred habitat includes gulf cordgrass *(Spartina spartinae)*, marshhay cordgrass *(Spartina patens)*, sea-oxeye daisy (*Borrichia frutescens*), and has minimal woody cover (Oberholser 1974). No critical habitat has been designated.

2.13 Range

In North America, Eastern Black Rails are found sporadically throughout the country, with the majority of the populations located along Atlantic and Gulf coastal areas (USFWS 2018).

2.14 Distribution in Texas

Eastern Black Rails are year-round residents along the upper and central Texas coast and rare migrants in the eastern third of the state.

2.15 Presence in the action area

While a review of online birdwatching databases revealed no sightings in or around the action area in recent years, the lack of public access and the nocturnal and otherwise secretive nature of these birds makes it impossible to rule out their presence. Additionally, the nearby San Bernard Wildlife Refuge is known to harbor a sizeable population of rails (Haverland 2019). Therefore, the presence of this species within the action area is possible.

3.0 EFFECTS ANALYSIS

3.1 GENERAL IMPACTS

The impacts from the proposed project will occur as outlined in the design maps located in Appendix A. Potential impacts to the biological resources known to utilize the proposed action area will vary according to the timing of the construction activities. Due to the location of the proposed construction activities, impacts to nesting sea turtles is unlikely.

3.2 KEMP'S RIDLEY SEA TURTLE

3.2.1 Direct Effects

There have been no recorded Kemp's ridley turtle nesting within the designated boundary of the action area. Due to the low frequency of Kemp's ridley sea turtles nesting on Galveston beach, it is unlikely the proposed project would have any significant direct effects on the species.

3.2.2 Indirect Effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. The proposed project will avoid construction in areas along the beach. Based on the habitat preference of the Kemp's ridley sea turtle, it is unlikely the proposed project will have significant indirect effects on the Kemp's ridley sea turtle.

3.3 LOGGERHEAD SEA TURTLE

3.3.1 Direct Effects

There have been no recorded loggerhead turtle nests recorded within the designated boundary of the action area. In 2018 there was only one recorded loggerhead nest found on the entirety of Galveston Island (Seaturtle.org, 2018). Based on the preferred beach habitat of the loggerhead sea turtle and the minimal project impacts to this habitat, it is unlikely that the proposed project will have any significant direct effects on the loggerhead sea turtle.

3.3.2 Indirect Effects

Should a loggerhead turtle nest within the action area post-construction activities, then effects from the proposed action is unlikely to affect loggerhead sea turtle nesting on the project site in future years.

3.4 GREEN SEA TURTLE

3.4.1 Direct Effects

Negligible impacts to the green sea turtle would be similar to those for loggerhead sea turtles. It is unlikely that a green sea turtle would be affected by any construction activities as preferred nesting habitat is not present within the action area.

3.4.2 Indirect Effects

Should a green sea turtle nest within the action area post-construction activities, then effects from the proposed action is unlikely affect green sea turtle nesting on the action area in future years.

3.5 HAWKSBILL SEA TURTLE

3.5.1 Direct Effects

Negligible impacts to the hawksbill turtle would be similar to those for the green and loggerhead sea turtles. Hawksbill nests in Texas are extremely rare: only one nest (in 1998) has been recorded on the Texas coast. Thus, it is extremely unlikely that the hawksbill would nest within the action area. Therefore, the proposed construction activities would have no impact on nesting hawksbills.

3.5.2 Indirect Effects

Should a hawksbill turtle nest within the action area post-construction activities, then effects from the proposed action is unlikely to affect hawksbill sea turtle nesting on the project in future years.

3.6 LEATHERBACK SEA TURTLE

3.6.1 Direct Effects

Negligible impacts to the leatherback turtle would be similar to those for the hawksbill, green, and loggerhead sea turtles. Leatherback turtle nests in Texas are extremely rare: the single nest recorded on Padre Island National Seashore in 2008 was the first one recorded in 70 years (NPS, 2014). Prior to that, one nest was recorded from the late 1920s and one from the mid-1930s, both on Padre Island (Hildebrand, 1982), which later became Padre Island National Seashore. The Padre Island National Seashore is the only location in Texas where leatherback nests have been recorded. Therefore, the proposed construction activities would have no impact on nesting leatherbacks.

3.6.2 Indirect Effects

Should a leatherback turtle nest within the action area post-construction activities, then effects from the proposed action is unlikely to affect the species in future years as the proposed construction is should have no lasting negative impacts to habitat within the area.

3.7 PIPING PLOVER

3.7.1 Direct Effects

No portion of the subject property has been deemed critical habitat for the piping plover. While sand flats do exist on the property, the size of the potential foraging areas is extremely limited. Much of the shoreline within the subject property and surrounding properties are vegetated which is not foraging habitat. There would likely be no direct effect on the species.

3.7.2 Indirect Effects

Increased human presence long-term in the area may occur. The proposed development will remove most of the uplands on-site and there will be an increase in the use of the property with regards to human activity. However, the potential habitat along the shoreline will be left intact for use by shorebird species. Other indirect effects that may potentially occur include additional noise from cars and lawn equipment. Due to the nature of the construction activities remaining outside of the shoreline beach habitat, it is unlikely there would be an indirect effect on the species.

3.8 RED KNOT

3.8.1 Direct Effects

Similar to piping plovers, short-term impacts to behavior may occur as a result of the construction operations. However, given their mobile foraging patterns, local disruptions to foraging habitat are likely not that disruptive to red knots (USACE, 2010). Therefore, disruption from construction activities will likely result in the movement of knots to an alternative foraging location. Multiple or large scale disruptions effecting all key foraging locations at one time could have a profound impact. As with the plovers, the "potential habitat" for red knots will not be developed and will remain intact after construction has completed. Therefore there would likely be no direct effect on the species.

3.8.2 Indirect Effects

Indirect effects for the red knot will be similar to the piping plover. Similar to the plover, the potential red knot habitat would be left intact with the development of the tract. Long term impacts could occur along with the increased human presence in the area to include increased noise and sound in the general vicinity. However, due to the nature of the construction activities remaining outside of the shoreline beach habitat, long term indirect effect on the red knot is considered minimal.

3.9 ATTWATER'S GREATER PRAIRIE CHICKEN

3.9.1 Direct Effects

There have been no sightings of an Attwater's greater prairie chicken within the action area boundary. Since, there is no overlap in the current range of the prairie chicken, the proposed construction should have no direct effects on the continued existence of the Attwater's prairie chicken.

3.9.2 Indirect Effects

Since no habitat currently exists on the project site for the prairie chicken, indirect effects on the species due to the proposed action are unlikely.

3.10 WEST INDIAN MANATEE

3.10.1 Direct Effects

There are no open water features within the action area that would provide suitable habitat for the manatee. Therefore, it is unlikely that the proposed project would have any direct effects on the West Indian Manatee.

3.10.2 Indirect Effects

There are no open water features within the action area that would provide suitable habitat for the manatee. Therefore, it is unlikely that the proposed project would have any indirect effects on the continued existence of the West Indian Manatee in Texas.

3.11 EASTERN BLACK RAIL

3.11.1 Direct effects

Short-term impacts to black rail habitat may occur during construction and removal of cattail. Additionally, noise and vibrations from machinery may disturb any nearby birds, though over a general area these impacts are a common occurrence and any local birds are likely accustom to, at least in part.

3.11.2 Indirect effects

It is unlikely that the proposed project would have any significant indirect effects on Eastern Black Rails. The birds are typically either nocturnal or remain within dense vegetation, the addition of planted clusters that align with other vegetation to create corridors and refuges adjacent the sand flats would be a benefit to the species.

3.12 CRITICAL HABITAT

Currently, the action area does not contain designated critical habitat for any listed species.

4.0 AVOIDANCE, MINIMIZATION, AND CONSERVATION MEASURES

As part of the proposed action, the following conservation measures, including avoidance and minimization measures, will be implemented by the Applicant to minimize impacts to federally listed species related to the construction of the proposed action.

4.1 CONSTRUCTION PROTOCOLS / CONTROL MEASURES

- **Construction Schedule:**

    - **Seasonal:**
      Given the relatively moderate abundance of wintering Piping Plovers , Red Knots , and Eastern Black Rail near this location, avoidance of the shorebirds' peak season will be prioritized. The full construction timeline would be approximately 30-45 days, beginning no sooner than mid-May and ending before mid-July, a timeframe when Piping Plovers and Red Knots should be absent. All construction activities involving dirt movement and machinery would be completed within the mid-May through mid-July window. Planting may occur outside this period as the plantings will be conducted manually.

      Provided the protocols in this document are implemented, construction activities "**may affect, but are not likely to affect**" threatened and endangered species. If construction activities proceed beyond mid-July (due to delays beyond the applicant's control, including weather), when Piping Plovers and Red Knots begin to return to the beaches, monitors will survey the proposed action area for presence of shorebirds.

    - **Daily:**
      Daily monitoring will only take place if construction activities occur outside the mid-May through mid-July period. If this does occur, daily construction activity will not begin until after monitors have surveyed the construction site for any listed species. Monitors will survey the site, and approximately 500 feet (152 meters) in all directions from the active work site, for a minimum of 30 minutes each morning, beginning at sunrise. If any listed species are observed within the vicinity of the active worksite, construction will not commence until all individuals have left the area on their own and the USFWS has been notified. Throughout the day, monitors will continue to survey the work zone and surrounding 500-foot survey areas. If any listed species are observed at any point throughout the day, construction will cease until all individuals have left the area on their own and the USFWS has been notified. All onshore construction will end at sunset each day.

- **Monitoring:**

  Spoonbill is responsible for ensuring that daily shoreline bird survey, protection, and monitoring program is conducted during construction activities that take place outside of the mid-May through mid-July timeframe. The USFWS should be notified of any listed threatened and endangered species sighting immediately, and DAILY LOG data will be submitted to the USFWS within 60 days of completion of the construction.

  - **Monitor Credentials**

    The monitoring program would be conducted only by individuals possessing appropriate expertise in the protocol trained by the USFWS. At the beginning of each work day, protected species Monitors will hold a meeting with all contractor/consultant employees to cover endangered species identification and possible locations, truck and equipment restrictions on the beach, and instructions as to stop work upon direction of the Monitor or at the sighting of any suspected threatened or endangered species.

  - **Schedule**

    Monitors will survey the site for a minimum of 30 minutes each morning, beginning at sunrise, and record any observations in the attached DAILY LOG data form. To detect any Piping Plover, Red Knots, or Eastern Black Rail that are present, the Monitor will conduct surveys **prior** to morning construction activities within 500 feet in all directions surrounding the worksite. If any listed species are observed within the vicinity of the worksite, construction will not commence until all individuals have left the area and the USFWS has been notified. Monitors will continue to survey the area throughout the day for signs of all listed species. If at any point a listed species is observed within the monitored area, USFWS will be notified immediately. All construction activity within 100 meters of a listed species will cease until the listed species has vacated on its own.

  - **Shorebird Observation Protocol**

    Within the survey area, a site-specific buffer of 100 meters (328 feet) will be established around any location where Piping Plovers, Red Knots, or Eastern Black Rail occur or winter migrants congregate in significant numbers. Previous studies have shown that a buffer distance of 100 meters sufficiently minimizes disturbance from personal watercraft, outboard motors, ATVs, and pedestrian traffic to most species of waterbirds, including plover species that are foraging and loafing (Rodgers and Smith, 1997; Valente and Fischer, 2011). Any and all construction activities, including movement of vehicles, will be prohibited in the buffer zone. If significant tides or weather conditions cause an influx of these birds, activity in that area could be delayed until the birds depart. The occurrence of one or two birds in the vicinity of the construction area, but outside of the 100 meter buffer, should not be considered significant. This activity will cause a cessation of activity within the 100 meter buffer. The width of the buffer zone should be increased if birds appear agitated or disturbed by construction or other

activities in adjacent areas. The buffer zones should be posted with clearly marked signs around the perimeter, *when possible* without disturbing the birds present. These markings should be maintained until Piping Plovers, Red Knots, Eastern Black Rail or other winter migrants depart. No construction activities or stockpiling of equipment will be allowed within the buffer areas. If Piping Plovers or Red Knots are observed resting or feeding within 100 meters of equipment or the work zone, operations will cease until the birds move without harassment to another area beyond this zone.

DAILY LOG

MONITORING FOR

PIPING PLOVER, RED KNOT, & EASTERN BLACK RAIL

Date: _____

Monitor Name: _____

Time of Survey: _____ to _____

Weather Conditions: ___ Sunny & Clear ___ Partly Cloudy ___ Windy
___ Raining ___ Other: _____

Temperature Range: _____ - _____°F

EVENTS:

___ None – No T&E shorebirds observed.

___ T&E shorebirds observed and construction ceased (*details below*).

___ T&E shorebird observed (___ piping plover; ____red knot) beyond 100 meter buffer. No action necessary.

___ T&E shorebird observed (___ piping plover; ____red knot) within 100 meter buffer. Construction ceased (*add details below*).

___ Other (*describe below*).

_____

_____

_____

_____

_____

_____

_____

_____

_____

4.2 CONSTRUCTION ACCESS AND EQUIPMENT

The following measures apply to construction access and equipment usage and staging during construction activities:

- Materials and equipment required for the project will be staged in upland areas and transported as needed to the proposed work sites.
- The number of vehicles transiting from upland areas to the project site will be kept to a minimum, all vehicles will use the same pathways, and access will be confined to the closest access point to the immediate work area.
- **Designated Work Area:**
    - A list of earth moving equipment, such as graders, dozers, and excavators, will be provided to USFWS before the work begins.
    - Staging areas will be designated before work begins.
    - Equipment may be fenced within these staging areas.
    - Ingress/egress routes will be delineated with flagged, wooden laths to ensure that work activities remain within the approved action area.
    - The contractor will coordinate and sequence the work to minimize the frequency and density of vehicular traffic on the property to the greatest extent practicable.

5.0 EFFECTS DETERMINATION

In this document, the USACE presents their determinations about each species potentially occurring within the affected area using language recommended by the USFWS:

- *No effect* – USACE determines that its proposed action will not affect a federally listed species or critical habitat;
- *May affect, but not likely to adversely affect* – USACE determines that the project may affect listed species and/or critical habitat; however, the effects are expected to be discountable, insignificant, or completely beneficial; or
- *Likely to adversely affect* – USACE determines adverse effects to listed species and/or critical habitat may occur as a direct result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or completely beneficial. Under this determination, an additional determination is made whether the action is likely to jeopardize the continued survival and eventual recovery of the species.

Under section 7(a)(2) "effects of the action" refers to the direct and indirect effects of an action on a species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action. Indirect effects are those caused by the proposed action that occur later in time, but are still reasonably certain to occur (5O CFR 402.02).

The following sections present the USACE's effect determinations for this project on federally listed species.

5.1 KEMP'S RIDLEY SEA TURTLE

The overall conclusion in this BA is that the proposed project will have "no effect" on the continued existence or recovery of the Kemp's ridley sea turtle.

5.2 LOGGERHEAD SEA TURTLE

The overall conclusion in this BA is that the proposed project will have "no effect" on the continued existence or recovery of the loggerhead sea turtle.

5.3 GREEN SEA TURTLE

The overall conclusion in this BA is that the proposed project will have "no effect" on the continued existence or recovery of the green sea turtle.

5.4 HAWKSBILL SEA TURTLE

The overall conclusion in this BA is that the proposed project will have "no effect" on the continued existence or recovery of the hawksbill sea turtle.

5.5 LEATHERBACK SEA TURTLE

The overall conclusion in this BA is that the proposed project will have "no effect" on the continued existence or recovery of the leatherback sea turtle.

5.6 PIPING PLOVER

The effects of the proposed construction activities on the piping plover are expected to be minimal, posing only a minor and temporary disturbance to resting and foraging areas when compared to current use of the habitat in general. However, as outlined in 3.7.1 and 3.7.2, this is not considered to be a habitat for Plovers so there should be limited to no impact.

The overall conclusion in this BA is that the proposed project may affect, but is not likely to adversely affect the piping plover or and would not adversely affect any designated critical habitat.

5.7 RED KNOT

Like the piping plover, the effects of the proposed construction activities on the red knot are expected to be minimal, posing only a minor disturbance to resting and foraging birds.

Potential impacts to red knots in the action area would be minimized by conservation measures undertaken before and during construction activities. The overall conclusion in this BA is that the proposed project may affect, but is not likely to adversely affect the continued existence or recovery the red knot.

5.8 ATTWATER'S GREATER PRAIRIE CHICKEN

The overall conclusion in this BA is that the proposed project will have "no effect" on the continued existence or recovery of the Attwater's greater prairie chicken.

5.9 WEST INDIAN MANATEE

The overall conclusion in this BA is that the proposed project will have "no effect" on the continued existence or recovery of the West Indian manatee.

6.0 SUMMARY

In summary, the Applicant proposes to create a waterfront canal residential development and associated boat launch. The project will impact a total of 11.67 acres of Waters of the U.S. (Appendix A). More specifically, the Applicant proposes to impact 9.10 acres of adjacent non-tidal (freshwater) wetlands; 2.14 acres of tidal wetlands; and 0.43 acres of Section 10 Waters of the U.S. within a 98.00-acre tract of land with direct access to Farm-to-Market Road (FM) 3005 and direct access to West Galveston Bay for recreational boating. To offset these impacts, the Applicant has agreed to create a total of 23.64 acres of wetland mitigation. 15.84 acres of wetlands would be created, and 7.80 acres of wetlands would be enhanced. The majority of the shoreline habitat has been avoided and left intact for shorebird habitat.

Table 2: Effect Determinations Summary for the Proposed Activities

Common Name	Scientific Name	Implementation of the Project
REPTILES		
Kemp's ridley sea turtle	*Lepidochelys kempii*	No effect
Loggerhead sea turtle	*Caretta caretta*	No effect
Green sea turtle	*Chelonia mydas*	No effect
Hawksbill sea turtle	*Eretmochelys imbricata*	No effect
Leatherback sea turtle	*Dermochelys coriacea*	No effect
BIRDS		
Red knot	*Calidris canutus rufa*	May affect, not likely to adversely affect
Piping plover	*Charadrius melodus*	May affect, not likely to adversely affect
Attwater's Greater Prairie Chicken	*Tympanuchus cupido attwateri*	No effect
MAMMALS		
West Indian Manatee	*Trichechus manatus*	No effect

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Appendix A

Project Design Plans