DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
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GALVESTON, TEXAS 77553-1229

December 1, 2016

Regional Planning and Environmental Center

Chuck Ardizzone
Project Leader
Texas Coastal Ecological Services Field Office
17629 El Camino Real, Suite 211
Houston, Texas 77058

Dear Mr. Ardizzone,

The Galveston District is currently preparing a Draft Integrated General Reevaluation Report-Environmental Assessment for the Freeport Harbor Channel Improvement Project, Brazoria County, Texas. The Tentatively Selected Plan (TSP) proposes widening and bend-easing of a constricted section of channel within the inner harbor area of the Freeport Harbor Channel. The TSP would include widening the channel from 275 to 400 feet along about 3,600 feet of the east side of the navigation channel around the Dow Thumb, dredging about 7.5 acres of submerged and 16.4 acres of emergent land to ease a bend on the west side of the channel, and excavating about 8.3 acres of submerged land to create a notch at the Upper Turning Basin to facilitate vessel turning. All of the widening and bend easing would be done at the existing authorized depth of the Freeport Harbor Channel, which is -46 feet mean lower low water (MLLW) in this reach. A description of the TSP, as well as the USACE assessment of effects on listed species as required under Section 7(c) of the ESA, are provided in the attached Biological Assessment (BA) which is hereby submitted for your review.

We have prepared a BA for the proposed project as listed species could potentially occur within the affected area. The TSP would have no effect on the federally-listed piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), whooping crane (*Grus Americana*), West Indian manatee (T*richechus manatus*), any of the four whale species [fin (*Balaenoptera physalus*), humpback (*Megaptera novaeangliae*), sei (*Balaenoptera borealis*), and sperm (*Physeter macrocephalus*)] or the five sea turtle species [green (*Chelonia midas*), Hawksbill (*Eretmochelys imbricata*), Kemp's ridley (*Lepidochelys kempii*) leatherback (*Dermochelys coriacea*), and loggerhead (C*aretta caretta*)] listed as possibly occurring in the area. The TSP would also have no effect on any of the four coral species [lobed star (*Orbicella annularis)*, mountainous star (*Orbicella faveolata)*, boulder star (*Orbicella franksi*) and elkhom *Acropera palmata*) that occur in offshore waters of the region. Designated Critical Habitat does not occur in the project area.

We are hereby requesting your written concurrence, pursuant to the informal consultation procedures prescribed in 50 CFR 402.13, that the proposed action would have no effect on federally-listed species or designated critical habitat under your agency's jurisdiction. We appreciate your continued cooperation in allowing us to fulfill our responsibilities under the

Endangered Species Act. Should you require any additional information during review of the enclosed BA, please call Ms. Janelle Stokes at 409-766-3039.

Sincerely,

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Kelly Burks-Copes
Chief, Coastal Section

Enclosure

CF: Nick Laskowski, PM-J

DRAFT
BIOLOGICAL ASSESSMENT FOR THE PROPOSED FREEPORT HARBOR CHANNEL IMPROVEMENT PROJECT GENERAL REEVALUATION REPORT AND ENVIRONMENTAL ASSESSMENT

FREEPORT, TEXAS

Prepared by:

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

December 2016

Printed on recycled paper

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Acronyms and Abbreviations

AOU	American Ornithologists' Union
BA	Biological Assessment
BO	Biological Opinion
CR	County Road
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FHCIP	Freeport Harbor Channel Improvement Project
FR	Federal Register
GIWW	Gulf Intracoastal Water Way
GRBO	Gulf of Mexico Regional Biological Opinion
Gulf	Gulf of Mexico
HEP	Habitat Evaluation Procedure
IPAC	Information for Planning and Conservation
km	kilometer(s)
LPP	Locally Preferred Plan
mcy	million cubic yards
MMPA	Marine Mammal Protection Act
NDD	Natural Diversity Database
NED	National Economic Development
NFWL	National Fish and Wildlife Laboratory
NMFS	National Marine Fisheries Service
NPS	National Park Service
NRC	National Research Council
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
ODMDS	Ocean Dredged Material Disposal Site
PA	placement area
SH	State Highway
STSSN	Sea Turtle Stranding and Salvage Network
TED	turtle excluder device
TPWD	Texas Parks and Wildlife Department
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 Galveston District U.S. Army Corps of Engineers' (USACE) requirements as outlined under Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended. The Federal action requiring this assessment is the proposed widening and bend-easing of a constricted section of channel within the Freeport Harbor Channel in Freeport, Texas, specifically in Reach 2 (the Channel to the Upper Turning Basin and Upper Turning Basin). The Project is being proposed as a modification to the Freeport Harbor Channel Improvement Project (FHCIP), which was previously authorized for construction by the U.S. Congress under the Water Resources Reform and Development Act of 2014. The modifications proposed by the Project are identified by USACE as the "First Segment of Construction" in the Draft Integrated General Reevaluation Report and Environmental Assessment (DIGRR-EA). Section 216 of the Flood Control Act of 1970, Public Law 91-611, authorizes the proposed modifications to the existing improvement project. This BA evaluates the potential impacts of construction of the proposed Project on federally listed threatened and endangered species identified by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS).

1.2 DESCRIPTION OF THE PROJECT

Construction of the previously authorized FHCIP has not yet begun. As the first segment of construction, minor channel widening modifications proposed by this Project would be constructed prior to the improvements identified in the FHCIP. Therefore, the activities covered by this BA would be in addition to those described and coordinated in the BA for the authorized project, and construction would occur separately.

The Project area is located in the inner harbor, about one mile from the Gulf shoreline. Reach 2 occupies a big bend in the Old Brazos River channel, around a land area referred to as the Dow Thumb. The general vicinity of the Project area is shown in Figure 1 and a close-up of the Project area is shown in Figure 2. The proposed Project includes dredging approximately 9.9 acres of submerged land to widen the channel from 275 to 400 feet along about 3,600 feet of the east side of the navigation channel around the Dow Thumb; dredging about 7.5 acres of submerged and 16.4 acres of emergent land to ease a bend on the west side of the channel; and dredging about 8.3 acres of submerged land to create a notch at the Upper Turning Basin to facilitate vessel turning. The proposed modifications are illustrated in Figure 2. All of the widening and bend easing would be done at the existing authorized depth of the Freeport Harbor Channel, which is -46 feet mean lower low water (MLLW) in this reach. Routine advanced maintenance dredging and allowable overdepth result in a total dredged depth of 50 to 51 feet.

The new work widening would be accomplished by a combination of hydraulic pipeline and mechanical dredging. Material from construction would be piped or trucked to existing upland placement area (PA) 1. This assessment does not cover maintenance dredging as it is covered by the existing "Biological Opinion on Dredging of Gulf of Mexico Navigation Channels and Sand Mining ("Borrow") Areas Using Hopper Dredges by Corps of Engineers, Galveston, New Orleans, Mobile, and Jacksonville Districts (Consultation Number F/SER/2000/01287)" (also known as the Gulf of Mexico Regional Biological Opinion or GRBO). NMFS first issued the GRBO in 2003 and amended the document in 2005; the 2005 amendment was superseded by the 2007 amendment (NMFS, 2003, 2005, 2007). Also, it does not cover any of the activities associated with the authorized FHCIP deepening project and the related existing Biological Opinion (F/SER31: NB) dated December 19, 2012.

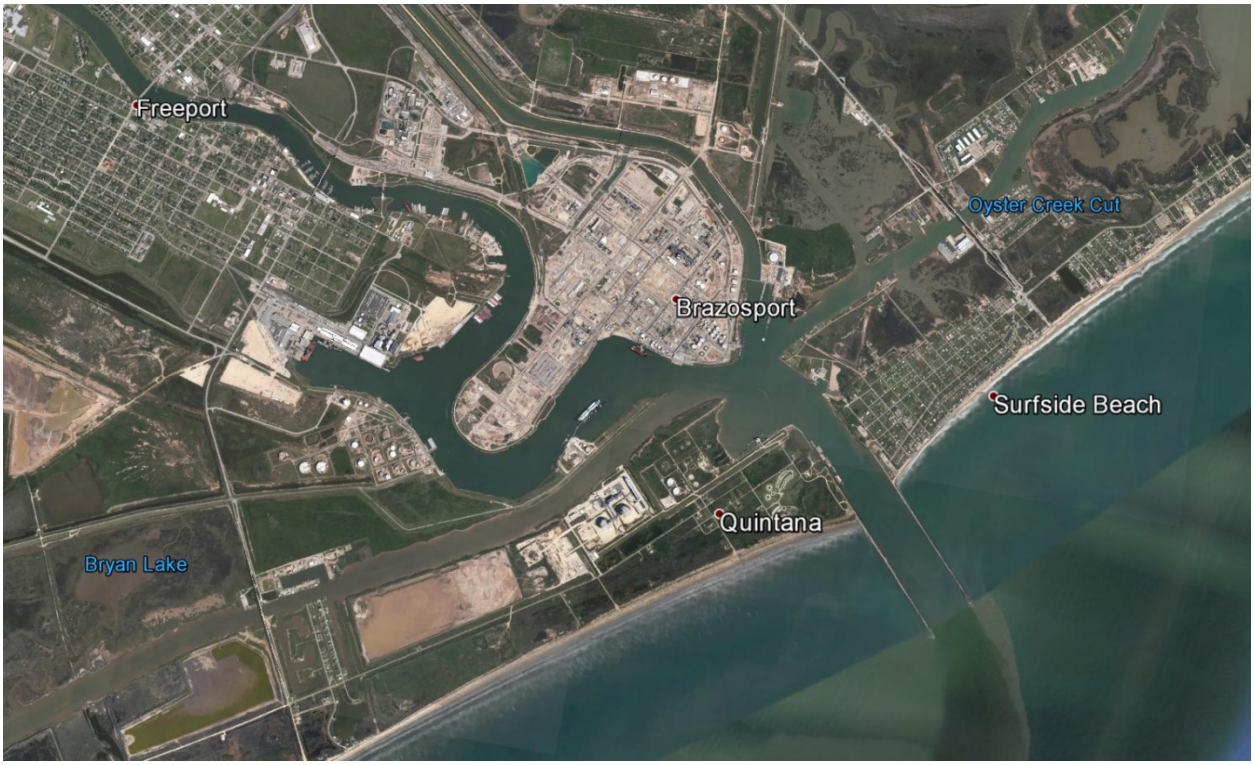

Figure 1 Freeport Harbor Channel and Surrounding Area Features

Figure 2 Project Area Map

2.0 FEDERALLY –LISTED THREATENED AND ENDANGERED SPECIES AND CRITICAL HABITAT

A list of protected species that may occur in the Project area was obtained from the USFWS IPAC and NMFS websites (Appendix A). Agency coordination letters and the subsequent Fish and Wildlife Coordination Act Report (CAR) for the authorized project were also reviewed. Table 1 presents a list of the 17 federally listed threatened and endangered species that are addressed in this BA.

This BA is offered to assist USFWS and NMFS personnel in fulfilling their obligations under the ESA. It also describes the avoidance, minimization, and conservation measures proposed for this Project relative to habitat and species covered in the BA. An EA has been prepared as part of the DIGRR to further address the potential effects resulting from the proposed Project.

TABLE 1
FEDERALLY LISTED SPECIES

		Status[1]	
Common Name	Scientific Name	USFWS	NMFS
REPTILES			
Green sea turtle	*Chelonia mydas*	T	T
Hawksbill sea turtle	*Eretmochelys imbricata*	E w/CH	E
Kemp's ridley sea turtle	*Lepidochelys kempii*	E	E
Leatherback sea turtle	*Dermochelys coriacea*	E w/CH	E
Loggerhead sea turtle	*Caretta caretta*	T w/CH	T
BIRDS			
Piping plover	*Charadrius melodus*	T w/CH	
Red knot	*Calidris canutus rufa*	T	
Whooping crane	*Grus americana*	E w/CH	
MAMMALS			
West Indian manatee	*Trichechus manatus*	E	

Common Name	Scientific Name	Status[1]	
		USFWS	NMFS
Fin whale	*Balaenoptera physalus*		E/D
Humpback whale	*Megaptera novaengliae*		E/D
Sei whale	*Balaenoptera borealis*		E/D
Sperm whale	*Physeter macrocephalus*		E/D
INVERTEBRATES			
Lobed star coral	*Orbicella annularis*		T
Mountainous star coral	*Orbicella faveolata*		T
Boulder star coral	*Orbicella franksi*		T
Elkhorn coral	*Acropora palmata*		T

[1]USFWS – U.S. Fish and Wildlife Service; NMFS – National Marine Fisheries Service. D – Depleted, as defined by the Marine Mammal Protection Act; E – Endangered; T – Threatened; w/CH – with designated Critical Habitat

2.1 ALTERNATIVES CONSIDERED

The Alternatives under consideration for the proposed Project include widening of the channel around what is known as the Dow Thumb to 375, 400, or 425 feet in total width, dredging out submerged and emergent land to create bend easing west of the channel, and dredging a "notch" at the Upper Turning Basin to facilitate vessel turning. The Preferred Alternative (proposed Project), needed to facilitate safe and efficient navigation around the Dow Thumb, is the 400-foot widening alternative. Each of the action alternatives listed below would be constructed at a depth of -46 feet MLLW.

- No Action or Future Without-Project Condition
- Widening at Dow Thumb (to 375 feet), bend easing, and notch at Upper Turning Basin
- Widening at Dow Thumb (to 400 feet), bend easing, and notch at Upper Turning Basin
- Widening at Dow Thumb (to 425 feet), bend easing, and notch at Upper Turning Basin

2.2 PROJECT HABITAT IMPACTS

Modifications proposed by the Project would represent minor incremental impacts beyond those identified for construction of the authorized FHCIP. The Project area is located within the Upper Coast division (Hatch et al., 1999) of the Gulf Coast Prairies and Marshes Ecoregion (Gould, 1975). This ecoregion is a nearly level plain less than 250 feet in elevation, covering approximately 10 million acres. The Gulf Coast Prairies include the coastal plain that extends approximately 30–80 miles inland, while the Gulf Marshes are located in a narrow strip of lowlands adjacent to the coast and barrier islands (Hatch et al., 1999).

The Project area encompasses the Dow Thumb area within the existing ship channel (see Figure 2). Shorelines are bulkheaded, riprapped or lined with constructed levee systems. There is essentially no natural terrestrial habitat. Very little undeveloped land occurs in the immediate vicinity of the ship channel; all open areas have been disturbed by prior construction or industrial activities. The Old Brazos River channel is narrow and busy with deep and shallow draft vessel traffic. It is a dead end channel, closed off from the Brazos River when the Brazos River Diversion Channel was constructed in 1929. Hurricane flood protection levees lining the channel block sheet flow and tidal energy is very low. The majority of the areas to be dredged are narrow benches of submerged lands adjacent to the existing navigation channel. No seagrass beds or mangroves are present in these submerged areas or in the Project area vicinity. Some emergent land would also be removed as part of the bend easing; this area has been disturbed by construction of the existing Freeport Hurricane Flood Protection Project. Placement of dredged material would not result in new impacts, as the material would be placed in the existing PA 1. The existing PA 1 lies south of Freeport, east of State Highway (SH) 288, and south of SH 36. Construction of the Project would represent a minor increase in dredged materials that would be placed at PA 1.

3.0 STATUS OF THE LISTED SPECIES

Species identified by the USFWS and NMFS for this BA are listed in Table 1 (see Section 2.0). The following sections present the natural history of each considered species relevant to its potential occurrence in the Project area and vicinity. Section 4.0 presents the potential of the Project to affect these species and USACE determinations of effect.

3.1 GREEN SEA TURTLE

3.1.1 Reasons for Status

The green turtle (*Chelonia mydas*) was listed on July 28, 1978, as threatened except for Florida and the Pacific Coast of Mexico (including the Gulf of California) where it was listed as endangered (43 FR 32808). Under the ESA, eight distinct population segments (DPSs) have been identified as threatened: the Central North Pacific, East Indian-West Pacific, East Pacific, North Atlantic, North Indian, South Atlantic, Southwest Indian, and Southwest Pacific, while three DPSs have been proposed as endangered: Central South Pacific, Central West Pacific, and Mediterranean (81 FR 20057, April 6, 2016). 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. Turtles are used for food and leather and some small turtles are stuffed and sold as curios. Incidental capture in fishing gear, primarily in gillnets, but also in trawls, traps and pots, longlines, and dredges is a serious ongoing source of mortality that also adversely affects the species' recovery (NMFS, 2016b). Epidemic outbreaks of fibropapilloma, or “tumor” infections, recently have occurred on green sea turtles, especially in Hawaii and Florida, posing a severe threat. The cause of these outbreaks is largely unknown, but it could be caused by a viral infection (Barrett, 1996). This species is also subject to various negative impacts shared by sea turtles in general.

3.1.2 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 en route to feeding grounds or nesting beaches (Meylan, 1982). Hatchlings often float in masses of sea plants (e.g., rafts of *Sargassum*) 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. Foods consumed 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).

3.1.3 Range

The green turtle is a circumglobal species in tropical and subtropical waters. In U.S. Atlantic waters, it occurs around the U.S. Virgin Islands, Puerto Rico, and continental U.S. 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 (Hirth, 1997; NMFS and USFWS, 1991).

3.1.4 Distribution in Texas

The green turtle in Texas inhabits shallow bays and estuaries where its principal foods, the various marine grasses, grow (Bartlett and Bartlett, 1999). Its population in Texas has suffered a decline similar to that of its world population. In the mid to late nineteenth century, Texas waters supported a green turtle fishery. Most of the turtles were caught in Matagorda Bay, Aransas Bay, and the lower Laguna Madre, although a few also came from Galveston Bay. Many live turtles were shipped to places such as New Orleans or New York and from there to other areas. Others were processed into canned products such as meat or soup prior to shipment. By 1900, however, the fishery had virtually ceased to exist. Turtles continued to be hunted sporadically for a while, the last Texas turtler hanging up his nets in 1935. Incidental catches by anglers and shrimpers were sometimes marketed prior to 1963, when it became illegal to do so (Hildebrand, 1982).

Green turtles still occur in these same bays today but in much-reduced numbers (Hildebrand, 1982). While green turtles prefer to inhabit bays with seagrass meadows, they may also be found in bays that are devoid of seagrasses. The green turtles in these Texas bays are mainly small juveniles. Adults, juveniles, and even hatchlings are occasionally caught on trotlines or by offshore shrimpers or are washed ashore in a moribund condition.

Green turtle nests are somewhat rare in Texas. Five nests were recorded at the Padre Island National Seashore in 1998, none in 1999, and one in 2000 (National Park Service [NPS], 2006; Shaver, 2000). Between 2001 and 2005, up to five nests per year were recorded from the Texas coast (Shaver, 2006). Two green turtle nests were recorded each year at Padre Island National Seashore during 2006 and 2007 (NPS, 2007). However, no green turtle nests were recorded along the Texas coast in either 2014 or 2015 (NPS, 2015). Green turtles nest more in Florida and in Mexico. Since long migrations of green turtles from their nesting beaches to distant feeding 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.

3.1.5 Presence in the Project Area

The USACE Sea Turtle Data Warehouse maintains records of documented incidental takes of sea turtles as a result of hopper dredging activities throughout southeastern coastal waters. However, the Sea Turtle Data Warehouse has been unavailable since 2013. Nevertheless, incidences involving impacts to two green sea turtle individuals within Freeport Harbor Channel were recorded in 2006; one incident regarding an individual green sea turtle within the Freeport Harbor Entrance Channel was documented in 2007, two incidences in 2008, one in 2009, and another incident in 2011 (USACE, 2013). However, they are not likely to be found in the inland harbor area near the Project area. While there is no evidence of occurrence in the Project area, this species could potentially occur in the vicinity of the Project area. No green turtle nests have been recorded in the vicinity (NPS, 2007, 2014, 2015; Shaver, 2006).

3.2 HAWKSBILL SEA TURTLE

3.2.1 Reasons for Status

The hawksbill sea turtle (*Eretmochelys imbricata*) 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 harvest 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, 2016b).

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 (Meylan, 1992), and predation on eggs and hatchlings. In American Samoa, most sea turtles and eggs encountered by villagers are harvested (Tuato'o-Bartley et al., 1993). See USFWS (1998) for detailed information on certain threats, including beach erosion, beach armoring, beach nourishment, 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).

3.2.2 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 Laboratory [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 optimum sites for sponge growth. In Texas, juvenile hawksbills are associated with stone jetties (NMFS, 2016b).

While this species is omnivorous, it prefers invertebrates, especially encrusting organisms, such as sponges, tunicates, bryozoans, mollusks, corals, barnacles, and sea urchins. Pelagic species consumed include jellyfish and fish, and plant material such as algae, sea grasses and mangroves have been reported as food items for this turtle (Carr, 1952; Rebel, 1974; Pritchard, 1977; Musick, 1979; Mortimer, 1982). The young are reported to be somewhat more herbivorous than adults (Ernst and Barbour, 1972).

Terrestrial habitat is typically limited to nesting activities. The hawksbill, 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 (National Research Council [NRC], 1990).

Critical Habitat

In September 1998, the NMFS and the USFWS designated critical habitat for the hawksbill sea turtles in waters and beach habitat of Puerto Rico (79 CFR 17.95). There is no designated critical habitat in Texas, including the Project area, but this species may be found off the coast of Texas.

3.2.3 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, 2016b). In the continental U.S., the hawksbill largely nests in Florida where it is sporadic at best (NFWL, 1980). However, 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).

3.2.4 Distribution in Texas

Texas is the only state outside of Florida where hawksbills are sighted with any regularity. Most of these sightings involve posthatchlings and juveniles, and are primarily associated with stone jetties. These small turtles are believed to originate from nesting beaches in Mexico (NMFS, 2016b). On 13 June 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, 2015).

3.2.5 Presence in the Project Area

No documented records of hawksbills exist from Brazoria County, Texas (Dixon, 2000) or from the Project area (USACE, 2013; TPWD, 2016b) and they are not expected to occur in the vicinity of the Project area.

3.3 KEMP'S RIDLEY SEA TURTLE

3.3.1 Reasons for Status

Kemp's ridley sea turtle (*Lepidochelys kempii*) was listed as endangered throughout its range on December 2, 1970 (35 FR 18320). Populations of this species have declined since 1947, when an estimated 42,000 females nested in one day (Hildebrand, 1963), to a total nesting population of approximately 1,000 in the mid-1980s. The decline of this species was primarily due to 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 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, 2003). Before the implementation of 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.

Another problem shared by adult and juvenile sea turtles is the ingestion of manmade debris and garbage. Postmortem examinations of sea turtles found stranded on the south Texas coast from 1986 through 1988 revealed 54 percent (60 of the 111 examined) of the sea turtles had eaten some type of marine debris. Plastic materials were most frequently ingested and included pieces of plastic bags, Styrofoam, plastic pellets, balloons, rope, and fishing line. Non-plastic debris such as glass, tar, and aluminum foil were also ingested by the sea turtles examined. Much of this debris

comes from offshore oil rigs, cargo ships, commercial and recreational fishing boats, research vessels, naval ships, and other vessels operating in the Gulf. Laws enacted during the late 1980s to regulate this dumping are difficult to enforce over vast expanses of water. In addition to trash, pollution from heavy spills of oil or waste products poses additional threats (Campbell, 2003).

Further threats to this species include collisions with boats, explosives used to remove oil rigs, and entrapment in coastal power plant intake pipes (Campbell, 2003). Dredging operations affect Kemp's ridley turtles through incidental take and by degrading the habitat. Incidental take of ridleys has been documented with hopper dredges. In addition to direct take, channelization of the inshore and nearshore areas can degrade foraging and migratory habitat through spoil dumping, degraded water quality/clarity, and altered current flow (NMFS, USFWS, and SEMARNAT, 2011).

Sea turtles are especially subject to human impacts during the time the females come ashore for nesting. Modifications to nesting areas can have a devastating effect on sea turtle populations. In many cases, prime sea turtle nesting sites are also prime real estate. If a nesting site has been disturbed or destroyed, female turtles may nest in inferior locations where the hatchlings are less likely to survive, or they may not lay any eggs at all. Artificial lighting from developed beachfront areas often disorients nesting females and hatchling sea turtles, causing them to head inland by mistake, often with fatal results. Adult females may also avoid brightly lit areas that would otherwise provide suitable nesting sites (Butler, 1998; Witherington and Martin 2003).

Because of the dangerous population decline at the time, a headstarting program for Kemp's ridley sea turtles was carried out from 1978 to 1992. Headstarting is a process whereby sea turtles are maintained in captivity for a period following hatching before being released into the wild in an effort to increase survival during the critical first year of life by protecting them from the high rates of natural predation that would otherwise have occurred in their early months in the natural environment. Other goals of the headstarting program were to establish a nesting colony on Padre Island, Texas, through imprinting hatchlings to natal sand beaches; to develop sea turtle captive-rearing practices; and to study growth and survival in captivity. This headstarting effort was a subsidiary and experimental part of the Kemp's Ridley Recovery Program. Eggs were collected from Rancho Nuevo, Mexico, and placed into polystyrene foam boxes containing Padre Island sand so that the eggs never touched the Rancho Nuevo sand. The eggs were flown to the U.S. and placed in a hatchery on Padre Island and incubated. The resulting hatchlings were allowed to crawl over the Padre Island beaches into the surf for imprinting purposes before being recovered from the surf and taken to Galveston, Texas, for rearing. They were fed a diet of high-protein commercial floating pellets for 7 to 15 months before being released into Texas or Florida waters. This program has had some success. The first nesting from one of these head-started individuals occurred at Padre Island in 1996 and more nesting has occurred since. In later years, some of the eggs were incubated and imprinted at Rancho Nuevo. The captive-rearing program ended in 1992

(Eckert et al., 1994; Caillouet et al., 1995; Shaver, 2000; Fontaine and Shaver, 2005; NMFS, USFWS, and SEMARNAT, 2011).

Kemp's ridley appears to be in the earliest stages of recovery. From the record low of 702 nests at Rancho Nuevo in 1985, the number of nests at Rancho Nuevo increased to 1,430 in 1995, 6,947 in 2005, and 15,459 in 2009 (NMFS and USFWS, 2015). In 2010, however, the number of nests at Rancho Nuevo dipped to 9,840, a 36 percent reduction from 2009 (NMFS and USFWS, 2015), but rebounded in 2011 to 20,570 nests (Jones, 2012). The total number of nests for all of Mexico was 20,913 in 2009, 13,832 (2010), 21,126 (2011), 22,458 (2012), 16,944 (2013), and 12,060 in 2014 (NMFS and USFWS, 2015). Similarly, increased nesting activity has been recorded on the Texas beaches in the last 20 years or so from 4 nests in 1995 to 159 nests in 2015 (Shaver, 2006, 2016). Some of these nests were from head-started ridleys. In 2012, a record 209 Kemps' ridley nests were recorded in Texas (Shaver, 2016), the same year that a peak of 22,458 nests occurred in Mexico (NMFS and USFWS, 2015). The increase can likely be attributed to two primary factors: full protection of nesting females and their nests in Mexico, and the requirement to use TEDs in shrimp trawls both in the U.S. and in Mexico (NMFS and USFWS, 2015).

3.3.2 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; Shaver, 1991; Campbell, 2003).

3.3.3 Range

Adults are primarily restricted to the Gulf, although juveniles may range throughout the Atlantic Ocean since 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 to Colombia.

3.3.4 Distribution in Texas

Kemp's ridley occurs in Texas in small numbers and in many cases may well be in transit between crustacean-rich feeding areas in the northern Gulf and breeding grounds in Mexico. It has 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 with a record 209 Kemp's ridley nests recorded in 2012 (NPS, 2013; Shaver, 2016) and 159 nests recorded in 2015 (NPS, 2015; Shaver, 2016). The majority of these ridley nests occur on Padre Island. 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.

3.3.5 Presence in the Project Area

Kemp's ridley has been recorded in the vicinity of the Project area. In 1994, a head-started ridley was accidentally caught by a fisherman on a rod and reel in the GIWW and released alive (TPWD, 2016b). The USACE Sea Turtle Data Warehouse (USACE, 2013) documents the taking of two Kemp's ridley turtles within the Freeport Harbor Entrance Channel in 2007. This database has been unavailable since 2013. While there is no evidence of occurrence in the Project area, this species could potentially occur in the vicinity of the Project area. Nests have been reported from Quintana and Surfside beaches (Yeargan, 2006, 2007; NPS, 2015). However, the proposed project would not affect the Quintana and Surfside beach areas.

3.4 LEATHERBACK SEA TURTLE

3.4.1 Reasons for Status

The leatherback sea turtle (*Dermochelys coriacea*) was 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).

This 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, 2016b). 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).

3.4.2 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). The leatherback typically nests on beaches with a deep-water approach (Pritchard, 1971).

Critical Habitat

In 1979, the NMFS and the USFWS designated critical habitat for the leatherback sea turtle along the coastal waters adjacent to Sandy Point, St. Croix, U.S. Virgin Islands (44 FR 17710) in 2012 designated critical habitat was added along the West Coast of the U.S. (77 FR 4170). There is no designated critical habitat in Texas, including the Project area, but this species may be found off the coast of Texas.

3.4.3 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). Within the U.S., the largest nesting assemblages occur in the U.S. Virgin Islands, Puerto Rico, and Florida (NMFS, 2016b).

The leatherback migrates farther and ventures into colder water 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.

3.4.4 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 of Mexico, the leatherback is often associated with two species of jellyfish: cabbagehead (*Stomolophus* sp.) and moon (*Aurelia* sp.) (NMFS and USFWS, 1992). According to 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, 1986), 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). No leatherback nests have been recorded since the 2008 nest (NPS, 2014, 2015).

3.4.5 Presence in the Project Area

A leatherback was caught by a relocation trawler in a shipping channel approximately 1.5 miles north of Aransas Pass in 2003 (i.e., well south of the Project area; NMFS, 2003). No leatherback takes have been recorded as a result of dredging activities in the vicinity of the Project area (USACE, 2013), and no leatherback nests have been recorded from the area. Indeed, as noted above, only one leatherback nest has been reported in Texas since the mid-1930s. This species is unlikely to occur in the Project area.

3.5 LOGGERHEAD SEA TURTLE

3.5.1 Reasons for Status

The loggerhead sea turtle (*Caretta caretta*) was listed by the USFWS as threatened throughout its range on July 28, 1978 (43 FR 32808). Four distinct population segments have been listed as threatened (Northwest Atlantic Ocean, South Atlantic Ocean, Southeast Indo-Pacific Ocean, and Southwest Indian Ocean), while five distinct population segments have been listed as endangered (Northeast Atlantic Ocean, Mediterranean Sea, North Indian Ocean, North Pacific Ocean, and South Pacific Ocean) (NMFS, 2016b). These distinct population segments were listed on

September 22, 2011 (76 FR 58868). The Atlantic and Gulf coasts of the U.S. fall within the Northwest Atlantic Ocean distinct population segment.

The decline of the loggerhead, like that of most sea turtles, 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).

3.5.2 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, creeks, and mouths of rivers. It 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).

Commensurate with their use of varied habitats, 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).

Critical Habitat

In July 2014, the NMFS and the USFWS designated critical habitat for the Northwest Atlantic DPS for loggerhead sea turtles in waters and beach habitat of the Gulf of Mexico and along the coast of the U.S. Atlantic Ocean. Texas waters fall under critical habitat unit LOGG-S-02 for *Sargassum* habitat (79 FR 39856). This unit follows the 10-meter depth contour off the Texas coast.

3.5.3 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, 2015). The loggerhead is the most abundant sea turtle species in U.S. coastal waters (NMFS, 2016b).

3.5.4 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). Since that time, several nests have been recorded along the Texas coast. In 1999, two loggerhead nests were confirmed in Texas, while in 2000, five loggerhead nests were confirmed (Shaver, 2000). Between 2001 and 2005, up to five loggerhead nests per year were recorded from the Texas coast (Shaver, 2006). Two loggerhead nests were recorded in 2006: one at Padre Island National Seashore and the other on South Padre Island; and six loggerhead nests were 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 (NPS 2014); however, only two nests were recorded in Texas in 2014 and eight nests in 2015 (NPS, 2015). Like the worldwide population, the population of loggerheads in Texas has declined. Prior to World War I, the species was taken in Texas for local consumption and a few were marketed (Hildebrand, 1982). Today, even with protection, insufficient loggerheads exist to support a fishery.

3.5.5 Presence in the Project Area

This species has been recorded in the vicinity of the Project area. Between 1995 and 2000, eight loggerheads were caught in Freeport Harbor Channel and during the Freeport Harbor Project (July 13 to September 24, 2002), a relocation trawler captured one loggerhead (NMFS, 2003). More recently, one loggerhead was incidentally taken in the Freeport Harbor Entrance Channel in 2006 as a result of dredging activities, one in 2008, and one in 2011 (USACE, 2013). This database has been unavailable since 2013. While there is no evidence of occurrence in the Project area, this

species could potentially occur in the vicinity of the Project area. No nests have been recorded in the vicinity (NPS, 2014, 2015).

3.6 PIPING PLOVER

3.6.1 Reasons for Status

The USFWS listed the piping plover (*Charadrius melodus*) as threatened and endangered 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 eggs by feral pets (USFWS, 1995).

3.6.2 Habitat

Piping plovers typically inhabit shorelines of oceans, rivers, and inland lakes. Nest sites include sandy beaches, especially where scattered tufts of grass are present; sandbars; causeways; bare areas on dredge-created and natural alluvial islands in rivers; gravel pits along rivers; silty flats; and salt-encrusted bare areas of sand, gravel, or pebbly mud on interior alkali lakes and ponds. On the wintering grounds, these birds use beaches, mudflats, sandflats, dunes, and offshore spoil islands (AOU, 1998; USFWS, 1995; Haig and Elliott-Smith, 2004).

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 GLO in 2006 (74 FR 23475–23600, May 19, 2009). The primary constituent elements (PCEs) for the 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.

3.6.3 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.

3.6.4 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, 2003; Haig and Elliott-Smith, 2004). The species is a common migrant and rare to uncommon winter resident on the upper Texas coast (Richardson et al., 1998; Lockwood and Freeman, 2004). 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).

3.6.5 Presence in the Project Area

USFWS critical habitat in the wintering range for this species (65 FR 41781–41812, 6 July 2000) includes the land from the seaward boundary of mean lower low water to where densely vegetated habitat, not used by the species, begins and where the PCEs no longer occur. Critical Habitat Unit TX-33 encompasses approximately 211 acres between the mouth of the Brazos River and Farm-to-Market Road 1495 and includes Bryan Beach and adjacent beach habitat (74 FR 23475–23600, May 19, 2009), southwest of the Project area. The piping plover has been recorded sporadically from area beaches, including Quintana Beach and jetty, Surfside Beach and jetty, and Bryan Beach. The most recent record is from Surfside Beach and jetty on January 10, 2016, when five piping

plovers were recorded. TPWD NDD data also show that piping plovers have been recorded form Bryan, Quintana, and Surfside beaches (TPWD, 2016b). No reports are recorded from the Dow Thumb area (eBird, 2016; TPWD, 2016b). The proposed Project would not impact any of the areas where the species has been recorded.

3.7 RED KNOT

3.7.1 Reasons for Status

The *rufa* subspecies of the red knot (*Calidris canutus rufa*) was federally listed as threatened on December 11, 2014 (79 FR 73706). No critical habitat has been designated by the USFWS for this species. Threats to the red knot from habitat destruction and modification are occurring throughout its entire range. Within the breeding portion of its range, the primary threat to red knot habitat is from climate change. Within the nonbreeding portion of its range, red knot habitat is primarily threatened by sea level rise, shoreline stabilization, and costal development. Lesser threats to nonbreeding habitat include beach cleaning, invasive vegetation, agriculture, and aquaculture. Reduced food availability and timing mismatches (asynchronies) throughout the bird's annual migratory cycle is another threat. For example, commercial harvest of the horseshoe crab at the Delaware Bay stopover site thus reducing the amount of crab eggs available as food for the red knot is considered a primary causal factor in the decline of the rufa red knot in the 2000s (USFWS, 2014).

3.7.2 Habitat

Red knots generally nest in dry, slightly elevated tundra locations, often on windswept slopes with little vegetation. Preferred wintering and stopover habitat includes muddy or sandy coastal areas, specifically the mouths of bays and estuaries, tidal mudflats, tidal inlets, salt marshes, shallow coastal impoundments and lagoons, sand spits, islets, shoals, sandbars, and along sandy, gravel, or cobble beaches. Along the Texas coast, red knots forage on beaches, oyster reefs, exposed bay bottoms, and extensive tidal flats on the bay side of barrier islands, and roost on high sandflats, reefs, and other sites protected from high tides. A study at Laguna Madre found that red knots prefer bay habitats when they are available, and are sensitive to high water levels in bays. In general, red knots primarily forage on intertidal flats and sandy beaches (USFWS, 2014).

On the breeding grounds, the red knot's diet consists primarily of terrestrial invertebrates such as insects and other arthropods. On the wintering grounds, the red knot is a specialized molluscivore, eating hard-shelled mollusks. The diet is sometimes supplemented by accessible softer invertebrates such as shrimp- and crab-like organisms, marine worms, and horseshoe crab eggs (USFWS, 2014).

3.7.3 Range

The rufa red knot migrates annually between its breeding grounds in the Central Canadian Arctic and several wintering regions, including the southeast U.S. (mainly Florida and Georgia, with smaller numbers in South Carolina), the northeast Gulf of Mexico (including Texas), northern Brazil, the Atlantic coasts of Argentina and Chile, and Tierra del Fuego at the southern tip of South America. This represents a round trip of 18,641 miles (30,000 kilometers) for some red knots and they may travel thousands of miles without stopping. During both the spring (northbound) and fall (southbound) migrations, red knots use key staging and stopover areas. The Delaware Bay area (in Delaware and New Jersey) is the largest known spring migration stopover area, accounting for 50 to 80 percent of the red knot population making its way to the arctic breeding grounds each spring. Red knots congregate in Delaware from the middle of May to early June, which corresponds to the spawning season of the horseshoe crab. The red knots feed primarily on the horseshoe crab eggs to rebuild their energy reserves prior to completion of their migration to the arctic breeding grounds (USFWS, 2014).

Another subspecies, *Calidris canutus roselaari*, breeds in western Alaska and on Wrangel Island in eastern Russia and winters on the Pacific coast from northern Mexico through Panama and possibly farther south. While the breeding areas of these two subspecies do not overlap, their nonbreeding ranges are known to overlap in a few locations such as Texas during spring and in Panama during winter. While marked birds of both subspecies have been observed in Texas, they are primarily the *rufa* subspecies. The *roselaari* subspecies has been observed during spring migration, but not overwintering. The two subspecies cannot be distinguished in the field (USFWS, 2014).

3.7.4 Distribution in Texas

The Texas Gulf coast provides wintering habitat as well as spring and fall migration stopover areas for red knots. As noted above, while both subspecies have been observed in Texas, it is predominantly *rufa*. The *roselaari* red knots have only been observed during spring migration and not overwintering, and it is considered that all or nearly all of the red knots wintering in Texas are rufa red knots. It is estimated that approximately 2,000 red knots currently winter along the Texas coast, particularly at Laguna Madre (USFWS, 2014).

3.7.5 Presence in the Project Area

The red knot has been recorded sporadically from area beaches, including Quintana Beach and jetty, Surfside Beach and jetty, and Bryan Beach. The most recent record is from Surfside Beach and jetty on January 10, 2016, when a single red knot was recorded. The proposed Project would not impact any of these areas. No reports are recorded from the Dow Thumb area (eBird, 2016; TPWD, 2016b).

3.8 WHOOPING CRANE

3.8.1 Reasons for Status

The whooping crane (*Grus americana*) was federally listed as endangered on March 11, 1967 (32 FR 4001). Critical habitat has been designated in Aransas, Calhoun, and Refugio counties in Texas, and includes the Aransas National Wildlife Refuge (NWR). The main factors for the decline of the whooping crane were loss of habitat to agriculture (hay, pastureland, and grain production), human disturbance of nesting areas, uncontrolled hunting, specimen and egg collection, collisions with power lines, fences, and other structures, loss and degradation of migration stopover habitat, disease such as avian cholera, predation, lead poisoning, and loss of genetic diversity. Biological factors, such as delayed sexual maturity and small clutch size, prevent rapid population recovery. Drought during the breeding season presents serious hazards to this species. Exposure to disease is a special problem when large numbers of birds are concentrated in limited areas, as often happens during times of drought (Lewis, 1995; Campbell, 2003; Canadian Wildlife Service [CWS] and USFWS, 2007).

While in Texas, the main population is at risk from chemical spills along the GIWW, which passes through the center of their winter range (Campbell, 2003). The presence of contaminants in the food base is another potential problem on their wintering grounds (Oberholser, 1974), and a late-season hurricane or other weather event could be disastrous to this concentrated population.

3.8.2 Habitat

Nesting habitat in northern Canada is poorly drained region of freshwater marshes and wet prairies interspersed with numerous potholes and narrow-wooded ridges. Whooping cranes use a variety of habitats during migration, including freshwater marshes, wet prairies, inland lakes, small farm ponds, upland grain fields, and riverine systems. Shallow flooded palustrine wetlands are used for roosting, while croplands and emergent wetlands are used for feeding. Riverine habitats, such as submerged sandbars, are often used for roosting. The principal winter habitat in Texas is brackish bays, marshes, and salt flats, although whooping cranes sometimes feed in upland sites characterized by oak mottes, grassland swales, and ponds on gently rolling sandy soils (Lewis, 1995; Campbell, 2003; CWS and USFWS, 2007).

Whooping cranes are omnivorous and forage by probing and gleaning foods from soil, water, and vegetation. Summer foods include dragonflies, damselflies, other aquatic insects, crayfish, clams, snails, grasshoppers, crickets, frogs, mice, voles, small birds, minnows, reptiles, and berries. During the winter in Texas, they eat a wide variety of plant and animal foods, with blue crabs, clams, and berries of Carolina wolfberry (*Lycium carolinianum*) being predominant in the diet. Foods taken at upland sites include acorns, snails, crayfish, and insects. Waste grains, such as barley and wheat, form an important part of the diet during the spring and fall migrations (Lewis, 1995; Campbell, 2003; CWS and USFWS, 2007).

Critical Habitat

Critical habitat was designated in 1993 in Aransas, Calhoun, and Refugio counties, Texas (USFWS, 1995). There is no critical habitat in or near the vicinity of the Project area.

3.8.3 Range

Whooping cranes were originally found throughout most of North America. In the nineteenth century, the main breeding area was from the Northwest Territories to the prairie provinces in Canada, and the northern prairie states to Illinois. Only four populations of whooping cranes exist in the wild, the largest of which is the Aransas-Wood Buffalo population, which breeds in isolated marshy areas of Wood Buffalo National Park in Canada's Northwest Territories, Each fall, the entire population of whooping cranes from this national park migrates some 2,600 miles (4,183 kilometers) primarily to the Aransas NWR and adjacent areas of the central Texas coast in Aransas, Calhoun, and Refugio counties, where it overwinters in oak savannahs, salt marshes, and bays (USFWS, 1995). During migration they use various stopover areas in western Canada and the American Midwest. The three other wild populations have been introduced: an eastern population that migrates between Wisconsin and Florida and two non-migratory populations, one in central Florida, the other in Louisiana. As of the winter of 2014/2015, the four populations totaled 464 birds: 314 in the Aransas-Wood Buffalo flock, 103 in the eastern migratory population, 31 in the Louisiana non-migratory population, and 16 in the Florida non-migratory population (Whooping Crane Conservation Association, 2016).

3.8.4 Distribution in Texas

The natural wild population of whooping cranes spends its winters at the Aransas NWR, Matagorda Island, Isla San Jose, portions of the Lamar Peninsula, and Welder Point on the east side of San Antonio Bay (CWS and USFWS, 2007). The main stopover points in Texas for migrating birds are in the central and eastern Panhandle (USFWS, 1995).

3.8.5 Presence in the Project Area

Brazoria County is within the species' migration corridor; however, the species is unlikely to occur in the Project area because of the absence of suitable habitat. TPWD's NDD database (TPWD, 20016b and eBird (2016) show no records from the Project area, although TPWD (2016b) indicates documented records of whooping cranes from marshes west of the Brazos River; however, these are old records from 1986 and likely represent vagrant birds.

3.9 WEST INDIAN MANATEE

3.9.1 Reasons for Status

The West Indian manatee (*Trichechus manatus*) was federally listed as endangered on March 11, 1967 (32 FR 4001). The USFWS has recently proposed to downlist this species from endangered to threatened (81 FR 1000–1026; January 8, 2016). Two subspecies are recognized: the Florida manatee (*Trichechus manatus latirostris*) and the Antillean manatee (*Trichechus manatus manatus*). Critical habitat was designated in 1976 for the Florida subspecies. This was one of the first ESA designations of critical habitat for an endangered species and the first for an endangered marine mammal. The designated critical habitat was restricted to Florida and did not include Texas (USFWS, 2001).

Since the manatee was designated as an endangered species prior to enactment of the ESA, no formal listing package identifying threats to the species, as required by Section 4(a)(1) of the ESA was prepared. However, hunting and fishing pressure were responsible for much of its original decline because of the demand for meat, hides, and bones.

The primary human- related threat currently faced by the West Indian manatee is watercraft-related strikes (direct impact and/or propeller), which cause injury and death. The next largest human-related cause of manatee deaths is entrapment or crushing in water-control structures and navigational locks. Other known causes of human-related manatee deaths include poaching and vandalism, entanglement in shrimp nets, monofilament fishing line, crab pot lines etc., entrapment in culverts and pipes, and ingestion of debris. Entrapment in shrimp nets has been the largest component of this catch-all category. Natural threats include exposure to cold and red tide. Mortality associated with these natural threats are cold stress syndrome and brevitoxicosis, respectively (USFWS, 2001, 2007).

3.9.2 Habitat

The West Indian manatee inhabits freshwater, brackish and marine habitats such as shallow coastal waters, estuaries, bays, rivers, and lakes, although it seems to prefer rivers and estuaries to marine habitat. Manatees are herbivores and feed opportunistically on a wide variety of submerged, floating, and emergent vegetation. In coastal areas, seagrasses appear to be a staple of their diet, with preferences for water hyacinth, hydrilla, and smooth cordgrass. Manatees use springs and freshwater runoff sites for drinking water; secluded canals, creeks, embayments, and lagoons for resting, cavorting, mating, calving and nurturing their young; and open waterways and channels as travel corridors. Manatees occupy different habitats during various times of the year, with a focus on warm-water sites during winter (USFWS, 2001, 2007). Manatees occur in loose knit groups, but are not gregarious by nature. Breeding and calving occurs year round (Schmidly, 2004).

3.9.3 Range

The West Indian manatee ranges from the southeastern U.S. (primarily Florida), the east coast of Mexico and Central America, northeastern South America, the Greater Antilles (Cuba, Hispaniola, Puerto Rico, and Jamaica), and parts of the Lesser Antilles, including Trinidad and Tobago. Manatees in the southeastern U.S. are found in Florida year-round and occasionally in Georgia and Alabama during warmer months. Vagrants can be found as far north as Massachusetts and as far west as Texas (81 FR 1000). Because of its intolerance for cold (prolonged exposure to water colder than 68°F), the West Indian manatee is at the northern limit of its range in the southeastern U.S.

3.9.4 Distribution in Texas

In 2015, the Florida subspecies of the West Indian manatee was estimated at 6,350 individuals (81 FR 1000). However, very few of these are found in Texas waters. Manatees are considered extremely rare in Texas and probably represent migrants from coastal Mexico. The Texas Marine Mammal Standing Network has recovered fewer than 10 manatees along the Texas coast since 1980 (Rice, 2012). Texas records include specimens from Cow Bayou, near Sabine Lake, Copano Bay, San Jose Island, the Bolivar Peninsula, the Laguna Madre, and the mouth of the Rio Grande (Schmidly, 2004). More recent sightings include a manatee observed first in Nueces Bay and then again in Corpus Christi Bay in Nueces County in September 2012 (Kelly, 2012); a sighting 2 weeks later in a canal between Lake Madeline and Offatts Bayou in Galveston in October 2012 (Rice, 2012); and one in Trinity Bay, Chambers County in November 2014 (McCulley, 2014). It is believed that these manatees originated in Florida.

3.9.5 Presence in the Project Area

TPWD NDD data show no occurrences of the West Indian manatee in the Project area vicinity (TPWD, 2016b). The occurrence of the West Indian manatee in the Project area is possible, but unlikely.

3.10 WHALES

Four listed whale species are identified by the NMFS (2016c) as occurring in Texas coastal waters: fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), sei whale (*Balaenoptera borealis*), and sperm whale (*Physeter macrocephalus*). These species are generally restricted to offshore waters; therefore, it is unlikely that any of these five species would occur in the Project area vicinity. No whales were included in the USFWS IPAC report.

3.11 CORALS

3.11.1 Reasons for Status

On September 10, 2014, NMFS published a final rule listing 20 of the original 83 Caribbean species of coral petitioned by the Center for Biological Diversity for endangered/threatened status under the ESA as threatened (79 FR 53852). NMFS lists four of these species as occurring in Texas: lobed star coral (*Orbicella annularis*), mountainous star coral (*Orbicella faveolata*), boulder star coral (*Orbicella franksi*), and elkhorn coral (*Acropora palmata*). The elkhorn coral was listed as threatened in 2006; it retained its threatened status rather than being listed as endangered as proposed. Star corals historically dominated coral reefs throughout the Caribbean both by abundance and cover. Over the last 20 years, however, major declines between 50 to 95 percent have been reported in many locations, although a few locations report stable or increasing coverage (NMFS, 2015a, 2015b).

The threats to these four coral species are generally the same threats affecting coral reefs throughout the world (climate change impacts, fishing impacts, and land-based sources of pollution impacts). Specifically, disease and ocean warming are the two biggest threats that will impact the potential for recovery of all four coral species. Sea-surface temperature is expected to continue to rise over time and may exacerbate disease impacts. Additional threats include local threats posed by human activity such as construction, dredging, run-off, water pollution, toxicants, physical damage from storms, ocean acidification, coastal development, agricultural and land-use practices, predation, reef fishing, aquarium trade, physical damage from boats and anchors, marine debris, and aquatic invasive species (NMFS, 2015a, 2015b, 2016d).

3.11.2 Habitat

Elkhorn coral was formerly the dominant species in shallow water (3 to 16 ft deep throughout the Caribbean and on the Florida Reef Tract, forming extensive, densely aggregated stands in areas of heavy surf. Coral colonies prefer exposed reef crest and fore reef environments in depths of less than 20 feet, although isolated corals may occur to depths of 65 feet (NMFS, 2016d). Mountainous star coral was the most abundant member of the species complex between 2 and 5 meters depth, while lobed star coral was the most abundant at depths of 10 to 15 meters and boulder star coral was the most abundant at depths of 20 to 30 meters (79 FR 53852). Star corals have slow growth rates, late reproductive maturity, and low recruitment rates. Colonies can grow very large and live for centuries (NMFS, 2015b).

Critical Habitat

NMFS designated critical habitat for elkhorn (and staghorn corals) in November 2008 in four areas: Florida, Puerto Rico, St. John/St. Thomas, and St. Croix (NMFS, 2016d). Critical habitat has not been designated for the three star coral species.

3.11.3 Range

The four coral species are widely distributed throughout the western Atlantic, Caribbean, and Gulf of Mexico, both inside U.S. jurisdiction (Florida, Puerto Rico, U.S. Virgin Islands, northwestern Gulf of Mexico [Flower Garden Banks National Marine Sanctuary], Navassa Island) and outside U.S. jurisdiction (79 FR 53852; NMFS, 2015a, 2015b). Its northern limit is Biscayne National Park, Florida, and it extends south to Venezuela, though it is not found in Bermuda (NMFS, 2016d).

3.11.4 Distribution in Texas

All four coral species can be found in Flower Garden Banks National Marine Sanctuary, which is located near the outer edge of the continental shelf in the northwestern Gulf of Mexico, approximately 120 miles southeast of Galveston, Texas.

3.11.5 Presence in the Project Area

The current U.S. distribution of the four coral species is limited to Florida, Puerto Rico, U.S. Virgin Islands, northwestern Gulf of Mexico (Flower Garden Banks National Marine Sanctuary), and Navassa Island. These species are offshore species and not present in the Project area.

4.0 EFFECTS ANALYSIS

The following sections provide the USACE's effect determinations of this Project on federally listed species and species-specific avoidance, minimization, and conservation measures, as appropriate, that support the effect determinations. Effects determinations are presented using terminology recommended by 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.

4.1 SEA TURTLES

Sea turtles may be present in the vicinity of the Entrance Channel area during certain times of the year, but they are unlikely to occur in the inner harbor area where the proposed Project would be constructed because of the lack of suitable habitat, forage and prey species in this area. Furthermore, the types of equipment proposed for use for construction of the channel widening and bend-easing are not known to adversely affect sea turtles. A cutterhead hydraulic pipeline dredge would be used to construct the channel widening and notch features. The bend easing feature would be constructed with both a cutterhead dredge and mechanical dredging. Cutterhead dredges are not known to cause injury to, or mortality of, sea turtles (NMFS, 2003). The mechanical dredging would be conducted from land in the dry, prior to connecting the area to the channel with a cutterhead dredge.

As noted in Section 2, green, loggerhead, and Kemp's ridley sea turtles may occur in the general vicinity of the Project area (NMFS, 2003; USACE 2013; NPS, 2014, 2015; TPWD, 2016b). Of the five species of sea turtle known to potentially occur in Texas waters, the leatherback is the least likely to occur in the Project area due to its pelagic nature and there are no documented records of hawksbills occurring in Brazoria County. While it is known that sea turtles are taken incidentally by hopper dredges during dredging operations (NMFS, 2003; USACE, 2013), mechanical and cutterhead dredges are not known to cause incidental take (NMFS, 2003; 2014). The chance of injury or death from interaction with clamshell/bucket or hydraulic cutterhead dredging equipment is discountable as these sea turtle species are highly mobile and are likely to avoid the areas during

construction. Therefore, USACE has determined that channel construction activities would have no effect on the green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles. The Project would not affect beach areas which are potential turtle nesting sites, and no beach nourishment activities are proposed as part of the Project; therefore, the Project would have no effect on nesting sea turtles.

4.2 PIPING PLOVER

Open-water dredging would not directly affect the piping plover. Wintering piping plovers are of known occurrence on beaches and sand and mudflats along the open-water Gulf margins in the general vicinity of the Project area and in USFWS-designated critical habitat for the piping plover (Critical Habitat Unit TX-33) southwest of the Project Area. There are no records of occurrence in the Project area (eBird, 2016; TPWD, 2016b). Wintering piping plovers have been observed using upland PAs for resting between placement activities. PA 1 is currently used every 10 months for maintenance-dredged material placement, and no change in that placement schedule is anticipated. Prior to placing material in PA 1, USACE would survey PA 1 for use by piping plovers and coordinate with USFWS to ensure that none are affected by construction in the unlikely event they are found. Accordingly, the USACE has determined that the proposed Project would have no effect on the piping plover.

4.3 RED KNOT

The red knot utilizes the same habitat areas as the piping plover. Like the piping plover, it has been recorded sporadically from area beaches, including Quintana Beach and jetty, Surfside Beach and jetty, and Bryan Beach. There are no records of occurrence in the Project area (eBird, 2016; TPWD, 2016b). Prior to placing material in PA 1, USACE would survey PA 1 for use by red knots and coordinate with USFWS to ensure that none are affected by construction in the unlikely event they are found. Accordingly, the USACE has determined that the proposed Project would have no effect on the red knot.

4.4 WHOOPING CRANE

This species is not expected to occur in the Project area; therefore, the USACE has determined that the proposed Project would have no effect on the whooping crane.

4.5 WEST INDIAN MANATEE

Sightings of manatees are rare along the Texas coast, with only three sightings since 2012: one in Nueces County in 2012, one in Galveston County in 2012, and one on Chambers County in 2014 (Kelly, 2012; Rice, 2012; and McCulley, 2014, respectively). The occurrence of the West Indian manatee in the vicinity of the Project area is possible, but highly unlikely. Thus, the USACE has determined that the proposed Project would have no effect on the West Indian manatee.

4.6 WHALES

None of the four whale species are expected to occur in the Project area; therefore, the USACE has determined that the proposed Project would have no effect on the fin, humpback, sei, and sperm whales.

4.7 CORALS

The four coral species occur in offshore waters, the closest being the Flower Garden Banks National Marine Sanctuary. They are not present in the Project area; therefore, the USACE has determined that the proposed Project would have no effect on the lobed star, mountainous star, boulder star, and elkhorn corals.

4.8 CRITICAL HABITAT

4.8.1 Loggerhead sea turtle

As noted above, in July 2014 the NMFS and the USFWS designated critical habitat for the Northwest Atlantic DPS for loggerhead sea turtles in waters and beach habitat of the Gulf of Mexico and along the coast of the U.S. Atlantic Ocean. Texas waters fall under critical habitat unit LOGG-S-02 for *Sargassum* habitat (79 FR 39856). This unit follows the 10-meter depth contour off the Texas coast. In the Project area, this 10-meter contour is approximately 2 miles from the end of the jetties. The USACE has determined that the proposed Project would not result in the destruction or adverse modification of critical habitat for the loggerhead sea turtle (i.e., no effect).

4.8.2 Piping Plover

As noted above, Critical Habitat Unit TX-33 encompasses approximately 211 acres between the mouth of the Brazos River and Farm-to-Market Road 1495 and includes Bryan Beach and adjacent beach habitat (74 FR 23475–23600, May 19, 2009), just southwest of the Project area. The USACE has determined that the proposed Project would not result in the destruction or adverse modification of critical habitat for the piping plover (i.e., no effect).

5.0 SUMMARY OF EFFECT DETERMINATIONS

Table 2 presents a summary of effect determinations for the federally threatened and endangered species covered in this BA. Impacts from the proposed Project are expected to be negligible.

TABLE 2
EFFECT DETERMINATIONS SUMMARY FOR THE PROPOSED PROJECT

Common Name	Scientific Name	Dredging Activity*	Placement of Dredged
REPTILES			
Green sea turtle	*Chelonia mydas*	No effect	No effect
Hawksbill sea turtle	*Eretmochelys imbricata*	No effect	No effect
Kemp's ridley sea turtle	*Lepidochelys kempii*	No effect	No effect
Leatherback sea turtle	*Dermochelys coriacea*	No effect	No effect
Loggerhead sea turtle	*Caretta caretta*	No effect	No effect
BIRDS			
Piping plover	*Charadrius melodus*	No effect	No effect
Red knot	*Calidris canutus rufa*	No effect	No effect
Whooping crane	*Grus americana*	No effect	No effect
MAMMALS			
West Indian manatee	*Balaenoptera musculus*	No effect	No effect
Fin whale	*Balaenoptera physalus*	No effect	No effect
Humpback whale	*Megaptera novaengliae*	No effect	No effect
Sei whale	*Balaenoptera borealis*	No effect	No effect
Sperm whale	*Physeter macrocephalus*	No effect	No effect
INVERTEBRATES			
Lobed star coral	*Orbicella annularis*	No effect	No effect

Mountainous star coral	*Orbicella faveolata*	No effect	No effect
Boulder star coral	*Orbicella franksi*	No effect	No effect
Elkhorn coral	*Acropora palmata*	No effect	No effect
CRITICAL HABITAT			
Leatherback sea turtle	*Dermochelys coriacea*	No effect	No effect
Hawksbill sea turtle	*Eretmochelys imbricata*	No effect	No effect
Loggerhead sea turtle	*Caretta caretta*	No effect	No effect
Piping plover	*Charadrius melodus*	No effect	No effect

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Appendix A

USFWS IPAC and NOAA Threatened and Endangered Species Lists

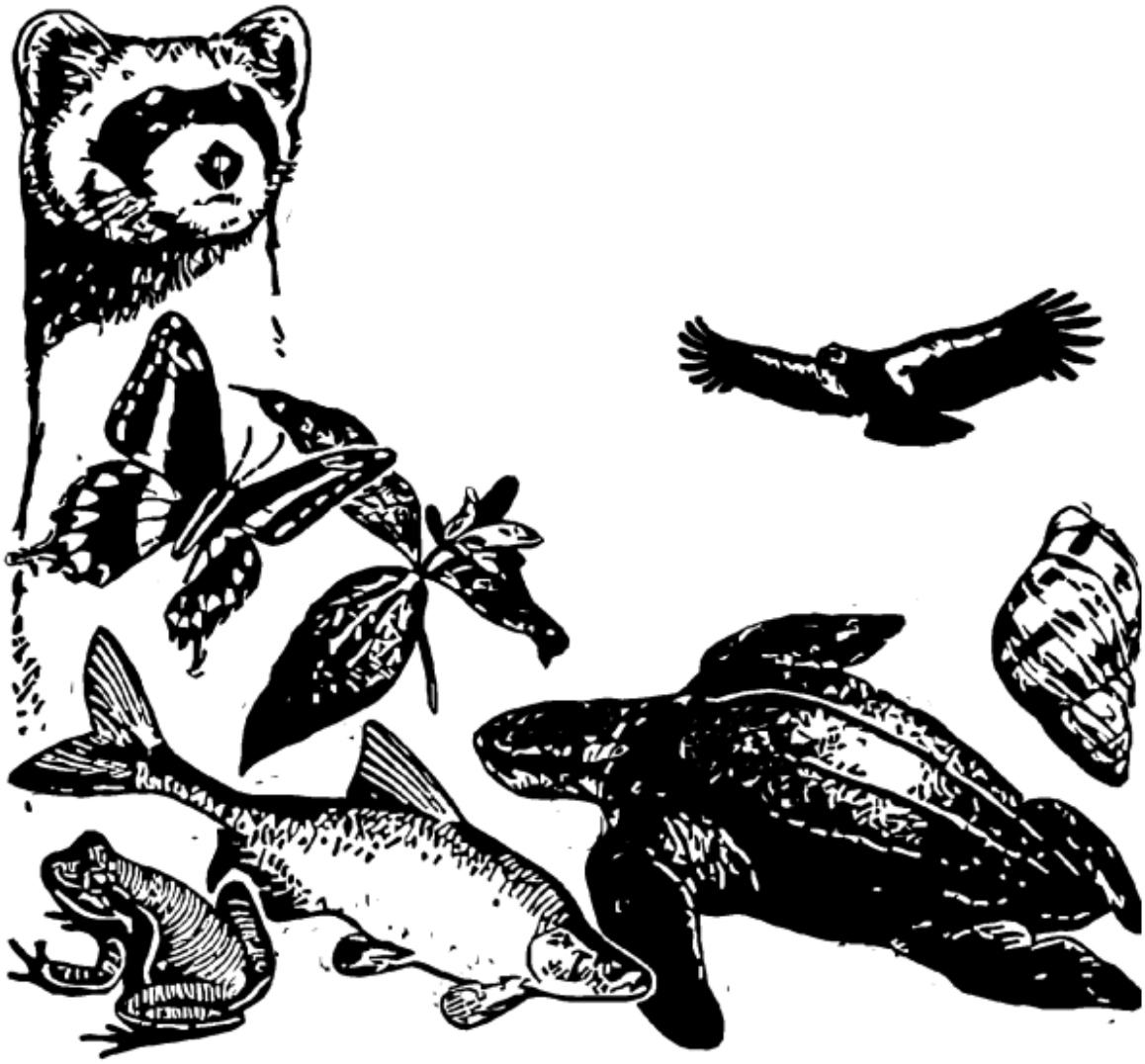
U.S. Fish & Wildlife Service

Port Freeport GRR-EA

IPaC Trust Resources Report

Generated September 30, 2016 10:55 AM MDT, IPaC v3.0.9

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



IPaC - Information for Planning and Conservation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

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U.S. Fish & Wildlife Service

IPaC Trust Resources Report

NAME

Port Freeport GRR-EA

LOCATION

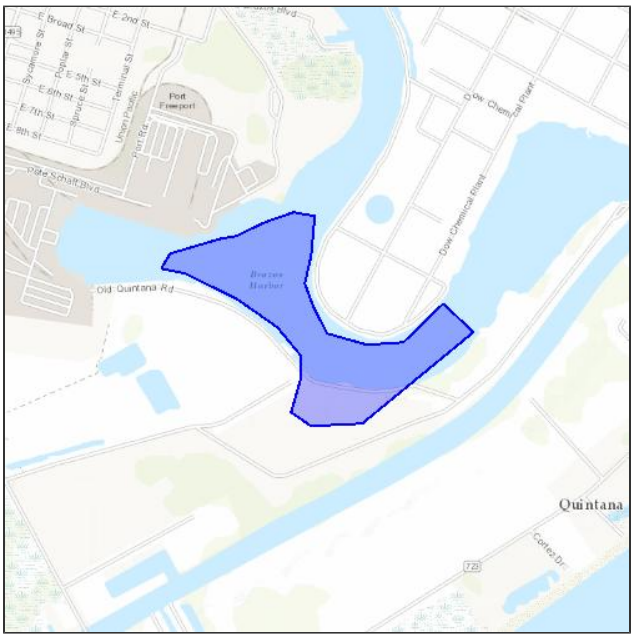
Brazoria County, Texas

DESCRIPTION

Channel widening, bend easing, and turning basin

IPAC LINK

https://ecos.fws.gov/ipac/project/IQZE5-2HWZF-EORPT-JQZ4I-L2ZSDE



U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

Texas Coastal Ecological Services Field Office
17629 El Camino Real, Suite 211
Houston, TX 77058-3051
(281) 286-8282

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Birds

Piping Plover Charadrius melodus — Threatened

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

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B079

Red Knot Calidris canutus rufa — Threatened

CRITICAL HABITAT
No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DM

Whooping Crane Grus americana — Endangered

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

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B003

Mammals

West Indian Manatee Trichechus manatus — Endangered

CRITICAL HABITAT

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

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A007

Reptiles

Hawksbill Sea Turtle Eretmochelys imbricata — Endangered

CRITICAL HABITAT

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

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=C00E

Kemp's Ridley Sea Turtle Lepidochelys kempii — Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=C00O

Leatherback Sea Turtle Dermochelys coriacea — Endangered

CRITICAL HABITAT

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

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=C00F

Loggerhead Sea Turtle Caretta caretta — Threatened

CRITICAL HABITAT

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

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=C00U

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

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

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

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1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.birdscanada.org/birdmon/default/datasummaries.jsp

The following species of migratory birds could potentially be affected by activities in this location:

American Oystercatcher Haematopus palliatus — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0G8

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Black Rail Laterallus jamaicensis — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B09A

Black Skimmer Rynchops niger — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EO

Burrowing Owl Athene cunicularia — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0NC

Dickcissel Spiza americana — Bird of conservation concern
Season: Breeding

Fox Sparrow Passerella iliaca — Bird of conservation concern
Season: Wintering

Gull-billed Tern Gelochelidon nilotica — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JV

Henslow's Sparrow Ammodramus henslowii — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B09D

Hudsonian Godwit Limosa haemastica — Bird of conservation concern
Season: Migrating

Le Conte's Sparrow Ammodramus leconteii — Bird of conservation concern
Season: Wintering

Least Tern Sterna antillarum — Bird of conservation concern
Season: Breeding

Lesser Yellowlegs Tringa flavipes — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0MD

Loggerhead Shrike Lanius ludovicianus — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FY

Long-billed Curlew Numenius americanus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06S

Magnificent Frigatebird Fregata magnificens — Bird of conservation concern
Season: Wintering

Marbled Godwit Limosa fedoa — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JL

Nelson's Sparrow Ammodramus nelsoni — Bird of conservation concern
Season: Wintering

Painted Bunting Passerina ciris — Bird of conservation concern
Season: Breeding

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Red Knot Calidris canutus rufa — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DM

Red-headed Woodpecker Melanerpes erythrocephalus — Bird of conservation concern
Season: Wintering

Reddish Egret Egretta rufescens — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06U

Rusty Blackbird Euphagus carolinus — Bird of conservation concern
Season: Wintering

Sandwich Tern Thalasseus sandvicensis — Bird of conservation concern
Season: Year-round

Seaside Sparrow Ammodramus maritimus — Bird of conservation concern
Season: Year-round

Sedge Wren Cistothorus platensis — Bird of conservation concern
Season: Wintering

Short-billed Dowitcher Limnodromus griseus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JK

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Snowy Plover Charadrius alexandrinus — Bird of conservation concern
Season: Breeding

Solitary Sandpiper Tringa solitaria — Bird of conservation concern
Season: Wintering

Swainson's Warbler Limnothlypis swainsonii — Bird of conservation concern
Season: Breeding

Whimbrel Numenius phaeopus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JN

White-tailed Hawk Buteo albicaudatus — Bird of conservation concern
Season: Year-round

Wilson's Plover Charadrius wilsonia — Bird of conservation concern
Season: Breeding

Worm Eating Warbler Helmitheros vermivorum — Bird of conservation concern
Season: Migrating

Yellow Rail Coturnicops noveboracensis — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JG

Wildlife refuges and fish hatcheries

There are no refuges or fish hatcheries in this location

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

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

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

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

DATA EXCLUSIONS

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

DATA PRECAUTIONS

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

This location overlaps all or part of the following wetlands:

Estuarine And Marine Deepwater

E1UBL

Freshwater Emergent Wetland

PEM1Kh

A full description for each wetland code can be found at the National Wetlands Inventory website: http://107.20.228.18/decoders/wetlands.aspx

NOAA FISHERIES
Southeast Region
Protected Resources Division

Texas' Threatened and Endangered Species

For more information on listed species please visit:
http://www.nmfs.noaa.gov/pr/species/esa/listed.htm
http://sero.nmfs.noaa.gov/protected_resources/index.html

Marine Mammal Species	Scientific Name	Status
fin whale	*Balaenoptera physalus*	Endangered
humpback whale	*Megaptera novaeangliae*	Endangered
sei whale	*Balaenoptera borealis*	Endangered
sperm whale	*Physeter macrocephalus*	Endangered
Sea Turtle Species		
green sea turtle	*Chelonia mydas*	Threatened[1]
hawksbill sea turtle	*Eretmochelys imbricata*	Endangered
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered
leatherback sea turtle	*Dermochelys coriacea*	Endangered
loggerhead sea turtle	*Caretta caretta*	Threatened[2]
Invertebrate Species		
lobed star coral	*Orbicella annularis*	Threatened
mountainous star coral	*Orbicella faveolata*	Threatened
boulder star coral	*Orbicella franksi*	Threatened
elkhorn coral	*Acropora palmata*	Threatened[3]

Critical Habitat Designations

For final rules, maps, and GIS data please visit:
http://sero.nmfs.noaa.gov/maps_gis_data/protected_resources/critical_habitat/index.html

Loggerhead sea turtle: There are 38 designated marine areas that occur throughout the Southeast Region.

[1] North Atlantic and South Atlantic distinct population segments.
[2] Northwest Atlantic distinct population segment.
[3] Colonies located at Flower Garden Banks National Marine Sanctuary.

NOAA FISHERIES
Southeast Region
Protected Resources Division

Species Proposed for Listing Under the Endangered Species Act

Federal action agencies are encouraged to include species proposed for listing under the Endangered Species Act (ESA) in their Section 7 consultation requests. Species that are proposed for listing are those which have been found to warrant federal protection under the ESA, but a final rule formally listing the species has not yet published. By including these species in your Section 7 consultation, reinitiating consultation after the ESA listing is finalized may not be necessary.

For more information on species proposed for listing under the ESA, please visit: http://www.nmfs.noaa.gov/pr/species/esa/candidate.htm#proposed