Appendix I

Endangered Species Act – Biological Assessment

Brazos Island Harbor, Texas
Channel Improvement Project
Cameron County, Texas

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

December 2013

US Army Corps
of Engineers ®
Galveston District

DRAFT
BIOLOGICAL ASSESSMENT FOR FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES

BRAZOS ISLAND HARBOR CHANNEL IMPROVEMENT PROJECT
TENTATIVELY SELECTED PLAN (52 FEET BY 250 FEET PROJECT)
CAMERON COUNTY, TEXAS

PREPARED BY U.S. ARMY CORPS OF ENGINEERS
GALVESTON DISTRICT
2000 FORT POINT ROAD
GALVESTON, TEXAS 77550

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1.0 INTRODUCTION

1.1 PURPOSE OF THE BIOLOGICAL ASSESSMENT

This Biological Assessment (BA) is being prepared for the purpose of fulfilling the U.S. Army Corps of Engineers (USACE) requirements as outlined under Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended, and to assist the National Marine Fisheries Service (NMFS) and United States Fish and Wildlife Service (USFWS) personnel in fulfilling their obligations under the ESA. The proposed Federal action is a channel improvement project for the Brazos Island Harbor (BIH) Project, an existing Federal deep-draft navigation project in Cameron County, Texas (USACE, 1990). The tentatively selected plan (TSP) would deepen the existing 42-foot authorized project to an authorized depth of 52-feet mean lower low water (MLLW).

This BA addresses potential new construction to deepen the channel and associated placement of new work materials, and operations and maintenance dredging activities for the 50-year period of analysis. However, for the purposes of Section 7 consultation with NMFS, operation and maintenance dredging activities for the proposed project would be covered by the existing Biological Opinion Consultation No. F/SER/2000/01287 with the National Marine Fisheries Service (NMFS, 2003).

1.2 PROJECT SETTING

The existing BIH navigation project services the Port of Brownsville (POB), which is situated at the western end of the man-made BIH navigation channel in Cameron County, Texas (Figure 1). The non-Federal sponsor for the study is the Brownsville Navigation District (BND). The existing project includes the BIH Entrance-Jetty Channel which extends about 2.5 miles into the Gulf of Mexico, and the Brownsville Main Channel which terminates at a turning basin about 17 miles inland from the Gulf of Mexico (Table 1). The POB is located at the turning basin, about three miles north of the Rio Grande River (the international border with Mexico) and five miles east of the City of Brownsville. In this assessment, the footprint of proposed navigation improvements and placement areas will be referred to as the “project area.”

The” study area” encompasses the entire project area, as defined above, and is a larger area for which environmental effects of alternative plans have been analyzed. The study area consists of approximately 103,250 acres (160 square miles) in the Brownsville Navigation District (BND

and extends 3 miles north, south, and west of the BIH channel and 5 miles offshore into the Gulf of Mexico. The study area also is extended for 10 miles along the Gulf of Mexico beach on both sides of Brazos Santiago Pass for the purpose of evaluating potential shoreline impacts from

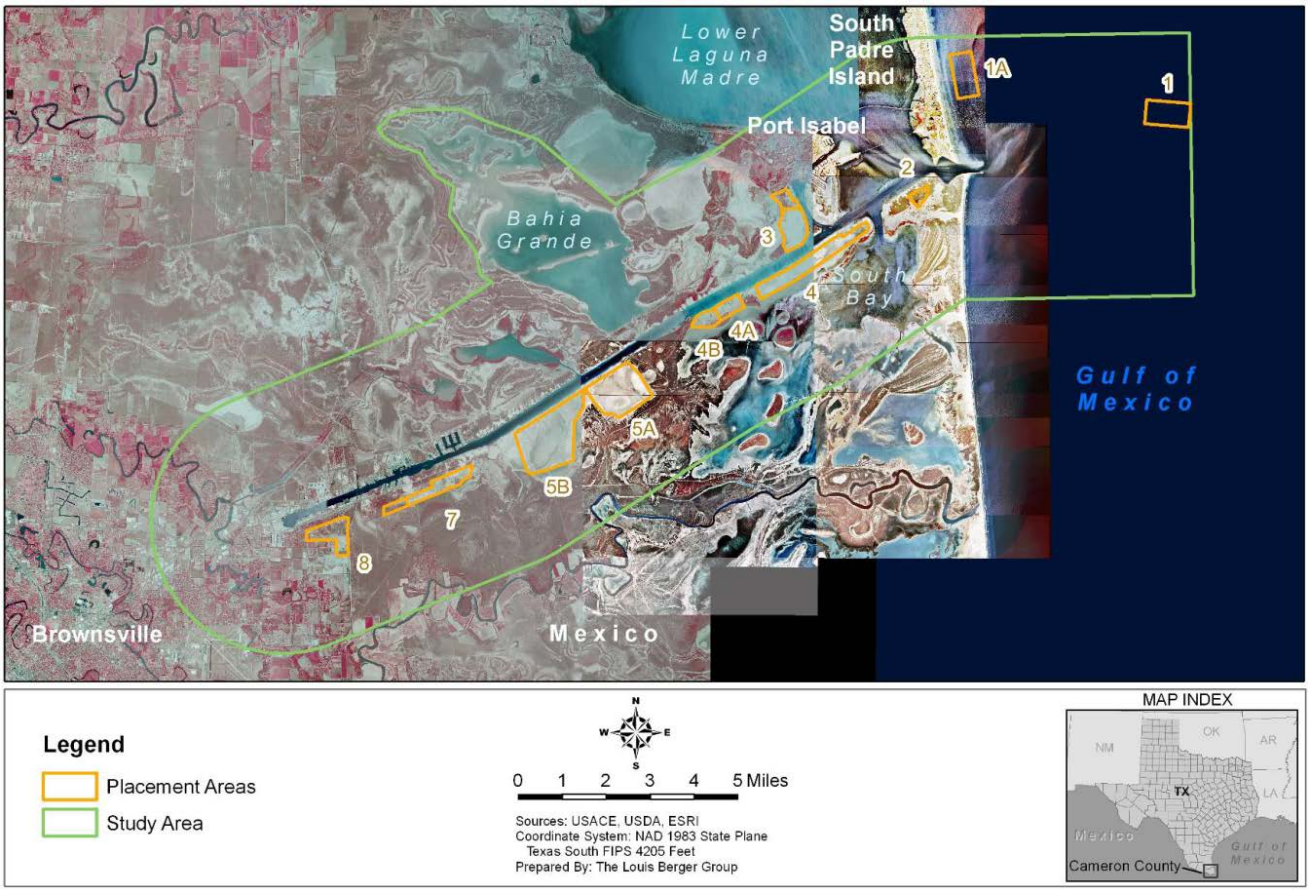

Figure 1: BIH Project Vicinity Map and Study Area

deepening and extending the Entrance Channel.

1.3 HABITATS IN THE STUDY AREA

Biological communities from the desert, coastal, temperate, sub-tropical, and tropical zones converge at the LRGV, creating one of the most biologically diverse areas in North America (McMahan et al., 1984). The diversity of ecosystems located within the project area provide habitat for an array of terrestrial and coastal flora and fauna, including a variety of threatened and endangered species, as well as providing an important stopping point for a substantial number of migratory birds.

Consistent with much of the Texas Gulf coast, the study area includes barrier islands, shallow inland lagoons, and a relatively flat inland area. South Padre Island and Brazos Island, which border the Entrance Channel to the north and the south, respectively, are barrier islands. Unique to the area are extensive mud tidal flats and clay dune formations, or lomas, several of which lie adjacent to the ship channel. Emergent elevations within the study area range from sea level to a maximum of 12 feet above sea level, with an average land elevation of 1.2 feet above sea level.

Table 1: Dimensions of Existing and Proposed Brazos Island Harbor Project

Channel Reach	**Constructed Depth (feet, MLLW)**	**Proposed Depth (feet, MLLW)**	**Constructed Bottom Width (feet)**	**Proposed Bottom Width (feet)**	**Channel Length (miles)**
Entrance Channel Extension		54		300	0.75
Entrance Channel (Gulf of Mexico to offshore end of jetties)	44	54	300	same as existing	1.3
Jetty Channel (Gulf of Mexico to Laguna Madre)	44	54	Transitions from 300 to 400	same as existing	1.1
Main Channel (Laguna Madre to Turning Basin Extension)	42	52	Varies 250 to 400	same as existing	15.1
Turning Basin Extension	Transitions from 42 to 36	same as existing	Transitions from 400 to 325	same as existing	1.3
Turning Basin	36	same as existing	Transitions from 325 - 1,200	same as existing	0.6

The major inland bay is the Laguna Madre, a long, narrow, shallow, hypersaline lagoon extending from Corpus Christi Bay to the southern end of Port Isabel. Only the Lower Laguna Madre is within the project study area; it lies between the Texas mainland and South Padre Island. One of two main inlets connecting Laguna Madre to the Gulf of Mexico, the Brazos-Santiago Pass Inlet, is also located within the study area.

The Laguna Madre is the largest estuarine system on the Texas coast and is characterized as a hypersaline lagoon having little freshwater inflow, clear waters, and abundant submerged aquatic vegetation (SAV). In the Lower Laguna Madre, SAV cover approximately 118,000 acres of water bottom, or slightly more than 65 percent of the total water bottom. Seagrasses grow in patchy strips along the banks of navigation channels where water depths and clarity are sufficient

to allow light penetration, including along portions of the GIWW and BIH channels. Although shoal, turtle, and manatee grasses are the primary SAV in the study area, widgeon grass may occur where salinity levels are lowest; South Bay contains small patches of star grass.

Important fish and wildlife habitats in the study area include thornscrub forest and brush, mesquite savannahs, tidal and wind-tidal algal flats, clay lomas, coastal dunes, and bays and deepwater habitats.

- The thornscrub forest and brush serve as travel corridors for the federally-listed ocelot (*Leopardus pardalis*) and jaguarundi (*Herpailurus yaguarondi*). Many birds only found in the LRGV use thornscrub forest and brushland as habitat. Within the study area, thornscrub forest occurs along resacas in and near the City of Brownsville and on high depositional ridges and lomas throughout the Rio Grande Delta.
- Mesquite savannahs mostly occur south of the Main Channel and north of the Rio Grande (Jahrsdoerfer and Leslie,1988) . The open grassland or savannah habitats have scattered mesquite trees or yucca (Yucca spp.). The grassland is a good hunting area for Northern Aplomado Falcon (*Falco femoralis*) and the yuccas are resting and nesting habitat.
- Tidal flats provide important habitat for a variety of coastal wildlife from migratory waterfowl, shorebirds (like the federally listed piping plover, *Charadrius melodius*), wading birds, and other estuarine-dependent species like shrimp and various finfish (White, 1986). Some portions of study area are unique in that wind and storm events dictate inundation, as opposed to typical, astronomically driven tidal regimes. Since wind and storm events only rarely inundate these flats, they are called wind-tidal flats (Tunnel and Judd, 2002). Conditions on wind-tidal flats are not conducive to marsh vegetation, and consequently these flats are usually barren except for large areas colonized by blue-green algae mats called algal flats.
- Clay lomas are brush-covered clay dunes situated within tidal and wind-tidal flats. Since lomas are dunes situated within tidal zones, the abrupt topographic reliefs create unique habitats. Lomas can reach a height of 30 feet above surrounding flats. Texas fiddlewood, Texas ebony and other woody brush typically colonize lomas while base vegetation usually consists of sea ox-eye daisy and glasswort (Jahrsdoerfer and Leslie, 1988). Clay lomas occur within wind-tidal flats north and south of the Main Channel and are located primarily in the eastern portion of the study area.
- Coastal dunes are mounds or ridges associated with barrier islands and beaches that are formed from sands that are transported and deposited by the wind and the Gulf longshore current. Coastal dunes occur in the study area on Brazos and South Padre islands. In the study area, primary dunes generally occur immediately landward of the beachfront and are

usually the largest. Immediately behind the primary dunes, secondary and back island dunes form. Although a variety of wildlife species use coastal dunes and barrier islands, coastal dune habitats are especially known to include species like the Gulf Coast kangaroo rat, keeled earless lizard, and the spotted ground squirrel. Migrating peregrine falcons also use study area coastal dunes and barrier islands as stopover habitat (Tunnel and Judd, 2002).

- Bays and deepwater habitats are extensive in the study area and include the Main Channel, South Bay, the Laguna Madre, and the open Gulf of Mexico (USFWS, 2012). These bays and deepwater areas are important habitats for a variety of marine species, such as commercially and recreationally important finfish, federally endangered sea turtles, marine mammals and benthos. The Lower Laguna Madre is one of the most productive estuaries in Texas, supporting a diversity of fish species, plankton, and benthic organisms and has great importance as a finfish and shellfish nursery area (Armstrong et al., 1987, Tunnel and Judd, 2002).

1.4 ALTERNATIVES CONSIDERED

A lengthy array of alternatives was considered during plan formulation. The alternatives were developed from ideas provided by the public, resource agencies, USACE, and the non-Federal sponsor. Alternatives considered were the "no-action" plan (retaining the existing 42 feet deep by 250 feet wide channel), non-structural plans (improving traffic scheduling, modifying traffic rules, utilizing another port), and numerous structural alternatives which consisted of variations of channel depths (ranging from 45 to 55 feet deep), widths (ranging from the existing 250-foot width to a 650-foot width) and turning basin location (moving the primary turning basin closer to the Gulf of Mexico). An initial array, an evaluation array, and a final array of alternatives were screened to identify the TSP. All of the alternatives were evaluated in terms of whether they met the planning objective and produced a positive preliminary benefit to cost ratio. The planning objective is to develop a comprehensive plan to increase the efficiency of ship and offshore rig traffic on the BIH while avoiding and minimizing impacts to the area's environmental resources. The TSP, the Final Array alternative plan which maximizes net excess benefits, is the 52 feet by 250-foot plan which would deepen the channel to -52 feet MLLW with no widening.

1.5 DESCRIPTON OF THE TENTATIVELY SELECTED PLAN (TSP)

The 52 by 250 feet TSP for the BIH channel improvement project would:

- extend the Brazos Island Harbor (BIH) Entrance Channel 0.75 miles farther into the Gulf of Mexico (station -17+000 to -13+000) at a depth of -54 feet mean lower low water (MLLW) and a width of 300 feet;
- deepen the existing BIH Entrance Channel from station -13+000 to -6+000 to a depth of -54 feet MLLW at the existing width of 300 feet;
- deepen the BIH Jetty Channel to -54 feet MLLW from station -6+000 to -1+026 at the existing width of 300, transitioning to the existing 400 feet width through station 0+000;
- deepen the Brownsville Main Channel to a depth of -52 feet MLLW at the existing 400 feet width from station 0+000 to 1+517, transitioning to the existing 250 feet width at station 2+329;
- deepen 15.5 miles of the Brownsville Main Channel to a depth of -52 feet MLLW at existing widths ranging from 250 to 400 feet from station 2+239 to station 84+200; and maintain existing depth of -42 feet MLLW and width of 325 feet from station 84+200 to 86+000, and existing depth of -36 feet MLLW and width ranging from 325 to 1200 feet from station 86+000 through the end of the channel and turning basin at station 89+500.

New work material from channel deepening would be distributed among the existing New Work ODMDS and upland, confined PAs as shown in Table 2. All project channels and PAs are shown on draft plan drawings presented in Exhibit A. Under the first construction contract, a hopper dredge would be used to construct the Entrance and Jetty Channels, with a total length (after extension of the Entrance Channel) of 3.2 miles. Although the authorized depth of the offshore channels would be -54 feet MLLW, the potential dredging depth of the Entrance and Jetty Channels could actually be -58 feet MLLW, after accounting for 2 feet of advance maintenance and 2 feet of allowable overdepth. One hopper dredge would be operated continuously for an

Table 2: BIH TSP - New Work Quantities and Placement Area Dike Elevations

Channel Stations		Placement Area (PA)	Current PA Acreage	Deepening Dredge Quantity in Cubic Yards (CY)	Existing PA Dike Elevation in Feet (NAVD 88)	New Work Dike Elevation in Feet (NAVD 88)
-17+000	00+000	New Work ODMDS	350	2,066,300		
00+000	07+000	2	71	937,200	27	36
07+000	25+000	4B	243	2,688,800	7	19

25+000	50+000	5A	704	3,611,800	6	12
50+000	70+000	5B	1020	2,599,000	12	15
70+000	82+000	7	257	1,804,000	20	26
82+000	89+500	8	288	438,900	22	25
			Total CY	14,146,000		

estimated duration of seven months to remove approximately 2,066,300 cubic yards of new work material from the Entrance and Jetty Channels. Bed leveling may be performed at the conclusion of dredging by dragging a metal bar to smooth over high spots. All of the material would be placed at the existing New Work Ocean Dredged Material Disposal Site (ODMDS) (EPA, 1991). This site is located in a dispersive offshore environment and has unlimited capacity. It is located approximately four miles from shore in 60-70 feet of water. The 350-acre site is large enough to contain the all new work material that would be placed there during construction.

It is estimated that five subsequent contracts would be awarded for cutterhead suction dredging of the Brownsville Main Channel through station 84+200 for a total length of 15.9 miles. The remainder of the channel (the Turning Basin Extension and Turning Basin) would remain at existing depths. The authorized depth for the inland Main Channel would be -52 feet MLLW, but the potential dredging depth could actually be -55 feet MLLW, after accounting for 2 feet of advance maintenance and 1 foot of allowable overdepth. Two or three cutterhead dredges would be working simultaneously to remove approximately 12,079,700 cubic yards of new work material over an estimated 29 months. New work material from the Brownsville Main Channel (stations 0+000 through 84+200) would be pumped from the dredges through a combination of fully submerged and floating hydraulic pipelines into existing upland confined PAs managed by the Brownsville Navigation District (PAs 2, 4B, 5A, 5B, 7 and 8). In addition, new work material may be placed in PA 3, a PA managed by the San Benito Navigation District and generally used for Port Isabel Channel material. The clay new work material would be stockpiled and used to raise the PA 3 dikes for later, unrelated maintenance dredging of the Port Isabel Channel. Specific quantities going to PA 3 are unknown at this time; should PA 3 be utilized, quantities going to PA 2 and/or 4B would be reduced. None of the existing PAs would need to be expanded and no new PAs would be needed. Construction to raise the containment dikes to heights needed to accommodate new work quantities would be done within the footprints of the existing PAs. The resulting elevations of the PA dikes for the new work placement activities are also shown in Table 3. They would range from a total elevation of 12 feet NAVD 88 around PA 5A to a total

elevation of 36 feet around PA 2. Armoring of the exterior toe of the PA 4A and 4B dikes on the side facing the channel would be necessary from station 22+000 to 33+800.

Maintenance dredging would generally be conducted by hopper and cutterhead dredges, with material being distributed among a nearshore Feeder Berm or the existing Maintenance ODMDS, and upland, confined PAs as shown in Table 4. Maintenance dredging would utilize the same placement areas as those utilized for existing conditions, and the duration and frequency of dredging events would be within the range occurring under current conditions. Dredging of the Entrance and Jetty Channels and the first 11,000 feet of the Main Channel (+11+000 to -17+000) would generally be performed by a hopper dredge, and material would be placed in the nearshore Feeder Berm Site 1A, located between 1.5 and 2.5 miles from the north jetty and from 0.4 to 0.9 miles from shore (USACE, 1988). Sediment removed by maintenance dredging would therefore be regularly placed back into the littoral system, available for cross-shore and longshore sediment transport to the beaches of South Padre Island. Monitoring of material placed at the Feeder Berm has demonstrated that it moves toward the beach and disperses with the major movement being in the alongshore direction (McLellan et al. 1997; CETN; 1989). If for some reason the Feeder Berm cannot be used, maintenance material from the Entrance and Jetty Channels (station -17+000 to 0+000) could be placed in the Maintenance ODMDS which is located approximately 2.5 nautical miles from shore and north of the channel (USACE, 1975; 1999). The ODMDS and Feeder Berm are located in dispersive environments and have unlimited capacities.

Maintenance material from the remainder of the Main Channel (stations 11+000 through 89+500) would be placed in existing PAs 4A, 4B, 5A, 5B, 7 and 8. Upland PAs and containment dikes are sized to accommodate total quantities over the 50-year period of analysis. None of the existing PAs would need to be expanded and no new PAs would be needed. Construction to raise the containment dikes to heights needed to accommodate the 50-year maintenance quantities would be done within the footprints of the existing PAs. Dikes would be raised incrementally as needed to contain maintenance quantities. The resulting elevations of the PA dikes for the 50-year placement plan are also shown in Table 3. They range from a total elevation of 17 feet NAVD 88 around PA 5A to a total elevation of 38 feet around PA 7.

Table 3: BIH TSP - O&M Quantities and Placement Area Dike Elevations

Stations		Shoaling Rate in Cubic Yards/ Year (CY/YR)	Placement Area	Dredge Cycle (years)	Number of Cycles in 50 years	Quantity per Cycle (CY/Cycle)	Total O&M Quantity in 50 Years (CY)	Total Dike Elevation in 50 yrs (feet NAVD88)
-17+000	0+00	470,630	Nearshore Feeder Berm Site 1A	5	10	2,353,150	23,531,500	N/A
0+00	11+000	161,595	Nearshore Feeder Berm Site 1A	3	16	484,785	7,756,600	N/A
11+000	28+000	183,995	4A	4	12	735,980	8,831,800	35
28+000	34+000	43,047	4B	4	12	172,188	2,066,300	24
34+000	50+000	123,527	5A	4	12	494,108	5,929,300	17
50+000	65+000	143,577	5B	5	10	717,885	7,178,900	19
65+000	79+000	98,637	7	6	8	591,822	4,734,600	38
79+000	89+500	30,377	8	7	7	212,639	1,488,500	28
					Total CY	5,762,557	61,517,500	

2.0 FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES AND CRITICAL HABITAT

The study area is located entirely in Cameron County, Texas. USACE contacted the USFWS and NMFS by letter, requesting information on threatened and endangered species in the study area. The agency responses are provided in Exhibit B. The USFWS and NMFS consider the endangered or threatened species contained in Table 5 as possibly occurring in this county. The status, range, habitat and presence in the study area are presented below for the species listed in Table 4. The USFWS has also identified Critical Habitat for the wintering piping plover in the study area. No other species, and no other designated or proposed critical habitat, were identified as occurring in study area.

Table 4: Threatened and Endangered Species, Cameron County, Texas

Common Name	Scientific Name	Listing Status	Jurisdiction
BIRDS			
brown pelican	*Pelecanus occidentalis*	Delisted/Monitoring	USFWS
piping plover	*Charadrius melodus*	Threatened	USFWS
Northern Aplomado falcon	*Falco femoralis septentrionalis*	Endangered/ Experimental Non-Essential Population	USFWS
MAMMALS			
Gulf Coast jaguarundi	*Herpailurus (=Felis) yagouaroundi cacomitli*	Endangered	USFWS
ocelot	*Leopardus (=Felis) pardalis*	Endangered	USFWS
West Indian manatee	*Trichechus manatus*	Endangered	USFWS
blue whale	*Balaenoptera musculus*	Endangered	NMFS
finback whale	*Balaenoptera physalus*	Endangered	NMFS
humpback whale	*Megaptera novaeangliae*	Endangered	NMFS
sei whale	*Balaenoptera borealis*	Endangered	NMFS
sperm whale	*Physeter macrocephalus*	Endangered	NMFS
REPTILES			
green sea turtle	*Chelonia mydas*	Threatened	USFWS; NMFS
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	USFWS; NMFS
Common Name	**Scientific Name**	**Listing Status**	**Jurisdiction**
loggerhead sea turtle	*Caretta caretta*	Threatened	USFWS; NMFS
hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	USFWS; NMFS
leatherback Sea turtle	*Dermochelys coriacea*	Endangered	USFWS; NMFS
PLANTS			
South Texas Ambrosia	*Ambrosia cheiranthifolia*	Endangered	USFWS
Texas Ayenia	*Ayenia limitaris*	Endangered	USFWS
CANDIDATE SPECIES			
red knot	*Calidris canutus rufa*	Candidate	USFWS
red-crowned parrot	*Amazona viridigenalis*	Candidate	USFWS
Sprague's pipit	*Anthus spragueii*	Candidate	USFWS

scalloped hammerhead shark	*Sphyrna lewini*	Candidate	NMFS
boulder star coral	*Montastraea annularis*	Candidate	NMFS
boulder star coral	*Montastraea franksi*	Candidate	NMFS
elliptical star coral	*Dichocoenia stokesii*	Candidate	NMFS
Lamarck's sheet coral	*Agaricia lamarcki*	Candidate	NMFS
mountainous star coral	*Montastraea faveolata*	Candidate	NMFS
pillar coral	*Dendrogyra cylindrus*	Candidate	NMFS
rough cactus coral	*Mycetophyllia ferox*	Candidate	NMFS
SPECIES OF CONCERN			
dusky shark	*Carcharhinus obscurus*	Species of Concern	NMFS
sand tiger shark	*Carcharias taurus*	Species of Concern	NMFS
opossum pipefish	*Microphis brachyurus lineatus*	Species of Concern	NMFS
warsaw grouper	*Epinenphelus nigritus*	Species of Concern	NMFS
speckled hind	*Epinephelus drummondhayi*	Species of Concern	NMFS

Sources: USFWS and NMFS websites:
http://www.fws.gov/southwest/es/ES_Lists_Main.cfm (accessed June 6, 2013)
http://sero.nmfs.noaa.gov/pr/esa/specieslst.htm (accessed June 6, 2013)
http://www.nmfs.noaa.gov/pr/species/esa/other.htm (accessed June 6, 2013)
http://sero.nmfs.noaa/gov/pr/SOC.htm (accessed June 6, 2013)

2.1 BROWN PELICAN

The adult brown pelican (*Pelecanus occidentali)s* is a large dark gray-brown water bird with white about the head and neck which lives primarily in coastal marine and estuarine environments along the coast of the Gulf of Mexico from Mississippi to Texas and the coast of Mexico, and other coastal zones of the Caribbean, the Pacific Coast and the West Indies. The brown pelican almost completely disappeared from the coast of Texas by the 1960s, largely due to the use of agricultural pesticides which bioaccumulate in the marine food chain and cause reproductive failure (TPWD, 2013a). Since then, the use of chlorinated hydrocarbons for pest control has declined and the brown pelican has recovered and spread through its original range. It is now common along the Texas coast and nests on several isolated islands where they are safe from predators such as raccoons and coyotes. The brown pelican forages and rests in the coastal and near-shore zones of the study area. In 2010, four brown pelican nests were sighted on small islands in the Bahia Grande (Brownsville Herald, 2010). However, the majority of breeding brown pelicans in Texas occur from Nueces County to Galveston County (USFWS, 2009a). The species was delisted in 2009 due to recovery but is currently being monitored by the USFWS (USFWS, 2013a).

2.2 PIPING PLOVER

2.2.1 Status, Habitat and Presence in the Study Area

USFWS listed the piping plover (*Charadrius melodus*) as threatened and endangered on 11 December 1985 (50 FR 50726, December, 11 1985). The piping plover is an endangered species in the northern Great Plains and Great Lakes where it breeds in the summer. Piping plovers wintering in Texas are part of the northern Great Plains and Great Lakes populations and, therefore, are listed as threatened (USFWS, 2009b). The wintering range on the Atlantic and Gulf coasts stretches from North Carolina to Mexico (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). 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. Piping plover concentrations in Texas occur in the following counties: Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kleberg, Matagorda, Nueces, San Patricio, and Willacy. On their wintering grounds, piping plover use beaches, mudflats, sandflats, dunes, and offshore emergent placement areas (USFWS, 1995; AOU, 1998), as well as sandflats in existing USACE placement areas. Piping plovers are known to frequent the study area.

Threats to piping plovers and their habitat in their migration and wintering ranges indicates a continuing loss and degradation of habitat due to sand placement projects, inlet stabilization, sand mining, groins, seawalls and revetments, exotic and invasive vegetation and wrack removal (USFWS, 2009b). There is also concern with projects that would impede the ability of barrier islands to respond to natural habitat building processes in the context of "accelerating sea-level rise".

2.2.2 Critical Habitat

USFWS has designated critical habitat for the overwintering piping plover in the study area (66 FR 36137, July 10, 2001a) (Figure 2). Unit TX-1 is located on the south side of the Brazos Island Harbor Jetty Channel and Brownsville Main Channel, extending from the coast on Brazos Island inland about 5.5 miles. Unit TX-2 is located on the Laguna Madre side of South Padre Island on both sides of the Queen Isabella Causeway. Critical habit in Unit TX-3 is divided into subunits 3A (Gulf of Mexico Shoreline) and 3B (South Padre Island interior) (74 FR 23476, May 19, 2009). The Unit 3A beach unit and the 3B interior unit begin about 5 miles and 6 miles, respectively, from Brazos Santiago Pass and extend northward well past the study area boundary. Threats identified in these areas are oil and gas activities, including stockpiling materials, dredge disposal, and discharging fresh water; residential and commercial development; recreational use, including beach maintenance, human, vehicle, and domestic animal disturbance; and predation. Critical habitat is comprised of areas considered essential for the conservation of a listed species. Piping plovers spend the majority of the year on the wintering grounds. Due to the difficulty of separating out the populations of piping plover (Great Lakes, Northern Great Plains, and Atlantic) when on their wintering grounds, critical habitat was designated for all wintering piping plover.

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 only those areas containing these PCEs within the designated boundaries are considered critical habitat. The PCEs are found in coastal areas that support intertidal beaches and flats (between annual low tide and annual high tide) and associated dune systems and flats above annual high tide. The USFWS describes the important components of the PCEs as follows (66 FR 36137, July 10, 2001a):

> Important components (primary constituent elements) of 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, detritus

Figure 2: Piping Plover Critical Habitat in BIH Study Area

(decaying organic matter), or micro-topographic relief (less than 50 cm above substrate surface) 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 backbeach (beach area above mean high tide seaward of the dune line, or in cases where no dunes exist, seaward of a delineating feature such as a vegetation line, structure, or road) for roosting and refuge during storms, spits (a small point of land, especially sand, running into water) for feeding and roosting, salterns (bare sand flats in the center of mangrove ecosystems that are found above mean high water and are only irregularly flushed with sea water 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. Several of these components (sparse vegetation, little or no topographic relief) are mimicked in artificial habitat types used less commonly by piping plovers, but that are considered critical habitat (e.g., dredge spoil sites).

Unit TX–01 (South Bay and Boca Chica) is located south of the BIH channel and is 7,217 acres in size. The northern half (approximately) of the interior of the unit and the entire Gulf beach part of the unit are located in the study area. The general boundaries of the unit are the BIH channel on the north, the MLLW line along the Gulf of Mexico beach on the east, the Rio Grande River on the south, and a line from Loma de Las Vacas to Loma Ochoa on the east. The unit is comprised mainly of wind tidal flats that are infrequently inundated by seasonal winds; it does not include densely vegetated habitat. Beaches within the unit reach from the mouth of the Rio Grande northward to Brazos Santiago Pass. The unit boundaries mark the change in habitat from wind tidal flats, preferred by the piping plover, to densely vegetated habitat that is not used by the piping plover. Portions of this unit are owned and managed by the Lower Rio Grande Valley National Wildlife Refuge, the South Bay Coastal Preserve, Boca Chica State Park, and private citizens. BIH PAs 2, 4A, and most of 4B are located within Unit TX-01. They are considered critical habitat because they mimic naturally-formed critical habitat, containing sand and mud flats with sparse vegetation and little or no topographic relief. Sparsely vegetated sand and mud flats result from the periodic placement of hydraulic dredged material into the PAs. These events disturb the existing habitat for a few months, and then new sand or mud flats form that again serve as habitat.

Unit TX–02 (Queen Isabella Causeway) is a 6 acre-area bisected by the Queen Isabella Causeway on the Laguna Madre side of South Padre Island. All of this unit is located within the study area, but there are no project features in or adjacent to this unit. The southern boundary is the Queen Isabella State Fishing Pier, and the northern boundary is at the shoreline at the end of Sunny Isles Street. The eastern boundary is the where developed areas and/or dense vegetation

begin, and the western boundary is the MLLW line. This unit contains lands known as wind tidal flats that are infrequently inundated by seasonal winds.

Subunit TX–3A (South Padre Island – Gulf of Mexico Shoreline). This subunit consists of 2,891 acres in Cameron and Willacy Counties, Texas. It is a beach 30 miles long on the gulfside of South Padre Island. The eastern boundary is the estimated MLLW line, and the western boundary is the dune line where the habitat changes from lightly vegetated, sandy beach to densely vegetated dunes. The vegetated dune and Park Road 100, which runs north-south along the western side of the dune, separates Subunits TX–3A and 3B. Approximately one quarter of the subunit is in the Laguna Atascosa National Wildlife Refuge (LANWR), and approximately 64 percent is in private ownership. Ten percent is State land managed by the Texas General Land Office (GLO), and a small portion at the southern end is County park land managed by Andy Bowie County Park. The southern five miles of TX-3A is in the Gulf shoreline study area of the BIH project, but there would be no project construction activities in this unit.

Subunit TX–3B (South Padre Island –Laguna Madre side) consists of 44,137 acres in Cameron and Willacy Counties, Texas. The general boundaries of the unit are from about latitude 26° 09' 19.00'' N on the south, the edge of the intertidal mudflats bordering the lower Laguna Madre on the west, the Mansfield Channel on the north, and dense vegetation, dunes or the western boundary of Park Road 100 on the east. Within that boundary, areas that do not contain PCEs have been excluded from critical habitat designation. Approximately 42 percent of the land is in the LANWR, and approximately 38 percent is State owned and managed by the GLO. The remaining 20 percent is privately-owned. None of this subunit is located within the study area and there would be no project construction activities in this unit.

2.3 NORTHERN APLOMADO FALCON

The Northern aplomado falcon (*Falco femoralis septentrionalis*) is one of three subspecies of the aplomado falcon and the only subspecies recorded in the U.S. Historically, these falcons occurred throughout coastal prairie habitat along the southern Gulf coast of Texas, and in savanna and grassland habitat along both sides of the Texas-Mexico border, southern New Mexico, and southeastern Arizona, and extended south through Mexico and into Central America (USWFS, 2006). Although this falcon continued to nest in the U.S. as late as 1952, it disappeared from most of its U.S. range by 1940 (Hector, 1990).

It was listed as an endangered, nonessential experimental population species in 1986 (51 FR 6686; 25 February 1986) in response to extirpation from the United States (U.S.) and evidence of population declines and severe pesticide contamination in eastern Mexico (Hector, 1990). However, reasons for the decline are poorly known. Poisoning of prairie dogs could have had

adverse effects on the falcons, and loss of the ecosystems generated by the prairie dogs could have degraded habitat conditions (NatureServe Explorer, 2013a). Other causes could include widespread shrub encroachment resulting from control of range fires and agricultural or pasture development of grassland habitats (71 FR 42298, July 26, 2006). No critical habitat has been designated.

The USFWS finalized its plan to reintroduce this species into their historic habitat in southern New Mexico and Arizona in 2006 (71 FR 42298, July 26, 2006). It is hoped that current reintroduction efforts may reestablish this bird as a breeder in the southwestern U.S. Captive-bred falcons were released onto private lands in Texas, beginning in 1985. In the study area, releases have occurred on the LANWR. By 2006, these releases had established at least 44 pairs in southern Texas and adjacent Tamaulipas, Mexico, and pairs or reintroduced falcons began breeding in 1995 ((71 FR 42298, July 26, 2006). Nests have been located on a variety of structures, both artificial and natural. Nesting productivity increased by about 40 percent in 2003 and 2004, when falcons were provided with artificial nesting structures that prevent predators (such as horned owls, raccoons, and coyotes) from entering. The USFWS is using information learned from the reintroduction effort in south Texas to inform a reintroduction effort within the species' historical range in New Mexico and Arizona.

Essential habitat elements appear to be open terrain with scattered trees (such as mesquite and yucca in the study area), relatively low ground cover, an abundance of small to medium-sized birds along with insects, rodents, snakes, and lizards for prey, and a supply of nest sites (USFWS, 2013b). The species appears to be non-migratory with most pairs using the vicinity of previous season's nesting platforms as a hunting, roosting, and display area throughout the year. Pairs nest in old stick nests of other bird species such as hawks, caracaras and ravens (NatureServe Explorer, 2013a). Suitable habitat for these falcons in the study area is located primarily in the mesquite/yucca flats south of the placement areas which line the Brownsville Main Channel, and in the Laguna Atascosa NWR, north of the Main Channel.

2.4 GULF COAST JAGUARUNDI

The Gulf Coast Jaguarundi (*Herpailurus yagouaroundi cacomitli*) is listed as endangered throughout its range, from southern Texas into the eastern portion of Mexico in the states of Coahuila, Nuevo Leon, Tamaulipas, San Luis Potosi and Veracruz. The last confirmed siting of this subspecies within the U.S. was in 1986 when a roadkill specimen, found near Brownsville, Texas, was positively identified. In Mexico, as recently as 2010, jaguarundis were photographed by remotely-triggered cameras in central and southern Tamaulipas. Since 1990, little additional information has been obtained and since 1986, no new sightings in Texas have been confirmed. The Gulf Coast subspecies of jaguarundi is currently believed to occur in areas of northeastern

Mexico, where suitable habitat exists but there is no information on current population size or distribution in Mexico (USFWS, 2012b).

In 1975, USFWS proposed listing the Gulf Coast Jaguarundi as an endangered species because it was included in a list of species presented as Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora and it was not already listed as threatened or endangered in the U.S. (40 FR 44329, September 26, 1975). The final rule listing the jaguarundi as endangered was published in 1976 (41 FR 21062, June 14, 1976). This species is currently listed under the Act as *Herpailurus (=Felis) yagouaroundi cacomitli*. Recent genetic work has assigned the jaguarundi to the genus *Puma*, and this has become the generally accepted nomenclature. USFWS has therefore accepted the new scientific name as *Puma yagouaroundi* for its recovery plan. No critical habitat has been designated.

The Gulf Coast jaguarundi is found in the Tamaulipan Biotic Province where it uses dense thorny shrublands or woodlands and bunchgrass pastures if dense brush or woody cover is nearby. Information on life history aspects of jaguarundi in the wild is limited (USFWS, 2012b). Jaguarundis are solitary, except during mating season (November and December in Mexico), or when a female is raising kittens. Jaguarundis prey mainly on birds, small mammals, and reptiles. The jaguarundi is the only cat in northeastern Mexico which is primarily active during the day, whereas the other cats, such as ocelot, are primarily nocturnal. Jaguarundis are still difficult to observe because they prefer the cover provided by dense woody communities and bunchgrass pastures. The home range of jaguarundis in Tamaulipas was sometimes similar in size to ocelot home ranges—about 3.3 to 4.5 square miles. However, home range sizes vary greatly, with reports of up to 38.6 square miles.

Primary known threats are habitat destruction, degradation, and fragmentation associated with agriculture and urbanization, and to some extent, border security activities (lighting; road, tower, and fence construction and maintenance; brush clearing; human activity) In the U.S., the habitat historically used by the Gulf Coast jaguarundi was once extensive throughout the Lower Rio Grande Valley (LRGV) but has been converted to agriculture and urban development. Roads may cause mortality through collisions with vehicles and by fragmenting habitat, increasing demographic and genetic isolation of populations. Competition with bobcats may be a potential limiting factor in the northern portion of its range (USFWS, 2012b).

Patches of dense brush and woody cover are present in the study area, especially behind the foredune along the Gulf shoreline south of the BIH channel, on isolated lomas, and north of the channel in the LANWR. None of these dense brush areas are located within upland PAs.

2.5 OCELOT

The ocelot (*Leopardus pardalis*) is listed as endangered throughout its range in the western hemisphere where it is distributed from southern Texas and southern Arizona through Central and South America into northern Argentina and Uruguay (USFWS, 2010a). The U.S. contains only a small proportion of the ocelot's current range and habitat. At one time, this species inhabited brushland in the southwestern U.S. as far north as the Texas panhandle and central Arizona.

In 1972, USFWS added the ocelot to the U.S. List of Endangered Foreign Fish and Wildlife (37 FR 6476, March 30, 1972). However, due to an oversight, the U.S. population of this species was not officially listed as an endangered species until a final ruling was issued in 1982 (47 FR 31670, July 21, 1982). No critical habitat has been designated.

Habitats used by the ocelot throughout its range vary from tropical rainforest, pine forest, gallery forest, riparian forest, semi-deciduous forest, and dry tropical forest, to savanna, shrublands, and marshlands. In south Texas, the ocelot inhabits dense thornscrub communities on LANWR and on private lands in three Texas counties. The ocelot requires dense vegetation (greater than 75 percent canopy cover), with 95 percent cover of the shrub layer preferred in Texas. Its prey consists primarily of rabbits, rodents, birds, and lizards (USFWS, 2010a).

As of February 2010, there were fewer than 25 total known individuals in the two populations in south Texas, with the possibility that more cats inhabit surrounding ranches (USFWS, 2010). One population occurs in Willacy and Kenedy Counties (Arroyo Colorado Unit) primarily on private ranches and the other occurs in eastern Cameron County primarily on the LANWR. Both populations are isolated from each other and occupy remnant habitat fragments. Individuals have occurred outside of these two populations, but there is no recent evidence that a breeding population occurs in other areas of Texas.

Habitat conversion, fragmentation, and loss are the primary threats to the ocelot today. Human population growth and development continue throughout the ocelot's range. In Texas, more than 95 percent of the dense thornscrub habitat in the LRGV has been converted to agriculture, rangelands, or urban land uses, and less than one percent of south Texas supports the extremely dense thornscrub used by ocelots. Small population sizes in Texas and isolation from conspecifics in Mexico threaten the ocelot in Texas with inbreeding. Issues associated with border barrier development and patrolling the boundary between the U.S. and Mexico further exacerbate the isolation of Texas and Arizona ocelots from those in Mexico. Commercial exploitation and illegal hunting were significant threats to the species when the ocelot was

originally listed, but the harvest and export of ocelots has significantly declined and is controlled by international convention (USFWS, 2010a).

USFWS published a draft recovery plan for the ocelot in 1990 and a first revision in 2010 (USFWS, 2010a). The major focus of this recovery plan is on two cross-border management units, the Texas/Tamaulipas Management Unit (TTMU) and the Arizona/Sonora Management Unit. The TTMU emphasizes efforts to reduce habitat loss and fragmentation of remaining suitable habitat in these borderland areas, to facilitate connectivity with ocelots in Tamaulipas.

Patches of dense brush and woody cover are present in the study area, especially behind the foredune along the Gulf shoreline south of the BIH channel, on isolated lomas, and north of the channel in the LNWR. None of these dense brush areas are located within upland PAs.

2.6 WEST INDIAN MANATEE

Manatees (*Trichechus manatus*) are marine mammals found in marine, estuarine, and freshwater environments. The manatee ranges from the southeastern U.S. and coastal regions of the Gulf, through the West Indies and Caribbean, to northern South America. U.S. populations occur primarily in Florida, where they are effectively isolated from other populations by the cooler waters of the northern Gulf and the deeper waters of the Straits of Florida (NatureServe, 2013b) .

USFWS listed the West Indian manatee (*Trichechus manatus*) as endangered in 1967 (32 FR 4001, March 11,1967). Later it received protection under the ESA of 1973. Critical habitat has been designated in Florida, but none in Texas.

The West Indian manatee inhabits shallow coastal waters, estuaries, bays, rivers, and lakes. Throughout most of its range, it appears to prefer rivers and estuaries to marine habitats. It is not averse to traveling through dredged canals or using quiet marinas. Manatees are apparently not able to tolerate prolonged exposure to water colder than 68 degrees Fahrenheit. In the northern portions of their range, during October through April, they congregate in warmer water bodies, such as spring-fed rivers and outfalls from power plants. They usually avoid areas with strong currents (NatureServe, 2013b). Manatees are primarily dependent upon submergent, emergent, and floating vegetation, with the diet varying according to plant availability.

The largest known human-related cause of manatee mortality is collisions with hulls and/or propellers of boats and ships. The second-largest human related cause of mortality is entrapment in floodgates and navigation locks. Other known causes of human-related manatee mortality include poaching and vandalism, entrapment in shrimp nets and other fishing gear, entrapment in water pipes, and ingestion of marine debris (USFWS, 2001b). Hunting and fishing pressures

were responsible for much of its original decline because of the demand for meat, hides, and bones, which resulted in near extirpation of the species (USFWS, 1995). A prominent cause of natural mortality in some years is cold stress, and major die-offs associated with the outbreaks of red tide have occurred (USFWS, 2001b). The low reproductive rate and habitat loss make it difficult for manatee populations to recover.

The West Indian manatee historically inhabited the Laguna Madre, the Gulf, and tidally influenced portions of rivers. It is currently, however, extremely rare in Texas waters and the most recent sightings are likely individuals migrating or wandering from Mexican waters. Historical records from Texas waters include Cow Bayou, Sabine Lake, Copano Bay, the Bolivar Peninsula, and the mouth of the Rio Grande River (Schmidly, 2004). In May 2005, a live manatee appeared in the Laguna Madre near Port Mansfield (Blankinship, 2005). The occurrence of the West Indian manatee in the study area is unlikely.

2.7 WHALES

NMFS identifies five endangered whale species of potential occurrence in the Gulf. These are the sei whale (*Balaenoptera borealis*), blue whale (*Balaenoptera musculus*), finback whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), and sperm whale (*Physeter macrocephalus*). These species are generally restricted to deeper offshore waters; therefore, it is unlikely that any of these five species would regularly occur in the study area (NMFS, 2003).

2.8 GREEN SEA TURTLE

The green turtle (*Chelonia mydas*) 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 (NMFS and USFWS, 1991a; Hirth, 1997).

The green turtle was listed in 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, July 28, 1978a). In 1998, NMFS designated critical habitat to include the coastal waters around Culebra Island, Puerto Rico (63 FR 46693, September 2, 1998).

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 almost exclusively 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). They prefer high-energy beaches with deep sand, which may be coarse to fine, with little organic content. Most green turtles nest in Florida and in Mexico. 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). Green turtle nests are rare in Texas. In 1987 the first confirmed nesting of a green sea turtle on the Texas coast was recorded (Shaver and Amos, 1988). More recently, two green turtle nests were documented in 2006 and three in 2007; all but one in 2007 were from the Padre Island National Seashore (PINS) (Echols, 2006). In 2012, six green sea turtle nests were reported from PINS and two from South Padre Island . The 2012 nest total sets a new record for the number of green turtle nests documented in Texas in a year. The previous record of 6 nests was set during 2011 (NPS, 2012).

The principal cause of the historical, worldwide decline of the green turtle is 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. Incidental capture in fishing gear, such as gillnets and trawls, is a serious ongoing source of mortality that also adversely affects the species' recovery (NMFS, 2013a). 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). Incidental take of ridleys has been documented with hopper dredges.

Of the green turtle strandings reported from 2004 through 2007 (last year reported) along the Texas Coast, 374 were from Zone 21, which extends from the mouth of the Rio Grande to the vicinity of Yarborough Pass (STSSN, 2013). In 2007, 233 green turtles were reported stranded; of these, at least 147 were cold-stunned turtles resulting from a strong cold front that passed in January (Sea Turtle, Inc., 2008).

Since 1995, the BIH Entrance Channel has been dredged 12 times using hopper dredges; green turtles were captured by the dredge during all of these dredging events. During the course of dredging, 23 green turtles were documented as dredge takes: four in 1995, two of which

survived; two in 1999; four in 2002 (two separate dredging contracts); three in 2003; two in 2006; five in 2007, and one each in 2008, 2009 and 2013 (USACE, 2013a). Between 2002 and 2009, pre-dredging and during-dredging relocation trawling was conducted in conjunction with BIH maintenance dredging projects. During the course of this trawling, 118 green turtles were tagged and released unharmed: seven in 2002; 13 in 2003; 34 in 2006; and 64 in 2007 (USACE, 2013a).

2.9 KEMP'S RIDLEY SEA TURTLE

The Kemp's ridley sea turtle (*Lepidochelys kempii*) is the smallest of the sea turtles, with adults reaching about 2 feet in length and weighing up to 100 pounds. 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.

The Kemp's ridley sea turtle was listed as endangered throughout its range in 1970 (35 FR 18319, December 2, 1970a). It is considered to be the most seriously endangered of all sea turtles (USFWS and NMFS, 1992; NPS, 2013b). In 2010, a petition was filed by the WildEarth Guardians to designate critical habitat for nesting beaches along the Texas coast and marine habitats in the Gulf of Mexico and Atlantic Ocean. No critical habitat has yet been designated.

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 while juveniles feed on sargassum and associated infauna, and other epipelagic species of the Gulf (USFWS and NMFS, 1992). 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, 1995).

Populations of this species have declined since 1947, when an estimated 42,000 females nested in one day, to a total nesting population of approximately 1,000 in the mid-1980s. The decline of this species was primarily the result of human activities including collection of eggs, fishing for juveniles and adults, killing adults for meat and other products, and direct take for indigenous use. In addition to these sources of mortality, Kemp's ridleys have been subject to high levels of

incidental capture in fishing gear, primarily in shrimp trawls, but also in gill nets, longlines, and traps (USFWS and NMFS, 1992; NMFS, 2013b). The National Research Council's (NRC) Committee on Sea Turtle Conservation estimated in 1990 that 86 percent of the human-caused deaths of juvenile and adult loggerheads and Kemp's ridleys resulted from shrimp trawling (Campbell, 1995).

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 of the sea turtles had eaten some type of marine debris. 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, 1995).

Further threats to this species include collisions with boats, explosives used to remove oil rigs, and entrapment in coastal power plant intake pipes (Campbell, 1995). 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 dredged material placement, degraded water quality/clarity, and altered current flow (USFWS and NMFS, 1992).

Because of the dangerous population decline at the time, a head-starting program was carried out from 1978 to 1988. Eggs were collected from Rancho Nuevo, 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 for rearing, before being released into Texas (mainly) or Florida waters (Caillouet et al., 1995). This program has shown some results. The first nesting from one of these head-started individuals occurred at Padre Island in 1996. From 1996 through the 2007 nesting season, 59 nests were from Headstart turtles (NPS, 2013b).

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 also may avoid brightly lit areas that

would otherwise provide suitable nesting sites.

Egg collection was an extreme threat to the population, but since nesting beaches were afforded official protection in 1966, this threat no longer poses a major concern. This together with the requirement to use TEDs in shrimp trawls and other measures to reduce turtle bycatch are some of the primary factors in recovery of this species (NMFS, 2013b).

Kemp's ridley appears to be in the earliest stages of recovery. During the 2000 nesting season, an estimated 2,000 females nested at Rancho Nuevo, a single arribada of 1,000 turtles was reported in 2001, and an estimated 3,600 turtles produced over 8,000 nests in 2003. In 2006, a record number of nests were recorded since monitoring began in 1978; 12,143 nests were documented in Mexico, with 7,866 of those at Rancho Nuevo (NMFS, 2013b).

Kemp's ridleys may have nested sporadically in Texas in the last 50 years; however, the number of nests over recent years has shown an ever-increasing trend: 1996 (6 nests); 1997 (9 nests); 1998 (13 nests); 1999 (16 nests); 2000 (12 nests); 2001 (8 nests); 2002 (38 nests); 2003 (19 nests); 2004 (42 nests); 2005 (51 nests); 2006 (102 nests); and 2007 (128 nests); 2008 (195 nests); 2009 (197 nests); 2010 (141 nests); 2011 (199 nests), and 2012 (209 nests) (NPS, 2012 and 2013a). As noted above, some of these nests were from headstarted ridleys. The majority of the Kemp's ridley nests recorded in Texas were at the PINS. Such nestings, together with the proximity of the Rancho Nuevo rookery, probably account for the occurrence of hatchlings and subadults in Texas.

Kemp's ridley occurrence in Texas may well be a reflection of crustacean-rich feeding areas in the northern Gulf and breeding grounds in Mexico. Kemp's ridley nests have been reported in the study area; in 2012, 106 were report from the PINS (most of which lies outside of the study area), 59 were reported from South Padre island, and 10 were located on Boca Chica Beach, south of the BIH Channel (USFWS, 2013a). Of the latest reported ridley standings (2007) along the Texas Coast, 35 were from Zone 21, which extends from the Mouth of the Rio Grande to the vicinity of Yarborough Pass (STSSN, 2013).

Since 1995, the BIH Entrance Channel has been dredged 12 times using hopper dredges; Kemp's ridley turtles were killed by the dredge during three of these dredging events: one each in 1995, 1997 and 2009 (USACE, 2013a). Between 2002 and 2009, pre-dredging and during-dredging relocation trawling was conducted in conjunction with BIH maintenance dredging projects. During the course of this trawling, three Kemp's ridley turtles were tagged and released unharmed. All three relocations occurred in 2008 (USACE, 2013a).

2.10 LOGGERHEAD SEA TURTLE

Loggerhead sea turtles (*Caretta caretta*) were named for their relatively large heads, which support powerful jaws and enable them to feed on hard-shelled prey, such as whelks and conch. The loggerhead is widely distributed in tropical and subtropical seas, being found in the Atlantic Ocean from Nova Scotia to Argentina, the Gulf, Indian, and Pacific oceans (although it is rare in the eastern and central Pacific), and the Mediterranean Sea (Rebel, 1974; Ross, 1982; Iverson, 1986), and is the most abundant sea turtle species in U.S. coastal waters (NMFS, 2013c). 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.

The Northwest Atlantic Ocean population of the loggerhead turtle was listed as threatened in 2011 (76 FR 58868, September 22, 2011). In 2011, the NMFS and USFWS determined that the loggerhead sea turtle is composed of nine distinct population segments (DPSs) that constitute ‘‘species’’ that may be listed as threatened or endangered under the ESA. Formerly, all populations of the loggerhead were determined threatened throughout its range (43 FR 32808, July 28, 1978b). In the 2011 final rule, four DPSs were listed as threatened and five as endangered under the ESA. The four threatened DPSs are located in the Northwest Atlantic Ocean, the South Atlantic Ocean, the Southeast Indo-Pacific Ocean, and the Southwest Indian Ocean. The five endangered DTSs are located in the Mediterranean Sea, the North Indian Ocean, the North Pacific Ocean, the Northeast Atlantic Ocean and the South Pacific Ocean. NMFS and USFWS also announced they intend to propose the designation of critical habitat for the two loggerhead sea turtle DPSs occurring within the U.S. (the Northwest Atlantic and North Pacific Oceans) in a future rulemaking. The proposal to designate critical habitat in the Northwest Atlantic was published in 2013 (78 FR 17999, March 25, 2013c). The proposed critical habitat is located in coastal counties in North Carolina, South Carolina, Georgia, Florida, Alabama, and Mississippi.

The loggerhead 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 sargassum. They may remain associated with sargassum for perhaps 3 to 5 years (NMFS and USFWS, 1991b). 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 starts, fish (carrion or slow-moving species), and even hatchling loggerheads have all been recorded as loggerhead

prey (Rebel, 1974; Hughes, 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).

Recent analyses of nesting data from southeast Florida show the population is declining. Similarly, long-term nesting data show loggerhead nesting declines in North Carolina, South Carolina, and Georgia (NMFS, 2013c). The decline of the loggerhead, like that of most sea turtles, is the result of overexploitation by man, and inadvertent mortality associated with fishing and trawling activities. The most significant threats to its population are incidental capture in fishing gear, directed harvest, coastal development, increased human use of nesting beaches, and pollution (NMFS, 2013c). Incidental take of ridleys has been documented with hopper dredges.

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 stranded turtles on the Texas coast each year (STSSN, 2013). A large proportion of these deaths are the result of accidental capture by shrimp trawlers, where caught turtles drown and their bodies dumped overboard.

Before 1977, no positive documentation of loggerhead nests in Texas existed. Since that time, several nests have been recorded along the Texas coast. Two to five loggerhead nests were confirmed along the Texas Coast each year from 1999 through 2005 (USACE, 2007). During the last decade, nesting has remained relatively stable on the Texas coast, with 0-6 nests per year. Although nests have been found state-wide, the largest numbers have been located at the National Seashore (NPS, 2013c).

This species has been recorded in the study area. Loggerhead nests were recorded at South Padre Island in 2001, 2003, 2005, 2006, and 2007. In 2012, one nest was recorded at the PINS and one was recorded on South Padre Island (NPS, 2012). Since 1995, the BIH Entrance Channel has been dredged 12 times using hopper dredges; loggerhead turtles were killed by the

dredge during five of these dredging events: one each in 1997, 2007 and 2008, and two in 2009 (USACE, 2013a). Between 2002 and 2009, pre-dredging and during-dredging relocation trawling was conducted in conjunction with BIH maintenance dredging projects. During the course of this trawling, 16 loggerhead turtles were tagged and released unharmed (USACE, 2013a).

2.11 HAWKSBILL SEA TURTLE

The hawksbill sea turtle (*Eretmochelys imbricata*) 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, 2013d). 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).

The hawksbill sea turtle was Federally listed as endangered in 1970 on (35 FR 84952, June 2, 1970b). In 1998, NMFS and USFWS designated critical habitat near Mona Island and Isla Monito, Puerto Rico, seaward to 5.6 kilometers (km) (63 FR 46693, September 2, 1998).

Hawksbills generally inhabit coastal reefs, bays, rocky areas, passes, estuaries, and lagoons, where they occur at depths of less than 70 ft. Like some other sea turtle species, hatchlings are sometimes found floating in masses of marine plants (e.g., sargassum rafts) in the open ocean (NFWL, 1980). Hawksbills reenter 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.

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, (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, which is typically a solitary nester, nests on undisturbed, deep-sand beaches, from high-energy ocean beaches to tiny pocket

beaches several meters wide bounded by crevices of cliff walls. Typically, the sand beaches are low energy, with woody vegetation, such as sea grape (*Coccoloba uvifera*), near the waterline (NRC, 1990).

The primary global threat to hawksbills is habitat loss of coral reef communities. Coral reefs are vulnerable to destruction and degradation caused by human activities. Historically, commercial exploitation was the primary cause of the decline of hawksbill sea turtles. There remains a continuing demand for the hawksbill's shell as well as other products, including leather, oil, perfume, and cosmetics. Additionally, hawksbills are harvested for their eggs and meat while whole stuffed turtles are sold as curios in the tourist trade. In addition to directed harvest, increased human presence is a threat to hawksbills. In particular, increased recreational and commercial use of nesting beaches, beach camping and fires, litter and other refuse, general harassment of turtles, and loss of nesting habitat from human activities negatively impact hawksbills. Incidental capture in fishing gear, primarily gillnets, and vessel strikes also adversely affect this species' recovery (NMFS, 2013d).

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, 2013d). On 13 June 1998, the first hawksbill nest recorded on the Texas coast was found at PINS. This nest remains the only documented hawksbill nest on the Texas coast (NPS, 2013d). Stranding data from 2004 through 2007 show that 59 hawksbills were found along Texas waters or shorelines (STSSN, 2013). Of the hawksbill standings reported from 2004 through 2007 along the Texas Coast, 17 were from Zone 21, which extends from the mouth of the Rio Grande to the vicinity of Yarborough Pass (STSSN, 2013). No hawksbills have been killed or captured during relocation trawls during BIH maintenance dredging projects since record-keeping began in 1995 (USACE, 2013a).

2.12 LEATHERBACK SEA TURTLE

Leatherback sea turtles (*Dermochelys coriacea*) are named for their appearance. They do not have shells as other sea turtles do. Instead, their backs are covered by a slate black to bluish-black leathery skin with irregular white or pink patches. They are the largest turtles in the world, reaching over 6 feet in length and 650-1,200 pounds in weight (NPS, 2013e).

The leatherback sea turtle was listed as endangered throughout its range in 1970 (35 FR 84952, June 2, 1970), with critical habitat designated in the U.S. Virgin Islands in 1978 and 1979 (43 FR 43688, September 26, 1978 and 44 FR 17710, March 23, 1979, respectively). In 2011, USFWS announced that revision of the critical habitat to include the coastline and offshore

waters of the Northeast Ecological Corridor of Puerto Rico may be warranted and that assessment of the need for revisions to critical habitat would be conducted during a future planned status review (76 FR 47133, August 4, 2011c).

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, the Cape of Good Hope, and Argentina; and in other water bodies such as the Mediterranean Sea (NFWL, 1980). The leatherback migrates further 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. 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.

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). The U.S. Caribbean, primarily Puerto Rico and the U.S. Virgin Islands, and southeast Florida support minor nesting colonies, but represent the most significant nesting activity within the United States (NMFS, 2013e).

The leatherback sea turtle is mainly pelagic, inhabiting the open ocean, and seldom approaches land except for nesting (Eckert, 1992). 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. 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 deepwater approach (Pritchard, 1971).

Its decline is attributable to overexploitation by man and incidental mortality 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). Nesting populations of leatherback sea turtles are especially difficult to estimate because the females frequently change nesting beaches; however, Spotila et al. (1996) estimated the 1995 worldwide population of nesting female leatherbacks at 26,000 to 42,000. Major threats include egg collecting and mortality associated with bycatch in longline, trawl and gillnet fisheries throughout their range although they are jeopardized to some extent by harvesting of adult females, destruction or degradation of nesting habitat, and ingestion of floating trash (Nature Serve, 2013d). This species is probably more susceptible than other turtles to drowning in shrimp trawlers equipped

with turtle extruder devices (TEDs) because adult leatherbacks are too large to pass through the TED exit opening. 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).

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, leatherbacks are rare along the Texas coast, tending to keep to deeper offshore waters where their primary food source, jellyfish, occurs. In the Gulf, the leatherback is often associated with two species of jellyfish: the cabbagehead (*Stomolophus sp*.) and the moon jellyfish (*Aurelia sp.*) (NMFS and USFWS, 1992). According to USFWS (1981), leatherbacks never have been common in Texas waters. Leatherback nests were recorded on Padre Island in the 1930's-40's. One leatherback nest was located at PINS in 2008. Since then, no leatherback nests have been located anywhere in Texas (NPS, 2013e).

No leatherbacks have been taken by dredging activities in Texas (USACE, 2013a). No leatherback strandings were reported from 2004 through 2007 in Zone 21, which extends from the mouth of the Rio Grande to the vicinity of Yarborough Pass (STSSN, 2013). This species is unlikely to occur in the study area.

2.13 SOUTH TEXAS AMBROSIA

South Texas ambrosia (*Ambrosia cheiranthifolia*), a member of the aster family, is a herbaceous, perennial plant with erect stems. It is grayish-green in color with yellow flowers, 4 to 12 inches in height. It is also known as South Texas Ragweed, Rio Grande Ragweed (TPWD, 2013b). This plant was listed as endangered in 1994 (59 FR 43648, August 24, 1994). No critical habitat has been designated.

Historically, South Texas ambrosia is known from northern Tamaulipas in Mexico, Cameron, Jim Wells, Kleberg and Nueces Counties in Texas and the state of Tamaulipas, Mexico (TPWD, 2013a). In 1994, populations had been verified in eight populations, four in Nueces County, three in Kleberg County, and one overlapping both counties. It occurs at low elevations in open clay-loam to sandy-loam prairies and savannas. Associated native grasses found at the existing sites include Texas grama, buffalograss, Texas wintergrass, and tobosa. Native woody species found scattered throughout the existing sites include mesquite, huisache, huisachillo, brasil, granjeno, and lotebush (TPWD, 2013a). Much of the original native habitat for South Texas ambrosia has been converted to agricultural fields, improved pastures, or urban areas (59 FR 43648, August 24, 1994).

Loss and fragmentation of habitat has led to the decline of this species (59 FR 43648, August 24, 1994; TPWD, 2013a). Conversion of habitat to agricultural fields and urban areas has limited the amount of habitat available for colonization. In addition, introduced species such as buffelgrass and King Ranch bluestem compete with this and other natives of the coastal prairie. Invasion of grasslands by shrub and tree species also contributes to loss of available habitat, although the species does occur among scattered woody plants. Disturbance associated with activities occurring along road right-of-ways where the species is found may also be detrimental.

Today, the species occurs at six locations in Nueces and Kleberg counties (TPWD, 2013a). The current status of any populations in Mexico is unknown. The number of occurrences is about 15-20 occurrences in South Texas and Tamaulipas Mexico. However, one report notes that the species is, or may be, extirpated in Cameron County, Texas (NatureServe, 2013e). It is not known to occur in the study area.

2.14 TEXAS AYENIA

Texas ayenia, a member of the cacao family, is a thornless, medium-sized shrub, two to five feet tall (TPWD, 2013b). This species occupies dense subtropical thorn woodland or tall shrubland on soils ranging from heavy clay to fine sandy clay loam and fine sandy loam. The current known population in Texas is within the Texas Ebony-Anacua plant community, a closed-canopy community of riparian terraces that once covered much of the Rio Grande delta, but is now reduced to remnant fragments surrounded by agricultural fields, pastures, and urban areas with less than 5 percent of the original acreage remaining (NatureServe 2013f). It was listed as endangered in 1994 (59 FR 43648, August 24, 1994). No critical habitat has been designated.

Habitat loss is thought to be the major threat to the continued existence of this species (59 FR 43648, August 24, 1994; TPWD, 2013b). Much of the native woodland and brush within the historical range of Texas Ayenia has been converted to agricultural or urban use. Flood control may be of particular importance to this species and the ecosystem upon which it depends. Introduction and spread of non-native species such as guinea grass (Panicum maximum) also poses a serious threat to the species. The small size of the existing U. S. population makes this species very vulnerable.

Historically, Texas ayenia once occurred in Cameron and Hidalgo counties in south Texas, and in the states of Coahuila and Tamaulipas in Mexico. Available information on recent occurrences is conflicting. USFWS reports there are known populations ranging from Soto la Marina in east-central Tamaulipas to Cameron, Hidalgo and Willacy Counties (USFWS, 2013d). TPWD reports that Texas ayenia exists in the U.S. in only one small population of about 20 individuals in Hidalgo County (TPWD, 2013c). NatureServe (2013f) reports there is an extremely limited

amount of native habitat remaining, with six known extant populations (four in south Texas and two in Mexico). These Texas populations are limited to the Rio Grande Valley in Cameron County. It is not likely to occur in the study area.

2.15 CANDIDATE SPECIES

2.15.1 Red Knot

Red knots of the *rufa* subspecies (*Calidris canutus rufa*) are medium-sized shorebirds that breed only in Arctic Canada and migrate approximately 18,500 miles annually between Arctic breeding grounds and primary wintering areas in Tierra Del Fuego, at the southern tip of South America. They also winter in three other distinct coastal areas of the Western Hemisphere: the southeastern United States (mainly Florida and Georgia, with smaller numbers in South Carolina), the Gulf of Mexico coast of Texas, and Maranhão in northern Brazil (USFWS, 2011a). The USFWS began proposing that this species be considered a Candidate for listing in 2008, and confirmed this finding in the most recent filing (77 FR 69993, November 21, 2012a). USFWS expected to publish a proposed listing rule within the next year.

In South American wintering areas, red knots are found principally in intertidal marine habitats, especially near coastal inlets, estuaries, and bays, or along intertidal earthen shelf formations. The Delaware Bay area (in Delaware and New Jersey) is the largest known spring migration stopover area, with far fewer migrants congregating elsewhere along the Atlantic coast. The concentration in the Delaware Bay area occurs from the middle of May to early June, corresponding to the spawning season of horseshoe crabs. The knots feed on horseshoe crab eggs, rebuilding energy reserves needed to complete migrations to the Arctic. Surveys at wintering areas and at Delaware Bay during spring migration indicate a substantial decline in the red knot in recent years. Research shows that since 1998, a high proportion of red knots leaving the Delaware Bay failed to achieve threshold departure masses needed to fly to breeding grounds and survive an initial few days of snow cover, and this corresponded to reduced annual survival rates (73 FR 75176, December 10, 2008).

The primary factor threatening the red knot is destruction and modification of its habitat, particularly the reduction in key food resources resulting from reductions in horseshoe crabs, which are harvested primarily for use as bait and secondarily to support a biomedical industry.
Counts of red knots within the principal wintering areas in Chile and Argentina declined by nearly 75 percent from 1985 to 2007 and declined by an additional 15 percent in the past year (2007 to 2008).

Along the Texas coast, red knots forage on beaches, oyster reefs, and exposed bay bottoms and roost on high sand flats, reefs, and other sites protected from high tides (NatureServe, 2013c). They have been reported to use the barrier island beaches, exposed tidal flats, washover passes, and mudflats associated with the Laguna Madre (Port Isabel Economic Development Corporation, 2013). In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. It has been reported that Coquina clams (Donax variabilis) serve as a frequent and often important food resource for red knots along Gulf beaches. Reports of the size of flocks of along the Gulf of Mexico coast vary considerably, from highs of about 2,800 to 700 (USFWS 2011a).

2.15.2 Red-Crowned Parrot

The red-crowned parrot (*Amazona viridigenalis*) is native to Mexico and is currently found in northeastern Mexico, inhabiting lush areas in arid lowlands and foothills, particularly gallery forests, deciduous woodlands, and dry, open, pine-oak woodlands. In Mexico, the species' distribution is confined to the lowland plains (Atlantic coastal plain) and the low eastern slopes of the Sierra Madre Oriental. In addition, several introduced populations occur in urban areas of the United States, Puerto Rico, and Mexico. Evidence suggests populations in the LRGV consist, at least partly, of naturally occurring populations. Therefore, USFWS treats the Lower Rio Grande Valley populations as native populations (76 FR 62016, October 6, 2011b).

USFWS initiated a status review in response to a petition filed in 2009 (74 FR 33957, July 14, 2009d) which resulted in the red-crowned parrot being considered a Candidate for listing. In 2011, USFWS found that listing was warranted but precluded by higher priority listing actions (76 FR 62016, October 6, 2011b). This finding was confirmed in 2012 (77 FR 69994, November 21, 2012b).

In the LRGV, red-crowned parrots occur primarily in urban areas. Although little information on urban habitat use specific to the LRGV is available, in cities where the species is introduced it is reported to prefer areas with large trees that provide both food and nesting sites. Red-crowned parrots are nonmigratory, but are apparently nomadic during the winter (non-breeding) season when large flocks range widely to forage. The red-crowned parrot usually forages in the crowns of trees, but will occasionally feed on low-lying bushes. Foraging appears to be opportunistic. Its diet includes a variety of primarily seeds and fruits, but also buds and flowers (76 FR 62016, October 6, 2011b).

The primary threats to the red-crowned parrot at this time include habitat loss, illegal capture for the pet trade, and the inadequacy of regulatory mechanisms that address those threats. It is estimated that the global population of red-crowned parrots is fewer than 5,000 individuals and

the recent population trend is a decrease greater than or equal to 50 percent over 30 years. Numbers and trend of the species within Texas portion are largely unknown, and speculative. USFWS has no information indicating whether future urban growth may positively or negatively affect the red-crowned parrot population in the region (76 FR 62016, October 6, 2011b) .

2.15.3 Sprague's Pipit

The Sprague's pipit (*Anthus spragueii*) is a small passerine endemic to the Northern Great Plains and is one of the few bird species endemic to the North American prairie (75 FR 56028, September 15, 2010b). Sprague's pipits are strongly tied to native prairie throughout their life cycle but will utilize nonnative planted grassland. These birds are sensitive to fragmentation and require relatively large grassland patches to form breeding territories.

USFWS initiated a status review in response to a petition filed in 2009 (74 FR 63337, December 3, 2009e) which resulted in the Sprague's pipit being considered a Candidate for listing. In 2010, USFWS found that listing was warranted but precluded by higher priority listing actions (75 FR 56028, September 15, 2010b).

The Sprague's pipit breeding range extends throughout North Dakota, except for the easternmost counties, northern and central Montana east of the Rocky Mountains, northern portions of South Dakota, northwestern Minnesota, southeastern Alberta, the southern half of Saskatchewan, and into southwest Manitoba. It's wintering range includes south-central and southeast Arizona, Texas, southern Oklahoma, southern Arkansas, northwest Mississippi, southern Louisiana, and northern Mexico. Migration and wintering ecology are poorly known, but migrating and wintering Sprague's pipits are found in both densely and sparsely vegetated grassland, and pastures; they are rarely found in fallow cropland. Sprague's pipits exhibit a strong preference for grassland habitat during the winter and an avoidance of areas with too much shrub encroachment. They eat a wide variety of insects during the breeding season and a very small percentage of seeds (74 FR 63337, December 3, 2009e). Recent sightings have been reported outside of the study area upstream in the LRGV (Bird Treks, 2013).

The primary threats to the Sprague's pipit are habitat fragmentation on the breeding grounds, energy development, roads, and inadequacy of existing regulatory mechanisms. Native prairie is one of the most imperiled habitats worldwide, with loss rates approximating 70 percent in the United States and Canada, and prairie loss is accelerating. There is less specific information available on the wintering grounds, but the data available indicate that large areas of the wintering grounds are being converted from grassland habitat. The 40–year trend in Christmas Bird County data shows an annual decline of 2.54 percent of this species in Texas. Adequate

regulations are not in place at the local, State, or Federal level to adequately minimize the threat of habitat degradation and fragmentation.

2.15.4 Scalloped Hammerhead Shark

The scalloped hammerhead shark (*Sphyrnea lewini*) is a moderately large shark with a global distribution (NMFS, 2013g). The eight or so species of hammerhead sharks are characterized by the flat, extended head or "cephalofoil." The cephalofoil of a scalloped hammerhead shark is characterized by an indentation located centrally on the front margin of the broadly arched head. Two more indentations flank the main central indentation, giving this hammerhead a "scalloped" appearance.

In response to a petition submitted by WildEarth Guardians and Friends of Animals to list the species as threatened or endangered, the NMFS completed a comprehensive status review for the scalloped hammerhead shark which determined that the species is comprised of six DPSs that qualify as species under the ESA: Northwest Atlantic and Gulf of Mexico (NW Atlantic and GOM); Central and Southwest Atlantic (Central and SW Atlantic); Eastern Atlantic DPS; Indo-West Pacific DPS; Central Pacific DPS; and Eastern Pacific DPS (78 FR 20717, April 5, 2013h). The NMFS further determined that two DPSs warrant listing as endangered, the Eastern Atlantic and Eastern Pacific DPSs; two DPSs warrant listing as threatened, the Central & SW Atlantic and Indo-West Pacific DPSs; and two DPSs do not warrant listing at this time, the NW Atlantic and GOM DPS and the Central Pacific DPS. The study area is located in the NW Atlantic and GOM DPS.

The scalloped hammerhead shark is a coastal pelagic species that can also be found in ocean waters and occurs over continental and insular shelves and adjacent to deeper water. It has been observed close inshore and even entering estuarine habitats, as well as offshore. They feed on crustaceans, teleosts, cephalopods and rays (NMFS, 2013g).

This species is highly desired for the shark fin trade because of its fin size and high fin ray count. They are valuable in the international fin and are often used to make shark fin soup. A recent stock assessment found that the northwestern Atlantic population has decreased from about 155,500 in 1981 to about 26,500 in 2005 (NMFS, 2013g).

The scalloped hammerhead shark may be found within the study area. However, the study area is located in the NW Atlantic and GOM DPS, and did not warrant listing at this time.

2.15.5 Corals

On October 20, 2009, NMFS received a petition from the Center for Biological Diversity to list 83 species of coral as either threatened or endangered under the ESA. In response, NMFS issued a 90-day finding (75 FR 6616, February 10, 2010a), which determined that the petition contained substantial information indicating listing may be warranted for all of the petitioned species except *Oculina varicosa*. NMFS convened a Coral Biological Review Team to assess the biological status and threats to each of the 82 corals. In addition, the Pacific Islands Regional Office staff developed a report on management actions relevant to the species across their range, including existing regulatory mechanisms and conservation efforts (NMFS, 2012).

Of the 82 coral species included in the status review, seven are located in the Caribbean region which includes the reef tract of south Florida and the Florida Keys, Puerto Rico, the U.S. Virgin Islands and all the islands of the wider Caribbean region (NMFS, 2012). The seven coral species are boulder star coral (*Montastraea annularis*), boulder star coral (*Montastraea franksi*), elliptical star coral (*Dichocoenia stokesii),* Lamarck's sheet coral (*Agaricia lamarcki*), mountainous star coral (*Montastraea faveolata*), pillar coral (*Dendrogyra cylindrus*), and rough cactus coral (*Mycetophyllia ferox*) (75 FR 6616, February 10, 2010a).

Relatively high human population densities and a long history of pervasive human impacts to coral reef systems exist across the Caribbean region (NMFS, 2012). Nearly two-thirds of Caribbean coral reefs are threatened by at least one form of human activity, with continuing threats of region-wide damage due to rising sea temperatures and disease. Additionally, none of the Caribbean's three keystone species indicative of reef health (the corals *Acropora palmata* and *A.cervicornis*, and the urchin *Diadema antillarum*) show significant recovery over decadal time scales. The region is also susceptible to strengthening storms and hurricanes, and suffers mass bleaching events, hampering ecosystem recovery.

The seven coral species current U.S. distribution is restricted to south Florida and the Florida Keys, Puerto Rico, the U.S. Virgin Islands. None are located within the study area.

2.16 SPECIES OF CONCERN

2.16.1 Dusty and Sand Tiger Sharks

NMFS identified two sharks as Species of Concern for the study area – the dusky shark (*Carcharhinus obscurus*) and the sand tiger shark (*Carcharias taurus*). Both dusky and sand tiger sharks could occur in the study area.

The dusky shark is also known as the bronze whaler or black whaler (NMFS, 2010b). It is a large, fairly slender shark with a low ridge between the dorsal fins. It occurs in both inshore and offshore waters at depths as low as 1300 feet. Adults of this species tend to avoid areas of low salinity and rarely enter estuaries. The young congregate in very shallow coastal water in estuaries and bays. Their diet includes bony fishes, cartilaginous fishes, and squid. In the western Atlantic, it occurs from southern Massachusetts and Georges Bank to Florida, Bahamas, and Cuba. It also occurs in the Northern Gulf of Mexico, and Nicaragua; Southern Brazil, Eastern Atlantic; and Southern California to the Gulf of California.

Today the dusky shark population in the northwestern Atlantic and Gulf of Mexico is probably at 15 to 20 percent of its mid-1970s abundance (NMFS, 2010b). Currently the principal threat to dusky sharks is from bycatch and illegal landings in commercial and recreational shark fisheries. Commercial and recreational possession was prohibited in 2000. However, despite being prohibited, dusky sharks are regularly caught in commercial longlines and incidentally caught on a variety of other gears. With life history traits such as slow growth, late maturity, and reproduction every three years, the dusky shark is susceptible to overfishing.

The sand tiger shark is a bulky, light brown shark with a maximum length of about 10.5 feet (NMFS, 2010c). It has a flattened conical snout and a long mouth. This shark occurs as solitary individuals, but aggregations of small to large schools may occur for feeding, courtship, mating and birth. They are present in all warm and temperate seas except the eastern Pacific. They range from the surf zone down to depths as great as 626 feet, preying on bony fishes, small sharks, rays, squid, crabs and lobsters.

Currently, the principal threat to sand tiger sharks is exploitation. It is highly regarded as a food fish in Japan and is also used for fishmeal, oil and the shark-fin trade. Increased exploitation along the U.S. east coast in the 1980s and 1990s resulted in declines of 90 percent. Their aggregating behavior, slow growth, late maturity and low productivity make them susceptible to population declines due to overexploitation.

2.16.2 Opossum Pipefish, Warwaw Grouper and Speckled Hind

NMFS identified three fishes as Species of Concern for the study area - Opossum pipefish (*Microphis brachyurus lineatus*), Warwaw grouper (*Epinenphelus nigritus*), and speckled hind (*Epinephelus drummondhayi*).

The oppossum pipefish is a relatively large pipefish, reaching a standard length of 7.6 inches (NMFS, 2009). It is carnivorous, preying on crustaceans and small fish as ambush predators in

dense vegetation. It is a widespread species that spawns in brackish waters, with larvae moving quickly downstream to estuarine and marine environments. The smallest juveniles have only been captured in oceanic Sargassum rafts or coastal marine environments, while adults only occur in freshwater tributaries within 30 miles of the coast. This subspecies is known to range from New Jersey south through the Gulf of Mexico and Caribbean to Sao Paulo, Brazil, and also occurs on the Pacific Coast of Panama. The major threats to the opposum pipefish are habitat destruction, water control structures, declining water quality, and an increase in disease. The opposum pipefish occurs in the study area, having been reported in South Bay and tidal reaches the Rio Grande River (TPWD, no date).

The Warsaw grouper is a deepwater fish, inhabiting reefs or other growth-encrusted hard bottoms on the continental shelf break in waters 250 to 720 feet deep (IUCN, 2012a). Egg and larval phases occur offshore, but juveniles can be found in nearshore areas, occasionally seen on jetties and shallow water reefs. Adults are normally found on rough, rocky bottom in deep water. It is long-lived (up to 41 years) and has a slow growth rate, with a maximum size of about 440 pounds. The major threat to the Warsaw Grouper is mortality as a result of fishing or by-catch release mortality (due to barotraumas since it is deep-living). Landings have been reported in Alabama, Louisiana, North Carolina, South Carolina, Texas and Florida. The Florida west coast is the largest landing port; however, landings in Texas have been increasing. Warwaw grouper juveniles could be found in the study area.

The speckled hind is deepwater grouper which has its pelagic egg and larval stages offshore (IUCN, 2012b). Adults inhabit offshore rocky bottoms in depths of 82 to 600 feet. Juveniles are more commonly found in shallower portions of the depth range. Maximum weight is about 65 pounds. Prey include fishes, crabs, shrimp, lobster, and molluscs. The species occurs in the waters around Bermuda and along the U.S. coast from North Carolina to the Florida Keys, and in the northern and eastern Gulf of Mexico. The primary threat to the speckled hind is mortality as a result of fishing or bycatch. It is unlikely that speckled hinds would be found in the study area.

3.0 EFFECTS ON LISTED SPECIES

3.1 BROWN PELICAN

Foraging pelicans are common along the Texas Coast and may be found loafing or feeding in the project area. They would easily be able to avoid temporary construction sites. In addition, no nesting sites are located in the project area. Therefore, it is determined that the proposed project would have no effect on this species.

3.2 PIPING PLOVER

USACE PAs 2, 4A, and most of 4B are located within the piping plover's Critical Habitat Unit TX-01. These PAs are part of the environmental baseline, having been in use since before the first National Environmental Policy Act review of the BIH project in 1975 (USACE, 1975). PAs 4A and 4B contain sand and/or mud flats with sparse vegetation and little or no topographic relief which could be used by piping plovers for feeding, roosting and loafing. The sand and/or mud flats are the result of the periodic use of these areas for the placement of dredged material; after the water decants from the PAs, the sand and/or mudflats emerge after a few months and are again available as habitat. Without the disturbance of the periodic placement of material, vegetation would eventually grow in these areas, making the PAs unsuitable as habitat. Since the piping plovers naturally rely on a dynamic landscape in which habitats disappear, only to be replaced nearby, piping plovers would comfortably move to nearby sand or mud flats in the landscape mosaic while the PAs are in use. These flats are numerous in the study area. Therefore, it has been determined that the use of the PAs for the placement of dredged material would have no effect on piping plovers or their critical habitat.

Shoreline impact analyses of proposed channel improvements were conducted to determine the potential for 4-field alterations to impact adjacent Gulf shorelines ten miles to the north and south of the BIH channel (HDR, 2011). The southern five miles of Critical Habitat Unit TX-3A are located within the ten-mile shoreline study area north of the channel. Proposed channel modifications were predicted to result in relatively minor alterations to the typical nearshore wave field. If the proposed channel modifications were constructed, net longshore sediment transport would continue to carry sand from the south towards the BIH channel along Brazos Island. This sand would continue to be primarily impounded by the south jetty and/or transported around the jetty and deposited within the ship channel. A significant decrease in net longshore sediment transport would be unlikely and the shoreline immediately south of the channel would be expected to remain stable to accretional.

North of the channel, shoreline change data and wave modeling indicate that interaction between the predominant southeast waves and the ship channel, jetties, and natural inlet at Brazos Santiago Pass influences the beaches along South Padre Island for several miles, with the most discernible changes historically occurring within about three miles of the ship channel (HDR, 2011). When waves are from the southeast, channel modifications would possibly cause a decrease in wave heights and angles along South Padre Island resulting in a slight decrease in net longshore transport to the north. This reduction would possibly provide some benefit in terms of shoreline stability. However, over the long term, positive impacts would likely be indistinguishable from background shoreline change because of the natural variability of coastal processes. Dredged material from maintenance of the channel would be regularly placed in the

nearshore, submerged Feeder Berm, located from 1.5 to 2.5 miles north of the BIH channel in approximately 25 feet of water. Monitoring of dredged material placed in the Feeder Berm has shown that it moves toward the shoreline and is available for cross-shore transport and longshore sediment transport to the north (McLellan et al., 1997: USACE, 1989). Sediment movement onto the beach would be by natural processes. Overall, if the TSP were to be constructed, existing shoreline change trends would generally continue, with possible improvements in shoreline stability. Beaches adjacent to the BIH channel would not be expected to experience significant impacts from the proposed channel deepening. Therefore, it has been determined that deepening and extension of the BIH Entrance Channel would have no effect on piping plovers or their critical habitat.

Studies were also conducted to determine the potential for improvements to the BIH channel to exacerbate the effects of future relative sea-level rise (RSLR) in the study area. USACE estimates that RSLR over the 50-year period of analysis could range between 0.6 feet and 2.4 feet. These studies have determined that construction of the TSP would not increase the effect of RSLR or storm surges on the study area (USACE, 2013d; Ratcliff and Massey, 2012).

No other direct or indirect impacts on piping plovers or their critical habitat are anticipated. All sediments from construction of the Main Channel would be placed in upland, confined PAs or in the existing New Work ODMDS site. Maintenance dredged material would be placed in the same areas as those used under existing conditions, i.e. in existing upland, confined PAs, the Feeder Berm, and if necessary, the existing Maintenance ODMDS site. The frequency and duration of maintenance dredging would be within the range occurring under existing maintenance dredging. Any impacts would be minor and temporary, occuring only during dredging periods. Hydraulic pipelines may cross small, narrow stretches of sand flats along the BIH Main Channel shoreline in order to access PAs 4A and 4B, but these installations and their impacts would be temporary and affect a negligible portion of the habitat. The TSP does not include the direct placement of dredged materials on the beach or on critical habitat anywhere in the study area. No PAs or construction activities are planned in or adjacent to units TX-02, TX 3-A and 3-B. In summary, there would be no effect to piping plovers or their critical habitat from other direct or indirect impacts of the TSP.

3.3 NORTHERN APLOMADO FALCON

No direct or indirect impacts to the Northern Aplomado falcon from construction of the TSP are anticipated. No construction impacts would occur within its favored habitat, mesquite/yucca flats south of the PAs lining the south side of the BIH channel and in the LANWR north of the channel. Existing unpaved access roads pass through or adjacent to favored habitat and nesting areas. These roads would be utilized for access during construction and maintenance of the PAs,

as they are utilized under existing conditions. It is expected there would be no significant differences in the minor, temporary disturbances caused by these activities. No impacts to nesting platforms would occur and construction activities would not disturb hunting, roosting, and display activities in their habitat areas. Therefore, it is determined that the proposed project would have no effect on this species.

3.4 GULF COAST JAGUARUNDI AND OCELOT

Although no recent sightings of the Gulf Coast Jaguarundi or ocelot have been reported in the study area, they are believed to be of potential occurrence in the study area. Lomas with dense brush cover in the study area have been known to facilitate the travel of endangered cats from Mexico to protected habitat in the LANWR north of the BIH channel (Reyes, 2012). Protection of habitat like that provided by these lomas is one goal of the USFWS recovery plans for each species (USFWS, 2010a and 2012b). None of these dense brush areas are located within upland PA, but several lomas are located between the PAs. All impacts to these lomas would be avoided during construction to raise the levees for initial construction and to incrementally raise levees for maintenance dredging. A new levee would be constructed to protect the loma in PA 4B from all construction impacts. Existing unpaved access roads pass through or adjacent to these lomas. These roads would be utilized for access during construction and maintenance of the PAs, as they are used under existing conditions. It is expected there would be no significant differences in the minor, temporary disturbances caused by these activities. Therefore, it is determined that the proposed project would have no effect on these species.

3.5 WEST INDIAN MANATEE

No recent records of West Indian manatee exist from the study area, and such an occurrence would be rare. If a manatee was to enter the project area during construction or maintenance activities, it would be able to move away from construction equipment. Therefore, it is determined that the proposed project would have no effect on this species.

3.6 WHALES

Whales occur in offshore waters and none of these species are likely to wander into shallow coastal estuaries. If a whale were to occur offshore in the project area during construction or maintenance dredging, it would be able to avoid from construction activities. Therefore, it is determined that the proposed project would have no effect on these species.

3.7 SEA TURTLES

3.7.1 Effects on Sea Turtles

Green, Kemp's ridley, loggerhead and hawsbill sea turtles are abundant in the study area throughout the year. Of the five species of sea turtle known to potentially occur in Texas waters, the leatherback is the least likely to occur due to its pelagic nature. The TSP would utilize both pipeline and hopper dredges. It has been well documented that hopper dredging activities occasionally result in sea turtle entrainment and death, even with seasonal dredging windows. To construct the TSP, one hopper dredge would be operated continuously for an estimated duration of seven months to remove approximately 2,066,300 cubic yards of new work material from the Entrance and Jetty Channels. Bed leveling may be performed at the conclusion of dredging by dragging a metal bar to smooth over high spots. All of the material would be placed at the existing New Work Ocean Dredged Material Disposal Site (ODMDS). It is estimated that five subsequent contracts would be awarded for cutterhead suction dredging of the Brownsville Main Channel through station 84+200 for a total length of 15.9 miles.. The remainder of the channel (the Turning Basin Extension and Turning Basin) would remain at existing depths. Two or three cutterhead dredges would be working simultaneously to remove approximately 12,079,700 cubic yards of new work material over an estimated 29 months. New work material from the Brownsville Main Channel (stations 0+000 through 84+200) would be pumped from the dredges through a combination of fully submerged and floating hydraulic pipelines into existing upland confined PAs managed by the Brownsville Navigation District (PAs 2, 4A, 4B, 5A, 5B, 7 and 8).

Between 1995 and 2012, a total of 31 turtles were taken as a result of hopper dredging of the BIH Entrance and Jetty Channels (Table 6). The takes were comprised of 23 green, 5 loggerhead, and 3 Kemp's ridley sea turtles. Hawksbills and leatherbacks are not known to have been caught in hopper dredges since monitoring began (USACE, 2013c). Sea turtles easily avoid pipeline cutterhead dredges due to the slow movement of the dredge. Restriction of hopper dredging activities to between December 1 and March 31, whenever possible, would reduce the likelihood of mortality. Any dredging activities outside of this window should be with hydraulic dredges, if possible, to reduce mortality.

It is generally accepted that hopper dredging impacts to sea turtles can also be reduced by having a trawler precede the dredges to capture turtles and relocate them away from the project. The history of the use of pre-dredge and relocation trawling for the BIH channel is also shown in Table 6. Relocation trawling was performed in the BIH Entrance and Jetty channels from 2003-2009 in association with seven dredging events; no takes occurred in association with these trawling projects. Relocation trawling captured 137 turtles during 4,568 tows; catch per tow unit

effort was 58 tows for each turtle relocated. With relocation trawling, this resulted in a total of 19 dredge takes over a total of 2,112,622 cubic yards (CYs) dredged. Restated as takes per CY, 9.0 takes per 1 million CYs occurred with relocation trawling. The five dredging events since 1995 in which no relocation trawling was conducted resulted in a total of 12 dredge takes over 1,758,106 CYs. Restated as takes per CY, 6.8 takes per 1 million CYs occurred without relocation trawling. This comparison indicates that relocation trawling in the BIH Entrance and Jetty Channels may not be as effective in reducing takes as commonly assumed. Rather than conducting relocation from the start of each dredging project, Galveston District proposes that trawling be initiated after the triggers outlined in the Impact Avoidance Plan detailed in Section 3.7.2 are reached.

In addition to adverse impacts from hopper dredges, other impacts to sea turtles could result from project construction. The small increase in marine traffic predicted with the project could result in a higher incidence of collisions with sea turtles. Other potential impacts of the project include temporary affects by sedimentation and turbidity. However, these impacts have been determined to be insignificant.

The majority of takes in the BIH project area (23) since 1995 have been green sea turtles (USACE, 2013b). Similarly, relocations as a result of pre-dredging or relocation trawls are much higher for the green turtle than for both other species combined (118 compared to 19). Loggerheads, the most abundant sea turtle in the project area, have experienced five takes since 1995 with relocations totaling 16 over the same period. Three takes of Kemp's ridley turtles have occurred during dredging of the Entrance and Jetty channels (USACE, 2013). If dredging were to occur during the nesting season window (March 15–September 30), Kemp's ridley hatchlings, if present, could be adversely affected by disorientation from bright lights generated by hopper dredges or by temporarily elevated levels of total suspended solids (TSS) during Feeder Berm placement. Typically, hatchlings take the shortest route to water; however, bright lights can cause hatchlings to move toward the lights rather than the water, resulting in disorientation and increased danger from predators. Minor elevations of TSS would be temporary (lasting approximately two weeks) and similar to natural levels during periods of heavy wave action. No direct impacts to turtle nests on South Padre Island are expected since the TSP does not include typical beach nourishment which involves the placement of maintenance material directly onto the beach.

In summary, four sea turtle species (green, Kemp's ridley, loggerhead and hawksbill) could be adversely impacted by hopper dredging activities for the proposed TSP. Therefore, it has been determined that the TSP is likely to adversely affect these four sea turtle species. However, these impacts are not likely to jeopardize the continued existence or recovery of these species. The leatherback sea turtle is least likely to be affected by the proposed project because of its rare

Table 5: Brownsville Island Harbor - History of Hopper Dredging and Sea Turtle Takes

Fiscal Year	Dates of Dredging Events (calendar)	BIH Channel Reach	Quantity of Material Dredged (cubic yards)	No. of Takes	Species Taken			Seasonal Restriction Observed	Pre-Dredge Trawling Conducted	Relocation Trawling Conducted	No. of Relocation Trawls	Species Relocated During Trawling			Placement Location
					Green	Loggerhead	Kemp's ridley					Green	Loggerhead	Kemp's ridley	
1995	Jan 24, 1995-Feb 26, 1995	Entrance Ch 0+000 to -13+000	755,301	5	4		1	yes							Feeder Berm (1A)
1997	Mar 30, 1997-Jun 14,1997	Entrance Ch -6+000 to -12+000	350,907	2		1	1								Maintenance ODMDS
1999	Jan 31, 1999-Mar 3, 1999	Entrance Ch -6+000 to -12+000	186,571	2	2			yes							Feeder Berm (1A)
2002	Mar 10, 2002-Mar 20, 2002	Entrance Ch -6+000 to -12+500	207,338	2	2			yes							Feeder Berm (1A)
2003	Dec 13, 2002-Dec 19, 2002	Con't Entrance Ch -6+000 to -12+500	121,549	2	2			yes	yes	yes 1 trawler	297	5	1		Feeder Berm (1A)
2004	Dec 1, 2003-Dec 18, 2003	Brownsville Ch 1+423 to 13+000	355,957	3	3			yes	yes	yes 1 trawler	437	13			Feeder Berm (1A)
2006	Feb 23, 2006-Mar 11, 2006	Entrance & Jetty -5+000 to 5+000	332,721	2	2			yes	yes	yes 2 trawlers	338	34			Feeder Berm (1A)
2007	Feb 20, 2007-Mar 15, 2007	Jetty Ch -0+600 to -4+600	443,000	6	5	1		yes	yes	yes 2 trawlers	961	64	1		Feeder Berm (1A)
2008	Jun 3, 2008-Jun 23, 2008	Jetty Ch -0+600 to -5+600	490,690	2	1	1			yes	yes 2 trawlers	1,304	1	11	2	Feeder Berms (1A&1B)
2008	Aug 30, 2008-Sept 5, 2008	Entrance Ch -6+400 to -13+000	130,933							yes 2 trawlers	411		2	1	Feeder Berm (1A)
2009	Oct 31, 2008-Nov 15, 2008	Con't Entrance Ch -6+400 to -13+000	237,772	4	1	2	1			yes 2 trawlers	820	1	1		Feeder Berm (1A)
2013	Oct 25, 2012-Dec 9, 2012	Jetty Ch -0+600 to -5+600	257,989	1	1										South Padre Island Beach
Total			**3,870,728**	**31**	**23**	**5**	**3**				**4,568**	**118**	**16**	**3**	

occurrence in the study area and pelagic nature. However, since the leatherback does occur within Texas waters, it has been determined that the TSP may affect but is not likely to adversely affect this species.

3.7.2 Sea Turtle Impact Avoidance Plan

An avoidance plan has been developed to avoid and minimize adverse impacts to sea turtles from hopper dredging during construction of the TSP. This avoidance plan includes reasonable and prudent measures that have largely been incorporated in USACE regulatory and civil works projects throughout the Gulf for more than a decade. These measures are:

- *Training*: All contracted personnel involved in operating hopper dredges must receive thorough training (as specified by NMFS) on measures of dredge operation that will minimize sea turtle takes.
- *Seasonal Hopper Dredging Window*: Hopper dredging activities in Gulf waters up to one mile into rivers shall be completed, whenever possible, between 1 December and 31 March, when sea turtle abundance is lowest throughout Gulf coastal waters.
- *Nonhopper Type Dredging*: Pipeline or hydraulic dredges, which are not known to take turtles, must be used whenever possible between 1 April and 30 November in Gulf waters up to one mile into rivers.
- *Observers*: The USACE will arrange for NMFS-approved protected species observers to be aboard the hopper dredges to monitor the hopper bin, screening, and dragheads for sea turtles and their remains. Observer coverage sufficient for 100 percent monitoring (i.e., two observers) of hopper dredging operations will be implemented between April 1 and November 30 and/or if the surface water temperatures are 11°C or greater.
- *Screening*: 100 percent 4-inch inflow screening of dredged material is required. If conditions prevent 100 percent inflow screening using 4-inch mesh, the Galveston District, observers, and draghead operator must consult and USACE must notify NMFS before reducing or eliminating inflow screening and provide details regarding effective overflow screening. If deemed necessary, screening may be modified gradually (increasing mesh size to 6-inch by 6-inch, then 9-inch by 9-inch, then 12-inch by 12-inch). If clogging is still an issue after gradual changes, then effective 100 percent overflow screening is required.
- *Sea Turtle Deflecting Draghead and Dredging Pumps*: A state-of-the-art rigid deflector draghead will be used on all hopper dredges at all times of the year. Dredging pumps will be disengaged by the operator when the dragheads are not firmly on the bottom, to prevent impingement or entrainment of sea turtles within the water column (especially important during dredging cleanup).

- *Dredge Lighting*: From March 15 through September 30, sea turtle nesting and emergence season, all lighting aboard hopper dredges and hopper dredge pumpout barges operating within three nautical miles of sea turtle nesting beaches shall be limited to the minimal lighting necessary to comply with U.S. Coast Guard and/or Occupational Safety and Health Administration requirements. Non-essential lighting shall be minimized through reduction, shielding, lowering, and appropriate placement.
- *Dredge Take Reporting*: Observer reports of incidental take by hopper dredges will be submitted by e-mail (takereport.nmfsser@noaa.gov) to NMFS Southeast Regional Office by 10 onboard protected species observers within 24 hours of any observed sea turtle take. An end-of-project summary report of the hopper dredging results and any documented sea turtle takes will be submitted to NMFS Southeast Regional Office within 30 working days of completion of the dredging project. The USACE will submit an annual report to NMFS Southeast Regional Office summarizing hopper dredging projects and documented incidental takes. This report must include a complete explanation why alternative dredges (other than hopper dredges) were not used for maintenance dredging, if that activity occurs between April and November.
- *Sea turtle stranding and salvage network (STSSN) notification*: USACE or its representative will notify the STSSN state representative of start-up and completion of dredging, bedleveling, and relocation trawling operations and ask to be notified of any turtle strandings in the project area that may bear the signs of draghead impingement or entrainment or interaction with a bed-leveling type dredge. Dredge relevant stranding information will be reported in the end-of-project summary report and end of year annual report (these strandings will not be counted against USACE take limit during maintenance).
- *Relocation Trawling*: Relocation trawling will be undertaken by the USACE where any of the following conditions are met: (a) two or more turtles are taken in a 24-hour period in the project; (b) four or more turtles are taken in the project; or, (c) when 75 percent of a District's sea turtle species fiscal year quota for a particular species has previously been met. Handling of sea turtles captured during relocation trawling in association with hopper dredging project in Gulf navigation channels and sand mining areas shall be conducted by NMFS-approved endangered species observers.

Other conditions may also apply. A detailed outline of the conditions of the USACE's sea turtle avoidance during maintenance dredging project is included in the NMFS Biological Opinion for dredging of Gulf navigation channels and sand mining areas using hopper dredges (Consultation Number F/SER/2000/01287).

3.8 SOUTH TEXAS AMBROSIA

This plant is not known to occur in the project area and may be extirpated in Cameron County. It is not known to occur in the study area. Therefore, it is determined that the proposed project would have no effect on this species.

3.9 TEXAS AYENIA

These Texas populations of the Texas ayenia are limited to specific vegetation communities along the Rio Grande in Cameron County. It is not likely to occur in the study area. Therefore, it is determined that the proposed project would have no effect on this species.

3.10 CANDIDATE SPECIES

Red knots have been reported to use the barrier island beaches, exposed tidal flats, washover passes, and mudflats associated with the Laguna Madre in the study area. Red-crowned parrots occur primarily in urban areas in the LRGV where there are large trees that provide both food and nesting sites. Wintering Sprague's pipits are found in both densely and sparsely vegetated grassland and pastures. They have been recently sighted in the LRGV outside the study area. None of three species are known to utilize the project area. Therefore, it is determined that the proposed project would have no effect on these species.

The scalloped hammerhead shark may be found within the study area. It has been observed close inshore and even entering estuarine habitats, as well as offshore in deep water. It is highly mobile, capable of moving away from any disturbance. Therefore, it is determined that the proposed project would have no effect on these species.

Known U.S. populations of the seven coral species (boulder star coral [two subspecies], elliptical star coral, Lamarck's sheet coral, mountainous star coral, pillar coral and rough cactus coral are all located in south Florida and the Florida Keys, Puerto Rico, the U.S. Virgin Islands. Therefore, it is determined that the proposed project would have no effect on these species.

3.11 SPECIES OF CONCERN

The dusky and sand tiger sharks may be found within the study area. Both are highly mobile, capable of moving away from any disturbance. Therefore, it is determined that the proposed project would have no effect on these species.

The opposum pipefish may occurs in the study area, having been reported in South Bay and tidal

reaches the Rio Grande River. Juvenile Warsaw groupers can be found in the study area, nearshore and occasionally near the jetties. Dredging would create temporary, insignificant increases in turbidity, but would not cause any permanent changes in water quality or salinity. The speckled hind is deepwater grouper which spends all of its life phases in deep offshore waters; it is unlikely to occur in the study area. Therefore, it is determined that the proposed project would have no effect on these species.

4.0 SUMMARY OF EFFECT

This Biological Assessment has determined that the BIH TSP would have no effect on the following listed animal and plant species: piping plover, Northern Aplomado falcon, Gulf Coast jaguarundi, ocelot, West Indian manatee, blue whale, finback whale, humpback whale, sei whale, sperm whale, South Texas ambrosia, and Texas ayenia. Furthermore, it has been determined that the TSP would have no effect on designated piping plover critical habitat. The BIH TSP would also have no effect on the following Candidate species and Species of Concern: red knot, red-crowned parrot, Sprague's pipit, scalloped hammerhead shark, boulder star coral (subspecies *annularis* and *franksi*), elliptical star coral, Lamarck's sheet coral, mountainous star coral, pillar coral, rough cactus coral, dusky shark, sand tiger shark, opossum pipefish, warwaw grouper and speckled hind.

Five sea turtle species may be adversely affected by the proposed project. It is unlikely that leatherback sea turtles would be found in the study area but since they could potentially occur, it has been determined that the TSP may effect, but is not likely to adversely affect the leatherback sea turtle. Four sea turtle species (green, Kemp's ridley, loggerhead and hawksbill) could be adversely impacted by hopper dredging activities for the proposed BIH CIP. Therefore, it has been determined that the TSP is likely to adversely affect these four sea turtle species. However, these impacts are not likely to jeopardize the continued existence or recovery of these species. A Sea Turtle Impact Avoidance Plan has been developed to implement conservation measures.

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EXHIBIT A

DRAFT ENGINEERING DRAWINGS FOR BIH TSP (52 X 250-FOOT PROJECT)

Drawings are provided Appendix B of the Integrated Feasibility Report and Environmental Assessment for the Brazos Island Harbor Channel Improvement Project

EXHIBIT B
NMFS AND USFWS COORDINATION

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

March 18, 2013

Environmental Section

David M. Bernhart
Assistant RA for Protected Resources
Southeast Regional Office
National Marine Fisheries Service
263 13th Avenue South
St. Petersburg, FL 33701

Dear Mr. Bernhart:

This letter is in regard to proposed modification of the Brazos Island Harbor Navigation Project in Cameron County, Texas. The existing project is shown on the enclosed figure. The project is expected to include deepening and possibly widening of the Entrance Channel and Brownsville Ship Channel, to allow larger vessels and offshore oil rigs to more efficiently navigate to the Turning Basin located near Brownsville, Texas.

To facilitate compliance with the requirements of Section 7, subsection (a)(2) of the Endangered Species Act Amendments of 1978, a list of any species which is listed or proposed to be listed, that may be present in the area of the proposed action is requested.

If you or your staff have any questions regarding this activity, please contact Janelle Stokes at (409) 766-3039 or by email at Janelle.S.Stokes@usace.army.mil.

Sincerely,

Carolyn Murphy
Chief, Environmental Section

Enclosure

CF:

Mr. Rusty Swafford
National Marine Fisheries Service
Habitat Conservation Division
4700 Avenue U
Galveston, Texas 77551

From:	Teletha Mincey - NOAA Federal
To:	Stokes, Janelle S SWG
Cc:	Hawk, Eric
Subject:	Brazos Island Harbor Navigation Project in Cameron County, TX
Date:	Friday, March 22, 2013 9:16:11 AM
Attachments:	Texas.pdf

Good Morning Ms. Stokes:

This is in response to the COE's letter, dated March 18, 2013, referencing the above-mentioned subject. Attached is a listing of species under the jurisdiction of the National Marine Fisheries Service, for the state of Texas, which may be present in the proposed action area.

Thank you.
--
Teletha Mincey
Program Analyst
NOAA Fisheries
Southeast Region
263 13th Ave S
St. Petersburg, FL 33701-5505
(727) 824-5312 - Main Line
(727) 551-5772 - Direct Line
(727) 824-5309 - Fax
http://sero.nmfs.noaa.gov/pr/pr.htm

Endangered and Threatened Species and Critical Habitats
under the Jurisdiction of the NOAA Fisheries Service

Texas

Listed Species	Scientific Name	Status	Date Listed
Marine Mammals			
blue whale	*Balaenoptera musculus*	Endangered	12/02/70
finback whale	*Balaenoptera physalus*	Endangered	12/02/70
humpback whale	*Megaptera novaeangliae*	Endangered	12/02/70
sei whale	*Balaenoptera borealis*	Endangered	12/02/70
sperm whale	*Physeter macrocephalus*	Endangered	12/02/70
Turtles			
green sea turtle	*Chelonia mydas*	Threatened[1]	07/28/78
hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	06/02/70
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	12/02/70
leatherback sea turtle	*Dermochelys coriacea*	Endangered	06/02/70
loggerhead sea turtle	*Caretta caretta*	Threatened[2]	09/22/11
Fish			
None			

[1] Green turtles are listed as threatened, except for breeding populations of green turtles in Florida and on the Pacific Coast of Mexico, which are listed as endangered

[2] Northwest Atlantic Ocean (NWA) DPS. On September 22, 2011, NMFS and USFWS issued a final rule changing the listing of loggerhead sea turtles from a single, threatened species to nine distinct population segments (DPSs) listed as either threatened or endangered (FR 76 58868). The NWA DPS was listed as threatened.

Texas

Candidate Species[3]	Scientific Name
Fish	
scalloped hammerhead shark	*Sphyrna lewini*
Invertebrates	
boulder star coral	*Montastraea annularis*
boulder star coral	*Montastraea franksi*
elliptical star coral	*Dichocoenia stokesii*
Lamarck's sheet coral	*Agaricia lamarcki*
mountainous star coral	*Montastraea faveolata*
pillar coral	*Dendrogyra cylindrus*
rough cactus coral	*Mycetophyllia ferox*

Species of Concern[4]	Scientific Name
Fish	
dusky shark	*Carcharhinus obscurus*
opossum pipefish	*Microphis brachyurus lineatus*
sand tiger shark	*Carcharias taurus*
speckled hind	*Epinephelus drummondhayi*
warsaw grouper	*Epinephelus nigritus*

[3] Candidate species are those petitioned species that are actively being considered for listing as endangered or threatened under the Endangered Species Act (ESA), as well as those species which NMFS has initiated an ESA status review.
[4] Species of Concern are not protected under the Endangered Species Act, but concerns about their status indicate that they may warrant listing in the future. Federal agencies and the public are encouraged to consider these species during project planning so that future listings may be avoided. For more information please visit: http://sero.nmfs.noaa.gov/pr/SOC.htm

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

March 18, 2013

Environmental Section

Allan M. Strand
Field Supervisor
U.S. Fish and Wildlife Ecological Services
6300 Ocean Drive
Corpus Christi, Texas 78412

Dear Mr. Strand:

This letter is in regard to proposed modification of the Brazos Island Harbor Navigation Project in Cameron County, Texas. The existing project is shown on the enclosed figure. The project is expected to include deepening and possibly widening of the Entrance Channel and Brownsville Ship Channel, to allow larger vessels and offshore oil rigs to more efficiently navigate to the Turning Basin located near Brownsville, Texas.

To facilitate compliance with the requirements of Section 7, subsection (a)(2) of the Endangered Species Act Amendments of 1978, a list of any species which is listed or proposed to be listed, that may be present in the area of the proposed action is requested.

If you or your staff have any questions regarding this activity, please contact Janelle Stokes at (409) 766-3039 or by email at Janelle.S.Stokes@usace.army.mil.

Sincerely,

Carolyn Murphy

Carolyn Murphy
Chief, Environmental Section

Enclosure

From:	Pat Clements
To:	Stokes, Janelle S SWG
Subject:	RE: Endangered species list for Cameron Co - BIH project (UNCLASSIFIED)
Date:	Friday, March 22, 2013 2:16:35 PM

That list looks good. It does not note, however, that the piping plover also has critical habitat designated.

Pat

-----Original Message-----
From: Stokes, Janelle S SWG [mailto:janelle.s.stokes@usace.army.mil]
Sent: Friday, March 15, 2013 4:04 PM
To: Pat Clements
Subject: Endangered species list for Cameron Co - BIH project (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Pat,

I pulled down the attached ESA list for Cameron County from the Region 2 website. Should I use this for the BIH BA, or do you recommend that we send you a letter requesting a species list?

Jan

Classification: UNCLASSIFIED
Caveats: NONE

Southwest Region

Ecological Services

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List of species by county for Texas:

Counties Selected: Cameron

Select one or more counties from the following list to view a county list:

Anderson
Andrews
Angelina
Aransas
Archer

View County List

Cameron County

Common Name	Scientific Name	Species Group	Listing Status	Species Image	Species Distribution Map	Critical Habitat	More Info
brown pelican	*Pelecanus occidentalis*	Birds	DM				P
green sea turtle	*Chelonia mydas*	Reptiles	E, T				P
Gulf Coast jaguarundi	*Herpailurus (=Felis) yagouaroundi cacomitli*	Mammals	E				P
hawksbill sea turtle	*Eretmochelys imbricata*	Reptiles	E				P
Kemp's ridley sea turtle	*Lepidochelys kempii*	Reptiles	E				P
leatherback sea turtle	*Dermochelys coriacea*	Reptiles	E				P
loggerhead sea turtle	*Caretta caretta*	Reptiles	T				P
northern aplomado falcon	*Falco femoralis septentrionalis*	Birds	E, EXPN				P
ocelot	*Leopardus (=Felis) pardalis*	Mammals	E				P
piping Plover	*Charadrius melodus*	Birds	E, T			Final	P
red knot	*Calidris canutus rufa*	Birds	C	No Image			P
red-crowned parrot	*Amazona viridigenalis*	Birds	C	No Image	No Map		P
south Texas ambrosia	*Ambrosia cheiranthifolia*	Flowering Plants	E				P
Sprague's pipit	*Anthus spragueii*	Birds	C	No Image			P
Texas ayenia	*Ayenia limitaris*	Flowering Plants	E				P
West Indian Manatee	*Trichechus manatus*	Mammals	E				P

Last updated: December 17, 2012

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

June 17, 2013

Environmental Section

David M. Bernhart
Assistant RA for Protected Resources
Southeast Regional Office
National Marine Fisheries Service
263 13th Avenue South
St. Petersburg, FL 33701

Dear Mr. Bernhart:

This letter is in regard to a proposed Federal project for improvements to the Brazos Island Harbor Project in Cameron County, Texas. The Galveston District is currently preparing a draft integrated feasibility report and environmental assessment which recommends deepening the existing navigation channel from 42 to 52 feet. A description of the proposed project, the Tentatively Selected Plan (52 by 250-foot project), is provided in the attached Biological Assessment (BA).

We have prepared a BA for the proposed project as both listed species and critical habitat are located within the affected area. We have concluded that the proposed project is likely to adversely affect the federally-listed endangered Kemp's ridley and hawksbill sea turtles, and the threatened green and loggerhead sea turtles. We have also concluded that the project may affect, but is not likely to adversely affect the endangered leatherback sea turtle. The proposed project will have no effect on the federally-listed piping plover, Northern Aplomado falcon, Gulf Coast jaguarundi, ocelot, West Indian manatee, blue whale, finback whale, humpback whale, sei whale, sperm whale, South Texas ambrosia, and Texas ayenia, and will have no effect on designated piping plover critical habitat.

Since the proposed project may affect federally-listed species, we request initiation of formal consultation pursuant to 50 CFR 402.14, to evaluate the effects of the proposed project on threatened and endangered sea turtles. Please notify us within 30 days of receipt of the letter if additional information beyond that provided in the Biological Assessment is required, and notify us when the 90-day preparation period for the draft Biological Opinion has begun. In accordance with Section 402.14(g)(5), we also request that a draft copy of the biological opinion be furnished for our review at the end of the 90-day preparation period.

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,

Carolyn Murphy

Carolyn Murphy
Chief, Environmental Section

Enclosure

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

June 17, 2013

Environmental Section

Edith Erfling
Field Supervisor
U.S. Fish and Wildlife Service
Clear Lake Ecological Services Field Office
17629 El Camino Real, Suite 211
Houston, Texas 77058

Dear Ms. Erfling:

This letter is in regard to a proposed Federal project for improvements to the Brazos Island Harbor Project in Cameron County, Texas. The Galveston District is currently preparing a draft integrated feasibility report and environmental assessment which recommends deepening the existing navigation channel from 42 to 52 feet. A description of the proposed project, the Tentatively Selected Plan (52 by 250-foot project), is provided in the attached Biological Assessment (BA).

We have prepared a BA for the proposed project as both listed species and critical habitat are located within the affected area. We have concluded that hopper dredging to construct the proposed project is likely to adversely affect federally-listed endangered, swimming Kemp's ridley and hawksbill sea turtles, and the threatened swimming green and loggerhead sea turtles. We have also concluded that the project may affect, but is not likely to adversely affect the endangered swimming leatherback sea turtle. The proposed project will have no effect on the federally-listed piping plover, Northern Aplomado falcon, Gulf Coast jaguarundi, ocelot, West Indian manatee, blue whale, finback whale, humpback whale, sei whale, sperm whale, South Texas ambrosia, and Texas ayenia, and will have no effect on designated piping plover critical habitat.

We are hereby requesting your written concurrence, pursuant to the informal consultation procedures prescribed in 50 CFR 402.13, that the proposed action will have no effect on federally-listed species or designated critical habitat under your agencies 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,

Carolyn Murphy

Carolyn Murphy
Chief, Environmental Section

Enclosure

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

October 30, 2013

Environmental Section

Edith Erfling
Field Supervisor
U.S. Fish and Wildlife Service
Clear Lake Ecological Services Field Office
17629 El Camino Real, Suite 211
Houston, Texas 77058

Dear Ms. Erfling:

Based upon recommendations in the US Fish and Wildlife Service's (USFWS) July 25, 2013 Coordination Act Report (CAR) for the Brazos Island Harbor Channel Improvement Project 52 x 250-Foot Alternative, Cameron County, Texas, Galveston District would like to clarify or modify our assessment of effects for several protected species under USFWS jurisdiction in the project area. The Tentatively Selected Plan (TSP) improvements to the channel would consist of extending the Entrance Channel 4,000 feet farther into the Gulf of Mexico, deepening the Jetty and Entrance Channels to 54 feet mean lower low water (MLLW), and deepening the Main Channel to 52 feet MLLW. Material from construction of the TSP would be placed in the existing New Work Ocean Dredged Material Disposal Site (ODMDS), and in upland, confined PAs 2, 4A, 4B, 5A, 5B, 7 and 8. Dredged material from maintaining the channel would be placed in the same upland PAs, the existing Maintenance ODMDS, and an existing Feeder Berm.

The CAR states that the Galveston District's Biological Assessment (BA) did not provide a specific assessment of potential project effects to nesting sea turtles. The BA did describe project impacts to the Gulf beaches and included the following statement "No direct impacts to turtle nests on South Padre Island are expected since the TSP does not include typical beach nourishment which involves the placement of maintenance material directly onto the beach." Additional information is provided here to clarify anticipated project effects to green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*), loggerhead (*Caretta caretta*) and hawsbill (*Eretmochelys imbricata*) nesting sea turtles. While swimming sea turtles are abundant in the study area throughout the year, nesting turtles and nests of these species are not common but have been found sporadically in the study area. No impacts to the beaches where nests occur are expected with construction of the TSP. All dredging and placement activities associated with the Entrance and Jetty channels would be accomplished with hopper dredges, which would release material directly into the open water the Feeder Berm or ODMDS. All placement activities along the Main Channel would be accomplished with hydraulic pipeline dredges pumping directly from the channel into adjacent upland PAs. No hydraulic pipelines or other construction equipment would be used along the Gulf shoreline in potential sea turtle nesting locations.

While the Maintenance ODMDS would be available for use if needed, maintenance material from the first 11,000 feet of the Main Channel, and the entire Jetty and Entrance Channels would be regularly placed in the Feeder Berm located between 1.5 and 2.5 miles from the north jetty and from 0.4 to 0.9 miles from shore. Sediment removed by maintenance dredging would therefore be regularly placed back into the littoral system, available for natural cross-shore and longshore sediment transport to the beaches of South Padre Island. Gulf beaches would not be expected to experience significant impacts from the proposed channel deepening. Existing shoreline change trends would generally continue, with possible improvements in shoreline stability. Therefore, it has been determined that the BIH TSP would have no effect on nesting green, Kemp's ridley, loggerhead and hawsbill sea turtles in the project area.

The CAR also provided information regarding the potential for the TSP to impact federally-listed threatened and endangered species, and specific conservation recommendations for the following species - piping plover (*Charadrius melodus*), northern aplomado falcon (*Falco femoralis septentrionalis*), ocelot (*Leopardus pardalis*), jaguarundi (*Herpailurus yagouaroundi cacomitli*), and West Indian manatee (*Trichechus manatus*). Based on this new information and on a subsequent telephone consultation, Galveston District has reevaluated its effects determinations for these species and the conservation recommendations, as follows:

Piping plover. Hydraulic pipeline pumping of dredged material into upland PAs within designated piping plover critical habitat Unit TX-01 may affect but is not likely to adversely affect piping plovers in the following limited circumstances. Piping plovers may roost in these upland PAs to conserve energy and body reserves during combinations of certain adverse weather conditions, and disturbing the birds under these conditions could cause harm by stressing the birds. As identified in the CAR, these conditions are cold temperatures (below 40° F), high winds (above 15-20 mph), and precipitation. If any two of these weather conditions occur in combination when the pumping of new work or maintenance material into PAs 2, 4A and 4B is ready to begin, Galveston District would survey unvegetated sand flats in these PAs for the presence of roosting piping plovers. If roosting piping plovers are identified, then pumping into affected PAs would be delayed until weather conditions ameliorate and two of these three weather conditions are no longer occurring in combination. With implementation of this conservation recommendation, it has been determined that the TSP may affect but is not likely to adversely affect piping plovers.

Northern aplomado falcon. While no nests are known in the project area at this time, it is possible that aplomado falcons may use mesquite savannah and grassland areas south of the PAs for foraging and nesting. Nest structures that could be utilized by the aplomado falcon have been documented approximately 0.5 mile south of PAs 7 and 5A. All construction activities would occur within the footprint of existing PA levees, avoiding direct impacts to potential grassland and savannah habitat near the PAs. However, the activity and noise from construction activities on the PA levees or use of access roads south of the PAs may disturb birds in nests within 100 yards of these activities. Prior to commencing levee maintenance activities for new work and future maintenance during the months of March through June, areas within 100 yards of the PA levees and access roads would be examined from a distance of at least 100-300 yards for stick

nests and signs of adult falcons incubating eggs or brooding chicks. If an actively utilized nest is found to exist within 100 yards of the levees or access roads, further surveys would be performed and USFWS would be contacted for a review of survey results and impact determinations. With implementation of this conservation recommendation, it has been determined that the TSP may affect but is not likely to adversely affect the Northern aplomado falcon.

Gulf Coast jaguarundi and ocelot. While rare, these cats are known to occur around the project area, and may use a variety of habitats for moving between preferred habitat sites. All TSP construction activities would occur within the footprint of existing PA levees, avoiding direct impacts to lomas and brush habitat adjacent to PAs 4A and 4B. A new levee would be constructed at least 30 feet from the outer edge of the loma on the south side of PA 4B to protect that landform and its brush habitat. To prevent possible harm to a jaguarundi or ocelot moving through the area during construction, USACE would require that construction activities for levee rehabilitation or construction be conducted during daylight hours only. This requirement would be incorporated into project construction and maintenance contract plans. With implementation of this conservation recommendation, it has been determined that the TSP may affect but is not likely to adversely affect the jaguarundi and ocelot.

West Indian Manatee. Although sightings of West Indian manatees are rare along the Texas coast, they do occur. To avoid potential impacts to the West Indian manatee, USACE would incorporate the following education measures into construction and maintenance contracts for the TSP:

- Contractors and staff would be advised that manatees may be found in the Brazos Island Harbor Entrance Channel, the Brownsville Ship Channel, and adjacent areas of the Lower Laguna Madre and that boat operators should be cautious to avoid collisions with manatees.
- If a manatee is sighted, the Contractor would be instructed to contact the Texas Marine Mammal Stranding Network at 361-947-4313 or the group's hotline at (800) 962-6625.
- Training would be provided on avoiding potential impacts to the manatee for all personnel involved in construction and maintenance of in-water dredging activities.
- The training materials would include a poster to assist in identifying the mammal.
- The training materials would instruct personnel not to feed or water the animal.
- The training materials would include instructions to call the Corpus Christi Office of the Texas Coastal Ecological Services Field Office (TCESFO-CC) in the event a manatee is sighted in or near the project area.

We appreciate the time and expertise your staff have provided to assist our efforts to avoid significant impacts to federally-listed threatened and endangered species by the Brazos Island Harbor TSP. If you or your staff have any further questions, please contact Ms. Janelle Stokes at 409/766-3039 or janelle.s.stokes@usace.army.mil.

Sincerely,

Carolyn Murphy
Chief, Environmental Section

CF: E. Dawn Whitehead
Texas Coastal Ecological Services Field Office
c/o TAMU-CC, Unit 5837
6300 Ocean Drive
Corpus Christi, Texas 78412-5837