APPENDIX P
DRAFT BIOLOGICAL ASSESSMENT

BIOLOGICAL ASSESSMENT FOR THE PROPOSED BLUEWATER SPM PROJECT IN ARANSAS, NUECES, AND SAN PATRICIO COUNTIES, TEXAS

On behalf of

U.S. Maritime Administration (MARAD) / United States Coast Guard (USCG)
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1. INTRODUCTION AND REGULATORY CONTEXT

SWCA Environmental Consultants (SWCA) prepared this Biological Assessment (BA) on behalf of Lloyd Engineering (Lloyd) for the Bluewater Texas Terminals, LLC (BWTT; also referred to as Applicant). BWWT is proposing to construct, own, and operate a deepwater port (DWP), associated pipeline infrastructure, and a booster station collectively known as the Bluewater SPM Project (Project), to provide a safe and environmentally responsible solution for the export of abundant domestic crude oil supplies from major shale basins. The Applicant is filing a Deepwater Port License (DWPL) application to obtain a license to construct, own, and operate the Project pursuant to the Deepwater Port Act of 1974, as amended, and in accordance with the United States Coast Guard (USCG) and the Maritime Administration's (MARAD's) implementing regulations.

The purpose of the proposed Project is to provide a safe and environmentally responsible solution for the export of abundant domestic crude oil supplies from major shale basins. The proposed Project would help fulfill market demands and support economic growth in the United States. Projections from the U.S. Energy Information Administration (EIA) *2019 Annual Energy Outlook* indicate that total crude oil production in the United States reached an average of 10.8 million barrels per day (MMbpd) in 2018. By 2023, crude production is expected to increase by 3.2 MMbpd in the United States.

The Applicant is proposing to construct and operate the Project to allow for the loading of Very Large Crude Carriers (VLCCs) at the proposed DWP via single point mooring (SPM) buoy systems. The proposed Project design would allow for up to two VLCCs, or other crude oil carriers, to moor at two SPM buoy systems. The proposed Project is capable of loading VLCCs and other crude oil carriers at rates of up to approximately 80,000 barrels per hour (bph) and throughput capacities of approximately 16 VLCCs per month.

1.1. Project Location and Description

The proposed Project involves the design, engineering, and construction of a DWP; 56.48 miles of pipeline infrastructure; and a booster station. For the purposes of this DWPL application, the proposed Project is described in three distinguishable segments by locality - offshore, inshore, and onshore.

Offshore components associated with the proposed Project are defined as those components located seaward of the mean high tide (MHT) line located at the interface of San Jose Island and the Gulf of Mexico (GOM). The offshore Project components include approximately 27.13 miles of two new 30-inch-diameter crude oil pipelines extending to two SPM buoy systems (i.e., SPM Buoy System 1 and SPM Buoy System 2).

The proposed offshore pipelines would extend from the MHT line located at the interface of San Jose Island and the GOM to the proposed SPM buoy systems. The offshore pipelines would intersect portions of Texas State submerged lease tracts 848, 849, 850, 851, 845, 721, 839, 838, 837, 693, 694, and 695. The pipelines would also intersect Outer Continental Shelf (OCS) Mustang Island Area TX3 Bureau of Ocean Energy Management (BOEM) blocks 695, 696, 697, 698, and 699.

The proposed DWP consists of two SPM buoy systems which would be installed offshore, within the GOM and outside of United States' territorial seas, within BOEM block numbers 698 and 699. The proposed SPM Buoy System 1 is positioned at latitude 27.889361 and longitude -96.651156 within BOEM block number 698 approximately 15.0 nautical miles (17.26 statute miles) off the coast of San Jose Island in San Patricio County, Texas. The proposed SPM Buoy System 2 is positioned at latitude 27.902577 and longitude -96.628119, within BOEM block number 699, approximately 1.7 miles northeast of SPM Buoy System 1.

The proposed 27.13 miles of offshore pipeline infrastructure includes approximately 1.68 miles of two 30-inch-diameter pipelines connecting SPM Buoy Systems 1 and 2.

Inshore components associated with the proposed Project are defined as those components located between the western Redfish Bay MHT line and the MHT line located at the interface of San Jose Island and the GOM. Inshore Project components include approximately 7.15 miles of two new 30-inch-diameter crude oil pipelines and an approximately 19-acre booster station located on Harbor Island.

Onshore components associated with the proposed Project are defined as those components landward of the western Redfish Bay MHT line, located in San Patricio and Aransas Counties, Texas. Onshore Project components include approximately 22.20 miles of two new 30-inch-diameter crude oil pipelines extending from the landward side of the MHT line of Redfish Bay to the existing Midway Terminal located south of Taft in San Patricio County, Texas.

Refer to **Figure 1** for a vicinity map depicting the location of the proposed Project and the locations of the onshore, inshore, and offshore Project components. Refer to **Figure 2** for an aerial view of the proposed Project location.

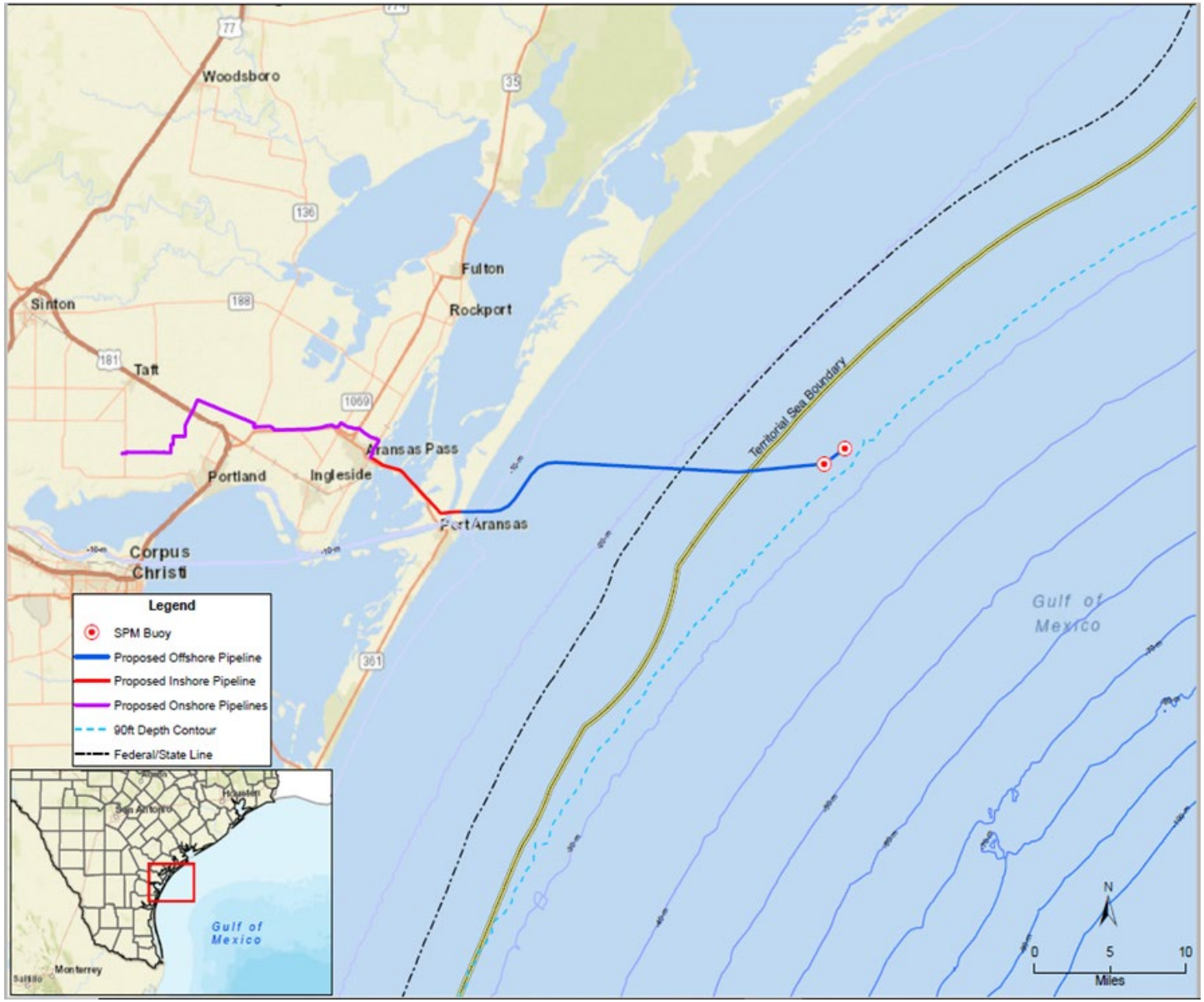

Figure 1. Location of the Bluewater SPM Project in Aransas, Nueces, and San Patricio, Counties, Texas.

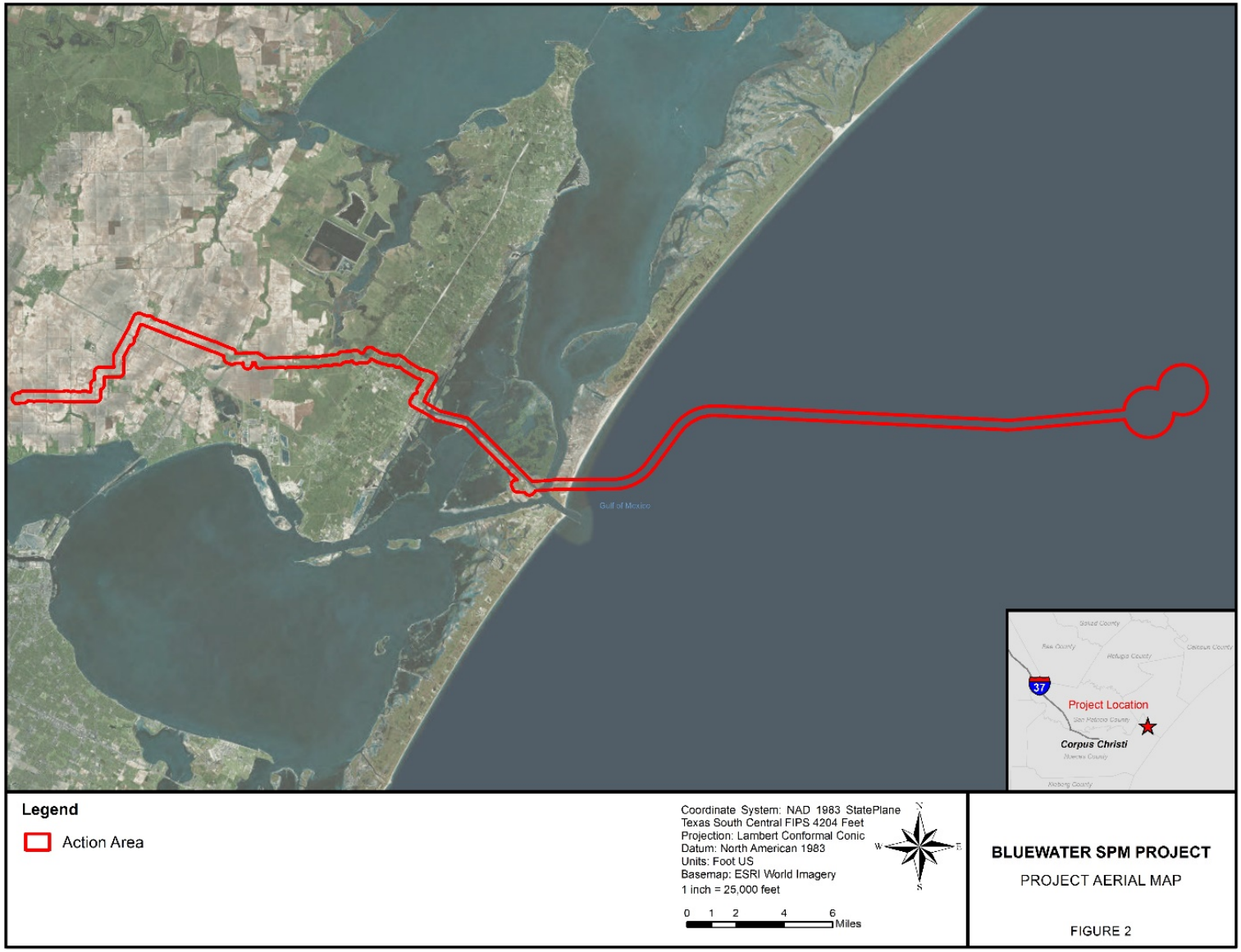

Figure 2. Bluewater SPM Project in Aransas, Nueces, and San Patricio, Counties, Texas.

1.2. Regulatory Background

The purpose of this BA is to support a federal interagency consultation between the MARAD/USCG, the U.S. Fish and Wildlife Service (USFWS), and the National Marine Fisheries Service (NMFS) in accordance with Section 7(a)(2) of the Endangered Species Act (ESA). The BA evaluates the effects of the actions, as defined in 50 Code of Federal Regulations (CFR) 402.02, taken by the MARAD/USCG to authorize construction and operation of a DWP (i.e., the effects of the Proposed Actions) on species listed as threatened or endangered under the ESA or species proposed for such listing (together, the "listed species") and on areas designated as critical habitat under the ESA or areas proposed for such designation (together, the "designated critical habitats"). The BA provides the MARAD/USCG determination of effects for listed species and designated critical habitats.

Section 7(a) of the ESA addresses federal agency actions and consultations. This section of the ESA states that:

> *…Each Federal agency shall, in consultation with and with the assistance of the Secretary [of the Interior], insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical…In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available.*

Federal agencies have the responsibility and obligation to determine whether their activities "may affect" a listed species or designated critical habitats. If a federal action agency determines that an activity will have "no effect" on listed species or critical habitats, then no coordination with or concurrence from the USFWS or the NMFS is necessary. However, if the action "may affect" a listed species, even if the effect is entirely beneficial, then consultation with the USFWS and NMFS is required.

During consultation, the USFWS and NMFS determine if the activity "may affect, but is not likely to adversely affect" listed species or critical habitats or if the activity "may affect and is likely to adversely affect" listed species or critical habitats. If adverse effects are not likely, then consultation may be completed informally with written concurrence from the USFWS and NMFS. If adverse effects are likely, then a formal consultation between the federal action agency and the USFWS and the NMFS is necessary. This BA provides the federal action agency's (in this case, the MARAD/USCG's) assessment of likely effects to listed species and designated critical habitats.

During formal consultation, the USFWS and NMFS prepare a Biological Opinion wherein the agencies either determine that the effects of the Proposed Action will not jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat, or the USFWS and NMFS propose Reasonable and Prudent Alternatives to the Proposed Action that avoid these circumstances. The USFWS and NMFS also describe the amount and extent of take (as defined by Section 3 of the ESA) and related implementing regulations that are likely to occur, identifies Reasonable and Prudent Measures (RPMs) to minimize take, and includes an Incidental Take Statement (ITS) with terms and conditions needed to implement the RPMs. The federal action agency then implements the terms and conditions of the Biological Opinion.

The USFWS and NMFS are responsible for administering the ESA and have published guidance for implementing the ESA Section 7 consultation process in their handbook entitled *Endangered Species*

Consultation Handbook: Procedures for Conducting Consultation and Conference Activities under Section 7 of the Endangered Species Act (Consultation Handbook) (USFWS and NMFS 1998). The Consultation Handbook identifies the following potential outcomes for evaluating the effects of a proposed federal action, which include the effects of any interrelated or interdependent actions:

- **No Effect** – The appropriate conclusion when the action agency determines its proposed action will not affect a listed species or designated critical habitat.
- **May Affect** – The appropriate conclusion when a Proposed Action may pose any effects on listed species or designated critical habitat. When the federal agency proposing the action determines this situation exists, then they must either initiate formal consultation or seek written concurrence from the USFWS and NMFS that the action "is not likely to adversely affect" listed species.
    - **Is Not Likely to Adversely Affect** – The appropriate conclusion when effects on listed species (or designated critical habitat) are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on the best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.
    - **Is Likely to Adversely Affect** – The appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species (or designated critical habitat) may occur as a direct or indirect result of the Proposed Action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" determination should be made. An "is likely to adversely affect" determination requires the initiation of formal Section 7 consultation.

When evaluating whether a proposed action will adversely affect listed species or critical habitats, the USFWS considers the effects of the proposed action in concert with the effects of any interrelated or interdependent actions. Interrelated actions are those that have no independent utility apart from the proposed action and interdependent actions are those that are part of a larger action and depend on the larger action for their justification (50 CFR 402.02).

During consultation, the action agency (here, MARAD/USCG) determines if the proposed federal action "may affect" but is "not likely to adversely affect" listed species or designated critical habitats or if the activity "may affect" and is "likely to adversely affect" listed species or designated critical habitats. If the action agency determines adverse effects are not likely, then consultation may be completed informally with written concurrence from the USFWS and the NMFS. If the action agency determines adverse effects are likely or USFWS and NMFS do not concur in the action agency's determination that the federal action is not likely to adversely affect listed species or result in the destruction or adverse modification of designated critical habitats, then a formal consultation between the action agency and the USFWS and NMFS may be warranted. A BA (or similar document) provides the action agency's assessment of likely effects to listed species and designated critical habitats associated with its proposed federal action.

If formal consultation is necessary, the USFWS and NMFS prepare a Biological Opinion wherein the USFWS and NMFS either determine that the effects of the proposed federal action will not jeopardize the

continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat, or the USFWS and NMFS determine jeopardy of listed species or destruction or adverse modification of designated critical habitat will occur and proposes Reasonable and Prudent Alternatives to the proposed federal action that avoid these outcomes. The USFWS and NMFS also describe the amount and extent of take that is likely to occur, identifies Reasonable and Prudent Measures (RPMs) to minimize take, and includes an ITS with terms and conditions needed to implement the RPMs. The ITS authorizes take of listed species that otherwise would be prohibited under Section 9 of the ESA. The action agency then implements the terms and conditions of the Biological Opinion and ITS.

The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 United States Code [USC] 1532 [19]). Harm is defined by USFWS regulations as an "act which actually kills or injures wildlife and may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding or sheltering" (50 CFR 17.3). Harass in the definition of "take" is also defined by regulation to mean "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering" (50 CFR 17.3).

As required by Section 7(c) of the ESA, this BA includes the information required to initiate formal interagency consultation with the USFWS and NMFS, should it be necessary, including

- a description of the action being considered;
- a description of the specific area that may be affected by the action;
- a description of any listed species or designated critical habitat that may be affected by the action;
- relevant reports, including any environmental impact statement, environmental assessment, biological assessment, or other analyses prepared on the proposal; and
- any other relevant studies or other information available on the action, the affected listed species, or designated critical habitat.

2. DESCRIPTION OF THE PROPOSED ACTION AND ACTION AREA

2.1. Proposed Action

The Proposed Action considered in this BA includes the construction and operation of the proposed Project as described within this DWPL application. The Proposed Action requires the installation and operation of offshore, inshore, and onshore Project components to allow for the loading of vessels at the proposed DWP. Refer to **Figures 1 and 2** for the locations of the onshore, inshore, and offshore components associated with the proposed Project.

Offshore components associated with the proposed Project includes approximately 27.13 miles of two new paralleling 30-inch diameter offshore pipelines and the DWP. The proposed DWP consists of two SPM buoy systems (SPM Buoy Systems 1 and 2). The proposed SPM buoy systems would be connected via approximately 1.68 miles of two 30-inch-diameter submerged pipelines. The proposed SPM buoy systems serve as the primary device for the loading vessels berthed at the DWP. The SPM buoy systems would each consist of a pipeline end manifold (PLEM), catenary anchor leg mooring (CALM) system, mooring hawsers, sub-marine hoses, and floating hoses for the transfer of crude oil from the SPM buoy systems to moored vessels.

Inshore components associated with the proposed Project includes the construction and operation of approximately 7.15 miles of two new 30-inch-diameter pipelines and a booster station. The proposed inshore Project components connect the onshore to offshore Project components for the transport of crude oil and operation of the proposed DWP. The approximately 7.15 miles of the proposed inshore pipeline infrastructure extends from the western Redfish Bay MHT line and the MHT line located at the interface of San Jose Island and the GOM. The proposed inshore pipeline infrastructure crosses three navigable waterways including the Gulf Intracoastal Waterway (GIWW), the Aransas Pass Channel, and the Lydia Ann Channel (LAC). The inshore pipelines would intersect portions Texas State submerged lease tract 306 near the LAC. The alignment of the inshore pipeline generally parallels Highway 361 from Aransas Pass to Harbor Island. The proposed booster station would occupy approximately 19 acres on Harbor Island in Nueces County, Texas, and consist of the necessary operating and pumping infrastructure to support the transport of crude oil and operations of the DWP.

Onshore components associated with the proposed Project include the construction and operation of an approximately 22.20 miles of two new paralleling 30-inch-diameter pipelines located within San Patricio and Aransas Counties, Texas. The proposed onshore pipelines extend from the western Redfish Bay MHT line to the location of the Midway Terminal located south of Taft in San Patricio County, Texas.

All the above described components are discussed within the DWPL application for overall Project clarity. The Applicant is requesting authorization from MARAD/USCG under this application for offshore Project components for which it has jurisdiction (i.e., Project components extending seaward of the MHT line located at the interface of San Jose Island and the GOM). Additionally, the Applicant has also prepared and submitted a separate permit application to the U.S. Army Corps of Engineers (USACE) for the authorization under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act (RHA) for the proposed Project components, as necessary, for full authorization for the construction and operation of the proposed Project. Refer to **Figures 1 and 2**, for the locations of the offshore, inshore, and onshore Project components.

2.1.1. Applicant-proposed Conservation Measures

Conservation measures are most frequently used to reduce or minimize impacts that are unavoidable, such as applying buffer zones around proposed work areas. The following specific mitigation measures will be incorporated into this project to reduce potential impacts to federally listed or federal candidate species.

1. The pipeline and associated facilities will be constructed using currently acceptable and preferable construction industry standards. The use of Horizontal Direction Drill (HDD) and Direct Bore technologies to construct pipelines under sensitive environmental areas including wetlands, vegetated shallows, and sensitive beach and sand dune areas, will reduce direct impacts to these resources.
2. Best Management Practices (BMPs) will be utilized prior to or immediately following commencement of clearing activities and will be designed and maintained to avoid/minimize soil erosion and sedimentation into adjacent areas, including wetlands, waterbodies, and tidal flats, throughout construction and until permanent vegetation has become established. BMPs for erosion and sediment control include silt fencing, matting, and hay bales.
3. Native seed mixes will be used to restore vegetation.
4. Final grading in wetlands, waterbodies, and mud flats will be restored to near pre-construction conditions/contours to ensure the topography matches pre-construction and adjacent contours.
5. Pile driver equipment will be necessary to construct the Proposed Action but will be restricted to only 16 weeks of operation, thereby reducing the amount of underwater sound impacts to federally listed or federal candidate species.
6. Chemicals, liquids, fuels, and other potentially hazardous materials will be properly stored on fuel barges, water barges, work boats, construction debris barges, and tugboats in the vicinity of the proposed Project Area.
7. The Applicant will have an approved oil spill action plan, as well as an emergency response contractor in place during the Proposed Action.
8. Although some impacts to the shallow water areas in the eastern portion of the inshore Project Area will be necessary, work barges and work boats will refrain from running into shallow water areas, to the extent practicable. This will reduce vessel grounding and resulting negative impacts to sensitive areas dominated by shoal grass (*Halodule wrightii*) and turtle grass (*Thalassia testudium*), which are utilized by marine turtles in the area. Anchoring on or using draglines in these vegetated shallows will not be allowed.
9. Qualified biologists will conduct biological monitoring for the federally listed manta ray, bird, whale, and sea turtle species known to occur in the Action Area or likely to inhabit the Action Area.
10. Bluewater SPM employees and contractors will receive training for the federally listed species known to occur in the Action Area or likely to inhabit the Action area.
11. Sea turtle conservation measures will be implemented during potential cold-stunning events during winter months (see Section 5.4.3).

12. Species-specific avoidance and minimization procedures will be observed for the various species discovered to inhabit the Project area.

2.2. Action Areas

The Consultation Handbook defines the "Action Area" for an interagency consultation as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR 402.02) (USFWS and NMFS 1998). The Proposed Action is the construction and operation of a DWP and associated pipelines within the Project Area. The USFWS interprets the effects of proposed federal actions to also include the direct and indirect effects of any interrelated or interdependent actions. In this case, the Action Area would include not only the 56.48 mile direct impact Project Area, but would also include the adjacent shallow water areas, estuarine emergent wetlands, and beach areas located on San Jose Island, Harbor Island, and the mainland adjacent to the Project Area, as well as deeper portions of the channels located throughout the inshore portion of the Project Area.

2.2.1. Location and Extent

This BA evaluates the effects, individually and cumulatively, of the construction and operation of the DWP that would occur within the Action Area. There may be continued indirect sedimentation effects caused by construction vessel propeller wash occurring in the Project Area, as well as the indirect and/or cumulative impacts to estuarine wetlands and vegetated shallows located in the eastern portion of the Action Area. Most of these effects will be limited to the Project Area proper; however, some effects may be felt beyond the limits of the Project Area. For the purposes of this BA, potential indirect or off-site effects are assumed to extend no more than 1,000 feet (0.2 mile) on either side of the proposed pipeline right-of-way (ROW).

Therefore, the Action Area for the Proposed Action includes: all terrestrial lands and wetlands of the onshore portion of the Project; the islands, wetlands, beaches, vegetated shallows and open water areas of the inshore portion of the Project Area; the barrier island of San Jose Island; and offshore marine waters at the eastern end of the Project Area (**Figure 3**). The Action Area covers an approximate 56.48-mile-long by 2,000-feet-wide area, as well as a larger buffer around the DWP. The Action Area occurs entirely within Aransas, Nueces, and San Patricio Counties, Texas.

2.2.2. Environmental Setting

The environmental setting within the Action Area is briefly discussed below to provide context for the effects analysis. Specific information on the environmental character of the Action Area is based upon site inspections completed by SWCA biologists from January through March 2019.

Ecoregion

The Action Area is completely contained within the Western Gulf Coastal Plains Ecoregion – Mid-coast Barrier Islands and Coastal Marshes Sub-region (Griffith et al. 2007). This Sub-region extends from Galveston Island in the north to Corpus Christi Bay in the south and is a transitional zone between the humid coastal areas further up the coast and the more arid areas further down the coast.

The Sub-region is underlain primarily by Holocene deposits with saline, brackish, and freshwater marshes; barrier islands with washover fans; and tidal flat sands and clays. The most common species in the more saline estuarine marshes include saltmarsh cordgrass (*Spartina alterniflora*), marsh hay cordgrass (*S. patens*), and coastal saltgrass (*Distichlys spicata*). This Sub-region is dominated by barrier islands; salt marshes and wind-tidal flats are generally confined to the back side ("bay side") of the islands. Marsh hay cordgrass becomes less common, whereas black mangrove (*Avicennia germinans*) becomes more common,

as one travels south through this Sub-region. Trees are sparse within this Sub-region, except on some of the larger barrier islands (Griffith et al. 2007).

The Sub-region supports important nursery areas for shrimp, crabs, oysters, and a wide variety of game fish. Corpus Christi Bay, found immediately south of the Project Area, marks a boundary between two distinct ecosystems (Griffith et al. 2007). Copano Bay and Mesquite Bay (to the north) are marked by low to moderate salinity and are utilized by a wide variety of birds, whereas Laguna Madre (to the south) is hypersaline and is dominated by huge expanses of seagrass beds (Griffith et al. 2007) (**Figure 3**).

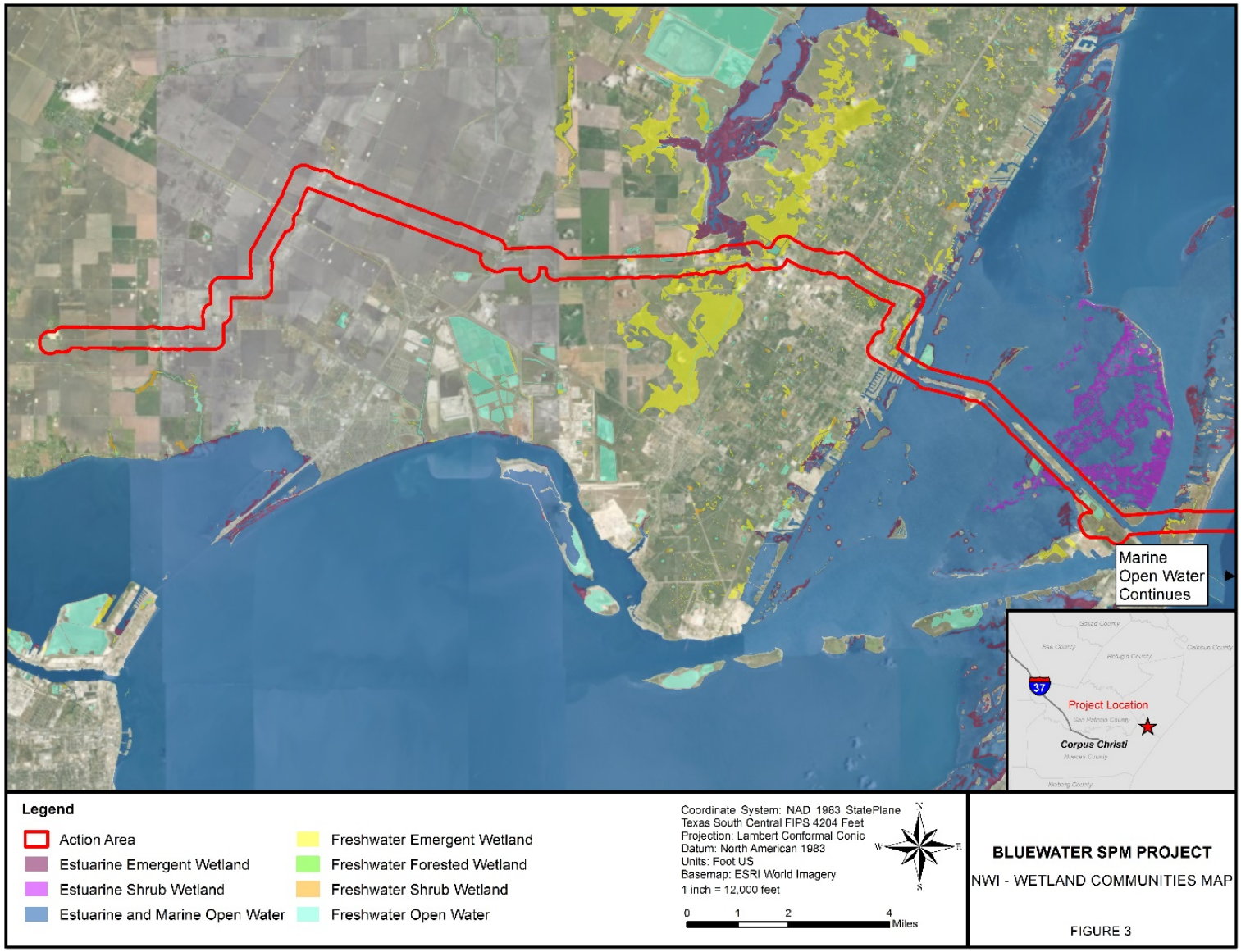

Figure 3. Aquatic Ecological Communities found in the Bluewater SPM Project Action Area.

Climate

The climate of the Action Area is characterized by average precipitation of 34 to 46 inches annually, increasing from southwest to northeast. This precipitation is mostly a result of frontal storms in spring and early summer; high-intensity, convective thunderstorms occurring in summer; and tropical storms and depressions during the late summer and early fall. Mean temperatures range from 47-62 degrees Fahrenheit (°F) in January and from 75-90°F in July. Seasonal snowfall is negligible and the mean annual frost-free days within the Sub-region range from 290-320 days (Griffith et al. 2007).

Geology and Soils

The Quaternary-age portion of the coastal plain consists of a series of terraces deposited during interglacial periods due to sea level changes, formed by alluvial and deltaic processes in an approximate 100 mi belt along the coast (Hosman 1996; U.S. Geological Survey [USGS] 2002; Davis 2013). The youngest of these terraces is the Beaumont formation along the eastern margin of the state, found along the mainland coast in the Project Area, At its surface, this area is composed of late Pleistocene-aged clay and mud of the Beaumont formation, underlain by the Pliocene- and Miocene-aged Fleming formation (USGS 2015; Hosman 1996). In south Texas, the Fleming formation is composed predominantly of clay with sand content increasing eastwardly until it is mostly sand along the coast. Here, calcareous strata contain thin layers of chalky limestone and crossbedded sands. Only 200 feet thick in the outcrop, the Fleming Formation actually extends thousands of feet below the surface (Hosman 1996).

From the end of the Pleistocene epoch, sea level along the Gulf Coast has varied drastically in accordance with contemporary degrees of glaciation (Morton 1994; Davis 2013; Freese and Nichols 2016). The most recent transgression of the shoreline began approximately 17,000 years ago due to glacial melting, causing a sea level rise of approximately 300 feet. Many of the barrier islands that dot the Texas Gulf Coast began to form on the present continental shelf as sea level moved slowly landward around 5,000-6,000 years ago, formed by a combination of alluvial deposits and reworking of relic deposits on the shelf. Storm systems, including tropical cyclones, and daily tides play a significant role in reshaping of the barrier islands in modern times (Morton 1994).

The main islands of the Project Area are part of the Harbor Island flood-tidal delta complex, which is a large, triangular, shallow depositional environment which has been bisected and bordered by dredged channels and dredged-material disposal sites (USGS 2002; Pulich 2007). The islands are comprised of Quaternary alluvium deposits along the lagoon-side of barrier islands and barrier island deposits along the sea-side of San Jose Island (USGS 2002). Alluvium deposits primarily consist of clay, silt, sand, and gravel, with organic material abundant in localized areas. Barrier island deposits are comprised of well-sorted, fine-grained sand, abundant with shells and shell fragments. The eastern margin of San Jose Island is comprised of foredunes, which effectively shield the fragile ecosystem of the interior grasslands from storm tide inundation and westward dune advancement. These dunes will be avoided during construction, as well as the adjacent beach, via horizontal directional drilling (HDD). Stedman and Harbor Islands have been significantly impacted by fill and spoil material from dredging activities. Material properties are highly variable, containing mixtures of mud, silt, sand, and shell materials.

The Project mostly follows Aransas Pass, crossing segments of Redfish Bay and the GIWW through Aransas Channel before crossing LAC towards San Jose Island. The area contains historically dredged channels and dredged-material fill disposal sites to allow for ship navigation (Oppenheimer 1963; USGS 2002; Pulich 2007). Redfish Bay is one of a series of bays and tidal lagoons, formed as a consequence of the formation of the barrier island chain down the Texas Gulf Coast (Collier and Hedgepeth 1950; Morton 1994; Davis 2013). The bay is a designated Texas Parks and Wildlife Department (TPWD) State Scientific

Area, created to protect sensitive marine habitats in the bay, particularly shallow seagrass flats, which have special protections in the bay (TPWD 2013).

Past San Jose Island, the Project extends approximately 25.5 miles along the seafloor of the GOM until terminating at the proposed DWP, located approximately 18 miles from the shoreline. From the east coast of Texas, the continental shelf ranges in width from approximately 60 miles at the southern tip of the state to 125 miles north of the GOM. The Texas shelf is marked by subtle relict features, such as stream channels and shorelines, formed when sea levels were lower due to glaciation (Freese and Nichols 2016). Structurally, this Northwestern Gulf Shelf has also been influenced by the presence of vast amounts of salt in the sedimentary sequence, which causes a high degree of tectonic mobility in an area that is otherwise relatively stable. Formations of the Neogene period have been arched by deep-seated salt pillows while sedimentary beds from the same period have been pierced by narrow columns of salt (Garrison and Martin 1973). These evaporite (salt-rich) deposits commonly form domes and other diapiric formations as the buoyant, evaporitic material upwells through the overlying sediment (Davidson and Mace 2006). It is generally accepted that these salts have their origin in the Jurassic period (ca. 200-145 million years ago). Although the Rio Grande Embayment, a significant inland depression extending through the majority of south Texas, is underlain by several salt domes, these features are located further inland and away from the proposed Project Area. The lateral migration of evaporitic material has also displaced and replaced clastic deposits via faulting, slumping, and local thickening or thinning of beds. In the strike-fault systems that pervade the northern Gulf Coastal Plain, faulting is normal and down-to-basin with the fault plane being 35–70°, flattening basinward with depth (Garrison and Martin 1973). Faults along the Texas Gulf Coastal Plain are known as growth faults—curved faults that are syndepositional and grow with depth of burial—and are commonly caused by the buoyant rise of materials such as salt or shale (Chowdhury and Turco 2006).

The GOM is host to various depositional environments made up of sediments primarily transported via fluvial processes from the mainland. The terrigenous sediment supply along the coastal bend of Texas is the second largest such supply (after the Mississippi-borne sediment supply) in the GOM due to the numerous rivers crossing the region's coastal plain. After initial deposition, sediments migrate via wave, tidal, current, and gravitational forces, with some eventually arriving in the deep abyssal environment. Presently, Holocene sediments, especially those deposited since the recent stabilization of sea level, dominate coastal environments, with small amounts of locally produced biogenic skeletal material contributing to a limited extent (Davis 2017). Due to the frequently dense human populations in these environments, these sediments are typically polluted to some degree. Sediments arrive at the continental shelf via three significant modern drainage systems: the Mississippi River, the Rio Grande delta complex, and the Colorado-Brazos delta complex. These drainages deposit sediments in a rather thin blanket across the inner portions of the shelf, covering the fluvial-deltaic deposits laid down during the sea level lowstands of the Quaternary period (Davis 2017).

Soils within the Project Area formed in sand-dominated sediments deposited by the aeolian and alluvial processes at work since the stabilization of sea level during the late Holocene. Data from the Natural Resources Conservation Service (NRCS) was utilized to create a table and figure illustrating all soil units crossed by the Project Area (**Table 1; Figure 4**). Soils in the coastal prairie surrounding Aransas Pass are primarily composed of vertisols with a higher presence of the mineral smectite in the clay fraction (NRCS 2019a). Typical soil series in the area consist of Mustang fine sands and Dianola soils further inland; Ijam clay loam, Mustang fine sand, and Tidal flats along Stedman Island and Harbor Island; and Psamments and Beaches along San Jose Island (NRCS 2019b, 2019c).

Table 1. Soils Intersected by the Project Area

Soil Map Units	Primary soil components	Texture	Location	Description	Minor soil components
Aransas clay, 0 to 1 percent slopes, slightly saline, moderately sodic, frequently flooded (As)	Aransas (90%)	Clay	Coastal Plains	The Aransas series consists of very deep, poorly drained, very slowly permeable soils that formed in clayey alluvial sediments of Holocene age. Slopes range from 0 to 1 percent.	Rydolph (3%), Placedo (3%), Barrada (2%), Swan (2%)
Banquete clay, 0 to 1 percent slopes (Ec)	Banquete (85%)	Clay	Coastal Plains	The Banquete series consists of very deep, moderately well drained, very slowly permeable soils that formed in clayey fluviomarine sediments. Slopes range from 0 to 1 percent.	Victoria (5%), Cranell (5%), Edroy (5%)
Calallen sandy clay loam, 0 to 1 percent slopes (Os)	Calallen (85%)	Sandy Clay	Coastal Plains	The Calallen series consists of very deep, well drained, moderately permeable soils that formed in loamy fluviomarine sediments. Slopes range from 0 to 1 percent.	Cranell (10%), Edroy (5%)
Dietrich loamy fine sand, 0 to 1 percent slopes, very rarely flooded (Dt)	Dietrich (90%)	Loamy Sand	Coastal Plains	The Dietrich series consists of very deep, poorly drained, very slowly permeable soils that formed in loamy sediments of late Pleistocene age. Slopes range from 0 to 2 percent.	Mustang (5%), Dianola (3%), Narta (2%)
Galveston-Mustang complex, 0 to 3 percent slopes, occasionally flooded, frequently ponded (GM)	Galveston (50%), Mustang (30%)	Fine Sand	Barrier Islands	The Galveston series consists of very deep, somewhat excessively drained, very rapidly permeable soils that formed in sandy eolian deposits derived from igneous, metamorphic and sedimentary rock. Slopes range from 0 to 12 percent. The Mustang series consists of very deep, poorly drained, very slowly permeable soils that formed in sandy eolian and storm wash over sediments. Slopes range from 0 to 1 percent.	Barrada (5%), Dianola (5%), Dietrich (5%), Tatton (5%)
Narta loam, 0 to 1 percent slopes, rarely flooded (Na)	Narta (90%)	Fine Sand	Coastal Plains	The Narta series consists of very deep, poorly drained, very slowly permeable soils that formed in loamy fluviomarine sediments derived from the Beaumont Formation of Late Pleistocene age. Slopes range from 0 to 1 percent.	Victine (5%), Aransas (4%), Dietrich (1%)
Orelia fine sandy loam, 0 to 1 percent slopes (Or)	Orelia (90%)	Fine Sand	Coastal Plains	The Orelia series consists of very deep, well drained, slowly permeable soils that formed in loamy fluviomarine deposits of Pleistocene age. Slopes range from 0 to 3 percent.	Wyick (5%), Greta (3%), Edroy (2%)
Papalote fine sandy loam, 0 to 1 percent slopes (PaA)	Papalote (85%)	Sandy Loam	Coastal Plains	The Papalote series consists of very deep, moderately well drained soils that formed in loamy and clayey alluvium. Slopes range from 0 to 5 percent.	Unnamed (10%), Edroy (5%)
Raymondville clay loam, 0 to 1 percent slopes (RaA)	Raymondville (90%)	Clay Loam	Coastal Plains	The Raymondville series consists of deep, moderately well drained, slowly permeable soils that formed in calcareous moderately fine and fine textured sediments. Slopes range from 0 to 5 percent.	Edroy (5%), Unnamed (5%)

Soil Map Units	Primary soil components	Texture	Location	Description	Minor soil components
Raymondville clay loam, 1 to 3 percent slopes (RaB	Raymondville (90%)	Clay Loam	Coastal Plains	Raymondville —See Description Above	Unnamed (10%)
Victoria clay 0 to 1 percent slopes (VcA)	Victoria (97%)	Clay	Coastal Plains	The Victoria series consists of very deep, well drained, very slowly permeable soils that formed in clayey deltaic and marine sediments. Slopes range from 0 to 3 percent.	Cranell (2%), Edroy (1%)
Victoria clay, depressional (Vd)	Victoria (90%)	Clay	Coastal Plains	Victoria series – See Description Above	Edroy (5%), Unnamed (5%)
Willacy fine sandy loam, 0 to 1 percent slopes (WfA)	Willacy (90%)	Fine Sandy	Coastal Plains	The Willacy series consists of deep, well drained, moderately permeable soils that formed in alkaline loamy sediments. Slopes range from 0 to 5 percent.	Unnamed (10%)
Ijam clay loam (Ma), rarely flooded	Ijam (85%)	Clay loam	Flats	Slopes are 0 to 1 percent. This component is on flats on dredge spoil banks on lagoons. The parent material consists of sandy dredge spoils and/or loamy dredge spoils. The natural drainage class is poorly drained. This soil is rarely flooded. It is not ponded.	None
Psamments (Ps), rarely flooded	Psamments (80%)	Fine sand	Foredunes, dune fields	Slopes are 0 to 3 percent. This component is on foredunes on barrier islands. The parent material consists of sandy eolian deposits. The natural drainage class is well drained. This soil is rarely flooded. It is not ponded.	Tatton (5%), Mustang (5%), Dianola (5%)
Mustang fine sand (Mu), 0-1% slopes, occasionally flooded, frequently ponded	Mustang (85%)	Fine sand	Barrier flats	This component is on shallow depressions on barrier flats on barrier islands. The parent material consists of storm washover and sandy eolian deposits derived from igneous, metamorphic and sedimentary rock. The natural drainage class is poorly drained. This soil is occasionally flooded. It is frequently ponded.	Malaquite (4%), Padre (3%), Arrada (2%), Daggerhill (2%), Barrada (2%), Tatton (2%)
Dianola soils (Ds)	Dianola (85%)	Loamy fine sand	Strand plains	Slopes are 0 to 1 percent. This component is on strand plains on low coastal plains. The parent material consists of loamy fluviomarine deposits of Quaternary age. The natural drainage class is poorly drained. This soil is frequently flooded. It is not ponded.	Dietrich (3%), Mustang (3%), Aransas (3%), Barrada (3%), Tatton (3%)

Source: NRCS 2019a

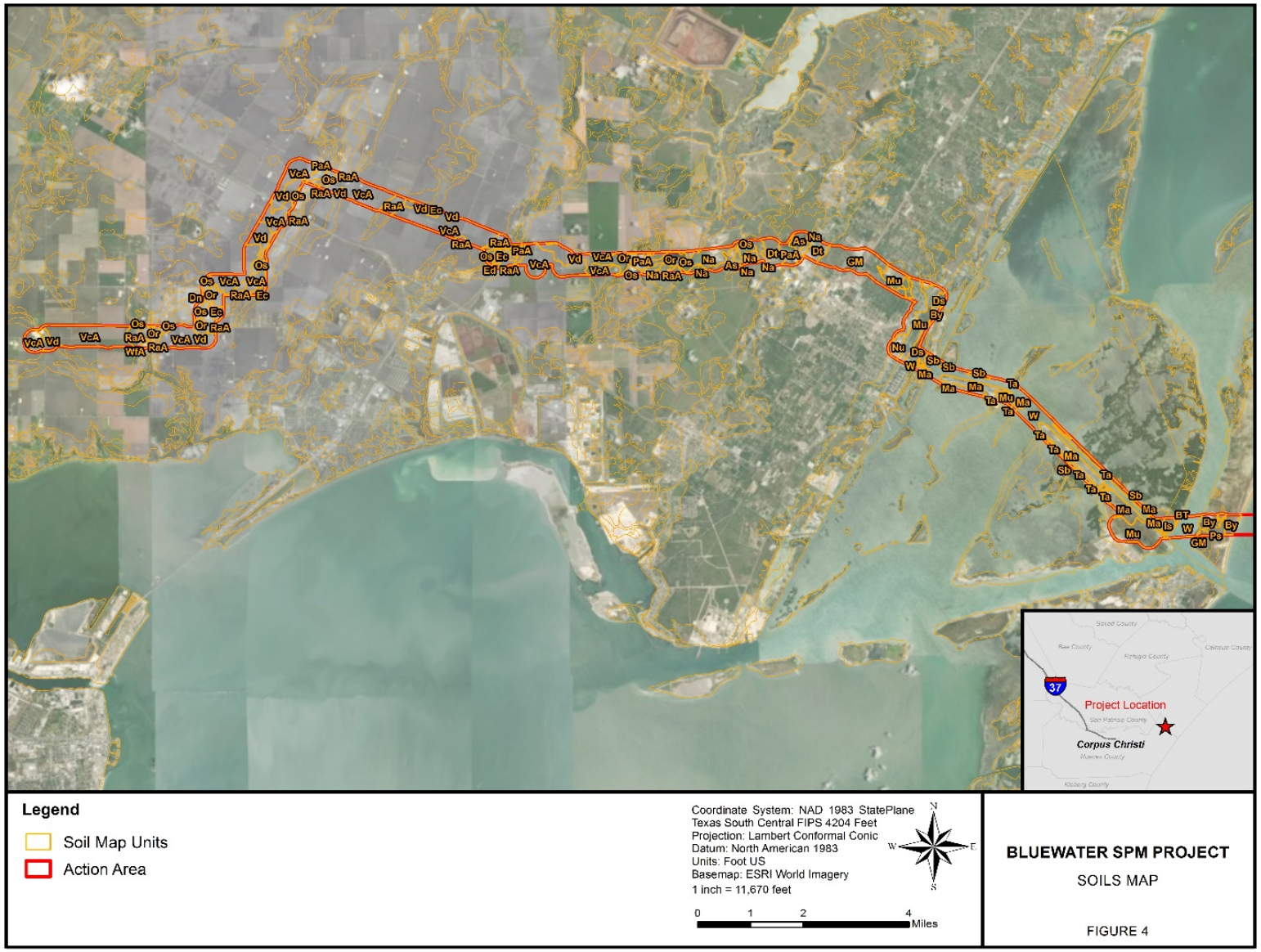

Figure 4. Soil series map of the Bluewater SPM project alignment (NRCS 2019a).

Water Resources and Wetlands

The water portion of the Action Area is dominated by the Gulf of Mexico, the LAC, Harbor Island Channel, Redfish Bay, and South Bay. The LAC is a major conduit of tidal waters from the Gulf of Mexico to the Aransas and Redfish Bay systems. There are numerous cuts, flats, and reefs along both sides of the LAC and the area is recognized as a significant recreational fishery among local residents. There are also various brackish waterbodies, bays, and inlets found on the northeastern portion (land side) of the Action Area that empty into the LAC.

Wetlands in the Action Area consist of palustrine emergent, estuarine intertidal emergent, estuarine unconsolidated shore, palustrine scrub-shrub, and estuarine intertidal scrub-shrub. The various field surveys completed for the Project identified seven vegetation community types within the Project Area: five wetland vegetation communities (i.e., emergent wetlands and scrub-shrub wetlands) and two upland vegetation communities (i.e., herbaceous uplands and scrub-shrub uplands). The dominant species identified within each vegetation community type are listed below.

Palustrine Emergent Wetland: The emergent wetland community consists of a prevalence of hydrophytic non-woody vegetation less than 3 feet in height and are located along depressional areas and near coastal waterbodies within the project area. Dominant herbaceous species include shoregrass (*Distichlis littoralis*), Virginia glasswort (*Salicornia depressa*), smallflowered milkvetch (*Astragalus nuttallianus*), bushy seaside tansy (*Borrichia frutescens*), bushy bluestem (*Andropogon glomeratus*), shoregrass (*Monanthochloe littoralis*), green flatsedge (*Cyperus virens*), five-stamen tamarisk (*Tamarix chinensis*), Carolina desert-thorn (*Lycium carolinianum*), gulf cordgrass (*Spartina spartinae*), black mangrove (*Avicennia germinans*), smooth cordgrass (*Spartina alterniflora*), three-square (*Schoenoplectus pungens*), broadleaf cattail (*Typha latifolia*), saltgrass (*Distichlis spicata*), common spikerush (*Eleocharis palustris*), and small spikerush (*Eleocharis minima*).

Estuarine Intertidal Emergent Wetland: The estuarine intertidal emergent wetland community consists of a prevalence of hydrophytic non-woody vegetation less than 3 feet in height and are located near coastal waterbodies within the project area. Dominant herbaceous species include black mangrove (*Avicennia germinans*), turtleweed, sea ox-eye, Carolina desert-thorn (*Lycium carolinianum*), shore grass, coastal saltgrass, common spike-rush (*Eleocharis palustris*), dwarf saltwort (*Salicornia bigelovii*), woody saltwort (*S. depressa*), shoreline sea-purslane (*Sesuvium portulacastrum*), saltwater cord grass (*Spartina alterniflora*), gulf cord grass, three-square, and broad-leaf cat-tail.

Estuarine Unconsolidated Shore Wetland. The estuarine unconsolidated shore wetland community consists of a prevalence of hydrophytic non-woody vegetation less than 3 feet in height and are located near coastal shores within the project area. Dominant herbaceous species include shore grass and woody saltwort.

Palustrine Scrub-Shrub Wetland: The scrub-shrub wetland community consists of a prevalence of hydrophytic woody species 3 to 20 feet in height and less than 3 inches in diameter at breast height. The dominant shrub arsh primrose-willow (*Ludwigia palustris*), Chinese tallow (*Triadica sebifera*), sand spike-rush, broom-sedge bluestem (*Andropogon virginicus*), common buttonbush (*Cephalanthus occidentalis*), bigpod sesbania (*Sesbania herbacea*), coastal salt grass, Brazilian peppertree (*Schinus terebinthifolia*), and saw greenbrier (*Smilax bona-nox*).

Estuarine Intertidal Scrub-Shrub Wetland: The estuarine intertidal scrub-shrub wetland community consists of a prevalence of hydrophytic woody species 3 to 20 feet in height and less than 3 inches in diameter at breast height located near coastal waterbodies within the project area. The dominant shrub and sapling species include black mangrove. Dominant herbaceous species include turtleweed, shore grass, dwarf saltwart, woody saltwort, and saltwater cord grass.

Herbaceous Upland: The herbaceous upland community consists of non-wetland areas dominated by nonwoody vegetation. Dominant herbaceous species include Bermudagrass (*Cynodon dactylon*), little bluestem (*Schizachyrium scoparium*), cactus apple (*Opuntia engelmannii*), bushy seaside tansy, yellow bluestem (*Bothriochloa ischaemum*), bushy bluestem, perennial ragweed (*Ambrosia psilostachya*), common sunflower (*Helianthus annuus*), and nimblewill (*Muhlenbergia schreberi*), hairyfruit chervil (*Chaerophyllum tainturieri*), stickywilly (*Galium aparine*), giant reed (*Arundo donax*), big bluestem (*Andropogon gerardii*), black medick (*Medicago lupulina*), shepherd's purse (*Capsella bursa-pastoris*), switchgrass (*Panicum virgatum*), chinaberry tree (*Melia azedarach*), peach (*Prunus persica*), yellow bluestem (*Bothriochloa ischaemum*), henbit deadnettle (*Lamium amplexicaule*), corn (*Zea mays*), Texas nightshade (*Solanum triquetrum*), spiny hackberry (*Celtis pallida*), Texas persimmon (*Diospyros texana*), Santa Maria feverfew (*Parthenium hysterophorus*), sweet acacia (*Vachellia farnesiana*), sand spikerush (*Eleocharis montevidensis*), scarlet pimpernel (*Lysimachia arvensis*), spiny chloracantha (*Chloracantha spinosa*), redroot amaranth (*Amaranthus retroflexus*), curly dock (*Rumex crispus*), Johnsongrass (*Sorghum halepense*), bristly nama (*Nama hispidum*), common dandelion (*Taraxacum officinale*), lime pricklyash (*Zanthoxylum fagara*), hooded windmill grass (*Chloris cucullata*), gulf cordgrass (*Spartina spartinae*), eastern baccharis (*Baccharis halimifolia*), pinkladies (*Oenothera speciosa*), Texas prickly pear (*Opuntia lindheimeri*), Christmas cactus (*Opuntia leptocaulis*), Heller's rosette grass (*Dichanthelium oligosanthes*), and camphorweed (*Heterotheca subaxillaris*).

Scrub-shrub Upland: The scrub-shrub upland class consists of non-wetland areas with canopies dominated by woody vegetation such as immature trees and shrubs. The scrub-shrub upland within the project area is comprised of a sapling/shrub layer dominated by Brazilian peppertree (*Schinus terebinthifolius*) and saltcedar (*Tamarix ramosissima*). The herbaceous layer is comprised predominantly of Bermudagrass, cactus apple, gulf cordgrass, nimblewill, and white clover (*Trifolium repens*).

Land Cover

Based upon visual observations during the 2019 field surveys of the Project Area, more than 60% of the Action Area consists of open water (**Figure 5; Table 2**). Within the offshore portion of the Project, the Action Area consists of marine open water. Within the inshore portion of the project, open water areas are non-vegetated deepwater, un-vegetated shallows, oyster reefs, and vegetated shallows dominated by two species of seagrasses, including shoal grass and turtle grass. The remainder of the inshore portion of the Action Area is dominated by herbaceous uplands, palustrine emergent wetlands, estuarine wetlands, palustrine scrub-shrub wetlands, sand beaches, mangroves, oyster reefs, salt flats, and mud flats, characterized by areas of persistent standing water, a lack of rooted macrophytes and a dominance of blue-green algal mats. The onshore portion of the Action Area consists of herbaceous uplands, scrub-shrub uplands, palustrine emergent wetlands, palustrine scrub-shrub wetlands, a few estuarine emergent wetlands, row crops (i.e., agricultural land), urban land, and barren land. **Table 2** summarizes the acreage of the various land covers within the Action Area. **Figure 5** shows a land cover map for the Bluewater SPM Action Area.

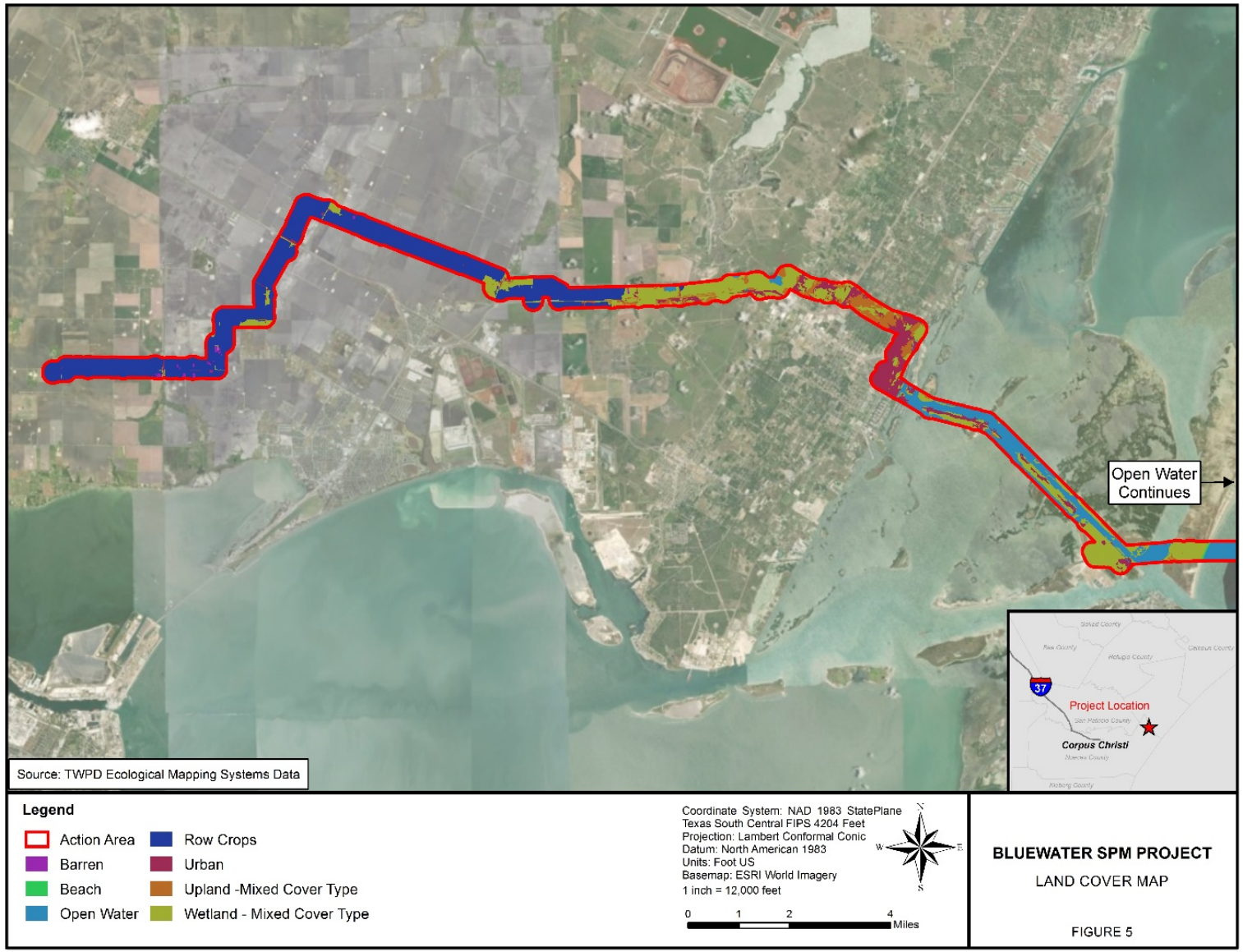

Figure 5. Landcover map for the Bluewater SPM project alignment.

Table 2. Land Cover Types Within the Action Area

Land Cover Type	Acres in the Action Area	Percent of the Action Area
Open Water	11,126.8	61.3%
Wetland Mixed Cover Type	2,146.3	11.8%
Sand Beach	7.9	0.04%
Row Crops	3,533.5	19.4%
Upland Mixed Cover Type	489.4	2.7%
Urban	799.6	4.4%
Barren	34.4	0.18%
TOTAL	**18,137.9**	**100.0%**

3. PROTECTED SPECIES AND CRITICAL HABITATS

3.1. Listed Species and Designated Critical Habitats

The USFWS maintains a list of endangered and threatened species protected by the ESA (and species proposed for such protection) and areas of designated critical habitat. The Applicant queried the USFWS Information for Planning and Consultation (IPaC) online database on February 28, 2019, to obtain an official species list for the proposed Project. The Applicant requested a list of federal trust resources from the Texas Natural Diversity Database (TXNDD) compiled by the TPWD for the topographic quadrangles surrounding the Project Area, which was received on February 16, 2019 (TXNDD 2019).

The USFWS and TXNDD identify 30 species as having the potential to occur within the Action Area within Aransas, Nueces, and San Patricio Counties, Texas (**Table 3; Figure 6**).

Table 3. Federally Listed Species with Potential to Occur Within the Action Area

Common Name (*Scientific Name*)	Status*	Critical Habitat	Range or Habitat Requirements
Fish			
Oceanic whitetip shark (*Carchharhinus longimanus*)	T	No	Found throughout tropical and sub-tropical waters. This species is a pelagic species, generally preferring offshore habitats in the open ocean along the OCS of near ocean islands in waters with depths greater than 600 ft (NOAA 2019a). No effect. The Proposed Project is located in offshore waters with depths of approximately 87 ft (27 m) which will not be preferred by this species. **No further analysis is required.**
Giant manta ray (*Manta birostris*)	T	No	This species is a migratory pelagic species that prefers sparse, highly fragmented habitats within tropical, sub-tropical, and temperate marine waters. Populations within the GOM are small and sparely distributed; however, a population of this species occurs within the Flower Garden Banks National Marine Sanctuary. These filter feeders are known near the Yucatan Peninsula as well as other areas of the GOM (NOAA 2019b, c). May affect, but is not likely to adversely affect. A known population of this species is within the GOM and could transit the area; however, given the distance of known populations of this species, it is unlikely they will be impacted by the Proposed Project.
Birds			
Attwater's greater prairie chicken (*Tympanichus cupido attwateri*)	E	No	This species utilizes native coastal prairies. The Project occurs mainly in agricultural areas and open land areas in the city of Aransas Pass and does not cross suitable habitat. This species has been extirpated from this portion of its range and habitat is not present in the Action Area. **No further analysis is required.**
Interior least tern (*Sterna antillarum athalassos*)	E	No	Nests colonially along sand and gravel bars within large braided streams and rivers. In the fall, all least terns migrate south to winter in the Caribbean and the northern coast of South America. Project impacts to this species only need to be considered for wind related projects within the migratory route for this species. **No further analysis is required.**
Northern aplomado falcon (*Falco femoralis septentrionalis*)	E	No	In Texas, Northern aplomado falcons are found in the South Texas and Trans-Pecos regions (Campbell 2003; USFWS 2014a). Their geographical distribution ranges from southern Argentina through Mexico and into the southwestern U.S., including south Texas. They can be found in a variety of habitats, generally containing open grassland with scattered patches of shrubs or trees or woodland and forest borders. In the Gulf Coast region of Texas and Mexico the species occupies coastal prairie habitat, coastal savannas, marshes, and tidal flats with few trees, mesquite, yucca and cactus, or other tall succulent shrubs (Keddy-Hector 2000). Nesting is known to occur on Matagorda Island and near Brownsville, Texas; the coastal region between these populations (including the Proposed Project area) is not known to include nesting pairs (USFWS 2014a).
Piping plover (*Charadrius melodus*)	T	Yes	The piping plover is a migratory species with a breeding distribution within the Great Lakes region and Atlantic coast and along central North America from Alberta, Canada to Colorado and Oklahoma (USFWS 2012a). The non-breeding or wintering distribution occurs mainly coastal from North Carolina to Florida and the Gulf Coast states including Texas (USFWS 2012a; NatureServe 2019c).

Common Name (*Scientific Name*)	Status*	Critical Habitat	Range or Habitat Requirements
			Piping plovers nest on wide, gravelly beaches with little vegetation in alkali lakes and wetlands, inland lakes, reservoirs, and major rivers in the northern Atlantic coast, Great Lakes region, and around waterbodies of the Great Plains and Canada. Wintering habitat includes beaches, tidal sand flats, mud flats, algal mats, washover passes, and small dunes where they feed primarily on small invertebrates (Campbell 2003; NatureServe 2019c).
Rufa red knot (*Calidris canutus rufa*)	T	No	The rufa red knot prefers the shoreline of coast, bays, and uses mudflats during rare inland encounters. Primary prey items include coquina clam (*Donax spp.*) on beaches and dwarf surf clam (*Mulinia lateralis*) in bays (USFWS 2013a). Wintering range includes Aransas County, as well as areas further up and down the Texas coast. It winters close to the coast, inhabiting tidal flats and beaches, herbaceous wetlands, and tidal flats and shorelines (USFWS 2015a). The majority of this project does not cross estuarine habitat. The sections that it does cross will be horizontally directional drilled. The estuarine environments present are heavily vegetated rather than open beach habitat. Additionally, this species is also highly mobile and would likely avoid the Project area once construction commences.
Whooping crane (*Grus americana*)	E	Yes	Endemic to North America the species can currently only be found in three locations. Breeding occurs in northern Canada and Wisconsin, and the species winters along the Texas Gulf Coast within and near the Aransas National Wildlife Refuge (USFWS 2012b). A variety of habitats are used during migration including croplands and wetlands (Austin and Richert 2001). The Project area is within the migratory range of the species (Figure 7) and suitable stopover/foraging habitat is present.
Mammals			
Gulf coast jaguarundi (*Herpailurus yagouaroundi cacomitli*)	E	No	Found in Tamaulipan thorn scrub of extreme south Texas. This species utilizes thick, dense shrublands or woodlands, and it prefers natural, undisturbed areas. The Project occurs mainly in agricultural areas and open land areas in the city of Aransas Pass. Habitat is not present in the Action Area. This species has been extirpated from this portion of its range. **No further analysis is required.**
Ocelot (*Leopardus pardalis*)	E	No	Found in Tamaulipan thorn scrub of extreme south Texas. This species utilizes a wide range of natural habitats but prefers undisturbed areas. The Project occurs mainly in agricultural areas and open land areas in the city of Aransas Pass. Habitat is not present in the Action Area. This species has been extirpated from this portion of its range. **No further analysis is required.**
Florida manatee (*Trichechus manatus latirostris*)			Distributed throughout the northeastern GOM. Prefers riverine and shallow nearshore waters where temperatures are above 63 degrees Fahrenheit (°F) with abundant seagrasses, water hyacinth, and aquatic weeds (USFWS 2019h). No effect. The Proposed Project is outside of the range of this species and all inshore waters will be crossed by HDD. **No further analysis is required.**
West Indian manatee (*Trichechus manatus*)	E	Yes-Outside of Action Area	Distributed throughout the northeastern GOM. Prefers riverine and shallow nearshore waters where temperatures are above 63 degrees Fahrenheit (°F) with abundant seagrasses, water hyacinth, and aquatic weeds. Only transient individuals are found in Texas. Not known to inhabit bays or estuaries of the middle Texas Coast, except under extremely rare conditions. Texas waters of the GOM area the very western extent of their range (USFWS 2019h). No effect. The Proposed Project is located along the

Common Name (*Scientific Name*)	Status*	Critical Habitat	Range or Habitat Requirements
			western extent of the range of this species and all inshore waters will be crossed by HDD. **No further analysis is required.**
Bryde's whale (*Balaenoptera edeni*)	PE	No	Occurs in tropical, sub-tropical, and warm temperate waters worldwide, including the northwestern and central GOM (NOAA 2019d). No effect. No confirmed sightings of Bryde's whales have been documented in the north central or western GOM since NMFS began surveys in the early 1990s. **No further analysis is required.**
Fin whale (*Balaenoptera physalus*)	E	No	Distributed in deep, offshore waters of all major oceans, primarily in temperate to polar latitudes; less common in the tropics. Most migrate from the Arctic and Antarctic feeding areas in the summer to tropical breeding and calving areas in the winter (NOAA 2019e). Most likely occurs in deeper waters but is occasionally known to occur in coastal waters.
Sei whale (*Balaenoptera borealis*)	E	No	Distributed in sub-tropical, temperate, and sub-polar waters. May unpredictably and randomly occur in a specific area, sometimes in large numbers. These events may occur suddenly and then not occur again for long periods of time. May migrate toward lower latitudes during winter and higher latitudes during summer (NOAA 2019f). Due to the random occurrence of this species in an area, there is the potential that they could occur in the Proposed Project area.
Sperm whale (*Physeter macrocephalus*)	E	No	Distributed worldwide, but generally prefer waters deeper than 1,641 ft (500 m, NOAA 2019g). No effect. The Proposed Project is located in offshore waters with maximum depths of approximately 88 ft (26.8 m) which will not be preferred by this species**. No further analysis is required.**
Blue whale (*Balaenoptera musculus*)	E	No	Distributed in sub-polar to sub-tropical latitudes worldwide. Migrates toward polar waters in spring. While found in coastal waters, they are thought to occur generally more offshore than other whales. **No further analysis is required.**
Humpback whale (*Megaptera novaeangliae*)	E	No	Distributed throughout all major oceans from the equator to sub-polar latitudes. Not expected to occur in the northern and western GOM. **No further analysis is required.**
Reptiles			
Green sea turtle (*Chelonia mydas*)	T**	Yes	Global distributions in either the tropics, subtropics or temperate waters (NOAA 2018; USFWS 2019c). Dependent upon life history stage the green sea turtle has been documented using a variety of habitats. Adults spend most of their time within shallow coastal waterways with large sea grass beds (Reich et al. 2007). Juvenile turtles will spend most of their time within deep pelagic waters (Reich et al. 2007). Open beaches with a sloping platform and minimal disturbance are required for nesting. Known to occur in Aransas Bay, Redfish Bay and Port Aransas jetties.
Hawksbill sea turtle (*Eretmochelys imbricata*)	E	Yes- Outside of Action Area	Global distributions in either the tropics, subtropics or temperate waters (NOAA 2016; USFWS 2019d). Found in near shore and beach areas of the southwestern Gulf of Mexico and the Florida Keys. Not known to inhabit bays or estuaries of the middle Texas Coast. Only one known recent nesting record from Texas, at the Padre Island National Seashore. Historically known from Aransas County; last sighting was a specimen collected in 1958. Very few sightings of transients in near shore or offshore marine environments such as the Flower Garden Banks.

Common Name (*Scientific Name*)	Status*	Critical Habitat	Range or Habitat Requirements
Kemp's Ridley sea turtle (*Lepidochelys kempii*)	E	Yes-	Ranges from north Atlantic Ocean across the east coast and west into the Gulf of Mexico as far was as Texas and northern Mexico. Adult and sub-adult Kemp's Ridley sea turtles primarily occupy nearshore habitats that contain muddy or sandy bottoms where prey can be found. Kemp's Ridley hatchlings and small juveniles inhabit a very different environment than adults. After emerging from the nest, hatchlings enter the water and quickly swim offshore to open ocean developmental habitat where they associate with floating sargassum seaweed (NMFS et al. 2011; National Park Service [NPS] 2018; USFWS 2019e). Outside of nesting, the major habitat is the nearshore and inshore marine waters of the northern Gulf of Mexico. Adult and sub-adults primarily occupy nearshore habitats that contain muddy or sandy bottoms where prey can be found. Kemp's Ridley hatchlings and small juveniles swim offshore to open ocean developmental habitat where they associate with floating *Sargassum* seaweed.
Leatherback sea turtle (*Dermochelys coriacea*)	E	Yes- Outside of Action Area	Global distributions in either the tropics, subtropics or temperate waters (NOAA 2016; USFWS 2019f). Found primarily in open ocean habitat. This species has been documented traveling distances of over 12,000 miles. Nests in and adjacent to tropical waters of the Gulf of Mexico and is the most pelagic of the five marine turtles, along with the hawksbill sea turtle. Not known to inhabit bay and estuaries of the middle Texas Coast. Only one known nesting record from Texas, at the Padre Island National Seashore (2008) and one stranding record from 2007. Historically known from Aransas County but now only very rarely seen in this portion of its range, almost never seen in bays or estuaries.
Loggerhead turtle (*Caretta caretta*)	T**	Yes- Outside of Action Area	Global distributions in either the tropics, subtropics or temperate waters (NOAA 2018; USFWS 2019g). Open ocean and shallow coastal waterways. Juveniles will spend time within sargassum. Nests on the Texas coast from South Padre Island National Seashore to Louisiana. Sandy beaches on the Gulf side with well-developed dunes are preferred nesting habitat. Hatchlings and young juveniles occupy floating Sargassum. Oceanic juveniles migrate to nearshore coastal areas (neritic zones) and continue maturing in the bays and estuaries until adulthood. Most of the bays, sounds, and estuaries along the Texas Gulf coast are infrequently used by adults.
Invertebrates			
Golden orb (Quadrula aurea)	C	No	The Golden Orb prefers flowing fresh waters in moderately sized rivers with firm and stable substrate (USFWS 2009b, 2011). Distribution is restricted to the Guadalupe, San Antonio, and Nueces-Frio River basins in central Texas. There is no habitat for this species in the onshore portion of the proposed Project Area. If suitable habitat was present, onshore river crossings would be completed via HDD. **No further analysis is required.**
Lobed star coral (*Orbicella annularis*)	T	No	This reef-building coral grows in varying colony shapes in response to differing light conditions. It lives in the western Atlantic Ocean and is the most abundant species of reef-building coral in the Caribbean (NOAA 2019a). *No effect*. The Proposed Project is outside of the species' range. **No further analysis is required.**
Mountainous star coral (*Orbicella faveolata*)	T	No	Identified as occurring off the State of Florida (NatureServe 2019b). No effect. The Proposed Project is outside of the species' range. **No further analysis is required.**
Boulder star coral (*Orbicella franksi*)	T	No	Identified as occurring off the State of Florida (NatureServe 2019c). No effect. The Proposed Project is outside of the species' range. **No further analysis is required.**

Common Name (*Scientific Name*)	Status*	Critical Habitat	Range or Habitat Requirements
Elkhorn coral (*Acropora palmata*)	T	No	Elkhorn coral can be found in shallow water throughout the Caribbean and in the United States in the Florida Keys and along the east coast of Florida north to Broward County. The species is currently listed as threatened but is Proposed for reclassification as endangered (NMFS 2019d). No effect. The Proposed Project is outside of the species' range. **No further analysis is required.**
Flowering Plants			
Slender rush-pea (*Hoffmannseggia tenella*) South Texas ambrosia (*Ambrosia cheiranthifolia*)	E	No	Historically known to occur in Nueces and Kleberg Counties along remnant native prairie habitats that have not been tilled or developed. This species prefers patches of short-grass native prairies adjacent to intermittent and perennial waterbodies. Both plants have very small and localized ranges in south Texas, limited to Nueces and Kleberg Counties (USFWS 2019f). The slender rush-pea prefers coastal prairie grasslands on level uplands and on gentle slopes along drainages, usually in areas of shorter or sparse vegetation with Blackland clay soils (NatureServe 2019e). The South Texas ambrosia prefers thorn shrub and mesquite wooded habitats. Both prefer fine, calcareous clay soils associated with Pleistocene deltas (USFWS 2019f). No effect. Terrestrial habitat within the Proposed Project area consists primarily of cleared industrial, residential, and agricultural habitat. Therefore, the slender rush-pea and the South Texas Ambrosia are not anticipated to occur in the Proposed Project area. **No further analysis is required.**

*USFWS Status Definitions: E = Endangered. T = Threatened. PE = Proposed Endangered.

**Green sea turtle and loggerhead turtle distinct population segments are federally threatened in Texas.

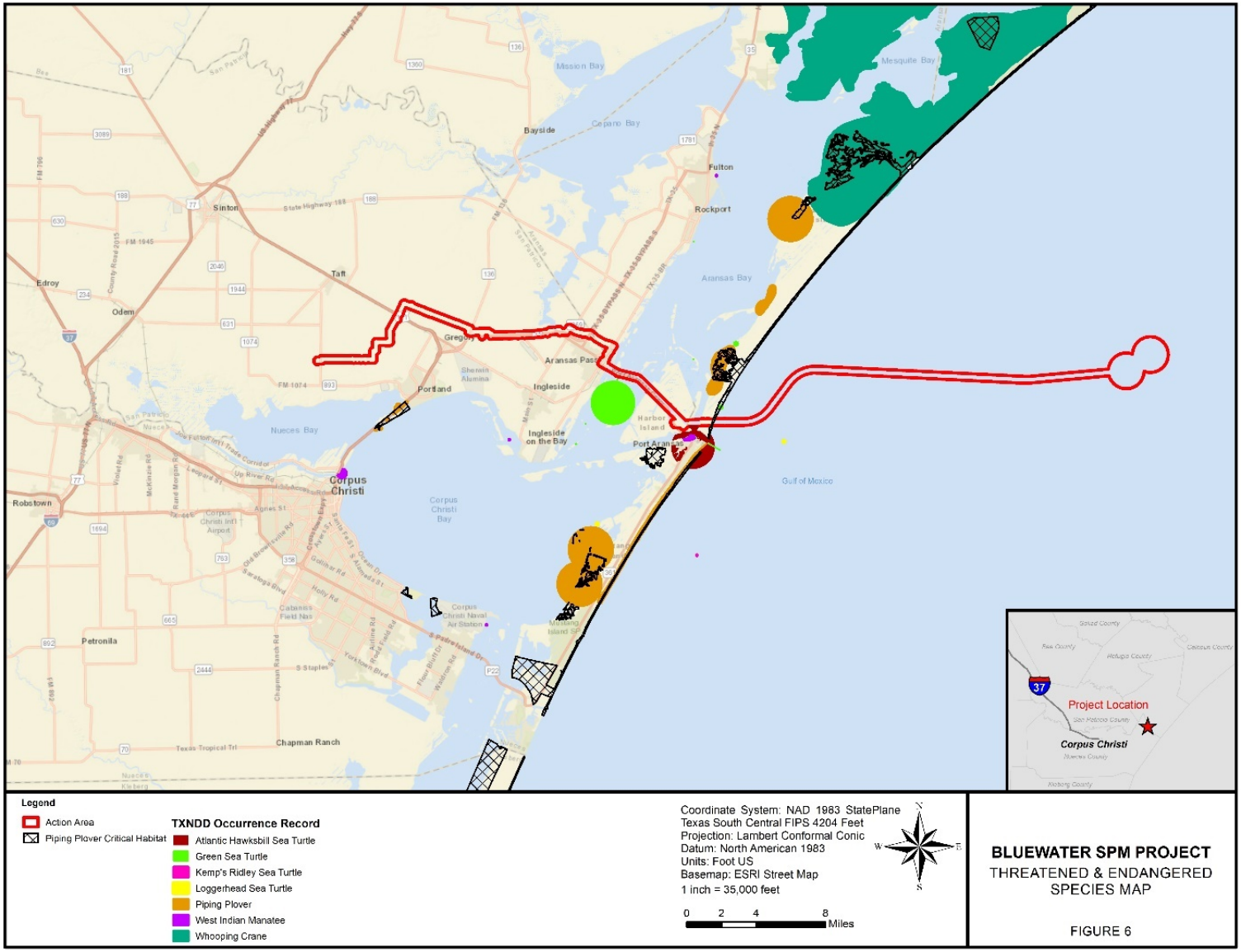

Figure 6. Federally listed species with potential to occur within Aransas, Nueces, and San Patricio Counties, Texas

The piping plover (*Charadrius melodus*), whooping crane (*Grus americana*), West Indian manatee (*Trichechus manatus*), green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricata*), leatherback sea turtle (*Dermochelys coriacea*), and loggerhead turtle (*Caretta caretta*) each have designated areas of critical habitat.

3.1.2. Marine Mammal Protection Act

Under the Marine Mammal Protection Act (MMPA) of 1972 (16 USC 1361 et seq.), the Secretary of Commerce is responsible for the protection of all cetaceans (whales, porpoises, and dolphins) and pinnipeds (seals and sea lions), except walruses, and has delegated authority for implementing the MMPA to the National Oceanic and Atmospheric Administration (NOAA) NMFS. Under Section 3 of the MMPA, all marine mammals are protected from "take" which is defined as "harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill any marine mammal," and "harass" is defined as "any act of pursuit, torment, or annoyance that has the potential to injure marine mammal stock in the wild; or has the potential to disturb a marine mammal or marine mammal stock in the wild by disrupting behavioral patterns, including migration, breathing, nursing, breeding, feeding, or sheltering."

Substantial amendments were made to the MMPA in 1994 that allow for the incidental take of small numbers of marine mammals. NOAA identifies incidental take as activities other than commercial fishing that affect a small number, have no more than a negligible impact, and do not have an unmitigated adverse impact on the stock for subsistence uses. Activities that are frequently identified as incidental take and therefore authorized include oil and gas development, geophysical surveys, and military training exercises.

Twenty-eight species and one sub-species of marine mammals (**Table 4**) are known to occur in waters of the GOM (BOEM 2017). With one exception, all of these mammals belong to the order Cetacea. Of the 28 species of cetaceans occurring in the GOM, 6 belong to the suborder Mysticeti (baleen whales), and 21 belong to the suborder Odontoceti (toothed whales). The exception, the West Indian manatee (*Trichechus manatus*) and its subspecies, the Florida manatee (*Trichechus manatus latirostris*), belong to the order Sirenia. All these species are protected by the MMPA, and six are further protected by the ESA of 1973, and are covered separately under the earlier ESA discussion, including the Bryde's whale (*Balaenoptera edeni*) which is proposed endangered under the ESA. **Only those marine mammal species that are listed under the ESA are considered in this BA.**

Table 4. Marine Mammals Occurring in the Gulf of Mexico

Common Name	Scientific Name	Protection	Expected Occurrence in the Project Vicinity
Order Cetacea			
Suborder Mysticeti (baleen whales)			
Blue whale	*Balaenoptera musculus*	ESA (E), MMPA	Distributed in sub-polar to sub-tropical latitudes worldwide. Migrates toward polar waters in spring. While found in coastal waters, they are thought to occur generally more offshore than other whales.
Bryde's whale	*Balaenoptera edeni*	MMPA (strategic stock), proposed endangered under the ESA	Occurs in tropical, subtropical and warm temperate waters worldwide, including the northwestern and central GOM.
Fin whale	*Balaenoptera physalus*	ESA (E), MMPA	Distributed in deep, offshore waters of all major oceans, primarily in temperate to polar latitudes; less common in the tropics. Most migrate from the Arctic and Antarctic feeding areas in the summer to tropical breeding and calving areas in the winter.
Humpback whale	*Megaptera novaeangliae*	ESA (E), MMPA	Distributed throughout all major oceans from the equator to sub-polar latitudes. Not expected to occur in the northern and western GOM.
Minke whale	*Balaenoptera acutorostrata*	MMPA	Distributed in temperate, tropical, and high latitude waters. Common and widely distributed throughout the Atlantic EEZ. Prefer the continental shelf from spring to fall; prefer oceanic waters from fall to spring.
Sei whale	*Balaenoptera borealis*	ESA (E), MMPA	Distributed in subtropical, temperate, and subpolar waters. May unpredictably and randomly occur in a specific area, sometimes in large numbers. These events may occur suddenly and then not occur again for long periods of time. May migrate toward lower latitudes during winter and higher latitudes during summer.
Suborder Odontoceti (toothed whales and dolphins)			
Atlantic spotted dolphin	*Stenella frontalis*	MMPA	In the GOM, occur primarily along the continental shelf at 33 to 656 ft. (10 to 200 m) deep, to the continental slope at 1,641 ft. (500 m).
Blainville's beaked whale	*Mesoplodon densirostris*	MMPA	Oceanic species; prefers temperate and tropical waters > 1,641, ft. (500 m) deep.
Bottlenose dolphin	*Tursiops truncatus*	MMPA	Western coastal stock occurs outside of bays and estuaries, and in GOM waters less than 20 m deep, from the Laguna Madre to the Florida Keys.
Clymene dolphin	*Stenella clymene*	MMPA	Endemic to tropical and sub-tropical waters of the Atlantic. Prefers deep, oceanic waters off the continental shelf in the GOM, west of the Mississippi River.

Common Name	Scientific Name	Protection	Expected Occurrence in the Project Vicinity
Cuvier's beaked whale	*Ziphius cavirostris*	MMPA	Oceanic species; prefers waters > 1,641 ft. (500 m) deep.
Dwarf sperm whale	*Kogia simus*	MMPA	Distributed worldwide in temperate to tropical waters. Prefer oceanic waters in northern GOM.
False killer whale	*Pseudorca crassidens*	MMPA	Distributed worldwide in warm temperate and tropical oceans. In the northern GOM, this species prefers deep, oceanic waters.
Fraser's dolphin	*Lagenodelphis hosei*	MMPA	Distributed worldwide in tropical waters. In the northern GOM, this species prefers oceanic waters > 656 ft. (200 m) deep.
Gervais' beaked whale	*Mesoplodon europaeus*	MMPA	Distributed worldwide in temperate and tropical waters of the world oceans. Prefers oceanic waters in the GOM > 1,641 ft. (500 m) deep.
Killer whale	*Orcinus orca*	MMPA	Distributed worldwide from tropical to polar regions. In the northern GOM, the killer whale prefers oceanic waters ranging from 840 to 8,701 ft. (256 to 2,652 m).
Melon-headed whale	*Peponocephala electra*	MMPA	Distributed worldwide in tropical to sub-tropical waters. In the northern GOM, this species prefers oceanic waters west of Mobile Bay, Alabama that are > 2,625 ft. (800 m) deep.
Pantropical spotted dolphin	*Stenella attenuata*	MMPA	Distributed worldwide in tropical and certain sub-tropical oceans. In the northern GOM, this species prefers oceanic waters.
Pygmy killer whale	*Feresa attenuata*	MMPA	Distributed worldwide in tropical and sub-tropical waters. In the northern GOM, pygmy killer whales prefer oceanic waters.
Pygmy sperm whale	*Kogia breviceps*	MMPA	Distributed worldwide in temperate to tropical waters. In northern GOM, the pygmy sperm whale prefers oceanic waters during all seasons.
Risso's dolphin	*Grampus griseus*	MMPA	Distributed worldwide in tropical to warm temperate waters. In the northern GOM, Risso's dolphin prefers oceanic waters but is concentrated in waters along the continental slope during all seasons.
Rough-toothed dolphin	*Steno bredanensis*	MMPA	Distributed worldwide in tropical to warm temperate waters. In the northern GOM, this species occurs in oceanic waters averaging 640 ft. (195 m) deep and sometimes along the continental shelf.
Short-finned pilot whale	*Globicephala macrorhynchus*	MMPA	Distributed worldwide in tropical to temperate waters. In the northern GOM, the short-finned pilot whale occurs primarily on the continental slope during all seasons.
Sperm whale	*Physeter macroc€alus*	ESA (E), MMPA	Distributed worldwide, but generally prefer waters deeper than 1,641 ft. (500 m).
Spinner dolphin	*Stenella longirostris*	MMPA	Distributed worldwide in tropical to temperate oceanic waters. In the northern GOM, the spinner dolphin is located generally east of the Mississippi River.

Common Name	Scientific Name	Protection	Expected Occurrence in the Project Vicinity
Striped dolphin	*Stenella coeruleoalba*	MMPA	Distributed worldwide in tropical to temperate oceanic waters. In the northern GOM the striped dolphin prefers oceanic waters.
Sowerby's beaked whale	*Mesoplodon bidens*	MMPA	Prefers northern temperate waters of the northern Atlantic. In the GOM considered extralimital due to only 1 reported stranding throughout its history.
Order Sirenia (sea cows)			
Florida manatee	*Trichechus manatus latirostris*	ESA (E), MMPA	Distributed throughout the northeastern GOM. Prefers riverine and shallow nearshore waters where temperatures are above 63 degrees Fahrenheit (°F) with abundant seagrasses, water hyacinth, and aquatic weeds.
West Indian manatee	*Trichechus manatus*	ESA (E), MMPA	Distributed throughout the northeastern GOM. Prefers riverine and shallow nearshore waters where temperatures are above 63 degrees Fahrenheit (°F) with abundant seagrasses, water hyacinth, and aquatic weeds.

Source: Byrnes et al. 2017; Hayes et al. 2017.

3.2. No Effect – Species and Habitats Not Considered for Further Analysis

Most federally listed or proposed species that may be present within the region are not expected to actually occur within the Action Area due to lack of suitable habitat or the extirpation from that part of its range. Other species might occur within the Action Area but are not likely to be affected by the specific activities associated with the Proposed Action. In either case, the Proposed Action will have no effect on 18 of the 30 federally threatened or endangered species and one candidate species that may occur within Aransas, Nueces, and San Patricio Counties, Texas. The federally listed species that will experience no effect from the Proposed Action include

- Oceanic whitetip shark
- Attwater's greater prairie chicken
- Interior least tern
- Gulf coast jaguarundi
- Ocelot
- Florida manatee
- West Indian manatee
- Bryde's whale
- Sperm whale
- Blue whale
- Humpback whale
- Golden orb
- Lobed star coral
- Mountainous star coral
- Boulder star coral
- Elkhorn coral
- Slender rush-pea
- South Texas ambrosia

Species and critical habitats for those species with a no effect determination from MARAD/USCG are not addressed any further in this BA. USFWS and NMFS concurrence for no effect determinations by a federal action agency is not necessary under Section 7 of the ESA.

3.3. May Affect – Species Considered for Further Analysis

The remaining 12 species, including the giant manta ray (*Manta birostris*), Northern aplomado falcon (*Falco femoralis septentrionalis*), piping plover, rufa red knot (*Calidris canutus rufa*), whooping crane, fin whale (*Balaenoptera physalus*), sei whale (*Balaenoptera borealis*) , green sea turtle, Kemp's Ridley sea

turtle (*Lepidochelys kempii*), loggerhead turtle, hawksbill sea turtle, and leatherback seas turtle may be affected by the Proposed Action and are considered for further analysis both individually and collectively. Since the Proposed Action may affect one or more of these species, informal or formal consultation with USFWS and NMFS is necessary. Written concurrence from USFWS and NMFS for findings of "not likely to adversely affect" or the issuance of a Biological Opinion for findings of "likely to adversely affect" is necessary to complete the consultation.

3.3.1. Giant Manta Ray

Biology and Habitat

The giant manta ray is a migratory pelagic ray species that occurs in sparse, highly fragmented populations across tropical, sub-tropical, and temperate marine waters. This species is highly migratory and a seasonal visitor along productive coastlines with regular upwelling within oceanic island groups and near offshore pinnacles or seamounts. The manta inhabits temperate, tropical, and subtropical waters worldwide, between 35°N and 35°S latitudes. In the western Atlantic Ocean, they range from North Carolina south to Brazil and east to Bermuda. Occasionally this ray is observed as far north as New Jersey in the western Atlantic and as far north as San Diego in the eastern Pacific. In the GOM, the giant manta ray seldom occurs further west than the western coast of Florida, but it does occasionally wander into the northern and western GOM.

Habitat of this species ranges from near shore to pelagic, occurring over the continental shelf near reef habitats and offshore islands. It swims by flapping its large pectoral fins and is usually observed near the surface or in the mid-waters of reefs and lagoons (Florida Museum of Natural History 2019).

Giant manta rays occasionally swim in loose aggregations and spend considerable time near the surface. Mantas have been observed breaching, jumping clear of the water and returning with a splash. Three types of jumps have been observed, including forward jumps landing head-first, forward jumps landing tail first, and somersaulting. Groups of these animals have been seen participating in this behavior, breaching one after the other. While it is not understood why this behavior is exhibited, some speculate it may play a role in attracting mates or is a form of play (Florida Museum of Natural History 2019).

This filter feeder feeds primarily on planktonic organisms including, but not limited to, decapods, mysids, copepods, and shrimp. Giant manta rays occur at a wide range of depths. Although they feed in waters with depths less than 33 feet, recent studies have recorded this species exceeding depths of 3,281 feet (NOAA 2019c).

Identified Threats

By far the greatest threat to manta rays comes from fisheries, both directed and incidental (bycatch). Coral reef degradation could negatively impact manta rays by disrupting feeding areas and disrupting reproductive behavior. Rays depend on zooplankton for much of their food. As changing sea temperatures disrupt the natural history and life cycles of plankton, manta rays will likely find themselves having to struggle to find enough food to survive. Fishing line entanglement and the resulting amputation or damage to cephalic fins, can also impair the ray's ability to migrate, forage and reproduce. Ingestion of plastic debris. Manta rays die from marine debris, plastics and vessel pollution. Ingestion of plastic debris by large pelagic fish, whales and marine reptiles has been well-documented in the recent past, and can cause a significant number of health problems, injuries and death in the large animals. Manta rays can be injured or killed by boat strikes as they travel through maritime shipping lanes. Rays can also become entangled in mooring, anchor lines, cables, and other underwater obstructions associated with shipping and DWPs.

When rays become entangled in these features, they can become ensnared by the head or cephalic fins and drown (Heinrichs et al. 2011).

Initial Effects Determination

The offshore pipelines and SPM buoy systems are within the range of the federally threatened giant manta ray. Although this species occurs across the Atlantic in isolated areas and along the Yucatan Peninsula, a small population of giant manta rays is also known within the Flower Garden Banks National Marine Sanctuary, approximately 160 miles east-northeast of the SPM Project Area (NOAA 2019b). Given the distance of known populations and the potential for the species to occur along vessel transit routes and in other areas of the northern GOM, the proposed Project *may affect, is not likely to adversely affect*, the giant manta ray.

3.3.2. Northern Aplomado Falcon

Biology and Habitat

The Northern aplomado falcon (*Falco femoralis septentrionalis*) is a medium-sized raptor with a weight of approximately 6 to 14 ounces, a body length of 14 to 18 inches, and a wingspan of 2.5 to 3 feet. Males and females have a similar appearance of rust-colored underparts, a gray back, a long-banded tail, and black markings on the top of the head, around the eyes, and extending down its face. The falcon was listed as endangered on February 25, 1986 (51 Federal Register 6690) and was formerly distributed across the southwestern United States and northern Central America (Peregrine Fund 2015; USFWS 2007). Landscape alterations and pesticide use may have led to its extirpation throughout much of its range in the United States; currently it is limited to reintroduced populations in the central portion of southeastern New Mexico and South Texas. Captive-bred Northern aplomado falcons have been released at select locations often referred to as "hack sites" with a goal of restoring the species to its historical range in the United States (USFWS 2014a). Some of these hack sites are located in south Texas at Brownsville and Matagorda Island, and in the Chihuahuan Desert region of west Texas (USFWS 2014a). Reintroduction efforts began in 1993, with current nesting pairs numbering between 16 and 20 (Chris Perez [USFWS] pers. comm. 2015). Captive-bred Northern aplomado falcons have also been released on private land in southwestern New Mexico. The population status in South Texas is stable to increasing (Birdlife International 2016). No critical habitat is designated for this species.

Northern aplomado falcons are permanent residents in South Texas occurring in savannas, open woodlands, grassy plains, coastal prairies, and desert grasslands. In the Gulf Coast region of Texas and Mexico, the species occupies coastal prairie habitat, coastal savannahs, marshes, and tidal flats with few trees, mesquite, yucca and cactus, or other tall succulent shrubs. In northern Mexico, southeastern Arizona, New Mexico, and west Texas, the species has a strong association with Chihuahuan desert grasslands with scattered tall yuccas (USFWS 2014a). In the southwestern U.S., the Northern aplomado falcon uses old nests of ravens and other raptors. Nests can be found in Spanish dagger (*Yucca treculeana*), mesquite (Prosopis spp.), and manmade structures like power poles. Nests built in Spanish dagger are typically 6 to 10 feet off the ground and average 1 to 3 feet in diameter. Nesting/breeding activities occur between February 1st and August 31st; however, this species is territorial, and pairs may stay near and defend their nest or nest site throughout the year. Their diet consists primarily of birds, but also includes insects, small snakes, lizards, and rodents (Keddy-Hector 2000).

There are no known TXNDD occurrences within the vicinity of the proposed Project Area (TXNDD 2019). The nearest populations, which were reintroduced into the region starting in 1978, occur near Brownsville, over 100 miles south of the Project Area, and in and near the Aransas National Wildlife Refuge (ANWR) on Matagorda Island and the northern end of San Jose Island, approximately 10 miles northeast of the

Project Area (USFWS 2014a). While the Project Area does contain coastal wetland and prairie habitat, there are minimal shrub and trees for perching and nesting, and consequently it is not considered prime nesting habitat for this species. Additionally, no nests or individuals were observed during SWCA's field survey; thus, the species is unlikely to occur in the Project Area.

Identified Threats

The greatest threat to the Northern aplomado falcon is habitat loss and degradation due to human and agricultural development. The conversion of grasslands to farmland and overgrazing by domestic livestock in its native habitat adversely impact the Northern aplomado falcon and its prey. The decline of the species is also attributed to the persistent use of pesticides (Keddy-Hector 2000). Strychnine poisoning was historically used as a method of pest control and killed many birds and mammals. Relay toxicity may have occurred through feeding and negatively impacted the Northern aplomado falcon population (TPWD 2019).

Initial Effects Determination

The Northern aplomado falcon historically ranges throughout northern Mexico and the southern tip of Texas, with the nearest population introduced to the ANWR in 1978 (USFWS 2014a). This population is located at least 10 miles from the Project Area, and there are no TXNDD documented occurrences within the Project Area (USFWS 2014a; TXNDD 2019). Therefore, it is SWCA's professional opinion that the project *may affect, is not likely to adversely affect* the Northern aplomado falcon.

3.3.3. Piping Plover

Biology and Habitat

The piping plover is a small, pale sand-colored shorebird with a weight of 1.5 to 2.5 ounces, a body length of 7 inches and a wingspan of 15 inches (Palmer 1967; Elliot-Smith and Haig 2004). Plumage differs in breeding and wintering seasons by the presence of a single black breast band, often incomplete, and a black bar across the forehead in the breeding season. The bill color may also turn from orange to black. The piping plover was listed as threatened in Texas wintering grounds on January 10, 1986 (USFWS 1985). The piping plover is a migratory species with a breeding distribution within the Great Lakes region and Atlantic coast and along central North America from Alberta, Canada to Colorado and Oklahoma (USFWS 2012b) with non-breeding or wintering distribution mainly coastal from North Carolina to Florida and the Gulf Coast states including Texas (USFWS 2012b).

Piping plovers nest on wide, gravelly beaches with little vegetation in alkali lakes and wetlands, inland lakes, reservoirs, and major rivers along the northern Atlantic coast, Great Lakes region, and around waterbodies of the Great Plains and Canada. Wintering habitat includes beaches, tidal sand flats, mud flats, algal mats, washover passes, and small dunes where they feed primarily on small invertebrates (Campbell 2003). The migration and wintering period may last as long as 10 months (mid-July through mid-May) (USFWS 2012b). Migration to breeding grounds may occur from mid-February through mid-May, with peak migrations in March (USFWS 2012b). The piping plover exhibits intra- and inter-annual wintering site fidelity (Drake et al. 2001; Noel and Chandler 2008; Stucker et al. 2010) and the mean-average home-range size for piping plovers in southern Texas is 4.9 square miles with a core area of 1.1 square miles. They may move 2 miles between sites within a season (Drake et al. 2001). Piping plovers can also be seen foraging along sandy, wet areas along waterways and wetland beaches. Wintering piping plovers forage on invertebrates located on top of the sand or just below the surface along wrack lines. Specific prey items may include polychaete marine worms, crustaceans, fly larvae, beetles, and bivalve mollusks (USFWS 2012b). The Texas wintering population census indicates a fluctuating to increasing trend in populations from 1,904 plovers in 1991 to 2,145 plovers in 2011 (Haig et al. 2005; USFWS 2012b). Fluctuations may

be due to localized effects of weather conditions; changes in roosting, foraging, or nesting habitats; or variance in survey efforts among observers.

Piping plovers nest on wide, gravelly beaches with little vegetation in alkali lakes and wetlands, inland lakes, reservoirs, and major rivers in the northern Atlantic coast, Great Lakes region, and around waterbodies of the Great Plains and Canada. Wintering habitat includes beaches, tidal sand flats, mud flats, algal mats, washover passes, and small dunes where they feed primarily on small invertebrates (Campbell 2003). The migration and wintering period may last as long as 10 months (mid-July through Mid-May) (USFWS 2012; USFWS 2012b). Migration to breeding grounds may occur from mid-February through mid-May, with peak migrations in March (USFWS 2012). The piping plover exhibits intra- and inter-annual wintering site fidelity (Drake et al. 2001; Noel and Chandler 2008; Stucker et al. 2010) and the mean-average home-range size for piping plovers in southern Texas is 4.9 square miles with a core area of 1.1 square miles. They may move 2 miles between sites within a season (Drake et al. 2001). Piping plovers can also be seen foraging along sandy, wet areas along waterways and wetlands beaches. Wintering piping plovers forage on invertebrates located on top of the sand or just below the surface along wrack lines. Specific prey items may include polychaete marine worms, crustaceans, fly larvae, beetles, and bivalve mollusks (USFWS 2012).

Critical habitat for the wintering population of piping plovers was designated July 10, 2001, and divided into 137 units across eight states (66 Federal Register 36038) (USFWS 2001). Critical habitat for the piping plover has been designated and revised based on current use and conditions of the habitat (USFWS 2012b). With revisions of critical habitats in North Carolina (USFWS 2008a) and Texas (USFWS 2009a) there are now 141 designated units, totaling 256,513 acres, still among eight states; 18 of these units are located along the Texas coastline and comprise 139,029 acres. Although these units are designated to protect essential life cycle needs of the species (i.e., primary constituent elements), these critical habitat units are protecting the wintering habitat of the species which are not associated with the leading threats to the species. The proposed Project crosses one identified piping plover critical habitat designated unit, referred to as TX-15-19 and totaling 5,257.25 acres. Twenty-five acres (0.47%) occurs within the proposed construction corridor (temporary and maintained ROW), areas that will ultimately be avoided via HDD (USFWS 2001). According to the USFWS (2001) this unit includes wind tidal flats that are infrequently inundated by seasonal winds and includes the tidal flats which are hydrologically connected to the South Bay. Beaches within the TX-15-19 unit reach from the mouth of Corpus Cristy Bay northward into the Aransas Bay all along San Jose Island.

There are 13 TXNDD occurrence records documenting wintering piping plover within the immediate Action Area, including known occurrences of the species in 1991 in the bayside flats of San Jose Island, extending from LAC up to and including North Pass (TXNDD 2019). SWCA utilized information from aforementioned studies to assess potential habitat and to verify its existence during field surveys. Vegetation communities occurring in the Action Area were inspected and evaluated for the potential occurrence of the piping plover. Suitable wintering habitat for the piping plover includes the unvegetated mud flats and algal flats occurring on the San Jose Island and Lydia Ann Island portions of the Action Area. These locations may potentially serve as stopover for migrating piping plovers. They contain wide sand banks, estuarine waters, and potential foraging habitat for piping plovers.

Field studies were conducted in early 2019 and no piping plovers were observed. Designated critical habitat for the piping plover is present throughout the surrounding coastal areas of the Project Area; therefore, the species may be present in the Action Area. The potential for impacts to the piping plover are discussed in Section 5.2.

Identified Threats

Population declines historically were due to hunting and currently are the result of habitat alteration at nesting grounds, nest depredation, and nest disturbance on beach habitat. Wintering habitats on the Gulf Coast are threatened by industrial activities, urban development, and maintenance activities for commercial waterways, with the potential for pollution from spills of petrochemicals or other hazardous materials also being a concern (Campbell 1995). Human activity on beaches can disturb wintering piping plovers and degrade habitat conditions (Campbell 1995; USFWS 2003b).

Initial Effects Determination

The project Action Area contains designated critical habitat along the eastern shore of San Jose Island (USFWS 2009a; TXNDD 2019; USFWS 2019b). Sightings recorded by the TXNDD are as close as 1 mile south and 1.4 miles north of the Project Area (TXNDD 2019). The beachfront of San Jose Island, containing critical habitat TX-16, will be strictly avoided during construction by use of specialized construction methods such as HDD. Therefore, it is SWCA's professional opinion that the project *may affect, is not likely to adversely affect* the piping plover.

3.3.4. Rufa Red Knot

Biology and Habitat

The rufa red knot is a medium-sized shorebird with a body length of 10 inches with distinctive red plumage during breeding season covering the face, breast, and upper belly. During the nonbreeding season, plumage shifts to predominately dusky gray above and whitish below (USFWS 2013a). The rufa red knot breeding range encompasses the central Canadian Artic and breeding takes place from late May to early August, with females of the species beginning a southward migration earlier than males of the species (USFWS 2015a). The species migrates annually between breeding grounds in the Canadian Arctic to various wintering locations spanning from northern Brazil, Tierra del Fuego at the southern tip of South America, the Southeast United States, and the Northwest Gulf of Mexico, including Texas. During both spring and fall migrations, the Texas Gulf Coast serves as a well-known stopover area for members of the species that winter in South America (USFWS 2013a).

Long-term systematic population surveys are lacking for this species, but current estimates suggest Texas wintering populations may range between approximately 50–2,000 with numbers increasing from survey counts in the early 1990s to recent counts in 2012 (USFWS 2014b). The increase in numbers does not necessarily reflect an increase in the population but may be due to an increase or variation in survey effort. Although rigorous population estimates are lacking preliminary trends indicate prolonged decline followed by stabilization of small populations (USFWS 2014b).

Wintering habitat for the species includes both coastal marine and estuarine habitats with large areas of exposed intertidal sediments (USFWS 2015a). The species prefers muddy or sandy coastal areas located in the mouths of bays, with a strong preference being given towards beaches. Along the Texas Gulf Coast specifically, the species will make regional movements between the Upper and Lower Laguna Madre in order to take advantage of periods of inundation and exposed flats (USFWS 2013a). The wintering and migration diet of the rufa red knot includes hard-shelled mollusks, small crustaceans, and marine worms found along beaches, oyster reefs, and exposed bay bottoms (USFWS 2013a, 2015a).

The species was listed as threatened on December 11, 2014 (USFWS 2014b). The primary threats to the species occur throughout its entire range. Population declines are currently due to habitat loss and vegetation shifts at nesting grounds, rapid sea level rise at nonbreeding locations, and human driven efforts

to stabilize shorelines. Wintering habitats on the Texas Gulf Coast are threatened by industrial activities, urban development, and maintenance activities for commercial waterways, with the potential for pollution from spills of petrochemicals or other hazardous materials also being a concern (Campbell 2003). Human activity on beaches can also disturb wintering rufa red knots and degrade habitat conditions (USFWS 2013a). Due to the recent listing of the species, no recovery plan or critical habitat has been established at this time. Field studies were conducted in winter 2019; no rufa red knots were observed. Habitat for the rufa red knot is present throughout the surrounding coastal areas of the Project Area; therefore, the species may be present in the Action Area. The potential for impacts to the rufa red knot are discussed in Section 5.2.

Identified Threats

The greatest threat to the rufa red knot population is habitat loss in the United States followed by reduction of preferred prey items in nesting areas and along migration routes (USFWS 2014b). Habitat alteration on nesting grounds, nest depredation, and nest disturbance on beach habitat also play a role in the decline of this species. Wintering habitats on the Gulf Coast are threatened by land development, industrial activities such as oil and gas exploration and development, as well as maintenance activities for commercial facilities, with the potential for pollution from spills of petroleum or other hazardous materials also being a concern.

Initial Effects Determination

There have been no TXNDD occurrences nor species sightings during SWCA field surveys in the Project Area (TXNDD 2019). However, the species is known to occur at Laguna Madre and Padre Island as well as Mustang Island, located south of the Project Area, and there is potential habitat on San Jose Island and Harbor Island. However, the species is more likely to occur in less developed portions of Harbor Island outside of the Project Area. While there is potential for occurrence in or near the Project Area, particularly at San Jose Island, there will be efforts to minimize construction impacts, such as HDD drilling for sensitive areas of San Jose Island. Therefore, it is SWCA's professional opinion that the Project *may affect, is not likely to adversely affect* the rufa red knot.

A detailed discussion of the environmental baseline for the rufa red knot within the Action Area and an analysis of potential direct and indirect effects of the Proposed Action are provided in Section 4.3 and 5.2, respectively.

3.3.5. Whooping Crane

Biology and Habitat

The whooping crane occurs only in North America and is North America's tallest bird, with males approaching 5 feet when standing erect. The whooping crane adult plumage is snowy white except for black primaries, black or grayish alula (specialized feathers attached to the upper leading end of the wing), sparse black bristly feathers on the carmine crown and malar region (side of the head from the bill to the angle of the jaw), and a dark gray-black wedge-shaped patch on the nape (USFWS 2007). The whooping crane was listed as endangered on March 11, 1967 (32 Federal Register 4001) and whooping crane critical habitat was designated on August 17, 1978.

Whooping cranes currently exist in the wild at three locations and in captivity at 12 sites. The July 2010 total wild population was estimated at 383. There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park (WBNP) population, which nests in WBNP and adjacent areas in Canada, and winters in coastal marshes in Texas. The whooping crane nests within and directly adjacent to WBNP in the Northwest Territories and Alberta provinces of Canada, and winters mainly in and adjacent to ANWR

along the central Texas coast in Aransas, Calhoun, and Refugio Counties. The cranes migrate during spring and fall through an approximately 200-mile-wide corridor between ANWR and WBNP (**Figure 7**). The migration corridor basically follows a straight line through the Great Plains, with the cranes traveling through Alberta, Saskatchewan, extreme eastern Montana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas (CWS and USFWS 2007). Whooping cranes migrate primarily during daylight hours, relying heavily on tailwinds and thermal currents to aid their flight. They normally migrate at altitudes between 1,000 and 6,000 feet (Kuyt 1992) and typically fly from 200 to 400 miles per day and land at night. Approximately 12 to 15 stopovers are made during migration (Kuyt 1992). The birds begin to arrive at their wintering grounds in mid-October, with most birds arriving from late October through mid-November (CWS and USFWS 2007). Spring migration generally begins in late March, with some birds remaining on the wintering grounds into early May.

Whooping cranes use a variety of habitats during migration, including croplands for feeding and wetlands for roosting (Howe 1987, 1989; Lingle et al. 1991). Austin and Richert (2001) report that migrant whooping cranes observed at feeding sites have primarily been recorded in upland crop fields, including row crop stubble, small grain stubble, and green crops such as winter wheat (*Triticum aestivum*) and alfalfa (*Medicago sativa*). Whooping cranes have also been observed feeding in palustrine wetlands, seasonally flooded habitats, permanent water, pastures, and meadows (Austin and Richert 2001).

Austin and Richert (2001) report that migrant whooping cranes roost predominantly in palustrine or riverine wetland systems, with these types of wetlands accounting for 91.5% of roost sites recorded. Most palustrine roost sites were adjacent to cropland or grassland; less than 8% of palustrine roost sites were reported as occurring adjacent to woodland (Austin and Richert 2001). When using riverine habitat, whooping cranes roost on submerged sandbars in wide, unobstructed channels ranging from 249 to 1,500 feet wide (Armbruster 1990). Austin and Richert (2001) report that remaining roost sites were mostly lacustrine wetlands (7.8% of occurrences) or flooded cropland (2.8% of occurrences). Studies of whooping cranes in migration indicate that they prefer to roost in wetlands that are less than 10 acres in size, have good horizontal visibility, have water depth of 12 inches or less, and generally occur adjacent (or within 0.62 mile) of cropland feeding areas (Howe 1987, 1989; CWS and USFWS 2007). Studies cited by USFWS (2007b) suggest landscapes characterized as "wetland mosaics" provide the most suitable stopover habitat.

Although there are no known TXNDD occurrences for whooping crane within the Action Area, it is known to inhabit Aransas County, Texas during the winter (TXNDD 2019). Wintering crane territories have expanded to the north and south (Stehn and Prieto 2010). Wintering cranes have occupied suitable estuarine wetlands as close as the northern end of San Jose Island, approximately 7 miles north of the northern end of the Action Area. However, no cranes have established wintering territories on the south end of San Jose Island, but the habitat appears suitable (Stehn and Prieto 2010). At the end of the fall migration, cranes occasionally have been documented on Mud Island (3 miles to the north of the Action Area) and in Redfish Bay (4 miles west of the Action Area) south of the current range, as well as on Harbor Island, immediately across from the south end of San Jose Island, within the immediate Project vicinity (Stehn and Prieto 2010). These areas may be colonized in the near future. However, black mangrove grows extensively in that area. In the past, the northernmost range of mangrove stopped just south of the whooping crane winter range, except for scattered colonies as far north as Galveston, Texas (Stehn and Prieto 2010). Starting in the 1990s, with no prolonged hard winter freezes to limit the northward spread, mangrove is now found in portions of the current crane winter range on northern portions of Matagorda Island. This presumably makes the habitat less suitable for the birds and could increasingly become a major threat to whooping cranes if predicted climate change reduces winter freezes in the Aransas area (Stehn and Prieto 2010).

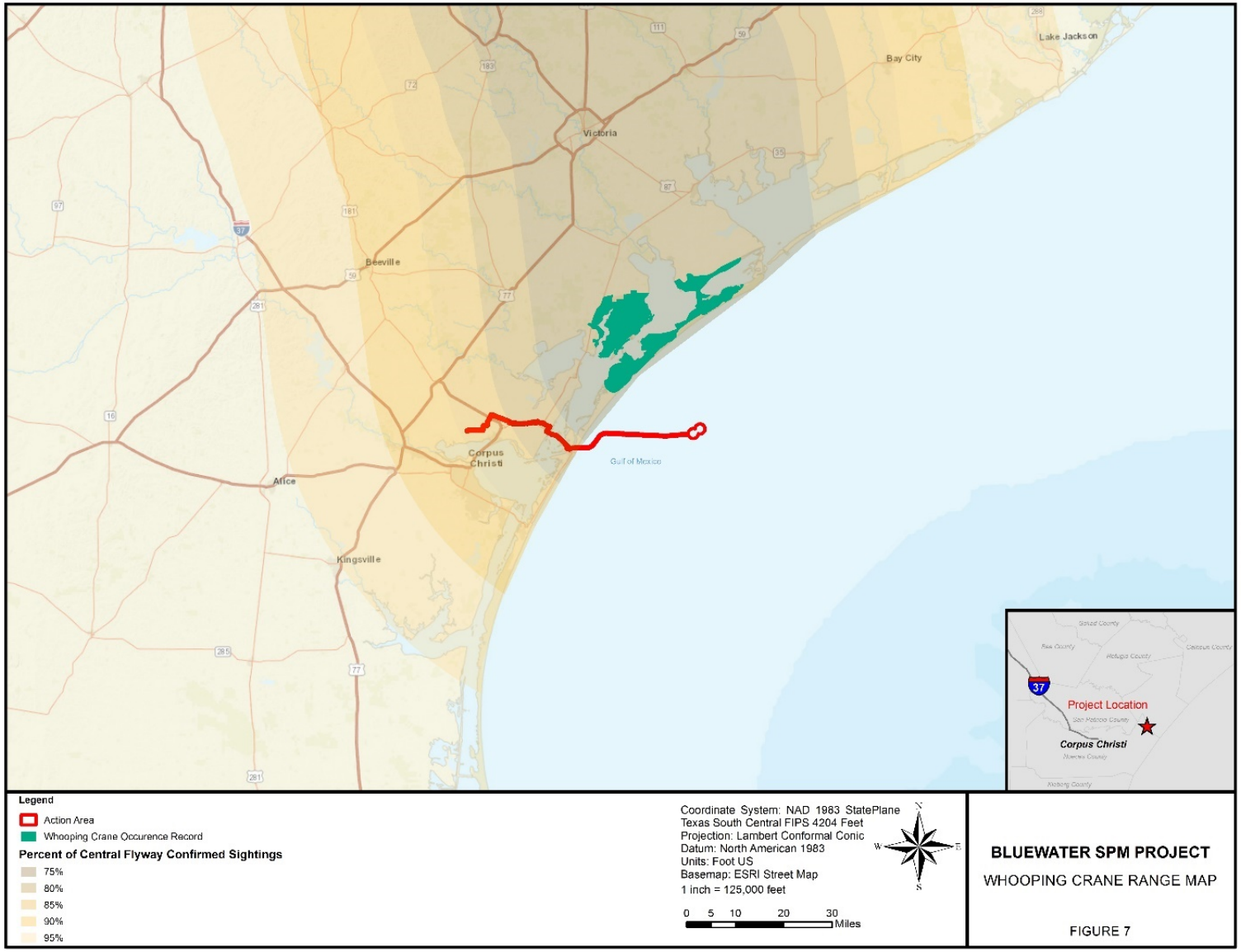

Figure 7. Whooping crane range within Texas Gulf Coast.

There are no known TXNDD occurrences for the whooping crane within the vicinity of the proposed Project Area (TXNDD 2019). The Project Area does not occur within the nesting grounds (Northwest Territories and Alberta) or wintering grounds (Aransas, Calhoun, and Refugio Counties) used by the whooping cranes; however, the Project Area in Aransas, Nueces, and San Patricio Counties does occur within the whooping crane migratory corridor. The Project will be located within the whooping crane migratory corridor band that accounts for 80-85% of whooping crane sightings (see **Figure 7**). The Project Area includes small palustrine emergent wetlands that more than likely lack the adequate invertebrate and other forage to sustain whooping cranes. The majority of the wetlands present within the Project Area are extremely vegetated and would not be preferred by the species.

Field studies were conducted in the winter of 2019 and no whooping cranes were observed. Suitable whooping crane habitat is present on the San Jose Island portion of the Action Area, as well as throughout the surrounding coastal areas of the Project Area; therefore, the species may be present in the Action Area. The potential for impacts to the whooping crane are discussed in Section 5.2.

Identified Threats

The main threat to whooping cranes in the wild is the potential of a hurricane or contaminant spill destroying their wintering habitat on the Texas Gulf Coast. Collisions with power lines and fences are known hazards to wild whooping cranes. Historic population declines resulted from habitat destruction, shooting, and displacement due to human activities.

Initial Effects Determination

The proposed Action Area lies immediately adjacent to the wintering range of the whooping crane and there are records of known occurrences in Mud Island, Harbor Island, and San Jose Island in Aransas County, as well as Redfish Bay in Aransas and San Patricio Counties. In addition, high quality wintering foraging habitat, including beaches, algal flats, unvegetated mud flats, estuarine wetlands, and shallow estuarine open water areas occurs in the eastern portion of the Action Area. Thus, the Proposed Action *may affect, is not likely to adversely affect* this species.

A detailed discussion of the environmental baseline for whooping crane within the Action Area and an analysis of potential direct and indirect effects of the Proposed Action are provided in Sections 4.3 and 5.2, respectively.

3.3.6. Fin Whale

Biology and Habitat

Fin whales are the second-largest species of whale, with a maximum length of about 75 feet in the Northern Hemisphere, and 85 feet in the Southern Hemisphere. Fin whales are found in deep, offshore waters of all major oceans, primarily in temperate to polar latitudes (Davis et al. 2002). They are less common in the tropics. They occur year-round in a wide range of locations, but the density of individuals in any one area changes seasonally. Most migrate from the Arctic and Antarctic feeding areas in the summer to tropical breeding and calving areas in the winter. The location of winter breeding grounds is not known. Fin whales travel in the open seas, away from the coast, so they are difficult to track (NMFS 2015). There are an estimated 2,700 fin whales in the North Atlantic and GOM (NOAA 2019e). NMFS manages the Western North Atlantic stock of fin whales, and individuals have been documented in continental shelf waters during aerial surveys (Hayes 2017b).

Identified Threats

Fin whales are typically found in deep, offshore waters and occurrence in the Proposed Project area is unlikely; however, this species has been observed in continental shelf waters and it is possible that a fin whale could transit the proposed Project Area. If a fin whale were to occur in the proposed Project Area, the greatest potential for impacts will be due to vessel strikes and noise associated with pile-driving during construction. In addition, marine mammals in the vicinity could be exposed to oil in the event of an oil spill during operation of the SPM buoy systems. The potential impacts and mitigation for these activities are further discussed in Section 8 of this report, in the Marine Mammal Protection Act Assessment portion of the MARAD/USCG permit application, and in Volume II – Section 8: Wildlife and Protected Species of the MARAD/USCG Permit Application.

Initial Effects Determination

Given the low likelihood of occurrence in the proposed Project Area and BWTT's proposed mitigation (including use of applicable Notices to Lessees (NTLs) and pending consultation with NMFS regarding pile-driving noise), the proposed Project *may affect, is not likely to adversely affect* the fin whale.

3.3.7. Sei Whale

Biology and Habitat

Sei whales have a cosmopolitan distribution and occur in sub-tropical, temperate, and sub-polar waters around the world. This species may unpredictably and randomly occur in a specific area, sometimes in large numbers. These events may occur suddenly and then not occur again for long periods of time. Populations of sei whales, like other rorquals, may seasonally migrate toward the lower latitudes during the winter and higher latitudes during the summer (NMFS 2015).

Identified Threats

Underwater noise threatens whale populations, interrupting their normal behavior and driving them away from areas important to their survival. Increasing evidence suggests that exposure to intense underwater sound in some settings may cause some whales to strand and ultimately die (NMSF 2015). Drilling for oil and gas generally produces low-frequency sounds with strong tonal components in frequency ranges in which large baleen whales communicate. There are few data on the noise from conventional drilling platforms, but recorded noise from an early study of one drilling platform and three combined drilling production platforms found that noise was so weak it was almost undetectable alongside the platform at Beaufort scale sea states of three or above. The strongest tones were at low frequencies, near 5 hertz (Hz) (Richardson et al. 1995). The movements of sei whales are not well known; however, individuals prefer temperate waters in the mid-latitudes and are typically observed in deeper waters far from the coastline (NOAA 2019f). However, they occasionally enter shallower, more inshore waters (Hayes 2017a). The Nova Scotia stock of sei whales is estimated at 357 individuals; however, NMFS does not track a GOM stock of this species (Hayes 2017a).

Given that sei whales are typically observed in deeper waters, it is unlikely that this species will occur in the proposed Project Area; however, sei whales occasionally enter shallower waters and could enter the waters near the SPM buoy systems. If a sei whale were to occur in the proposed Project vicinity, the greatest potential for impacts will be due to vessel strikes and noise associated with pile-driving during construction. In addition, marine mammals in the vicinity could be exposed to oil in the event of an oil spill during operation of the SPM buoy systems. The potential impacts and mitigation for these activities are further

discussed in Section 8.5 of this report and in the Marine Mammal Protection Act Assessment contained in the MARAD/USCG permit application.

Given the low likelihood of occurrence in the proposed Project Area and BWTT's Proposed mitigation (including use of applicable NTLs and pending consultation with NMFS regarding pile-driving noise), the proposed Project *may affect, is not likely to adversely affect* the sei whale.

3.3.8. Green Sea Turtle

Biology and Habitat

The green sea turtle grows to a maximum size of about 4 feet and a weight of 440 pounds. It has a heart-shaped shell, small head, and single-clawed flippers with variable color. Hatchlings generally have a black carapace, white plastron, and white margins on the shell and limbs. The adult carapace is smooth, keelless, and light to dark brown with dark mottling; the plastron is whitish to light yellow. Adult heads are light brown with yellow markings (USFWS 2019c; Witherington et al. 2006a). Identifying characteristics include four pairs of costal scutes, none of which borders the nuchal scute, and only one pair of prefrontal scales between the eyes (USFWS 2019c). The green sea turtle was listed as threatened and critical habitat was designated (50 Federal Register 226) on July 28, 1978.

The green sea turtle has a worldwide distribution in tropical and subtropical waters. Major green sea turtle nesting colonies in the Atlantic occur on Ascension Island, Aves Island, Costa Rica, and Surinam. Within the United States, green sea turtles nest in small numbers in the Virgin Islands, Puerto Rico, Georgia, South Carolina, and North Carolina, and in larger numbers in Florida and Hawaii. The Florida green sea turtle nesting aggregation is recognized as a regionally significant colony. Nest numbers in Florida have ranged from 435 laid in 1993 to 13,225 in 2010, which likely represents over 5,000 females nesting in 2010 (USFWS 2019c; Witherington et al. 2006a).

In the U.S. Pacific, over 90% of nesting throughout the Hawaiian archipelago occurs at French Frigate Shoals, where an average of 390 females nested annually from 2000-2009. Elsewhere in the U.S. Pacific, nesting takes place at scattered locations in the Commonwealth of the Northern Marianas, Guam, and American Samoa. Along the coast of Texas, green sea turtles are known to nest on barrier islands on the middle coast and lower coast, especially at Padre Island National Seashore (PINS) (USFWS 2019c).

Hatchling green sea turtles eat a variety of plants and animals, but adults feed almost exclusively on seagrasses and marine algae. The species is generally found in reefs, bays, inlets and estuaries, especially dominated by sea grasses (submerged aquatic vegetation) and algae. The green sea turtle migrates in deeper marine waters; open beaches with gradual slopes and minimal disturbance are required for nesting (USFWS 2019c).

Along the coast of Texas, green sea turtles are known to nest on barrier islands on the middle coast and lower coast, especially at PINS (USFWS 2019c). This species is common in inshore waters of Texas foraging on seagrass and algae (Dixon 2014). During the 2017-2018 winter, numerous green sea turtles were found cold stunned within the Project Area on both sides of the island. Many of these animals were taken to rehabilitation centers and released once temperatures were brought back to normal (Turtle Island Restoration Network 2018). The species is therefore known to exist within the Project Area.

There are 11 TXNDD occurrence records for the green sea turtle within the Project vicinity, including three records from as recently as 2008 (TXNDD 2019). Some of the occurrence records for green sea turtles are from the immediate Action Area, including the coastal bays between Rockport and Port Ingleside, both sides of San Jose Island, and the Port Aransas Jetty. Submerged aquatic vegetation communities occurring

in the Action Area were inspected and determined to be suitable foraging and resting habitat for the green sea turtle. It was determined that the beach areas in the Action Area were suitable for green sea turtle nesting, mainly due to the presence of extensive, somewhat undisturbed (when compared to other parts of the Texas Coast) beach areas.

Field studies were conducted during the winter months of 2019 and during this time the species was not observed in or around the Project Area. However, it is known to occur in and has several occurrences documented within 5 miles of the Project Area in 2004 and 2008 (TXNDD 2019). In addition, SWCA biologists observed this species in the LAC adjacent to San Jose Island in September 2016. The species is common along the Texas coast in nearshore waters, such as at the PINS, and future occurrences are likely (Landry 2010; NPS 2019).

Identified Threats

A major factor contributing to the green sea turtle's decline worldwide is commercial harvest for eggs and meat. Fibropapillomatosis, a disease of sea turtles characterized by the development of multiple tumors on the skin and internal organs, is also a mortality factor and has seriously affected green sea turtle populations. The tumors interfere with swimming, eating, breathing, vision, and reproduction, and turtles with heavy tumor burdens may become severely debilitated and die (USFWS 2019c; Witherington et al. 2006a). Other threats include loss or degradation of nesting habitat from coastal development and beach replenishment and nourishment projects, as well as bulkheading and beach armoring; disorientation of hatchlings by beachfront lighting; nest predation by native and non-native predators; degradation of foraging habitat; marine pollution and plastic debris; watercraft strikes; and incidental take from channel dredging and commercial fishing operations (USFWS 2019c).

Initial Effects Determination

The green sea turtle is known to occur in the Action Area, with suitable nesting habitat present on San Jose Island and foraging areas in nearby waters. There will be no effects on beach habitat in the Action Area because it will be avoided via HDD construction methods. There are no anticipated effects to food sources given avoidance of construction in seagrass beds that occur in the Action Area. Furthermore, biological monitors will be present to ensure there will be no unanticipated take of green sea turtles during offshore construction. Consequently, the project *may affect, but is not likely to adversely affect* green sea turtle in the terrestrial and marine environments.

A detailed discussion of the environmental baseline for green sea turtle within the Action Area and an analysis of potential direct and indirect effects of the Proposed Action are provided in Sections 4.8 and 5.4, respectively.

3.3.9. Kemp's Ridley Sea Turtle

Biology and Habitat

The Kemp's Ridley sea turtle is one of the smallest sea turtles in the world. Adults reach about 2 feet in length and about 100 pounds in weight and have an oval-shaped carapace that is almost as wide as it is long and is usually olive-gray in color. The carapace usually has five pairs of costal scutes. In each bridge adjoining the plastron to the carapace, there are four inframarginal scutes, each of which is perforated by a pore. The head has two pairs of prefrontal scales (USFWS 2019e).

Recent hatchlings are black on both the upper and lower surfaces of the carapace. The most distinguishing feature of the Kemp's Ridley is its triangular-shaped head with a moderately-hooked beak with large

crushing surfaces. This turtle is a shallow water benthic feeder with a diet consisting primarily of crabs and other crustaceans (Schmid and Barichivich 2006; Meylan 2006; USFWS 2019e). The species was listed as endangered (35 Federal Register 18319) on December 2, 1970. Critical habitat has not been designated for this species.

The species is found in the GOM in Mexico and the United States, as well as the Atlantic coast from Florida to New Jersey, with sightings as far north as Newfoundland. Nesting is limited to the beaches of the western Gulf of Mexico, primarily in the Mexican States of Tamaulipas and Veracruz, with a few historical records from Campeche. Nesting also occurs regularly along the Texas coast and infrequently in other states. Possibly precipitated by strong winds and changes in barometric pressure, the females often nest in synchronized emergences, known as arribadas or arribazones, primarily during daylight hours and clutch size averages 100 eggs. Some females breed annually and nest an average of 2.5 times in a season at intervals of 14 to 28 days. Sexual maturity is believed to be reached at about 12 years (USFWS 2019e; Schmid and Barichivich 2006) This species occupies nearshore and offshore waters of the northern Gulf of Mexico outside of nesting season (Landry n.d.; USFWS 2019e).

The Kemp's Ridley is one of the rarest sea turtles in the world. Its numbers precipitously declined after 1947, when over 40,000 nesting females were estimated in a single arribada. The nesting population produced a low of 702 nests in 1985; however, since the mid-1980s, the number of nests laid in a season has been increasing primarily due to nest protection efforts and implementation of regulations requiring the use of turtle excluder devices in commercial fishing trawls. In 2011, a total of 20,570 nests were documented in Mexico, 81% of these nests were documented along the 18.6 miles of coastline patrolled at Rancho Nuevo (USFWS 2019e). In addition, 199 nests were recorded in the United States in 2011, primarily in Texas (Peterson 2014; USFWS 21019e). Known nesting areas include the PINS, as well as the Gulf-side of San Jose and Mustang Islands (Landry n.d.; Peterson 2014; USFWS 2019e).

Outside of nesting, turtles are usually found in the nearshore and inshore waters of the northern Gulf of Mexico. Adults and sub-adults primarily occupy nearshore habitats that contain muddy or sandy bottoms where prey can be found. Hatchlings and small juveniles enter the water and quickly swim offshore to open ocean developmental habitat where they associate with floating *sargassum* (*Sargassum sp.*) seaweed. They passively drift within the *Sargassum*, feeding on a wide variety of floating items. Some of these juvenile turtles remain within Gulf of Mexico while others are swept out of the Gulf and into the Atlantic Ocean by the Gulf Stream (USFWS 2019e). This developmental period is estimated to last for a few years, at which time these sub-adult turtles return to shallow-water zones of the northern Gulf of Mexico or northwestern Atlantic Ocean where they feed and continue growing until they reach adulthood.

There are 19 TXNDD occurrence records for the Kemp's Ridley sea turtle within the Project vicinity; however, no date of occurrence data and no locational data are included with the records (TXNDD 2019). SWCA assessed the Action Area's potential for providing suitable habitat for the Kemp's Ridley sea turtle and attempted to verify its existence during field surveys. Submerged aquatic vegetation communities occurring in the Action Area were inspected and determined to be suitable foraging and resting habitat for this species. It was determined that the beach areas on the San Jose Island portion of the Action Area were suitable for species nesting, mainly due to the extensive sandy, somewhat undisturbed (when compared to other parts of the Texas Coast) beach areas.

Identified Threats

The primary threat to this species has been and continues to be direct human predation on adults and eggs for food, as well as incidental capture in commercial fishing and shrimping operation. In addition, coastal industrial and residential land development continues to threaten the animal's existence. Today, under strict

protection, there is some cause for optimism that the Gulf population of the Kemp's Ridley has stabilized and is on is on its way to recovery (Schmid and Barichivich 2006; USFWS 2019e).

Initial Effects Determination

While the species may occur in the Project Area, particularly along San Jose Island, there will be no effects on beach habitat in the Action Area because it will be avoided via HDD construction methods. This species is relatively common in inshore waters of Texas and has a broad preference for hard-shelled marine invertebrates not limited to the vicinity of the Project Area. Individuals would be able to continue foraging outside the Project Area and after the temporary disturbance of offshore construction activities. The sediment plume associated with offshore construction activities will be localized and temporary, and thus not expected to appreciably affect foraging activities of the Kemp's Ridley sea turtle. Biological monitors will be present to ensure there will be no unanticipated take of this species during construction activities. Consequently, the Project *may affect, is not likely to adversely affect* the Kemp's Ridley sea turtle in the terrestrial and marine environments.

A detailed discussion of the environmental baseline for Kemp's Ridley sea turtle within the Action Area and an analysis of potential direct and indirect effects of the Proposed Action are provided in Sections 4.5 and 5.4, respectively.

3.3.10. Loggerhead Turtle

Biology and Habitat

Loggerheads 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. Adults can reach three feet in length and up to 250 pounds in weight (Witherington et al. 2006b). The carapace is slightly heart-shaped and reddish-brown in adults and sub-adults, while the bottom shell (plastron) is generally a pale yellowish color. The neck and flippers are usually dull brown to reddish brown on top and medium to pale yellow on the sides and bottom. Hatchlings lack the reddish-brown coloration of adults and juveniles. Their flippers are dark gray to brown above with white to white-gray margins. The coloration of the plastron is generally yellowish to tan (Witherington et al. 2006b). The loggerhead turtle was originally listed as threatened throughout its range on July 28, 1978. On September 22, 2011, the listing was revised to include separate listings for seven distinct population segments (DPSs); loggerhead turtles found in the Gulf of Mexico were designated part of the Northwest Atlantic Ocean DPS and continued to be designated as threatened. Critical terrestrial nesting habitat for the species was designated (79 FR 39755) on August 11, 2014 for areas in North Carolina, South Carolina, Georgia, Florida, Alabama, and Mississippi. Critical marine habitat for the species was also designated (79 Federal Register 39855) on August 11, 2016.

Loggerhead turtles are found throughout the world in mid-latitude warm ocean waters. The turtle is found throughout the Gulf of Mexico, with more nesting occurring from Mississippi to Florida; occasional nesting occurs in the western Gulf (Witherington et al. 2006b). Adult loggerheads are known to make considerable migrations between foraging areas and nesting beaches. During non-nesting years, adult females from U.S. beaches are distributed in waters off the eastern U.S. and throughout the Gulf of Mexico, Bahamas, Greater Antilles, and Yucatan. Mean clutch size varies from about 100 to 126 along the southeastern U.S. coast. Incubation duration ranges from about 42 to 75 days, depending on incubation temperatures, but averages 55-60 days for most clutches in Florida (Witherington et al. 2006b). Hatchlings generally emerge at night. Remigration intervals of 2 to 3 years are most common in nesting loggerheads, but remigration can vary from 1 to 7 years. Age at sexual maturity is believed to be about 32 to 35 years.

The loggerhead is widely distributed within its range. It may be found hundreds of miles out to sea, as well as in inshore areas such as bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers. Coral reefs, rocky places, and shipwrecks are often used as feeding areas. Nesting occurs mainly on open beaches or along narrow bays having suitable sand, and it is often in association with other species of sea turtles. Most loggerhead hatchlings originating from United States' beaches are believed to lead a pelagic existence in the North Atlantic gyre for an extended period of time, perhaps as long as 7 to 12 years, and are best known from the eastern Atlantic near the Azores and Madeira. Post-hatchlings have been found floating at sea in association with *Sargassum* rafts. Once they reach a certain size, these juvenile loggerheads begin recruiting to coastal areas in the western Atlantic where they become benthic feeders in lagoons, estuaries, bays, river mouths, and shallow coastal waters. These juveniles occupy coastal feeding grounds for about 13 to 20 years before maturing and making their first reproductive migration, the females returning to their natal beach to nest (Witherington et al. 2006b).

During the 2018 nesting period, six loggerhead nests were identified along the Texas coast, including three in the PINS (NPS 2019). Nesting of this species occurs from April through September, peaking in June and July across the southeastern coast of the United States (USFWS 2019c). The species is known to occur in the Project Area, with the last TXNDD occurrence approximately 7.5 miles southwest in Corpus Christi Bay in 2009 (TXNDD 2019). Loggerhead sea turtles are known to occur in the inshore Texas waters in relative abundance (NMFS and USFWS 2007; Landry 2010). Nesting occurrences have been documented at the PINS, located south of the Project Area, and thus are anticipated to continue to occur in the region (SpaceX 2013).

Critical habitat for the Northwest Atlantic Ocean DPS was designated in 2014 to protect both marine and terrestrial habitats. While the terrestrial critical habitat is restricted to the Florida coast, critical marine habitat includes *Sargassum* habitats, for the protection of post-hatchlings and juveniles. As Sargassum forms floating mats and travels with the Loop Current in the Gulf of Mexico, critical habitat was established to account for the edge of the Loop Current (**Figure 8**) (NOAA 2014). The Project is located outside of final critical habitat for the species (USFWS 2019b).

Field studies were conducted in late winter of 2019. No loggerhead turtles were identified in the Action Area; however, since the area is actively utilized by green sea turtles, it is possible that the area would also be utilized by the loggerhead turtle.

Identified Threats

Threats to existence of this species include loss or degradation of nesting habitat from coastal development and beach armoring; disorientation of hatchlings by beachfront lighting; nest predation by native and non-native predators; degradation of foraging habitat; marine pollution and debris; watercraft strikes; disease; and incidental take from channel dredging and commercial trawling, long-line, and gill net fisheries (Witherington et al. 2006b). There is particular concern about the extensive incidental take of juvenile loggerheads in the eastern Atlantic by long-line fishing vessels from several countries.

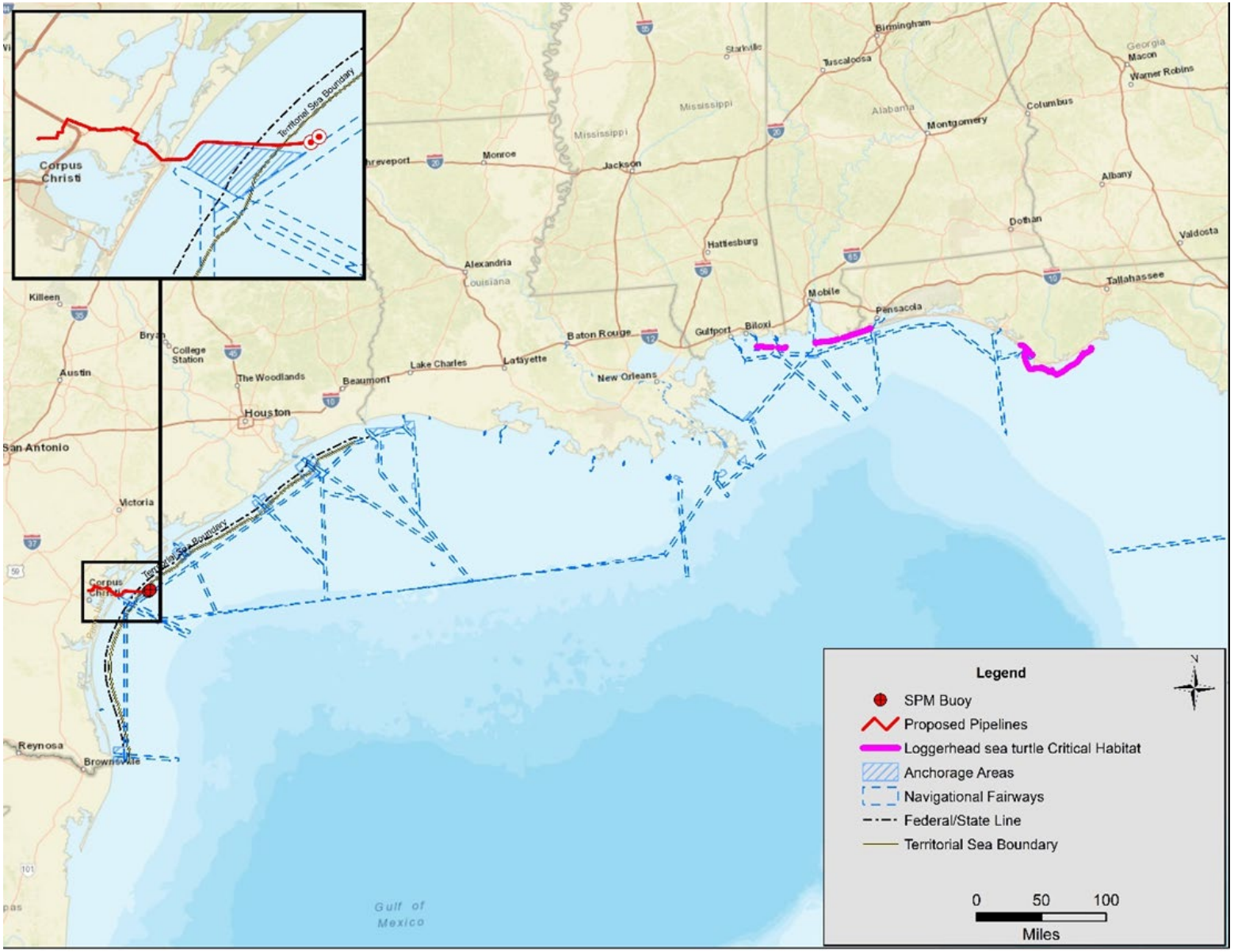

Figure 8. Loggerhead sea turtle critical habitat map (Source: BOEM 2019).

Initial Effects Determination

In the terrestrial environment, suitable beach nesting habitat is present in the Action Area at San Jose Island. There will be no effects on beach habitat in the Action Area because it will be avoided via HDD construction methods. This species is known to inhabit the inshore waters of Texas and has a broad preference for hard-shelled marine invertebrates not limited to the vicinity of the survey area, and individuals would be able to continue foraging outside and after the temporary disturbance of offshore construction activities. The sediment plume associated with offshore construction activities will be localized and temporary, and thus is not expected to affect foraging activities of the loggerhead sea turtle. Additionally, biological monitors will be present to ensure there will be no unanticipated take of loggerhead sea turtles during offshore construction. Consequently, the Project *may affect, is not likely to adversely affect* the loggerhead sea turtle in the terrestrial and marine environments.

A detailed discussion of the environmental baseline for loggerhead sea turtle within the Action Area and an analysis of potential direct and indirect effects of the Proposed Action are provided in Sections 4.8 and 5.4, respectively.

3.3.11. Hawksbill Sea Turtle

Biology and Habitat

The hawksbill sea turtle gets its name from its hawk-like beak and are typically small to medium sized (NMFS and USFWS 2013a; SpaceX 2013; Herps of Texas 2019c). They are not generally deep divers compared to other sea turtle species, and thus are often found in shallow coastal areas as opposed to the open ocean (NMFS and USFWS 2013a). While they occupy different marine environments throughout their lifecycle, such as shallow coastal areas and lagoons, they prefer coral reefs where there is adequate shelter from predators and areas for resting. They feed primarily on sponges but will also feed on other invertebrates and algae (NMFS and USFWS 2013a; SpaceX 2013). This species generally occurs in rocky areas, coral reefs, shallow coastal areas, lagoons or ocean islands, and narrow creeks or passes. They generally prefer shallow waters less than 65 feet. Hatchlings often occur in pelagic environments within Sargassum mats where they can feed on a variety of floating flora and fauna within the Sargassum. Nesting occurs between April and November on undisturbed deep-sand beaches within the tropics (USFWS 2019e).

There is one TXNDD occurrence record in the Project Area, near Port Aransas in 1958 (TXNDD 2019). The Project is located outside of final critical habitat (USFWS 2019b). The Project Area does not contain their preferred habitat and food source of coral reefs and sponges, and therefore they are unlikely to occur even though they have historically been seen nearby.

Identified Threats

Current threats to the hawksbill sea turtle are primarily from the illegal human exploitation of the hawksbill sea turtle shell, nest predation by native and non-native predators, degradation of foraging habitat, watercraft strikes, incidental takes from commercial fishing operations, and marine pollution and debris (USFWS 2019e). Although the species is not currently known to nest in the Project Area or occur in inshore waters, it may be present in offshore waters as it feeds, rests, and travels. Given the potential for inadvertent vessel strikes during construction and/or operation, and impacts to Sargassum within the Project Area, the proposed Project *may affect, is not likely to adversely affect* the hawksbill sea turtle.

Initial Effects Determination

In the terrestrial environment, suitable beach nesting habitat is present in the Action Area at San Jose Island, though the species is not known to nest in Texas (SpaceX 2013). There will be no effects on the beach habitat because it will be avoided via HDD construction methods. The preferred prey species, sponges, are uncommon in this portion of the Gulf of Mexico and the sediment plume associated with offshore construction activities will be localized and temporary, thus construction activities are not anticipated to affect foraging activities of this species. Biological monitors will be present to ensure there will be no take of hawksbill sea turtle during offshore construction. Consequently, the Project *may affect, but is not likely to adversely affect* the species.

A detailed discussion of the environmental baseline for hawksbill sea turtle within the Action Area and an analysis of potential direct and indirect effects of the Proposed Action are provided in Sections 4.5 and 5.4, respectively.

3.3.12. Leatherback Sea Turtle

Biology and Habitat

The leatherback sea turtle has a global distribution, found in the tropical waters of the Atlantic, Pacific, Indian oceans, and Gulf of Mexico (NMFS and USFWS 2013b; SpaceX 2013; NOAA 2019). This species prefers pelagic habits and is known to be the most pelagic of all sea turtles and feed primarily on soft-bodied animals such as jellyfish and sea squirts; however, they are also known to consume sea urchins, crustaceans, fish, and floating seaweed. Nesting occurs from March to July on beaches backed with vegetation that are sloped so that distance to dry sand is minimal (USFWS 2019f). They can migrate significant distances, known to travel up to 6,800 miles from their breeding areas (USFWS 2013While the species has been seen along the Texas Gulf Coast, the region is not part of their major nesting range (NMFS and USFWS 2013).

There have been no TXNDD occurrences in the Project vicinity (TXNDD 2019). Additionally, the species is known to prefer deeper waters of the open ocean and are not commonly found in nearshore areas such as the Project Area (SpaceX 2013). The Project is located outside of final critical habitat for this species (USFWS 2019b). Thus, while the species has been known to occur in the Gulf of Mexico, they are unlikely to occur in the Project Area.

Identified Threats

Current threats to the leatherback sea turtle include human exploitation of eggs and meat, incidental take by commercial fisheries, degradation of nesting habitat resulting from coastal development, disorientation resulting from artificial lighting, nest predation, degradation of foraging habits, vessel strikes, and marine pollution and debris. No elemental occurrences of this species were reported by TPWD during the TXNDD (2019) search and no nesting is anticipated to occur in the Project Area.

Initial Effects Determination

In the terrestrial environment, suitable beach nesting habitat is present in the Action Area at San Jose Island. However, the probability of a nesting occurrence is very low given the rarity of nesting on the Texas coast and the very few sightings of these species in near-shore marine environments (NMFS and USFWS 2013b; SpaceX 2013). There will be no effects on the beach habitat because it will be avoided via HDD construction methods. The leatherback sea turtle prefers jellyfish, of which some species do occur in the area. The sediment plume associated with offshore construction activities will be localized, temporary, and

thus not expected to affect foraging activities of these sea turtle species. Biological monitors will be present to ensure there will be no take of leatherback sea turtles during Project activities.

Given the potential for inadvertent vessel strikes during construction and/or operation, and impacts to *Sargassum* within the Project area, the proposed Project *may affect, is not likely to adversely affect* the leatherback sea turtle.

A detailed discussion of the environmental baseline for the leatherback sea turtle within the Action Area and an analysis of potential direct and indirect effects of the Proposed Action are provided in Sections 4.5 and 5.4, respectively.

4. ENVIRONMENTAL BASELINE WITHIN ACTION AREAS

This section includes a discussion of the 12 evaluated species regarding breeding and non-breeding habitat related to the Action Area, as well as the summary of potential habitat for these species within the Action Area. The piping plover, red knot, and whooping crane are combined into one environmental baseline category due to the similarity of their wintering and migratory habitat. The fin whale and the sei whale are combined into one environmental baseline category due to the similarity of their non-breeding habitat. The five sea turtle species are combined into one environmental baseline category due to the similarity of their non-nesting habitat. Additional detail and analysis are provided in the following discussion.

4.1. Giant Manta Ray

The Action Area is located approximately 160 miles west-southwest of the Flower Garden Banks National Marine Sanctuary, which is known to support a breeding population of giant manta rays. The Action Area is within the migratory range of the giant manta ray and it is possible that the species could be found traveling through the Action Area, especially in the deeper water areas near the actual DWP location.

According to current USFWS and TXNDD data, the giant manta ray does not occur within Aransas, Nueces, and San Patricio Counties, Texas. Even though this species is not found on the official federal or state lists, it is known from marine waters in and around the Action Area (NOAA 2019b). SWCA considers the giant manta ray a rare to very rare visitor to this area. It is not expected to utilize the Action Area as a breeding site but could potentially be found foraging or migrating through this area.

Table 5 identifies the land cover types that may be used by the giant manta ray for foraging or travel corridors during parts of the year.

Table 5. Giant Manta Ray Potentially Suitable Land Cover Types Within the Action Area

Land Cover Type	Potentially Suitable Foraging Habitat	Potentially Suitable Travel Corridors	Likely Unsuitable
Open Water	X	X	
Wetlands Mixed Cover Type			X
Sand Beach			X
Row Crops			X
Upland Mixed Cover Type			X
Urban			X
Barren			X

SWCA did not observe the giant manta ray during winter 2019 field studies. The SWCA field investigations were carried out only in the inshore portions of the Action Area, as well as the extreme western edge of the offshore portion of the Project. These surveys were also carried out during a small portion of the year when the giant manta ray might be expected to occur, and before the time when the species might be expected to occur most often in the Action Area (spring, summer, and fall months). SWCA is not aware of any additional giant manta ray presence/absence survey data from the Action Area. Where there are no Project-specific presence/absence survey data, the overall habitat quality and other available occurrence records may be used to infer the potential for these species to occur in the area. If other occurrence records are available that demonstrate the presence of the species in the vicinity and suitable habitat exists within the

Action Area, the conservative approach with respect to the species is to assume the presence of the species within areas of suitable habitat. Given the lack of Project-specific survey data across the Action Area, this BA assumes that the giant manta ray may be present during the late fall, winter, and early spring months within at least some portions of the Action Area that contain potentially suitable habitat.

4.2. Northern Aplomado Falcon

The Northern aplomado falcon is considered a rare to locally uncommon resident along the Coastal prairies from the Coastal Bend to the Rio Grande Valley. This species has been sighted as far up the coast as Jefferson County. Therefore, this species could be found in the grasslands, shrublands, palustrine scrub-shrub wetlands, and estuarine wetlands at any time of year. The falcon may also be found foraging and migrating through these cover types, as well as urban setting and in and adjacent to agricultural land (i.e., row crops). The Action Area is within the breeding, wintering and migratory range of the falcon. The closest known observations are approximately 10-15 miles to the northeast, where the hacking tower on the north end of San Jose Island is found (Lockwood and Freeman 2004).

According to current USFWS and TXNDD data, this species has been documented within Aransas, Nueces, and San Patricio Counties, Texas. USFWS data document the falcon within the ANWR and on San Jose Island. It is expected that this species would possibly utilize the Action Area during the breeding, wintering and migration seasons.

Table 6 identifies the land cover types that may be used by the Northern aplomado falcon for nesting during the spring, summer, and early fall, as well as the land cover types that may be used for roosting, resting, foraging, or travel corridors during any time of year.

Table 6. Northern Aplomado Falcon Potentially Suitable Land Cover Types Within the Action Area

Land Cover Type	Potentially Suitable Nesting Habitat	Potentially Suitable Roosting and Resting Habitat	Potentially Suitable Foraging Habitat or Travel Corridors	Likely Unsuitable
Open Water				X
Wetlands Mixed Cover Type	X	X	X	
Sand Beach				X
Row Crops			X	
Upland Mixed Cover Type	X	X	X	
Urban			X	
Barren				X

SWCA did not observe the Northern aplomado falcon during winter 2019 field studies. These site inspections were carried out only during a small portion of the year when the falcon might be expected to occur in the Action Area. SWCA is not aware of any additional Northern aplomado falcon presence/absence survey data from the Action Area. Where there are no Project-specific presence/absence survey data, the overall habitat quality and other available occurrence records may be used to infer the potential for this species to occur in the area. If other occurrence records are available that demonstrate the presence of the species in the vicinity and suitable habitat exists within the Action Area, the conservative approach with respect to the species is to assume the presence of the species within areas of suitable habitat. Given the

lack of Project-specific survey data across the Action Area, this BA assumes that the Northern aplomado falcon may be present during any time of the year within the inshore and onshore portions of the Action Area that contain potentially suitable habitat.

4.3. Piping Plover, Rufa Red Knot, and Whooping Crane

The Action Area is completely outside the breeding range of the piping plover, the rufa red knot, and the whooping crane. The Action Area is within the wintering and migratory range of the piping plover and red knot and within the 80% and 85% bands of the migratory range of the whooping crane. The closest known observations are approximately 10-15 miles to the northeast.

According to current USFWS and TXNDD data, all three species have been documented within Aransas, Nueces, and San Patricio Counties, Texas. TXNDD data document the piping plover critical habitat within the Action Area (see **Figure 6**). Other data (Stehn and Prieto 2010) document the whooping crane from immediately adjacent to the Project Area, if not actually within the Action Area.

Table 7 identifies the land cover types that may be used by the piping plover, rufa red knot, and whooping crane for foraging, roosting, resting, or travel corridors during the late fall migration, wintering, and early spring migration.

Table 7. Piping Plover, Rufa Red Knot, and Whooping Crane Potentially Suitable Land Cover Types Within the Action Area

Land Cover Type	Potentially Suitable Roosting and Resting Habitat	Potentially Suitable Foraging Habitat or Travel Corridors	Likely Unsuitable
Open Water			X
Wetlands Mixed Cover Type	X	X	
Sand Beach	X	X	
Row Crops		X	
Upland Mixed Cover Type		X	
Urban			X
Barren			X

SWCA did not observe the piping plover, red knot, or whooping crane during winter 2019 field studies. These site inspections were carried out only during a small portion of the year when the piping plover, rufa red knot, and whooping crane might be expected to occur in the Action Area. SWCA is not aware of any additional piping plover, red knot, and/or whooping crane presence/absence survey data from the Action Area. Where there are no Project-specific presence/absence survey data, the overall habitat quality and other available occurrence records may be used to infer the potential for these species to occur in the area. If other occurrence records are available that demonstrate the presence of the species in the vicinity and suitable habitat exists within the Action Area, the conservative approach with respect to the species is to assume the presence of the species within areas of suitable habitat. Given the lack of Project-specific survey data across the Action Areas, this BA assumes that the piping plover, the red knot, and the whooping crane may be present during the late fall, winter, and early spring months within at least some portions of the Action Area that contain potentially suitable habitat.

4.4. Fin Whale and Sei Whale

The Action Area is located within the potential foraging and travel corridors of the fin whale and the sei whale. The Action Area is not considered within the breeding habitat for these two species, as they are considered as migrants through the area.

According to current USFWS and TXNDD data, the fin whale and the sei whale do not occur within Aransas, Nueces, and San Patricio Counties, Texas. Even though these species are not found on the official federal or state lists, they are known to inhabit marine waters in and around the Action Area. SWCA considers the fin whale and the sei whale as rare to very rare visitors to this area. These species are not expected to utilize the Action Area as a breeding site but would be potentially found foraging or migrating through this area.

Table 8 identifies the land cover types that may be used by the fin whale and the sei whale for foraging or travel corridors during parts of the year.

Table 8. Fin Whale and Sei Whale Potentially Suitable Land Cover Types Within the Action Area

Land Cover Type	Potentially Suitable Foraging Habitat	Potentially Suitable Travel Corridors	Likely Unsuitable
Open Water	X	X	
Wetlands Mixed Cover Type			X
Sand Beach			X
Row Crops			X
Upland Mixed Cover Type			X
Urban			X
Barren			X

SWCA did not observe the fin whale or the sei whale during winter 2019 field studies. The SWCA field investigations were carried out only in the inshore portions of the Action Area, as well as the extreme western edge of the offshore portion of the Project. These surveys were also carried out during a small portion of the year when these two whales might be expected to occur, and before the time when the species might be expected to occur most often in the Action Area (spring, summer, and fall months). SWCA is not aware of any additional fin whale or sei whale presence/absence survey data from the Action Area. Where there are no Project-specific presence/absence survey data, the overall habitat quality and other available occurrence records may be used to infer the potential for these species to occur in the area. If other occurrence records are available that demonstrate the presence of the species in the vicinity and suitable habitat exists within the Action Area, the conservative approach with respect to the species is to assume the presence of the species within areas of suitable habitat. Given the lack of Project-specific survey data across the Action Area, this BA assumes that the fin whale and the sei whale may be present during the late fall, winter, and early spring months within at least some portions of the Action Area that contain potentially suitable habitat.

4.5. Sea Turtles

The Action Area could potentially be utilized for nesting by three of the five listed sea turtle species being evaluated in the BA, including the green sea turtle, Kemp's Ridley sea turtle, and loggerhead turtle. The

Action Area is within the range of all three species of sea turtles and may be utilized by any of those species for foraging, resting, or travel. The two additional turtle species, the leatherback sea turtle and the hawksbill sea turtle, are pelagic species in this part of the GOM and would only be seen on rare occasions. They would not be expected to nest in the Project Area but may use the offshore (marine) portion of the Action Area for foraging, resting, or travel/migration. The leatherback and hawksbill would not be expected to occur in the inshore portion of the Action Area.

Table 9 identifies likely suitability of Action Area cover types as potential green sea turtle, Kemp's Ridley sea turtle, loggerhead turtle nesting and non-nesting habitat, as well as leatherback sea turtle and hawksbill sea turtle non-nesting habitat.

Table 9. Sea Turtle Potentially Suitable Land Cover Types Within the Action Area

Land Cover Type	Potentially Suitable Nesting Habitat	Potentially Suitable Foraging/Resting Habitat or Travel Corridors	Likely Unsuitable
Open Water		X	
Wetlands Mixed Cover Type		X	
Sand Beach*	X	X	
Row Crops			X
Upland Mixed Cover Type			X
Urban			X
Barren			X

*Includes sand dune system adjacent to the GOM.

SWCA observed no sea turtles during the field studies for this Project during the early winter months of 2019. SWCA is not aware of any additional sea turtle survey data from the Action Area. Since occurrences of three of the five species have been determined within the project vicinity and suitable habitat exists within the Action Area, the conservative approach with respect to the species is to assume the presence of the species within areas of suitable habitat. This BA assumes that the green sea, Kemps Ridley, and loggerhead seas turtles are present within portions of the Action Area that contain potentially suitable habitat for foraging, resting, or traveling. Due to the lack of typical nesting beach habitat it is our opinion that none of the three sea turtle species would utilize the site for nesting.

5. EFFECTS OF THE ACTION

The USFWS Consultation Handbook explains that the effects of an action can be direct or indirect. Direct effects are those that are caused by the action and occur contemporaneous with the action. For example, operating a motorized boat may cause a direct killing or wounding of a sea turtle by striking it during construction or operation. Indirect effects are those that are caused by the action but occur later in time. An example of an indirect effect may be the subsequent changes to the vegetation and faunal community in the Action Area caused by intermittent running barges and work boats into the vegetated shallows found within the Project Area, during facility operation. However, for an impact to qualify as a direct or indirect effect, it must have a causal relationship with the action. That is, the effects must flow from that particular action. "Flow" means there is a logical, unbroken, traceable, explainable, predictable chain of events that result in, or "cause" a given effect on listed species. The difference between direct and indirect effects is that direct effects flow immediately from the action and indirect effects are further removed in time and possibly distance.

5.1. Giant Manta Ray

5.1.1. Direct Effects

Potential direct effects may consist of directly killing, injuring, or wounding a ray. These direct effect pathways are dependent upon the actual presence of an individual of this species in the Action Area. Though harassment would also be considered a direct effect, the Project will not include a large amount of percussive underwater noise or pile-driving events; thus, harassment effects are less likely than direct effects such as killing or wounding. The primary threat to rays resulting from vessel transits in shipping lanes in the GOM will be an increased risk of vessel strikes while VLCCs and support vessels are underway. The VLCCs and support vessels traveling to the SPM buoy systems will use established and well-traveled shipping lanes. In addition, BWTT will provide the operators of VLCCs with NMFS *Vessel Strike Avoidance Measures and Reporting for Mariners* (NMFS 2008) and request that these measures be used when transiting to and from the SPM buoy systems. As such, ship strikes are not anticipated. Finally, the presence of anchor chains, cables, mooring lines, tow lines, and other underwater obstructions associated with the construction of the DWP would present a potential entanglement and drowning risk to manta rays entering the Action Area.

The probability of a major crude oil spill during operation is extremely low (see Volume II – Section 14: Navigation, Safety, and Security of the MARAD/USCG application). The major elements of the Proposed Project that could leak crude oil include the SPM buoy systems, the offshore pipelines from shore to the SPM buoy systems, and the flexible hoses connecting the pipelines to the SPM buoy systems and the SPM buoy systems to the loading tankers.

Killing or Wounding

Although unlikely to occur in the Proposed Project area, the giant manta ray could be impacted by vessel strikes and noise impacts during all phases of the Proposed Project. Impacts from pile-driving noise are anticipated to have the highest potential impacts to marine fauna, but BWTT will implement appropriate mitigation for this potential impact through coordination with NMFS and implementation of noise abatement and mitigation measures. There is the potential for entanglement and drowning from tow lines, mooring lines, anchor chains, cables, and other similar underwater obstacles during DPW construction. Implementation of mitigation and biological observers in the area would reduce the likelihood of take.

In the event of an operational spill resulting from the Proposed Project, eggs and larvae in the immediate vicinity of the spill would likely be subject to oil-induced mortality. Mortality rates for ichthyoplankton are naturally high, and therefore the localized mortality associated with a spill is not expected to affect fishery populations. Pelagic and demersal fish are unlikely to be exposed to concentrations sufficient enough to result in mortality, although fish within contaminated habitats could be subject to sub-lethal, toxic effects. Therefore, the localized, short-term, adverse impact to giant manta rays as a result of the worst-case scenario oil spill associated with the Proposed Project would not be significant; adult rays are mainly transient in the area, would spend most of their time below the water surface, and would be able to migrate out of the affected area.

Harassment

The hearing sensitivity of manta rays is unknown but that of most elasmobranchs is very acute. Conditioning studies have shown sharks most sensitive to low frequency sounds in the vicinity of 100 Hz, the frequency often produced by struggling prey (Deakos 2010). Therefore, it is believed that giant manta rays are somewhat sensitive to sounds in the ocean, both natural and human-made, but they are less sensitive than marine mammals, which have a highly developed, acute sense of hearing and depend on sound to communicate over long distances. The location of eyes on the sides of the head allow manta rays to see in all directions; they communicate with each other through courtship displays and they have a keen sense of smell. They have well-developed electrosensory systems, as do all elasmobranchs, and can detect sounds using their inner ears (Marshall and Bennett 2010).

Marine mammals hear a broad range of sounds to navigate and communicate because the oceans are much more transparent to sound than to light (National Research Council [NRC] 2003). Manta rays are somewhat less sensitive to noise impact, but are susceptible, nevertheless. Each species has an auditory threshold dictating the frequencies that can be heard. Increases in background noise often interfere with, or mask, noises that generally can be heard by an individual (Richardson et al. 1995). Masking occurs when both the signal and the masking noise have similar frequencies and overlap or occur very close together, decreasing the ability of an individual to hear other sounds (NRC 2003; NMFS 2003). Masking becomes a problem when it covers biologically significant sounds, such as the call of a calf or conspecific, or the sound of a predator or hazard (NMFS 2003).

As described in Section 1, "harass" is defined by USFWS regulation as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include but are not limited to, breeding, feeding, or sheltering." When exposed to noise, marine mammals and rays can experience a variety of behavioral and physical effects. Behavioral effects on rays may include a change in swimming direction, depth, migration routes, and/or general movements. The duration and extent of the behavioral effects are influenced by the hearing sensitivity of the species, the individual, as well as by its age, sex, current activity, past exposure to the noise, and the presence of dependent offspring. Behavioral effects of an individual are also influenced by the characteristics of the sound, such as the frequency and intensity, and the location and duration of the sound (NRC 2003).

Exposure to noise also can result in physical injury to marine mammals and rays in the form of temporary threshold shifts (TTS) and permanent threshold shifts (PTS), hemorrhage, and death (NMFS 2003). TTS in marine mammals occurs when an individual is exposed to a sound for a period, causing the hair cells within the ear to become fatigued and change shape. When that occurs, the individual temporarily loses hearing in that range for a certain period, depending on the duration and level of sound exposure (NRC 2003). Exposure that occurs above a certain sound level and duration may cause the inner ears of rays to become permanently damaged, resulting in PTS, or a permanent loss of hearing over a certain frequency range (NRC 2003).

As described in Volume II – Section 8: Wildlife and Protected Species section of the MARAD/USCG Application, sound from pile-driving that exceeds the injury thresholds may result in injury or mortality to rays and other fish. Pile-driving for the proposed Project will produce peak sounds above the injury threshold up to 112 feet from the source, although impacts may occur at further distances if rays remain in the exposure zone for longer periods of time. Noise-related disturbance resulting in behavioral effects to rays could occur over a significant distance. In addition, the transmission loss constant used to estimate the zone of influence (ZOI) may be conservative, since transmission loss depends on many physical factors including depth and bathymetry.

As estimated sound levels for pile-driving exceed the threshold for behavioral effects and injury to rays and other fishes, pile-driving activities could result in the mortality, injury, or disturbance of rays and other fishes that are present in the vicinity of pile-driving activity. Because pile-driving for the proposed Project will be limited to the 16-week period required for construction of the SPM buoy systems, and given the small size of the injury zone of influence for peak sound level, impacts are expected to be temporary and minor, and will not result in population-level effects.

As with general changes in behavior, the level and durations of sound exposure that cause TTS and PTS are species-specific. BWTT will implement appropriate mitigation for this potential impact through coordination with NMFS and implementation of noise abatement and mitigation measures.

5.1.2. Indirect Effects

Once constructed, the SPM buoy systems' seafloor components will act as an artificial hard structure, providing a permanent, beneficial impact by allowing sessile invertebrates with a substrate on which to attach in an otherwise ubiquitous soft-bottom habitat. The 24-hour lighting may cause behavioral changes in nearby fauna, including attraction of predator and prey species, as well as trans-GOM migratory birds; however, measures will be taken to minimize the amount of total lighting used on the proposed DWP to that required for safety, such that impacts would be permanent, but minor. Anchor chain scour will also occur within each SPM buoy system's swing circle (radius of 125 feet), but this continual disturbance to the benthic community is considered negligible, and therefore, would constitute a negligible impact to the occasional rays entering the area.

5.1.3. Effects Determination

May affect, is not likely to adversely affect

Given the low likelihood of occurrence in the Proposed Project area and Bluewater SPM's proposed mitigation (including use of applicable NTLs and pending consultation with NMFS regarding pile-driving noise), we conclude that the Proposed Project *may affect, is not likely to adversely affect* the giant manta ray.

5.2. Northern Aplomado Falcon, Piping Plover, Rufa Red Knot, and Whooping Crane

The construction and operation activities have the potential to affect winter and migratory habitat for the Northern aplomado falcon, piping plover, rufa red knot, and whooping crane, where it exists within the Action Area, as well as nesting habitat for the Northern aplomado falcon. These types of activities could directly or indirectly cause habitat loss, habitat degradation, or habitat fragmentation (or a combination thereof). If and where affected habitat is occupied by Northern aplomado falcon, piping plover, red knot, or whooping crane, the Proposed Action has the potential to affect these species.

Direct and indirect effects on the Northern aplomado falcon, piping plover, red knot, or whooping crane or their habitats may include

- Direct encounters with individual birds that kill, injure, or harass, thereby disrupting their natural behaviors;
- Loss of suitable foraging, roosting, or resting areas, potentially resulting in loss of wintering and migratory habitat and behavioral changes;
- Modification and alteration of suitable roosting habitat, foraging habitat, and travel corridors, potentially resulting in the functional, if not physical, loss or degradation of wintering and migratory habitat and behavioral changes; and
- Loss of suitable nesting habitat for the Northern aplomado falcon.

5.2.1. Direct Effects

Potential direct effects may consist of directly killing, injuring, or wounding a Northern aplomado falcon, piping plover, red knot or whooping crane. These direct effect pathways are dependent upon the actual presence of an individual of these species in the Action Area. Though harassment would also be considered a direct effect, the Project will be developed so that the majority of construction work boat and port facility operation could take place in open water areas, thereby avoiding direct interactions with the four bird species. The terrestrial impacts associated with the construction and operation of the onshore pipeline system would also potentially affect these four bird species.

5.2.1.1. Northern Aplomado Falcon

Habitat Loss and Reduced Dispersal, Fragmentation, and Isolation: Direct effects of habitat loss, fragmentation, reduced dispersal, and isolation effects on the Northern aplomado falcon are not anticipated due to anticipated regrowth of vegetation in the unmaintained temporary and additional workspace corridor. Although there will be a maintained 50-foot-wide ROW easement in which trees and shrubs will be removed, significant adverse impacts are not anticipated as the Northern aplomado falcon would be able to nest elsewhere.

Road Mortality: Construction equipment and vehicle collisions are not a major threat to this species or populations of the Northern aplomado falcon. There has not been any documented vehicular mortality of the Northern aplomado falcon within the Action Area. Thus, vehicular collisions are not anticipated to be a direct nor adverse effect on the Northern aplomado falcon.

Noise and Human Disturbance: Ellis et al. (1991) studied aircraft and sonic boom activities on nesting peregrine falcons and found negative responses including crouching or rare flushing of brooding parents in response to these activities. However, the responses lessened as the birds became habituated to the activities. Northern aplomado falcons are also considered to be relatively tolerant of human presence but less so during reproductive activities (Keddy-Hector 2000; USFWS 2006). Construction activities may create noise levels that range from 65 to 90 dBA. According to the aforementioned studies normal behaviors should resume once activities are complete. Precautions include pre-construction surveys for Northern aplomado falcons or potential nest sites along the route, biological monitors present during construction, and avoidance of construction between February 1 and August 31 for these locations, to the extent practicable, to avoid direct effects to nesting. These precautions will help reduce potential effects to the Northern aplomado falcons from noise and disturbance.

Lighting: Although lighting may have deleterious effects on migrating and nocturnal bird species, lighting is not expected to have negative effects on diurnal raptors like the falcon. In contrast, lighting may have a positive effect if the artificial light expands the foraging time for diurnal raptors due to greater night visibility (Cronenwett 2014). Additionally, lighting may also deter a leading nocturnal predator of falcon fledglings, the great horned owl (*Bubo virginianus*) (Jenny et al. 2004). Lighting associated with construction of the pipelines will be temporary and permanent lighting associated with booster station is not expected to differ nor contribute significantly to existing lighting of the surrounding area especially considering similarly lighted facilities and the towns of Aransas Pass and Port Aransas are located within the vicinity of the Action Area. Thus, lighting is not expected to have a permanent adverse direct effect on the Northern aplomado falcon.

Temperature of Substrate and Environment: The main effects of temperature changes associated with the pipeline will be located at surface or subsurface levels. Temperatures differences are not anticipated to have a significant effect on foraging rates or metabolic processes of the birds**.**

No anticipated effects to ambient temperatures are expected. Consequently, there are no anticipated effects of temperature associated with the pipeline on the nesting, foraging, or sheltering habitats of the falcon.

5.2.1.2. Piping Plover and Rufa Red Knot

Given shared habitat preferences of beaches, tidal flats, algal mats, washover passes, small dunes, and herbaceous wetlands, the piping plover and rufa red knot are discussed together. Both species return to the same general wintering grounds each year (Drake et al. 2001; Noel and Chandler 2008; Stucker et al. 2010; Buchanan et al. 2012). These wintering habitats provide foraging, roosting, and sheltering for piping plovers and rufa red knots.

Habitat Loss and Reduced Dispersal, Fragmentation, and Isolation: The Project route traverses through piping plover and rufa red knot habitat. Designated critical habitat for the piping plover is also crossed by the Action Area (the entire GOM beach is designated as piping plover critical area). No permanent adverse modification or alteration of designated critical habitat or other habitat areas are anticipated. Direct effects of habitat loss, fragmentation, reduced dispersal, and isolation effects on the piping plover and rufa red knot are not anticipated due to Bluewater SPM's tailored construction methods and use of BMPs. A combination of HDDs and/or Direct Pipe boring installation construction methods will be used to reduce the movement of heavy equipment and reduce the amount of soil disturbance associated with the Project in piping plover and rufa red knot habitat. Bluewater SPM will prevent/minimize erosion, runoff, and sedimentation during construction in habitat areas by utilizing BMPs such as silt fence and matting. All areas will be restored to pre-construction contours and conditions using grading, resulting in maintenance of ecological and hydrological functions of the habitat. A reduced construction footprint, reduction in compaction of soils, and soil segregation techniques will be utilized to enhance the re-establishment of the ecological function of tidal flat areas in a timely manner.

Biological monitors will be present during geotechnical boring and construction activities to ensure that any piping plovers or rufa red knots visiting the Project Area during these activities will not be injured or killed as a result of these activities. Should a piping plover or rufa red knot be present in the area, construction activities will stop, and USFWS will be contacted to determine appropriate actions to be taken.

Road Mortality: Vehicular collisions may injure or kill sheltering or roosting piping plovers or rufa red knots in low areas of the beach. However, vehicle collisions are not anticipated to occur due to BMPs, including the operation of vehicles and equipment above the beach wet zones and presence of biological monitors prior to and during construction to prevent and minimize any potential collisions.

Noise and Human Disturbance: Some of the tidal and algal flats present within the inshore portion of the Action Area are of lower quality due to regular recreational human disturbance including use of all-terrain vehicles (ATVs), relative to higher quality mud flat areas with minimal human disturbance (Maslo et al. 2012; USFWS pers. comm. 2016). Thus, these areas are already exposed to noise and human disturbances. Construction and geotechnical activities are likely to temporarily elevate noise and human disturbance levels. Noise emissions from construction may range from 65 to 90 dBA. The proposed compressor station is located more than 1 mile from piping plover/rufa red knot habitat areas; thus, compressor station construction and operation are not expected to contribute to any permanent noise disturbances for these species.

Noise emissions and human disturbance may illicit responses including crouching, startle effects, or flushing. These responses may lead to added energy expenditure that would otherwise be devoted to normal behaviors including foraging, roosting, and sheltering (NoiseQuest 2016). The construction noise may cause these species to be temporarily diverted to other habitat areas, but this will not cause more than an insignificant effect and normal behaviors should resume once activities are complete.

During cold temperatures (below 40 F°), high winds (above 15-20 mph), and precipitation, piping plovers and rufa red knots are likely to roost to conserve energy and body reserves. Disturbing birds during these conditions will cause stress to the birds; therefore, biological surveys will be conducted under these conditions to ensure the area is not being utilized by roosting piping plovers and rufa red knots during construction activities.

Lighting: Similar to the Northern aplomado falcon, lighting may have a positive effect if the artificial light expands the foraging time and visual detection of predators due to greater night visibility (Burger 1986, 1994; Fitzgerald and Halliday 1998). Thus, lighting is not anticipated to have a negative or a potentially positive temporary direct effect on piping plovers and rufa red knots in the action area.

Temperature of Substrate and Environment: The main effects of temperature changes associated with the pipeline will be located at surface or subsurface levels. The slightly warmer soil surfaces during winter when piping plovers and rufa red knots are anticipated to be present may attract the birds to the area; however, temperature differences are not anticipated to be have a substantial effect on foraging rates or metabolic processes of the birds.

5.2.1.3. Whooping Crane

Habitat Loss and Reduced Dispersal, Fragmentation, and Isolation: The Action Area does not traverse whooping crane wintering habitats; however, areas for potential migration stopovers may occur in the Project Area. No permanent impacts to these areas are anticipated due to BWTT's construction BMPs and restoration. BMPs implemented by BWTT include use of the push/pull construction method to reduce potential impacts of soil compaction and control of erosion, runoff, and sedimentation during construction. Wetlands will be restored to pre-construction contours and conditions using grading, laser-level equipment, and water-packing resulting in maintenance of ecological and hydrological functions of the habitat. Reduced construction footprint, reduction in compaction of soils, and soil segregation techniques will be utilized to enhance the re-establishment of the ecological function in a timely manner. As such, effects of habitat loss, habitat fragmentation, reduced dispersal, and isolation are expected to be negligible or temporary. There is no anticipated loss and degradation of foraging and roosting habitat since construction activities would impact such small areas, when compared to habitat available to this species.

Whooping Crane Critical Habitat: The proposed Project does not cross any whooping crane critical habitat.

Noise and Human Disturbance: Many of the wetlands present within the Project Area are of lower quality due to regular recreational human disturbance relative to higher quality wetland areas with minimal human disturbance (Maslo et al. 2012; USFWS pers. comm. 2016). Thus, these areas are already exposed to noise and human disturbances. Construction activities are likely to temporarily elevate noise and human disturbance levels. The proposed compressor station is not located near known whooping crane concentration or wintering areas, and thus is not expected to contribute to any permanent noise disturbances for this species.

Noise emissions and human disturbance may illicit responses including crouching, startle effects, or flushing. These responses may lead to added energy expenditure that would otherwise be devoted to normal behaviors including foraging, roosting, and sheltering (NoiseQuest 2016). As stated, earlier disturbances will be temporary, thus normal behaviors should resume once activities are complete.

Lighting: Similar to the other avian species, lighting may have a positive effect if the artificial light expands the foraging time and visual detection of predators due to greater night visibility (Burger 1986, 1994; Fitzgerald and Halliday 1998). Thus, lighting may have no negative or a potentially positive temporary direct effect on whooping cranes if they stopover in the project area.

Temperature of Substrate and Environment: The main effects of temperature changes associated with the pipelines will be located at surface or subsurface levels. Temperatures differences are not anticipated to be have a significant effect on foraging rates or metabolic processes of the birds**.**

No anticipated effects to ambient temperatures are expected. Consequently, there are no anticipated effects of temperature associated with the pipelines on the nesting, foraging, or sheltering habitats of the whooping crane.

Killing or Wounding

As described above, there is temporal variation to habitat type usage throughout the year for piping plover, rufa red knot, and whooping crane. In general, these species would only utilize the islands within the Action Area including Stedman, Harbor and San Jose islands for roosting, resting, and foraging during the fall, winter, and spring months. During the day, the birds would be utilizing the adjacent estuarine wetlands and mud flats for feeding, preening, resting, and loafing. During the night, the birds would be roosting in the wetlands, mud flats, and beaches within and adjacent to the Action Area or would be flying into the Action Area. As stated earlier, whooping cranes are known to land in their wintering grounds at night. Killing or wounding of an individual bird may occur if birds flying into the area happen to become disoriented or blinded by lights on the work boats, work barges, towlines, or other object or structure within the Action Area. The Applicant's proposed conservation measures include working mainly in open water areas and avoiding estuarine areas to the extent practicable, thereby reducing the likelihood for direct killing or wounding of individuals of these species when operating the barge fleeting facility in the Project Area.

Harassment

Another form of potential direct effect of the Proposed Action on the piping plover, red knot and whooping crane could be via the harassment of individuals related to noise or vibration associated with the operation of engines, barges, tugboats, cranes, and other machinery while constructing the inshore pipelines. As described in Section 1, "harass" is defined by USFWS regulation as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include but are not limited to, breeding, feeding, or sheltering." Piping plovers, red knots, or whooping cranes must be present at the same time and place (or very near) of

the Proposed Action to be exposed to conditions that could disrupt their behavior, making harassment a potential form of direct effect.

5.2.2. Indirect Effects

Harm, as defined by ESA implementing regulations, could occur if proposed project activities significantly destroyed or modified piping plover, red knot, or whooping crane habitat. To rise to the level of take, such habitat loss or modification would require a substantial disruption of essential roosting or feeding behaviors that result in the actual death or injury of individuals from one of the three species. Injury can include reductions in reproductive capacity or physical condition that might translate into future population declines. However, as described below, harm via habitat modification is not likely to occur since piping plovers, red knots, and whooping cranes are highly mobile; have proportionately large wintering home ranges in comparison to the Action Area; and suitable habitat does not appear to be limited across the landscape. Therefore, extent and magnitude of piping plover, red knot, and whooping crane habitat disturbances within the Action Area are not likely to significantly disrupt essential behaviors either within or adjacent to the Action Area, or even generally within the greater landscape, either immediately or over time.

Nesting Habitat Disturbance

In the southwestern United States, the Northern aplomado falcon uses old nests of ravens and other raptors. Nests can be found in Spanish dagger (*Yucca treculeana*), mesquite (*Prosopis* spp.), man-made structures like power poles, and man-made hacking towers. Nests built in Spanish dagger are typically 6 to 10 feet off the ground and average 1 to 3 feet in diameter. Nesting/breeding activities occur between February 1 and August 31; however, this species is territorial, and pairs may stay near and defend their nest or nest site throughout the year. Nesting habitat disturbance could include mechanized land clearing of upland scrub-shrub and herbaceous land containing suitable nesting substrate.

Roost Disturbance

During winter and migration, piping plover, red knot, and whooping crane generally roost on the ground in estuarine wetlands, mud flats, beach areas, or other suitable habitat. However, since all three species are mobile, and have such large home ranges, roosting sites within the Action Area including Stedman Island, Harbor Island, and San Jose Island would prove to be ephemeral. They would just move on to another area, if disturbed. Since these three bird species are so mobile, disturbance of their roosting areas during the winter months is not expected to add to the energetic load of individuals of any of the three species. In addition, most of the intercoastal Action Area will be avoided via HDD methodology and thus not receive any long-term on ground impacts.

Habitat Loss and Wintering Area Disturbance

Whooping cranes and piping plovers show a very high fidelity to the wintering foraging grounds. If the impact of the construction barges intermittently being pushed into the wetlands on San Jose Island causes enough degradation to the wetlands, then it might cause a modification of behavior on the part of the three species. In addition, construction barges coming close enough to the shore may be disruptive enough to cause individuals to relocate to other suitable foraging areas. This increased energetic demand may disrupt behavior during winter, leading to possible sickness, injury, or death of an individual. However, given an average wintering home range size of approximately 0.4 square miles for whooping crane pairs and an average wintering core area size of approximately 1.1 square miles for piping plovers in southern Texas, loss of habitat and wintering area disturbance to these three species represents an insignificant modification to potentially suitable piping plover, red knot, and whooping crane wintering habitat.

5.2.3. Effects Determination

May affect, is not likely to adversely affect

As described above, the direct or indirect adverse effects to the Northern aplomado falcon, piping plover, red knot, and whooping crane arising from the operation of the on-ground pipeline construction and construction work boat activities in the shallows and open water areas adjacent to the barrier islands, including San Jose, Harbor, and Stedman Islands, are discountable and insignificant and not likely to have an adverse effect on any of the four bird species. Direct killing or wounding of individuals of these four species within the Proposed Action Area is not expected for the following reasons.

1. The actual location of the majority of the construction activities would be in open water areas generally not inhabited by these species.

2. The Applicant-proposed conservation measures.

3. The four species are generally diurnal (except during migration) and are highly mobile when the majority of the construction and operational activities will take place; therefore, they will be able to see the dangers and hazards presented by the Proposed Action in terrestrial and open water portions of the Action Area.

These factors make encountering one of the four species extremely unlikely; therefore, the possibility of project activities directly killing or wounding a Northern aplomado falcon, a piping plover, a red knot, or a whooping crane is discountable.

The likelihood of directly harassing a Northern aplomado falcon, piping plover, red knot, or whooping crane that may be present within the Action Area is similarly discountable. It is not anticipated that noise, lighting, and engine exhaust will be severe enough to have an adverse effect on these species. Again, the likelihood of such adverse effects is discountable in terms of both the presence of the species in or near an area of operating work boats and in terms of the actual means of potential harassment.

Habitat loss and wintering area disturbance are also not expected to have a significant adverse effect on the Northern aplomado falcon, piping plover, red knot, or whooping crane. The scale of the proposed changes to wetlands habitats within the Proposed Action Area is far too small and dispersed to have any meaningful effect on the greater landscape or its associated faunal community, especially when considered in the context of the home range size of each species.

Therefore, all potential effects of the Proposed Action on the Northern aplomado falcon, piping plover, red knot, and whooping crane are expected to be discountable and insignificant, such that based on the best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate significant effects; or (2) expect quantifiable effects to occur. In any case, effects rising to the level of incidental take are not expected and no incidental take authorization is warranted for the Proposed Action to proceed in accordance with the ESA.

5.3. Fin Whale and Sei Whale

5.3.1. Direct Effects

Potential direct effects may consist of directly killing, injuring, or wounding a whale. These direct effect pathways are dependent upon the actual presence of an individual of those species in the Action Area. Though harassment would also be considered a direct effect, the Project will not include percussive

underwater noise or pile-driving events; thus, harassment is unlikely. The primary threat to marine mammals resulting from vessel transits in shipping lanes in the GOM will be an increased risk of vessel strikes while VLCCs and support vessels are underway. The VLCCs and support vessels traveling to the SPM buoy systems will use established and well-traveled shipping lanes. In addition, BWTT will provide the operators of VLCCs with the NMFS *Vessel Strike Avoidance Measures and Reporting for Mariners* (NMFS 2008) and request that these measures be used when transiting to and from the SPM buoy systems. As such, ship strikes are not anticipated.

As mentioned above, the probability of a major crude oil spill during operation is extremely low. The major elements of the proposed Project that could leak crude oil include the SPM buoy systems, the offshore pipelines from shore to the SPM buoy systems, and the flexible hoses connecting the pipelines to the SPM buoy systems and the SPM buoy systems to the loading tankers.

Killing or Wounding

Although unlikely to occur in the proposed Project Area, these species could be impacted by vessel strikes and noise impacts during all phases of the proposed Project. Impacts from pile-driving noise are anticipated to have the highest potential impacts on marine fauna, but BWTT will implement appropriate mitigation for this potential impact through coordination with NMFS.

In the event of an oil spill, some individual marine mammals would likely be exposed to the resulting oil on the surface, in the water column, and where volatile organic compounds and oil droplets enter the air over unweathered oil. Dolphins and whales have been observed swimming in oil-contaminated waters and would not necessarily avoid a large spill if it were to occur (Dias et al. 2017). In addition to impacts on marine mammals, a spill could degrade their habitats including the shelf and marine waters of the GOM.

Exposure pathways for marine mammals include inhalation, ingestion, and dermal contact (Deepwater Horizon [DWH] Natural Resource Damage Assessment [NRDA] Trustees 2016). Marine mammals breathe, rest, and swim at the surface, where the greatest amount of oil would likely occur (DWH NRDA Trustees 2016). Marine mammals near the surface of large oil spills may inhale volatile petroleum compounds, where they are the most highly concentrated (Geraci 1990 in NRC 2003, Takeshita et al. 2017). While foraging in the water column, droplets of oil may be ingested along with contaminated prey; some marine mammals (such as bottlenose dolphins) also forage in sediments, which could become contaminated. When marine mammals pass through floating oil, their skin can become fouled (NRC 2003).

Inhalation of volatile petroleum compounds may result in inflammation and lung congestion (Geraci & St. Aubin 1990 as cited in Dias et al. 2017). Oil that comes into contact with the skin of marine mammals may result in skin and eye irritation and can foul the baleen of large whales (NMFS 2018a). Ingestion can lead to gastrointestinal injury, vomiting, and absorption of oil into the body tissues (Takeshita et al. 2017). As summarized by Schwacke et al., studies of bottlenose dolphins following the DWH oil spill found evidence of poor health, reproductive failure, and increased mortality; health effects included lung disease and an impaired stress response (2017).

Harassment

Marine mammals are very sensitive to sounds in the ocean, both natural and human-made. Marine mammals produce and hear a broad range of sounds to navigate and communicate because the oceans are much more transparent to sound than to light (NRC 2003). Each species has an auditory threshold dictating the frequencies that can be heard. Increases in background noise often interfere with, or mask, noises that generally can be heard by an individual (Richardson et al. 1995). Masking occurs when both the signal and the masking noise have similar frequencies and overlap or occur very close together, decreasing the ability

of an individual to hear other sounds (NRC 2003; NMFS 2003). Masking becomes a problem when it covers biologically significant sounds, such as the call of a calf or conspecific, or the sound of a predator or hazard (NMFS 2003).

As described in Section 1, "harass" is defined by USFWS regulation as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include but are not limited to, breeding, feeding, or sheltering." When exposed to noise, marine mammals can experience a variety of behavioral and physical effects. Behavioral effects may include a change in dive duration and frequency, vocalizations, migration routes, and general movements. The duration and extent of the behavioral effects are influenced by the hearing sensitivity of the individual, as well as by its age, sex, current activity, past exposure to the noise, and the presence of dependent offspring. Behavioral effects of an individual are also influenced by the characteristics of the sound, such as the frequency and intensity, and the location and duration of the sound (NRC 2003).

Exposure to noise also can result in physical injury to marine mammals in the form of TTS and PTS, hemorrhage, and death (NMFS 2003). TTS occurs when an individual is exposed to a sound for a period, causing the hair cells within the ear to become fatigued and change shape. When that occurs, the individual temporarily loses hearing in that range for a certain period, depending on the duration and level of sound exposure (NRC 2003). Exposure that occurs above a certain sound level and duration may cause the hair cells to become permanently damaged, resulting in PTS, or a permanent loss of hearing over a certain frequency range (NRC 2003). As with general changes in behavior, the level and durations of sound exposure that cause TTS and PTS are species-specific.

Installation of the proposed pipelines and SPM buoy systems will result in an increase in airborne and underwater noise, which will be most pronounced at the sites of the HDDs on San Jose Island, and at the SPM buoy systems, about 17.0 miles offshore. Sources of continuous noise, such as underwater pipeline installation and vessel activity, will have a negligible contribution to total ambient underwater sound levels, as described above. Noise from support vessels (and vessels in general) are dependent on the size and speed, with larger, faster vessels creating more noise (BOEM 2017). Although increases in underwater noise from transiting vessels could mask important biological sounds, they will be temporary in nature. Therefore, impacts from and underwater sound due to these continuous sources will be negligible and are unlikely to result in temporary noise levels that are injurious to marine species. However, impulsive sound from pile-driving will exceed thresholds established by NOAA for the protection of marine species, and impacts will need to be addressed through direct consultation with NMFS.

Underwater pile-driving will exceed the PTS on low-frequency cetaceans (baleen whales) within a ZOI estimated to extend about 1,364 feet from pile-driving activities. However, as it is highly unlikely that these baleen whales will be present on the continental shelf in the vicinity of the proposed Project during the short period of pile-driving (a period of 16 weeks), BWTT believes that the potential for impact on baleen whales through pile-driving noise is so small as to be discountable.

The threshold for marine mammal behavioral effects will be exceeded in a ZOI extending about 2,814 feet from pile-driving activities. As the ZOIs for marine mammal behavioral effects and low-frequency cetacean injury are too large to be effectively monitored, BWTT will ensure proper coordination with NMFS to identify what additional measures, if any, will need to be implemented during pile-driving to minimize impacts on marine mammals.

In addition to pile-driving, helicopter overflights in close proximity to local marine mammals may elicit a startle response, abrupt dives or turns, or other changes in behavior as the aircraft approaches (BOEM 2017); however, these impacts are anticipated to be temporary and minor. As described above for sea turtles, the effects of airborne noise on marine mammals are not widely studied and no thresholds for behavioral

effects or injury have been established; therefore, individual responses to intermittent foghorn use is anticipated to be similar to that described for helicopter noise.

5.3.2. Indirect Effects

Once constructed, the SPM buoy systems' seafloor components will act as an artificial hard structure, providing a permanent, beneficial impact by allowing sessile invertebrates with a substrate on which to attach in an otherwise ubiquitous soft-bottom habitat. The 24-hour lighting may cause behavioral changes in nearby fauna, including attraction of predator and prey species, as well as trans-GOM migratory birds; however, measures will be taken to minimize the amount of total lighting used on the proposed DWP to that required for safety, such that impacts would be permanent, but minor. Anchor chain scour will also occur within each SPM buoy system's swing circle (radius of 125 feet), but this continual disturbance to the benthic community is considered negligible, and therefore, would constitute a negligible impact to the occasional whales entering the area

5.3.3. Effects Determination

May affect, is not likely to adversely affect

Given the low likelihood of occurrence in the Action Area and Bluewater SPM's proposed mitigation (including use of applicable NTLs and pending consultation with NMFS regarding pile-driving noise), the Proposed Project *may affect, is not likely to adversely affect* the sei whale and the fin whale.

5.4. Sea Turtles

Construction operations have the potential to affect nesting and non-nesting sea turtle habitat where it exists within the Action Area. These types of activities could directly or indirectly cause habitat loss, habitat degradation, or habitat fragmentation (or a combination thereof). If and where affected habitat is occupied by the five sea turtle species, the Proposed Action has the potential to affect these species.

Direct and indirect effects on sea turtle species or their habitats may include:

- Direct encounters with individual sea turtles that kills, injures, or harasses them (thereby disrupting their natural behaviors);
- Direct encounters with sea turtle nests on San Jose Island that results in a take of nests, eggs or hatchlings;
- Loss of suitable foraging habitat, loafing areas, resting areas, or travel corridors, potentially resulting in loss of non-nesting habitat and behavioral changes; and
- Modification and alteration of suitable foraging habitat, loafing areas, resting areas, and travel corridors, potentially resulting in the functional, if not physical, loss or degradation of non-nesting habitat.

5.4.1. Direct Effects

Potential direct effects may consist of directly killing, injuring, or wounding a sea turtle. These direct effect pathways are dependent upon the actual presence of an individual of those species in the area of activity. Though harassment would also be considered a direct effect, the Project will include limited percussive underwater noise or pile-driving events over a 16-week time period; thus, significant harassment is unlikely.

Noise from pile-driving will be audible to sea turtles in the Proposed Project vicinity; potential physical and behavioral effects on sea turtles are described in Volume II – Section 8: Wildlife and Protected Species in the MARAD/USCG Permit Application. Noise created by pile-driving at the SPM buoy systems is expected to exceed the levels of behavioral and physical effects designated by NMFS for the protection of sea turtles.

By using a standard transmission loss constant of 15 to account for attenuation over distance, it is estimated that the distance to the behavioral root mean square level for sea turtles is about 2,814 feet. The distance to the injury threshold is about 1,172 feet. As the ZOI for sea turtles is too large to be effectively monitored, BWTT will ensure proper coordination with NMFS to identify what additional measures will need to be implemented during pile-driving to minimize impacts on sea turtles (see Volume II – Section 8: Wildlife and Protected Species in the MARAD/USCG Permit Application).

In addition to pile-driving, construction of the SPM buoy systems may require helicopter transits between shore and the proposed Project site and the use of foghorns. Helicopter overflights in close proximity to sea turtles may elicit a startle response and temporary disruption of behavior (BOEM 2017). These impacts are anticipated to be temporary and minor for any sea turtles transiting under the helicopter's path.

The effects of airborne noise, such as fog horns, on sea turtles is not widely studied and no thresholds for behavioral effects or injury have been established for airborne noise on sea turtles. It is anticipated that, during inclement weather with low visibility, effects of foghorns on individuals in close proximity to the SPM buoy systems may cause behavioral effects, including startle responses upon commencement of foghorn blasts, as well as changes in dive duration and frequency, migration routes, and general movements. However, no injury or other significant effects are anticipated based on use of the foghorn.

As mentioned above, the probability of a major crude oil spill during operation is extremely low. The major elements of the proposed Project that could leak crude oil include the SPM buoy systems, the offshore pipelines from shore to the SPM buoy systems, and the flexible hoses connecting the pipelines to the SPM buoy systems and the SPM buoy systems to the loading tankers.

Killing or Wounding

As described above, juvenile and young adult sea turtles could utilize the Action Area at any point during the year; however, since these animals are cold-blooded reptiles, they are much less active during the coolest part of the year. In general, these species would only utilize the open water, seagrass, and oyster reef portions of the Action Area for foraging, resting, and traveling through the Action Area. Sea turtles are primarily diurnal during the non-nesting season. During the day, the turtles would utilize the open water portions of the Action Area for feeding, resting, or traveling. During the night, the turtles would be less active, floating near or at the water surface, or tucked into reefs or underwater seagrasses or crevices in the Project Area, only surfacing to breathe. Killing or wounding of an individual sea turtle may occur if an animal happens to strike or is struck by a work boat or a VLCC, or gets tangled up in one of the towlines in the work area.

Sea turtles are poikilothermic (cold blooded) reptiles that completely depend upon external sources of heat to determine and regulate their body temperature. In cold water they do not have the ability to warm themselves and must avoid conditions that would lead to a decrease in their core body temperature. The term "cold stunning" refers to the hypothermic reaction that occurs when sea turtles are exposed to cold water temperatures for a prolonged period of time. Cold stunning is a natural threat to sea turtles; although, it is not considered a major source of mortality in most cases, as temperatures fall below 8 degrees Celsius (°C) to 10°C (46–50°F), turtles may lose their ability to swim and dive, often floating to the surface. The rate of cooling that precipitates cold stunning appears to be the primary threat, rather than the water

temperature itself (Milton and Lutz 2003). Sea turtles that overwinter in inshore waters are most susceptible to cold stunning because temperature changes are most rapid in shallow water (Witherington and Ehrhart 1989). Initial symptoms expressed by cold-stunned sea turtles include a decreased heart rate, decreased circulation, and lethargy, followed by shock, pneumonia, and possibly death. During periods of cold stunning, affected sea turtles normally float on the water surface and are exposed to a variety of hazards including predation, starvation (cold-stunned turtles do not normally forage), and collisions with commercial and recreational watercraft.

Sea turtles are known to have excellent eyesight and hearing and are normally able to avoid oncoming boats and barges by diving and/or swimming away (Hazel et al. 2007; DeRuiter and Doukara 2012). Sea turtles on or near the water surface are known to dive in response to perceived threats, including air guns (DeRuiter and Doukara 2012) as well as approaching boats (Hazel et al. 2007). Green sea turtles are capable of avoiding boats in both deep and shallow water up to a speed of 2.5 miles per hour (Hazel et al. 2007). Therefore, as long as the turtles are able to see and hear, they will be able to detect and avoid the relatively slow-moving construction boats and barges.

As the water within the vicinity of San Jose Island and Harbor Island is at least 12 feet in depth it is our opinion that sea turtles found within the Project Area that are not cold stunned should have ample opportunity to escape to deeper water away from construction activities. The use of HDD technology, drilling under the shipping channels will also help prevent inadvertent impacts to sea turtles using these habitats.

An additional risk to sea turtles would be inadvertent disturbance of nesting areas on the GOM beach side (eastern side) of San Jose Island. Potential take could occur if nests are inadvertently disturbed during construction activities, resulting in loss of the nest, destruction of eggs or direct killing of recent hatchlings attempting to access the GOM open water.

The main risk to sea turtles from the operation of the facility would be during those times of the year when they are unable to swim away and/or avoid approaching barges either because they approached too rapidly to give them enough time to escape, or because they are unable to swim, due to cold stunning. The Florida Department of Environmental Protection considers that "when the water temperatures drop below 50°F (Fahrenheit) (10°C [Celsius]), sea turtles become at risk." (SWCA 2016). The PINS states that "if water temperatures drop below 50 degrees Fahrenheit, sea turtles become unable to swim." (SWCA 2016). Accordingly, it is our opinion that cold stunning events would occur when the water temperature in the Action Area drops below 10°C (50°F) (SWCA 2016)

Construction activities will cease if cold-stunned turtles are located. Biological monitors will be onsite to observe these habitats to make sure that no turtles are left cold stunned within the Project Area.

In the event of an oil spill during operation, some individual sea turtles would likely be exposed to the resulting oil on the surface, in the water column, in Sargassum habitat along convergence zones, and where volatile organic compounds and oil droplets enter the air over unweathered oil. Nesting females, eggs, and hatchlings may be exposed in the event that sandy beaches become fouled with oil during the nesting season. In addition to impacts on individual sea turtles, a spill could degrade sea turtle habitats including the shelf and marine waters of the GOM, submerged aquatic vegetation (SAV), *Sargassum*, and sandy beaches (see Volume II - Section 4: Water Quality, and Volume II - Section 6: Aquatic Environment of the MARAD/USCG Application).

Sea turtles may be exposed to oil via inhalation, ingestion, and dermal contact (DWH NRDA Trustees, 2016). Sea turtles breathe at the ocean surface, where they may inhale volatile petroleum compounds where they are most highly concentrated and where the greatest amount of oil would likely occur (DWH NRDA Trustees 2016). Sea turtles may ingest oil-contaminated water and prey, and oil compounds may be

transferred to developing embryos from adult females (DWH NRDA Trustees 2016). In addition, potentially due to indiscriminate feeding behavior in convergence zones where young turtles may consume anything floating, sea turtles are known to ingest petroleum (Shigenaka 2010; DWH NRDA Trustees 2016).

Oiled sea turtles and turtles breathing at the surface of oiled surface waters are at risk for aspiration on oil and oil compounds, and inhalation exposure may result in inflammation and lung congestion (DWH NRDA Trustees 2016). While few studies assess the toxicological effects of oil on sea turtles, ingestion may result in dehydration and decreased digestive function (Mitchelmore et al. 2017). Dermal contact and physical fouling with oil can impact the diving ability of sea turtles, which may contribute to physical exhaustion, suffocation, and potential thermal stress (Stacy 2012). If not rehabilitated, heavily oiled sea turtles are typically subject to mortality.

Harassment

Another form of potential direct effect of the Proposed Action on the five species of sea turtles could be via the harassment of individuals related to noise or vibration associated with the operation of engines, barges, tugboats, cranes, and other machinery associated with the DWP and associated pipeline construction and operation. As described in Section 1, "harass" is defined by USFWS regulation as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include but are not limited to, breeding, feeding, or sheltering." Sea turtles must be present at the same time and place (or very near) of the Proposed Action to be exposed to conditions that could disrupt their behavior, making harassment a potential form of direct effect.

During the spring, summer, and fall, these sea turtle species will typically be active during the day, when most of the operational activities will be taking place. However, if the operation continues into the evening or night hours or takes place in the early morning hours, resting or drifting turtles may be exposed to noise, vibration, or lighting associated with the demolition activities. Disturbance would have to be severe in order to constitute harassment of turtles.

Direct Seagrass and Oyster Reef Habitat Alteration

All major water channels will be crossed via HDD technology. Harm via habitat modification is not likely to occur since sea turtles are highly mobile, have proportionately large home ranges in comparison to the Action Area, and suitable sea turtle habitat does not appear to be limited across the landscape.

5.4.2. Indirect Effects

Harm, as defined by ESA implementing regulations, could occur if proposed Project activities significantly destroyed or modified sea turtle habitat. To rise to the level of take, such habitat loss or modification would require a substantial disruption of essential resting, feeding, or swimming behaviors that result in the actual death or injury of individuals from one of the three species. Injury can include reductions in reproductive capacity or physical condition that might translate into future population declines. However, as described below, harm via habitat modification is not likely to occur since sea turtles are highly mobile, have proportionately large home ranges in comparison to the Action Area, and suitable sea turtle habitat does not appear to be limited across the landscape. Therefore, extent and magnitude of sea turtle habitat disturbances within the Action Area are not likely to significantly disrupt essential behaviors either within or adjacent to the Action Area, or even generally within the greater landscape, either immediately or over time.

Non-nesting Habitat Loss

As described earlier in this report, during pipeline construction incidental disturbance of vegetated shallows, seagrass beds, oyster bars, beaches, estuarine wetlands, and mangroves found on the barrier islands including San Jose, Harbor, and Stedman Islands may rarely occur. In addition, propeller wash will occasionally push sediment into these areas and has the potential to indirectly affect these species. If this scouring and/or sediment compression/compaction causes enough of the vegetation in the shallows and in the estuarine wetlands to be removed or die, then the habitat could be negatively affected to the point where there is a reduction in the value or function of the wetlands, or there is a reduction in the amount of foraging potential on the site.

Sea turtles are extremely mobile and show little affinity to home ranges. If the impact on the seagrasses and oyster bars within the Action Area causes enough degradation of the vegetated shallows and oysters, then it might cause a modification of behavior on the part of the sea turtles. This increased energetic demand may disrupt behavior during cooler months, leading to possible sickness, injury, or death of individuals that are normally stressed at that time of the year. However, given how far these turtle species migrate and the large amount of suitable habitat in this area, Project-induced loss of foraging habitat represents an insignificant modification to the three species of sea turtles expected to occur in the inshore portion of the Action Area (green sea turtle, Kemp's Ridley sea turtle, and loggerhead turtle).

5.4.3. Conservation and Management Guidelines During Periods of Cold Stunning

The following specific conservation and management guidelines will be followed, in order to mitigate for potential operational impacts to sea turtles within the Action Area:

- Construction vessels will observe a 2.5-mile per hour speed limit while operating during cold stunning events within the open water portion of the 2,000-foot-wide Action Area.
- Construction contractors will monitor the air and water temperatures for NOAA Buoy RTAT2, located approximately 2 miles southwest of San Jose Island.
- If the data recorder at NOAA Buoy RTAT2 goes off-line or stops recording/transmitting data (as occurred during late 2008 and early 2009), construction personnel will monitor on-site air and water temperatures within the Action Areas, in order to accurately reflect on-site conditions.
- As air temperatures drop towards 40°F and water temperatures drop towards 50°F, construction contractors will notify all essential Project personnel that a potential cold stunning event is likely and that they should go on alert.
- As water temperatures reach 50°F, construction contractors will mobilize a search boat and environmental monitors to search for stranded, stunned, and/or distressed sea turtles in the Project Area. Sea turtles that are cold stunned will float at or near the surface of the water, unless they have drowned, and then they will sink below the surface of the water. Therefore, when they are initially cold stunned and still alive, they are easily located; sea turtle heads are very large, have a distinctive profile, and are easily identified up to a distance of approximately 150 yards, especially with the aid of binoculars and/or spotting scopes. Environmental monitors will be trained in the detection and identification of sea turtles.
- If a stranded or cold-stunned sea turtle is located within the Action Area, the environmental monitor will immediately take photographs of, and GPS coordinates for, the stranded turtle. Then the environmental monitor will immediately call the Sea Turtle Stranding and Salvage Network

(STSSN) on their 24-hour hotline. The environmental monitor will give STSSN personnel the location and description of the sea turtle and will request immediate assistance.

- The NOAA lists several contacts for the STSSN, including
    - Donna Shaver, PhD, Texas Coordinator for the STSSN, 361-949-8173, ext. 226
    - Tony Amos, University of Texas (UT) -Marine Science Institute Animal Rehabilitation Keep, 361-442-7638
    - 1-866-887-8535 (1-866-TURTLE-5).
- The search vessel and environmental monitor will accompany the cold stunned sea turtle, protecting it from harm and/or approach by other vessels, until STSSN personnel arrive to take possession of the sea turtle. STSSN estimates that picking up the sea turtle takes a few hours to complete after they are contacted. Turtles that drown before they can be rescued will be considered casualties of natural selection and not a take under the ESA.
- Due to the requirement for those handling federally listed sea turtles to hold USFWS and/or the NMFS handling permits, it will be the responsibility of the STSSN personnel to take possession of and transport any cold stunned turtles to the rehabilitation center at the University of Texas Marine Science Institute. Bluewater SPM environmental monitors are not authorized to handle or rescue sea turtles.
- Operational stand-down and environmental monitoring will cease once water temperatures in the Action Area rise above 50°F. Due to its proximity to the Project Area, NOAA Buoy RTAT2 will represent the prevailing surrogate at all times for on-site water temperatures.
- Operational stand-down and environmental monitoring will resume once water temperatures drop to below 50°F.
- Environmental monitoring will not be necessary if there are no barges, boats or vessels operating during a cold stunning event.

5.4.4. Effects Determination

May affect, is not likely to adversely affect

As described above, the direct or indirect adverse effects to the sea turtle species within this region arising from the construction and operation of the DWP and associated pipeline within the Action Area and adjacent vegetated shallows and oyster bars adjacent to San Jose Island are discountable and insignificant and are not likely to have an adverse effect on any of the five sea turtle species.

Direct killing or wounding of individual sea turtles within the Proposed Action Area is not expected due to the following reasons:

1. Overall avoidance of nesting habitat during construction activities because HDD will totally avoid the San Jose Island dune system and beach area.

2. The Applicant-proposed conservation measures will reduce the likelihood of cold-stunned turtle strikes in the Project Area.

3. The species are generally diurnal and are highly mobile; therefore, they will be able to see the dangers and hazards presented by the Proposed Action in open water portions of the Action Area.

These factors make the possibility of directly killing or wounding a green sea turtle, a Kemp's Ridley sea turtle, loggerhead sea turtle, hawksbill sea turtle, or leatherback sea turtle as highly unlikely and discountable.

The likelihood of directly harassing a sea turtle that may be present within the Action Area is similarly discountable. It is not anticipated that noise, lighting, and engine exhaust will be severe enough to have an adverse effect on sea turtles. As a matter of record, the NMFS, the federal agency that would authorize incidental take of sea turtles, does not normally require incidental take authorization of either recreational or commercial boat traffic in the vicinity of LAC or anywhere in the Gulf of Mexico.

A recent consultation between the U.S. Nuclear Regulatory Commission and NMFS concluded that although the potential impact to sea turtles from barge traffic at the Colorado River delta and upstream of the delta was theoretically possible, the likelihood of interactions with healthy sea turtles was discountable (U.S. Nuclear Regulatory Commission 2010). Again, the likelihood of such adverse effects is discountable in terms of both the presence of the species in or near an area of active demolition and in terms of the actual means of potential harassment.

Non-nesting habitat loss is also not expected to have a significant adverse effect on the three sea turtle species expected to inhabit the inshore portion of the Action area (i.e., green sea turtle, Kemp's Ridley sea turtle, and loggerhead sea turtle). The scale of the possible impacts to seagrass and oyster habitats within the Proposed Action Area is far too small and dispersed to have any meaningful effect on the greater landscape or its associated faunal community, especially when considered in the context of the amount of adjacent seagrass habitat found across the LAC near Harbor Island, Hog Island, Stedman Island, Ransom Island, and Redfish Bay.

The potential effects on endangered sea turtle species found in the area are expected to be discountable and insignificant, such that based on the best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate significant effects; or (2) expect quantifiable effects to occur. In any case, effects rising to the level of incidental take are not expected and in our experience the NMFS is likely to conclude that no incidental take authorization is warranted for the operation of the Bluewater SPM DWP facility to proceed in accordance with the ESA.

6. CUMULATIVE EFFECTS

According to the USFWS Guidance for Preparing Biological Assessments under Section 7 of the ESA (USFWS 2016), cumulative effects are effects resulting from future state or private activities not involving federal activities that are reasonably certain to occur within the Action Area of the federal action subject to consultation. Completing cumulative effects analysis for a BA is necessary only if listed resources will be adversely affected and formal consultation is therefore necessary.

In the case of the Proposed Bluewater SPM Project, it has been determined that the Proposed Action will have *no effect* on the following species:

- Oceanic whitetip shark
- Attwater's greater prairie chicken
- Interior least tern
- Gulf coast jaguarundi
- Ocelot
- Florida manatee
- West Indian manatee
- Bryde's whale
- Sperm whale
- Blue whale
- Humpback whale
- Golden orb
- Lobed star coral
- Mountainous star coral
- Boulder star coral
- Elkhorn coral
- Slender rush-pea
- South Texas ambrosia

It has also been determined that the Proposed Action *may affect, is not likely to adversely affect* the giant manta ray, Northern aplomado falcon, piping plover, rufa red knot, whooping crane, fin whale, sei whale, green sea turtle, Kemp's Ridley sea turtle, loggerhead turtle, hawksbill sea turtle, and the leatherback sea turtle. Since listed resources would not be adversely affected and formal consultation will not be necessary under Section 7, completing cumulative impacts analysis will not be necessary.

7. CONSERVATION MEASURES

7.1. Wetland and Aquatic Resource Minimization of Impacts and Restoration

The pipeline construction will include the grading and clearing of vegetation for construction workspace, topsoil segregation where required, trench excavation, pipeline welding and lowering in, hydrostatic pressure testing (i.e., to verify pipeline integrity in accordance with federal requirements), soil replacement, final grading, and restoration. Geotechnical activities will involve minimal temporary soil disturbance at a maximum depth of 150 feet below ground surface, with the top 2 feet backfilled with native soils. BWTT proposes to implement the following measures during construction of the Project to minimize the potential for adverse impacts to wetlands, other aquatic resources, and federally listed threatened and endangered species.

To minimize impacts and restore the functions and properties of wetlands, waterbodies, and tidal flats located adjacent to or within potential habitat, BWTT will take the following measures during construction:

- The pipeline and associated facilities will be constructed using currently acceptable and preferable construction methods.
- BMPs will be utilized prior to or immediately following commencement of clearing activities and will be designed and maintained to avoid/minimize soil erosion and sedimentation into adjacent areas, including wetlands, waterbodies, and tidal flats, throughout construction and until permanent vegetation has become established. BMPs for erosion and sediment control include silt fencing, matting, and hay bales.
- Native seed mixes will be used to restore vegetation.
- Final grading in wetlands, waterbodies, and mud flats will be restored to near pre-construction conditions/contours to ensure the topography matches pre-construction and adjacent contours.

During the excavation of the trench, topsoil and subsoil will be side cast in separate piles to maintain hydrological functions and soil profiles ensuring soil structure is maintained when the trenches are backfilled, and soils are replaced. During topsoil segregation BWTT will utilize the previously mentioned BMP soil erosion control measures and reduce soil compaction.

7.2. Threatened and Endangered Species Avoidance, Minimization of Impacts, and Restoration

It is expected that the Project, utilizing the proposed species-specific conservation measures discussed below, will result in no permanent loss of designated critical habitat for any of the listed species. Consequently, there will be no adverse effects to any species, insignificant or discountable effects are anticipated for 12 species, and no effects are anticipated for 18 species.

Bluewater SPM will use HDD and Direct Pipe boring construction methods to avoid impacts to the dunes and beach of San Jose Island, thereby avoiding potential sea turtle nesting areas. In addition, vehicular use along the beach will be avoided during sea turtle nesting periods to avoid contact with species. Biological monitors will conduct pre-construction surveys for the 12 federally listed species and will also be present in areas of potential occurrence of these 12 species prior to and during construction to further reduce potential collisions, harm, or take of protected species.

The number of biological monitors during construction will be greatest during the clearing and grading phases when the threat of harm is the greatest. The monitors will immediately contact the Construction Supervisor, who will in turn immediately stop all work in proximity to a federally listed species observation until word is received from the monitor that the animal has left the vicinity and work may safely be resumed. The monitor will be empowered to stop work if the Construction Supervisor cannot be reached, or if the urgency of the situation does not allow time for such contact to be made.

Suggested conservation measures for the four bird species for which it is determined the Project's activities *may affect, is not likely to adversely affect* are provided below.

7.2.1. Northern Aplomado Falcon

No known nesting sites are within the Project Action Area. The species is known from the Project Area counties and the Project is within 20 miles of known observations. Possible avoidance and minimization measures for this species may include:

- A qualified biologist will conduct biological monitoring for Northern aplomado falcons along their habitats (coastal prairies and savannahs, marshes and tidal flats, open grasslands with scattered trees and shrubs) to determine if falcons are present or nesting before vegetation clearing and construction begins.
- Bluewater SPM employees and contractors will receive training on Northern aplomado falcon identification and procedures for notifying supervisors if the species is observed.
- Construction activities will take place outside of the nesting season anticipated to occur between February 1 and August 31, where practicable. Where that is impracticable, pre-clearing nest surveys will be conducted to verify the Northern aplomado falcon is not nesting in the project area.
- If an active Northern aplomado falcon nest is observed within 0.25 mile of the construction corridor, construction activities will be suspended until the end of the breeding season or the nest is otherwise vacated, as determined by a qualified biologist.
- Aboveground utilities required for operation of the pipeline will be equipped with devices to discourage nest building and perching (e.g. visual fright devices).

7.2.2. Piping Plover and Rufa Red Knot

Any potential long-term disturbance to piping plover and rufa red knot habitat is anticipated to be avoided through mud flat restoration and reclamation efforts. Because habitat utilized by rufa red knot overlaps with the wintering piping plover, conservation measures for the piping plover are applied to rufa red knot as well. Impacts will be minimized via use of BMPs described below.

- A qualified biologist will conduct biological monitoring for piping plovers and rufa red knots along their habitats (unvegetated or sparsely vegetated tidal, sand and algal flats, depressional wetlands and beach wet zones) to demarcate areas of known or potential occurrence.
- If a piping plover or rufa red knot is detected within 165 feet of geotechnical boring activities or construction activities, all activities within 165 feet of the animal will stop as soon as safely possible and crew members will avoid the area to the maximum extent practicable until the biological monitor confirms that the animal has vacated the area. USFWS will also be contacted to determine appropriate actions to be taken.

- Bluewater SPM employees and contractors will receive training on piping plover and rufa red knot identification, the potential for vehicle collisions with these birds, and procedures for notifying supervisors if these birds are observed.
- Minimizing vehicular traffic on beaches and driving slow to avoid direct mortality of piping plovers and rufa red knots.
- Vehicles and equipment operating on beaches shall operate above the beach wet zones (e.g., exposed wet sand where water washes onto the shore after an incoming wave has broken, seaweed and vegetative debris lines) where practicable to minimize disturbance of foraging and roosting areas known to contain or potentially contain piping plovers or rufa red knots.
- HDD and Direct Pipe boring installation construction method to reduce the movement of heavy equipment and reduce the amount of soil disturbance associated with the Project in piping plover and rufa red knot habitat.
- Restoring habitat to pre-construction contours and conditions immediately following the pipeline installation.
- Avoiding or minimizing the discharge of water across tidal flats.
- Prevent/minimize erosion, runoff, and sedimentation during construction in habitat areas by utilizing BMPs such as silt fence and matting.
- Temporary access roads will be micro-sited to avoid or minimize, to the maximum extent practical, areas where roadbed erosion or surface flow entrapment could enter critical habitat.

7.2.3. Whooping Crane

The ANWR is about 17 miles from the closest point of the onshore pipelines and is about 25 miles from the offshore SPM buoy systems. Some suitable wintering habitat may be present within the footprint of the proposed Project, where grassland and wetlands are present. If whooping cranes were present at the time of construction for the onshore and inshore pipelines, construction within these habitats will temporarily displace them to nearby habitat. However, given the lack of species breeding/nesting in the southern United States, and the limited potential habitat present within the pipeline ROW, the proposed Project *may affect, is not likely to adversely affect* the whooping crane. Impacts will be minimized via use of BMPs described below.

- A qualified biologist will conduct biological monitoring for whooping cranes along their habitats to demarcate areas of known or potential occurrence.
- Bluewater SPM employees and contractors will receive training on whooping crane identification and procedures for notifying supervisors if a whooping crane is observed.
- If construction activities take place during the fall (October through November) or spring (March through May) migration periods, a qualified biologist will conduct biological monitoring for whooping cranes along potential wetland habitats to determine if cranes are present in the migration corridor.
- If whooping cranes are observed within the construction corridor, construction activities will be suspended until the birds leave of their own accord.

7.2.4. Giant Manta Ray, Fin Whale, and Sei Whale

The giant manta ray, the fin whale, and the sei whale all prefer deep offshore open water habitats. Any occurrence of these species would likely be the result of an individual or group of individuals wandering

into the Action Area. Any potential impacts to these species will be temporary. Furthermore, impacts will be minimized via use of the BMPs described below.

- A qualified biologist will conduct biological monitoring for manta ray and whale species during open water construction and operation activities.
- BWTT employees and contractors will receive training on manta ray and whale identification and procedures for notifying supervisors if these species are observed within the Action Area.
- If rays or whales are observed within the Action Area, construction activities will be suspended until the animals leave of their own accord.
- BWTT will implement appropriate whale and ray noise mitigation through coordination with NMFS and implementation of noise abatement measures.

7.2.5. Sea Turtles

Any of the five sea turtle species could occur within the offshore portion of the Action Area. It is expected that only three of the sea turtle species would could occur within the inshore portion of the Action Area, including the green sea turtle, the Kemp's Ridley sea turtle, and the loggerhead sea turtle. Any impacts to these sea turtles will be temporary in nature. Furthermore, impacts will be minimized via use of BMPs described below.

- A qualified biologist will conduct biological monitoring for sea turtle species during open water construction activities.
- BWTT employees and contractors will receive training on sea turtle identification and procedures for notifying supervisors if these species are observed within the Action Area.
- If sea turtles are observed within the construction corridor, construction activities will be suspended until the animals leave of their own accord.
- Protocols for cold-stunned turtles outlined in Section 5 will be implemented.
- BWTT will implement appropriate sea turtle noise mitigation through coordination with NMFS and implementation of noise abatement measures.

8. SUMMARY

This BA presents an evaluation of potential effects of the proposed Project on federally listed species that have the potential to occur in the Action Area due to their documented occurrences and likelihood to occur in Aransas, Nueces, and San Patricio Counties, Texas (USFWS 2019). This evaluation included a review of species' habitat requirements, their temporal and spatial distributions and occurrences, pedestrian field surveys of respective habitats in the vicinity of the Action Area, and a discussion of the direct, indirect, and cumulative effects of construction activities on these species.

8.1. Summary of Effect Determinations

A summary of effect determinations is presented below for each species and designated critical habitat discussed in this BA. Species were assigned to one of three categories of possible effect, following USFWS recommendations:

- *May affect, is likely to adversely affect*—adverse effects to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent activities, and the effect is not discountable, insignificant, or beneficial.
- *May affect, is not likely to adversely affect*—the proposed action may affect listed species and/or critical habitat; however, the effects are expected to be discountable, insignificant, or completely beneficial.
- *No effect*—the proposed action will have no adverse or beneficial effects on the species or critical habitat.

8.1.1. May Affect, Is Likely to Adversely Affect

None of the species or designated critical habitat with the potential to occur in the Action Area have the potential to be adversely affected by the Project's activities or environmental consequences. There is no anticipated take of any individual for each species due to BWTT's proposed BMPs, minimization and avoidance measures, and tailored construction methods.

8.1.2. May Affect, Is Not Likely to Adversely Affect

The Project's activities are anticipated to have a designation of *may affect, is not likely to adversely affect*, on the giant manta ray, Northern aplomado falcon, piping plover, rufa red knot, whooping crane, fin whale, sei whale, loggerhead sea turtle, green sea turtle, Kemp Ridley's sea turtle, hawksbill sea turtle, and leatherback sea turtle.

Giant Manta Ray

No known observations occur for this species within the Action Area. This species is migratory and prefers sparse, highly fragmented habitats within open ocean. A known population of this species is within the GOM and could transit the area; however, given the distance of known populations of this species from the Action Area, it is unlikely they will be impacted by the proposed Project. Construction activities will be temporary and thus normal foraging, travel and resting behaviors are anticipated to resume upon completion of the Project's activities. Consequently, the effects of the Project's activities and environmental consequences are anticipated to be insignificant and discountable for this species.

Northern Aplomado Falcon

This species was not observed during field studies. No known occurrences of the species are within the Action Area. Suitable habitat is located within the Action Area. However, the loss of suitable habitat within the 50-foot-wide ROW permanent easement is anticipated to be an insignificant or discountable effect due to the availability of additional scrub-shrub and herbaceous habitat immediately adjacent to the proposed construction corridor. Given this species' broad food preferences, the Project's activities are not anticipated to significantly reduce prey sources or hinder foraging activities. Finally, BWTT will implement the previously discussed BMPs to avoid potential impacts to the breeding and nesting activities of this species. Construction activities will be temporary and thus normal foraging, breeding, and nesting behaviors are anticipated to resume upon completion of the Project's activities. Consequently, the effects of the Project's activities and environmental consequences are anticipated to be insignificant and discountable for this species.

Piping Plover

The presence of suitable habitat and individuals in the vicinity of the Action Area results in the potential for effect on the piping plover. Although piping plover critical habitat is within the Project corridor, there are no anticipated adverse effects to piping plovers due to BWTT's previously discussed BMPs. Construction activities will be temporary and thus normal foraging and roosting behaviors are anticipated to resume upon completion of the Project's activities. Consequently, the effects of the Project's activities and environmental consequences are anticipated to be insignificant and discountable for this species.

Piping Plover Designated Critical Habitat (TX-15-19)

The presence of designated critical habitat in the Action Area results in the potential for effects of the Project's activities on this habitat. There are no anticipated permanent effects to primary constituent elements such as unvegetated or sparsely vegetated intertidal sand, mud, and algal flats within and above the high tide line in the vicinity of the Action Area due to Bluewater SPM's construction, restoration, and reclamation BMPs. This designated critical habitat unit will be totally avoided by HDD construction under the dunes and beach area. Direct effects on foraging habitat of wet zones and wrack lines within the TX-15-19 unit will be avoided where practicable. Topsoil in the tidal flats will be segregated during construction to maintain hydrologic and biotic processes of tidal flats. Soil disturbance, compaction, and erosion will be minimized by HDD and Direct Pipe boring construction, temporary matting, silt fencing, and micro-siting of access roads. Impacts to the habitat are anticipated to be temporary as habitat will be restored to pre-construction contours and conditions immediately following the pipeline installation. Consequently, the effects of the Project's activities and environmental consequences are anticipated to be insignificant and discountable for designated critical habitat unit TX-15-19.

Rufa Red Knot

The presence of suitable habitat in the vicinity of the action area results in the potential for effect on the rufa red knot. Although the Action Area contains suitable foraging and roosting habitat for rufa red knots, there are no anticipated adverse effects to rufa red knots due to BWTT's BMPs discussed above for the piping plover, as these will also benefit the rufa red knot. There is no designated critical habitat for the rufa red knot in the vicinity of the Action Area, and all potential effects of the Project's activities on the habitat are anticipated to be temporary. Consequently, the effects of the Project's activities and environmental consequences are anticipated to be insignificant and discountable for the rufa red knot.

Whooping Crane

There is little suitable wetland wintering habitat of the whooping crane in the vicinity of the Action Area. The few ponds that occur in the Action Area, which may serve as potential stopover areas, will not be disturbed by the Project's activities or environmental consequences due to boring construction methods and temporal restrictions. With addition of biological monitors present prior to and during construction, the Project's activities and environmental consequences on the whooping crane are anticipated to be insignificant and discountable.

Fin and Sei Whales

While fin and sei whales prefer deep open ocean habitats, both have been observed to have random occurrences in the vicinity of the Action Area. It is unlikely that these species will occur in the vicinity of the Action Area and be exposed to the Project's activities. The localized and temporary sediment plume associated with offshore construction activities will be comprised of sediments that will quickly return to the sea floor upon completion of construction activities and therefore this is not expected to affect foraging activities of the whales. In the unlikely event that this species is present in the Project Area, Bluewater SPM will have marine mammal monitors present during construction to identify the species should it appear during offshore construction activities, to ensure construction activities do not result in unanticipated take of this species. Consequently, the Project's environmental consequences on the fin whale and the sei whale are anticipated to be insignificant and discountable.

Loggerhead Sea Turtle

In the terrestrial environment, suitable beach (dune) nesting habitat is present in the Action Area; however, the probability of a nesting occurrence is moderately low given the few (0-6) annual nesting occurrences documented at the PINS. There will be no effects on beach habitat in the Action Area because it will be avoided up to 1 mile offshore via HDD or Direct Pipe boring construction methods. This species is relatively common in inshore waters of Texas and has a broad preference for hard-shelled marine invertebrates not limited to the vicinity of the Action Area. Individuals would be able to continue foraging outside and after the temporary disturbance of offshore construction activities. As stated above the sediment plume associated with offshore construction activities will be localized and temporary and thus not expected to affect foraging activities of the loggerhead sea turtle. Biological monitors will be present to ensure there will be no unanticipated take of loggerhead sea turtles during offshore construction. Consequently, the Project's activities and environmental consequences on loggerhead sea turtles in the terrestrial and marine environments are anticipated to be insignificant and discountable.

Green Sea Turtle

In the terrestrial environment, suitable beach nesting habitat is present in the Action Area. However, the probability of a nesting occurrence is moderately low given that PINS is the only area with documented nesting occurrences. There will be no effects on beach habitat in the Action Area because it will be avoided up to 1 mile offshore via HDD or Direct Pipe boring construction methods. This species is common in inshore waters of Texas foraging on seagrass and algae. There are no anticipated effects to this foraging habitat given avoidance of construction in seagrass beds that occur in the Action Area. Lastly, biological monitors will be present to ensure there will be no unanticipated take of green sea turtles during offshore construction. Consequently, the Project's activities and environmental consequences on green sea turtles in the terrestrial and marine environments are anticipated to be insignificant and discountable.

Kemp's Ridley Sea Turtle

In the terrestrial environment, suitable beach nesting habitat is present in the Action Area; however, the probability of a nesting occurrence is moderately low given the primary nesting areas are in Mexico and secondarily at the PINS. There will be no effects on beach habitat in the Action Area because it will be avoided up to 1 mile offshore via HDD or Direct Pipe boring construction methods. This species is relatively common in inshore waters of Texas and has a broad preference for hard-shelled marine invertebrates not limited to the vicinity of the Action Area, and individuals would be able to continue foraging outside and after the temporary disturbance of offshore construction activities. As stated above the sediment plume associated with offshore construction activities will be localized and temporary and therefore is not expected to affect foraging activities of the Kemp's Ridley sea turtle. Biological monitors will be present to ensure there will be no unanticipated take of Kemp's Ridley sea turtles during offshore construction. Consequently, the Project's activities and environmental consequences on Kemp's Ridley sea turtles in the terrestrial and marine environments are anticipated to be insignificant and discountable.

Hawksbill Sea Turtle and Leatherback Sea Turtle

In the terrestrial environment, suitable beach nesting habitat is present in the Action Area. However, the probability of a nesting occurrence is very low given the rarity of nesting on the Texas coast and the very few sightings of these species in near-shore marine environments. There will be no effects on the beach habitat because it will be avoided up to 1 mile offshore via HDD or Direct Pipe boring construction methods, and offshore construction is anticipated to occur outside of sea turtle nesting season. The preferred prey species of Atlantic Hawksbill sea turtles, sponges, is uncommon in this portion of the GOM and thus construction activities are not anticipated to affect foraging activities of this species. The leatherback sea turtle prefers jellyfish, of which some species do occur in the area. As stated above the sediment plume associated with offshore construction activities will be localized and temporary and thus not expected to affect foraging activities of these sea turtle species. Biological monitors will be present to ensure there will be no take of hawksbill and leatherback sea turtles during offshore construction. Consequently, the Project's activities and environmental consequences on hawksbill sea turtle and leatherback sea turtle in the marine environments are anticipated to be insignificant and discountable.

8.1.3. No Effect

The Project activities are anticipated to have a designation of *no effect* on 18 of the 30 federally threatened or endangered species discussed above. These species are not anticipated to be exposed to the Project's activities or environmental consequences and thus not are not anticipated to experience adverse or beneficial effects. These species are listed in detail in Section 3.

9. CONCLUSIONS

The Proposed Action by the MARAD/USCG involves the operation of a DWP, associated pipeline infrastructure, and a booster station collectively known as the Bluewater SPM Project. The Applicant seeks authorization from the MARAD/USCG to construct the Bluewater SPM Project to provide a safe and environmentally responsible solution for the export of abundant domestic crude oil supplies from major shale basins. The Applicant is filing this DWP License application to construct, own, and operate the Project pursuant to the Deepwater Port Act of 1974, as amended, and in accordance with the USCG and MARAD's implementing regulations.

The Proposed Action occurs within the ranges of 30 federally threatened, endangered, or candidate species as well as numerous species protected under the MMPA. However, the Project will have no effect on 18 of these 30 species, due to lack of suitable habitat, extirpation, or absence of project impacts. The remaining 12 ESA species, including the giant manta ray, piping plover, red knot, Northern aplomado falcon, whooping crane, green sea turtle, Kemp's ridley sea turtle, loggerhead sea turtle, hawksbill sea turtle, leatherback sea turtle, sei whale, and the fin whale may be affected, but are not likely to be adversely affected by the Proposed Action.

The Proposed Action may directly or indirectly affect the 12 species due to the Applicant's proposed activities at the 56.48-mile-long by 2,000-foot-wide Action Area. Where potential effects to one or more of the 12 species are possible, none of the possible direct or indirect effect pathways are likely to adversely affect the giant manta ray, four bird species, five sea turtle species, or two whale species.

Direct effects to the piping plover, rufa red knot, and whooping crane by way of killing, wounding, or harassing individuals are discountable due to proposed work mainly being conducted in inshore areas not directly utilized by the bird species. Direct effects to the Northern aplomado falcon by way of killing, wounding or harassing are discountable due to the extreme rarity of this species in the Action Area. Direct effects to the three species of turtles which would potentially nest in the area (green sea turtle, Kemp's Ridley sea turtle, and loggerhead sea turtle) are also discountable due to the proposed work totally avoiding sensitive inshore beach and dune areas used for potential nesting areas, and mostly avoiding inshore open water, vegetated shallows, and oyster reefs used for potential foraging, resting and, travel corridors. Direct effects to the mainly pelagic species of this project (giant manta ray, fin whale, sei whale, leatherback sea turtle, and hawksbill sea turtle) are discountable due to the extreme rarity of the species in the Action Area and the huge home ranges of these species.

Indirect effects to the 12 species related to habitat loss and fragmentation are similarly discountable and insignificant to the species because of the context of the habitat loss within the comparatively much larger home range of individuals of the species. With the Applicant's proposed conservation measures, no incidental take of the giant manta ray, Northern aplomado falcon, piping plover, red knot, whooping crane, fin whale, sei whale, green sea turtle, Kemp's Ridley sea turtle, loggerhead sea turtle, hawksbill sea turtle, or leatherback sea turtle is anticipated.

With the implementation of the Applicant's proposed conservation measures and in consideration of the size and environmental setting of the Proposed Project, the operation of the proposed PDW and pipeline is not expected to result in adverse effects that rise to the level of take. Therefore, the Proposed Action is unlikely to jeopardize the continued existence of the giant manta ray, Northern aplomado falcon, piping plover, red knot, whooping crane, fin whale, sei whale, green sea turtle, Kemp's Ridley sea turtle, loggerhead sea turtle, hawksbill sea turtle, or leatherback sea turtle. Although designated critical habitat for the piping occurs within the Action Area, this area (GOM dune and beach system) is being completely avoided by the Project.

MARAD/USCG requests concurrence from USFWS and NMFS that the Proposed Action *may affect, is not likely to adversely affect* the giant manta ray, piping plover, red knot, Northern aplomado falcon, whooping crane, fin whale, sei whale, green sea turtle, Kemp's Ridley sea turtle, loggerhead sea turtle, hawksbill sea turtle, and leatherback sea turtle, thereby informally concluding the agency's ESA Section 7 consultation obligations. Should the USFWS and/or NMFS not concur with this effects determination, the MARAD/USCG formally requests that USFWS and/or NMFS immediately initiate formal consultation, thereby starting the 135-day statutory timeframe for completion of the formal consultation process.

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———. 2019d. Hawksbill Sea Turtle (Eretmochelys imbricate). Available at: https://www.fws.gov/northflorida/seaturtles/turtle%20factsheets/hawksbill-sea-turtle.htm. Accessed March 2019.

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APPENDIX A

USFWS IPAC Report for Action Area

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Aransas, Nueces and San Patricio counties, Texas

Local office

Texas Coastal Ecological Services Field Office

(281) 286-8282
(281) 488-5882

17629 El Camino Real #211
Houston, TX 77058

http://www.fws.gov/southwest/es/TexasCoastal/
http://www.fws.gov/southwest/es/ES_Lists_Main2.html

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Gulf Coast Jaguarundi Herpailurus (=Felis) yagouaroundi cacomitli — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/3945

Ocelot Leopardus (=Felis) pardalis — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/4474

West Indian Manatee Trichechus manatus — Threatened
Marine mammal
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/4469

Birds

NAME	STATUS

Attwater's Greater Prairie-chicken Tympanuchus cupido attwateri — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/7259

Least Tern Sterna antillarum — Endangered
This species only needs to be considered if the following condition applies:
- Wind Related Projects Within Migratory Route

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/8505

Northern Aplomado Falcon Falco femoralis septentrionalis — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/1923

Piping Plover Charadrius melodus — Threatened
There is **final** critical habitat for this species. Your location overlaps the critical habitat.
https://ecos.fws.gov/ecp/species/6039

Red Knot Calidris canutus rufa — Threatened
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/1864

Whooping Crane Grus americana — Endangered
There is **final** critical habitat for this species. Your location overlaps the critical habitat.
https://ecos.fws.gov/ecp/species/758

Reptiles

NAME	STATUS
Green Sea Turtle Chelonia mydas No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6199	Threatened
Hawksbill Sea Turtle Eretmochelys imbricata There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/3656	Endangered
Kemp's Ridley Sea Turtle Lepidochelys kempii There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/5523	Endangered
Leatherback Sea Turtle Dermochelys coriacea There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/1493	Endangered
Loggerhead Sea Turtle Caretta caretta There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/1110	Threatened

Clams

NAME	STATUS
Golden Orb Quadrula aurea No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9042	Candidate

Flowering Plants

NAME	STATUS
Slender Rush-pea Hoffmannseggia tenella No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5298	Endangered
South Texas Ambrosia Ambrosia cheiranthifolia No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3331	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
Piping Plover Charadrius melodus https://ecos.fws.gov/ecp/species/6039#crithab	Final
Whooping Crane Grus americana https://ecos.fws.gov/ecp/species/758#crithab	Final

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

MIGRATORY BIRD INFORMATION IS NOT AVAILABLE AT THIS TIME

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to

occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Marine mammals

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take (to harass, hunt, capture, kill, or attempt to harass, hunt, capture or kill) of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

1. The Endangered Species Act (ESA) of 1973.
2. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following marine mammals under the responsibility of the U.S. Fish and Wildlife Service are potentially affected by activities in this location:

NAME
West Indian Manatee *Trichechus manatus* https://ecos.fws.gov/ecp/species/4469

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

This location overlaps the following National Wildlife Refuge lands:

LAND	ACRES

Aransas National Wildlife Refuge 141,659.53 acres

(361) 286-3559
(361) 286-3722

MAILING ADDRESS
1 Wildlife Circle
Austwell, TX 77950-0100

PHYSICAL ADDRESS
Farm Market Road 2040
Austwell, TX 77950

https://www.fws.gov/refuges/profiles/index.cfm?id=21532

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

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

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

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME
This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

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

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

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

Data exclusions

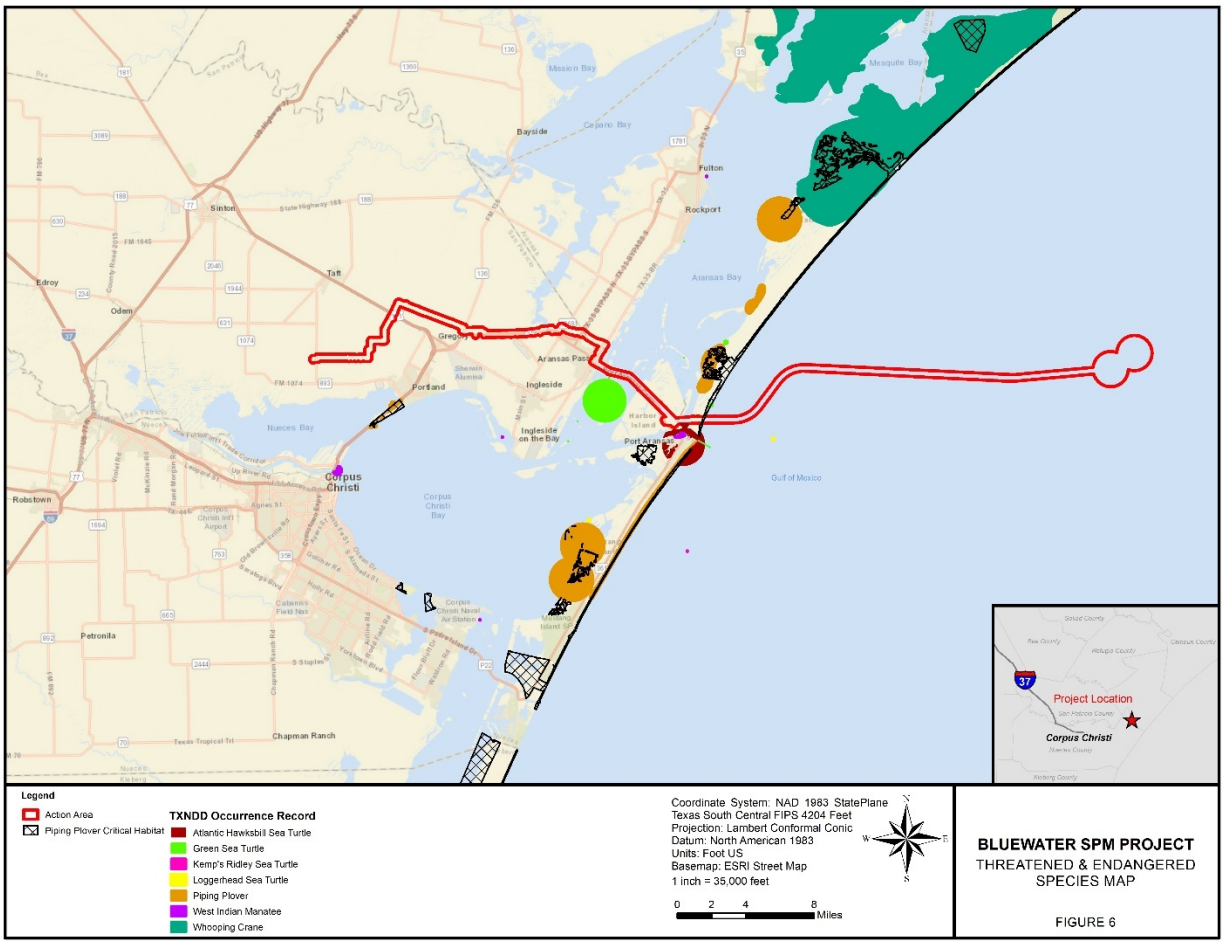
Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and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

Data precautions

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

APPENDIX B

TXNDD Element Occurrences Report and Map



BLUEWATER SPM PROJECT

THREATENED & ENDANGERED SPECIES MAP

FIGURE 6

Occurrence List for Quads Surrounding Request Area

Scientific Name:	Common Name:	Occurrence Number:	State Status:	Federal Status:	Eo Id:
Allium elmendorfii	Elmendorf's onion	11			5009
Allium elmendorfii	Elmendorf's onion	15			6813
Atractosteus spatula	Alligator Gar	19			14063
Brazoria arenaria	sand Brazos mint	20			11187
Cemophora coccinea lineri	Texas Scarlet Snake	2	T		2808
Cemophora coccinea lineri	Texas Scarlet Snake	6	T		4814
Centropomus parallelus	Fat Snook	1			12898
Charadrius melodus	Piping Plover	1	T	LT	66
Charadrius melodus	Piping Plover	2	T	LT	4066
Charadrius melodus	Piping Plover	28	T	LT	1482
Charadrius melodus	Piping Plover	31	T	LT	2083
Charadrius melodus	Piping Plover	32	T	LT	7725
Charadrius melodus	Piping Plover	33	T	LT	2950
Charadrius melodus	Piping Plover	34	T	LT	1605
Charadrius melodus	Piping Plover	35	T	LT	4418
Charadrius melodus	Piping Plover	36	T	LT	3369

Scientific Name:	Common Name:	Occurrence Number:	State Status:	Federal Status:	Eo Id:
Charadrius melodus	Piping Plover	37	T	LT	7324
Charadrius melodus	Piping Plover	38	T	LT	628
Charadrius melodus	Piping Plover	40	T	LT	125
Charadrius melodus	Piping Plover	41	T	LT	5554
Charadrius melodus	Piping Plover	68	T	LT	1698
Chelonia mydas	Green Sea Turtle	1	T	LT	1881
Chloris texensis	Texas windmill grass	28			7590
Conepatus leuconotus	Western hog-nosed skunk	41			13896
Croton coryi	Cory's croton	7			10208
Cuscuta exaltata	tree dodder	5			8763
Cuscuta exaltata	tree dodder	27			11282
Desmanthus reticulatus	net-leaf bundleflower	7			10192
Echinocereus reichenbachii var. albertii	black lace cactus	5	E	LE	6453
Eleocharis austrotexana	South Texas spikesedge	7			10873
Euphorbia innocua	velvet spurge	1			8407
Euphorbia innocua	velvet spurge	2			8408
Euphorbia innocua	velvet spurge	3			8409

Scientific Name:	Common Name:	Occurrence Number:	State Status:	Federal Status:	Eo Id:
Euphorbia innocua	velvet spurge	20			11169
Euphorbia innocua	velvet spurge	22			11283
Geomys personatus maritimus	maritime pocket gopher	1			316
Geomys personatus maritimus	maritime pocket gopher	3			10802
Geomys personatus maritimus	maritime pocket gopher	4			10805
Grus americana	Whooping Crane	2	E	LE	4226
Holbrookia lacerata	Spot-tailed Earless Lizard	58			9529
Holbrookia propinqua	Keeled Earless Lizard	5			6070
Holbrookia propinqua	Keeled Earless Lizard	9			1060
Lasiurus ega	Southern yellow bat	4	T		3660
Lenophyllum texanum	Texas stonecrop	7			6500
Lepidochelys kempii	Kemp's Ridley Sea Turtle	3	E	LE	2550
Lepidochelys kempii	Kemp's Ridley Sea Turtle	16	E	LE	8984
Liatris bracteata	coastal gay-feather	13			5277
Malaclemys terrapin littoralis	Texas Diamondback Terrapin	1			3963
Malaclemys terrapin littoralis	Texas Diamondback Terrapin	22			12451
Menidia clarkhubbsi	Texas Silverside	1			13888

Scientific Name:	Common Name:	Occurrence Number:	State Status:	Federal Status:	Eo Id:
Notophthalmus meridionalis	Black-spotted Newt	10	T		7800
Notophthalmus meridionalis	Black-spotted Newt	25	T		1845
Notophthalmus meridionalis	Black-spotted Newt	38	T		12665
Paronychia jonesii	Jones' nailwort	1			10352
Paronychia jonesii	Jones' nailwort	2			10195
Paronychia jonesii	Jones' nailwort	9			10000
Prosopis glandulosa-acacia smallii series	Mesquite-huisache Series	8			7904
Prunus texana	Texas peachbush	20			10400
Prunus texana	Texas peachbush	23			10314
Pseudacris streckeri	Strecker's Chorus Frog	4			12752
Puma yagouaroundi	jaguarundi	12	E	LE	2516
Quercus virginiana-persea borbonia series	Coastal Live Oak-redbay Series	1			754
Quercus virginiana-persea borbonia series	Coastal Live Oak-redbay Series	2			1975
Rhododon angulatus	Tharp's rhododon	1			1009
Rhododon angulatus	Tharp's rhododon	6			8476
Rhynchospora indianolensis	Indianola beakrush	2			11082
Rookery		39			6087

Scientific Name:	Common Name:	Occurrence Number:	State Status:	Federal Status:	Eo Id:
Rookery		40			6086
Rookery		41			627
Rookery		42			7569
Rookery		53			7625
Rookery		54			2721
Rookery		55			8048
Rookery		68			2145
Rookery		69			4309
Rookery		70			4308
Rookery		71			1900
Rookery		72			7540
Rookery		73			2302
Rookery		74			7314
Rookery		75			5657
Rookery		386			2564
Rookery		387			5184
Rookery		590			8403

Scientific Name:	Common Name:	Occurrence Number:	State Status:	Federal Status:	Eo Id:
Salicornia bigelovii/salicornia virginiana-batis maritima series	Glasswort-saltwort Series	1			6836
Salicornia bigelovii/salicornia virginiana-batis maritima series	Glasswort-saltwort Series	5			3421
Schizachyrium littorale - Paspalum monostachyum Herbaceous Vegetation	Seacoast Bluestem - Gulfdune Paspalum Tallgrass Prairie	1			11384
Schizachyrium scoparium - Paspalum plicatulum - Sorghastrum nutans - Dichanthelium oligosanthes - Paspalum setaceum - Symphyotrichum pratense Alfisol Grassland	Alfisol Coastal Prairie	108			11778
Schizachyrium scoparium - Sorghastrum nutans - Bifora americana Alfisol Grassland	Alfisol Blackland Prairie	2			11378
Schizachyrium scoparium var. littoralis-paspalum monostachyum series	Seacoast Bluestem-gulfdune Paspalum Series	3			150
Sesuvium trianthemoides	roughseed sea-purslane	2			10885
Sesuvium trianthemoides	roughseed sea-purslane	3			10926
Siren sp. 1	South Texas Siren (Large Form)	22	T		3234
Spartina spartinae - Schizachyrium scoparium Herbaceous Vegetation	Gulf Cordgrass - Little Bluestem Wet Prairie	4			11413
Spartina spartinae - Schizachyrium scoparium Herbaceous Vegetation	Gulf Cordgrass - Little Bluestem Wet Prairie	6			11415
Spartina spartinae Herbaceous Vegetation	Salty Prairie	6			11516
Spartina spartinae Herbaceous Vegetation	Salty Prairie	7			11517
Spartina spartinae Herbaceous Vegetation	Salty Prairie	9			11519
Spartina spartinae Herbaceous Vegetation	Salty Prairie	10			11520
Spartina spartinae Herbaceous Vegetation	Salty Prairie	11			11521
Spartina spartinae Herbaceous Vegetation	Salty Prairie	12			11522

Scientific Name:	Common Name:	Occurrence Number:	State Status:	Federal Status:	Eo Id:
Spilogale putorius	Eastern spotted skunk	30			12778
Spilogale putorius interrupta	plains spotted skunk	30			12640
Sporobolus tharpii	Tharp's dropseed	1			10395
Sporobolus tharpii	Tharp's dropseed	5			10068
Sporobolus tharpii	Tharp's dropseed	20			10360
Trichechus manatus	West Indian Manatee	1	E	LT	6570
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	1			10229
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	3			10390
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	20			10264
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	24			10080
Uniola paniculata-panicum amarum series	Sea Oats-bitter Panicum Series	2			2025
Zephyranthes refugiensis	Refugio rainlily	2			10024

Element Occurrence Record

Scientific Name: Brazoria arenaria **Occurrence #:** 1 **Eo Id:** 8416

Common Name: sand Brazos mint **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G3 **State Rank:** S3 **Federal Status:**

Location Information:

Directions

West edge of Wisconsin Blvd. ca. 500 feet south of its curving intersection with Ticonderoga Blvd of Naval Air Station Ingleside.

Survey Information:

First Observation: 1996-04-09 **Survey Date:** 1996-04-09 **Last Observation:** 1996-04-09

Eo Type: **Eo Rank:** E **Eo Rank Date:** 1996-04-09

Observed Area:

Comments:

General Description: Unshaded margin of coastal live oak-redbay woodland on deep, loose sand of Pleistocene barrier island.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: Rare, one plant observed. Specimen collected.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

CARR, W.R. (15169). 1996. SPECIMEN # NONE TEX-LL.

Specimen:

CARR, W.R. (15169). 1996. SPECIMEN # NONE TEX-LL. (S96CAR01TXUS)

University of Texas Herbarium. 1996. W.R. Carr (15169). Specimen # none. 9 April 1996. (TEX-LL).

Element Occurrence Record

Scientific Name: Caretta caretta **Occurrence #:** 7 **Eo Id:** 8973

Common Name: Loggerhead Sea Turtle **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:** T

Global Rank: G3 **State Rank:** S4 **Federal Status:** LT

Location Information:

Directions

Shamrock Island, on the bay side of Mustang Island. The directions were created by database staff.

Survey Information:

First Observation: 2001-04-10 **Survey Date:** 2001-04-10 **Last Observation:** 2001-04-10

Eo Type: **Eo Rank:** E **Eo Rank Date:** 2001-04-10

Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 10 April 2001: One individual was observed with a curved carapace length of 250 millimeters.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Texas Parks and Wildlife Department. 2008. Texas Parks and Wildlife Department - Coastal Fisheries Division summary of stranding and catch information for tracked sea turtles and terrapin.

Specimen:

Element Occurrence Record

Scientific Name: Cemophora coccinea lineri **Occurrence #:** 13 **Eo Id:** 12829

Common Name: Texas Scarlet Snake **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:** T

Global Rank: G5T2 **State Rank:** S1S2 **Federal Status:**

Location Information:

Directions

0.2 miles south of the main gate at Naval Station Ingleside.

Survey Information:

First Observation: 2006-06-29 **Survey Date:** 2006-06-29 **Last Observation:** 2006-06-29

Eo Type: **Eo Rank:** E **Eo Rank Date:** 2006-06-29

Observed Area:

Comments:

General Description:

Comments: The taxonomy of this EO was changed from C. c. copei to C. c. lineri based on genetic data described in A17WEI01TXUS (Reference ID 394420).

Protection Comments:

Management Comments:

Data:

EO Data: 2006: 1 individual was collected

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

LaDuc, Travis. 2014. Creating a centralized catalog for georeferenced specimen records of Texas reptiles and amphibians : the Herps of Texas Database. Contract # 441514. Prepared for USFWS. 3 pp. 9 January 2014.

Weinell, J.L. and C.C. Austin. 2017. Refugia and speciation in North American Scarlet snakes (Cemophora). Journal of Herpetology 51:161-171

Specimen:

Texas Natural History Collection, University of Texas at Austin, Austin, TX; Mike Duran (#unknown), 85151, 29 June 2006, TNHC.

Element Occurrence Record

Scientific Name: Charadrius melodus **Occurrence #:** 1 **Eo Id:** 66

Common Name: Piping Plover **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:** T

Global Rank: G3 **State Rank:** S2N **Federal Status:** LT

Location Information:

Directions

MUSTANG ISLAND BEACH, NUECES COUNTY

Survey Information:

First Observation: 1978 **Survey Date:** **Last Observation:** 1988

Eo Type: **Eo Rank:** C **Eo Rank Date:**

Observed Area:

Comments:

General Description: SANDY BEACH BACKED BY DUNES; MUCH BEACH TRAFFIC, DEVELOPMENT

Comments: IMPORTANT WINTER GROUNDS FOR BOTH POPULATIONS OF PIPING PLOVER; PLAINS AND GREAT LAKES

Protection Comments:

Management Comments:

Data:

EO Data: WEEKLY SURVEYS FOR PAST TEN YEARS SHOW UNIFORM DISTRIBUTION ALONG BEACH; PEAK NUMBERS IN SEPT-OCT AND AGAIN IN MAY-APR; 10 YEAR TREND IS FEWER BIRDS ANNUALLY

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

AMOS, TONY, PhD. UNDATED. MARINE SCIENCE INSTITUTE. UT. PORT ARANSAS, TEXAS 76373-1267. 512/749-6711.

Specimen:

Element Occurrence Record

Scientific Name: Charadrius melodus **Occurrence #:** 31 **Eo Id:** 2083

Common Name: Piping Plover **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:** T

Global Rank: G3 **State Rank:** S2N **Federal Status:** LT

Location Information:

Directions

BAYSIDE FLATS AND ISLANDS JUST NORTH OF WILSONS CUT ON MUSTANG ISLAND

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1991

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data:

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Linam, Lee Ann Johnsom. 1992. Performance Report. Job No. 9.1: Piping plover and peregrine falcon coastal habitat use. Grant No. E-1-3 Endangered and Threatened Species Conservation. Submitted to Texas Parks and Wildlife Department, Austin, TX. January 3, 1992.

Specimen:

Element Occurrence Record

Scientific Name: Charadrius melodus
Occurrence #: 39 **Eo Id:** 126
Common Name: Piping Plover
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status: T
Global Rank: G3 **State Rank:** S2N
Federal Status: LT

Location Information:

Directions

BAYSIDE FLATS OF SAN JOSE ISLAND FROM LYDIA ANN CHANNEL TO AND INCLUDING NORTH PASS

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1991

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: SAND/SILT AND SAND/MUD

Comments:

Protection Comments:

Management Comments:

Data:

EO Data:

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Linam, Lee Ann Johnsom. 1992. Performance Report. Job No. 9.1: Piping plover and peregrine falcon coastal habitat use. Grant No. E-1-3 Endangered and Threatened Species Conservation. Submitted to Texas Parks and Wildlife Department, Austin, TX. January 3, 1992.

Specimen:

Element Occurrence Record

Scientific Name: Chelonia mydas **Occurrence #:** 1 **Eo Id:** 1881

Common Name: Green Sea Turtle **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:** T

Global Rank: G3 **State Rank:** S4 **Federal Status:** LT

Location Information:

Directions

The coastal bays between Rockport and Port Ingleside, and both sides of San Jose Island. The directions were created by database staff. The directions are generalized as this record consists of multiple populations/observations.

Survey Information:

First Observation: 1967-06-23 **Survey Date:** 2008-11-10 **Last Observation:** 2008-11-10

Eo Type: **Eo Rank:** E **Eo Rank Date:** 2008-10-11

Observed Area:

Comments:

General Description: 2008, Port Aransas Jetty: The sides of the jetty descend to, and continue below, the surface of the water through a series of stepped blocks. Exposed portions of the jetty are barren. Submerged portions of the jetty support algal development in places. The gaps between blocks of granite attract and hold schools of small fish, which in turn can attract larger, predatory fish. The deeper water on either side of the jetty is used by even larger fish, such as redfish, speckled sea trout, black drum, flounder, etc. Water in the channel between the north and south jetties can be rough, but is usually calmer than water on the outside of the jetty. The channel is used by a variety of boats and ships, including small fishing boats, larger fishing boats and shrimp trawlers, tugboats, crew ships, and large freighters.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 23 June 1967: A specimen was collected. 22 Oct 1991: One individual was observed with a curved carapace length of 235 millimeters. 25 MAY 1993: One individual was observed with a curved carapace length of 280 millimeters. 02 Nov 1994: One individual was observed with a curved carapace length of 397 millimeters. 27 April 2000: One individual was observed with a curved carapace length of 280 millimeters. 20 April 2001: One individual was observed with a curved carapace length of 394 millimeters. 10 May 2001: One individual was observed with a curved carapace length of 344 millimeters. 23 May 2007: One individual was observed with a curved carapace length of 290 millimeters. 11 Oct 2008: Three individuals were observed foraging along the Port Aransas Jetty.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Texas Parks and Wildlife Department. 2008. Texas Parks and Wildlife Department - Coastal Fisheries Division summary of stranding and catch information for tracked sea turtles and terrapin.

Sunby, Paul. 2008. Texas Natural Diversity Database Reporting Form documenting an observation of three Chelonia mydas (green sea turtle) at the Port Aransas Jetty in Nueces County.

Specimen:

Texas A&M University Museum. 1967. Zimmerman and Chaney, Specimen # 1854 AI. 23 June 1967.

Element Occurrence Record

Scientific Name: Conepatus leuconotus **Occurrence #:** 41 **Eo Id:** 13896

Common Name: Western hog-nosed skunk **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G4 **State Rank:** S4 **Federal Status:**

Location Information:

Directions

The specimen labels state that they were located in Rockport. The georeferenced coordinates, based on VertNet Best Practices Guidelines, were used.

Survey Information:

First Observation: 1893-03-15 **Survey Date:** 1893-10-30 **Last Observation:** 1893-10-30

Eo Type: **Eo Rank:** H **Eo Rank Date:** 1893-10-30

Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 30 October, 15 August, and 15 March 1893: Skin and skull of two male preserved specimens and one preserved specimen of unknown sex.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Ferguson, Adam. 2014. Texas Skunk Record Database regarding five specices of skunk in Texas.

Dragoo, Jerry W., G. D. Baumgardner, D. B. Fagre, and D. J. Schmidly. 1988. Status survey of the Gulf Coast hog-nosed skunk (Conepatus leuconotus) in South Texas. Report submitted to Texas Parks and Wildlife Department, Austin, TX. August 1988.

Specimen:

American Museum of Natural History, New York, NY; H. P. Attwater (#151), Catalog #MS-7277, 15 Mar 1893, AMNH.

American Museum of Natural History, New York, NY; H. P. Attwater (#153), Catalog #MO-5883, 30 Oct 1893, AMNH.

American Museum of Natural History, New York, NY; H. P. Attwater (#unknown), Catalog #MO-5130, 15 Aug 1893, AMNH.

Element Occurrence Record

Scientific Name: Cuscuta exaltata **Occurrence #:** 1 **Eo Id:** 8414

Common Name: tree dodder **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G3 **State Rank:** S3 **Federal Status:**

Location Information:

Directions

East edge of perimeter road on west edge of Naval Station Ingleside. Ca. 5,200 feet southwest of junction of FM 2725 and FM 1069.

Survey Information:

First Observation: 1992-09-11 **Survey Date:** 1996-09-10 **Last Observation:** 1996-09-10

Eo Type: **Eo Rank:** E **Eo Rank Date:** 1996-09-10

Observed Area:

Comments:

General Description: 1992 - Oak-redbay woodland on well drained sand. 1996 - Edge of live oak-redbay woodland on deep, neutral, loose, somewhat excessively drained fine sand (Galveston Series, Typic Udipsamments) on slope of Pleistocene-era relict barrier island dune. PARASITIC ON QUERCUS VIRGINIANA ON OAK-REDBAY WOODLAND ON DEEP, WELL-DRAINED SAND OF BARRIER ISLAND.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 11 September 1992 - Local, parasitic on a few large Quercus virginiana. 10 September 1996 - rare, parasitic on low growing (3-4 ft.) Quercus virginiana or Q. hemisphaerica. There are scattered plants in other parts of the base that were not mapped.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

CARR, W.R. & D. WOLFE (15719). 1996. TEX-LL.

Specimen:

CARR, W.R. & D. WOLFE (15719). 1996. TEX-LL. (S96CAR01TXUS)

CARR, W.R. & R. CARTER (12341). 1992. TEX-LL. (S92CAR01TXUS)

University of Texas Herbarium. 1992. W.R. Carr (12341) with R. Carter. Specimen # none. 11 September 1992. (TEX-LL).

University of Texas Herbarium. 1996. W.R. Carr (15719) with D. Wolfe. Specimen # none. 10 September 1996. (TEX-LL).

Element Occurrence Record

Scientific Name: Cuscuta exaltata **Occurrence #:** 8 **Eo Id:** 11138

Common Name: tree dodder **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G3 **State Rank:** S3 **Federal Status:**

Location Information:

Directions

Aransas Pass.

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1922-05-22

Eo Type: **Eo Rank:** H **Eo Rank Date:** 2006-12-07

Observed Area:

Comments:

General Description:

Comments: Complete label citation: Aransas Pass, 24 May 1922, B. C. Tharp s.n. (TEX-LL). Orig. det. Cassytha filiformis; ann. to Cuscuta exaltata by Alan Prather, 1993.

Protection Comments:

Management Comments:

Data:

EO Data:

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Tharp. B.C. 1922. Specimen # none TEX-LL

Specimen:

Tharp. B. C. 1922. Specimen # none TEX-LL (S22THATXTXUS)

Element Occurrence Record

Scientific Name: Eleocharis austrotexana **Occurrence #:** 6 **Eo Id:** 10908

Common Name: South Texas spikesedge **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G3 **State Rank:** S3 **Federal Status:**

Location Information:

Directions

Ca. 3 mi NE of Ingleside.

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1968-06-13

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: In sandy low grounds in cultivated field.

Comments: Complete specimen citation: Ca. 3 mi NE of Ingleside in sandy low grounds in cultivated field, 13 Jun 1968, F. B. Jones 7378 (CCM).

Protection Comments:

Management Comments:

Data:

EO Data:

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Jones, F. B. (7378). 1968. Specimen # ? Corpus Christi Museum.

Specimen:

Jones, F. B. (7378). 1968. Specimen # ? Corpus Christi Museum. (S68JONCCTXUS)

Element Occurrence Record

Scientific Name: Eretmochelys imbricata **Occurrence #:** 1 **Eo Id:** 5451

Common Name: Atlantic Hawksbill Sea Turtle **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:** E

Global Rank: G3 **State Rank:** S2 **Federal Status:** LE

Location Information:

Directions

PORT ARANSAS

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1958-10-05

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments: COLLECTED 5 OCTOBER 1958

Protection Comments:

Management Comments:

Data:

EO Data:

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

DEGENHARDT, D.W. 1958. SPECIMEN # 38321. ONE SPECIMEN. UNIV. OF NEW MEXICO

Specimen:

DEGENHARDT, D.W. 1958. SPECIMEN # 38321. ONE SPECIMEN. UNIV. OF NEW MEXICO (S58DEGNMTXUS)

University of New Mexico Museum, Albuquerque. 1958. W.G. Degenhardt #1915, Specimen # 38321 UNM. 5 October 1958.

Element Occurrence Record

Scientific Name: Euphorbia innocua **Occurrence #:** 7 **Eo Id:** 11221

Common Name: velvet spurge **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G3 **State Rank:** S3 **Federal Status:**

Location Information:

Directions

Marine Station apartment house, 1/4 mi S of Station, Mustang Island, Port Aransas.

Survey Information:

First Observation: 1976-02-14 **Survey Date:** **Last Observation:** 1976-02-28

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: Sand dunes

Comments: Complete label citation: Sand dunes at Marine Station apartment house, 1/4 mi S of Station, Mustang Island, Port Aransas, 28 Feb 1976, W. V. Brown s.n. (TEX-LL). Also: sand dunes, Mustang Island, at Marine Station apartment house, 1/4 mi S of the main building, common, in flower, 14 Feb 1976, W. V. Brown s.n. (TEX-LL).

Protection Comments:

Management Comments:

Data:

EO Data:

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Brown, W.V. (s.n.). 1976. TEX-LL.

Specimen:

Brown, W.V. (s.n.). 1976. TEX-LL. (S76BROTXTXUS)

Element Occurrence Record

Scientific Name: Euphorbia innocua **Occurrence #:** 8 **Eo Id:** 11237

Common Name: velvet spurge **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G3 **State Rank:** S3 **Federal Status:**

Location Information:

Directions

Mustang Island, ca. 1/2 mi S of Port Aransas.

Survey Information:

First Observation: 1965-04-30 **Survey Date:** **Last Observation:** 1967-04-12

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: On low dune.

Comments: Complete label citation: Mustang Island, ca. 1/2 mi S of Port Aransas on low dune, 30 Apr 1965, F. B. Jones 6381 and 12 Apr 1967, F. B. Jones 7064 (CCM).

Protection Comments:

Management Comments:

Data:

EO Data:

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Jones, F.B. (7064). 1967. Corpus Christi Museum.

Specimen:

Jones, F.B. (6381). 1965. Corpus Christi Museum. (S65JONCCTXUS)

Jones, F.B. (7064). 1967. Corpus Christi Museum. (S67JONCCTXUS)

Element Occurrence Record

Scientific Name: Euphorbia innocua
Occurrence #: 17 **Eo Id:** 11129
Common Name: velvet spurge
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G3 **State Rank:** S3
Federal Status:

Location Information:

Directions

Mustang Island, about 2 mi S of Port Aransas.

Survey Information:

First Observation: 1948-05-01 **Survey Date:** **Last Observation:** 1948-05-01
Eo Type: **Eo Rank:** H **Eo Rank Date:** 2006-12-07
Observed Area:

Comments:

General Description: Sand dunes.

Comments: Complete label citation: Mustang Island, about 2 mi S of Port Aransas, sand dunes, 1 May 1948, E. Whitehouse 19842 (BRIT/SMU).

Protection Comments:

Management Comments:

Data:

EO Data:

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Whitehouse, E. (19842). 1948. BRIT/SMU.

Specimen:

Whitehouse, E. (19842). 1948. BRIT/SMU. (S48WHISMTXUS)

Element Occurrence Record

Scientific Name: Holbrookia propinqua **Occurrence #:** 9 **Eo Id:** 1060

Common Name: Keeled Earless Lizard **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G4 **State Rank:** S3 **Federal Status:**

Location Information:

Directions

1 MILE WEST OF INGLESIDE

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1961-05-19

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data:

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Elliott, Lee. 1994. Memorandum to Dorinda Sullivan dated December 2, 1994 concerning Texas A&M-Kingsville Vertebrate Specimens Catalogue.

Specimen:

1962. SPECIMEN #57. VERTEBRATE COLLECTION, TEXAS A & M UNIVERSITY, KINGSVILLE.

TEXAS A & M UNIVERSITY-KINGSVILLE--VERTEBRATE COLLECTION. 1961. UNKNOWN COLLECTOR, SPECIMEN #57 AI. 19 MAY 1961.

Element Occurrence Record

Scientific Name: Malaclemys terrapin littoralis
Occurrence #: 1
Eo Id: 3963
Common Name: Texas Diamondback Terrapin
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G4T3Q
State Rank: S2
Federal Status:

Location Information:

Directions

Texas coast from Copano Bay to San Antonio Bay. The directions were created by database staff. The directions are generalized as this record consists of multiple observations.

Survey Information:

First Observation: 1942
Survey Date: 2007-05-30
Last Observation: 2007-05-30
Eo Type:
Eo Rank: E
Eo Rank Date: 2007-05-30
Observed Area:

Comments:

General Description:

Comments: This record represents the consolidation of EO #s 2-5, 7, 22-24, and 26 which were EOIDs 5807, 2188, 6823, 2036, 4565, 2413, 7109, 1802, and 6102, respectively.

Protection Comments:

Management Comments:

Data:

EO Data: 1942, 15 Aug 1948, Apr 1950, 19 Aug 1951, 1952: A specimen was collected. 24 May 1983, 06 Sep and 01 Oct 1984, 16 May and 08 Oct 1985, 15 Apr, 18 June, and 17 Sep 1986: A single terrapin was observed. June, July, Aug 1985-1987: Terrapin were confirmed in 8 different areas. 24 July 1989 and 19 Oct 1992: A single terrapin was observed. 13 May 1994: Three dead terrapins were collected from a crab trap. 09 Aug 1996, 26 Sep 2000, 01 June 2001, 16 Apr 2002, 06 May 2003, and 30 May 2007: A single terrapin was observed.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Mabie, David W. 1988. Progress report on the Texas diamondback terrapin. Internal report to Bruce Thompson, Wildlife Division, Texas Parks and Wildlife Dept.

Texas Parks and Wildlife Department. 2008. Texas Parks and Wildlife Department - Coastal Fisheries Division summary of stranding and catch information for tracked sea turtles and terrapin.

BARRERA, T. 1994. FIELD EVALUATION FOR CONTAMINANTS IN SAN ANTONIO BAY BY USFWS ON 13 MAY 1994. FIELD NOTES.

Specimen:

Bryce C. Brown Collection at the Mayborn Museum, Baylor University, Waco, TX; Owen Axtell, Catalog # 6214, April 1950, BCB.

Field Museum of Natural History, Chicago, IL; Dr. Gordon Gunter, Catalog # 43599, 1942, FMNH.

Museum Of Zoology, University of Michigan, Ann Arbor, MI; R. Russell, Catalog # 103424, 19 August 1951, UMMZ, Topotype.

Texas Cooperative Wildlife Collection, Texas A & M University, College Station, TX; Unknown Collector, Catalog # 4642, 15 August 1948, TCWC.

Texas Natural History Collection, University of Texas at Austin, TX; Unknown Collector, Catalog # 31026, 1952, TNHC.

Element Occurrence Record

Scientific Name: Notophthalmus meridionalis **Occurrence #:** 10 **Eo Id:** 7800

Common Name: Black-spotted Newt **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:** T

Global Rank: G1 **State Rank:** S2 **Federal Status:**

Location Information:

Directions

ROCKPORT

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1930-06-27

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments: COLLECTED 27 JUNE 1930

Protection Comments:

Management Comments:

Data:

EO Data:

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Specimen:

University of Michigan, Museum of Zoology. 1930. H.K. Gloyd, Catalog # 69994 UMMZ. 27 June 1930.

Element Occurrence Record

Scientific Name: Panicum amarum - Paspalum monostachyum Herbaceous Vegetation
Occurrence #: 1 **Eo Id:** 11386
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G3? **State Rank:** SNR
Federal Status:

Location Information:

Directions

The site is located approximately 2.3 air miles directly northwest of Kosmos and 3.0 air miles directly west-southwest of Palm Harbor. The directions were created by database staff.

Survey Information:

First Observation: 2010-08-06 **Survey Date:** 2010-08-06 **Last Observation:** 2010-08-06
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2010-08-06
Observed Area:

Comments:

General Description: See the Composition Tab for other species within the area.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 6 August 2010: One site of this plant community of medium quality grass species consisting 50 percent high quality increasers, and 50 percent decreasers; Forb species are of medium quality consisting of 50 percent high quality forbs, and 50 percent increasers; Exotic species are present; Woody cover is less than 1 percent.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:
Chamaecrista fasciculata	Herb (field)	N	Forb	SFID: 23391
Helianthus debilis	Herb (field)	N	Forb	SFID: 23391
Panicum amarum	Herb (field)	Y	Graminoid	SFID: 23391
Paspalum monostachyum	Herb (field)	Y	Graminoid	SFID: 23391
Quercus virginiana	Tree (canopy & subcanopy)	N	Broad-leaved deciduous tree	SFID: 23391
Schizachyrium scoparium	Herb (field)	Y	Graminoid	SFID: 23391
Smilax bona-nox	Herb (field)	N	Liana	SFID: 23391

Reference:

Citation:

Native Prairies Association of Texas. 2011. Tallgrass prairie survey project that includes shapefiles, excel files, documents, images, and protocol for multiple counties in Texas (2000-2013).

Specimen:

Element Occurrence Record

Scientific Name: Panicum amarum - Paspalum monostachyum Herbaceous Vegetation
Occurrence #: 2 **Eo Id:** 11387
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G3? **State Rank:** SNR
Federal Status:

Location Information:

Directions

The two sites are located approximately 1.0 air miles almost directly east of Aransas Pass, San Patricio County. They are located off of Canal Street on the Peninsula jutting out past Turning Basin Conn Brown Harbor. The directions were created by database staff. The directions are generalized as this record consists of multiple observations.

Survey Information:

First Observation: 2010-08-06 **Survey Date:** 2010-08-06 **Last Observation:** 2010-08-06
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2010-08-06
Observed Area:

Comments:

General Description: See the Composition Tab for other species within the area.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 6 August 2010: Two sites of this plant community are of medium quality grass species; Forb species are poor quality; Exotic species are present; Woody cover is less than 1 percent of the total vegetation.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:
Ambrosia psilostachya	Herb (field)	N	Forb	SFID: 23377, 23378
Chamaecrista fasciculata	Herb (field)	N	Forb	SFID: 23377, 23378
Panicum amarum	Herb (field)	Y	Graminoid	SFID: 23377, 23378
Paspalum floridanum	Herb (field)	Y	Graminoid	SFID: 23377, 23378
Paspalum monostachyum	Herb (field)	Y	Graminoid	SFID: 23377, 23378
Paspalum plicatulum	Herb (field)	Y	Graminoid	SFID: 23377, 23378
Spartina spartinae	Herb (field)	N	Graminoid	SFID: 23377, 23378

Reference:

Citation:

Native Prairies Association of Texas. 2011. Tallgrass prairie survey project that includes shapefiles, excel files, documents, images, and protocol for multiple counties in Texas (2000-2013).

Specimen:

Element Occurrence Record

Scientific Name: Phrynosoma cornutum **Occurrence #:** 61 **Eo Id:** 12500

Common Name: Texas horned lizard **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:** T

Global Rank: G4G5 **State Rank:** S3 **Federal Status:**

Location Information:

Directions

Observations were made on Harbor Island near Port Aransas.

Survey Information:

First Observation: 2009 **Survey Date:** 2009 **Last Observation:** 2009

Eo Type: **Eo Rank:** E **Eo Rank Date:** 2009

Observed Area:

Comments:

General Description:

Comments: 2009: Individuals appeared to be eating ants other than harvester ants (photos included).

Protection Comments:

Management Comments:

Data:

EO Data: 2009: Several horned lizards were observed.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Skoruppa, Mary Kay. 2014. E-mail of 17 July to Lee Ann Linam, retired Texas Parks & Wildlife Dept. biologist, concerning observations of Phrynosoma cornutum by Jerry Batey on Harbor Island near Port Aransas .

Specimen:

Element Occurrence Record

Scientific Name: Pseudacris streckeri **Occurrence #:** 4 **Eo Id:** 12752

Common Name: Strecker's Chorus Frog **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G5 **State Rank:** S3 **Federal Status:**

Location Information:

Directions

Live Oak Peninsula W and SW of Rockport.

Survey Information:

First Observation: 1968-04-06 **Survey Date:** 1968-04-11 **Last Observation:** 1968-04-11

Eo Type: **Eo Rank:** H **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 1968: 9 individuals were collected.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

LaDuc, Travis. 2014. Creating a centralized catalog for georeferenced specimen records of Texas reptiles and amphibians : the Herps of Texas Database. Contract # 441514. Prepared for USFWS. 3 pp. 9 January 2014.

Specimen:

Texas Natural History Collections, The University of Texas at Austin, Austin, TX; D. Armentrout (#unknown), Catalog# (unknown), 6 Apr 1968, TNHC

Texas Natural History Collections, The University of Texas at Austin, Austin, TX; Ramsey (#unknown), Catalog# (unknown), 11 Apr 1968, TNHC

Texas Natural History Collections, The University of Texas at Austin, Austin, TX; Ramsey (#unknown), Catalog# (unknown), 9 Apr 1968, TNHC

Element Occurrence Record

Scientific Name: Puma yagouaroundi **Occurrence #:** 8 **Eo Id:** 1473

Common Name: jaguarundi **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:** E

Global Rank: G4 **State Rank:** SX **Federal Status:** LE

Location Information:

Directions

The observation was made crossing FM 1069 near Ingleside, Texas.

Survey Information:

First Observation: 1984-FA **Survey Date:** 1984-FA **Last Observation:** 1984-FA

Eo Type: **Eo Rank:** H **Eo Rank Date:** 2016-12-09

Observed Area:

Comments:

General Description: Fall 1984: The habitat consisted of oak mottes.

Comments: Fall 1984: The observer was driving.

Protection Comments:

Management Comments:

Data:

EO Data: Fall 1984: One observation was made, in the Summer or Fall, near dusk.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Withers, Kim. 1994. Letter of 18 August 1994 to Texas Parks and Wildlife Department Endangered Species Program concerning jaguarundi sightings on Aransas National Wildlife Refuge , near Ingleside, TX, and near Cotulla, TX.

Specimen:

Element Occurrence Record

Scientific Name: Puma yagouaroundi **Occurrence #:** 44 **Eo Id:** 804

Common Name: jaguarundi **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:** E

Global Rank: G4 **State Rank:** SX **Federal Status:** LE

Location Information:

Directions

MCCAMPBELL SLOUGH

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1991-03-09

Eo Type: **Eo Rank:** H **Eo Rank Date:** 2016-12-09

Observed Area:

Comments:

General Description:

Comments: This record was originally identified as General ("G"), Class II = Reliable Observation/Observer. 23 January 2019: A final decision to treat Puma yagouaroundi Class II, and III, and/or unmappable (Precision BCD "U") records as MisIDs was determined by the TXNDD staff. On 8 August 2017, Jonah Evans, Texas Parks and Wildlife Department Mammalogist, brought up the issue of unreliable sightings of this species and wanted to remove them from the Database. 20 February 2019, Stephanie Shelton, TXNDD Data Manager, went through the MisID process, removing these records and adding them to the MisID layer and supporting documentation to the MisID folder.

Protection Comments:

Management Comments:

Data:

EO Data: ONE CLASS II OBSERVATION

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Homerstad, Gary E. 1987. Performance Report. Job No. 12: Endangered feline status study. Grant No. W-103-R-17 Federal Aid in Wildlife Restoration. Submitted to Texas Parks and Wildlife Department, Austin, TX. 9 October 1987.

Homerstad, Gary E. 1988. Performance Report. Job No. 12: Endangered feline status study. Grant No. W-103-R-18 Federal Aid in Wildlife Restoration Act. Submitted to Texas Parks and Wildlife Department, Austin, TX. 9 November 1988.

Homerstad, Gary E. 1989. Performance Report. Job No. 12: Endangered feline status study. Grant No. W-103-R-19 Federal Aid in Wildlife Restoration. Submitted to Texas Parks and Wildlife Department, Austin, TX. 6 October 1989.

Prieto, F. G. 1990. Performance Report. Job No. 12: Endangered feline population and habitat enhancement. Grant No. W-125-R-1 and ESEC6-1 Federal Aid in Wildlife Restoration Act and Endangered and Threatened Species Conservation. Submitted to Texas Parks and Wildlife Department, Austin, TX. 29 October 1990.

Prieto, Felipe G. 1991. Performance Report. Job No. 12: Endangered feline population and habitat enhancement. Grant No. W-125-R-2 and ESEC6-2 Federal Aid in Wildlife Restoration Act and Endangered and Threatened Species Conservation. Submitted to Texas Parks and Wildlife Department, Austin, TX. 8 November 1991.

Benn, S. J. 1993. Performance Report. Job No. 12: Endangered feline population and habitat enhancement. Grant No. W-125-R-3 Federal Aid in Wildlife Restoration Act. Submitted to Texas Parks and Wildlife Department, Austin, TX. 22 September 1993.

McKelvey, K. S., K. B. Aubry, and M. K. Schwartz. 2008. Using anecdotal occurrence data for rare or elusive species: the illusion of reality and a call for evidentiary standards. Bioscience 58(6):549-555.

Aubry, K. B, C. M. Raley, and K. S. McKelvey. 2017. The importance of data quality for generating reliable distribution models for rare, elusive, and cryptic species. PLOS ONE 12(6):1-17.

Aubry, K. B., and L. A. Jagger. 2006. The importance of obtaining verifiable occurrence data on forest carnivores and an interactive website for archiving results from standardized surveys. Pages 159-176 in: M. Santos-Reis, J. D. S. Birks, E. C. O'Doherty, and G. Proulx, editors. Alpha Wildlife Publications, Sherwood Park, Alberta, Canada.

Specimen:

Element Occurrence Record

Scientific Name: Quercus virginiana-persea borbonia series **Occurrence #:** 3 **Eo Id:** 5746

Common Name: Coastal Live Oak-redbay Series **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G2? **State Rank:** S3 **Federal Status:**

Location Information:

Directions

NAVAL STATION INGLESIDE, SOUTH OF FM 1069, WEST OF FM 2725, NORTH OF CORPUS CHRISTI SHIP CHANNEL, BETWEEN PORT INGLESIDE AND INGLESIDE-ON-THE-BAY

Survey Information:

First Observation: **Survey Date:** 1992-06-17 **Last Observation:** 1992-06-17

Eo Type: **Eo Rank:** BC **Eo Rank Date:** 1992-06-17

Observed Area:

Comments:

General Description: QUERCUS VIRGINIANA-Q. HEMISPHAERICA-PERSEA BORBONIA DENSE THICKETY WOODLAND OR SHRUBLAND, FEW OPENINGS, HUNDREDS OF POTHOLES, SOME PERMANENT PONDS, DIVERSE GROUND LAYER, DEEP SANDS OF INGLESIDE BARRIER

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: NONE

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

CARR, W.R. 1992. FIELD SURVEY OF NAVAL STATION INGLESIDE, 17 JUNE 1992.

Specimen:

Element Occurrence Record

Scientific Name: Rhododon angulatus **Occurrence #:** 5 **Eo Id:** 4694

Common Name: Tharp's rhododon **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G1Q **State Rank:** S1 **Federal Status:**

Location Information:

Directions

FIVE MILES NORTH OF ARANSAS PASS, EAST SIDE OF STATE HIGHWAY 35

Survey Information:

First Observation: 1964-06-16 **Survey Date:** 1994 **Last Observation:** 1964-06-16

Eo Type: **Eo Rank:** X **Eo Rank Date:** 1994-01-01

Observed Area:

Comments:

General Description: 1964, LARGE STABILIZED SAND DUNES ON EAST SIDE OF HIGHWAY, IN LIVE OAK MOTT

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 16 JUNE 1964, TWO PLANTS; SITE REVISITED IN 1994, NO PLANTS, PROMINENT DUNES ALONG ROAD HAD BEEN LEVELED FOR HIGHWAY EXPANSION AND COMMERCIAL DEVELOPMENT

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Turner, B. L. 1995. Synoptical study of Rhododon (Lamiaceae). Phytologia 78(6):448-451. June 1995.

Specimen:

UNIVERSITY OF TEXAS AT AUSTIN HERBARIUM. 1964. B.L. TURNER #5030, SPECIMEN # ? TEX. 16 JUNE 1964.

Element Occurrence Record

Scientific Name: Rhynchospora indianolensis
Occurrence #: 17
Eo Id: 11036
Common Name: Indianola beakrush
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G3Q
State Rank: S3
Federal Status:

Location Information:

Directions

Ca. 1 mi N of Ingleside.

Survey Information:

First Observation: 1956-05-20
Survey Date:
Last Observation: 1956-05-20
Eo Type:
Eo Rank:
Eo Rank Date:
Observed Area:

Comments:

General Description: Clay loam in roadside ditch.

Comments: Complete specimen citation: Ca. 1 mi N of Ingleside in roadside ditch, clay loam, 20 May 1956, F. B. Jones 1202 (CCM).

Protection Comments:

Management Comments:

Data:

EO Data:

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Jones, F.B. (1202). 1956. Specimen No. unknown. CCM.

Specimen:

Jones, F.B. (1202). 1956. Specimen No. unknown. CCM. (S56JONCCTXUS)

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 43 **Eo Id:** 5841

Common Name: **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G5 **State Rank:** SNR **Federal Status:**

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 1.5 MILES NORTHWEST OF PORT ARANSAS

Survey Information:

First Observation: 1980 **Survey Date:** **Last Observation:** 1981

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: SPOIL ISLANDS (2) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 4 METERS; IS IN A PETROLEUM AND INDUSTRIAL COMPLEX

Comments: COLONY NUMBER 614-202

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LEAST TERN

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1981-1985. TEXAS COLONIAL WATERBIRD CENSUS SUMAMRY.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 44 **Eo Id:** 2946
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 3 MILES TO THE WEST-NORTHWEST OF PORT ARANSAS

Survey Information:

First Observation: 1977 **Survey Date:** **Last Observation:** 1992
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLANDS (8) ON THE INTRACOASTAL WATERWAY; ELEVATION IS UP TO 3 METERS

Comments: COLONY NUMBER 614-201

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE BLACK SKIMMER, GREAT BLUE HERON, SNOWY EGRET, BLACK-CROWNED NIGHT-HERON, GULL-BILLED TERN

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 45 **Eo Id:** 4807
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 2.75 MILES NORTHWEST OF THE ARANSAS PASS LIGHTHOUSE

Survey Information:

First Observation: 1979 **Survey Date:** **Last Observation:** 1981
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLAND (1) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 4.4 METERS; SITE IS ON ORIGINAL NATURAL ISLAND

Comments: COLONY NUMBER 614-200

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LEAST TERN, GULL-BILLED TERN, BLACK SKIMMER

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1981-1985. TEXAS COLONIAL WATERBIRD CENSUS SUMAMRY.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 46 **Eo Id:** 1089
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

NATURAL ISLAND IN THE INTRACOASTAL WATERWAY; THE SHAMROCK ISLANDS, 5 MILES SOUTH OF PORT INGLESIDE

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1992
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: NATURAL ISLAND (1) IN THE INTRACOASTAL WATERWAYS; ELEVATION IS 2 METERS

Comments: COLONY NUMBER 614-186

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LAUGHING GULL, SANDWICH TERN, ROYAL TERN, GREAT EGRET, REDDISH EGRET, CATTLE EGRET, SNOWY EGRET, BLACK SKIMMER, ROSEATE SPOONBILL, GREAT BLUE HERON, TRICOLORED HERON, BLACK-CROWNED NIGHT-HERON, WHITE-FACED IBIS, LITTLE BLUE HERON, WHITE IBIS, CASPIAN TERN, SOOTY TERN

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 47 **Eo Id:** 7543

Common Name: **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G5 **State Rank:** SNR **Federal Status:**

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 0.5 MILE SOUTH OF PORT INGLESIDE

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1992

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: SPOIL ISLANDS (2) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 10 METERS

Comments: COLONY NUMBER 614-185

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE BLACK SKIMMER, LEAST TERN

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 48 **Eo Id:** 3130
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 2 MILES EAST OF PORT INGLESIDE

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1992
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLAND (1) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 6 METERS MAXIMUM

Comments: COLONY NUMBER 614-184

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LAUGHING GULL, TRICOLORED HERON, GREAT BLUE HERON, BLACK-CROWNED NIGHT-HERON, CATTLE EGRET, GREAT EGRET, SNOWY EGRET, REDDISH EGRET, WHITE-FACED IBIS, BLACK SKIMMER, BROWN PELICAN, ROSEATE SPOONBILL, WHITE IBIS, LITTLE BLUE HERON

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 49 **Eo Id:** 1214
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

NATURAL ISLAND IN THE INTRACOASTAL WATERWAY 4 MILES EAST OF PORT INGLESIDE

Survey Information:

First Observation: 1977 **Survey Date:** **Last Observation:** 1992
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: NATURAL ISLAND (1) IN THE INTRACOASTAL WATERWAY; ELEVATION IS 2 METERS; DREDGED MATERIAL DEPOSITS

Comments: COLONY NUMBER 614-183

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LEAST TERN

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 50 **Eo Id:** 1215
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 2 MILES WEST-NORTHWEST OF PORT INGLESIDE

Survey Information:

First Observation: 1977 **Survey Date:** **Last Observation:** 1989
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLAND (1) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 4 METERS

Comments: COLONY NUMBER 614-182

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE GREAT BLUE HERON

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 51 **Eo Id:** 4522
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 4.25 MILES EAST OF PORT INGLESIDE

Survey Information:

First Observation: 1978 **Survey Date:** **Last Observation:** 1992
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLAND (1) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 1 METER

Comments: COLONY NUMBER 614-181

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LEAST TERN

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 52 **Eo Id:** 3921
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 3 MILES EAST OF INGLESIDE

Survey Information:

First Observation: 1978 **Survey Date:** **Last Observation:** 1990
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLAND (1) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 0.5 METER

Comments: COLONY NUMBER 614-180

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE GREAT BLUE HERON

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 54 **Eo Id:** 2721
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 2 MILES SOUTHWEST OF INGLESIDE

Survey Information:

First Observation: 1978 **Survey Date:** **Last Observation:** 1988
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLAND (1) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 6 METERS

Comments: COLONY NUMBER 614-160

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE GREAT BLUE HERON

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 57 **Eo Id:** 4201

Common Name: **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G5 **State Rank:** SNR **Federal Status:**

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY IN CORPUS CHRISTI BAY SOUTH OF PORT ARANSAS CAUSEWAY

Survey Information:

First Observation: 1977 **Survey Date:** **Last Observation:** 1990

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: SPOIL ISLANDS (2) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 3 METERS; BUILT ON NATURAL ISLAND

Comments: COLONY NUMBER 614-125

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LEAST TERN

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 58 **Eo Id:** 4984
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ISLANDS IN THE INTRACOASTAL WATERWAYS 0-4 MILES NORTH OF PORT ARANSAS

Survey Information:

First Observation: 1976 **Survey Date:** **Last Observation:** 1992
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLANDS (+) IN THE INTRACOASTAL WATERWAYS; ELEVATION IS 1.5 METERS

Comments: COLONY NUMBER 614-124

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE BLACK SKIMMER

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 59 **Eo Id:** 60
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 3 MILES DUE SOUTH OF CITY-BY-THE-SEA

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1992
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLANDS (3) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 1.5 METERS

Comments: COLONY NUMBER 614-123

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE GREAT BLUE HERON, GREAT EGRET, BLACK-CROWNED NIGHT-HERON

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 60 **Eo Id:** 61
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 2 MILES SOUTHEAST OF CITY-BY-THE-SEA

Survey Information:

First Observation: 1975 **Survey Date:** **Last Observation:** 1992
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLANDS (2) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 1 METER

Comments: COLONY NUMBER 614-122

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LAUGHING GULL, GREAT EGRET, SNOWY EGRET, TRICOLORED HERON, REDDISH EGRET, FORSTER'S TERN, GREAT BLUE HERON

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 61 **Eo Id:** 6807
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 1 MILE SOUTH OF CITY-BY-THE-SEA

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1992
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLANDS (20+) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 1 METER; ALSO, ERODING REMAINS OF OLD CAUSEWAY AND PETROLEUM PRODUCTION PLATFORMS AND DUCK BLINDS

Comments: COLONY NUMBER 614-121

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LAUGHING GULL, TRICOLORED HERON, GREAT BLUE HERON, REDDISH EGRET

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 62 **Eo Id:** 4152

Common Name: **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G5 **State Rank:** SNR **Federal Status:**

Location Information:

Directions

RESIDENTIAL CANAL DEVELOPMENT SITE AT PALM HARBOR

Survey Information:

First Observation: 1980 **Survey Date:** **Last Observation:** 1980

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: RESIDENTIAL CANAL DEVELOPMENT SITE AT PALM HARBOR; ELEVATION 1.4 METERS

Comments: COLONY NUMBER 614-120

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LEAST TERN

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 63 **Eo Id:** 2795
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

NATURAL AND SPOIL ISLANDS IN THE INTRACOASTAL WATERWAY 1 MILE SOUTHEAST OF ARANSAS PASS

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1987
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: NATURAL ISLANDS (2)AND 7 DREDGED MATERIAL ISLANDS IN THE INTRACOASTAL WATERWAY; ELEVATION IS 2 METERS

Comments: COLONY NUMBER 614-103

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LAUGHING GULL, CASPIAN TERN, GREAT BLUE HERON, TRICOLORED HERON, SNOWY EGRET, GREAT EGRET, FORSTER'S TERN

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 64 **Eo Id:** 4542
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 0.5 MILE WEST OF ARANSAS PASS TO 2 MILES WEST

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1989
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY; ELEVATION IS 1 METER; ALONG ARANSAS CHANNEL AND OIL WELL CHANNELS

Comments: COLONY NUMBER 614-102

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LAUGHING GULL

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 65 **Eo Id:** 1372
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ON MAINLAND ADJACENT TO THE INTRACOASTAL WATERWAY

Survey Information:

First Observation: 1980 **Survey Date:** **Last Observation:** 1981
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: CONFINED DREDGED DISPOSAL SITE ADJACENT TO INTRACOASTAL WATERWAY; ELEVATION IS 2.4 METERS

Comments: COLONY NUMBER 614-101

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LEAST TERN, BLACK SKIMMER

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1981-1985. TEXAS COLONIAL WATERBIRD CENSUS SUMAMRY.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 66 **Eo Id:** 7224
Common Name:
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G5 **State Rank:** SNR
Federal Status:

Location Information:

Directions

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 0.5 MILE EAST OF ARANSAS PASS

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1992
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLAND (1) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 3 METERS

Comments: COLONY NUMBER 614-100

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE GREAT BLUE HERON, GREAT EGRET

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Schizachyrium littorale - Paspalum monostachyum Herbaceous Vegetation
Occurrence #: 1 **Eo Id:** 11384
Common Name: Seacoast Bluestem - Gulfdune Paspalum Tallgrass Prairie
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G3? **State Rank:** SNR
Federal Status:

Location Information:

Directions

The site is on Mustang Island, between Port Aransas and Padre Island, on the north side of Texas State Highway 361. The directions were created by database staff.

Survey Information:

First Observation: 2010-06-24 **Survey Date:** 2010-06-24 **Last Observation:** 2010-06-24
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2010-06-24
Observed Area:

Comments:

General Description: 24 June 2010: This site is on ocean front property; See the Composition Tab for other species within the area.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 24 June 2010: One plant community of low-medium quality grass species with some areas of high quality; Forb species are of medium quality; Exotic species are present; Woody cover is 1-5 percent.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:
Avicennia germinans	Tree (canopy & subcanopy)	N	Tree	SFID: 25007
Paspalum monostachyum	Herb (field)	Y	Graminoid	SFID: 25007
Prosopis glandulosa	Tree (canopy & subcanopy)	N	Thorn tree	SFID: 25007
Schizachyrium scoparium ssp. littorale	Herb (field)	Y	Graminoid	SFID: 25007

Reference:

Citation:

Native Prairies Association of Texas. 2011. Tallgrass prairie survey project that includes shapefiles, excel files, documents, images, and protocol for multiple counties in Texas (2000-2013).

Specimen:

Element Occurrence Record

Scientific Name: Schizachyrium scoparium - Paspalum plicatulum - Sorghastrum nutans - Dichanthelium oligosanthes - Paspalum setaceum - Symphyotrichum pratense Alfisol Grassland

Occurrence #: 109 **Eo Id:** 11779

Common Name: Alfisol Coastal Prairie

Track Status: Track all extant and selected historical EOs

Identification Confirmed: Y - Yes

TX Protection Status:

Global Rank: G1 **State Rank:** SNR

Federal Status:

Location Information:

Directions

This site is located approximately 3.0 air miles southwest of Aransas Pass, and 2.0 air miles almost directly east of Ingleside, on the north side of Texas State Highway 361 and the Union Pacific rail line. The directions were created by database staff.

Survey Information:

First Observation: 2009-04-24 **Survey Date:** 2009-04-24 **Last Observation:** 2009-04-24

Eo Type: **Eo Rank:** E **Eo Rank Date:** 2009-04-24

Observed Area:

Comments:

General Description: See the Composition Tab for other species within the area.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 24 April 2009: One plant community of low quality grass species; Forb species are poor; Exotic species are present; Woody cover is 6-25 percent.

Community Information:

Element Occurrence Record

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:
Convolvulus arvensis	Herb (field)	N	Liana	SFID: 25694
Dichanthelium oligosanthes	Herb (field)	Y	Graminoid	SFID: 25694
Monarda citriodora	Herb (field)	N	Forb	SFID: 25694
Paspalum plicatulum	Herb (field)	Y	Graminoid	SFID: 25694
Paspalum setaceum	Herb (field)	Y	Graminoid	SFID: 25694
Phyla nodiflora	Herb (field)	N	Forb	SFID: 25694
Prosopis glandulosa	Tree (canopy & subcanopy)	N	Thorn tree	SFID: 25694
Quercus virginiana	Tree (canopy & subcanopy)	N	Broad-leaved deciduous tree	SFID: 25694
Schizachyrium scoparium	Herb (field)	Y	Graminoid	SFID: 25694
Sorghastrum nutans	Herb (field)	Y	Graminoid	SFID: 25694
Symphyotrichum pratense	Herb (field)	Y	Forb	SFID: 25694

Reference:

Citation:

Native Prairies Association of Texas. 2011. Tallgrass prairie survey project that includes shapefiles, excel files, documents, images, and protocol for multiple counties in Texas (2000-2013).

Specimen:

Element Occurrence Record

Scientific Name: Spartina spartinae - Schizachyrium scoparium Herbaceous Vegetation
Occurrence #: 2 **Eo Id:** 11411
Common Name: Gulf Cordgrass - Little Bluestem Wet Prairie
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G3 **State Rank:** SNR
Federal Status:

Location Information:

Directions

This site is located approximately 1.5 air miles almost directly north of Aransas Pass, on the south side of West Young Avenue. The directions were created by database staff.

Survey Information:

First Observation: 2010-08-06 **Survey Date:** 2010-08-06 **Last Observation:** 2010-08-06
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2010-08-06
Observed Area:

Comments:

General Description: See the Composition Tab for other species within the area.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 6 August 2010: One plant community of low quality grass species, and low quality invaders; Forb species are of poor quality; Exotic species are present; Woody cover is 6-25 percent.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:
Ambrosia psilostachya	Herb (field)	N	Forb	SFID: 23376
Chamaecrista fasciculata	Herb (field)	N	Forb	SFID: 23376
Panicum virgatum	Herb (field)	N	Graminoid	SFID: 23376
Prosopis glandulosa	Tree (canopy & subcanopy)	N	Thorn tree	SFID: 23376
Quercus virginiana	Tree (canopy & subcanopy)	N	Broad-leaved deciduous tree	SFID: 23376
Schizachyrium scoparium	Herb (field)	Y	Graminoid	SFID: 23376
Spartina spartinae	Herb (field)	Y	Graminoid	SFID: 23376

Reference:

Citation:

Native Prairies Association of Texas. 2011. Tallgrass prairie survey project that includes shapefiles, excel files, documents, images, and protocol for multiple counties in Texas (2000-2013).

Specimen:

Element Occurrence Record

Scientific Name: Spartina spartinae - Schizachyrium scoparium Herbaceous Vegetation
Occurrence #: 3 **Eo Id:** 11412
Common Name: Gulf Cordgrass - Little Bluestem Wet Prairie
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G3 **State Rank:** SNR
Federal Status:

Location Information:

Directions

This site is located approximately 5.5 air miles north-northeast of Aransas Pass, on the south side of Lamar Drive, to the west of Portia Avenue. The directions were created by database staff.

Survey Information:

First Observation: 2010-08-06 **Survey Date:** 2010-08-06 **Last Observation:** 2010-08-06
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2010-08-06
Observed Area:

Comments:

General Description: See the Composition Tab for other species within the area.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 6 August 2010: One plant community of medium quality grass species, and low quality invaders; Forb species are of poor quality; Exotic species are present; Woody cover is 26-50 percent.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:
Ambrosia psilostachya	Herb (field)	N	Forb	SFID: 23248
Panicum virgatum	Herb (field)	N	Graminoid	SFID: 23248
Paspalum plicatulum	Herb (field)	N	Graminoid	SFID: 23248
Prosopis glandulosa	Tree (canopy & subcanopy)	N	Thorn tree	SFID: 23248
Quercus virginiana	Tree (canopy & subcanopy)	N	Broad-leaved deciduous tree	SFID: 23248
Schizachyrium scoparium	Herb (field)	Y	Graminoid	SFID: 23248
Spartina spartinae	Herb (field)	Y	Graminoid	SFID: 23248

Reference:

Citation:

Native Prairies Association of Texas. 2011. Tallgrass prairie survey project that includes shapefiles, excel files, documents, images, and protocol for multiple counties in Texas (2000-2013).

Specimen:

Element Occurrence Record

Scientific Name: Spartina spartinae - Schizachyrium scoparium Herbaceous Vegetation
Occurrence #: 4 **Eo Id:** 11413
Common Name: Gulf Cordgrass - Little Bluestem Wet Prairie
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G3 **State Rank:** SNR
Federal Status:

Location Information:

Directions

This site is located approximately 7.5 air miles north-northeast of Aransas Pass, on the south side of 12th Street, and the west side of Fort Worth Street. The directions were created by database staff.

Survey Information:

First Observation: 2010-08-06 **Survey Date:** 2010-08-06 **Last Observation:** 2010-08-06
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2010-08-06
Observed Area:

Comments:

General Description: See the Composition Tab for other species within the area.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 6 August 2010: One plant community of low quality grass species, and low quality invaders; Forb species are of poor quality; Exotic species are present; Woody cover is 51-75 percent.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:
Ambrosia psilostachya	Herb (field)	N	Forb	SFID: 23247
Panicum virgatum	Herb (field)	N	Graminoid	SFID: 23247
Quercus virginiana	Tree (canopy & subcanopy)	N	Broad-leaved deciduous tree	SFID: 23247
Schizachyrium scoparium	Herb (field)	Y	Graminoid	SFID: 23247
Spartina spartinae	Herb (field)	Y	Graminoid	SFID: 23247

Reference:

Citation:

Native Prairies Association of Texas. 2011. Tallgrass prairie survey project that includes shapefiles, excel files, documents, images, and protocol for multiple counties in Texas (2000-2013).

Specimen:

Element Occurrence Record

Scientific Name: Spartina spartinae Herbaceous Vegetation **Occurrence #:** 3 **Eo Id:** 11418

Common Name: Salty Prairie **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G4 **State Rank:** SNR **Federal Status:**

Location Information:

Directions

This site is located approximately 2.0 road miles northeast of Aransas Pass on its northeastern edge, on the southeast side of Texas State Highway 35 and Union Pacific rail line. The directions were created by database staff.

Survey Information:

First Observation: 2010-08-06 **Survey Date:** 2010-08-06 **Last Observation:** 2010-08-06

Eo Type: **Eo Rank:** E **Eo Rank Date:** 2010-08-06

Observed Area:

Comments:

General Description: See the Composition Tab for other species within the area.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 6 August 2010: One plant community of low quality grass species; Forb species are of poor quality, and low quality invaders; Exotic species are absent; Woody cover is less than 1 percent of the total vegetation.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:
Ambrosia psilostachya	Herb (field)	N	Forb	SFID: 23249
Panicum virgatum	Herb (field)	N	Graminoid	SFID: 23249
Spartina spartinae	Herb (field)	Y	Graminoid	SFID: 23249

Reference:

Citation:

Native Prairies Association of Texas. 2011. Tallgrass prairie survey project that includes shapefiles, excel files, documents, images, and protocol for multiple counties in Texas (2000-2013).

Specimen:

Element Occurrence Record

Scientific Name: Spartina spartinae Herbaceous Vegetation **Occurrence #:** 5 **Eo Id:** 11515

Common Name: Salty Prairie **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G4 **State Rank:** SNR **Federal Status:**

Location Information:

Directions

This site is located approximately 5.5 air miles north-northwest of Aransas Pass, and 8.5 air miles southeast of Bayside, on the southwest side of County Road 188, and to the east of Copano Bay. The directions were created by database staff.

Survey Information:

First Observation: 2010-08-07 **Survey Date:** 2010-08-07 **Last Observation:** 2010-08-07

Eo Type: **Eo Rank:** E **Eo Rank Date:** 2010-08-07

Observed Area:

Comments:

General Description: 7 August 2010: This site slopes to Copano Bay; See the Composition Tab for other species within the area.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 7 August 2010: One plant community of low quality grass species consisting of 60 percent low quality natives, and 40 percent decreasers; Forb species are low quality consisting of 75 percent low quality forbs, and 25 percent overgrazed high quality native forbs; Woody cover is less than 1 percent.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:
Bothriochloa laguroides	Herb (field)	N	Graminoid	SFID: 23386
Opuntia littoralis	Herb (field)	N	Succulent shrub	SFID: 23386
Prosopis glandulosa	Tree (canopy & subcanopy)	N	Thorn tree	SFID: 23386
Quercus virginiana	Tree (canopy & subcanopy)	N	Broad-leaved deciduous tree	SFID: 23386
Setaria leucopila	Herb (field)	N	Graminoid	SFID: 23386
Spartina spartinae	Herb (field)	Y	Graminoid	SFID: 23386

Reference:

Citation:

Native Prairies Association of Texas. 2011. Tallgrass prairie survey project that includes shapefiles, excel files, documents, images, and protocol for multiple counties in Texas (2000-2013).

Specimen:

Element Occurrence Record

Scientific Name: Spartina spartinae Herbaceous Vegetation
Occurrence #: 7 **Eo Id:** 11517
Common Name: Salty Prairie
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G4 **State Rank:** SNR
Federal Status:

Location Information:

Directions

This site is located approximately 8.0 air miles directly north of Aransas Pass, and 7.5 air miles southeast of Bayside, on the west side of FM 1069, and to the east of Copano Bay. The directions were created by database staff.

Survey Information:

First Observation: 2010-08-06 **Survey Date:** 2010-08-06 **Last Observation:** 2010-08-06
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2010-08-06
Observed Area:

Comments:

General Description: 6 August 2010: This site slopes from the road to the salt prairie and on to Port Bay; See the Composition Tab for other species within the area.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 6 August 2010: One plant community of medium quality grass species consisting of 50 percent high quality increasers, and 50 percent decreasers; Forb species are low quality consisting of 60 percent low quality forbs, and 40 percent increasers; Exotic species are present; Woody cover is 1-5 percent.

Community Information:

Element Occurrence Record

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:
Bothriochloa laguroides	Herb (field)	N	Graminoid	SFID: 23388
Gaillardia pulchella	Herb (field)	N	Forb	SFID: 23388
Myrica heterophylla	Shrub/sapling (tall & short)	N	Broad-leaved evergreen shrub	SFID: 23388
Opuntia littoralis	Herb (field)	N	Succulent shrub	SFID: 23388
Prosopis glandulosa	Tree (canopy & subcanopy)	N	Thorn tree	SFID: 23388
Quercus virginiana	Tree (canopy & subcanopy)	N	Broad-leaved deciduous tree	SFID: 23388
Setaria parviflora	Herb (field)	N	Graminoid	SFID: 23388
Spartina spartinae	Herb (field)	Y	Graminoid	SFID: 23388

Reference:

Citation:

Native Prairies Association of Texas. 2011. Tallgrass prairie survey project that includes shapefiles, excel files, documents, images, and protocol for multiple counties in Texas (2000-2013).

Specimen:

Element Occurrence Record

Scientific Name: Spartina spartinae Herbaceous Vegetation **Occurrence #:** 8 **Eo Id:** 11518

Common Name: Salty Prairie **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G4 **State Rank:** SNR **Federal Status:**

Location Information:

Directions

This site is located approximately 6.0 air miles directly north of Aransas Pass, and 9.0 air miles southeast of Bayside, on the east side of FM 1069, to the north of Bee Road. The directions were created by database staff.

Survey Information:

First Observation: 2010-08-06 **Survey Date:** 2010-08-06 **Last Observation:** 2010-08-06

Eo Type: **Eo Rank:** E **Eo Rank Date:** 2010-08-06

Observed Area:

Comments:

General Description: See the Composition Tab for other species within the area.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 6 August 2010: One plant community of low quality grass species consisting of 60 percent low quality natives, and 40 percent decreasers; Forb species are low quality consisting of 60 percent low quality forbs, and 40 percent increasers; Exotic species are present; Woody cover is less than 1 percent.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:
Bothriochloa laguroides	Herb (field)	N	Graminoid	SFID: 23389
Panicum amarum	Herb (field)	N	Graminoid	SFID: 23389
Prosopis glandulosa	Tree (canopy & subcanopy)	N	Thorn tree	SFID: 23389
Quercus virginiana	Tree (canopy & subcanopy)	N	Broad-leaved deciduous tree	SFID: 23389
Setaria parviflora	Herb (field)	N	Graminoid	SFID: 23389
Spartina spartinae	Herb (field)	Y	Graminoid	SFID: 23389

Reference:

Citation:

Native Prairies Association of Texas. 2011. Tallgrass prairie survey project that includes shapefiles, excel files, documents, images, and protocol for multiple counties in Texas (2000-2013).

Specimen:

Element Occurrence Record

Scientific Name: Spartina spartinae Herbaceous Vegetation
Occurrence #: 12 **Eo Id:** 11522
Common Name: Salty Prairie
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G4 **State Rank:** SNR
Federal Status:

Location Information:

Directions

These sites are located approximately 8.5 air miles north-northwest of Aransas Pass, and 5.6 air miles south-southeast of Bayside, on the east side of Refugio Taft Road/County Road 4339, and on the west side of Copano Bay. The directions were created by database staff. The directions are generalized as this record consists of multiple observations.

Survey Information:

First Observation: 2010-08-07 **Survey Date:** 2010-08-07 **Last Observation:** 2010-08-07
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2010-08-07
Observed Area:

Comments:

General Description: 7 August 2010: There are stock tanks at one site (SFID: 23383); See the Composition Tab for other species within the area.

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 7 August 2010: Four plant communities of low to medium quality grass species; Forb species are poor quality, and low quality invaders; Exotic species are present; Woody cover is 6-25 percent.

Community Information:

Element Occurrence Record

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:
Ambrosia psilostachya	Herb (field)	N	Forb	SFID: 23379, 23380, 23383, 23384
Amphiachyris dracunculoides	Herb (field)	N	Forb	SFID: 23380, 23383, 23384
Hymenoxys odorata	Herb (field)	N	Forb	SFID: 23383, 23384
Panicum virgatum	Herb (field)	N	Graminoid	SFID: 23379
Paspalum plicatulum	Herb (field)	N	Graminoid	SFID: 23379, 23380, 23383, 23384
Prosopis glandulosa	Tree (canopy & subcanopy)	N	Thorn tree	SFID: 23379, 23380, 23383, 23384
Setaria parviflora	Herb (field)	N	Graminoid	SFID: 23379, 23380, 23383, 23384
Spartina alterniflora	Herb (field)	N	Graminoid	SFID: 23380, 23383, 23384
Spartina spartinae	Herb (field)	Y	Graminoid	SFID: 23379, 23380, 23383, 23384

Reference:

Citation:

Native Prairies Association of Texas. 2011. Tallgrass prairie survey project that includes shapefiles, excel files, documents, images, and protocol for multiple counties in Texas (2000-2013).

Specimen:

Element Occurrence Record

Scientific Name: Spilogale putorius interrupta **Occurrence #:** 30 **Eo Id:** 12640

Common Name: plains spotted skunk **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G4T4 **State Rank:** S1S3 **Federal Status:**

Location Information:

Directions

The specimen labels state that they were located in Rockport. The georeferenced coordinates, based on VertNet Best Practices Guidelines, were used.

Survey Information:

First Observation: 1893-05-20 **Survey Date:** 1893-09-24 **Last Observation:** 1893-09-24

Eo Type: **Eo Rank:** H **Eo Rank Date:** 1893-09-24

Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 20 May, 2 June, 14 July, and 24 September 1893: Skin (whole), and skull (unmounted cranium and mandible) of four male, and 1 female preserved specimens.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Ferguson, Adam. 2014. Texas Skunk Record Database regarding five specices of skunk in Texas.

Patterson, Bruce D. 1995. Printed list of 6 April to Peggy Horner, Texas Parks and Wildlife Department, Conservation Scientist, regarding Spilogale putorius interrupta, and Spilogale putorius leucoparia from The Field Museum of Natural History, Division of Mammals, Chicago, IL.

Van Gelder, Richard G. 1959. A taxonomic revision of the spotted skunks (Genus Spilogale). Bulletin of the American Museum of Natural History 117(5):229-392.

Specimen:

American Museum of Natural History, New York, NY; H. P. Attwater (#152), Catalog #M-14818, 24 September 1893, AMNH.

American Museum of Natural History, New York, NY; H. P. Attwater (#6/11063), Catalog #M-12769, 20 May 1893, AMNH.

American Museum of Natural History, New York, NY; H. P. Attwater (#unknown), Catalog #MS-6516, 2 June 1893, AMNH.

American Museum of Natural History, New York, NY; H. P. Attwater (#unknown), Catalog #MS-6517, 14 July 1893, AMNH.

The Field Museum, Chicago, IL; H. P. Attwater (#12769), Catalog #5436, 20 May 1893, FMNH.

Element Occurrence Record

Scientific Name: Sporobolus tharpii
Occurrence #: 1
Eo Id: 10395
Common Name: Tharp's dropseed
Track Status: Track all extant and selected historical EOs
Identification Confirmed: Y - Yes
TX Protection Status:
Global Rank: G3
State Rank: S3
Federal Status:

Location Information:

Directions

St. Joseph Island.

Survey Information:

First Observation:
Survey Date:
Last Observation: 1964-11-07
Eo Type:
Eo Rank:
Eo Rank Date:
Observed Area:

Comments:

General Description: Broad sand mound, back-island sandflat.

Comments: Complete specimen citation: St. Joseph Island, broad sand mound, back-island sandflat, 7 Nov 1964, P. B. Andrews 21 (TEX-LL).

Protection Comments:

Management Comments:

Data:

EO Data:

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Andrews, P. B. (21). 1964. Specimen # none TEX-LL.

Specimen:

Andrews, P. B. (21). 1964. Specimen # none TEX-LL. (S64ANDTXTXUS)

Element Occurrence Record

Scientific Name: Thurovia triflora **Occurrence #:** 2 **Eo Id:** 858

Common Name: threeflower broomweed **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:**

Global Rank: G2G3 **State Rank:** S2S3 **Federal Status:**

Location Information:

Directions

INGLESIDE

Survey Information:

First Observation: 1936 **Survey Date:** **Last Observation:** 1936-09-19

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: IN FLOWER

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Specimen:

Texas A & M University, Tracy Herbarium. 1936. H.B. Parks #20416, 20417, Specimen # 18987, 23120 TAES. 19 September 1936.

Element Occurrence Record

Scientific Name: Trichechus manatus **Occurrence #:** 1 **Eo Id:** 6570

Common Name: West Indian Manatee **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:** E

Global Rank: G2 **State Rank:** S1 **Federal Status:** LT

Location Information:

Directions

Corpus Christi Bay and Port Aransas. These are generalized directions as this record consists of multiple on-the-ground observations.

Survey Information:

First Observation: 2001-09-23 **Survey Date:** 2016-04-19 **Last Observation:** 2016-04-19

Eo Type: **Eo Rank:** E **Eo Rank Date:** 2016-04-19

Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 23 Sep 2001 and 5, 31 Oct 2006: One manatee observed. 23 Jan 2011: A manatee washed up on shore and later died; 19 April 2016: One manatee sighting.

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference:

Citation:

Cobb, Robyn. 2006. E-mail sent to Sandy Birnbaum, Natural Diversity Database Manager, concerning a manatee sighting in the Jewell Fulton Channel, near Ingelside On-the-Bay, TX.

Cobb, Robyn. 2006. E-mail sent to Sandy Birnbaum, Natural Diversity Database Manager, on 10 October concerning a manatee sighting in the Port Aransas City Marina Boat Basin, Port Aransas, TX.

PRESSLY, LORETTA. 2001. E-MAIL TO GARETH ROWELL CONCERNING MANATEE SIGHTING IN CORPUS CHRISTI BAY. SEPTEMBER 28, 2001.

Kiii News. 2011. Rockport Manatee Dies. http://www.kiiitv.com/story/13897645/rockport-manatee-dies. (Posted: Jan 24, 2011. Updated: Jan 31, 2011. Accessed: Sep 16, 2011.)

Whitehead, Heidi R. 2016. Email of 19 April 2016 to the Texas Marine Mammal Stranding Network (TMMSN) contacts concerning a manatee sighting at the Corpus Christi Naval Air Station, Corpus Christi, TX.

Specimen:

Texas Natural Diversity Database

The Texas Natural Diversity Database (TXNDD), established in 1983, is the Texas Parks and Wildlife Department's (TPWD) most comprehensive source of information on rare, threatened, and endangered plants, animals, natural communities, and animal aggregations. The TXNDD is continually updated with information on statewide status and locations of these unique elements of natural diversity. However, the data are not complete, as there are gaps in coverage due to the lack of access to land or data and a lack of staff and resources to collect and process data on all rare and significant resources.

The TXNDD houses biological information from public information sources such as museum and herbarium collection records, peer-reviewed publications, experts in the scientific community, organizations, qualified individuals, and on-site field surveys conducted by TPWD staff on public lands or private lands with written permission. TPWD staff botanists, zoologists, and ecologists perform field surveys to locate and verify specific occurrences of high-priority biological elements and collect information on their condition, quality, and management needs.

The TXNDD can be used to help evaluate environmental impacts of routing and siting options for development projects, environmental review, and permit review as well as for natural resource management, scientific research, and educational applications. **Appropriate use of TXNDD data requires both interpretation and extrapolation because of the many data gaps across the state**. The current and historic lack of access to private lands and the restriction of only being able to distribute data from public data sources are two of the reasons for these data gaps. Other reasons include a skew in the available data toward listed and the rarest species as well as lack of precision in many secondary data sources.

Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Although it is based on the best data available to TPWD regarding rare species, these data cannot provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features in any area. Nor can these data substitute for on-site evaluation by qualified biologists. The TXNDD information is intended to assist users in avoiding harm to rare species or significant ecological features. Refer all requests back to the TXNDD to obtain the most current information.

Contact:
TXNDD Administrator phone: (512) 389-8744
TXNDD Email: TexasNatural.DiversityDatabase@tpwd.texas.gov.

Shapefile Data Interpretation and Use

In our database, every element occurrence (EO) is represented geographically as a polygon. This polygon is a combination of the geographic location of the reported observation and the locational uncertainty of the observation for all elements of the same type within scientifically-determined separation distances.

Data Conversion from paper maps to a digital database

Historically, most of the data that were part of the original database was maintained geographically as points in latitude and longitude. Each point was one symbolized with either a circle, a triangle, or a square. These symbols represented the precision of the point occurrence: circles represented those records precise to seconds, the highest precision; triangles represented records precise to +/- 1 minute, the intermediate level of precision; and squares represented the least precise records and were used only when location description was especially vague.

When the database was converted to the new system (Biotics), the points were converted to polygons by applying an error buffer (*locational uncertainty*) to the point location based on the precision of that record. Records with seconds precision received a 100 m radius buffer; records with minutes precision received a 2,000 m radius buffer; and records with a general precision received an 8,000 m radius buffer. Thus, instead of point data, each record was now a polygon in which the imprecision and uncertainty of the data is graphically represented.

Alternatively, some of the data that were in the previous database was originally mapped as polygons with meaningful boundaries on paper topographic maps. In the conversion to the new database, each of these records was digitized as they were drawn as polygons using ArcGIS. Because the precision with which the boundaries of these records were initially mapped is unknown, each was given a 100 m radius buffer to achieve the final shape.

Current Mapping Methodology and Data Interpretation

When viewing the spatial data that have been provided in the shapefile, interpretation is not necessarily intuitive without an understanding of the current mapping methodology, which follows three general steps. First, an observation of an element is located on the map. Next, locational uncertainty is applied based on the precision with which the location information was collected, resulting in a *Source Feature*. At this point and/or after the last step (depending on when we receive/enter data), data obtained regarding the same element in the same location can be added to a source feature. Thus, each source feature can represent one or many observations over time. Finally, these source features are combined with other source features of the same element based on a scientifically-determined separation barriers and separation distance to create Element Occurrences (EOs). If two source features are within this distance, they become part of the same EO; if not, they become separate EOs. For this reason, you will see both single and multi-

polygon EOs in the data, which results in a better representation of that species in a specific area. Factors constituting *separation barriers* as well as the *separation distances* used to determine if an observation should be part of an existing EO or a new one can be found as part of the species information on the NatureServe Explorer web site (http://www.natureserve.org/explorer/).

Source features, then, can be interpreted as the smallest area that can be drawn in which we are confident the observed element was located. We cannot be certain where within that area the element was observed, but we have high confidence that it was somewhere within that area on the observation date(s). An EO, when complete, is a representation of a population of that element. However, due to the large amount of private land and other constraints to monitoring and surveying, **an absence of information on the map should not be interpreted as an absence of rare, threatened, or endangered species in that location**. These data cannot provide a definitive statement as to the presence, absence, or condition of species, natural communities, or other significant features in any area. Nor can these data substitute for on-site evaluation by qualified biologists. **The** Texas Wildlife Diversity Database **information is intended to assist users in avoiding harm to rare species or significant ecological features.**

Refer all requests for data or maps back to the Texas Natural Diversity Database to obtain the most current information. **The Texas Natural Diversity Database is a dynamic database that changes almost daily.** You are encouraged to request updates to data at least quarterly for ongoing long-term projects.

If you have any questions about use or interpretation of the data please call the TXNDD Administrator (contact information above).

Shapefile Export Attribute Explanations

Some attributes are exported automatically by the system, but do not provide any additional information about the EO. The following list includes fields relevant to most uses of TXNDD data and their descriptions. For questions regarding the remaining fields exported with the shapefile, contact the TXNDD Administrator (contact information above).

- EO_ID – Unique number automatically assigned by the TXNDD to the EO. If you have questions regarding a particular feature, use this number in any correspondence with the TXNDD to identify the feature in question.
- ELCODE – Unique code assigned to the particular taxon associated with this EO.
- SNAME – Subnational Scientific Name; Scientific name used in the state of Texas for the element.
- SCOMNAME – Subnational Common Name; Common name used in the state of Texas for the element.
- GNAME – Global Scientific Name; Scientific name used by the central NatureServe database for the element.
- GCOMMNAME – Global Common Name; Common name used by the central NatureServe database for the element.
- EST_REP_ACC – Estimated Representation Accuracy; a qualitative classification that indicates the accuracy associated with an Element Occurrence. It varies based on the area occupied by the observed Element relative to the area within the footprint of the EO. The field can be null. There is no default value.
- Y – Latitude of occurrence record point, or polygon link point located in the centroid of the polygon.
- X – Longitude of occurrence record point, or polygon link point located in the centroid of the polygon.
- BASIC_EO_R – EO Rank; indicates the estimated viability (species) or ecological integrity (community) of an EO, *i.e.*, the likelihood of persistence. EO Ranks provide an assessment of the likelihood that, if current conditions prevail, the occurrence will persist for a defined period of time, typically 20-100 years. The field can be null. There is no default value.
- NAME_CAT_1 – Name Category; broad biological label for the Element to which the Scientific Name applies. The field cannot be null. There is no default value.
- GRANK – Global Conservation Status Rank; rank for the Element's entire global range; factors together abundance, total range size, distribution, trends, threats, fragility, and number of adequately protected occurrences within global range. See table below for specific ranks. The field cannot be null. There is no default value.

- SRANK – State Conservation Status Rank; rank for the Element's state range; factors together abundance, state range size, distribution, trends, threats, fragility, and number of adequately protected occurrences within state range. See table below for specific ranks. The field cannot be null. The default value is 'SNR' (unranked).
- LAST_OBS_D – Last Observation Date; date a particular Element was last observed in the particular area of the EO as noted in the Reference(s); **refers only to species occurrence as noted in a reference and does not imply the last date the species was present.** The default value is null.
- SEPARATION – Separation Distance Comments; comments relating to the separation/combination of EOs if the default separation distances were not used to determine EOs. The field can be null. There is no default value.
- NEW_EO_REA – New EO Reason; comments relating to justification for creating a new EO from a source feature when the default separation distance would indicate that it should be part of an existing EO. Possible reasons include the presence of a separation barrier or a large difference in representation accuracy. The field can be null. There is no default value.

Code Key for Printouts from

This information is for your assistance only; due to continuing data updates, vulnerability of private land to trespass and of species to disturbance or collection, **please refer all requesters to our office to obtain the most current information available.** Also, please note, identification of a species in a given area does not necessarily mean the species currently exists at the point or area indicated.

LEGAL STATUS AND CONSERVATION RANKS

FEDERAL STATUS (as determined by the US Fish and Wildlife Service)

LE	Listed Endangered
LT	Listed Threatened
PE	Proposed to be listed Endangered
PT	Proposed to be listed Threatened
PDL	Proposed to be Delisted (Note: Listing status retained while proposed)
SAE, SAT	Listed Endangered on basis of Similarity of Appearance, Listed Threatened on basis of Similarity of Appearance
DL	Delisted Endangered/Threatened
C	Candidate. USFWS has substantial information on biological vulnerability and threats to support proposing to list as threatened or endangered. Data are being gathered on habitat needs and/or critical habitat designations.
C*	C, but lacking known occurrences
C**	C, but lacking known occurrences, except in captivity/cultivation
XE	Essential Experimental Population
XN	Non-essential Experimental Population
Blank	Species is not federally listed

TX PROTECTION (as determined by the Texas Parks and Wildlife Department)

E	Listed Endangered
T	Listed Threatened
Blank	Species not state-listed

GLOBAL RANK (as determined by NatureServe)

G1	Critically imperiled globally, extremely rare, typically 5 or fewer viable occurrences
G2	Imperiled globally, very rare, typically 6 to 20 viable occurrences
G3	Very rare and local throughout range or found locally in restricted range, typically 21 to 100 viable occurrences
G4	Apparently secure globally
G5	Demonstrably secure globally
GH	Of historical occurrence through its range
GU	Possibly in peril range-wide, but status uncertain
G#G#	Ranked within a range as status uncertain
GX	Apparently extinct throughout range
Q	Rank qualifier denoting taxonomic assignment is questionable
#?	Rank qualifier denoting uncertain rank
C	In captivity or cultivation only
G#T#	“G” refers to species rank; “T” refers to variety or subspecies rank

STATE (SUBNATIONAL) RANK (as determined by the Texas Parks and Wildlife Department)

S1	Critically imperiled in state, extremely rare, vulnerable to extirpation, typically 5 or fewer viable occurrences
S2	Imperiled in state, very rare, vulnerable to extirpation, typically 6 to 20 viable occurrences
S3	Rare or uncommon in state, typically 21 to 100 viable occurrences
S4	Apparently secure in State
S5	Demonstrably secure in State
S#S#	Ranked within a range as status uncertain
SH	Of historical occurrence in state and may be rediscovered
SU	Unrankable – due to lack of information or substantially conflicting information
SX	Apparently extirpated from State
SNR	Unranked – State status not yet assessed
SNA	Not applicable – species id not a suitable target for conservation activities
?	Rank qualifier denoting uncertain rank in State

ELEMENT OCCURRENCE RECORD

Element Occurrence Record (EO) Spatial and tabular record of an area of land and/or water in which a species, natural community, or other significant feature of natural diversity is, or was, present and associated information; may be a single contiguous area or may be comprised of discrete patches or subpopulations

Occurrence # Unique number assigned to each occurrence of each element when added to the TXNDD

LOCATION INFORMATION

Directions Directions to geographic location where occurrence was observed, as described by observer or in source

SURVEY INFORMATION

First/Last Observation Date a particular occurrence was first/last observed; refers only to species occurrence as noted in source and does not imply the first/last date the species was present

Survey Date Last date of survey. If the survey date and last observation date are the same, this indicates that the last time someone visited the EO and surveyed for the element and reported to us, the element was observed. If the survey date is later than the last observation date, this indicates that the last time that someone visited the EO to survey for the element and reported to us, the element was not observed.

EO Type State rank/EO rank qualifiers:

- **M** Migrant – species occurring regularly on migration at staging areas, or concentration along particular corridors; status refers to the transient population in the State
- **B** Qualifier indicating basic rank refers to the breeding population in State
- **N** Qualifier indicating basic rank refers to the non-breeding population in State

EO Rank

A	Excellent	**AI**	Excellent, Introduced
B	Good	**BI**	Good, Introduced
C	Marginal	**CI**	Marginal, Introduced
D	Poor	**DI**	Poor, Introduced
E	Extant/Present	**EI**	Extant, Introduced
H	Historical/No Field Information	**HI**	Historical, Introduced
X	Destroyed/Extirpated	**XI**	Destroyed, Introduced
O	Obscure	**OI**	Obscure, Introduced

EO Rank Date Latest date EO rank was determined or revised

Observed Area Acres, unless indicated otherwise

COMMENTS

General Description General physical description of area and habitat where occurrence is located, including associated species, soils, geology, and surrounding land use

Comments Comments concerning the quality or condition of the element occurrence at time of survey

Protection Comments Observer comments concerning legal protection of the occurrence

Management Comments Observer comments concerning management recommendations appropriate for occurrence conservation

DATA

EO Data Biological data; may include number of individuals, vigor, flowering/fruiting data, nest success, behaviors observed, or unusual characteristic, etc.

COMMUNITY INFORMATION

Stratum Stratum (or strata) in which the elements composing the community occurs within the specified geographic level (i.e., range-wide for global, within-state or province for subnational), *i.e.*, shrubland, herbaceous vegetation, woodland

Dominant Dominant element in the community as defined by the most abundant in terms of percent cover

Lifeform Type of lifeform of the elements composing the community, *i.e.*, tree, shrub, herbaceous, nonvascular, other)

Composition Note Notes regarding the community

Please use one of the following citations to credit the source for the printout information:

Texas Natural Diversity Database. [year of data export]. Element Occurrence data export. Wildlife Diversity Program of Texas Parks & Wildlife Department. [day month year of export].