

APPENDIX B

**BIOLOGICAL EVALUATION OF
IMPACTS TO THREATENED AND ENDANGERED SPECIES**

**SECTION 206
ECOSYSTEM RESTORATION PROJECT**

**UNIVERSITY OF TEXAS
MARINE SCIENCE INSTITUTE
PORT ARANSAS, TEXAS**

**U.S. ARMY ENGINEER DISTRICT
GALVESTON, TEXAS
MARCH 2003**

**TABLE OF CONTENTS
FOR
BIOLOGICAL EVALUATION OF
IMPACTS TO THREATENED AND ENDANGERED SPECIES**

**SECTION 206
ECOSYSTEM RESTORATION PROJECT**

**UNIVERSITY OF TEXAS
MARINE SCIENCE INSTITUTE
PORT ARANSAS, TEXAS**

1.0	INTRODUCTION AND PURPOSE	1
2.0	LISTED THREATENED AND ENDANGERED SPECIES	2
3.0	IMPACTS ON LISTED THREATENED AND ENDANGERED SPECIES	2
4.0	CRITICAL HABITAT FOR THE PIPING PLOVER.....	4
5.1	Definition of Critical Habitat	4
5.2	Description of Critical Habitat	5
5.0	IMPACTS ON PROPOSED CRITICAL HABITAT	6
5.1	Proximity of Proposed Work Areas to Proposed Critical Habitat	6
5.2	Impacts at Rollover Pass.....	6
5.2.1	U.S. Army Corps of Engineers	6
5.2.2	Galveston County/Texas General Land Office	8
6.0	IMPACTS ON CRITICAL HABITAT FOR THE PIPING PLOVER	8
7.0	SUMMARY & CONCLUSIONS.....	9
8.0	REFERENCES	9

**BIOLOGICAL EVALUATION OF
IMPACTS TO THREATENED AND ENDANGERED SPECIES**

**SECTION 206, ECOSYSTEM RESTORATION PROJECT
UNIVERSITY OF TEXAS MARINE SCIENCE INSTITUTE
PORT ARANSAS, TEXAS**

1.0 INTRODUCTION AND PURPOSE

This Biological Evaluation (BE) is part of the Environmental Assessment (EA) for a planning study which addresses the restoration of fishery and waterfowl (aquatic and wetland) habitat through the creation of 2.6-acres of wetlands and approximately 1600 feet of dunes adjacent to Aransas Pass, in the city of Port Aransas, located on Mustang Island, in Nueces County, Texas. The study area for this report is an approximate 12-acre site on land adjacent to the University of Texas Marine Science Institute (UTMSI) campus located immediately adjacent to the entrance channel to the Corpus Christi/Aransas Ship Channels.

The authority for this study is Section 206 of the Water Resources Development Act of 1996, as amended, which provides for aquatic ecosystem restoration and protection projects that improve environmental quality. The vehicle for the study is the Continuing Authorities Program of the Corps of Engineers.

The purpose of this BE is to fulfill the Galveston District's consultation requirements under Section 7(c) of the Endangered Species Act of 1973, as amended, and to comply with U.S. Army Corps of Engineers (USACE) regulations under ER 1105-2-100, Appendix C, revised April 2000 (USACE, 2000).

2.0 LISTED THREATENED AND ENDANGERED SPECIES

The Texas Parks and Wildlife Department (TPWD) and the U.S. Fish and Wildlife Service (USFWS) provided lists of threatened and endangered species that may occur in the study area. Table 1 lists Federally and State-endangered plant species and SOC that may occur in region of the study area. A list of wildlife that may occur in Nueces County that are considered by NMFS, FWS, and TPWD to be endangered, threatened or SOC is presented in Table 2. Species listed by the FWS have confirmed sightings in Nueces County; species not listed may occur as migrants. Inclusion in the list does not imply that a species is known to occur in the project area, but only acknowledges the potential for occurrence. State-endangered or threatened and federally- and state-listed SOCs have no legal status under Federal law and are not protected under the Endangered Species Act, however they are presented in this report.

Table 1. List of plant species that are Federal or State Endangered, Threatened or Species of Concern, Nueces County, Texas.

Common Name	Scientific Name	STATUS	
		FWS	TPWD
Plants			
Black lace cactus	<i>Echinocereus reichenbachii</i> var. <i>altertii</i>	---	E
Lilia de los llanos	<i>Echeandia chandleri</i>	SOC	---
Roughseed sea-purslane	<i>Sesuvium tranthemoides</i>	SOC	---
Slender rush-pea	<i>Hoffmannseggia tenella</i>	E	E
South Texas ambrosia	<i>Ambrosia cheiranthifolia</i>	E	E
Texas windmill-grass	<i>Chloris texensis</i>	SOC	---
Thieret's skullcap	<i>Scutellaria thieretii</i>	SOC	---
Welder machaeranthera	<i>Psilactis heterocarpa</i>	SOC	---

T=Threatened
 PT=Federally Proposed Threatened
 CH=Critical Habitat
 E=Endangered
 SOC=Species of Concern
 †=Migratory ‡=Proposed

Table 2. List of wildlife species that are Federal or State Endangered, Threatened or Species of Concern, Nueces County, Texas.

Common Name	Scientific Name	STATUS		
		NMFS	FWS	TPWD
Reptiles				
Green sea turtle	<i>Chelonia mydas</i>	E	E, T	T
Gulf saltmarsh snake	<i>Nerodia clarkii</i>	---	SOC	---
Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	E	E w/ CH‡	E
Indigo snake	<i>Drymarchon corais</i>	---	---	T
Kemp's Ridley sea turtle	<i>Lepidochelys kempii</i>	E	E	E
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E	E w/ CH‡	E
Loggerhead sea turtle	<i>Caretta caretta</i>	T	T	T
Texas diamondback terrapin	<i>Malaclemys terrapin littoralis</i>	---	SOC	---
Texas horned lizard	<i>Phrynosoma cornutum</i>	---	SOC	T
Texas scarlet snake	<i>Cemophora coccinea lineri</i>	---	---	T
Texas tortoise	<i>Gopherus berlandieri</i>	---	---	T
Amphibians				
Black-spotted newt	<i>Notophthalmus meridionalis</i>	---	SOC	T
Rio Grande lesser siren	<i>Siren intermedia texana</i>	---	SOC	---
Sheep frog	<i>Hypopachus variolosus</i>	---	---	T
South Texas siren	<i>Siren sp.1</i>	---	---	T
Insects				
Maculated manfreda skipper	<i>Stallingsia maculosus</i>	---	SOC	---
Birds				
Audubon's oriole	<i>Icterus graduacauda audubonii</i>	---	SOC	---
Bald Eagle†	<i>Haliaeetus leucocephalus</i>	---	T	---
Black rail	<i>Laterallus jamaicensis</i>	---	SOC	---
Black tern	<i>Chlidonias niger</i>	---	SOC	---

Brown pelican	<i>Pelecanus occidentalis</i>	---	E	E
Cerulean warbler	<i>Dendroica cerulea</i>	---	SOC	
Eskimo curlew	<i>Numenius borealis</i>	---	---	E
Ferruginous hawk	<i>Buteo regalis</i>	---	SOC	---
Least tern†	<i>Sterna antillarum athalassos</i>	---	E	---
Loggerhead shrike†	<i>Lanius ludovicianus</i>	---	SOC	---
Mountain plover	<i>Charadrius montanus</i>	---	PT	---
Northern gray hawk	<i>Buteo nitidus maximus</i>	---	SOC	---

Table 4 (Concluded)

Peregrine falcon	<i>Falco peregrinus</i>	---	---	E/T
Piping plover†	<i>Charadrius melodus</i>	---	T w/ CH	T
Reddish egret	<i>Egretta rufescens</i>	---	SOC	T
Sennet's hooded oriole	<i>Icterus cucullatus sennetti</i>	---	SOC	---
Snowy plover	<i>Charadrius alexandrinus</i>	---	---	T
Sooty tern	<i>Sterna fuscata</i>	---	---	T
Texas Botteri's sparrow	<i>Aimophila botterii texana</i>	---	SOC	T
Texas olive sparrow	<i>Arremonops rufivirgatus rufivirgatus</i>	---	SOC	---
White-faced ibis†	<i>Plegadis chihi</i>	---	SOC	T
White-tailed hawk	<i>Buteo albicaudatus</i>	---	---	T
Whooping crane†	<i>Grus Americana</i>	---	E w/ CH	E
Wood stork	<i>Mycteria americana</i>	---	---	T
Mammals				
Gulf Coast jaguarundi	<i>Herpailurus yagouraroundi cacomitli</i>	---	E	E
Maritime Texas pocket gopher	<i>Geomys personatus maritimus</i>	---	SOC	---
Ocelot	<i>Leopardus paradolis</i>	---	E	E
Southern yellow bat	<i>Lasiurus ega</i>	---	---	T
West Indian manatee	<i>Trichechus manatus</i>	E	E w/ CH‡	E
Fish				
Opossum pipefish	<i>Microphis brachyurus</i>	---	---	T

T=Threatened
E=Endangered
†=Migratory

PT=Federally Proposed Threatened
SOC=Species of Concern

CH=Critical Habitat
‡=Proposed

3.0 HABITAT AND DISTRIBUTION OF LISTED THREATENED AND ENDANGERED SPECIES AND SPECIES OF CONCERN WITHIN THE STUDY AREA

Flora

Two plant species listed by both the FWS and TPWD as endangered may potentially occur within the study area. These plants include south Texas ambrosia (*Ambrosia cheiranthifolia*) and slender rush-pea (*Hoffmannseggia tenella*).

South Texas ambrosia is an inhabitant of low elevations in open clay-loam to sandy-loam prairies and savannas. Much of its original habitat has been converted to cropland, and introduced forage species such as buffelgrass (*Cenchrus ciliaris*) and King Ranch bluestem (*Bothriochloa ischaemum var. songaricus*). Invasion of prairie by shrub

and tree species also contributes to loss of available habitat, although the species does occur among scattered woody plants. It occurs at six general locations in Nueces and Kleberg Counties in the Gulf Prairie region of Texas, and is also known from the state of Tamaulipas in Mexico. Known stands of this species occur in rights-of-way along highways and railways, where the species is subject to weed-control measures including mowing and herbicide applications (Turner, 1983). The closest record of occurrence for this species to study area is quite far away, adjacent to the Nueces River in the upper Corpus Christ Bay.

The slender rush-pea is known from only four populations in Kleberg and Nueces counties. It is found in barren openings within native grassland and brush in calcareous clay soils (FWS, 1997). Introduction non-native grasses and conversion of prairies to agriculture and other uses are thought to be responsible for its decline. The occurrence of this species within the study area is unlikely due to lack of suitable soils and habitat.

Four plant species identified as SOC by the FWS have records in Nueces County. These species include: lila de los llanos (*Echeandia chandleri*); Texas windmillgrass (*Chloris texensis*); Roughseed sea-purslane (*Sesuvium triantheroides*); and Welder machaeranthera (*Psilactis heterocarpa*). Thieret's skullcap is known from within the study area; lila de los llanos, roughseed sea-purslane, and Texas windmillgrass have records of occurrence near the general study area, thus the potential for occurrence of these species within the study area exists.

Lila de los llanos occurs on level to gently undulating sites inland from the Gulf Coast of Texas. It prefers full sunlight and grows among prairies and chaparral thickets on heavy clay and loamy clay soils (Poole, 1985). Texas windmillgrass occurs along the Gulf Coast and throughout the northeastern Rio Grande Plains of Texas. It prefers silty and sandy loam soils and is known from Nueces County (Poole et al., 2000). Thieret's skullcap occurs on shell, sand, shell ridges, or sandy meadows usually not far from brackish marshes. It is also found growing in clays in close association within woodlands dominated by honey locust (*Gleditsia tricanthos*) and sugar hackberry (*Celtis laevigata*) in non-disturbed soils (Kral, 1983). Roughseed sea-purslane occurs on dunes of south Texas (Correll and Johnston, 1970) and in brackish swales, marshes and depressions along the coast (Jones, 1977). Poole et al. (2000), show its range occurring only in Kenedy County. Welder machaeranthera occurs in shrub-invaded grasslands and open mesquite-huisache woodlands on mostly gray clays to silty soils overlying the Lissie and Beaumont formations (Texas Organization for Endangered Species [TOES], 1993). It has been documented in both Kleberg and Nueces counties (Poole et al., 2000). The occurrence of this species within the study area is unlikely due to lack of suitable soils and habitat.

One cactus considered endangered by the TPWD is known to have a geographic range that includes the study area. The black lace cactus has a range in the South Texas plains, where three populations are known to exist in Jim Wells, Kleberg, and Refugio counties. This cactus occurs in brushy, grassy areas along streams in an area where the coastal plain meets the inland mesquite/huisache/blackbrush savannah (Poole and

Riskind, 1987). The two causes for this species endangerment are clearing of the land for crops or cattle grazing and collectors. The occurrence of this species within the study area is unlikely due to lack of suitable soils and habitat. TPWD includes this species on their Nueces County list of rare species (TPWD, 2002).

A vegetation survey of the site was performed in February 2003 by USACE personnel. The site inspection did not reveal the presence of any of the above species in the vicinity of the project site. Due to lack of suitable soils and habitat on the project site, there is little likelihood that federally listed or state-listed endangered, threatened, or candidate plant species to occur there.

Reptiles

Five sea turtles are listed as Federally and State threatened or endangered within Nueces County. These sea turtles include the green sea turtle (*Chelonia mydas*), the hawksbill sea turtle (*Eretmochelys imbricate*), the Kemp's Ridley sea turtle (*Lepidochelys kempii*), the loggerhead sea turtle (*Caretta caretta*), and the leatherback sea turtle (*Dermochelys coriacea*). These sea turtles are known to occur in the Gulf of Mexico, including associated bay and estuarine waters. It is a possibility for any of these species to be observed within waters adjacent to the study area.

The Gulf saltmarsh snake (*Nerodia clarkia*), Texas horned lizard (*Phrynosoma cornutum*) and the Texas diamondback terrapin (*Malaclemys terrapin littoralis*) are listed by the FWS as a SOC within Nueces County. Species listed as threatened by the TPWD, but having no listing by the FWS, in Nueces County are the indigo snake (*Drymarchon corais*), the Texas scarlet snake (*Cemophora coccinea lineri*), and the Texas tortoise (*Gopherus berlandieri*).

Amphibians

Two species of amphibians listed as SOC in Nueces County by the FWS are the black spotted newt (*Notophthalmus meridionalis*) and the Rio Grande lesser siren. The State includes the black spotted newt, as well as the sheep frog (*Hypopachus variolosus*) and the South Texas siren (large form, *Siren* sp.1) on its list of threatened species within Nueces County. The sheep frog is known to occur in moist burrows of subterranean mammals, under vegetative debris, and around pond edges and irrigation ditches (Garrett and Barker, 1987). The blackspotted newt inhabits heavily vegetated, shallow water lagoons, streams, ditches and swamps (Garrett and Barker, 1987). The black-spotted newt may occur in wetland sites near the study area. The South Texas siren is known to occur in habitat similar to that occupied by the black-spotted newt; however, the newt requires year-round open water since it cannot aestivate in dry ground like the south Texas siren. The Rio Grande lesser siren prefers warm, shallow waters with vegetative cover such as those in ponds, irrigation canals and swamps in permanently to semipermanently inundated areas found along the lower coast of Texas and along the Rio Grande (Bartlett and Bartlett, 1999). All of these species (except the South Texas siren for which little information is known) have been recorded from the study area counties (Dixon, 2000). How-

ever, there is little likelihood of these species to exist on the project site due to lack of suitable freshwater habitats.

Insects

One species of insect, the maculated manfreda skipper (*Stallingsia maculosus*), is a rare butterfly known from several south Texas counties and northern Mexico. This species is identified as a SOC by the FWS in Nueces County. The larvae of this species are closely associated with Texas tuberose (*Manfreda maculosa*) which grows on prairies and chaparral covered hills of the Rio Grande Valley and Plains (Correll and Johnston, 1970; Tilden and Smith, 1986). There is little likelihood of this species occurring in the study area.

Birds

Twenty four endangered, threatened, and SOC bird species are listed by the FWS and/or the State as occurring or potentially occurring Nueces County. Several of these are predominantly inland species that are not ordinarily expected on the coast, or are migrants that pass through the region seasonally. Others may occur as breeding birds, permanent residents, or post-nesting visitors.

The Federally and State-endangered brown pelican (*Pelecanus occidentalis*) is primarily a coastal species that rarely ventures very far out to sea or inland. In Texas, it occurs from Chambers County on the upper coast to Cameron County on the lower coast (Campbell, 1995). Brown pelicans are colonial nesters, usually nesting on undisturbed offshore islands in small bushes and trees, including 3-55 mangroves (National Fish & Wildlife Laboratory [NFWL], 1980; Guzman and Schreiber, 1987). This species is a common resident of the general study area, and is likely to occur near open-water habitat and tidal flats. An occasional transient brown pelican may be observed loafing on or near the south jetty, however suitable habitat for more permanent uses such as roosting does not currently exist on the project site.

The bald eagle (*Haliaeetus leucocephalus*) has recovered sufficiently to be downlisted to threatened throughout its range, and the FWS has proposed to delist the species in the near future (64 FR 36453-36363; July 6, 1999). Two subspecies are currently recognized based on size and weight: the northern bald eagle and the southern bald eagle. The northern population nests from central Alaska and the Aleutian Islands through Canada into the northern U.S. The southern population primarily nests in estuarine areas and inland lakes of the Atlantic and Gulf coasts, northern California to Baja California, Arizona and New Mexico (Snow, 1981). Wintering ranges of the two populations overlap. The bald eagle inhabits coastal areas, rivers and large bodies of water as fish and waterfowl comprise the bulk of their diet. Nests are seldom far from a river, lake, bay, or other waterbody. Nests are generally built in the dominant or co-dominant tree of woodlands, woodland edges, or open areas (Green, 1985). The 2001 bald eagle nesting survey in Texas identified 98 occupied nesting territories statewide, the southernmost found in Refugio and Goliad counties (Ortego, 2001). Concentrations of wintering north-

ern eagles are often found around the shores of reservoirs in Texas, with most wintering concentrations occurring in the eastern part of the state. Wintering bald eagles in Texas have been observed as far south as Cameron County (Oberholser, 1974; Mabie, 1990). No nests are known to occur in the study area, nor have any been reported from Nueces or Kleberg counties (Ortego, 2001). The bald eagle should occur in the study area only as a rare migrant or post-nesting visitor.

Each year, the entire wild breeding population of the Federal and State-endangered whooping cranes (*Grus americana*) migrates 2,600 miles from Canada's Northwest Territories and winters along a narrow section of the Texas coast centered around the Aransas National Wildlife Refuge. Rest areas along the migration route include the central and eastern panhandle of Texas (FWS, 1995). In Texas, the principle winter habitat is brackish bays, marshes, and salt flats, as whooping cranes feed in nearby upland sites characterized by oak mottes, grassland swales, and ponds (Campbell, 1995). They eat a wide variety of plant and animal foods in their wintering habitat: blue crabs, clams, berries of Carolina wolfberry (*Lycium carolinianum*), acorns, snails, crayfish, and insects (Campbell, 1995). The whooping crane has been recorded from counties within the study area but is generally restricted to the Aransas National Wildlife Refuge in Aransas, Refugio, and Calhoun counties. The leeward side and interior of Padre Island provide suitable winter habitat for whooping cranes. They are unlikely to occur in the project area due to the lack of suitable habitat.

The Federally and State-threatened piping plover is a winter resident and spring and fall migrant of the general study area. This small shorebird breeds in the northern Great Plains of the U.S. and Canada, along beaches of the Great Lakes, and along the Atlantic coastline from North Carolina to Newfoundland (Haig and Oring, 1987). Post-breeding and wintering sites include the southern U.S. Atlantic coastline; the Gulf of Mexico from Florida to Veracruz, Mexico; and on scattered Caribbean islands (Haig and Oring, 1985). The piping plover can be found along Texas beaches, tidal flats, dunes, and offshore disposal islands (American Ornithologists' Union [AOU], 1998; FWS, 1995) arriving in mid- to late-July (Haig and Oring, 1985). The piping plover is a regular migrant and winter resident along the lower Texas coast (Oberholser, 1974; Haig and Oring, 1985). The checklist of birds of Mustang Island State Park lists the piping plover as a fairly common winter resident and a common migrant (Pulich et al., 1985). The project site is located behind the Aransas Pass South Jetty and more than 1,000 feet from the shoreline of the Gulf of Mexico at elevations of more than 3 feet above mean high tide. Therefore, the potential for this species to occur in the study area is unlikely due to its distance from suitable tidally influenced habitat.

The current status of the Eskimo curlew (*Numenius borealis*) is considered uncertain and possibly extinct (TOS, 1995), but it is Federally and State-listed as endangered. This species was extremely abundant in the nineteenth century, but was subject to extreme hunting pressures. The breeding habitat of the Eskimo curlew was treeless arctic and subarctic tundra (Gill et al., 1998). Non-breeding birds use a variety of habitats, such as grasslands, pastures, plowed fields, and less frequently, marshes and mud flats (AOU, 1983). Spring migration would bring them through Texas and the Midwestern U.S. (Gill

et al., 1998) from mid-March to late April in Texas (Oberholser, 1974). One record does exist from Galveston, Texas, in 1962 and others since have been reported, but the validity of these recent records is uncertain (TOS, 1995). The Eskimo curlew is unlikely to occur in the study area due to its extreme rarity and the lack of recent records of occurrence.

The interior least tern (*Sterna antillarum athalassos*) is listed as endangered by the FWS within the study area. In Texas, this subspecies may breed inland along the Red and Rio Grande River systems (TPWD, 1995), nesting in small colonies on sand bars or sandy flats along rivers (Oberholser, 1974). While the project area is considered to be within potential wintering range of the interior least tern (TPWD, 1995), the unprotected coastal subspecies (*Sterna antillarum antillarum*) is likely the one most frequently occurring in the area.

The mountain plover (*Charadrius montanus*) was proposed for listing as a federally threatened species on February 16, 1999 (64 FR 7587). Non-breeding birds prefer short-grass plains, fields, plowed fields, sandy deserts, and sod farms (NatureServe, 2000a). The mountain plover is a rare to uncommon local winter resident on the coastal plains, and inland from south Texas through the Edwards Plateau into the South Plains (TOS, 1995). The mountain plover has been recorded from Nueces County (Oberholser, 1974). It is most likely to occur in the agricultural areas away from the seashore. This species appears as an uncommon migrant on the checklist for birds of the Corpus Christi area (Audubon Outdoor Club of Corpus Christi [AOCCC], 1994), but is absent from checklists for Mustang Island State Park (Pulich et al., 1985) and the Padre Island National Seashore (Southwest Parks & Monuments Association [SPMA], 1990). This species is unlikely to occur within the study area.

The reddish egret (*Egretta rufescens*), a State threatened species and Federal SOC, typically inhabits saltwater bays and marshes. Its breeding range is restricted to the Gulf coast where it commonly nests in yucca-prickly pear thickets (Oberholser, 1974). The white-faced ibis (*Plegadis chihi*) is a common resident along the coast. This species is also State-listed as threatened and a Federal SOC. Preferred habitats of the white-faced ibis have been described as ranging from freshwater marshes and sloughs and irrigated rice fields to salt marshes (Oberholser, 1974). Both of these species are likely to occur in the study area.

The white-tailed hawk (*Buteo albicaudatus*) is considered an uncommon local resident along the Texas coastal plain (TOS, 1995). The white-tailed hawk could be present in prairies or cordgrass flats near the study area. This hawk is State-listed as threatened in Texas.

All North American peregrine falcons (*Falco peregrinus anatum*) were delisted from the Federal endangered species list (63 FR 45446-45463, Aug. 26, 1998), but remain on the State endangered list. The American Peregrine is found in the rugged canyon country in the western region of Texas, mainly along the Rio Grande, which forms a boundary with the states of Coahuila and Chihuahua, Mexico. The Arctic peregrine falcon (*Falco peregrinus tundrius*), which was listed as endangered due to similarity of ap-

pearance (E/SA), was delisted Federally but remains on the TPWD threatened list. The Arctic peregrine falcon winters along the entire Gulf coast and occurs statewide during migration (FWS, 1995). Both are potential migrants in the study area.

The sooty tern (*Sterna fuscata*), a State-listed threatened species and Federal SOC, is considered a rare local summer resident along the central and lower coast (TOS, 1995). This pelagic bird spends almost its entire life at sea. Many records have been reported on the Texas coast following large tropical storms. Oberholser (1974) shows a breeding and a summer record of the sooty tern in Nueces County. This species is a rare, but potential, vagrant to the study area.

The Texas Botteri's sparrow (*Aimophila botterii texana*) is an uncommon to locally common summer resident on the lower coastal plain, with isolated breeding records from Duval, Jim Wells, and San Patricio counties (TOS, 1995). This species may occasionally occur in the study area. This sparrow is an inhabitant of tall bunch grass prairies with widely scattered shrubs and small trees mostly within 20 miles of the Gulf coast (Oberholser, 1974). The reason for a decline in numbers of this species is attributed mostly to depletion of habitat due to agriculture practices (Oberholser, 1974). TPWD considers this sparrow to be State-threatened.

The wood stork (*Mycteria americana*) is listed as threatened by TPWD. This species is Federally listed as endangered only in Alabama, Florida, Georgia, and North and South Carolina. This bird is an uncommon to common post-breeding visitor to the central and upper coastal prairies and a regular visitor of lakes and reservoirs in central and east Texas. This species has been recorded within the study area counties (Oberholser, 1974; TOS, 1995).

Two additional *Buteo* species, northern gray hawk (*Buteo nitidus maximus*) and ferruginous hawk (*Buteo regalis*), are considered SOC by the FWS. The northern gray hawk is a rare to uncommon local resident in the Lower Rio Grande Valley (TOS, 1995). In Texas, this hawk inhabits mature woodlands of the river valleys and nearby semi-arid mesquite and scrub grasslands (Oberholser, 1974). Oberholser (1974) shows a fall record of the northern gray hawk from Nueces County. This species is unlikely to occur in the study area. The ferruginous hawk ranges the wide open spaces of the dry Great Plains and Great Basin in western North America (Oberholser, 1974). It is considered locally uncommon on Texas' barrier islands and the central and south coastal plains (TOS, 1995) and may rarely occur in the study area as a migrant or winter resident.

Three additional avian Federal SOC of potential occurrence in the study area include the black rail (*Laterallus jamaicensis*), black tern (*Chlidonias niger*), and loggerhead shrike (*Lanius ludovicianus*). The black rail is a rare migrant and winter resident to the state (Oberholser, 1974) and a potential migrant to the study area. It is primarily a bird of coastal marshes, typically dominated by smooth cordgrass (*Spartina alterniflora*). The black tern is a common migrant in all parts of Texas including offshore waters (TOS, 1995). It breeds in marshy areas of the northern U.S. and Canada, and may migrate through Texas during all months except January, February, and March (Oberholser,

1974). This species occurs within the study area. The loggerhead shrike is an inhabitant of open country with scattered trees and shrubs. It is a rare to common resident throughout the state, except for portions of the South Texas Plains. It is a possible resident/migrant within the study area.

Four songbirds of potential occurrence within the study area are considered SOC by the FWS. These four species are the cerulean warbler (*Dendroica cerulea*), Texas olive sparrow (*Arremonops rufivirgatus*), Sennett's hooded oriole (*Icterus cucullatus sennettii*), and Audubon's oriole (*Icterus gradaucada audubonii*). The cerulean warbler is a rare-to-uncommon spring migrant in the eastern half of the state, mostly on the coast, and south to the Rio Grande Valley (TOS, 1995). It prefers deciduous or mixed woodlands near stream bottoms. This species is likely to occur within the study area only during migration. The olive sparrow is a common resident in southern Texas, extending north to Goliad, Karnes, Uvalde, and Val Verde counties (TOS, 1995). This sparrow inhabits dense brushy areas where it spends much of its life on or near the ground. This species is unlikely to inhabit the study area, due to a lack of appropriate habitat. Sennett's oriole is a summer resident and rare winter resident in south Texas, where it inhabits areas closely associated with towns where it nests in palm (*Washingtonia* sp. and *Sabal* sp.) and pecan (*Carya illinoensis*) trees (Oberholser, 1974). Audubon's oriole is a rare to uncommon resident in south Texas and is typically found in wooded or brushy areas. During the warmer months, it tends to prefer mesquite woodlands. In winter it can be found in evergreen trees such as live oak along with huisache (*Acacia smallii*) and Texas ebony (*Pithecellobium flexicaule*) (Oberholser, 1974). The presence of either of these orioles in the study area is unlikely.

Mammals

The Gulf coast jaguarondi and ocelot are both listed by the FWS and TPWD as endangered. The historic range of both cat species included Nueces County, however currently they are known to occur in only the extreme southern part of Texas (Davis and Schmidly, 1994; Tewes and Everett, 1987). Both cats prefer dense thorn scrub habitat, with the jaguarondi also having an affinity for streams (Campbell, 1995; Davis and Schmidly, 1994). It is unlikely that either species occurs in the study area due to the lack of suitable habitat.

The West Indian manatee (*Trichechus manatus*) is a Federally and State-listed endangered aquatic mammal that inhabits brackish water bays, large rivers, and salt water (Davis and Schmidly, 1994). They feed upon submergent, emergent and floating vegetation. While more common to warm waters of the coasts of Mexico, the West Indies, and the Caribbean to northern South America (O'Shea and Ludlow, 1992), populations are found in the U.S., primarily in Florida. Occasional migrants have been observed along the Texas coast. A recent sighting occurred in Corpus Christi Bay on September 23, 2001, by Albert Oswald of the Texas State Aquarium. However, such sightings are quite rare. Manatees are unlikely to occur in waters surrounding the study area, although occasional appearances are possible.

The maritime Texas pocket gopher (*Geomys personatus maritimus*) is a Federally-listed SOC known from Nueces County. Numerous burrows of these gophers occur in the deep drift sands on Mustang and Padre Islands where the sand is moist enough to permit packing. It is a possible resident of the study area.

The southern yellow bat (*Lasiurus ega*) is a neotropical bat that is listed as State threatened. In the U.S., this bat has been recorded from southern California, southern Arizona, extreme southwestern New Mexico and in south Texas (Schmidly, 1991), where it has been recorded from Cameron, Kleberg, and Nueces Counties. The southern yellow bat is associated with trees, including ornamental palms, which provide daytime roosting sites. This mammal is unlikely to be found in the study area.

Fish

The State-threatened opossum pipefish (*Microphis brachyurus*) may potentially occur in the project area. This fish has been reported from the Rio Grande River, and in Spartina marshes as well as in Sargassum mats in the Gulf of Mexico (Hoese and Moore, 1998). Brooding adults are found in fresh or low salinity waters and the young move into more saline waters.

4.0 IMPACTS ON LISTED THREATENED AND ENDANGERED SPECIES

Plants

No Federally/State-listed or Federal SOC plant species are known to occur within the project site. Therefore, no impacts to protected of SOC plant species are anticipated from the proposed Project.

Wildlife

Four species of sea turtle, Kemp's Ridley, loggerhead, green, and hawksbill have been recorded from Corpus Christi Bay (Shaver, 2000). Construction activities associated with the project will not impact any of these turtle species. However, tidal exchange for the project will be provided through two 36-inch diameter culverts. To avoid impacts to these turtle species and other large animals, the culverts have been designed to include a grated cover to prevent them from entering the site. No other Federally/State-listed or Federal SOC wildlife species are known to occur within the project site.

5.0 CRITICAL HABITAT FOR THE PIPING PLOVER

5.1 Definition of Critical Habitat

Critical habitat identifies specific areas that are essential to the conservation of a listed species and may require special management considerations or protection. Federal

agencies may not fund, authorize, license, permit, or carry out an action that would destroy or adversely modify critical habitat. The primary constituent elements essential for the conservation of wintering piping plovers are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes that support these habitat components (Federal Register, 2000).

5.2 Description of Critical Habitat

The following description of critical habitat is from the Federal Register (2000, 2001).

Several areas along the Texas coast have been identified by the FWS as essential wintering habitat for the piping plover. Essential wintering habitat for the piping plover provides the space and requisite resources necessary for the continued existence and growth of piping plover populations and consists of coastal beach, and tidal flat habitat. The nearest known critical habitat for wintering piping plover is Unit TX-8, Mustang Island Beach (239 ac) in Nueces County. This is a stretch of Gulf beach extending from Fish Pass to the Horace Caldwell Pier on Holiday Beach within the City of Port Aransas, TX. The landward boundary is beginning of dense vegetation, and the gulf-ward boundary is MLLW. This unit includes lands known as wind tidal flats that are infrequently inundated by seasonal winds

6.0 IMPACTS ON CRITICAL HABITAT FOR THE PIPING PLOVER

The project site is located approximately 1 mile north of the northern boundary of Unit TX-8, and is located more than 3,000 feet beach dunes and vegetation line. The proposed project will not impact piping plover critical habitat.

7.0 SUMMARY & CONCLUSIONS

In summary, the potential for impacts to endangered or threatened species, is low and will be avoided by placing grates on the water exchange culverts.

8.0 REFERENCES

- American Ornithologist's Union (AOU). 1983. Committee on classification and nomenclature. Check-list of North American birds. 6th edition. American Ornithologists Union, Allen Press, Inc, Lawrence, Kansas.
- Audubon Outdoor Club of Corpus Christi (AOCCC). 1994. Checklist of the birds within a 40-mile radius of Corpus Christi, Texas. 6th edition. Audubon Outdoor Club of Corpus Christi, Corpus Christi, Texas.
- Bartlett, R.D. and P.P. Bartlett. 1999. A field guide to Texas reptiles and amphibians. Gulf Publishing Company, Houston, Texas.
- Blair, W. F. 1950. The Biotic Provinces of Texas. Texas Journal of Science. 2:93-117.
- Brown, L.F., Jr., J.L. Brewton, J.H. McGowen, T.J. Evans, W.L. Fisher, and C.G. Groat. 1976. Environmental geologic atlas of the Texas coastal zone: Corpus Christi area. Bureau of Economic Geology, University of Texas, Austin, Texas. 123 pp.
- Campbell, I. 1995. Endangered and threatened animals of Texas, their life history and management. Texas Parks And Wildlife, Resource Protection Division, Endangered Resources Branch. Austin, Texas. 130 pp.
- Correll, D.S. And M.C. Johnston. 1970. Manual of the vascular plants of Texas. The University of Texas at Dallas, Richardson, Texas. 1881 pp.
- Davis, W.B. and D.J. Schmidly. 1994. The mammals of Texas. Texas Parks and Wildlife. Distributed by University of Texas Press. 338 pp. Austin.
- Dixon, J.R. 1987. Amphibians and reptiles of Texas. Texas A&M University Press. College Station, Texas. 434 pp.
- Garrett, J.M. and D.G. Barker. 1987. A field guide to reptiles and amphibians of Texas. Texas Monthly Field Guide Series. Texas Monthly Press. Austin, Texas. 225 pp.
- Gill, R.E. Jr.; P. Canevari; and E.H. Iversen. 1998. Eskimo curlew (*Numenius borealis*). In: The Birds of North America, no. 347 (A. Poole and F. Gill, editors). The Birds of North America, Inc., Philadelphia, PA.
- Green, N. 1985. The Bald Eagle. In: A.M. Enos and R.L. DiSilvestro (editors), Audubon wildlife report 1985. Pp. 508-531. National Audubon Society, New York.
- Gulf of Mexico Fishery Management Council. 1998. Generic Amendment for Addressing Essential Fish Habitat Requirements in the Following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery of the Gulf of Mexico, Red Drum Fishery

- of the Gulf of Mexico, Reef Fish Fishery of the Gulf of Mexico, Coastal Migratory Pelagic Resources (Mackerels) in the Gulf of Mexico and South Atlantic, Stone Crag Fishery of the Gulf of Mexico, Spiny Lobster in the Gulf of Mexico and South Atlantic, and Coral and Coral Reefs of the Gulf of Mexico. National Oceanic and Atmospheric Award No. NA87FC0003.
- Guzman, H.M. And R.W. Schreiber. 1987. Distribution and status of brown pelicans in Venezuela In 1983. *Wilson Bull.* 99(2):275-279.
- Haig, S.M. And L.W. Oring. 1987. The Piping Plover. In: 1987 Audubon Wildlife Report National Audubon Society, Academic Press, New York, Pp. 5 8-519.
- Hoese, H.D. and R.H. Moore. 1998. *The Fishes of the Gulf of Mexico, Texas, Louisiana and Adjacent Waters.* Texas A&M University Press, College Station, Texas. 422 pp.
- HVJ Associates 2002
- Jones, F.B. 1977. *Flora of the Texas Coastal Bend.* Mission Press, Corpus Christi, Texas.
- Kral, R. 1983. A report on some rare, threatened, or endangered forest-related vascular plants of the south. Vol. II. Technical publication R8-TP2, U.S. Department of Agriculture, Forest Service, Southern Region.
- Mabie, D. W. 1990. Bald eagle nest survey and management. Performance report, Federal Aid Project No. W-125-R-1, Job NO. 30. Texas Parks and Wildlife, Austin, Texas. 1 November 1990. 12 pp.
- Miles, D.W. 1950. The life histories of the spotted seatrout (*Cynoscion nebulosus*) and redfish (*Sciaenops ocellatus*). Texas Game, Fish and Oyster Communication, Marine Laboratory Annual Report (1949-1950): 66-103.
- National Fish and Wildlife Laboratory (NFWL). 1980. Selected vertebrate endangered species of the seacoast of the United States – Brown Pelican Eastern and California subspecies. U.S. Fish and Wildlife Service, Biological Services Program, Washington D.C. FWS/OBS-80-01.40. 16pp.
- Nature Serve: an online encyclopedia of life [web application]. 2000. Version 1.0. Arlington (VA): Association for Biodiversity Information. Comprehensive report species *Charadrius montanus*. Available <http://www.natureserve.org/>. Accessed: December 16, 2002.
- Oberholser, H. C. 1974. *The bird life of Texas, vol. 2.* Univ. of Texas Press, Austin, Texas.

- Ortega, B. 2001. Bald eagle nest survey and management. Performance report, Federal Aid Project No. W-125-R-12, Job NO. 10. Texas Parks and Wildlife, Austin, Texas. 30 September 2001.
- O'Shea, T.J., and M.E. Ludlow. 1992. Florida manatee (*Trichechus manatus tatirostris*). Pp. 190-200 in S.R. Humphrey (editor). Rare and endangered biota of Florida. Volume 1: Mammals. University Press of Florida, Gainesville, Florida.
- Perret, W.S., J.E. Weaver, R.C. Williams, F.L. Johnson, T.D. McIlwain, R.C. Raulerson, and W.M. Tatum. 1980. Fishery profiles of red drum and spotted seatrout. Gulf States Marine Fishery Communication, Ocean Springs, MS. No. 6, 60 pp.
- Poole, J.M. 1985. Status report on *Anthericum chendleri* Greenm. and Thomps. Texas Natural Heritage Program. 4 Dec. Austin, Texas.
- Poole, J.M. And D.H. Riskind. 1987. Endangered, threatened, or protected native plants of Texas. Texas Parks and Wildlife, Austin, Texas.
- Poole, J.M., J. Singhurst, D. Huriburt-Price, and W.R. Carr. 2000. A list of rare plants of Texas. Austin, Texas.
- Port Aransas Chamber of Commerce (PACOC). 2002. www.portaransas.org. Accessed December 20, 2002.
- Pulich, W.M. Jr.; L. Amos, L. Turnbull, S. Holt, and J. Wilds, compilers. 1985. Birds of Mustang Island. Texas Parks and Wildlife, Resources Management Section. Austin, Texas. TPWD Brochure 4000-432. June 1985.
- Robinson, L., P. Campbell, and L. Butler. 1998. Trends in Texas commercial fishery landings, 1972-1997. Management Data Series No. 158. Texas Parks and Wildlife, Coastal Fisheries Division, Austin, Texas.
- Schmidley, J.D. 1991. The Bats of Texas. Texas A&M University Press, College Station, Texas. 188 pp.
- Simmons, E.G and J.P. Breuer. 1962. A study of redbfish (*Sciaenops ocellatus Linneaus*) and black drum (*Pogonias cromis Linneaus*). Pub. Of Inst. Mar. Sci., University of Texas. 8:184-211.
- Snow, C. 1981. Southern Bald Eagle (*Haliaeetus leucocephalus leucocephalus*) and Northern Bald Eagle (*Haliaeetus leucocephalus alascanus*). Habitat management series for endangered species, Report No. 5. Bureau of Land Management, Denver, Colorado. 1-N-i71. 58 pp.

- Southwest Parks And Monuments Association (Spma). 1990. A checklist of the birds of Padre Island National Seashore. Southwest Parks and Monuments Association, Tucson, Arizona. 4m/Spma/1990.
- Tewes, M. And D. Everett. 1987. Status and distribution of the endangered ocelot and jaguarundi in Texas. In: S.D. Miller And D.D. Everett (Eds.), Cats of the world: biology, conservation, and management. Pp. 147-158. National Wildlife Federation, Washington, D.C. 501 Pp.
- Texas Biological and Conservation Data System. 2002. Special species list for Nueces County. Texas Parks and Wildlife Department, Austin, Texas.
- Texas Commission on Environmental Quality (TCEQ). 2002. Draft 305(b) Water Quality Inventory for 2002.
- Texas Commission on Environmental Quality (TCEQ). 2002. <http://www.tnrcc.state.tx.us/oprd/sips/sipcc.html#Current>) Accessed December 12, 2002.
- _____. 2003. <http://www.tnrcc.state.tx.us/air/monops/naaqs.html> accessed January 31, 2003.
- Texas Organization for Endangered Species (TOES). 1993. Endangered, threatened and watch lists of Texas plants. Pub. 9, Third Revision. August 1993. Austin, Texas.
- Texas Ornithological Society (TOS). 1995. Checklist of the birds of Texas, 3rd Edition. 166 pp.
- Texas Parks and Wildlife Department, 1995. Endangered and Threatened Animals of Texas – Their Life History and Management. TPWD Resource Protection Division, Austin, Texas.
- The Handbook of Texas Online. 2002. "PORT ARANSAS, TX." <<http://www.tsha.utexas.edu/handbook/online/articles/view/PP/hjp11.html>> [Accessed Fri Dec 20 9:28:57 US/Central 2002].
- Texas Almanac. 2002.
- Tilden, J.W. and A.C. Smith. 1986. A field guide to western butterflies. The Peterson Field Guide Series. Houghton Mifflin Company, Boston. 370 pp.
- Tunnell, J.W. , Q.R. Dokken, E.H. Smith, And K. Withers. 1996. Current Status and Historical Trends of the Estuarine Living Resources within the Corpus Christi Bay National Estuary Program Study Area B Vol. 1 of 4. Texas Natural Resource Conservation Commission, Austin, Texas. CCBNEP-06A. 543 pp.

Turner, B.L. 1983. Status report of *Ambrosia cheiranthifolia* Gray. Prepared for U.S. Fish and Wildlife Service.

US Census Bureau American FactFinder, January 2000.
<http://factfinder.census.gov/servlet/BasicFactsServlet>

United States Department of Agriculture. 1960. Soil Survey of Nueces County, Texas. Soil Conservation Service, Washington, DC.

U.S. Environment Protection Agency (EPA). 1974. Information on levels of environmental noise requisite to protect public health and welfare with an adequate margin of safety. Office of Noise Abatement and Control.

_____. 1978. Protective noise levels: condensed version of EPA levels document. Office Of Noise Abatement And Control.

U.S. Fish and Wildlife Service (FWS), Department of the Interior. 2003. Federally listed as threatened and endangered species of Texas: county-by-county list. January 7, 2003.

_____. 1997. Federally and State Endangered Slender rush-pea *Hoffmannseggia tenella* information sheet. PWD LF W300-019N. Austin, Texas.

U.S. Fish and Wildlife Service (FWS), Department of the Interior. 1995. Threatened and Endangered species of Texas. FWS Texas State Office, Austin, Texas.

UTMSI, 2002. <http://www.utmsi.utexas.edu/institute/environment/11year.htm>. Accessed December 20, 2002.