Habitat Conservation and Coastal Public Access Plan for the San Antonio Bay System

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PREPARED BY:

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The Center for Coastal Studies at Texas A&M University-Corpus Christi
International Crane Foundation

IN COOPERATION WITH:

Coastal Bend Bays & Estuaries Program

FUNDING PROVIDED BY:

Texas General Land Office, Coastal Management Program, Cycle 16

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January 2014

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Preface

The authors of the *Habitat Conservation and Public Access Plan for the San Antonio Bay System* would like to thank the Texas General Land Office, Coastal Management Program for providing the funding to complete this planning effort. The Plan would also not have been possible without the project management support of the Coastal Bend Bays & Estuaries Program. Throughout the development of the Plan, input was gathered from a diverse group of stakeholders and used in the development of reports and planning documents. We thank the consistent involvement of a diversity of stakeholders who provided the information that forms the basis of this document. We are hopeful that the information generated for the Plan will provide the impetus for the San Antonio Bay Partnership and its' volunteer stakeholders to continue promoting conservation and stewardship activities in this important coastal ecosystem.

This document should be cited as:

Stanzel, K.M, Dodson, J.A., Berger, A.R. 2014. Habitat Conservation and Public Access Plan for the San Antonio Bay System. Coastal Bend Bays and Estuaries Program Publication CBBEP-90. pp. 1-171.

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Introduction

SECTION A

What is the purpose of the Plan?

The San Antonio Bay System (SABS) is located along the central Texas coast and supports significant natural resource dependent economic activities including commercial and recreational fisheries, ecotourism, and boating. Water quality in the bay system is generally good, and the area is home to one of the nation's most iconic endangered species, the Whooping Crane (*Grus americana*). The SABS, however, is under increasing pressure from the loss of freshwater inflow, recreational development, nonpoint source pollution, and habitat loss to other uses. The protection, restoration, and enhancement of the SABS has assumed a high priority as the Guadalupe-San Antonio Estuary was predicted to have a 67% or greater increase in low inflow periods (Johns et al., 2004), and hydraulic modifications within wetland areas have also affected habitat quality within the historic wintering grounds for the Whooping Crane. Additional changes in the SABS include increases and losses of habitat types. For example, between 1950 and 1992, approximately 10% of the emergent coastal wetlands in Texas estuaries were lost (Moulton et al., 1997) whereas an increase in submerged seagrasses has been observed in San Antonio Bay over the past 21 years (Norman Boyd, personal communication, August 19, 2011).

In order to better manage the SABS and ensure its long-term health and productivity, a Comprehensive Management Plan must be developed that addresses the major management issues within the System. The Plan should identify needs, opportunities, and priority actions across a number of implementation areas including, but not limited to: water quality, water quantity, habitat conservation/restoration, and public access.

Where is the planning area?

The San Antonio Bay System is located between Matagorda and Aransas bays along the Texas coast and at the terminus of the San Antonio River and the Guadalupe River watersheds, approximately 10,000 mi^2 (GSMA BBEST, 2011). The average depth within the bay is approximately 4 feet and the maximum natural depth is 7 feet; exceptions include Espiritu Santo Bay with a maximum depth of approximately 8 feet and Steamboat Pass with depths down to about 31 feet. The San Antonio Bay system exchanges water with Matagorda Bay, located to the northeast, and with Aransas-Copano Bay, located to the southwest. Marine water is exchanged between the Gulf of Mexico and the estuarine system through the Pass Cavallo tidal inlet, the Matagorda ship channel, and through Cedar Bayou, when open. The San Antonio Bay System project area is composed of Espiritu Santo Bay, Hynes Bay, Guadalupe Bay, Mesquite Bay, Carlos Bay, Ayres Bay, Mission Lake, and Pringle Lake. Communities located within the SABS project area include the communities of Port O'Connor, Seadrift, Austwell, and Tivoli. The larger City of Victoria is located just outside the project boundary. Counties within the project area include: Aransas, Calhoun, Refugio, and Victoria.

Map showing the San Antonio Bay System project area using Google Earth Pro software.

This large (531 km^2) estuarine complex is one of the seven major estuaries along the Texas coast and is extremely unique in that wetlands associated with large portions of the surrounding shoreline provides critical wintering habitat for the last wild flock of the endangered Whooping Crane (*Grus americana*). This iconic species is part of the higher biodiversity that is also dependent on a healthy, functioning ecosystem. Focal guilds representative of the San Antonio Bay system include nesting colonial waterbirds and migratory/wintering waterfowl and shorebirds. Additionally, the San Antonio

Bay also supports important commercial (oysters and shrimp) and recreational fisheries, which depend on surrounding wetlands for maintaining water quality and providing nursery grounds for fish and shellfish.

How was the plan developed?

The San Antonio Bay Partnership (SABP) received funding to begin the process of developing a Comprehensive Management Plan for San Antonio Bay from the Texas General Land Office, Coastal Management Program, Cycle 16 funding. The SABP decided to adopt the community- and consensus-based approach used during the development of the Environmental Protection Agency's National Estuary Programs (NEPs) because of the strategy's effectiveness in fostering the long-term protection and sustainable enjoyment of coastal resources. NEPs were established as placed-based programs designed to protect and restore the water quality and ecological integrity of estuaries of national significance, and each NEP is required to develop and implement a Comprehensive Conservation and Management Plan (CCMP) that outlines specific targeted actions designed to address water quality, habitat, and living resources within its estuarine watershed. There are two NEPs within Texas, the Coastal Bend Bays & Estuaries Program and the Galveston Bay Estuary Program, which are both guided by their own CCMPs. These Plans have proven to be catalytic, and are a cornerstone of estuarine project implementation and coordination within Texas. More than a decade after each Plan's completion, their value has been proven by the ongoing involvement and support of stakeholders, the number of implementation projects successfully completed, and amount of funding leveraged.

The SABP is a regional, non-profit, stakeholder-driven planning and management program for the SABS. The purpose of the Partnership is to create and sustain a working partnership of committed stakeholders in order to *protect, restore, and enhance* the natural resources of the SABS for the benefit of the ecosystem and its human uses. SABP stakeholders include businesses, conservation organizations, local governments, and resource agencies. The planning process was able to build upon the previous partnerships and collaborations that have been formed since the creation of the SABP. This resulted in strong stakeholder input throughout the development of the plan, ensuring a higher-likelihood of its implementation following completion.

Under the guidance of stakeholder groups, the SABP and private contractors worked to draft both a habitat conservation plan and a coastal public access plan. Although, the two plans were developed in separate phases of the project, they were written and structured in parallel so they could be included into the larger San Antonio Bay Plan once plans for all watershed programmatic areas are completed. The following general approach was used for the development of both plans: (1) review available scientific/technical information; (2) identify data gaps; (3) establish goals for habitat conservation and coastal public access; (4) map existing conservation and public access sites; (5) identify potential conservation and public access sites; (6) describe implementation activities that could take place at each potential conservation or public access site; and (7) develop separate implementation rankings for habitat conservation and public access. Before finalization, the plans were made available for public review and comment.

How can the plan be used?

Although additional plan development is still needed for other implementation areas, development of the *Habitat Conservation and Coastal Public Access Plan for the San Antonio Bay System* represents an important step towards better management of the SABS resources through implementation efforts that protect habitat and provide increased, well-managed public access to the coast. The Plan combines two closely related implementation areas, and identifies

priority opportunities and actions in each, which can be used by the local community and natural resource agencies to justify the acquisition of funding, generate collaboration between stakeholders, and move quickly toward on-the-ground project implementation. The conservation strategies for each habitat conservation, restoration, and protection site should be considered in conjunction with the need for continued and enhanced public access. Similarly, all public access enhancement projects should consider the need to conserve, restore, and protect the habitats of the SABS. As projects and conservation strategies are implemented, this will lead to restoration of degraded habitats, protection of critical habitats, better appreciation and awareness of coastal resources, and water quality improvements.

Several additional beneficial products were produced during the development of the *Habitat Conservation and Coastal Public Access Plan for the San Antonio Bay System*. During the process of reviewing available scientific/technical information and identifying data gaps, status and trends reports were developed for the SABS for the following topics: water quality, benthic macrofauna, and epibenthic fauna; colonial nesting waterbirds; upland birds; Aplomado Falcon; Attwater's Prairie Chicken; Whooping Crane; and fisheries (available for download at www.sabaypartnership.org). In addition to providing valuable information about the current status of the natural resources of the SABS, these reports also highlight potential natural resource issues, identify additional research and monitoring needs, and recommend potential conservation and management actions for the planning area.

The plan development process also resulted in the production of open access maps for (1) conservation, restoration, and protection projects, (2) existing public access opportunities, and (3) public access enhancement projects. All mapping data is accessible to stakeholders via the open access Google Earth software (Google 2010) and is available on the Coastal Bend Bays & Estuaries website.

Literature Cited

Google. 2010. Google Earth 6. Google, Inc., Mountain View California. (http://www.google.com/earth/index.html).

Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas, and San Antonio Bays Basin and Bay Expert Science Team (BBEST). 2011. Environmental Flows Recommendations Report Final Submission to the Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas, and San Antonio Bays Basin and Bay Area Stakeholder Committee, Environmental Flows Advisory Group, and Texas Commission on Environmental Quality. pp. 1-427.

Johns, N.D., M. Hess, S. Kaderka, L. McComrick, and J. McMahon. 2004. Bays in peril: A forecast for freshwater flows to Texas estuaries. National Wildlife Federation, Reston, VA, USA. pp. 1-48.

Moulton, D.W., T.E. Dahl, and D.M. Dahl. 1997. Texas Coastal Wetlands: Status and trends, mid-1950s to 1990s. U.S. Department of Interior, Fish and Wildlife Service Albuquerque, NM. pp. 1-32.

Inventory of Conservation, Restoration, & Protection Sites

SECTION B

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The Center for Coastal Studies at Texas A&M University – Corpus Christi

Elizabeth H. Smith, Ph.D.

International Crane Foundation

BASED ON PREVIOUS REPORTS:

Davis, N.A. and E.H. Smith. 2011. Preliminary inventory of conservation, restoration, and protection sites: San Antonio Bay system. Coastal Bend Bays and Estuaries Program Publication CBBEP-74. pp. 1-91.

Davis, N.A. and E.H. Smith. 2012. Inventory of conservation, restoration, and protection sites: San Antonio Bay system- Phase II. Coastal Bend Bays and Estuaries Program Publication CBBEP-82. pp. 1-94.

ADDITIONAL FUNDING FOR THIS SECTION PROVIDED BY:

Environmental Protection Agency

Introduction

In the San Antonio Bay System, identification of projects aimed at wetlands protection, restoration, and enhancement to protect/expand essential wildlife habitat would provide an early focal point and a means to encourage stakeholders through the tedious process of compiling scientific and technical information, identifying priority issues, and producing a management plan. The overall goal of this component of the planning process was to create a wetland inventory list from sites within the San Antonio Bay System recommended by local stakeholders and agencies as areas in need of "intervention" due to existing or threatened impairment of wetland quality and function.

A preliminary inventory (Phase I) of potential wetland projects was developed in 2011 and included sites aimed at wetland protection, restoration, and enhancement within the San Antonio Bay System (Davis and Smith, 2011). The recommended sites were mapped and made accessible to stakeholders via the open access Google Earth software (Google, 2010). Partners and participants in the project included the Center for Coastal Studies, Texas A&M University-Corpus Christi (CCS), International Crane Foundation (ICF), San Antonio Bay Partnership (SABP), Coastal Bend Bays & Estuaries Program, Inc. (CBBEP), Texas Parks & Wildlife (TPW), U.S. Fish & Wildlife Service (FWS), Texas State Soil and Water Conservation Board (TSSWCB), Coastal Conservation Association (CCA), De-Go-La Resource Center Conservation and Development, Inc., Ducks Unlimited (DU), San Antonio River Authority (SARA), Guadalupe-Blanco River Authority (GBRA), Guadalupe-Blanco River Trust (GBRT), and San Antonio Bay Foundation (SABF). Monthly meetings were organized to accomplish each task over a four-month period (April-July), and the final report was completed in August 2011. The effort resulted in a total of 53 recommended sites representing a range of conservation, restoration, and education strategies as well as a range of geomorphological types. The site locations and strategies were discussed and prioritized for each geomorphic assemblage within the San Antonio Bay system, which resulted in a two-page summary developed for each of the chosen 16 of the 53 sites. It was the intent of the project to provide a framework that could be expanded to include additional sites as more information becomes available. Funding from FY2012 CBBEP afforded the continuation of this project.

The inventory was further refined during Phase II of the project (Davis and Smith, 2012). Generally, the Phase II approach followed the sequence of activities developed in the Phase I project, with the following modifications. In Phase I stakeholders were provided with an overview of how to use Google Earth with the option to use and submit information on potential sites as ".kmz" files. In Phase II, a workshop was held on 17 April 2012 to present a tutorial on using Google Earth, then provided hands-on learning on computers to enable stakeholders to identify additional sites. These sites were submitted electronically at the conclusion of the workshop. Two workshops were also organized to discuss the prioritization process to identify the information necessary to query the database in order to develop information for specific grant proposals. In the first prioritization workshop on 22 May 2012, a list of key terms was developed that would be added to the database in MS Excel. Prior to the second prioritization workshop on 19 June 2012, the descriptions within each site were standardized and key terms were added. In the second workshop, a sample proposal was used to illustrate the utility of the database for prioritization. The SABP stakeholder group agreed that prioritization should only occur when an opportunity for potential funding is identified, and that the Phase II report should include all sites identified to date, without any type of ranking. Field trips were then held on 11 January 2012, 10 July 2012, 14-16 August 2012, and 21 August 2012 to visit each site not visited in Phase I in order to obtain digital photos documenting current conditions, gaining access to private sites whenever possible.

A total of 67 sites are included in this plan, and the plan is organized with one page per site. Information is organized into a portfolio by landform with a Google Earth image, field photo, coordinates, site number and name, habitat type based on National Wetland Inventory (NWI), and database information (phase, location, conservation strategy, potential partners, target species, and key terms). Furthermore, site descriptions were limited to a standardized format to provide a searchable database (MS Excel database file as Appendix). However, more detailed descriptions are provided

in the Google Earth file, which can be found on the Coastal Bend Bays & Estuaries Program's website or by hyperlinks throughout the plan.

The following activities are example project objectives for recommended sites within the San Antonio Bay system based on the Natural Resource Damage Assessment (NRDA) Project Activities (OMB Control #0648-0497). Each project site is accompanied by a proposed activity (below) to be completed with expected outcomes and the associated benefits the project is expected to have on the public and environment.

Conservation/Protection	Restoration/Enhancement	Education/Outreach
Land Acquisition	Hydrologic Modification	Signage
Conservation Easement	Water Quality Enhancement	Kiosks
Land Donation	Vegetation Management/Maintenance	Workshops
	Debris Removal	Webpage
	Bank Stabilization	Volunteer training/opportunities
	Reef/Rookery Island Creation/Enhancement	School Partnerships
		Master Naturalists
		Invasive Species Education

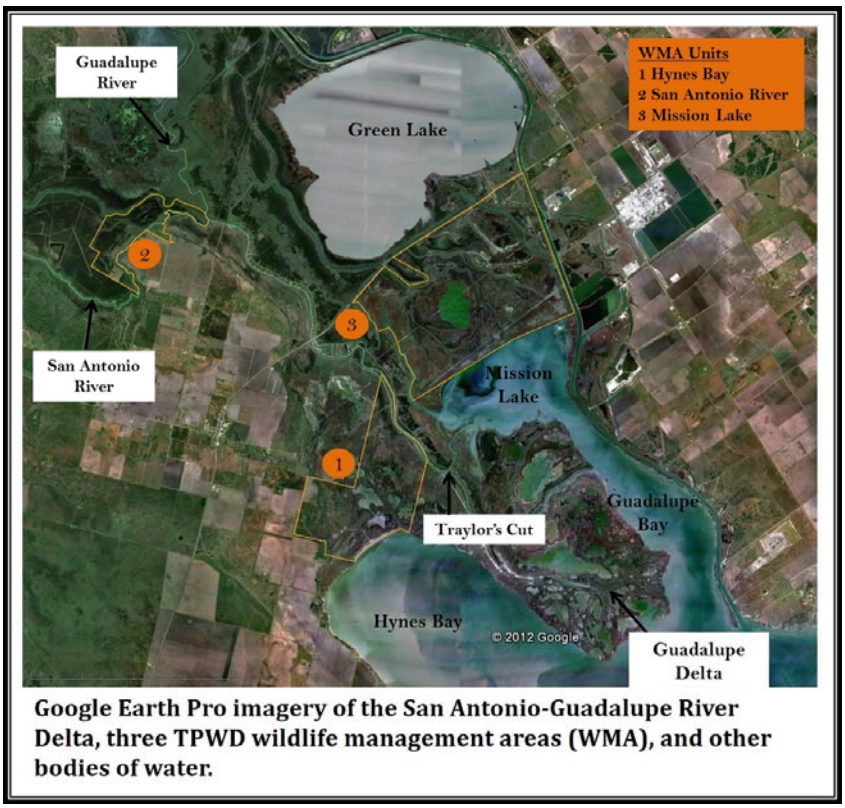
MAP OF CONSERVATION, RESTORATION, AND PROTECTION SITES

Overview map showing all 67 recommended sites within the San Antonio Bay system project area using Google Earth Pro software. Locations of demarcated sites are approximate and do not encompass the full area recommended in order to increase resolution quality.

LIST OF CONSERVATION, RESTORATION, AND PROTECTION SITES

Guadalupe-San Antonio River Delta

The Guadalupe River (250 mi), the San Antonio River (180 mi), and their associated watersheds provide freshwater inflows to the San Antonio Bay system. The Guadalupe River is one of the most popular rivers in Texas, known for having sufficient flows for in-stream recreational use, particularly in its upper reaches, whereas the San Antonio River is slow moving during normal conditions and known to have log jams in its lower reaches (TPWD, 2009). Both rivers provide instream habitats as well as riparian forest habitat essential for various colonial waterbirds and waterfowl. The Guadalupe Delta, including the lower floodplains of both the San Antonio and Guadalupe rivers, is a dominant feature of the San Antonio Bay system (Tremblay and Calnan, 2011) and is located in southern Victoria County, eastern Refugio County, and western Calhoun County along the Texas coast. Texas Parks and Wildlife Department (TPWD) acquired portions of the Delta as a wildlife management area (WMA); areas in the WMA include four units: Mission Lake Unit (4,447.62 acres), Hynes Bay Unit (1007.72 acres), Guadalupe River Unit (1138 acres), and the San Antonio Unit (818 acres) (TPWD, 2009). The habitats supported within the Guadalupe Delta range from coastal marsh, estuarine marsh, and natural and manmade wetlands to uplands. Additional lands within the delta that provide essential estuarine wetlands are private ranches located adjacent to Hynes Bay and Guadalupe Bay: Swan Point Ranch lies between the two bays and Marsh Ranch is North of Hynes Bay.



Google Earth Pro imagery of the San Antonio-Guadalupe River Delta, three TPWD wildlife management areas (WMA), and other bodies of water.

The Guadalupe Delta formed as a result of the San Antonio and Guadalupe rivers depositing sediments at the mouth of the Guadalupe River where it enters San Antonio Bay. Historically, the delta gradually enclosed an open bay area, forming what is now Green Lake, and more recently the delta is in the process of filling in and around Mission Lake. Traylor's Cut, on the Guadalupe River, was excavated in 1935 and effectively diverts water and sediment under normal and high flows into Mission Lake and Guadalupe Bay. Under overbank conditions, water and sediment will flood the entire delta; however, this diversion has limited delta maintenance and erosion along the delta shoreline has resulted (Tremblay and Calnan 2011).

A diversity of estuarine and freshwater marsh complexes occur throughout the Guadalupe Delta, as well as shallow fresh-water lakes and flats. Sea-level rise and subsidence in the delta area has resulted in increased inundation by bay waters; over time, habitats are shifting toward estuarine habitats (White and Morton, 1987). Recent assessments indicate that palustrine habitats have been converted to estuarine habitat types, and that estuarine marshes and open water have increased while tidal/algal flats have decreased (Tremblay and Calnan 2011).

The Guadalupe Delta is subdivided into large areas of private and state-owned parcels; Guadalupe Delta Wildlife Management Area encompasses several large tracts and is managed primarily for waterfowl habitat using impoundments and water diversions. Private tracts are used for ranching, although some tracts are becoming available for sale and potential development. The lower Guadalupe River section around the Hwy 35 crossing is subdivided into small riverfront parcels, and more development is occurring adjacent to these areas. Upstream of the confluence of the rivers, the land is primarily used for ranching and farming, although some tracts are for sale and there is an increasing potential for development outside the floodplain.

The location of twenty-three recommended sites within the Guadalupe-San Antonio River Delta within the river/delta geomorphic section of the San Antonio Bay system using Google Earth Pro software.

Twenty-three sites within the Guadalupe-San Antonio River/Delta were recommended during this project. Conservation strategies associated with these sites included: Management (11), Restoration, (8), and Protection (7), Education (4), Enhancement (4), and Monitoring (2).

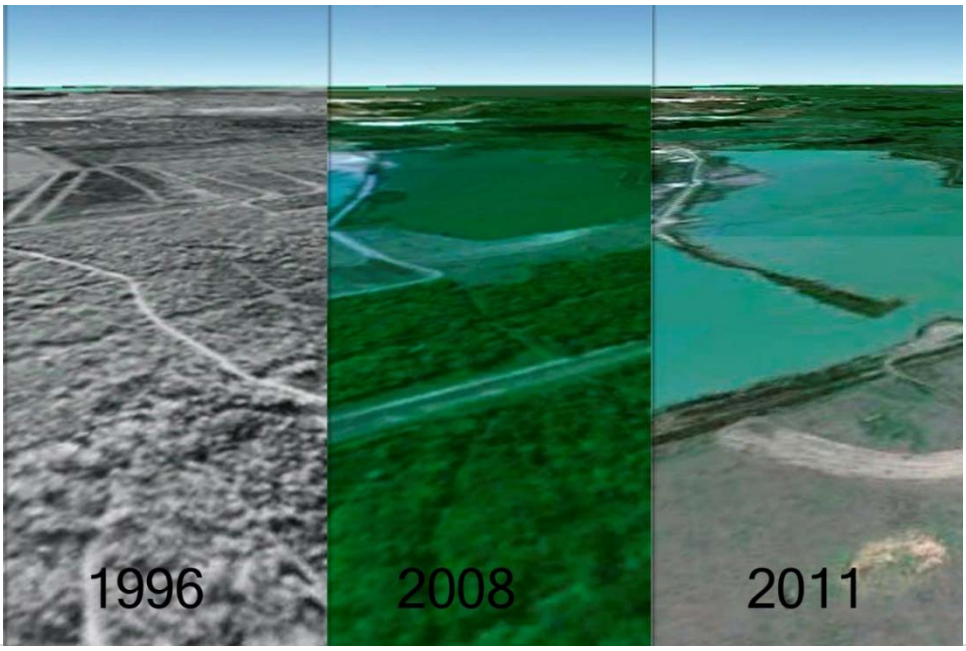
SAND PIT

SITE NUMBER: 1

Latitude/Longitude:
28°43’7.46” N, 96°58’43.00” W

Habitat Type:
Listed as PEM1Cx on the 2008-2009 National Wetland Inventory, a freshwater emergent wetland, and designated as marsh habitat for this project.

Conservation Strategy:
Restore habitat from disturbance.



DATABASE INFORMATION

Nominated:
Phase I

Land Ownership
Private

Potential Partners
None identified

Species
Colonial waterbirds including nesting Least Terns (*Sternula antillarum athalassos*)

Key Terms:
- Birds
- Restoration
- Rookery
- Migration
- Marsh

MARTHIJOHNNI SWAMP

SITE NUMBER: 2

Latitude/Longitude:
28°41’37.51” N, 97°2’13.03” W

Habitat Type:
Listed as PAB3H and PEM1C by the 2008-2009 National Wetland Inventory, a freshwater pond and freshwater emergent wetland, respectively, and designated as pond/basin and marsh habitats for this project, respectively.

Conservation Strategy:
Develop restoration and management plans to keep rookery wet during nesting season.

DATABASE INFORMATION

Nominated:
Phase I

Land Ownership
Private

Potential Partners
- Landowner
- TPWD
- USFWS

Species
Approximately 8,000 nesting pairs of Herons, Egrets, Ibis, and other nesting waterbirds

Key Terms:
- Birds
- Management
- Restoration
- Rookery
- Protected Species
- Migration
- Marsh
- Pond

LINN LAKE

SITE NUMBER: 3

Latitude/Longitude:
28°36’54.76” N, 96°58’23.10” W

Habitat Type:
Listed as L1UBH by the 2008-2009 National Wetland Inventory, a lake, and designated as lake habitat for this project.

Conservation Strategy:
Maintain overflow basin from siltation and local industry modification.

DATABASE INFORMATION

Nominated:
Phase I

Land Ownership
Private

Potential Partners
- Landowner
- Local Industry
- TPWD
- USFWS

Species
- Colonial waterbirds
- Nesting waterfowl
- Bald Eagle (*Haliaeetus leucocephalus*) nest nearby

Key Terms:
- Birds
- Management
- Rookery
- Protected Species
- Migration
- Lake

LINN LAKE SOUTH

SITE NUMBER: 4

Latitude/Longitude:
28°36’22.21” N, 96°57’1.10” W

Habitat Type:
Listed as PFO1F by the 2008-2009 National Wetland Inventory, a freshwater forest/shrub wetland, and designated as forested/scrub-shrub floodplain habitat for this project.

Conservation Strategy:
Acquire land or develop conservation easement.

DATABASE INFORMATION

Nominated:
Phase I

Land Ownership
Private

Potential Partners
None identified

Species
Nesting herons

Key Terms:
- Birds
- Rookery
- Protected Species
- Forest/Scrub-Shrub Wetland

BALD CYPRESS SWAMP

SITE NUMBER: 5

Latitude/Longitude:

28°35’53.42” N, 96°57’0.88” W

Habitat Type:

Listed as PUBH and PFO1A by the 2008-2009 National Wetland Inventory, a freshwater pond and freshwater forest/shrub wetland, respectively, and designated as pond/basin and forest/scrub-shrub floodplain habitat for this project, respectively.

Conservation Strategy:

Maintain southernmost bald cypress swamp rookery in Texas from siltation and modification; educate landowner on biological importance.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Private

Potential Partners

- Landowner
- TPWD
- USFWS

Species

- Yellow-crowned nigh heron (*Nyctanassa violacea*)
- Anhinga (*Anhinga anhinga)*
- Great blue heron (*Ardea herodidas*)
- Bald cypress (*Taxodium distichum*)

Key Terms:

- Education
- Birds
- Management
- Rookery
- Protected Species
- Cypress
- Riparian
- Pond
- Forest/Scrub-Shrub Wetland

ROOKERY OFF BARGE CANAL

SITE NUMBER: 6

Latitude/Longitude:
28°34’31.57” N, 96°53’14.30” W

Habitat Type:
Listed as PUBH by the 2008-2009 National Wetland Inventory, a freshwater pond, and designated as pond/basin habitat for this project.

Conservation Strategy:
Determine ownership, develop a rookery management plan, and enhance the rookery from Victoria Barge Canal modifications. Site is an island in a former bayou.

DATABASE INFORMATION

Nominated:
Phase I

Land Ownership
Private

Potential Partners
- CBBEP
- West Side Calhoun County Navigation District
- NRCS
- SABP
- TPWD
- USFWS

Species
Approximately 2,000 mixed pairs of nesting birds including colonial waterbirds

Key Terms:
- Education
- Birds
- Management
- Enhancement
- Rookery
- Protected Species
- Migration
- Pond

GUADALUPE FIELDS

SITE NUMBER: 7

Latitude/Longitude:

28°32'9.10" N, 96°54'35.39" W

Habitat Type:

Listed as L2USCh, PAB4H, PFO1A and PFO1C by the 2008-2009 National Wetland Inventory, a lake, freshwater pond, and freshwater forest/shrub wetland, respectively, and designated as lake, pond/basin, and forest/scrub-shrub floodplain habitats for this project, respectively.

Conservation Strategy:

Restore hydrology of wetlands and swamp to remain wet during droughts and enhance the swamps by planting bald cypress trees (*Taxodium distichum*).

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Private

Potential Partners

- Landowner
- NRCS
- TAMUK
- TPWD
- USFWS

Species

Approximately 10,000 nesting colonial waterbirds, waterfowls, and freshwater dependent organisms / wetland communities

Key Terms:

- Birds
- Restoration
- Enhancement
- Rookery
- Protected Species
- Commercial Species
- Bald cypress
- Hydrology
- Lake
- Pond
- Forest/Scrub-Shrub Wetland

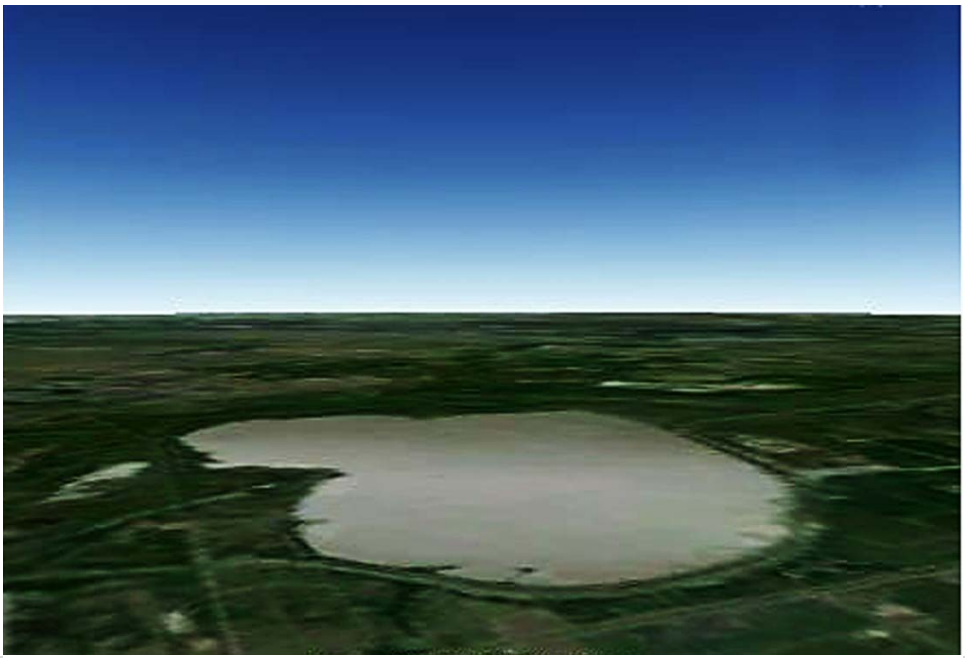
GREEN LAKE

SITE NUMBER: 8

Latitude/Longitude:
28°32'1.29" N, 96°50'22.46" W

Habitat Type:
Listed as L1UBH by the 2008-2009 National Wetland Inventory, a lake, and designated as lake habitat for this project.

Conservation Strategy:
Develop management plan to ensure waterbird nesting, recreational use, conservation of sensitive areas, and water level management. Also, spread awareness of natural resources. With management may produce abundant waterfowl food and have an enhanced freshwater fishery.



DATABASE INFORMATION

Nominated:
Phase I and II

Land Ownership
Calhoun County

Potential Partners
- Calhoun County
- CIAP
- CBBEP
- GBRA
- ICF
- Local Industry
- SABP
- TPWD
- USFWS

Species
- Endangered Whooping Cranes (*Grus americana*)
- Shorebirds
- Nesting colonial waterbirds

Key Terms:
- Education
- Recreation
- Land acquisition
- Fish
- Birds
- Management
- Enhancement
- Rookery
- Migration
- Protected Species
- Commercial Species
- Endangered Species
- Lake

CARBIDE COLONY

SITE NUMBER: 9

Latitude/Longitude:
28°30'0.34" N, 96°47'15.03" W

Habitat Type:
Listed as PAB3Hh and PABFh by the 2008-2009 National Wetland Inventory, freshwater ponds, and designated as pond/basin habitats for this project.

Conservation Strategy:
Develop management plan to ensure waterbird nesting.

DATABASE INFORMATION

Nominated:
Phase I

Land Ownership
Private

Potential Partners
- CBBEP
- Local Industry
- SABP
- TPWD
- USFWS

Species
Several thousand pairs of colonial nesting waterbirds

Key Terms:
- Birds
- Management
- Rookery
- Protected Species
- Migration
- Pond

MARSH RANCH

SITE NUMBER: 10

Latitude/Longitude:
28°26'45.17" N, 96°51'11.77" W

Habitat Type:
Listed as E2EM1P, E2US/EM1P, and E1UBL by the 2008-2009 National Wetland Inventory, estuarine and marine wetlands and estuarine marine deepwater, respectively, and designated as tidal marsh, tidal marsh/flats mix, and open water habitats for this project, respectively.

Conservation Strategy:
Develop conservation easement or acquire land.

DATABASE INFORMATION

Nominated:
Phase I

Land Ownership
Private

Potential Partners
- NRCS
- TNC
- TPWD
- USFWS

Species
- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Egrets
- Herons
- Avocets
- Ibis

Key Terms:
- Birds
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Wetlands
- Tidal Marsh
- Tidal Marsh/Flats Mix
- Open Water

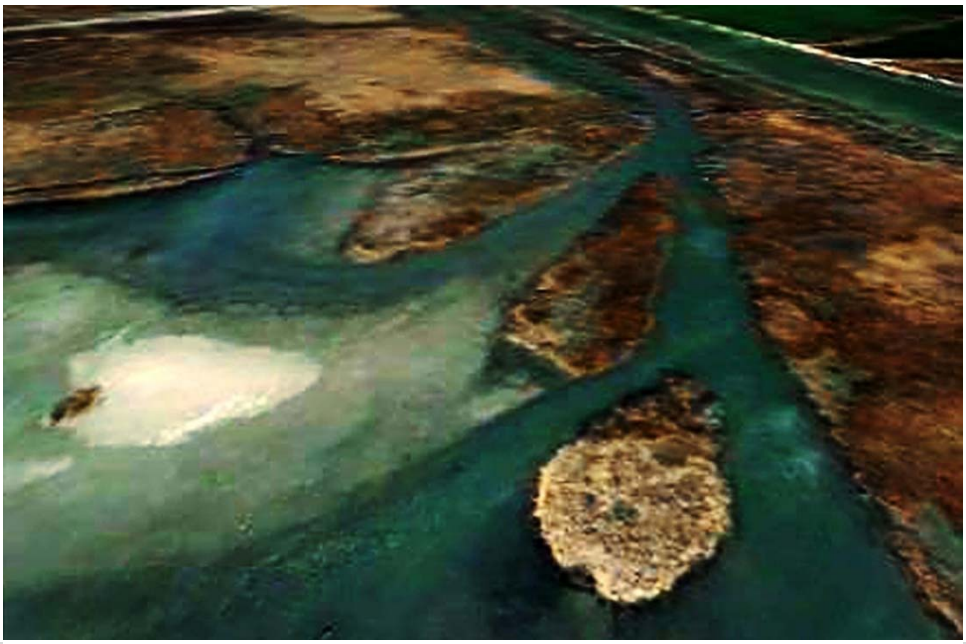
NE Mission Lake

SITE NUMBER: 11

Latitude/Longitude:
28°28’51.84” N, 96°47’35.32” W

Habitat Type:
Listed as E2SS3N by the 2008-2009 National Wetland Inventory, estuarine and marine wetland, and designated as forested/scrub-shrub floodplain habitat for this project.

Conservation Strategy:
Develop management plan for nesting birds and predators.



DATABASE INFORMATION

Nominated:
Phase I

Land Ownership
West Side Calhoun County Navigation District

Potential Partners
- CBBEP
- SABP
- TPWD
- USFWS

Species
- Nesting colonial waterbirds
- Predators

Key Terms:
- Birds
- Management
- Rookery
- Predators
- Protected Species
- Forested/Scrub-Shrub Wetland

GUDALUPE DELTA SWAMP COLONY

SITE NUMBER: 12

Latitude/Longitude:

28°27'57.86" N, 96°49'48.13" W

Habitat Type:

Listed as PEM1/SS3C PEM1C, PEM1A, PEM1F, and PUBH by the 2008-2009 National Wetland Inventory, freshwater emergent wetlands and freshwater pond, respectively, and designated as marsh/scrub-shrub mix, marshes, and pond/basin habitats for this project, respectively.

Conservation Strategy:

Develop management plan.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TPWD and Private

Potential Partners

- CBBEP
- SABP
- TPWD
- USFWS

Species

Approximately 2,000 pairs of nesting colonial waterbirds

Key Terms:

- Birds
- Management
- Rookery
- Protected Species
- Migration
- Marsh/Scrub-Shrub Mix
- Marsh
- Pond

TRAYLOR'S CUT

SITE NUMBER: 13

Latitude/Longitude:

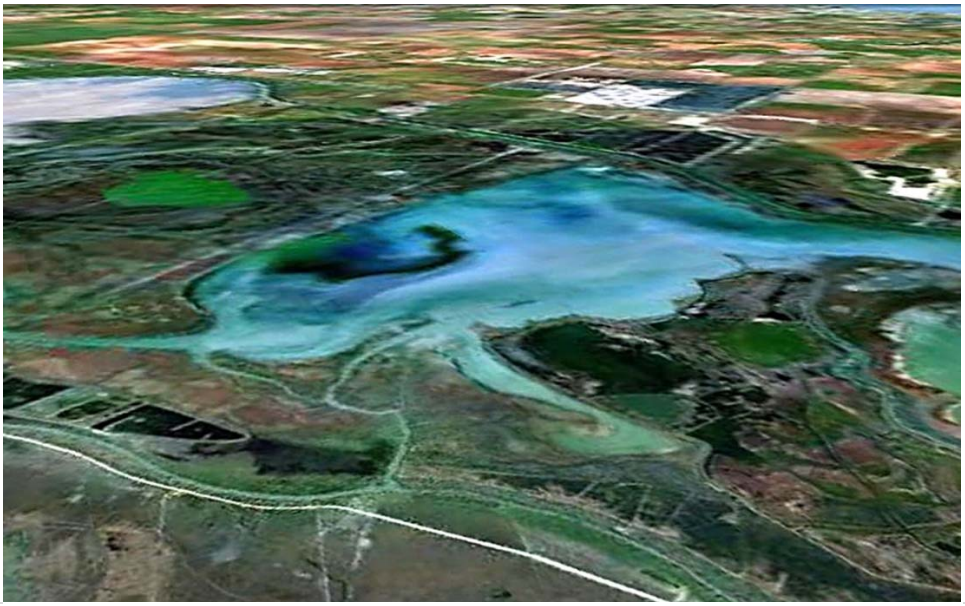
28°26'47.78" N, 96°49'30.99" W

Habitat Type:

Listed as R2UBH by the 2008-2009 National Wetland Inventory, riverine, and designated as river habitat for this project.

Conservation Strategy:

Restore flow to Guadalupe Delta, reduce siltation where the river is diverted toward Mission Lake, away from the old river channel, and control invasive species.



DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Private

Potential Partners

- TPWD
- NRCS
- USFWS
- GBRA

Species

Wetland communities

Key Terms:

- Restoration
- Invasive Species
- Riverine Hydrology
- River

KAMEY ISLAND ROOKERIES

SITE NUMBER: 14

Latitude/Longitude:

28°26'52.07" N, 96°48'35.49" W

Habitat Type:

Listed as PEM1Ch, PSS3Ch, PABHh, and PUBHh by the 2008-2009 National Wetland Inventory, freshwater emergent wetland, freshwater forested/scrub-shrub wetland, and freshwater ponds, respectively, and designated as marsh, forested/scrub-shrub floodplain, and ponds/basins habitats for this project, respectively.

Conservation Strategy:

Develop management plan and recognition of colonial waterbird colonies.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Private

Potential Partners

- CBBEP
- NRCS
- SABP
- TPWD
- USFWS

Species

- Colonial waterbirds
- Waterfowl
- Songbirds in riparian woodlands

Key Terms:

- Education
- Bird
- Management
- Rookery
- Riparian
- Protected Species
- Commercial Species
- Marsh
- Forested/Scrub-Shrub Floodplain
- Pond

GUADALUPE DELTA SHORELINE

SITE NUMBER: 15

Latitude/Longitude:

28°24’32.56” N, 96°46’19.62” W

Habitat Type:

Listed as E2EM1N and E2EM1P by the 2008-2009 National Wetland Inventory, estuarine and marine wetland, and designated as tidal marsh habitats for this project.

Conservation Strategy:

Restore eroding shoreline and develop management plan for lack of siltation from flooding and natural resources.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Private

Potential Partners

- ACOE
- CBBEP
- NRCS
- SABP
- TPWD
- USFWS

Species

- Sensitive marsh communities
- Waterfowl
- Endangered Whooping cranes (*Grus americana*)

Key Terms:

- Bird
- Management
- Restoration
- Endangered Species
- Protected Species
- Commercial Species
- Wetlands
- Tidal Marsh

SWAN POINT RANCH

SITE NUMBER: 16

Latitude/Longitude:

28°24’49.84” N, 96°46’35.64” W

Habitat Type:

Listed as E2EM1N, E2ABN, E2ABM, and E1UBL by the 2008-2009 National Wetland Inventory, estuarine and marine wetlands and estuarine and marine deepwater, respectively, and designated as tidal marsh, seagrass, and open water habitats for this project, respectively.

Conservation Strategy:

Develop a conservation easement or acquire land.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Private

Potential Partners

- NRCS
- TNC
- TPWD
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Egrets
- Herons
- Avocets
- Ibis

Key Terms:

- Bird
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Wetlands
- Tidal Marsh
- Seagrass
- Open Water

GUADALUPE DELTA

SITE NUMBER: 17

Latitude/Longitude:

28°26'42.67" N, 96°49'19.44" W

Habitat Type:

Listed as E2EM1P, E2EM1N, E2US/EM1P, E2ABN, E2USN, and E1UBL on the 2008-2009 National Wetland Inventory, an estuarine and marine wetlands and deepwater, respectively, and designated as tidal marsh, tidal marsh/flats mix, seagrasses, sandbars/flats, and open water habitats for this project, respectively.

Conservation Strategy:

Develop a conservation easement or acquire land and restore marsh communities.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Private

Potential Partners

- NRCS
- TNC
- TPWD
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Egrets
- Herons
- Avocets
- Ibis
- Wetland communities

Key Terms:

- Bird
- Restoration
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Marsh
- Tidal Marsh/Flats Mix
- Seagrass
- Sandbars/Flats
- Open Water

SAN ANTONIO RIVER: GOLDEN-ORB HABITAT

SITE NUMBER: 18

Latitude/Longitude:
28°30'16.62" N, 96°57'56.42" W

Habitat Type:
Not listed on the 2008-2009 National Wetland Inventory but, designated as riverine habitat for this project.

Conservation Strategy:
Monitoring habitat and density of potentially threatened species.

DATABASE INFORMATION

Nominated:
Phase II

Land Ownership
SARA

Potential Partners
SARA

Species
Golden-Orb Mussel

Key Terms:
- Monitoring
- Riverine
- Threatened Species
- Freshwater Hydrology
- Riverine

RIVER PASTURE 2

SITE NUMBER: 19

Latitude/Longitude:

28°25’27.10” N, 96°51’19.80” W

Habitat Type:

Listed as E2EM1P on the 2008-2009 National Wetland Inventory, an estuarine and marine wetland, and designated as tidal marsh habitat for this project.

Conservation Strategy:

Acquire land for the Texas Parks and Wildlife’s Wildlife Management Area - Hynes Bay unit.

DATABASE INFORMATION

Nominated:

Phase II

Land Ownership

Private

Potential Partners

- CCA
- DU
- NRCS
- TPWD
- USFWS

Species

- Waterfowl
- Shorebirds
- Wetland Communities

Key Terms:

- Bird
- Land Acquisition
- Protected Species
- Commercial Species
- Wetlands
- Tidal Marsh

River Pasture 1

SITE NUMBER: 20

Latitude/Longitude:

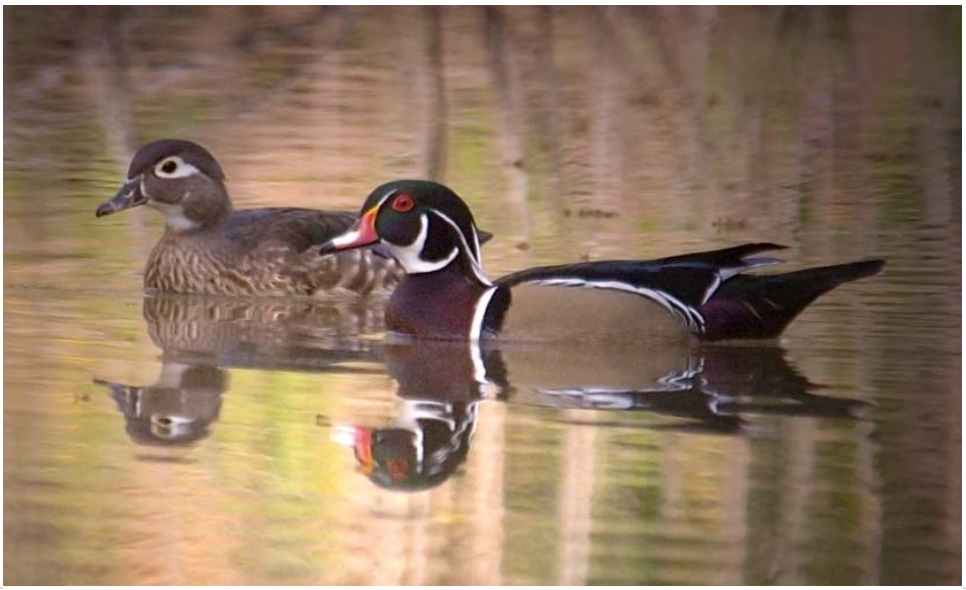
28°27’35.59” N, 96°51’16.75” W

Habitat Type:

Listed as E2EM1P and E2EM1N on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, and designated as tidal marsh habitats for this project.

Conservation Strategy:

Acquire land for the Texas Parks and Wildlife’s Wildlife Management Area - Hynes Bay unit.



DATABASE INFORMATION

Nominated:

Phase II

Land Ownership

Private

Potential Partners

- CCA
- DU
- NRCS
- TPWD
- USFWS

Species

- Waterfowl
- Shorebirds
- Wetland Communities

Key Terms:

- Bird
- Land Acquisition
- Protected Species
- Commercial Species
- Wetlands
- Tidal Marsh

McFaddin New Ranch Flat

SITE NUMBER: 21

Latitude/Longitude:

28°30’35.93” N, 96°57’43.13” W

Habitat Type:

Listed as PEM1A, PEM1C, PSS1A, and PFO1A on the 2008-2009 National Wetland Inventory, freshwater emergent wetlands and freshwater forested/scrub-shrub wetlands, respectively, and designated as marsh and forested/scrub-shrub floodplains habitats for this project.

Conservation Strategy:

Control invasive species and excavate shallow depressions for wetland development.

DATABASE INFORMATION

Nominated:

Phase II

Land Ownership

Private

Potential Partners

- DU
- NRCS
- TPWD
- USFWS

Species

- Waterfowl
- Shorebirds
- Wetland Communities

Key Terms:

- Bird
- Enhancement
- Protected Species
- Commercial Species
- Invasive Species
- Riparian
- Marsh
- Forested/Scrub-Shrub Floodplain

McFaddin New Ranch

SITE NUMBER: 22

Latitude/Longitude:

28°30’22.19” N, 96°57’55.36” W

Habitat Type:

Listed as PFO1A and PEM1C on the 2008-2009 National Wetland Inventory, freshwater forested/scrub-shrub wetlands and freshwater emergent wetland, and designated as forested/scrub-shrub floodplains and marsh habitats for this project.

Conservation Strategy:

Restore the riparian corridor and control invasive species and erosion.

DATABASE INFORMATION

Nominated:

Phase II

Land Ownership

Private

Potential Partners

- DU
- NRCS
- TPWD
- USFWS

Species

- Waterfowl
- Colonial waterbirds
- Wetland Communities

Key Terms:

- Bird
- Restoration
- Riparian
- Protected Species
- Commercial Species
- Invasive Species
- Forested/Scrub-Shrub
- Marsh

SAN ANTONIO RIVER LOG JAMS

SITE NUMBER: 23

Latitude/Longitude:
28°30’12.79” N, 96°58’33.48” W

Habitat Type:
Not listed on the 2008-2009 National Wetland Inventory but, designated as riverine habitat for this project.

Conservation Strategy:
Develop management plan to provide riparian and upland habitat for wildlife while also protecting human lives along the river.

DATABASE INFORMATION

Nominated:
Phase I

Land Ownership
Public and Private

Potential Partners
- GBRA
- GBRT
- Landowners
- SABF
- SARA

Species
None identified

Key Terms:
- Management
- Restoration
- Monitoring
- Hydrology
- Riverine

Blackjack and Seadrift-Port O'Connor Ridge Peninsulas

Two peninsulas border the San Antonio Bay system, Blackjack and Seadrift-Port O'Connor Ridge peninsulas. These peninsulas are part of the relict Pleistocene barrier strandplain (Tremblay and Calnan, 2011). Seadrift-Port O'Connor Ridge Peninsula is located on the northwest side of Espiritu Santo Bay and contains Seadrift and Port O'Connor communities. Blackjack Peninsula is located on the northwest side of Carlos, Mesquite, and Ayres bays. The peninsula is owned by the USFWS and is managed as part of the Aransas National Wildlife Refuge complex, which is renowned for providing wintering habitat for the last wild flock of endangered Whooping Cranes (*Grus americana*).

Blackjack and Seadrift-Port O'Connor Ridge peninsulas encompass the northern extent of the Pleistocene Ingleside Barrier Strandplain (Otvos and Howat, 1996). These linear landforms formed when sea level was about 6 meters higher than present. As sea-levels decreased, rivers flowing to the Gulf of Mexico incised the historic shoreline and separated the peninsulas. Although the ridge-and-swale topography ranges from 4-9 m in elevation, much of Blackjack and Seadrift-Port O'Connor Ridge peninsulas are less than 5 and 4 m, respectively (March and Smith, 2011).

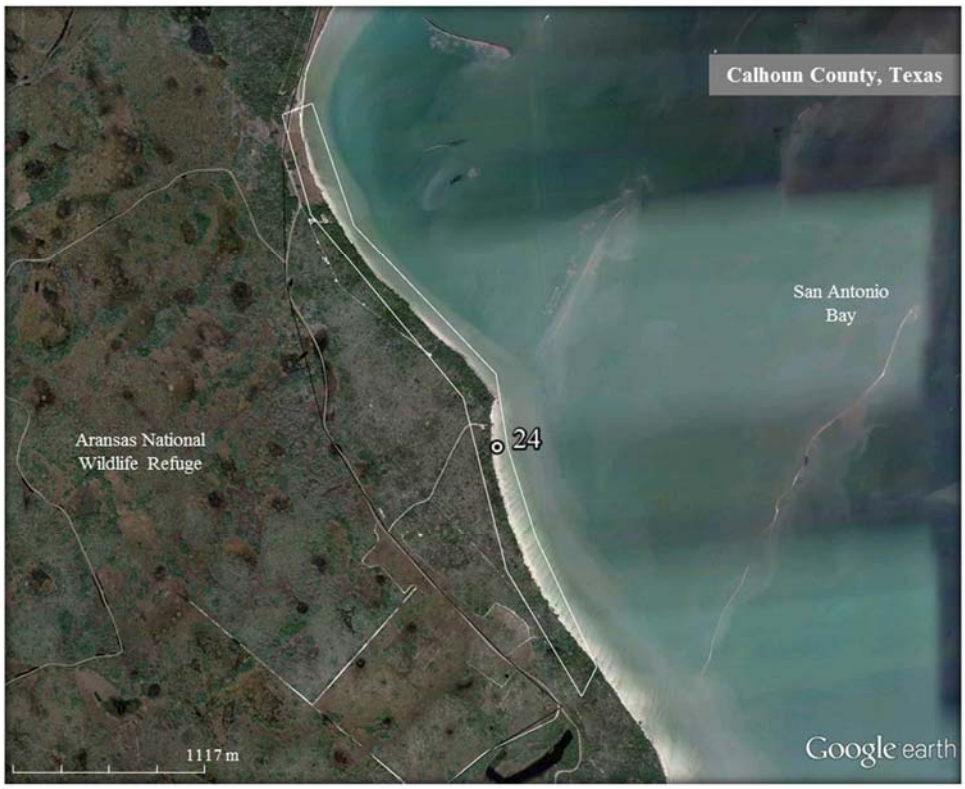
The original sand ridges are still present on higher elevations and low, flood-susceptible shorelines occur along the peninsulas. The Ingleside Barrier Strandplain contains a diversity of habitats, including coastal prairie, freshwater depressional wetlands, and live oak mottes on the uplands, grading into brackish and salt marshes to subtidal seagrass beds in the estuarine waters of the bays. From 1956-2009, estuarine marsh increased primarily from upland to salt marsh conversion along the Gulf Intracoastal Waterway (GIWW). Additionally salt marsh in 2009 was located further inland than those documented earlier from salt marsh migrating to other wetlands habitats (Tremblay and Calnan, 2011).

The location of nine recommended sites along Blackjack and Seadrift-Port O'Connor Ridge peninsulas within the peninsula geographic section of the San Antonio Bay system using Google Earth Pro software.

Development pressure is minor on Blackjack Peninsula as the Aransas National Wildlife Refuge covers most of the landform. The refuge affords protection for the endangered Whooping Crane habitat. More development

has occurred on Seadrift-Port O'Connor Ridge at the north-eastern point (Port O'Connor) and southern point (Seadrift); however, development speculation is high as all, or portions, of some large land holdings along the GIWW and Victoria Barge Canal are being sold to developers and sub-divided.

Nine sites along Blackjack and Seadrift-Port O'Connor Ridge peninsulas were recommended during this project. Conservation strategies associated with these sites included: Management (7), Protection (4), and Restoration (3), Education (2), Monitoring (1), and Enhancement (1).



ANWR Shoreline Erosion

SITE NUMBER: 24

Latitude/Longitude:
28°16’22.62” N, 96°47’52.79” W

Habitat Type:
Listed as E2USN on the 2008-2009 National Wetland Inventory, an estuarine and marine wetland, and designated as sandbars/flats habitat for this project.

Conservation Strategy:
Restore eroded shoreline and develop plan to maintain shoreline.

DATABASE INFORMATION

Nominated:
Phase I

Land Ownership
Aransas National Wildlife Refuge – U.S. Fish and Wildlife Service

Potential Partners
U.S. Fish and Wildlife Service

Species
Oak Trees

Key Terms:
- Management
- Restoration
- Monitoring
- Hydrology
- Sandbars/Flats
- Uplands

ANWR Mustang Lake Wetlands

SITE NUMBER: 25

Latitude/Longitude:

28°13'34.82" N, 96°48'15.59" W

Habitat Type:

Listed as E2EM1N, E2USN, E1UBL, E1AB3L, and PEM1A on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, estuarine and marine deepwater, and freshwater emergent wetlands, respectively, and designated as tidal marsh, sandbars/flats, open water, seagrasses, and marsh habitats for this project, respectively.

Conservation Strategy:

Maintain the shoreline from GIWW wave erosion; and manage mangrove development.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Aransas National Wildlife Refuge – U.S. Fish and Wildlife Service

Potential Partners

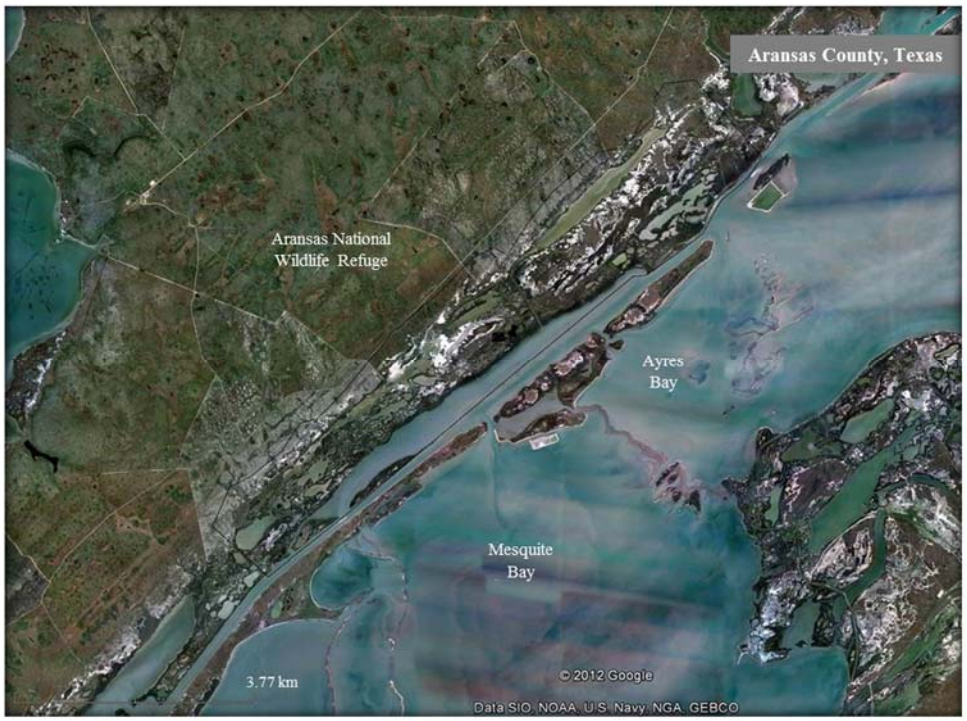
- ACOE
- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- TXDOT
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Shorebirds

Key Terms:

- Bird
- Management
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Marsh
- Sandbars/Flats
- Open Water
- Seagrasses
- Marsh



ANWR Sundown Bay Wetlands

SITE NUMBER: 26

Latitude/Longitude:

28°11'13.95" N, 96°51'23.15" W

Habitat Type:

Listed as E2EM1N, E2USN, E1UBL, E1AB3L, and PEM1A on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, estuarine and marine deepwater, and freshwater emergent wetlands, respectively, and designated as tidal marsh, sandbars/flats, open water, seagrasses, and marsh habitats for this project, respectively.

Conservation Strategy:

Maintain the shoreline from GIWW wave erosion; manage mangrove development; and develop management plan and education to share land with wintering Whooping cranes.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Aransas National Wildlife Refuge – U.S. Fish and Wildlife Service

Potential Partners

- ACOE
- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- TXDOT
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Marsh
- Sandbars/Flats
- Open Water
- Seagrasses
- Marsh

ANWR DUNHAM BAY WETLANDS

SITE NUMBER: 27

Latitude/Longitude:

28°8'15.94" N, 96°55'18.12" W

Habitat Type:

Listed as E2EM1N, E2USN, E1UBL, E1AB3L, and PEM1A on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, estuarine and marine deepwater, and freshwater emergent wetlands, respectively, and designated as tidal marsh, sandbars/flats, open water, seagrasses, and marsh habitats for this project, respectively.

Conservation Strategy:

Maintain the shoreline from GIWW wave erosion; manage mangrove development; and develop management plan and education to share land with wintering Whooping cranes.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Aransas National Wildlife Refuge – U.S. Fish and Wildlife Service

Potential Partners

- ACOE
- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- TXDOT
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Marsh
- Sandbars/Flats
- Open Water
- Seagrasses
- Marsh

WELDER FLATS

SITE NUMBER: 28

Latitude/Longitude:

28°20'16.65" N, 96°38'55.31" W

Habitat Type:

Listed as E2EM1N, E2EM1P, E2USN, E2EM1/USN, E2EM1/USP, E2EM1/SS3P, E1UBL, E1AB3L, and PEM1A on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, estuarine and marine deepwater, and freshwater emergent wetlands, respectively, and designated as tidal marsh, sandbars/flats, tidal marsh/flats mix, tidal marsh/mangrove mix, open water, seagrasses, and marsh habitats for this project, respectively.

Conservation Strategy:

Develop conservation easement or acquire land; restore hydrology; maintain the shoreline from GIWW wave erosion; manage mangrove development; brush control; and prescribed burning (some conservation mechanisms are already in place).

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Private

Potential Partners

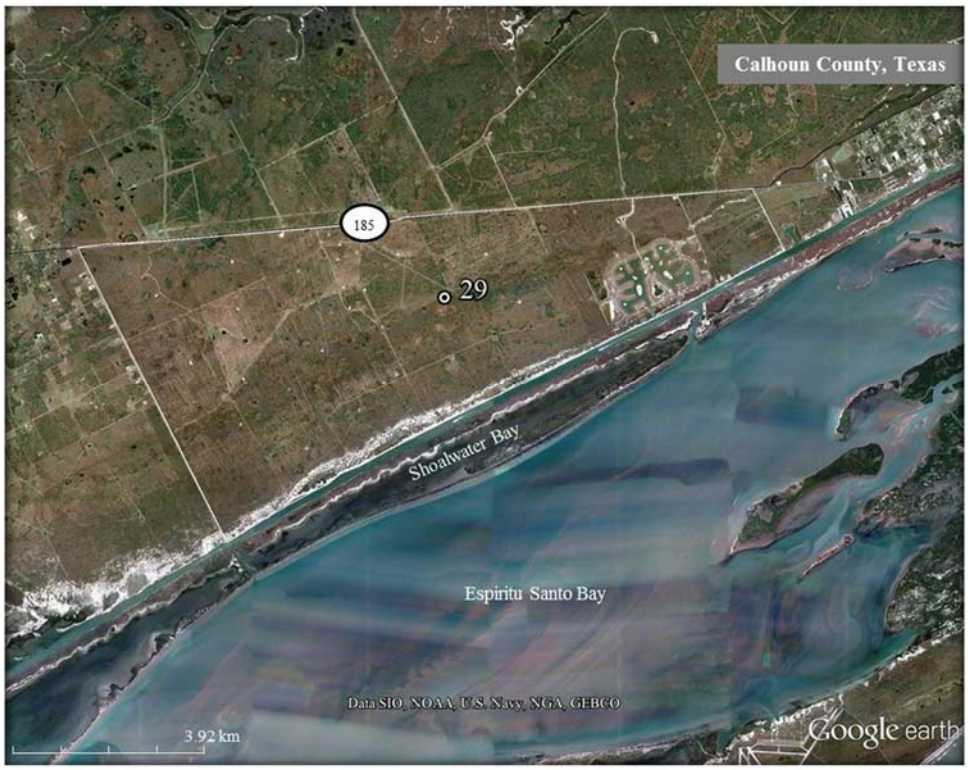
- ACOE
- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- TXDOT
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Shorebirds

Key Terms:

- Bird
- Management
- Restoration
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Marsh
- Sandbars/Flats
- Tidal Marsh/Flats Mix
- Tidal Marsh/Mangrove Mix
- Open Water
- Seagrasses
- Marsh
- Uplands



ARAPAHO HOLDINGS

SITE NUMBER: 29

Latitude/Longitude:

28°24’37.72” N, 96°31’57.56” W

Habitat Type:

Listed as E2EM1P, E2USN, E2US/EM1P, PEM1A, PEM1C, PEM1/SS3A, PEM1/SS3J on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands and freshwater emergent wetlands, respectively, and designated as tidal marsh, sandbars/flats, tidal marsh/flats mix, marsh, and marsh/scrub-shrub mix habitats for this project, respectively.

Conservation Strategy:

Maintain the shoreline from GIWW wave erosion; manage mangrove development; and develop management plan and education to share land with wintering Whooping cranes.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Private

Potential Partners

- ACOE
- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- TXDOT
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Shorebirds

Key Terms:

- Bird
- Management
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Marsh
- Sandbars/Flats
- Tidal Marsh/Flats Mix
- Marsh
- Marsh/Scrub-Shrub Mix
- Uplands

North Seadrift-Port O'Connor Ridge Shoreline Wetlands

SITE NUMBER: 30

Latitude/Longitude:

28°23'43.66" N, 96°31'4.96" W

Habitat Type:

Listed as E2EM1N, E2USN, E2ABM, and E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands and estuarine and marine deepwater, and designated as tidal marsh, sandbars/flats, seagrasses, and open water habitats for this project, respectively.

Conservation Strategy:

Develop conservation easement or acquire land to prevent development; maintain the shoreline from GIWW wave erosion; manage brush; and, prescribed burning.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Private

Potential Partners

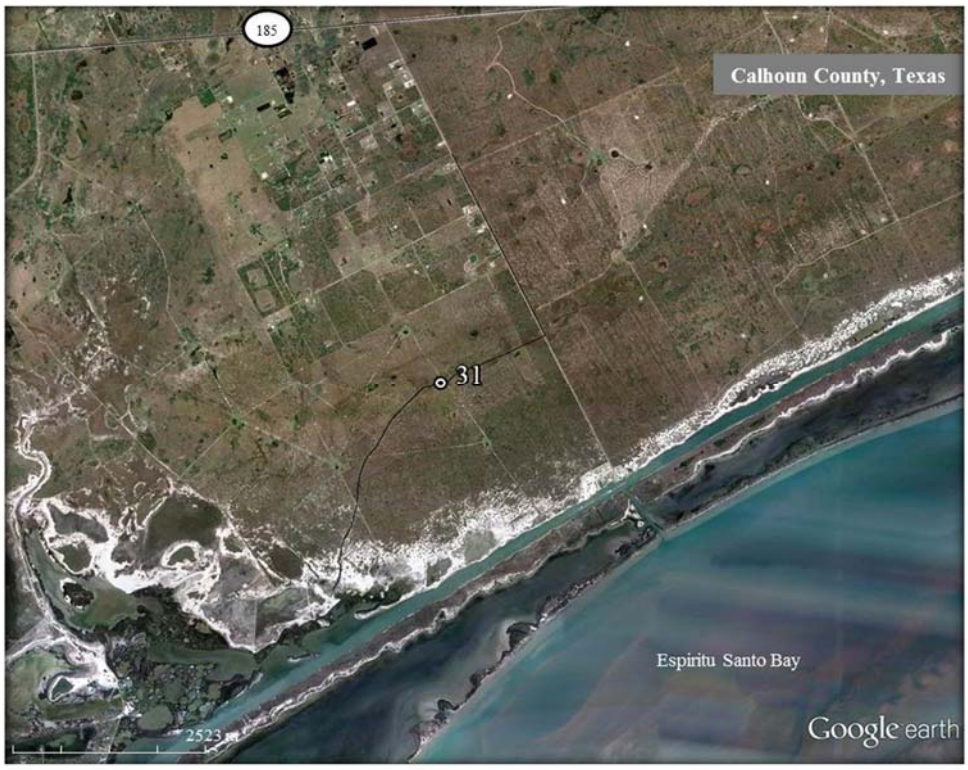
- ACOE
- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- TXDOT
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Shorebirds

Key Terms:

- Bird
- Management
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Marsh
- Sandbars/Flats
- Open Water
- Uplands



WELDER DITCH

SITE NUMBER: 31

Latitude/Longitude:

28°22’37.10” N, 96°36’7.55” W

Habitat Type:

Listed as PEM1A and PEM1C on the 2008-2009 National Wetland Inventory, freshwater emergent wetlands, and designated marsh habitats for this project, respectively.

Conservation Strategy:

Restore natural freshwater inflows to estuary.

DATABASE INFORMATION

Nominated:

Phase II

Land Ownership

Private

Potential Partners

- ICF
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Shorebirds

Key Terms:

- Bird
- Restoration
- Endangered Species
- Protected Species
- Migration
- Marsh

BOGGY BAYOU DRAINAGE

SITE NUMBER: 32

Latitude/Longitude:

28°26'21.86" N, 96°26'56.05" W

Habitat Type:

Listed as E2EM1N, E2USN, E1UBL, PSS3/EM1A, and PEM1C on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, estuarine and marine deepwater, freshwater forested /shrub wetland, and freshwater emergent wetlands, and designated as tidal marsh, sandbars/flats, open water, marsh/scrub-shrub mix, and marsh habitats for this project, respectively.

Conservation Strategy:

Develop conservation easement or acquire land and enhance water quality.

DATABASE INFORMATION

Nominated:

Phase II

Land Ownership

Private & Calhoun County

Potential Partners

- Calhoun County
- TGLO
- TPWD
- USFWS

Species

- Shorebirds
- Wetland communities
- Estuarine communities

Key Terms:

- Bird
- Enhancement
- Conservation Easement
- Land Acquisition
- Protected Species
- Water Quality
- Migration
- Tidal Marsh
- Sandbars/Flats
- Open Water
- Marsh/Scrub-Shrub Mix
- Marsh

San Antonio Bay Islands, Rookeries, & Reefs

The project area consists of multiple open water bays, with San Antonio Bay being the largest waterbody. The entire bay complex also includes Hynes Bay, Guadalupe Bay, and Mission Lake, secondary bays encompassing the Guadalupe Delta; Espiritu Santo Bay, located to the north of the mouth of the San Antonio Bay; and Mesquite Bay, located south of the San Antonio Bay.

Open bays includes open estuarine waters, oyster reefs, bay islands (often used rookery islands), natural passes, and dredged material islands. Open bay habitats encompass a majority of the project area and is characterized by deeper water (> 6 ft), unvegetated bay bottoms, and well-mixed water column. Oyster reefs are generally oriented perpendicular to the shorelines and historically bisected sections of open bays. Natural bay islands typically are exposed oyster reefs where shell hash accumulated at higher elevation, therefore allowing salt-tolerant vegetation to establish.

Dredged material islands (DMIs) were constructed from excavated material obtained when constructing and maintaining navigational waterways, the most prominent being the Gulf Intracoastal Waterway (GIWW) and Victoria Barge Canal. These islands have changed hydrodynamic patterns in the bay system. Many are still reserved for use by United States Army Corps of Engineers (USACE) as containment levees for GIWW maintenance. While these islands have changed hydrologic patterns in the bay system, some DMIs have been used beneficially for marsh creation and enhancement, and, in some scenarios, to create additional habitat for Whooping Cranes.

Rookery islands are used seasonally by colonial nesting waterbirds, including herons, egrets, spoonbills, terns, skimmers, and gulls. These habitats are essential to maintain the coastal populations of these species. Depending on the size and habitat complexity of a rookery island in the estuary, up to 24 species can nest during the season (generally January-August). The larger birds typically use the brush habitat, whereas the smaller species use the unvegetated shell and sandy shorelines. Additional rookeries are located in the riverine and freshwater marshes of the project area, and can harbor hundreds of pairs of herons and egrets as well as some other key species.

Each season, nesting and fledging success at rookeries is dependent on isolation from predation and human disturbance. Most mammalian predators will impact rookeries when access, such as shallow waters or reefs connecting to the mainland or developed areas, is available. Predation also occurs by gulls and other birds if human activity near or on the rookery forces the breeding adults away from the nests. Over the long-term scale, estuarine rookeries can diminish in size and habitat complexity from the effects of erosion and sea-level rise. In addition, wave energy from passing watercraft along navigational waterways can increase erosion effects.

Oyster reefs provide essential habitat for estuarine aquatic species and are commercially important in Texas bays. Oysters are harvested from public reefs and privately leased reefs throughout Texas bays. The largest portion of public reef areas harvested commercially and recreationally is located in bays with freshwater inflows; Galveston, Matagorda, and San Antonio Bay systems (TPWD, 2011). However, no public leases are issued outside of Galveston Bay (Norman Boyd, personal communication, August 19, 2011). Additionally, oyster reefs are important filter-feeders that aid in maintaining bay and estuary water quality.

Oysters reach optimum growth, reproduction, and survival at water temperatures between 68 to 86° F and salinities between 10 to 30 ppt. However, oysters can survive in temperatures ranging from 28 to 97° F and salinities ranging from 2 to 40 ppt. Although oysters can survive at these sub-optimal temperatures and salinities, oyster health can be impacted by disease and parasites.

The location of twenty-two recommended sites within the open bays geomorphic section of the San Antonio Bay system using Google Earth Pro software.

Twenty-two sites within the open water bays of the San Antonio Bay system were recommended during this project. Conservation strategies associated with these sites included: Management (11), Protection (10), and Education (9), Restoration (9), Monitoring (3), Enhancement (2), and Creation (1).

DUNHAM ISLAND WETLANDS

SITE NUMBER: 33

Latitude/Longitude:

28°7’33.78” N, 96°54’48.84” W

Habitat Type:

Listed as E2EM1Ns, E2USPs, E2USNs, and E1AB3L on the 2008-2009 National Wetland Inventory, estuarine and marine, and designated as tidal marsh, sandbars/flats, and seagrasses habitats for this project, respectively.

Conservation Strategy:

Develop conservation easement or acquire land; develop management plan to share land with wintering Whooping cranes; and manage shoreline erosion and mangrove development.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

ACOE and TGLO

Potential Partners

- ACOE
- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- TXDOT
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Marsh
- Sandbars/Flats
- Seagrasses

GRASS ISLAND

SITE NUMBER: 34

Latitude/Longitude:

28°7'53.88" N, 96°54'59.82" W

Habitat Type:

Listed as E2EM1N and E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands and estuarine and marine deepwater, and designated as tidal marsh, and open water habitats for this project.

Conservation Strategy:

Develop a new island using dredge spoil to enhance the present island.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TGLO

Potential Partners

- ACOE
- CBBEP
- SABP
- TGLO

Species

Colonial waterbirds

Key Terms:

- Bird
- Enhancement
- Rookery
- Protected Species
- Migration
- Tidal Marsh
- Open Water

ANWR South Bludworth Island Wetlands

SITE NUMBER: 35

Latitude/Longitude:

28°7'57.29" N, 96°54'25.39" W

Habitat Type:

Listed as E2EM1N, E2AB3L, and E2USPs on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands and estuarine and marine deepwater, and designated as tidal marsh, seagrasses, and sandbars/flats habitats for this project, respectively.

Conservation Strategy:

Develop management plan to share land with wintering Whooping cranes; and manage shoreline erosion and mangrove development.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Aransas National Wildlife Refuge – U.S. Fish and Wildlife Service

Potential Partners

- ACOE
- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- TXDOT
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Marsh
- Seagrass
- Sandbars/Flats

ANWR North Bludworth Island Wetlands

SITE NUMBER: 36

Latitude/Longitude:

28°9'57.19" N, 96°52'24.18" W

Habitat Type:

Listed as E2EM1Ms, E2EM1Ns, E2ABNh, E2USN, and E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands and estuarine and marine deepwater, and designated as tidal marsh, seagrasses, sandbars/flats, and open water habitats for this project, respectively.

Conservation Strategy:

Develop management plan to share land with wintering Whooping cranes; and manage shoreline erosion and mangrove development.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Aransas National Wildlife Refuge – U.S. Fish and Wildlife Service

Potential Partners

- ACOE
- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- TXDOT
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Marsh
- Seagrass
- Sandbars/Flats
- Open Water

RODDY ISLAND WETLANDS

SITE NUMBER: 37

Latitude/Longitude:

28°10'52.75" N, 96°50'53.12" W

Habitat Type:

Listed as E2EM1Ns, E2ABNs, E2USMs, and E2USNs on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, and designated as tidal marsh, seagrasses, and sandbars/flats habitats for this project, respectively.

Conservation Strategy:

Develop conservation easement or acquire land; develop management plan to share land with wintering Whooping cranes; and manage shoreline erosion and mangrove development.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Outside Aransas National Wildlife Refuge boundaries, other entities (state and federal) should be considered

Potential Partners

- ACOE
- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- TXDOT
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Waterfowl
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Marsh
- Seagrass
- Sandbars/Flats

RATTLESNAKE ISLAND WETLANDS

SITE NUMBER: 38

Latitude/Longitude:

28°11'25.98" N, 96°50'12.66" W

Habitat Type:

Listed as E2EM1Ns, E2EM1Ps, E2ABNs, and E2USNs on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, and designated as tidal marsh, seagrasses, and sandbars/flats habitats for this project, respectively.

Conservation Strategy:

Develop conservation easement or acquire land not within Aransas National Wildlife Refuge; develop management plan to share land with wintering Whooping cranes; and manage shoreline erosion and mangrove development.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Portions within Aransas National Wildlife Refuge and other entities (state and federal)

Potential Partners

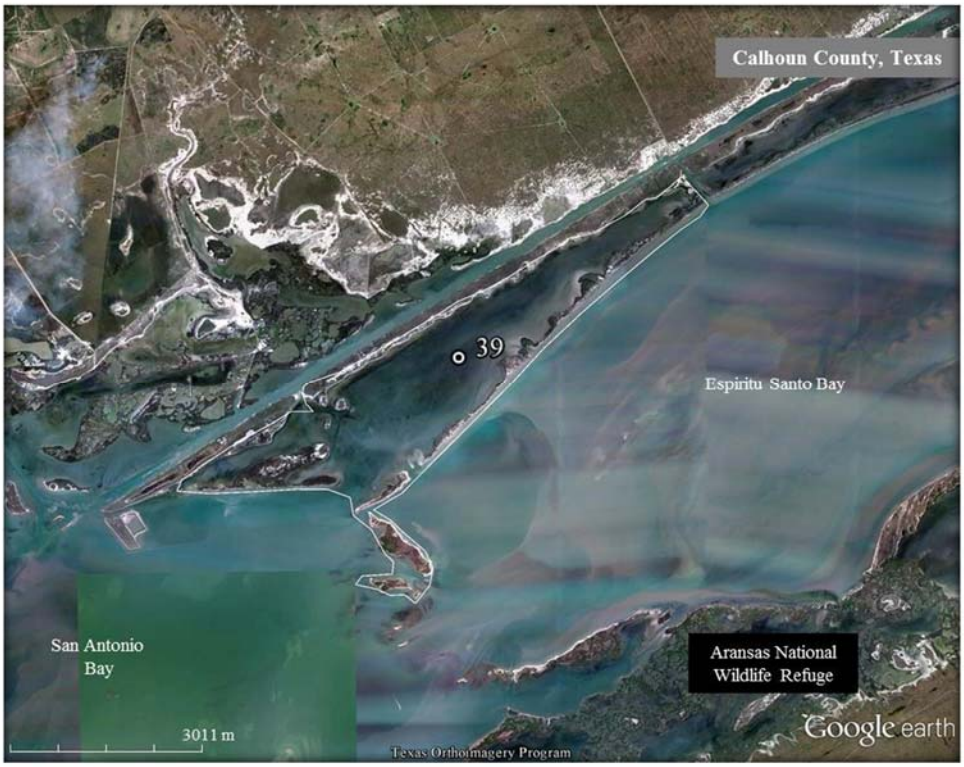
- ACOE
- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- TXDOT
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Piping plover (*Charadrius melodus*)
- Waterfowl
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Marsh
- Seagrass
- Sandbars/Flats



SHOALWATER BAY WETLANDS

SITE NUMBER: 39

Latitude/Longitude:

28°20'12.47" N, 96°36'44.67" W

Habitat Type:

Listed as E2EM1N, E2EM1Ps, E2USM, E2USN, E2USP, E1AB3L, E2ABM, E1UBL, PUBKh, and PEM1Kh on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, estuarine and marine deepwater, freshwater pond, and freshwater emergent wetland, and designated as tidal marsh, sandbars/flats, seagrasses, ponds/basins, and marsh habitats for this project, respectively.

Conservation Strategy:

Develop conservation easement or acquire land; develop management plan from siltation and mangrove development; and, develop education to share land with wintering Whooping cranes.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TGLO

Potential Partners

- ACOE
- CCA
- ICF
- TPWD
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Piping plover (*Charadrius melodus*)
- Waterfowl
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Marsh
- Seagrass
- Sandbars/Flats
- Ponds/Basins
- Marsh

DEWBERRY ISLAND WETLANDS

SITE NUMBER: 40

Latitude/Longitude:

28°22'57.06" N, 96°31'33.18" W

Habitat Type:

Listed as E2EM1N, E1AB3L, E2USNs, and E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands and estuarine marine deepwater, and designated as tidal marsh, seagrasses, sandbars/flats, and open water habitats for this project, respectively.

Conservation Strategy:

Develop conservation easement or acquire land; develop management plan to allow ridge to become vegetated and not become elevated; management plant from siltation and mangrove development; and, develop education to share land with wintering Whooping cranes.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TGLO

Potential Partners

- ACOE
- CCA
- ICF
- TPWD
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Piping plover (*Charadrius melodus*)
- Waterfowl
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Flats
- Tidal Marsh
- Seagrass
- Sandbars/Flats
- Open Water

BLACKBERRY ISLAND WETLANDS

SITE NUMBER: 41

Latitude/Longitude:

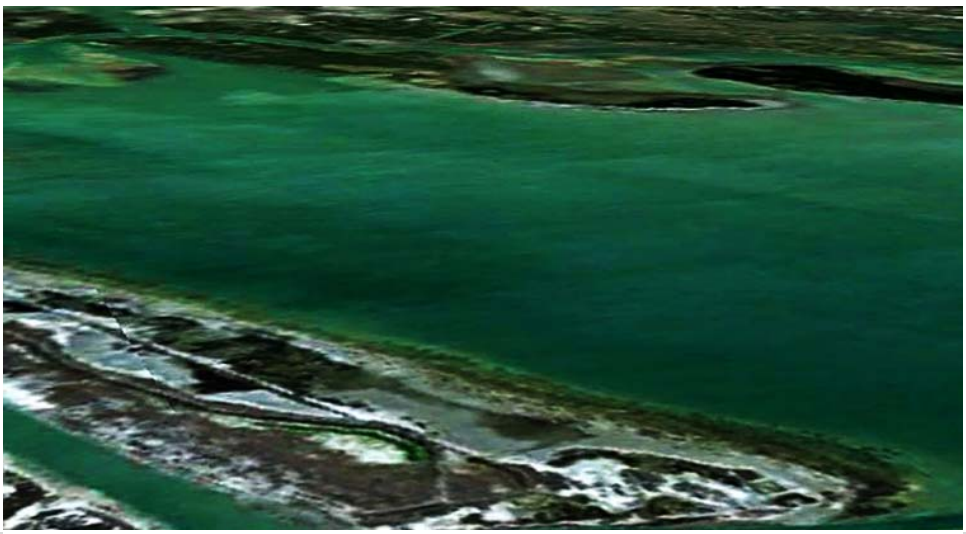
28°24'44.59" N, 96°27'47.54" W

Habitat Type:

Listed as E2EM1N, E2USP, E2USNs, E1AB3L, and E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands and estuarine and marine deepwater, and designated as tidal marsh, sandbar/flats, seagrasses, and open water habitats for this project, respectively.

Conservation Strategy:

Develop conservation easement or acquire land; develop management plan from siltation and mangrove development; and, develop education to share land with wintering Whooping cranes.



DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TGLO

Potential Partners

- ACOE
- CCA
- ICF
- TPWD
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Piping plover (*Charadrius melodus*)
- Waterfowl
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Flats
- Tidal Marsh
- Seagrass
- Sandbars/Flats
- Open Water

BAYUCOS ISLAND WETLANDS

SITE NUMBER: 42

Latitude/Longitude:

28°24'39.05" N, 96°24'45.99" W

Habitat Type:

Listed as E2EM1M, E2EM1N, E2USP, E1AB3L, and E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands and estuarine and marine deepwater, and designated as tidal marsh, sandbar/flats, seagrasses, and open water habitats for this project, respectively.

Conservation Strategy:

Develop conservation easement or acquire land; develop management plan from siltation and mangrove development; and, develop education to share land with wintering Whooping cranes.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Portions within Aransas National Wildlife Refuge and other entities (state and federal) should be consulted

Potential Partners

- ACOE
- CCA
- ICF
- TPWD
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Piping plover (*Charadrius melodus*)
- Waterfowl
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Commercial Species
- Migration
- Tidal Flats
- Tidal Marsh
- Seagrass
- Sandbars/Flats
- Open Water

SEADRIFT ISLAND 609-280C

SITE NUMBER: 43

Latitude/Longitude:

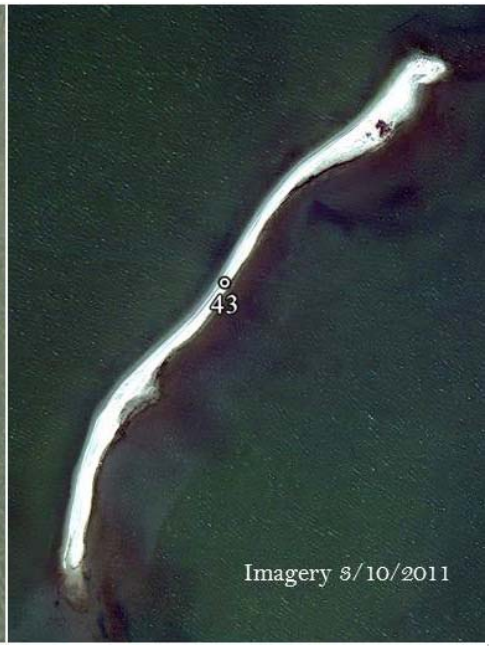
28°23'19.17" N, 96°43'33.32" W

Habitat Type:

Not listed on the 2008-2009 National Wetland Inventory.

Conservation Strategy:

Develop conservation easement or acquire land; develop management plan from siltation and mangrove development; and, develop education to share land with wintering Whooping cranes.



DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TGLO owned and leased by the Audubon Society

Potential Partners

- ACOE
- CBBEP
- Gulf Ecosystem Restoration Taskforce
- SABP
- TGLO

Species

Nesting colonial waterbirds

Key Terms:

- Bird
- Restoration
- Rookery
- Protected Species
- Migration

SEADRIFT ISLAND 609-280B & CHAIN

SITE NUMBER: 44

Latitude/Longitude:
28°23’40.41” N, 96°43’39.92” W

Habitat Type:
Not listed on the 2008-2009 National Wetland Inventory.

Conservation Strategy:
Restoration from erosion and develop a 4-6 acre island using dredge material from adjacent navigation channels.

DATABASE INFORMATION

Nominated:
Phase I and II

Land Ownership
TGLO owned and leased by the Audubon Society

Potential Partners
- Audubon Society
- Bird Conservancy
- Calhoun County
- Port of Victoria
- TGLO
- TPWD
- West Side Calhoun County Navigation District

Species
Nesting colonial waterbirds

Key Terms:
- Bird
- Restoration
- Enhancement
- Rookery
- Protected Species
- Migration

SECOND CHAIN ISLANDS

SITE NUMBER: 45

Latitude/Longitude:

28°11'34.98" N, 96°48'51.90" W

Habitat Type:

Listed as E2EM1N and E2USN on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, and designated as tidal marsh and sandbar/flats habitats for this project.

Conservation Strategy:

Restoration from erosion.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TGLO owned and leased by the Audubon Society

Potential Partners

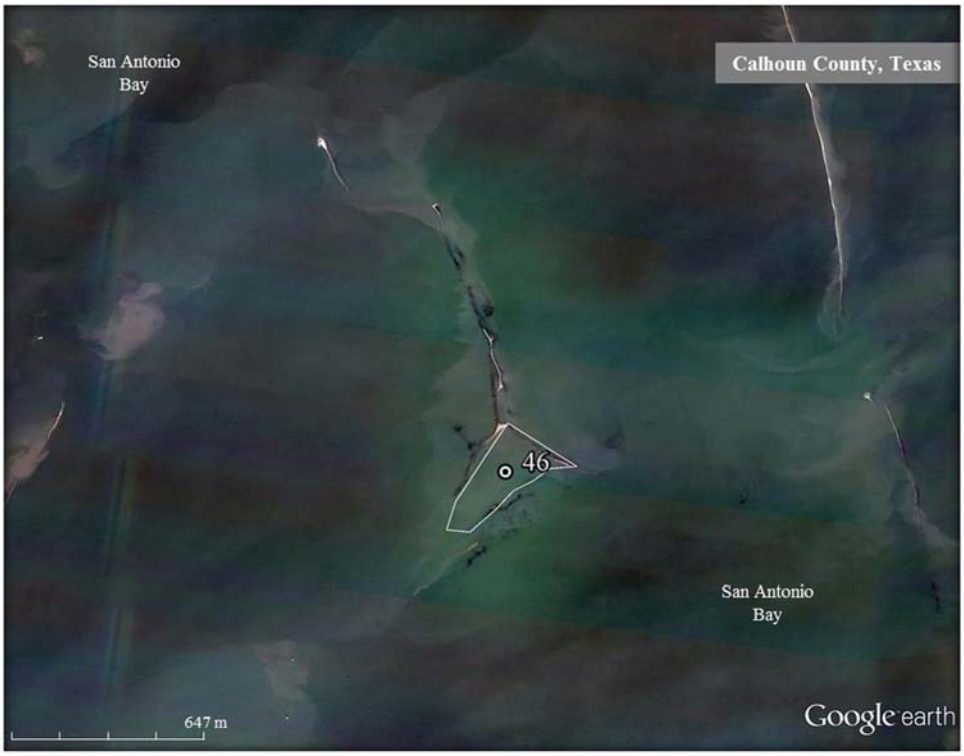
- ACOE
- CBBEP
- Gulf Ecosystem Restoration Taskforce
- SABP
- TGLO

Species

- Colonial waterbirds
- Egrets
- Herons
- Skimmers
- Terms

Key Terms:

- Bird
- Restoration
- Rookery
- Protected Species
- Migration
- Tidal Marsh
- Sandbars/Flats



BIG BIRD ISLAND

SITE NUMBER: 46

Latitude/Longitude:

28°16’30.45” N, 96°44’6.57” W

Habitat Type:

Listed as E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine deepwater, and designated as open water habitat for this project.

Conservation Strategy:

Develop new rookery island since no other rookery island exists in the area.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TGLO submerged land

Potential Partners

- ACOE
- CBBEP
- Gulf Ecosystem Restoration Taskforce
- SABP
- TGLO

Species

Potential colonial waterbirds

Key Terms:

- Bird
- Creation
- Rookery
- Protected Species
- Migration
- Open Water

SOUTH PASS ISLANDS

SITE NUMBER: 47

Latitude/Longitude:

28°16'30.45" N, 96°44'6.57" W

Habitat Type:

Listed as E2EM1P and E2USP on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, and designated as tidal marsh and sandbar/flats habitats for this project.

Conservation Strategy:

Restoration from erosion and need protection from boaters.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TGLO

Potential Partners

- ACOE
- CBBEP
- Gulf Ecosystem Restoration Taskforce
- SABP
- TGLO

Species

- Nesting colonial waterbirds
- Black skimmers (*Rynchops niger*)
- Royal terns (*Thalasseus maximus*)

Key Terms:

- Bird
- Restoration
- Rookery
- Protected Species
- Sensitive Species
- Migration
- Tidal Marsh
- Sandbars/Flats

VICTORIA BARGE CANAL ISLAND

SITE NUMBER: 48

Latitude/Longitude:

28°20’49.95” N, 96°42’23.67” W

Habitat Type:

Listed as E2EM1N, E2EM1P, and E2USN on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, and designated as tidal marsh and sandbar/flats habitats for this project.

Conservation Strategy:

Develop conservation easement or acquire land and restoration of habitat if determined suitable for the Aplomado falcon; Aplomado falcon was seen on the island in the winter of 2010.

DATABASE INFORMATION

Nominated:

Phase II

Land Ownership

TGLO

Potential Partners

- CBBEP
- SABP
- TGLO
- USFWS

Species

Endangered Aplomado falcon (*Falco femoralis*)

Key Terms:

- Bird
- Restoration
- Conservation Easement
- Land Acquisition
- Endangered Species
- Bay Island
- Tidal Marsh
- Sandbars/Flats

TURNSTAKE ISLAND COMPLEX

SITE NUMBER: 49

Latitude/Longitude:

28°19'0.58" N, 96°40'47.17" W

Habitat Type:

Listed as E2EM1N, E2EM1P, E2USP and E2USN on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, and designated as tidal marsh and sandbar/flats habitats for this project.

Conservation Strategy:

Restoration of habitat for potential rookery islands, removing invasive species, and thinning vegetation.

DATABASE INFORMATION

Nominated:

Phase II

Land Ownership

TGLO

Potential Partners

- CBBEP
- SABP
- TGLO
- USFWS

Species

Nesting colonial waterbirds

Key Terms:

- Bird
- Restoration
- Rookery
- Protected Species
- Migration
- Tidal Marsh
- Sandbars/Flats

CHESTER ISLAND

SITE NUMBER: 50

Latitude/Longitude:

28°27'6.25" N, 96°20'46.30" W

Habitat Type:

Listed as E2USN, PUBF, and PEM1C on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, freshwater pond, and freshwater emergent wetland, respectively, and designated as sandbar/flats, ponds/basins, and marsh habitats for this project, respectively.

Conservation Strategy:

Restoration from erosion and maintenance of largest rookery in bay system. Actually located in Matagorda Bay system, but included because of its size and importance.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TGLO owned and leased by the Audubon Society

Potential Partners

- ACOE
- CBBEP
- CCA
- National Audubon Society
- SABP
- TPWD
- USFWS

Species

Colonial waterbirds

Key Terms:

- Bird
- Management
- Restoration
- Rookery
- Protected Species
- Migration
- Sandbars/Flats
- Ponds
- Marsh

CHICKEN FOOT OYSTER REEF

SITE NUMBER: 51

Latitude/Longitude:

28°12'54.46" N, 96°46'17.35" W

Habitat Type:

Listed as E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine deepwater, and designated open water habitat for this project.

Conservation Strategy:

Restore degraded oyster reef and fishery habitat. Additional research on the health of the existing reef may be required.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TGLO submerged land

Potential Partners

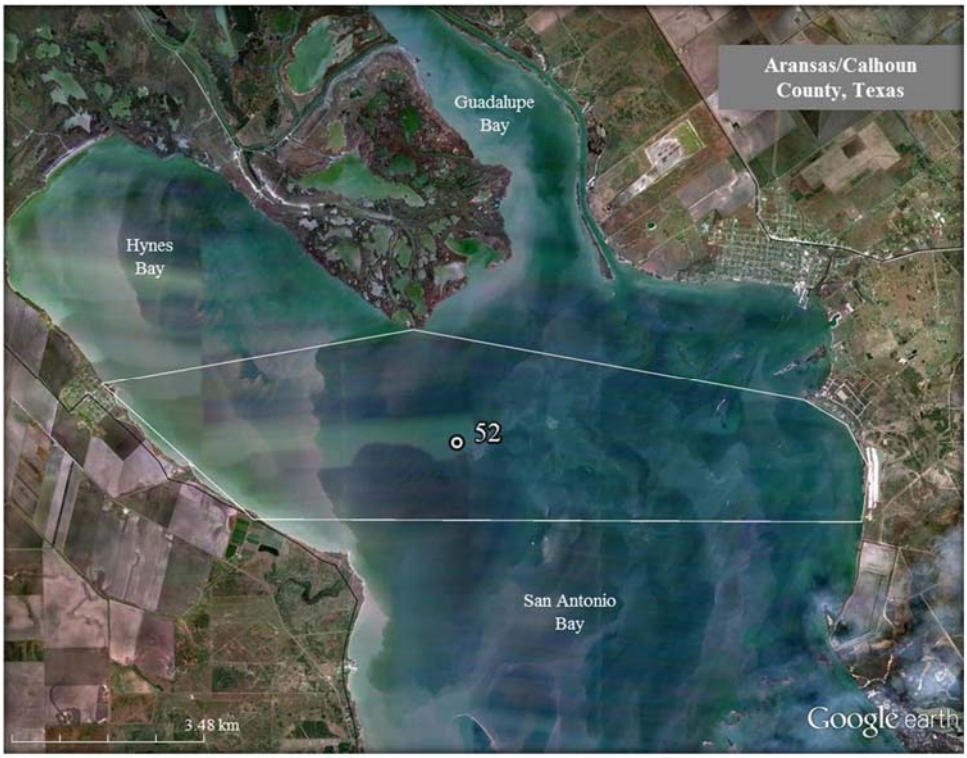
- CCA
- TGLO
- TPWD

Species

Shellfish and fishery habitat

Key Terms:

- Shellfish
- Fish
- Restoration
- Commercial Species
- Oyster Reef
- Open Water



UPPER SAN ANTONIO BAY OYSTER REEFS

SITE NUMBER: 52

Latitude/Longitude:

28°22'57.35" N, 96°46'28.25" W

Habitat Type:

Listed as E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine deepwater, and designated as open water habitats for this project.

Conservation Strategy:

Monitor and develop a more comprehensive database for oyster habitat and density; data in region used from Senate Bill 3 GSA BBEST.

DATABASE INFORMATION

Nominated:

Phase II

Land Ownership

TGLO submerged land

Potential Partners

- TPWD
- SARA

Species

Shellfish and fishery habitat

Key Terms:

- Shellfish
- Fish
- Monitoring
- Commercial Species
- Oyster Reef
- Open Water

MISSION LAKE-GUADALUPE BAY RANGIA CLAMS

SITE NUMBER: 53

Latitude/Longitude:

28°28’14.37” N, 96°48’14.46” W

Habitat Type:

Listed as E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine deepwater, and designated as open water habitats for this project.

Conservation Strategy:

Monitor and develop a more comprehensive database for rangia clam (Rangia spp.) habitat and density; data in region used from Senate Bill 3 GSA BBEST.

DATABASE INFORMATION

Nominated:

Phase II

Land Ownership

TGLO submerged land

Potential Partners

- TPWD
- SARA

Species

Shellfish and fishery habitat

Key Terms:

- Shellfish
- Fish
- Monitoring
- Clams
- Bay Bottom
- Open Water

HYNES BAY TIRE REMOVAL

SITE NUMBER: 54

Latitude/Longitude:

28°25'52.10" N, 96°50'15.04" W

Habitat Type:

Listed as E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine deepwater, and designated as open water habitats for this project.

Conservation Strategy:

Restoration by removing tires that have been moved off the shoreline into the nearshore area.

DATABASE INFORMATION

Nominated:

Phase II

Land Ownership

Private and TGLO submerged land

Potential Partners

CCA

Species

Fishery habitat

Key Terms:

- Fish
- Management
- Restoration
- Monitoring
- Open Water

Barrier Islands

Matagorda Island shelters the San Antonio Bay system from the Gulf of Mexico and is the northern barrier island located within the study area. It is jointly owned by The Texas General Land Office (TGLO) and USFWS and is managed as the Aransas National Wildlife Refuge Matagorda Unit and State Natural Area by cooperation between USFWS and TPWD. Matagorda Island is 38 miles long and ranges in width from <1 mile to 4.5 miles. The island is located between San Antonio Bay and the Gulf of Mexico in southern Calhoun County, Texas. San Jose Island is located immediately south of Matagorda Island; Cedar Bayou, an intermittent exchange channel, forms the boundary between Matagorda Island and San Jose Island. San Jose Island is privately owned and operates as a working cattle ranch.

Matagorda and San Jose barrier islands provide the eastern boundary of the study area and were formed about 5,000 years ago as accretionary barrier spits along the mainland and Gulf of Mexico. The island profile encompasses several dynamic habitats including gulf shore, foredunes, mid-island ridge and swales, back dunes, tidal flats, and coastal marshes. Freshwater wetlands are located within the swales and temporarily fill following rain events.

The islands have experienced minor development dating back as early as the Civil War, and include an abandoned lighthouse and airport runway on the northern tip and a lodge and ranching operation (Wynn Lodge) at the southern tip of Matagorda Island. This island is owned and managed by three governmental agencies (U.S. Fish & Wildlife Service, Texas Parks & Wildlife, and Texas General Land Office) within various agreements. San Jose Island, which is privately owned, has lodges and ranching operations about midway along the island. Currently, no plans are being developed to build or divide on either island.

Natural passes that historically connected the bay system to the Gulf of Mexico included Pass Cavallo at the northern extent and Cedar Bayou Pass at the southern extent of Matagorda Island. Both passes have been hydrologically compromised from the artificially created and maintained ship channels at Matagorda Bay and Port Aransas (south of the project area). Pass Cavallo has become much shallower over time; and Cedar Bayou Pass is only open following tropical storms.

Thirteen sites along Matagorda and San Jose barrier islands were recommended during this project. Conservation strategies associated with these sites included: Management (11), Monitoring (7), and Education (4), Restoration (2), and Protection (1).

The location of thirteen recommended sites along Matagorda Island within the barrier island geographic section of the San Antonio Bay system using Google Earth Pro software.

CEDAR BAYOU PASS

SITE NUMBER: 55

Latitude/Longitude:

28°4'4.20" N, 96°50'55.42" W

Habitat Type:

Listed as E2EM1N, E2USM, E2USN, E2ABM, M2USP, and E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine wetland, estuarine and marine deepwater, and designated as tidal marsh, sandbar/flats, seagrasses, beach and open water habitats for this project, respectively.

Conservation Strategy:

Restore hydrologic connection between San Antonio Bay and the Gulf of Mexico.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Private

Potential Partners

- ACOE
- Aransas County
- Aransas County Navigation District
- Calhoun County
- CBBEP
- CCA
- SABP
- TGLO
- TPWD
- USFWS

Species

Fishery habitat

Key Terms:

- Fish
- Restoration
- Hydrology
- Gulf Pass
- Tidal marsh
- Sandbars/Flats
- Seagrass
- Beach
- Open Water

ST JOE MARSH / TIDAL FLAT

SITE NUMBER: 56

Latitude/Longitude:

28°5'32.78" N, 96°51'56.94" W

Habitat Type:

Listed as E2EM1N, E2EM1M, E2USM, E2USN, E2SS3P, E2ABM, E1AB3L, and E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands and estuarine and marine deepwater, and designated as tidal marsh, sandbar/flats, mangrove, seagrasses, and open water habitats for this project, respectively.

Conservation Strategy:

Develop conservation easement or acquire land.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

Private

Potential Partners

- ACOE
- CBBEP
- NRCS
- SABP
- TGLO
- TNC
- TPWD
- USFWS

Species

- Endangered Whooping crane (*Grus americana*)
- Shorebirds

Key Terms:

- Bird
- Conservation Easement
- Land Acquisition
- Endangered Species
- Protected Species
- Migration
- Barrier Island
- Tidal marsh
- Sandbars/Flats
- Mangrove
- Seagrass
- Open Water

South Matagorda Island Tidal Fan Wetlands

SITE NUMBER: 57

Latitude/Longitude:

28°10'8.11" N, 96°46'56.38" W

Habitat Type:

Listed as E2EM1N, E2EM1P, E2USP, E2USN, E2ABM, E1AB3L, PEM1A, and E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, estuarine and marine deepwater, and freshwater emergent wetlands, and designated as tidal marsh, sandar/flats, seagrasses, marsh, and open water habitats for this project, respectively.

Conservation Strategy:

Restore hydrologic connectivity via culverts in roads and levees, and breaches in levees; and, develop management plan for mangrove establishment and education to share land with wintering Whooping cranes.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

U.S. Fish and Wildlife Service

Potential Partners

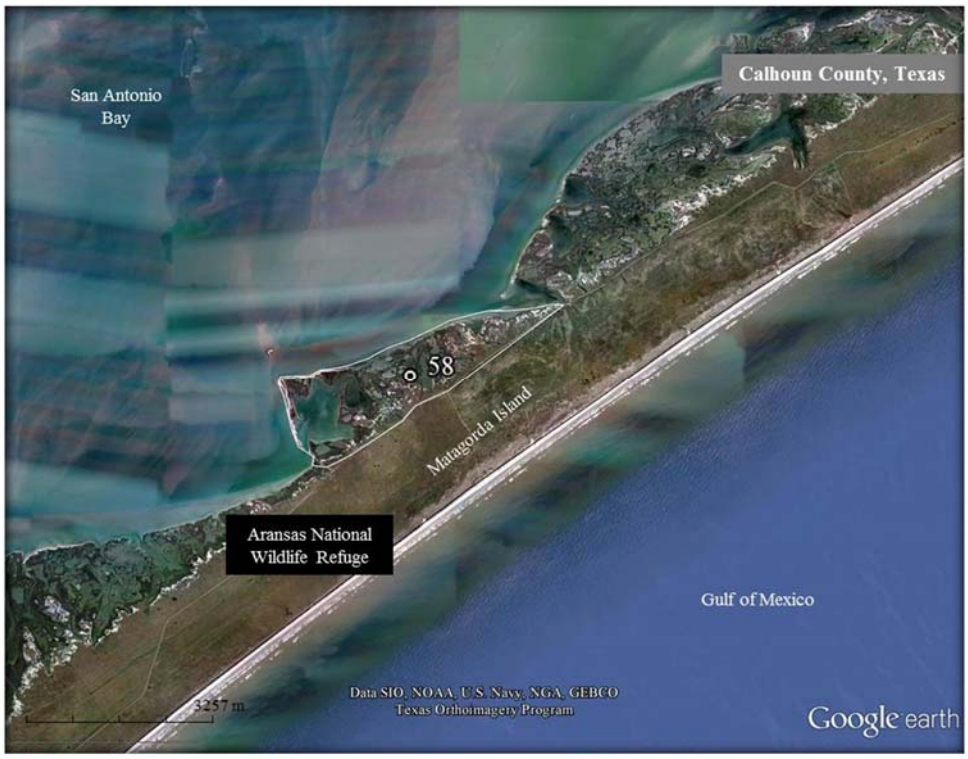
- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- USFWS

Species

- Endangered Whooping crane (*Grus americana*)
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Restoration
- Endangered Species
- Protected Species
- Barrier Island
- Tidal marsh
- Sandbars/Flats
- Seagrass
- Marsh
- Open Water



PANTHER POINT BACK BARRIER WETLANDS

SITE NUMBER: 58

Latitude/Longitude:

28°12’59.56” N, 96°40’49.25” W

Habitat Type:

Listed as E2EM1N, E2EM1P, E2USP, E2USN, E1AB3L, E1UBL, and PEM1A on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, estuarine and marine deepwater, and freshwater emergent wetlands, respectively, and designated as tidal marsh, sandbar/flats, seagrasses, open water, and marsh habitats for this project, respectively.

Conservation Strategy:

Develop management plan for mangrove establishment and education to share land with wintering Whooping cranes.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

U.S. Fish and Wildlife Service

Potential Partners

- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- USFWS

Species

- Endangered Whooping crane (*Grus americana*)
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Endangered Species
- Protected Species
- Migration
- Tidal marsh
- Sandbars/Flats
- Seagrass
- Marsh
- Open Water

LONG LAKE ENTRANCE

SITE NUMBER: 59

Latitude/Longitude:

28°16'11.04" N, 96°37'21.65" W

Habitat Type:

Listed as E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine deepwater, and designated as open water habitat for this project.

Conservation Strategy:

Maintain hydrologic connectivity with San Antonio Bay system.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TGLO submerged land

Potential Partners

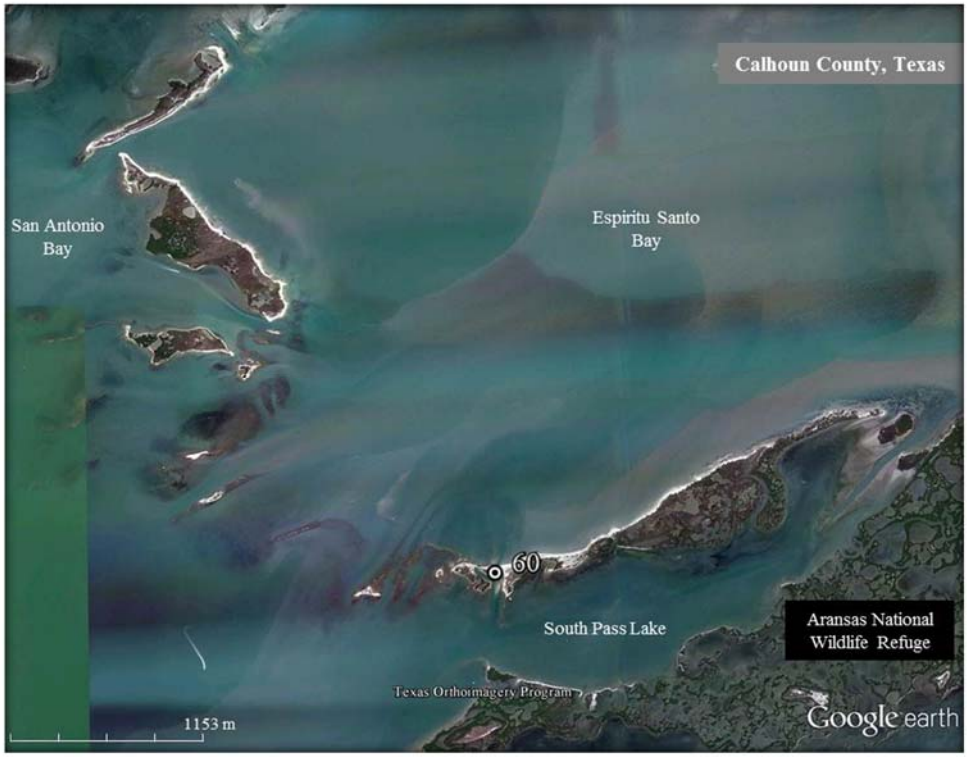
- CCA
- TGLO
- TPWD

Species

Fishery Habitat

Key Terms:

- Fish
- Management
- Monitoring
- Bay Pass
- Hydrology
- Open Water



SOUTH PASS LAKE ENTRANCE

SITE NUMBER: 60

Latitude/Longitude:

28°17’31.79” N, 96°36’14.63” W

Habitat Type:

Listed as E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine deepwater, and designated as open water habitat for this project.

Conservation Strategy:

Maintain hydrologic connectivity with San Antonio Bay system.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TGLO submerged land

Potential Partners

- CCA
- TGLO
- TPWD

Species

Fishery Habitat

Key Terms:

- Fish
- Management
- Monitoring
- Bay Pass
- Hydrology
- Open Water

CONTEE LAKE-VANDEVEER ISLAND BACK BARRIER WETLANDS

SITE NUMBER: 61

Latitude/Longitude:

28°17'14.60" N, 96°34'7.52" W

Habitat Type:

Listed as E2EM1N, E2EM1M, E2EM1P, E2USP, E2USN, E1AB3L, E1UBL, and PEM1A on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, estuarine and marine deepwater, and freshwater emergent wetlands, respectively, and designated as tidal marsh, sandbar/flats, seagrasses, open water, and marsh habitats for this project, respectively.

Conservation Strategy:

Develop management plan for mangrove establishment and education to share land with wintering Whooping cranes.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

U.S. Fish and Wildlife Service

Potential Partners

- CBBEP
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Shorebirds

Key Terms:

- Education
- Bird
- Management
- Endangered Species
- Protected Species
- Migration
- Tidal Marsh
- Sandbars/Flats
- Seagrass
- Open Water
- Marsh

PRINGLE LAKE ENTRANCE

SITE NUMBER: 62

Latitude/Longitude:

28°19’28.75” N, 96°30’52.81” W

Habitat Type:

Listed as E2EM1M, E2USN, and E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine wetland and estuarine and marine deepwater, and designated as tidal marsh, sandbar/flats, and open water habitat for this project.

Conservation Strategy:

Maintain hydrologic connectivity with San Antonio Bay system.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

TGLO submerged land

Potential Partners

- CCA
- TGLO
- TPWD

Species

Fishery habitat

Key Terms:

- Fish
- Management
- Monitoring
- Bay Pass
- Hydrology
- Tidal Marsh
- Sandbars/Flats
- Open Water

BACK BAY WETLANDS

SITE NUMBER: 63

Latitude/Longitude:

28°22'16.33" N, 96°25'8.61" W

Habitat Type:

Listed as E2EM1N, E2EM1M, E2EM1P, E2USP, E2USN, E2USM, E2ABM, E1AB3L, and E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands and estuarine and marine deepwater, respectively, and designated as tidal marsh, sandbar/flats, seagrasses, and open water habitats for this project, respectively.

Conservation Strategy:

Develop management plan for mangrove establishment and education to share land with wintering Whooping cranes; and, maintain hydrologic passes throughout the area.

DATABASE INFORMATION

Nominated:

Phase I

Land Ownership

U.S. Fish and Wildlife Service

Potential Partners

- CBBEP
- CCA
- EPA
- ICF
- GBRA
- NOAA
- NRCS
- SABP
- SARA
- TGLO
- TPWD
- USFWS

Species

- Endangered Whooping cranes (*Grus americana*)
- Shorebirds

Key Terms:

- Education
- Bird
- Fish
- Management
- Endangered Species
- Protected Species
- Migration
- Wetlands
- Barrier Island
- Tidal Marsh
- Sandbars/Flats
- Seagrass
- Open Water

SUNDAY BEACH

SITE NUMBER: 64

Latitude/Longitude:
28°23’22.66” N, 96°24’5.27” W

Habitat Type:
Listed as E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine deepwater, and designated open water habitat for this project.

Conservation Strategy:
Maintain hydrologic connectivity with San Antonio Bay system.

DATABASE INFORMATION

Nominated:
Phase I

Land Ownership
TGLO submerged land

Potential Partners
- CCA
- TGLO
- TPWD

Species
Fishery habitat

Key Terms:
- Fish
- Management
- Monitoring
- Gulf Pass
- Hydrology
- Open Water

SUNDAY BEACH

SITE NUMBER: 65

Latitude/Longitude:
28°19’58.20” N, 96°27’52.63” W

Habitat Type:
Listed as E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine deepwater, and designated as open water habitat for this project.

Conservation Strategy:
Maintain hydrologic connectivity with San Antonio Bay system.

DATABASE INFORMATION

Nominated:
Phase I

Land Ownership
TGLO submerged land

Potential Partners
- CCA
- TGLO
- TPWD

Species
Fishery habitat

Key Terms:
- Fish
- Management
- Monitoring
- Bay Pass
- Hydrology
- Open Water

PELICAN ISLAND AT PASS CAVALLO

SITE NUMBER: 66

Latitude/Longitude:

28°21’36.60” N, 96°23’57.65” W

Habitat Type:

Listed as E2USN and M2USP on the 2008-2009 National Wetland Inventory, estuarine and marine wetlands, and designated sandbar/flats and beach habitats for this project.

Conservation Strategy:

Maintain hydrologic connectivity with San Antonio Bay system and Gulf of Mexico.

DATABASE INFORMATION

Nominated:

Phase II

Land Ownership

TGLO submerged land

Potential Partners

- TPWD
- TGLO
- USFWS

Species

Fishery habitat

Key Terms:

- Fish
- Management
- Monitoring
- Bay Pas
- Gulf Pass
- Hydrology
- Sandbars/Flats
- Beach

OIL WELL CUTS – SALURIA BAYOU

SITE NUMBER: 67

Latitude/Longitude:

28°23'26.42" N, 96°25'6.24" W

Habitat Type:

Listed as E2EM1N, E2USN, E2USP, E2ABM, E1AB3L, E1UBLx, and E1UBL on the 2008-2009 National Wetland Inventory, estuarine and marine wetland and estuarine and marine deepwater, and designated as tidal marsh, sandbar/flats, and open water habitat for this project, respectively.

Conservation Strategy:

Maintain hydrologic connectivity with San Antonio Bay system, monitor dredging effects, and remove abandoned oil facilities.

DATABASE INFORMATION

Nominated:

Phase II

Land Ownership

U.S. Fish and Wildlife Service and TGLO submerged land

Potential Partners

- TGLO
- TPWD
- USFWS

Species

Fishery habitat

Key Terms:

- Fish
- Management
- Monitoring
- Bay Pas
- Hydrology
- Tidal Marsh
- Sandbars/Flats
- Open Water

Literature Cited

Davis, N.A. and E.H. Smith. 2011. Preliminary inventory of conservation, restoration, and protection sites: San Antonio Bay system. Coastal Bend Bays and Estuaries Program Publication CBBEP-74. pp. 1-91.

Davis, N.A. and E.H. Smith. 2012. Inventory of conservation, restoration, and protection sites: San Antonio Bay system-Phase II. Coastal Bend Bays and Estuaries Program Publication CBBEP-82. pp. 1-94.

Google. 2010. Google Earth Pro. Google, Inc., Mountain View California. (http://www.google.com/earth/index.html).

March, R.G. and E.H. Smith. 2011. Modeling Potential Coastal Vegetation Response to Sea Level Rise and Storm Surge on Estuarine Peninsulas. Journal of Coastal Research, online http://dx.doi.org/10.2112/JCOASTRES-D-10-00177.1

Otvos, E.G. and W.E. Howat. 1996. South Texas Ingleside barrier; coastal sediment cycles and vertebrate fauna. Late Pleistocene Stratigraphy Revised. Transactions of the Gulf Coast Association of Geological Societies, 46: 333-344.

TPWD. 2009. Texas Parks and Wildlife Department. (www.tpwd.state.tx.us).

Tremblay, T.A. and T.R. Calnan. 2011. Status and trends of inland wetland and aquatic habitats, Freeport and San Antonio Bay areas. Texas General Land Office and National Oceanic and Atmospheric Administration under GLO Contract NO. 10-060. Coastal Coordination Council pursuant to National Oceanic and Atmospheric Administration Award No. NA09NOS4190165. pp. 1-81.

White, W.A. and R.A. Morton. 1987. Historical shoreline changes in San Antonio, Espiritu Santo, and Mesquite Bays, Texas Gulf coast. Geological Circular 87-1. Bureau of Economic Geology, University of Texas at Austin, Austin, TX. pp. 1-41.

Public Access

Section C

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San Antonio Bay Partnership

Introduction

The rivers, wetlands, beaches, and bays of the San Antonio Bay System (SABS) offer residents and visitors with opportunities to participate in a variety of outdoor recreational activities, including fishing, swimming, wildlife viewing, picnicking, camping, boating, and kayaking. The SABS is located between Matagorda and Aransas bays along the Texas coast and at the terminus of the San Antonio and Guadalupe river watersheds. This bay system exchanges water with Matagorda Bay to the northeast and Aransas and Copano bays to the southwest. Marine water is exchanged between the Gulf of Mexico and the estuarine system through Pass Cavallo, Matagorda Ship Channel, Cedar Bayou (when open), and Aransas Pass (via Aransas Bay). The communities within the SABS include Port O'Connor, Seadrift, Austwell, and Tivoli, and the larger City of Victoria is located just outside of the SABS. Counties within the SABS include: Aransas, Calhoun, Refugio, and Victoria.

Ensuring public access to the rivers, wetlands, beaches, and bays is critically important to maintaining the ecotourism economies of SABS coastal communities. However, the need to provide public access must be balanced with the need to conserve and protect coastal habitats and resources. As coastal communities in the SABS grow and tourism continues to increases, the pressure to provide public access is becoming a critical issue. Therefore, current and future conservation planning efforts must consider public access issues in order to develop management strategies that benefit the SABS.

The following Public Access Plan represents an effort by the San Antonio Bay Partnership (SABP) (1) to provide an inventory of existing public access opportunities in the SABS and (2) to generate a list of projects that would enhance or expand existing public access opportunities. Input has been sought from San Antonio Bay stakeholders throughout the development of the report. Multiple meetings were held with targeted stakeholder groups that deal with public access issues in the SABS (e.g., Calhoun County, City of Seadrift, Port O'Connor Chamber of Commerce, West Side Calhoun County Navigation District, and Texas Parks and Wildlife Department), and a draft of the report was presented at a public meeting held on Jan 16, 2014. A total of 24 existing public access sites and 27 potential public access enhancement projects are included in this plan, and all were mapped and made accessible to stakeholders via the open access Google Earth Program (Google 2010).

The public access inventory portion of the Plan provides descriptions about existing public access opportunities in the SABS, including photos and Google Earth images. Based on the type of access provided, public access opportunities were categorized using one or more of the following descriptors: boat ramps, marinas, parks, piers, kayaking, and birding. Information about sites was gathered from existing documents (e.g., Calhoun County Texas Shoreline Access Plan [Calhoun County 2012a, 2012b, 2012c, 2012d]; Texas Beach and Bay Access Guide, Second Ed. [Texas General Land

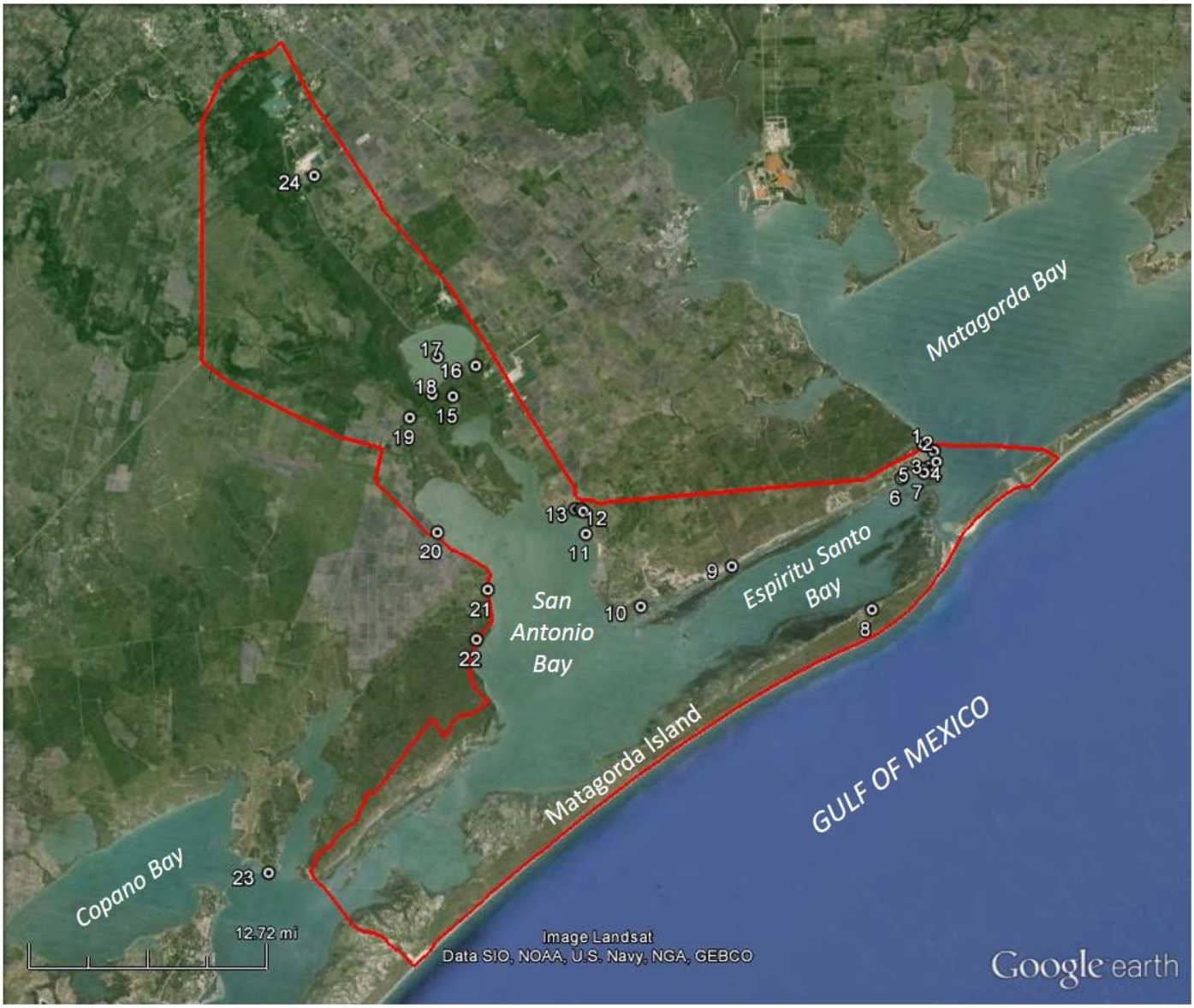
Office 2003]), site visits, and conversations with local stakeholders. Symbols are also provided to indicate the types of recreational activities (e.g., wildlife viewing, fishing, hiking) and amenities (e.g., fishing pier, boat ramp, restrooms) that are available at each site. Symbols are based on the system used by the Texas State Parks.

The public access enhancement and expansion section of the Plan provides descriptions of potential projects that would either (1) improve current public access facilities/infrastructure (i.e., parks, piers, boat ramps) and recreational opportunities (i.e., birding, kayaking, educational) or (2) result in the development of additional facilities/infrastructure and recreational opportunities. In addition to project descriptions, lists of potential partners are provided for each project. These lists are based on the knowledge of the planning team and stakeholder input, but it is recognized that other potential partners may exist and should be considered as projects are moved towards implementation. The SABP was not specifically listed as a partner in this section, but the Partnership does anticipate playing a role in the implementation of several of these projects. SABP was established to create and sustain working partnerships of committed stakeholders and could apply this role towards the implementation of several of these projects by assisting with facilitation, project management, grant management, grant writing, and/or other activities as deemed appropriate.

Similar to the previous section, descriptions of potential projects include photos/Google Earth images and are categorized based on the type of access provided: boat ramps, marinas, parks and piers, kayaking, birding, and education. Each project was also assigned a categorical value for estimated project cost (i.e., High, Moderate, Low), project complexity (i.e., High, Medium, Low), and project priority (i.e., High, Medium, Low). These values were assigned based on the project team's general understanding of the public access issues and needs within the SABS, as well as input from stakeholders. The purpose of these values is to help stakeholders in the SABS understand the relative differences between the proposed projects and allow for more strategic decision-making and prioritization when considering project implementation.

Public Access Inventory

MAP OF EXISTING PUBLIC ACCESS



Overview of 24 existing public access opportunities within the San Antonio Bay System project area using Google Earth software.

SYMBOLS


Park/Refuge Visitors Center


Concessions


Gift Shop


Parking


Restroom


Shower


Electricity/Lighting


Potable Water


Recreation Hall


Picnic Area


Tent Area


Tent Area with Water/Electricity


Primitive Camping Area


Dump Station


Historic Landmark


Interpretive Trail


Hiking Trail


Boat Ramp


Kayak Launch


Fishing Pier


Fishing


Fish Cleaning Station


Playground


Hunting


Windsurfing


Swimming


Biking


Wildlife Viewing


Handicap Accessible


User Fee and/or Permit Required

BOGGY BAYOU PARK

Public Access Category: Park, Kayaking, Birding

NUMBER: 1

Description:

Boggy Bayou Park is located at the northern end of 3rd Street in Port O'Connor. The Park is owned by Calhoun county. Current infrastructure in the Park includes a wooden boardwalk with observation platforms for wildlife viewing. A sand road is used by vehicles to access the south bayou shoreline for kayak launching and wade fishing, but roads are undesignated.

KINGFISHER PARK

Public Access Category: Park, Pier

NUMBER: 2

Description:

Kingfisher Park is located adjacent to Park Street in Port O'Connor and is owned by Calhoun County. The Park provides opportunities for fishing, kayaking, swimming, wind surfing, and wildlife viewing. It also offers an excellent sandy beach for residents and visitors with children. Amenities at the Park include picnic cabanas, restrooms, outdoor shower, and fishing pier with T-head and lights that extends into Matagorda Bay.

LITTLE JETTY

Public Access Category: Park, Pier, Kayaking

NUMBER: 3

Description:

Little Jetty is located at the intersection of Washington Blvd and Commerce St in Port O'Connor. This 'pocket park' is adjacent to a granite jetty that extends 2,300 feet into Matagorda Bay on the north side of the Gulf Intracoastal Waterway (GIWW). Little Jetty is a traditional public fishing location that offers access to the deeper waters of the GIWW and Matagorda Bay. The site offers public parking but no other amenities are available. The jetty is owned by the U.S. Army Corp of Engineers, while Calhoun County owns an adjacent tract of land and the road right-of-ways (ROW) that currently provide parking for visitors. The County ROW also offers some access to the shoreline for launching kayaks. Rock rip-rap has been placed off Washington Street to prevent erosion. All other lands adjacent to the Park are privately owned.

CLARK'S MARINA

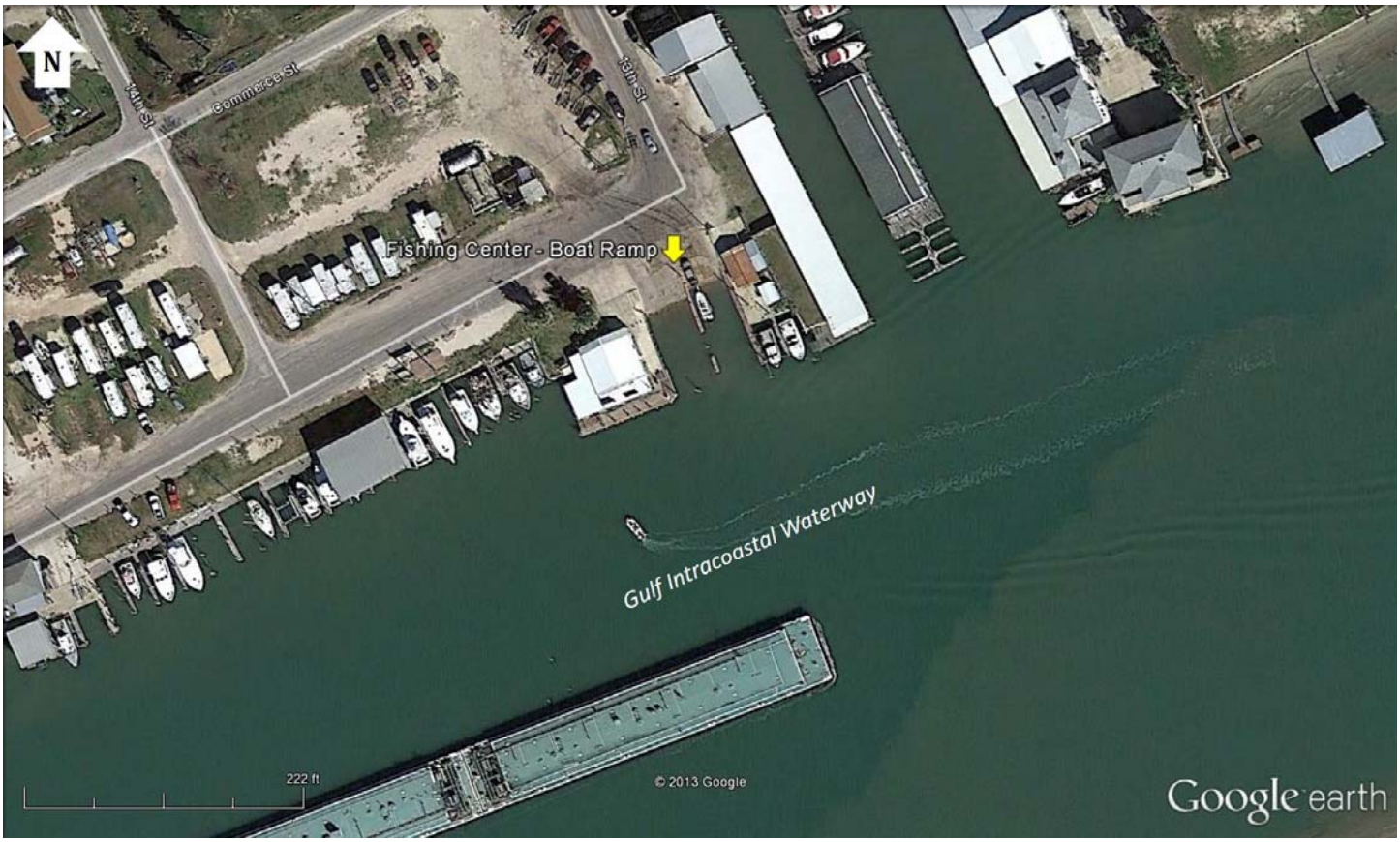
Public Access Category: Boat Ramp, Marina, Kayaking

NUMBER: 4

Description:

Clark's Marina is privately owned and located at end of 7th Street in Port O'Connor. The facility offers a single boat ramp with access to the Gulf Intracoastal Waterway. A fee is required to launch and park. The site can also be used to launch kayaks and access the Port O'Connor Paddling Trail. Additional amenities at the site include a bait stand, fuel pumps, fish cleaning station, and concessions. No restroom facilities are available because the adjacent restaurant is currently closed. Limited parking is available.

FISHING CENTER



Public Access Category: Boat Ramps, Kayaking

NUMBER: 5

Description:

The Fishing Center is privately owned and located at the end of 13th Street in Port O'Connor. The facility offers two boat ramps with access to the Gulf Intracoastal Waterway. A fee is required to launch and park. The site can also be used to launch kayaks and access the Port O'Connor Paddling Trail. Additional amenities at the site include a bait stand, fuel pumps, fish cleaning station, and concessions. A restroom is available in the concessions area. Limited parking is available.

FROGGIE'S BAIT DOCK

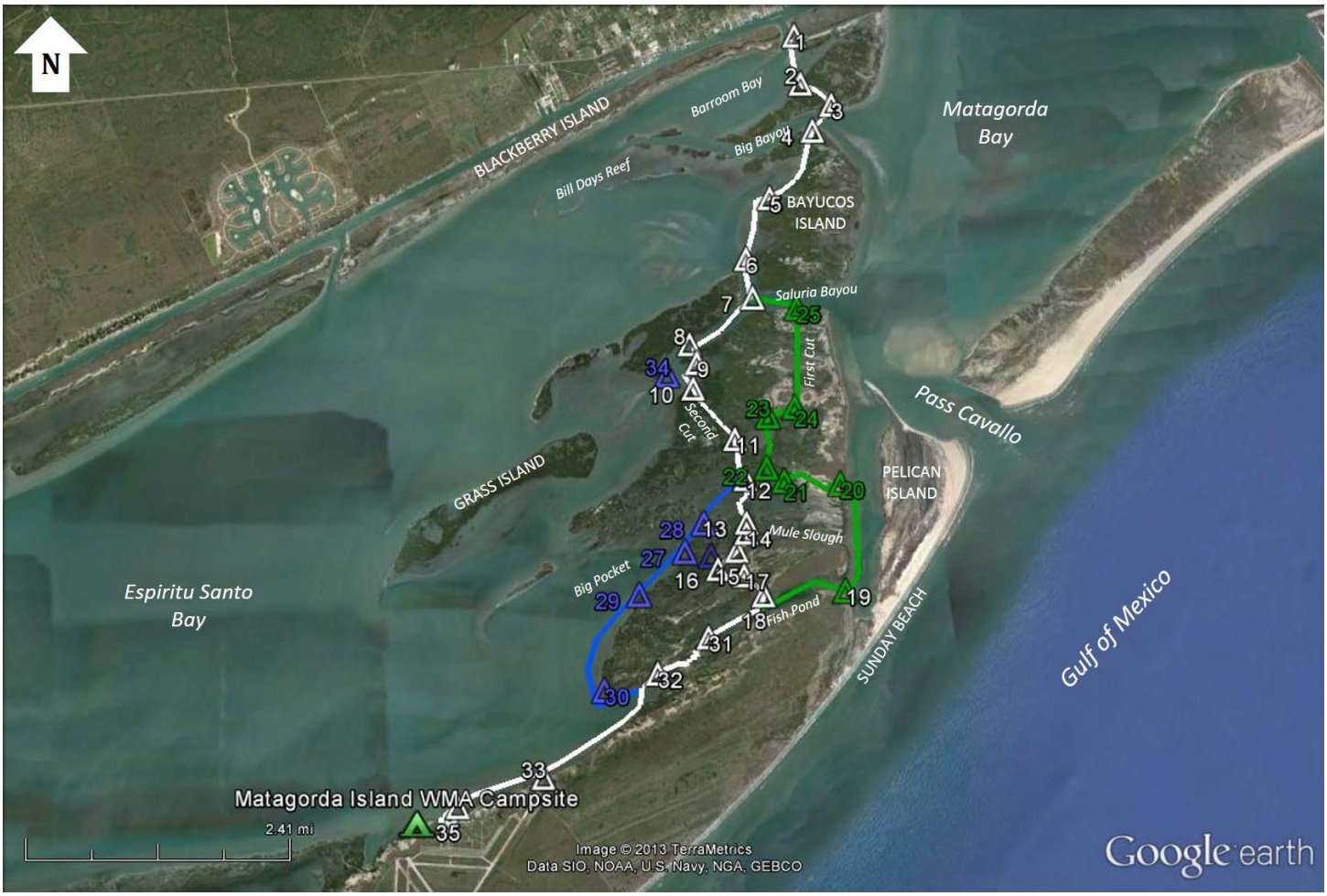
Public Access Category: Boat Ramps

NUMBER: 6

Description:

Froggie's Bait Dock is located at the end of Byers Street in Port O'Connor. The facility contains four boat ramps with access to the Gulf Intracoastal Waterway (GIWW). It is a Texas Parks and Wildlife Department boat ramp, and therefore, there is no fee to launch or park. Additional amenities at the site include a bait stand, fuel pumps, fish cleaning station, and concessions. A restroom is available in the concessions area. The parking area was recently expanded by Calhoun County to accommodate more vehicles.

PORT O'CONNOR PADDLING TRAIL



Public Access Category: Kayaking

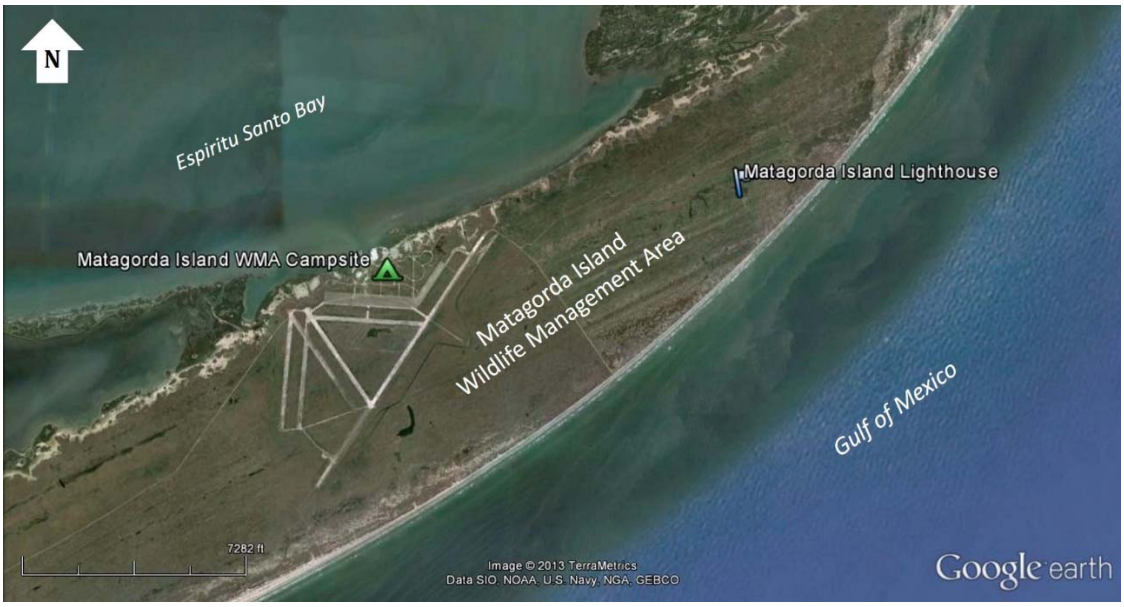
NUMBER: 7

Description:

The Port O'Connor (POC) Paddling Trail consists of three trails that total more than 25 miles: Fish Pond Trail, South Loop Trail, and North Loop Trail. The paddling trail winds through several bayous and across open water before eventually ending at Matagorda Island. The Fish Pond Trail begins in POC and travels through a number of bayous and cuts along the edge of Espiritu Santo Bay to Saluria Bayou, where it joins the North Loop Trail. From Mule Slough, the Fish Pond and South Loop trails continue east toward Sunday Beach Cove and to Lighthouse Cove, near the historic Matagorda Island Lighthouse. A one-day roundtrip is not recommended because of the long distance required to reach Matagorda Island. It is common to see campers on the Island, completing the trail over multiple days. Strong winds may also limit the completion of the entire paddling trail.

The POC Paddling Trail is currently the only marked trail within the San Antonio Bay System. The trail ends near a primitive camping site at the Matagorda Island Wildlife Management Area.

MATAGORDA ISLAND NATIONAL WILDLIFE REFUGE & STATE NATURAL AREA



Public Access Category: Park, Birding

NUMBER: 8

Description:

The Matagorda Island Wildlife Management Area (WMA) consists of 56,688 acres of offshore barrier island and bayside marshes. The area is jointly owned by the Texas General Land Office and the U.S. Fish and Wildlife Service (USFWS) and is cooperatively managed as the Matagorda Island National Wildlife Refuge and State Natural Area. Texas Parks and Wildlife Department (TPWD) manages the WMA for public use and USFWS has the main responsibility for managing the wildlife and habitat on the island.

Prior to its establishment as a WMA, the area was operated as a State Park by TPWD. The State Park was closed when the ferry that serviced the Island was destroyed and not replaced. Currently, Matagorda Island WMA is only accessible to the public by boat - private boat, arrangement with a local outfitter, or paddling the Port O'Connor (POC) Kayak Trail (approx. 12 miles). The POC Chamber of Commerce and the local TPWD office maintain a list of local outfitters that provide shuttle services.

Matagorda Island supports a variety of migratory birds, a large herd of white-tailed deer, alligators, and other wildlife. Activities on the Island include fishing, hunting (available through TPWD), wildlife viewing, picnicking, and historical interpretation. The bayside campground area includes picnic cabanas and restroom/shower facilities, but there is no potable water or electricity. A lighthouse dating from 1852 still stands at the north end of the island and is located several miles from the campground area. All access to the lighthouse, as well as the Gulf beach, is via hiking or biking. Picnic and camping sites are also available on the Gulf Beach side of the Island but are in poor condition. An education facility is located near the campground area. This building is no longer in use but is still in reasonably good condition. There is no fee for accessing the WMA, but a Limited Public Use Permit or an Annual Public Hunting Lands Permit is required for camping overnight. Regulations for use of TPWD WMAs are published in August of each year and should be consulted before visiting the Matagorda Island WMA and State Natural Area.

CHARLIE'S BAIT CAMP

Public Access Category: Boat Ramp, Kayaking

NUMBER: 9

Description:

Charlie's Bait Camp is privately owned and located at the end of Lane Road near Seadrift. The facility offers a single boat ramp with access to the Gulf Intracoastal Waterway. A fee is required to launch and park. Additional amenities at the site include a bait stand, fuel pumps, fish cleaning station, and concessions. Restrooms are also available in the concessions area.

WELDER FLATS COASTAL PRESERVE

Public Access Category: Park

NUMBER: 10

Description:

The Welder Flats Coastal Preserve, also known as the Welder Flats Wildlife Management Area, consists of 1,480 acres of submerged coastal wetlands in the San Antonio Bay area. The area is owned by the Texas General Land Office and is located in Calhoun County. The Preserve is bounded by San Antonio Bay, Shoalwater Bay, and privately owned land. Designated as a Gulf Ecological Management Site (or GEMS), Welder Flats has high value as nursery grounds for red drum and spotted sea trout; supports endangered and threatened species (e.g., Whooping Crane); and serves as the foraging grounds for a numerous wading, shorebird, and waterfowl species.

Texas Parks and Wildlife Department is responsible for managing the recreational resources provided by the Preserve and for maintaining its ecological integrity. The area provides great opportunities for recreational fishing and seasonal waterfowl hunting. The site is open to the public year-round, but can only be accessed by boat. All dry lands bordering the Preserve are privately owned and only the submerged lands may be accessed by the public. The nearest boat ramps are Sanders Park and Charlie's Bait Camp. Regulations for use of TPWD WMAs are published in August of each year and should be consulted before visiting the Welder Flats Coastal Preserve.

SANDERS MEMORIAL PARK

Public Access Category: Park, Boat Ramp, Kayaking

NUMBER: 11

Description:

Sanders Memorial Park is located at the end of Swan Point Road near Seadrift. The Park is owned by Calhoun County and offers visitors with opportunities for picnicking, fishing, swimming, wildlife viewing, and windsurfing. Amenities at the Park include a boat ramp, picnic cabanas, and electricity/lighting.

SEADRIFT MARINA

Public Access Category: Boat Ramp, Marina

NUMBER: 12

Description:

The City of Seadrift Marina provides visitors with numerous amenities, including a boat ramp, bait stand, fueling dock, and fish cleaning station. The Marina offers one of the fastest accesses to San Antonio Bay and the Guadalupe Delta. It is also the docking location for numerous shrimp and oyster boats. The City of Seadrift leases the operation of the boat ramp to a private company. Similarly, boat docks are leased by the City to private companies or individuals. The Marina is located next to hotels and other recreational infrastructure, providing easy access for tourists. Large numbers of boaters use this site during peak seasons and the parking area is often filled to capacity.

SEADRIFT NATURE PARK

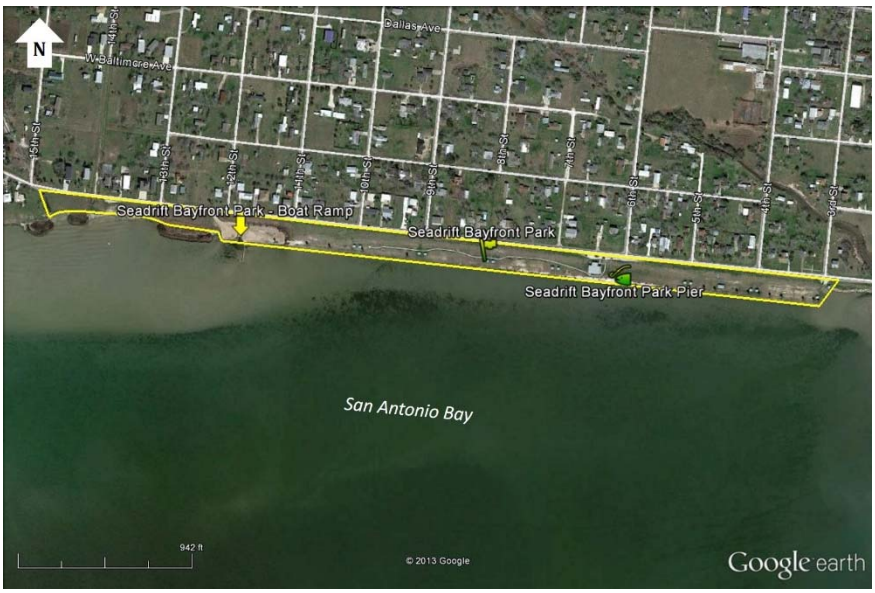
Public Access Category: Park

NUMBER: 13

Description:

This small "pocket" park is located in the City of Seadrift. The Park is situated just north of Bay Avenue (between Bayfront Park and Seadrift Marina) on City property. It is located on a small bayou/ditch and has a small number of trees that provide bird habitat and wildlife viewing opportunities. There is a short trail to lead visitors through the Park and benches for seating.

SEADRIFT BAYFRONT PARK



Public Access Category: Park, Pier, Boat Ramp, Kayaking

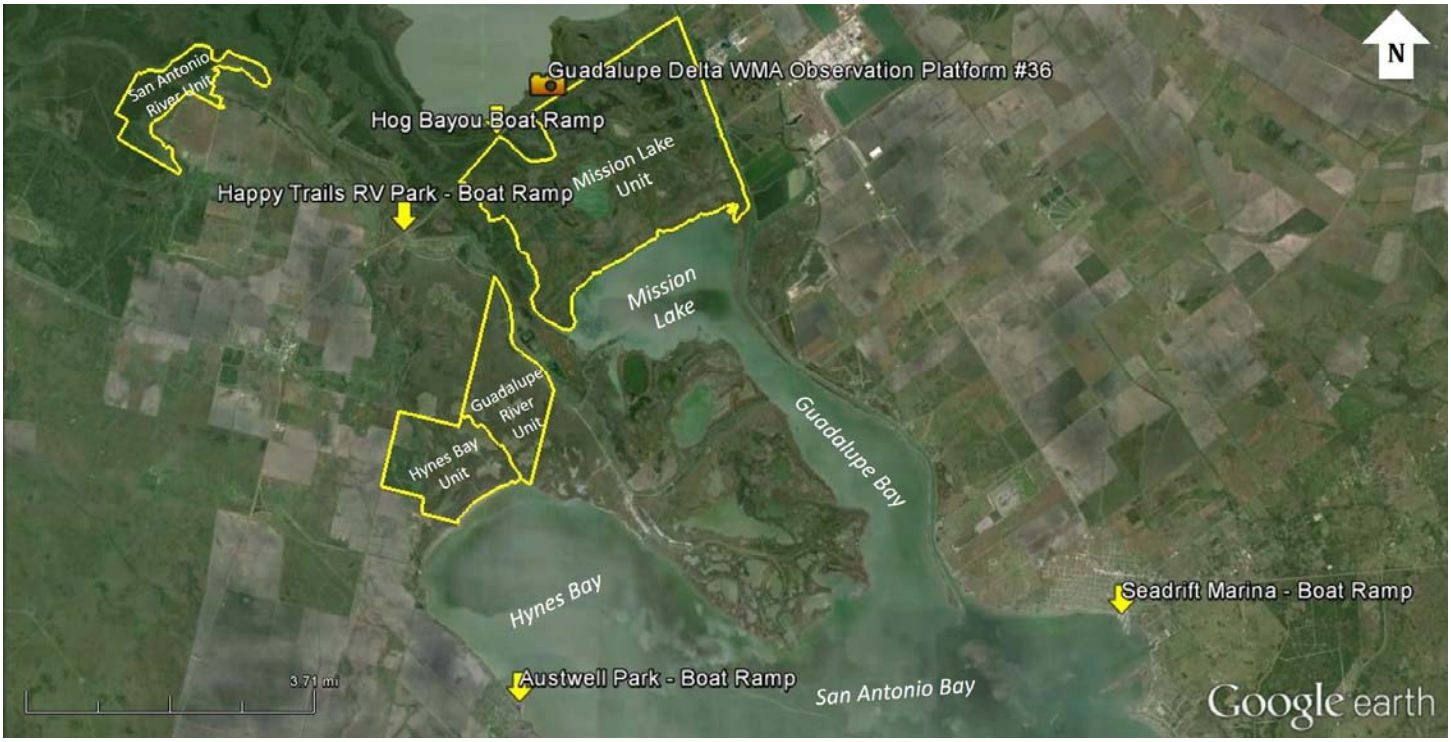
NUMBER: 14

Description:

Seadrift Bayfront Park is located adjacent to Bay Avenue in Seadrift. The Park stretches for approximately 3,300 feet along the shoreline of San Antonio Bay and offers opportunities for fishing, kayaking, wildlife viewing, picnicking, and wind surfing. Amenities at the park include picnic cabanas, playground equipment, covered pavilion, restrooms, seawall, and newly constructed fishing pier. A Texas Parks and Wildlife Department boat ramp is also located at the West end of the Park. It is not useable by larger boats due to shoaling issues, but it does provide the opportunity for launching kayaks.

This Park is the endpoint for the event known as the Texas Water Safari. The annual event features kayakers and canoeists in a race from San Marcos to Seadrift via the San Marcos and Guadalupe Rivers (260 mile course).

GUADALUPE DELTA WMA



Public Access Category: Park, Kayaking, Birding

NUMBER: 15

Description:

Guadalupe Delta Wildlife Management Area (WMA) is designated as a Gulf Ecological Management Site (GEMS) and consists of four units: Mission Lake Unit, Hynes Bay Unit, Guadalupe River Unit, and San Antonio Unit. The units are located in Calhoun, Victoria, and Refugio counties. The WMA consists of freshwater marshes that are subject to flooding from the Guadalupe and San Antonio rivers and its adjacent bayous, as well as tidal marshes. Riparian areas are also present along the numerous small bayous and form "corridor forests" of pecan, black willow, cedar elm, American elm, hackberry, and green ash. These forests provide excellent forage areas for neotropical songbirds. The WMA has traditionally provided important habitat for wetland dependent wildlife, especially migratory waterfowl.

An observation platform, located on the south side of State Hwy 35, is open throughout the year and provides wildlife viewing opportunities within the WMA. This roadside platform is part of the Calhoun Loop of the Central Coast Great Texas Coastal Birding Trail. Also, River Road is open to the public and can be used to access the west bank of the Guadalupe River for fishing. Access to the River is only allowed within the boundary of the Guadalupe River Unit and care should be taken to avoid trespassing on private property. Although it does not represent an official launch site, a portion of River Road that is located near the southern boundary of the Guadalupe River Unit also offers opportunities for launching kayaks and canoes. A general use permit is required when accessing the WMA in these areas. All other areas of the WMA are closed to the public, except during scheduled events. Hunting and fishing are part of the seasonal recreational activities offered in the WMA. Public hunting is permitted for waterfowl and migratory shore birds, alligators, and other wetland wildlife. Tours are also sometimes available in the spring and fall through the Texas Parks and Wildlife Department Conservation Passport Program. Regulations for use of TPWD WMAs are published in August of each year and should be consulted before visiting the Guadalupe Delta WMA. Separate regulations are developed for each unit of the WMA, so care should be taken to find the appropriate regulations.

VICTORIA BARGE CANAL AT HWY 35

Public Access Category: Park

NUMBER: 16

Description:

The area where the Victoria Barge Canal and State Highway 35 intersect provides the public with access to the Canal for fishing. An existing dirt road allows for easy access and parking, but the area has limited direct access to the water due to steep slopes on the banks.

GREEN LAKE

Public Access Category: Park

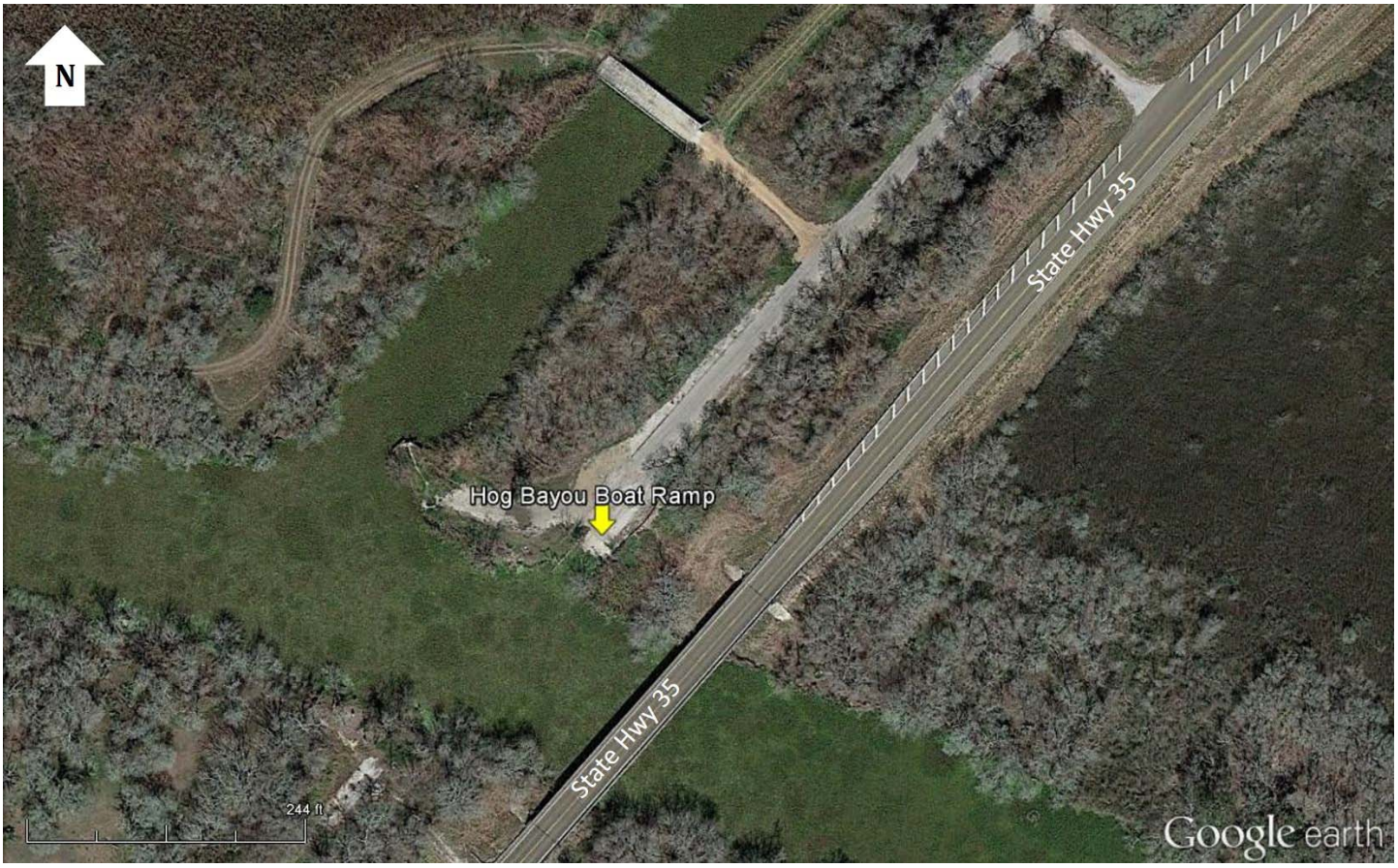
NUMBER: 17

Description:

Green Lake is a natural freshwater lake located in Calhoun County in the Guadalupe River floodplain. Known for its greenish waters, from which its name derives, the lake encompasses about 10,000 acres and is one of the largest natural freshwater lakes in Texas, in spite of its close proximity to salt water. Habitats associated with Green Lake include grassy, poorly drained freshwater marsh that provides habitat for a variety of waterfowl and colonial waterbirds.

Calhoun County recently acquired Green Lake and adjacent property using Coastal Impact Assistance Funding and plan to turn the area into a County park with managed recreational activities that emphasize conservation. A Master Plan is currently being developed for the site. Potential recreational uses may include: wildlife viewing, fishing, hiking, biking, swimming, camping, picnicking, and hunting.

HOG BAYOU



Public Access Category: Boat Ramp, Kayaking

NUMBER: 18

Description:

A Texas Parks and Wildlife Department boat ramp is located on the north side of the State Hwy 35 bridge at Hog Bayou. The entrance to the site lies just north of the bridge. Current infrastructure at the site includes a single concrete boat ramp and parking area. The boat ramp offers access to Hog, Schwings, and Goff bayous. The area provides great opportunities for kayaking.

HAPPY TRAILS RV PARK

Public Access Category: Boat Ramp

NUMBER: 19

Description:

A private boat ramp is located north of the State Hwy 35 bridge on the Guadalupe River. The ramp is associated with the Happy Trails RV Park. No signs are listed regarding boat launching fees. A small, aging platform (pictured left) is located nearby in the highway right-of-way and provides limited access to the River.

AUSTWELL PARK, PIER, & BOAT RAMP

Public Access Category: Park, Pier, Boat Ramp, Kayaking

NUMBER: 20

Description:

The Austwell Park can be accessed from Bay Street in Austwell. This small Park is owned and maintained by Refugio County. Amenities at the Park include a lighted fishing pier, portable toilets, picnic area, and boat launch. The Park also presents good opportunities for launching kayaks and windsurfing.

HOPPER'S LANDING

Public Access Category: Boat Ramp, Kayaking

NUMBER: 21

Description:

Hopper's Landing is a privately owned marina and RV campground located near Austwell. The facility can be accessed by taking FM 2040 to Hopper Lane. It offers a single boat ramp with access to San Antonio Bay. A fee is charged to launch but parking for vehicles and trailers is free. The site also provides public access to the beach for fishing and wildlife viewing. Additional amenities include restrooms, cabin rentals, RV campsites (with electric and water hookup), concessions, and fish cleaning station.

ARANSAS NATIONAL WILDLIFE REFUGE

Public Access Category: Park, Pier, Birding

NUMBER: 22

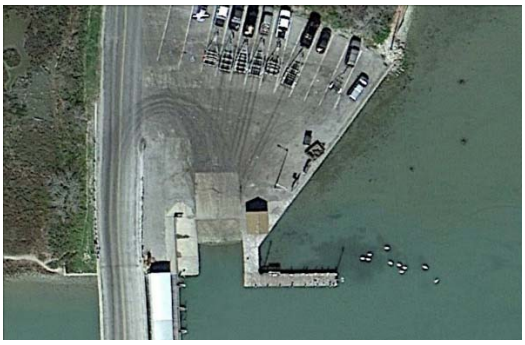
Description:

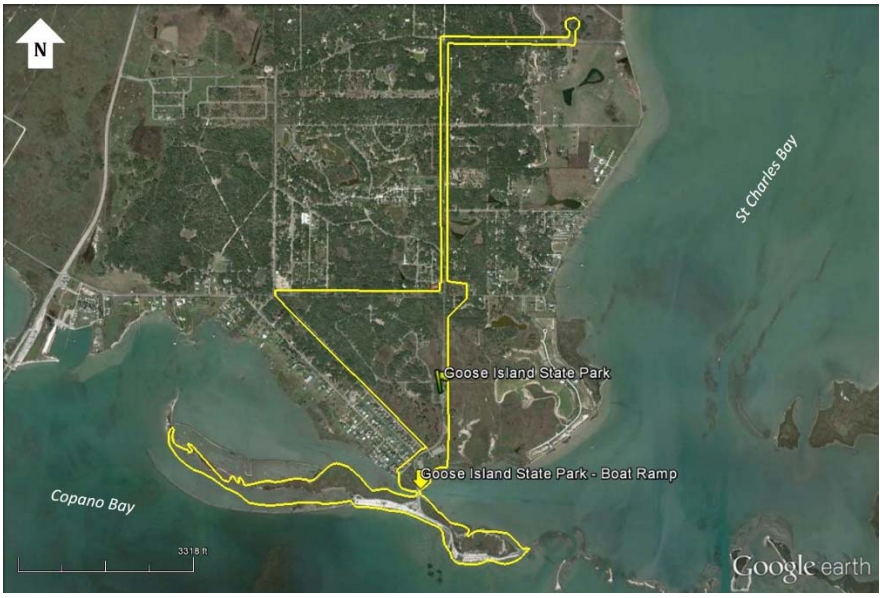
The Aransas National Wildlife Refuge was established in 1937 to serve as a refuge and breeding ground for migratory birds and other wildlife. The wildlife conservation mission of the National Wildlife Refuge System and the U.S. Fish and Wildlife Service ensures that the Refuge will continue to conserve, protect, and enhance these lands for the benefit of wildlife and people.

The mild winters, bay waters, and abundant food supply attract more than 400 species of birds to the Aransas National Wildlife Refuge, including the endangered Whooping Crane. Situated primarily on the Blackjack peninsula, the Aransas Refuge lies behind the protective influence of Matagorda Island (also considered part of the Refuge, but managed cooperatively with Texas Parks and Wildlife Department). The Refuge is surrounded by shallow bays where strong winds push bay waters onto a landscape that gradually shifts from salt to brackish and eventually freshwater marsh. This range of habitats supports a diversity of wildlife.

The Refuge Visitor Center is open Thursday to Sunday from 8:30am to 4:30pm. Exhibits and wildlife programs are available to the public. Refuge staff and volunteers are available to provide maps and checklists and let visitors know what is happening at the Refuge. The Visitor Center also has restrooms open to the public. Additional amenities at the Refuge include: driving tour, hiking trails, bicycle loop, fishing pier, observation platforms, and picnic areas. Public hunting opportunities are also available on a first come, first served basis. A fee is required to enter the Refuge.

GOOSE ISLAND STATE PARK





Public Access Category: Park, Pier, Boat Ramp, Kayaking, Birding

NUMBER: 23

Description:

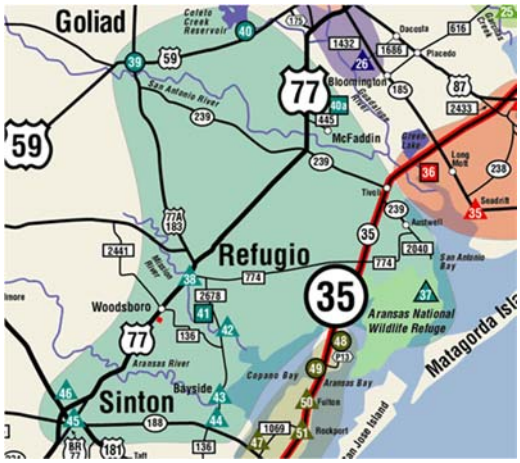
Goose Island State Park is located north of Rockport in Aransas County and is surrounded by St. Charles and Aransas bays. The Park was acquired in 1931-1935 by deeds from private owners and a legislative act setting aside the state-owned Goose Island as a park. Habitats at the Park include upland forests, shell ridge, and salt marsh. The nearby bays are filled with seagrass beds and oyster reefs.

A user fee is required to enter the Park. Recreational activities at the Park include camping, fishing, picnicking, boating, and wildlife viewing. Guided birding tours are available from January to April and interpretive programs are held every week. Amenities at the Park include: lighted fishing pier, boat ramp, campsites, and hiking trails. The boat ramp at the Park offers access to the western end of the San Antonio Bay System, including Mesquite and Ayers bays.

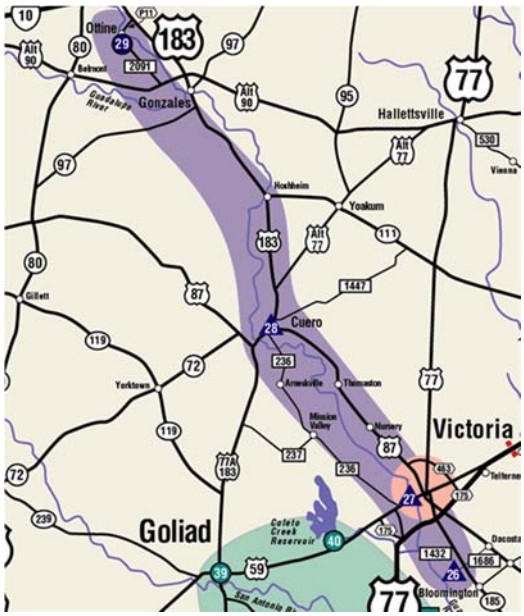
Great Texas Coastal Birding Trail: Central Coast

Calhoun Loop

La Bahia Loop



Guadalupe Loop



Public Access Category: Birding

NUMBER: 24

Description:

Three Great Texas Coastal Birding Trails have been designated to provide visitors with a well-rounded tour of the coast's top birding sites. Trail maps direct visitors to the best spots along the coast to observe birds and other types of wildlife. The Central Coast Trail starts near Matagorda Bay, travels through the Victoria and Corpus Christi areas, and ends just south of Kingsville. The Central Coast Trail is divided into twelve driving loops, three of which are located near San Antonio Bay – Calhoun Loop, La Bahia Loop, and Guadalupe Loop.

Sites along the Calhoun Loop include: #30 Port Lavaca Bird Sanctuary, #31 Magnolia Beach, #32 Magic Ridge, #33 Powderhorn Lake, #34 Port O'Connor/Matagorda Island State Park, #35 Seadrift/Swan Point (Sanders Memorial Park), and #36 Guadalupe Delta Wildlife Management Area.

Sites along the La Bahia Loop include: #37 Aransas National Wildlife Refuge, #38 Lion's/Shelly Park (Refugio), #39 Goliad State Park, #40 Coleto Creek Reservoir and Park, #40a Rio Vista Bluff Ranch, #41 Fennessey Ranch, #42 Mission River Flats, #43 Black Point (Bayside), #44 Egery Flats, #45 Welder Park (Sinton), and #46 Rob and Bessie Welder Park (Sinton).

Sites along the Guadalupe Loop include: #26 Dupont Wetlands, #27, Riverside Park and Athey Nature Sanctuary, #28 Cuero, and #29 Palmetto State Park.

Six of the sites listed above are located within the San Antonio Bay System project area: #26 Dupont Wetlands, #27 Riverside Park & Athey Nature Sanctuary, #34 Matagorda Island WMA, #35 Seadrift/Swan Point (Sanders Memorial Park), #36 Guadalupe Delta Wildlife Management Area, and #37 Aransas National Wildlife Refuge.

Public Access Enhancement

MAP OF PUBLIC ACCESS ENHANCEMENT PROJECTS

Overview of 27 public access enhancement projects within the San Antonio Bay System project area using Google Earth software.

Boggy Bayou Park Master Plan for Enhancement

PUBLIC ACCESS CATEGORY: PARK

NUMBER: 1

Current Status:

Boggy Bayou Park is located at the northern end of 3rd Street in Port O'Connor. Current infrastructure in the Park includes a wooden boardwalk with observation platforms. A sand road is used by vehicles to access the south bayou shoreline for kayak launching and wade fishing, but roads are undesignated and off-road vehicles frequently use these areas inappropriately. In addition, roads are often inundated and impassable after heavy rains and high tides. Other issues at the Park include shoreline erosion, illegal dumping, and inappropriate vehicle use.

Project Description:

Boggy Bayou Park has the potential to provide Port O'Connor residents and visitors with numerous high-quality recreational opportunities, but the Park is currently primitive and underutilized. Development of a master plan that outlines potential projects for enhancing the Park would be of great benefit to the County and other local partners. The plan should incorporate public input and include estimated project costs.

Project ideas for enhancing the Park include: (1) shoreline restoration, (2) improved roads and drainage, (3) installation of cabanas and picnic tables, (4) installation of restroom facilities, (6) closure of some areas to vehicle traffic, (7) security plan, (8) extension of the boardwalk to shoreline, (9) development of a short kayak trail, (10) development of a walking trail, (11) construction of salt marsh education facility, and (12) potential purchase of nearby property that could expand the Park and provide higher ground for installation of additional amenities.

Owner:

Calhoun County

Key Partners:

- Calhoun County
- Port O'Connor Chamber of Commerce

Other Partners:

- Texas Parks and Wildlife Department
- Texas General Land Office
- Texas Sea Grant Calhoun County Extension Agent
- Local foundations
- Private Landowners

Estimated Cost:

- Master Plan = Moderate
- Additional Amenities = Moderate
- Land acquisition = High

Priority:

Medium

Complexity:

Medium

Next Steps:

The next step in advancing this project is to develop a Master Plan for Boggy Bayou Park that defines the scope of the Park, outlines potential improvement projects, and prioritizes potential project ideas. Once the Plan has been approved by Calhoun County, potential partners and funding can be sought.

BOGGY BAYOU PADDLING TRAIL

PUBLIC ACCESS CATEGORY: KAYAKING

NUMBER: 2

Current Status:

Boggy Bayou Park is located at the northern end of 3rd Street in Port O'Connor and is owned by Calhoun County. Current infrastructure in the Park includes a wooden boardwalk with observation platforms. A sand road is used by vehicles to access the south bayou shoreline for kayak launching and wade fishing. This shoreline offers protected, shallow water areas that allow for easy launching by both experienced and beginner kayakers.

Project Description:

Creation of a designated paddling trail in Boggy Bayou will enhance the recreational opportunities offered to visitors at Boggy Bayou Park. If designated as an official Texas Parks and Wildlife Department Paddling Trail, there will be greater public awareness of the trail, resulting in increased visitation. However, this would require a "community sponsor" for the trail. The Bayou can be paddled upstream for a distance of about 2 miles (one way) from the starting point at the shoreline of the Park. A 1.5-mile loop around Boggy Bayou could also be added to the trail. Minimal trail markers would be needed given the enclosed nature of the bayou.

Installation of an official kayak launch site will provide easier use of the trail. This would also discourage launching from other areas along the shoreline, reducing potential habitat destruction. Signs at the launch site should be installed to provide guidance to visitors wishing to use the trail. Additional interpretive signs could also be installed to highlight the area ecology and wildlife.

Next Steps:

The next step in advancing this project is to incorporate the proposed kayak trail in the development of a Boggy Bayou Park Master Plan.

Owner:

- Calhoun County
- Texas General Land Office

Key Partners:

- Calhoun County
- Port O'Connor Chamber of Commerce

Other Partners:

- Texas Parks and Wildlife Department
- Texas Sea Grant Calhoun County Extension Agent
- Texas General Land Office

Estimated Cost:

Low

Priority:

Medium

Complexity:

Low

KINGFISHER PARK: PUBLIC FACILITIES IMPROVEMENTS

PUBLIC ACCESS CATEGORY: PARK, KAYAKING

NUMBER: 3

Current Status:

Kingfisher Park is located adjacent to Park Street in Port O'Connor and owned by Calhoun County. The Park provides opportunities for fishing, swimming, wind surfing, and wildlife viewing. It also offers an excellent sandy beach for residents and visitors with children. Amenities at the Park include picnic cabanas, restrooms, outdoor shower, and fishing pier with T-head and lights that extends into Matagorda Bay. However, some of the facilities located at the Park are in need of repair and/or updating. The installation of additional infrastructure could also increase the types of recreational activities available at the Park and potentially increase visitation. The Port O'Connor Chamber of Commerce currently has a preliminary plan for repair and updating, and they are actively fundraising.

Project Description:

Potential projects at Kingfisher Park include: (1) the pavilion at the Park is aging and needs to be replaced, (2) the playground equipment at the park should be upgraded, and (3) the beach volley ball court could be improved.

Opportunities to launch kayaks could be offered by opening the Jefferson Street right-of-way (ROW) for limited use by carts. This would allow access to the shoreline for cart-pulled kayak trailers, while still requiring parking on the street. Providing signage explaining the ordinance would ensure that the new launch area is used appropriately. If it is more beneficial, the Main Street ROW (just south of the Park) could also provide similar access for kayak launching.

Next Steps:

The next step in advancing this project is to assist the Port O'Connor Chamber of Commerce in their fundraising efforts to improve the pavilion and other amenities.

Owner:

Calhoun County

Key Partners:

- Calhoun County
- Port O'Connor Chamber of Commerce

Other Partners:

- Calhoun County Navigation District
- Texas General Land Office
- Local foundations

Estimated Cost:

Moderate

Priority:

- Pavilion = High
- Other = Medium

Complexity

Medium

KINGFISHER PARK: PARK EXPANSION

PUBLIC ACCESS CATEGORY: PARK

NUMBER: 4

Current Status:

Kingfisher Park is located adjacent to Park Street in Port O'Connor and is owned by Calhoun County. The Park provides opportunities for fishing, swimming, wind surfing, and wildlife viewing. It also offers an excellent sandy beach for residents and visitors with children. Amenities at the Park include picnic cabanas, restrooms, outdoor shower, and fishing pier with T-head and lights that extends into Matagorda Bay. As waterfront development occurs in areas adjacent to the Park, this could restrict access to sections of the Park that are currently used by the public.

Project Description:

According to the Calhoun County Appraisal District, there are two parcels of land located between Jefferson and Adams Avenues (below the old seawall and inside the berm built to protect the beach replenishment area). Acquisition of these properties by Calhoun County for inclusion within Kingfisher Park would allow for the long-term protection of this valuable public asset and ensure continued use by the public. Similarly, acquisition of a third parcel east of Park Street between Van Buren and Tyler Avenues would protect public access between the existing Park boundary and the Right of Way at Tyler Street.

Next Steps:

The next step in advancing this project is to contact the landowners adjacent to Kingfisher Park regarding their willingness to sell. If they are agreeable, funding could then be sought to purchase an easement or acquire the property.

Owner:

- Calhoun County
- Private Landowners

Key Partners:

- Calhoun County
- Port O'Connor Chamber of Commerce

Other Partners:

- Calhoun County Navigation District
- Texas General Land Office
- Local foundations
- Non-profits

Estimated Cost:

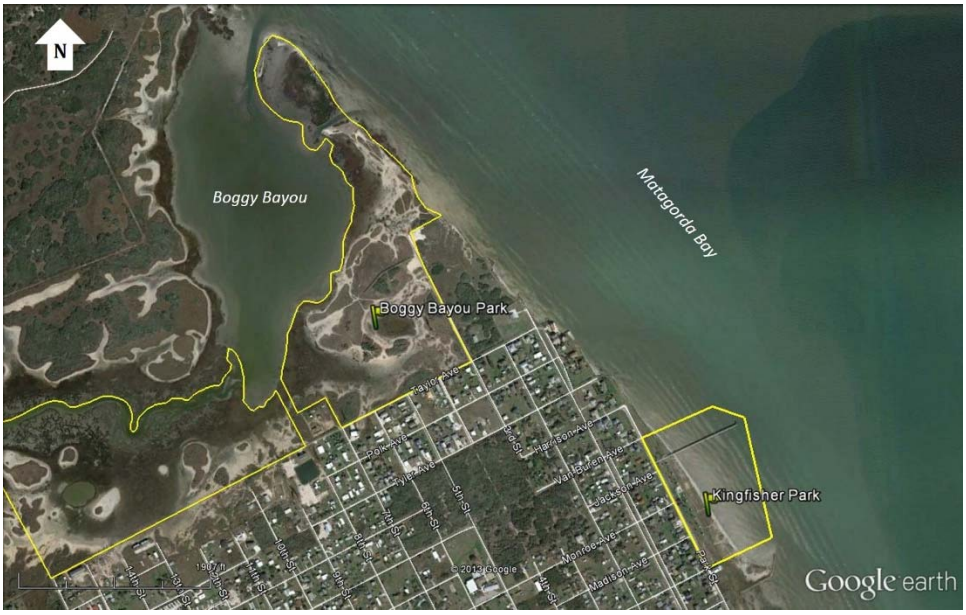
Moderate

Priority:

Low

Complexity:

High



Port O'Connor Beach Renourishment

PUBLIC ACCESS CATEGORY: PARKS, PIER

NUMBER: 5

Current Status:

In Port O'Connor, public access to the Matagorda Bay shoreline is currently provided at Kingfisher and Boggy Bayou parks. These sites are popular with residents and visitors because they offer access to the 'beach' and provide opportunities for fishing, swimming, kayaking, and windsurfing. Like many other areas along the Texas Coast, however, the shoreline from Kingfisher Park to Boggy Bayou Park is retreating. The placement of dredge material near the southern end of Kingfisher Park has helped to slow erosion problems in that area, but overall retreat of the shoreline is still an issue and must be considered on a larger scale that extends all the way to Boggy Bayou Park.

Project Description:

There are several major navigation channels within Calhoun County that require regular maintenance and dredging, and the sediments that result from these activities could provide opportunities to restore shorelines and habitats in Port O'Connor. Dredge material could also be collected near the end of the fishing pier at Kingfisher Park, which is currently too shallow to allow for effective fishing. Beneficial use of dredge material will provide protection for existing shoreline infrastructure, while also ensuring that residents and visitors can continue to enjoy the recreational activities available at Kingfisher and Boggy Bayou parks.

Next Steps:

The next step in advancing this project is to work with Calhoun County to form a committee to guide the beneficial use of dredge material in the Calhoun County area. By forming this committee, the County will be able to work proactively with the Army Corps of Engineers and Texas Department of Transportation to develop strategies for the best use of dredged sediments in restoration projects, such as beach renourishment.

Owner:

- Calhoun County
- Texas General Land Office

Key Partners:

- Calhoun County
- Texas General Land Office
- Calhoun County Navigation District
- Port O'Connor Chamber of Commerce
- Port of Calhoun County
- Army Corps of Engineers

Other Partners:

- Texas Department of Transportation
- U.S. Fish and Wildlife Service

Estimated Cost:

Moderate

Priority:

Medium

Complexity

High

Little Jetty: Public Facilities Planning and Improvements

PUBLIC ACCESS CATEGORY: PARK, PIER, KAYAKING

NUMBER: 6

Current Status:

Little Jetty is located at the intersection of Washington Blvd and Commerce St in Port O'Connor. This 'pocket park' adjacent to a granite jetty that extends 2,300 feet into Matagorda Bay on the north side of the Gulf Intracoastal Waterway (GIWW). Little Jetty is a traditional public fishing location that offers access to the deeper waters of the GIWW and Matagorda Bay. The site offers public parking but no other amenities are available. The jetty is owned by the U.S. Army Corp of Engineers, while Calhoun County owns an adjacent tract of land and the road right-of-ways (ROW) that currently provide parking for visitors. Rock rip-rap has been placed off Washington Street to prevent erosion. All other lands adjacent to the Park are privately owned.

Project Description:

Several improvements could be made to Little Jetty Park to enhance the recreational opportunities available to visitors. Potential improvements include: (1) provide a better surface for walking on jetty, (2) install lighting, (3) provide restroom facilities, (4) provide access to safety equipment, and (5) create kayak launch sites on both sides of the jetty. Additional parking areas would also be beneficial for allowing easier access to a larger number of visitors. The Washington Street ROW could be widened and stabilized (i.e., placement of shell material or additional rip-rap) to prevent further erosion and create additional parking areas. Planting of marsh grasses along the Washington Street frontage might also help protect this shoreline from erosion, while also improving habitat. If kayak launch facilities are provided, signs should be placed to remind kayakers to avoid damage to seagrass beds and to be especially careful during low tides. Acquisition of private parcels bordering the Jetty would ensure long-term public access. Additional improvements include the construction of facilities at a location further out the jetty (beyond seagrass).

Owner:

- Jetty = U.S. Army Corps of Engineers
- ROW for parking = Calhoun County
- Adjacent Land = private

Key Partners:

- Calhoun County
- Port O'Connor Chamber of Commerce
- Army Corp of Engineers

Other Partners:

- Port of Calhoun County
- Private Foundations

Estimated Cost:

Moderate (excluding any land acquisition costs)

Priority:

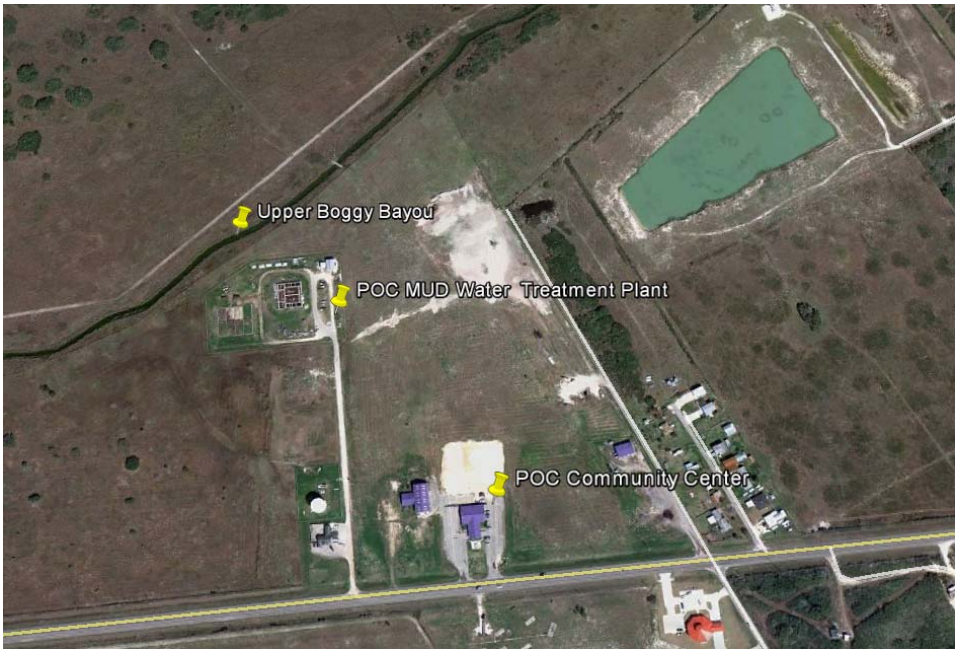
Medium

Complexity:

High

Next Steps:

The next step in advancing this project is to undergo a planning process to define the scope of the Little Jetty "pocket" park, outline potential improvement projects, prioritize potential projects, and identify partners and funding sources for various projects.



Port O'Connor Bird Sanctuary: Feasibility Analysis & Master Plan

PUBLIC ACCESS CATEGORY: BIRDING
NUMBER: 7

Current Status:

The treated effluent from the Port O'Connor Municipal Improvement District (MID) Wastewater Treatment Plant (WWTP) is currently discharged into Matagorda Bay, via the Boggy Bayou drainage area. The annual average flow at the Port O'Connor MID WWTP calculated from historic flow data is 0.15 MGD (2007–2010), which accounts for 25% of the permitted flow.

The MUD owns the land and/or maintains an easement on the land between the WWTP and the drainage creek. Calhoun County owns the adjacent property to the east where the Port O'Connor Community Center is located. The land is mostly undeveloped prairie with very few trees and shrubs.

Project Description:

The effluent from the Port O'Connor MID WWTP could be utilized to create a bird sanctuary by ensuring consistent water supply, planting appropriate vegetation, and installing necessary infrastructure (i.e., boardwalks, signs, viewing platforms). A similar project was undertaken in the City of Port Aransas near their WWTP, and this birding area serves as the one of the City's most popular tourist attractions.

In order to complete this type of project, a feasibility study should be conducted to determine the available options for using treated effluent to create an eco-tourism destination in Port O'Connor. The analysis should include estimates of the costs associated with building such a facility, as well consideration potential alternative sites.

Next Steps:

The next step in advancing this project is to identify and begin discussions with a group/entity that would be willing to lead this effort (e.g., Texas Audubon).

Owner:

- Port O'Connor Municipal Improvement District
- Calhoun County

Key Partners:

- Port O'Connor Chamber of Commerce
- Port O'Connor Municipal Improvement District
- Texas Audubon

Other Partners:

- Calhoun County
- Gulf Coast Bird Observatory
- Mid-Coast Texas Master Naturalists
- Texas Parks and Wildlife Department

Estimated Cost:

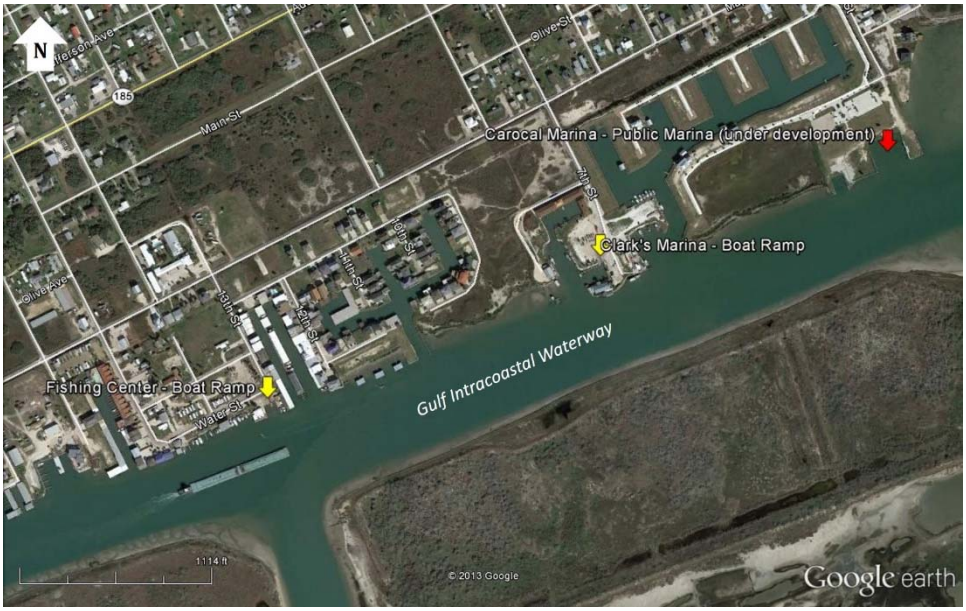
High

Priority:

Low

Complexity

High



Port O'Connor Public Marina & Boat Ramp

PUBLIC ACCESS CATEGORY: MARINA, BOAT RAMP
NUMBER: 8

Current Status:

Port O'Connor does not currently have a public marina, and the only publicly-owned boat ramp is the Texas Parks and Wildlife Department (TPWD) facility at Froggie's Bait Stand. The West Side Calhoun County Navigation District had previously considered the design and construction of a public marina and boat ramp, but no specific funding source was identified. Two private boat ramps that serve a significant percentage of boaters in Port O'Connor are currently for sale. Loss of these facilities to alternate waterfront development would significantly restrict boater access to local waters. Furthermore, continued growth within the Port O'Connor community will place increased pressure on existing boat ramps.

Recently, TPWD, in cooperation with Blackberry Island, LP, received funding from the U.S. Fish and Wildlife Service Boating Infrastructure Grant Program to refurbish an industrial marina near the Caracol Development. The new marina will feature dockage for 21 transient boats, restroom and shower facilities, and other boater amenities, but no boat ramp or parking.

Project Description:

Development of a public marina and boat ramp will ensure public access for the increasing numbers of residents and visitors seeking water access in Port O'Connor. The possibility of purchasing an existing facility that is currently for sale and/or purchasing undeveloped land for construction of a new marina/boat ramp should be explored.

Next Steps:

The next step in advancing this project is to engage the community and relevant partners in discussions about the need and feasibility of a public marina and boat ramp in Port O'Connor.

Owner:

Private Landowners

Key Partners:

- Calhoun County
- Port O'Connor Chamber of Commerce
- West Side Calhoun County Navigation District

Other Partners:

- US Fish and Wildlife Service
- Texas Parks and Wildlife Department

Estimated Cost:

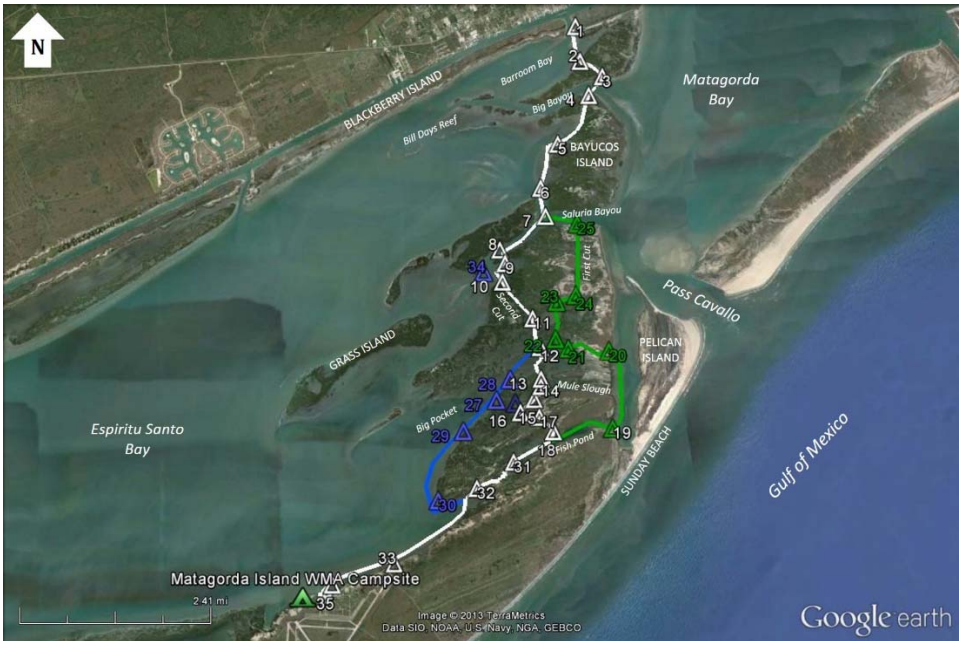
High

Priority:

High

Complexity:

High



Maintain and Expand the Port O'Connor Paddling Trail

PUBLIC ACCESS CATEGORY: KAYAKING

NUMBER: 9

Current Status:

The Port O'Connor (POC) Paddling Trail consists of three trails that total more than 25 miles: Fish Pond Trail, South Loop Trail, and North Loop Trail. The paddling trail winds through several bayous and across open water before eventually ending at Matagorda Island. The Fish Pond Trail begins in POC and travels through a number of bayous and cuts along the edge of Espiritu Santo Bay to Saluria Bayou, where it joins the North Loop Trail. From Mule Slough, the Fish Pond and South Loop trails continue east toward Sunday Beach Cove and to Lighthouse Cove, near the historic Matagorda Island Lighthouse. A one-day roundtrip is not recommended because of the long distance required to reach Matagorda Island. It is common to see campers on the Island, completing the trail over multiple days. Strong winds may also limit the completion of the entire paddling trail.

The POC Paddling Trail is currently the only marked trail within the San Antonio Bay System. The trail ends near a primitive camping site at the Matagorda Island Wildlife Management Area. The trail currently has no "community sponsor" or official start point, both of which are required by the current protocol for recognition as a certified Texas Parks and Wildlife Department (TPWD) Paddling Trail.

Project Description:

There are several maintenance and expansion projects that could be undertaken to the make the POC Paddling Trail the longest shallow water / near shore paddling trail in Texas. Maintenance projects include: identification of a "community sponsor," creation of a launch point and kiosk, and repair of existing trail markers. Expansion projects include additional trails to Bill Day's Reef and J-Hook and an Espiritu Santo Bay Loop. Potential expansion projects are described in more detail below:

Owner:

Texas Parks and Wildlife Department (trail currently has no community sponsor)

Key Partners:

- Calhoun County
- Port O'Connor Chamber of Commerce
- West Side Calhoun County Navigation District
- Texas Parks and Wildlife Department

Other Partners:

- Texas Sea Grant Calhoun County Extension Agent
- Local Foundations

Estimated Cost:

Low - Moderate

Priority:

Medium

Complexity:

Medium

Project 9a: Create official starting point for Port O'Connor Paddling Trail

Several options exist for creating an official starting point with an informational kiosk:

1. **Fishing Center** is a private boat ramp located at the intersection of Water St and 13th Street in Port O'Connor and currently serves as the official starting point of the POC Paddling Trail. The ramp is situated immediately adjacent to the Gulf Intracoastal Waterway (GIWW) and is the closest launch point to the start of the trail at Marker 1. A fee is charged to launch/park. The facility includes two concrete ramps that are separated by a short pier. The area is exposed to waves generated by boat traffic in the GIWW. As of November 2013, the property is listed for sale.
2. **Clarks Marina** is a private boat ramp and marina located at end of 7th Street in Port O'Connor Texas. It is located directly adjacent to the GIWW and a fee is charged to launch/park. The facility includes a single concrete boat ramp, but the marina area provides protection from boat waves generated in the GIWW and there is sufficient space for construction of a kayak launch. The northern portion of the marina (near Commerce St and the on-site motel) or the area across from the motel docks are both good potential locations for a kayak launch if appropriate arrangements can be made with the owner. The Marina is located about 0.4 miles east of Marker 1, requiring a longer paddle in the busy GIWW. As of November 2013, the marina is listed for sale.
3. The Washington Avenue and Commerce Street right-of-ways (ROWs) at **Little Jetty** are owned by Calhoun County and provide public access to the north side of the GIWW. Public parking is available for approximately six vehicles and access to the water is reasonably close. The site is subject to waves from the GIWW and can be exposed to strong wind and tidal currents due the proximity of the launch site to the GIWW entrance to Matagorda Bay. The main drawback of this site is that it requires a paddle of approximately 0.9 miles in the busy GIWW to reach Marker 1. An alternative paddling route that travels east out the GIWW then around the

shore to Big Bayou (Marker 3) could also be established. With the creation of this alternate route, the paddler could choose their route dependent on weather and boat traffic.

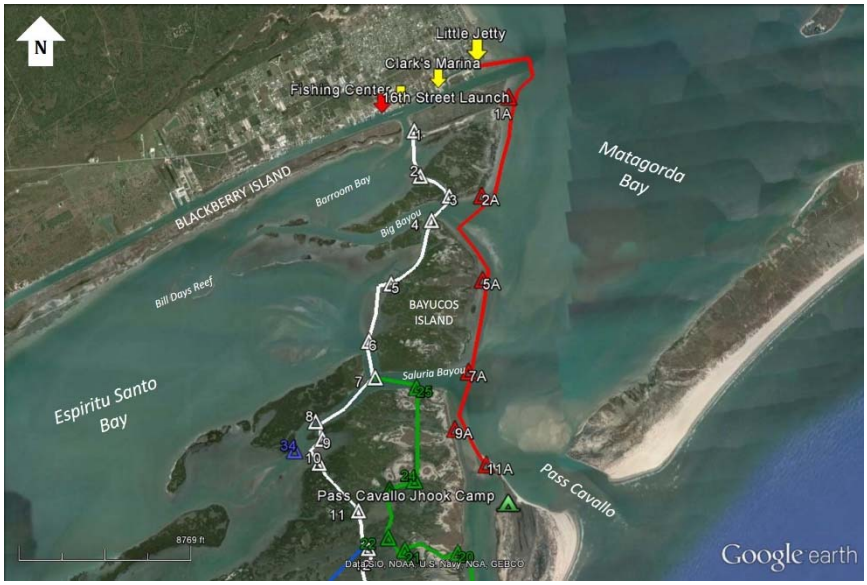
4. **Sixteenth Street** dead ends at the GIWW and could provide space for building a kayak launch site. After the Fishing Center, this site offers the closest access to Marker 1. Parking could be made available along the 16th Street ROW or through arrangements with the USFWS site that is adjacent. Before installation could begin, a survey is needed to mark boundaries to adjacent properties, a design for the kayak launch facility must be developed, and a parking plan should be established.
5. The information kiosk could be developed at or near **POC Paddling Trail Marker 1**. The kiosk could be supplemented with simple signage at the Fishing Center, Clarks, and Little Jetty Park, noting the location of Marker 1 relative to each potential launch site.

Project 9b: Expand POC Paddling Trail to Include Bill Day's Reef Loop

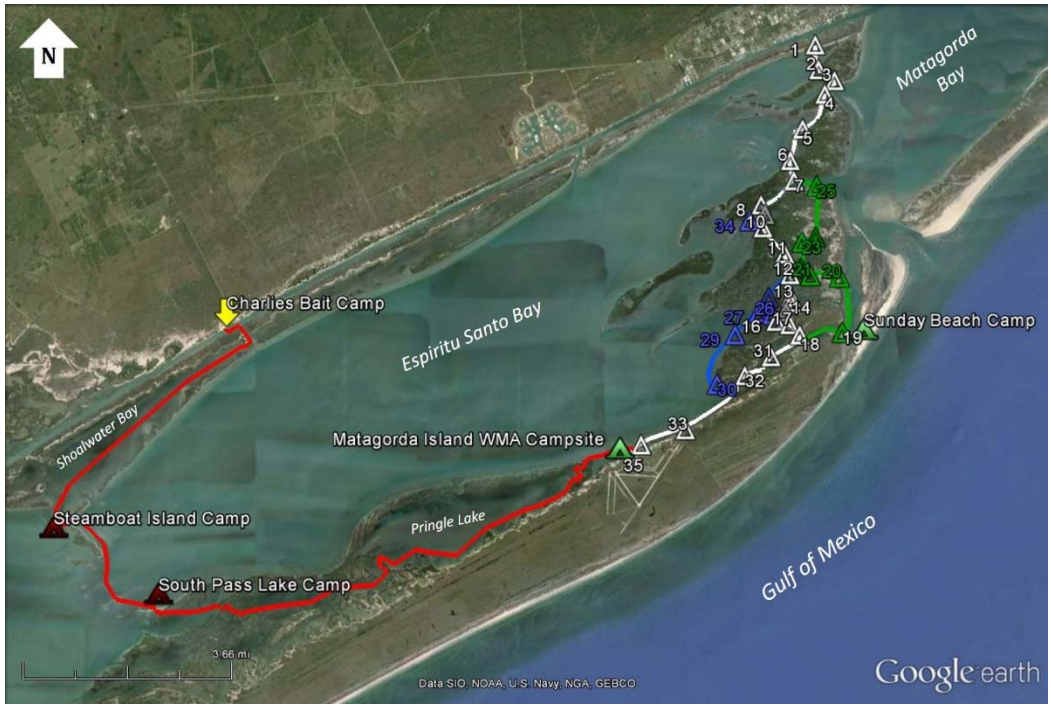
An additional option could be added to the POC Paddling Trail for paddlers with less experience, or those with less time. The Loop would begin near Marker 1 of the POC Paddling Trail, travel through Barroom Bay to Bill Day's Reef, and loop back to Marker 2 via Big Bayou and Barroom Bay. The addition of a marked trail (shown in yellow) would add approximately six miles of trails to the existing POC Paddling trails. The trail would be located in relatively protected waters and in an area of less boat traffic. The addition of this trail would provide kayaking opportunities for a wider range of paddling skill levels, potentially increasing the number of people that utilize this area for kayaking.

Project 9c: Expand trail to include Little Jetty Park to J-Hook/Pass Cavallo Trail

The POC Paddling Trail could also be expanded to include a trail from Little Jetty Park to the J-Hook near Pass Cavallo. The trail would travel south of Port O'Connor along the shoreline of Matagorda Bay, across Big Bayou and Saluria Bayou, to the J-Hook on the western side of Pass Cavallo. The total distance of the trail would be approximately 4.8 miles (one way). Primitive camping opportunities are available on the J-hook sand spit. This trail would offer excellent fishing opportunities in both the Pass and Sunday Cove. Loops to the existing POC Paddling Trail could be made to Markers 25, 21, and/or 20.



Project 9d: Expand POC Paddling Trail to include Espiritu Santo Bay Trail



Espiritu Santo Bay offers the opportunity for extended paddling trips through relatively protected waters. The current POC Paddling Trail ends at the Matagorda Island Wildlife Management Area, where primitive camping sites are available. However, the Trail could be extended south through Pringle Lake and Contee Lake to a primitive camp located on a shell reef at South Pass Lake. The Trail could then continue across Espiritu Santos Bay to Shoalwater Bay and, ultimately, to Charlie's Bait Camp. In total, the Trail would provide a 32-mile paddle. In certain areas of the trail, extra steps may be needed to ensure that paddlers maintain an adequate distance from islands that are being utilized by colonial nesting waterbirds. High reefs at South Pass and Steamboat Pass provide excellent primitive camping and have been used by local fisherman. Camping is also available at Sunday Beach and could be used as an additional stopping point along the Trail. Given the distances involved and lack of potable water, this trail should be described as an "expert" trail. Additionally, these trips are best accomplished with support by an outfitter or by private motor boat.

<u>Port O'Connor to Charlie's Bait Camp</u>
(utilizes 4 camp sites)
POC to Sunday Beach Camp = 8.0 mi
Sunday Beach to MIWMA Camp = 4.7 mi
MIWMA to South Pass Camp = 10.3 mi
South Pass to Steamboat Island Camp = 2.7 mi
<u>Steamboat Island to Charlie's Bait Camp = 5.5 mi</u>
Total (approx. 5 days, 4 nights) = 32.3 miles

Next Steps:

The next step in advancing this project is to finalize the agreements that establish an official community sponsor for the Trail through a formal partnership of the POC Chamber of Commerce, San Antonio Bay Partnership, West Side Calhoun County Navigation District, and Calhoun County. Following this step, the community sponsors listed above should work together to implement Projects 9a, 9b, and 9c.

16TH STREET FISHING PARK & KAYAK LAUNCH

PUBLIC ACCESS CATEGORY: PARK, KAYAKING

NUMBER: 10

Current Status:

The right-of-way on 16th Street in Port O'Connor, along with the bulkhead area of the adjacent U.S. Fish and Wildlife Service (USFWS) / Texas Parks and Wildlife Department (TPWD) facility, provides the opportunity for public access to the Gulf Intracoastal Waterway (GIWW).

The ROW on 16th Street is owned by Calhoun County and provides a potential location for the construction of a kayak launch site that can be used to access the GIWW. It is the closest publically owned property to Marker 1 on the POC Paddling Trail and would provide free access for paddlers, while reducing the amount of paddling time within the busy GIWW. The site is already being used by paddlers for launching kayaks.

U.S. Fish and Wildlife Service (USFWS) owns the dock adjacent to the 16th Street ROW. The dock is used by USFWS and TPWD to meet their research and management needs in San Antonio Bay and at the Matagorda Island Wildlife Management Area and Aransas National Wildlife Refuge. An area along the property's bulkhead lies outside of the security fence and could be made accessible for public use. The bulkhead is currently being used by fisherman.

Project Description:

The combination of the 16th street ROW and the adjacent USFWS property (outside the security fence) would make an excellent fishing park, while also providing an additional site to access the POC Paddling Trail. Designs for a fishing park and kayak launch site would need to be developed through collaboration with Calhoun County, USFWS, and TPWD.

Next Steps:

The next step in advancing this project is to engage the relevant partners in a discussion about the feasibility of each project component.

Owner:

- Calhoun County
- U.S. Fish and Wildlife Service
- Texas Parks and Wildlife Department

Key Partners:

- Calhoun County
- Port O'Connor Chamber of Commerce
- U.S. Fish and Wildlife Service
- Texas Parks and Wildlife Department

Other Partners:

West Side Calhoun County Navigation District

Estimated Cost:

Moderate

Priority:

Medium

Complexity:

High

San Antonio Bay Ecosystem Visitor Center

PUBLIC ACCESS CATEGORY: EDUCATION
NUMBER: 11

Current Status:

The Texas Parks and Wildlife Department (TPWD) Coastal Fisheries Division Office for the San Antonio Bay Ecosystem is located at 418 S 16th St in Port O'Connor. TPWD recently funded the demolition of the old, 1960's office building that was used by the staff of the Coastal Fisheries Division and funded the construction of a new, modern, "green" building. The newly constructed building was designed to withstand hurricane winds and storm surges, and is a candidate for Silver LEED certification due to the use of recycled materials, site sustainability, and water conservation systems. The new building provides office, lab, and storage areas for the Coastal Fisheries Division staff. The building also has space for the installation of a visitor center, but funding is not currently available to design and install one within the space provided.

Project Description:

The new TPWD Coastal Fisheries Division Office in Port O'Connor provides space to create a visitor center that can be utilized by the general public. The purpose of the facility would be to educate and inform the public regarding the following areas: (1) ecology of San Antonio Bay ecosystem, (2) mission and ongoing work of the TPWD Coastal Fisheries Division, (3) current status and trends of the San Antonio Bay ecosystem based on TPWD data, and (4) public access information. The facility would need to have a low operational cost, require little daily- and long-term maintenance, and be consistent with TPWD guidelines. In addition, since dedicated TPWD staff are not available to oversee the space on a daily basis, volunteers would be needed to serve as educational docents and help care for the space.

Owner:
Texas Parks and Wildlife Department

Key Partners:
- Texas Parks and Wildlife Department
- Mid-Coast Texas Master Naturalists
- Port O'Connor Chamber of Commerce

Other Partners:
- University of Houston – Victoria
- Calhoun County Independent School District

Estimated Cost:
Moderate

Priority:
Medium

Complexity:
Low

Next Steps:

The next step in advancing this project is to form a committee of representatives from partner groups that can assist with the development of a conceptual design for the visitor center space (i.e., layout, content of displays, method of operation, estimated cost). Potential members for the committee could include: San Antonio Bay Partnership, Mid-Coast Texas Master Naturalists, Port O'Connor Chamber of Commerce, University of Houston-Victoria, and Calhoun County Independent School District. Following the development of the conceptual design, funding would need to be sought to implement the design. All aspects of the design would have to be approved by designated representative(s) from TPWD before moving forward and seeking funding.

Restore Amenities at Matagorda Island WMA

PUBLIC ACCESS CATEGORY: PARK, PIER, KAYKING, BIRDING, EDUCATION

NUMBER: 12

Current Status:

The Matagorda Island Wildlife Management Area (WMA) consists of 56,688 acres of offshore barrier island and bayside marshes. The area is jointly owned by the Texas General Land Office and the U.S. Fish and Wildlife Service (USFWS) and is cooperatively managed as the Matagorda Island National Wildlife Refuge and State Natural Area. Texas Parks and Wildlife Department (TPWD) manages the WMA for public use and USFWS has the main responsibility for managing the wildlife and habitat on the island.

Prior to its establishment as a WMA, the area was operated as a State Park by TPWD. The State Park was closed when the ferry that serviced the Island was destroyed and not replaced. Currently, Matagorda Island WMA is only accessible to the public by boat - private boat, arrangement with a local outfitter, or paddling the Port O'Connor (POC) Kayak Trail (approx. 12 miles). The POC Chamber of Commerce and the local TPWD office maintain a list of local outfitters that provide shuttle services.

Matagorda Island supports a variety of migratory birds, a large herd of white-tailed deer, alligators, and other wildlife. Activities on the Island include fishing, hunting (available through TPWD), wildlife viewing, picnicking, and historical interpretation. The bayside campground area includes picnic cabanas and restroom/shower facilities, but there is no potable water or electricity. A lighthouse dating from 1852 still stands at the north end of the island and is located several miles from the campground area. All access to the lighthouse, as well as the Gulf beach, is via hiking or biking. Picnic and camping sites are also available on the Gulf Beach side of the Island but are in poor condition. An education facility is located near the campground area. This building is no longer in use but is still in reasonably good condition.

Owner:

- U.S. Fish and Wildlife Service
- Texas General Land Office
- Texas Parks and Wildlife Department

Key Partners:

- Calhoun County
- Port O'Connor Chamber of Commerce
- Texas Parks and Wildlife Department
- U.S. Fish and Wildlife Service
- Texas General Land Office

Other Partners:

- Texas Master Naturalists
- Friends of Aransas and Matagorda Island Refuges

Estimated Cost:

High

Priority:

Medium

Complexity:

High

Project Description:

Several steps or sub-projects should be considered in order to restore the amenities at Matagorda Island WMA and provide higher-quality recreational experiences to a larger number of visitors:

1. **Access to the Island should be improved.** This could be accomplished either by increasing the dissemination of information about existing outfitters that provide transport to the Island, or by building partnerships with a private entity that could provide a larger vessel for transportation of individuals on a periodic/seasonal basis.
2. **Provide public education opportunities.** Reinstating environmental and historical education programs on the Island would provide additional recreational opportunities for visitors. These programs could be done on a seasonal basis in cooperation with the Mid-Coast Texas Master Naturalist Chapter, who recently sought funding to reinstate a seasonal educational program in which the Master Naturalists would provide volunteer docents for programs on the Island. This could increase visitation to the Island by a wider audience, including families.
3. **Ensure ongoing maintenance of the Lighthouse.** Continued maintenance is needed in order to preserve the Matagorda Island Lighthouse. The Friends of the Aransas and Matagorda Island National Wildlife Refuges are currently working on an effort to assist with the maintenance of this historic treasure, but additional partnerships and funding are needed.
4. **Provide visitors with transportation to the interior of the Island.** The Lighthouse and Gulf beach are located several miles away from the bayside access point at the campground, and currently, the only way to reach these attractions is by foot or bike. Providing visitors with transportation to these areas of the Island would increase the number of recreational opportunities available to many visitors, which could ultimately increase visitation. This could be done on a seasonal basis.
5. **Repair camping/picnic facilities at the bayside camp site and on the Gulf Beach.** Repairing the camping/picnic facilities on the Island would provide visitors with improved amenities, resulting in a higher-quality experience for visitors.
6. **Construct a short fishing pier at the bayside camp site and on the Gulf Beach.** Construction of a short fishing pier at the bayside camp site and on the Gulf Beach side of the Island would enhance the fishing opportunities available to visitors, which could increase visitation.
7. **Upgrade visitor facilities at the lighthouse.**
8. **Install interpretive signs.** Installation of interpretive signs that highlight the ecology, wildlife, and history of Matagorda Island will help to educate the public, while also improving the experience that visitors have while on the Island.
9. **Restore to State Park status:** Undergo appropriate steps to reestablish Matagorda Island WMA as an official State

Next Steps:

The next step in advancing this project is to engage interested stakeholders in assessing and prioritizing the need for improved amenities at Matagorda Island WMA, developing strategies for implementation of potential improvements, and discussing approaches for seeking support from U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department.

SANDERS MEMORIAL PARK: PUBLIC FACILITIES IMPROVEMENTS

PUBLIC ACCESS CATEGORY: PARK, PIER, KAYAKING
NUMBER: 13

Current Status:

Sanders Memorial Park is located at the end of Swan Point Road near Seadrift. The Park is owned by Calhoun County and offers visitors with opportunities for picnicking, fishing, swimming, wildlife viewing, and windsurfing. Amenities at the Park include a boat ramp, picnic cabanas, and electricity/lighting.

Erosion problems are evident along the bulkhead at the Park, and several small bird islands located near the Park are also eroding. The Park would benefit from additional parking near the boat ramp, and it also lacks an official area to launch kayaks.

Project Description:

The open water area northwest of the Park is blocked from southeasterly winds and contains two nearby islands, which makes it ideal for kayaking. The construction of a kayak launch site would provide visitors with easier access to an excellent paddling area. The construction of a lighted fishing pier would also increase the recreational opportunities available to visitors by allowing access for fishing in deeper waters. Other potential improvements include construction of additional freshwater sources and restrooms.

Beneficial use of dredge material from nearby channels and/or other shoreline stabilization techniques (i.e., placement of shell, planting of marsh grass) could help prevent erosion along the bulkhead. Placement of dredge material next to seagrass areas could create additional bird habitats and improve wildlife viewing opportunities.

Owner:
Calhoun County

Key Partners:
- Calhoun County
- City of Seadrift

Other Partners:
Texas Parks and Wildlife Department

Estimated Cost:
Moderate

Priority:
Medium

Complexity:
Medium

Next Steps:

The next step in advancing this project is for Calhoun County to prioritize potential improvement projects at Sanders Memorial Park. Following the prioritization process, fundraising efforts can begin for specific projects.

SANDERS MEMORIAL PARK: BOAT RAMP DREDGING

PUBLIC ACCESS CATEGORY: BOAT RAMP

NUMBER: 14

Current Status:

Sanders Memorial Park is located at the end of Swan Point Road near Seadrift, Texas. The Park is owned by Calhoun County and offers visitors with opportunities for picnicking, fishing, swimming, wildlife viewing, and windsurfing. Amenities at the Park include a boat ramp, picnic cabanas, and electricity/lighting.

The entrance channel to the boat ramp is in need of maintenance dredging due to shoaling issues that currently make access difficult.

Project Description:

There are few public boat ramps that offer access to San Antonio Bay. Maintenance dredging of the boat ramp access channel at Sanders Memorial Park will help to ensure that continued access is available for boaters.

Next Steps:

The next step in advancing this project is for Calhoun County to work with partners to determine the cost and feasibility of ongoing maintenance dredging of the boat ramp.

Owner:

Calhoun County

Key Partners:

- Calhoun County
- West Side Calhoun County Navigation District

Other Partners:

- City of Seadrift
- Texas Parks and Wildlife Department
- Private Marina

Estimated Cost:

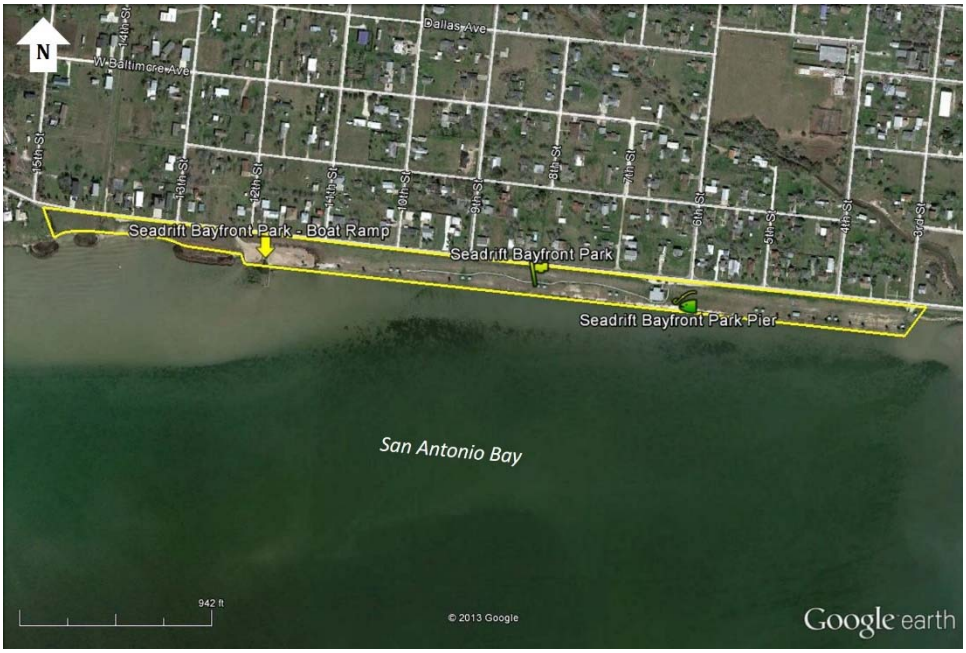
Moderate

Priority:

High

Complexity:

Medium



SEADRIFT BAYFRONT PARK: PUBLIC FACILITIES IMPROVEMENTS

PUBLIC ACCESS CATEGORY: PARK, KAYAKING

NUMBER: 15

Current Status:

Seadrift Bayfront Park is located at the intersection of Main and Bay Avenues in Seadrift. The Park stretches for approximately 3,300 feet along the shoreline of San Antonio Bay and offers opportunities for fishing, wildlife viewing, picnicking, and wind surfing. Amenities at the park include picnic cabanas, playground equipment, covered pavilion, restrooms, seawall, and newly constructed fishing pier. A Texas Parks and Wildlife Department boat ramp is also located at the West end of the Park, but it is not useable by larger boats due to shoaling issues.

This park is the endpoint for the event known as the Texas Water Safari. The annual event features kayakers and canoeists in a race from San Marcos to Seadrift via the San Marcos and Guadalupe Rivers (260 mile course).

Project Description:

There are several projects that would improve the quality of the Seadrift Bayfront Park. For example, the Park would benefit from refurbishing the existing restroom facilities, located at the East end of the Park, and construction of additional restroom facilities near the pavilion and fishing pier. Additionally, conversion of the boat ramp to a kayak launch site (potentially designed to support the needs of the Texas Water Safari) would provide paddlers with much easier access to the water. This will be especially important if a kayak trail is developed from Seadrift to the Guadalupe Delta. This type of trail would use interpretive signs to educate and guide paddlers through marsh, bay, delta, and riverine habitats. Establishment of kayak trails that depart from Austwell and the Guadalupe River could potentially increase use of the trail.

Owner:

City of Seadrift

Key Partners:

- City of Seadrift
- Calhoun County

Other Partners:

- Texas Parks and Wildlife Department
- Texas Water Safari

Estimated Cost:

Moderate

Priority:

- Restrooms = High
- Boat Ramp = High
- Other = Medium

Complexity:

Medium

Next Steps:

The next step in advancing this project is for the City of Seadrift to seek funding to implement their highest priority projects, which currently are the refurbishment of existing restrooms, construction of additional restrooms, and modifications to the boat ramp area.

CITY OF SEADRIFT MARINA: MAINTENANCE AND REPAIR

PUBLIC ACCESS CATEGORY: MARINA

NUMBER: 16

Current Status:

The City of Seadrift Marina provides visitors with numerous amenities, including a boat ramp, bait stand, fueling dock, and fish cleaning station. The Marina offers one of the fastest accesses to San Antonio Bay and the Guadalupe Delta. It is also the docking location for numerous shrimp and oyster boats. The City of Seadrift leases the operation of the boat ramp to a private company. Similarly, boat docks are leased by the City to private companies and individuals. The Marina is located next to hotels and other recreational infrastructure, providing easy access for tourists. The bulkheads, docks, and piers are in the Seadrift Marina are in need of general repair. The Marina also lacks sufficient navigational aids to guide boaters safely in and out of the marina area.

Project Description:

The City of Seadrift Marina would benefit from maintenance and repair of bulkheads, docks, and piers, as well as installation of additional navigational aids. Acquisition of a nearby property would also help ensure access to all sections of the Marina for maintenance and repair work.

Next Steps:

The next step in advancing this project is for the City of Seadrift to obtain cost estimates for improvement projects (i.e., repair bulkhead, dredge harbor, dredge boat ramps, repair piers/docks, navigational markers) so that funding can be sought.

Owner:

City of Seadrift

Key Partners:

- City of Seadrift
- Calhoun County
- West Side Calhoun County Navigation District

Other Partners:

- U.S. Army Corps of Engineers
- Texas Parks and Wildlife Department

Estimated Cost:

High

Priority:

High

Complexity:

Medium

CITY OF SEADRIFT MARINA: BOAT RAMP DREDGING

PUBLIC ACCESS CATEGORY: BOAT RAMP

NUMBER: 17

Current Status:

The City of Seadrift Marina provides visitors with numerous amenities, including a boat ramp, bait stand, fueling dock, and fish cleaning station. The Marina offers one of the fastest accesses to San Antonio Bay and the Guadalupe Delta. It is also the docking location for numerous shrimp and oyster boats. The City of Seadrift leases the operation of the boat ramp to a private company. Similarly, boat docks are leased by the City to private individuals. The Marina is located next to hotels and other recreational infrastructure, providing easy access for tourists.

Large numbers of boaters use this boat launching site during peak seasons and the parking area is often filled to capacity. However, there is currently no room for parking expansion. In addition, the boat access channel is shallow and would benefit from dredging.

Project Description:

The boat ramp at the City of Seadrift Marina provides great access to San Antonio Bay and the Guadalupe Delta. Efforts should be made to conduct maintenance dredging of the boat ramp access channel to ensure continued use by residents and visitors.

Next Steps:

The City of Seadrift is currently working with an engineering firm to determine the design and cost of creating the "Seadrift Channel." The next step in advancing this project is to support the City's efforts to acquire funding for the dredging project following the completion of the engineering study.

Owner:

City of Seadrift

Key Partners:

- City of Seadrift
- Calhoun County
- West Side Calhoun County Navigation District

Other Partners:

- U.S. Army Corps of Engineers
- Texas Parks and Wildlife Department

Estimated Cost:

High

Priority:

High

Complexity:

Medium

GUADALUPE DELTA PADDLING TRAIL

PUBLIC ACCESS CATEGORY: KAYAKING

NUMBER: 18

Current Status:

There are currently no designated paddling trails that depart from the communities of Seadrift, Austwell, or utilize the Lower Guadalupe River. The Lower Guadalupe River and Delta area, however, have the potential to provide visitors with a paddling trail that travels through several important coastal habitats.

Project Description:

The proposed paddling trail for Guadalupe Bay, Mission Lake, and Hynes Bay would allow access to the trail from several different points, including but not limited to: Seadrift Bayfront Park, River Road at the Guadalupe Delta Wildlife Management Area (GDWMA), Hynes Unit of the GDWMA, Guadalupe River bridge at Hwy 35, River Road Bridge right-of-way, private property off Sonneman Rd, and Austwell Park. The access points on the GDWMA would require approval of Texas Parks and Wildlife Department. This would likely require a general use permit and access terms would need to be determined. The Sonneman Road access point would require acquisition of a road right-of-way by Calhoun County or a contractual arrangement with the landowner.

Paddlers should recognize that there are risks associated with paddling in less protected areas with higher winds and more boat traffic. Given the remoteness of the area and the lack of quick emergency response, it is essential that the area be described for experience/expert paddlers only.

Guadalupe Delta Trails
Seadrift to Austwell = 8.3 miles
Guadalupe Bay/Mission Lake Loop (incremental) = 11.8 miles
Haynes Bay Loop (incremental) = 6.2 miles
River to Bay Interconnect = 3.6 miles
Traylor Cut Interconnect = 1.3 miles
Lower River Trail (Hwy 35 to River Road) = 3.6 miles
Total Trail Mileage = 34.8 miles

Owner:

- Texas General Land Office
- City of Seadrift
- City of Austwell
- Texas Parks and Wildlife Department
- Texas Department of Transportation

Key Partners:

- City of Seadrift
- City of Austwell
- Calhoun County
- Refugio County
- Texas Parks and Wildlife Department

Other Partners:

- Texas General Land Office
- Texas Department of Transportation
- Texas Water Safari
- Texas 200 Sailing Race

Estimated Cost:

Low - Moderate

Priority:

Medium

Complexity:

High

Next Steps:

The next step in advancing this project is to engage Texas Parks and Wildlife Department regarding the design and feasibility of the proposed Trail and then seek community support.

Victoria Barge Canal / State Hwy 35 Fishing Deck

PUBLIC ACCESS CATEGORY: PARK, PIER

NUMBER: 19

Current Status:

The area where the Victoria Barge Canal and State Highway 35 intersect provides the public with access to the Canal for fishing. An existing dirt road allows for easy access and parking, but the area has limited direct access to the water due to steep slopes on the banks. These steep slopes present a safety concern and are dangerous for visitors trying to access the water.

Project Description:

Installation of a foot path and wooden deck along the eastern shore of the Victoria Barge Canal at the State Hwy 35 intersection would greatly enhance the recreational fishing opportunities offered at this site. Construction of a deck underneath the bridge would allow fisherman to easily access the Canal and would reduce the potential danger to visitors. The majority of the area that is currently used for shoreline access is situated in the Texas Department of Transportation right-of-way (ROW), but the unpaved access roads that lie north and south of State Hwy 35 are located outside of the ROW on adjacent property. The property located to the north of the ROW is part of Green Lake, which was recently purchased by Calhoun County. The property to the south of the ROW belongs to Texas Parks and Wildlife Department. Additionally, the West Side Calhoun County Navigation District would need to be consulted before any type of fishing structure could be constructed within the Canal.

Next Steps:

Options for constructing a fishing deck along the Canal will likely be identified in the Green Lake Master Plan, which is currently under development. The next step in advancing this project is to explore the options identified in the Master Plan for their feasibility and cost.

Owner:

- Texas Department of Transportation
- Calhoun County
- Texas Parks and Wildlife Department

Key Partners:

- Calhoun County
- West Side Calhoun County Navigation District
- Texas Department of Transportation
- Texas Parks and Wildlife Department

Other Partners:

Army Corps of Engineers

Estimated Cost:

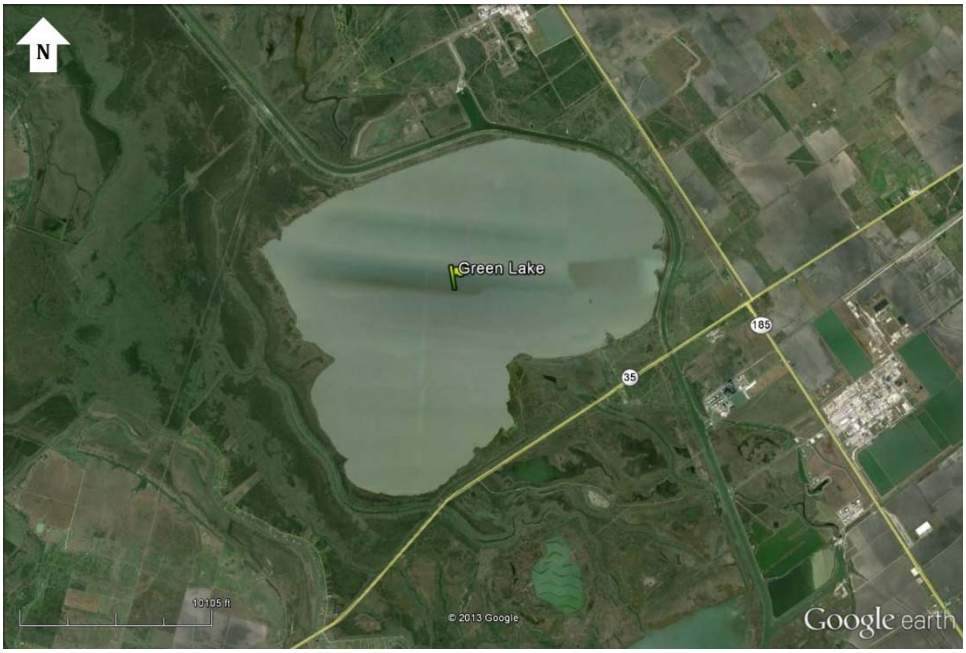
Moderate

Priority:

Medium

Complexity:

High



GREEN LAKE: MASTER PLAN

PUBLIC ACCESS CATEGORY: PARK

NUMBER: 20

Current Status:

Green Lake is a natural freshwater lake located in Calhoun County in the Guadalupe River floodplain. Known for its greenish waters, from which its name derives, the lake encompasses about 10,000 acres and is one of the largest natural freshwater lakes in Texas, in spite of its close proximity to salt water. Habitats associated with Green Lake include grassy, poorly drained freshwater marsh that provides habitat for a variety of waterfowl and colonial waterbirds.

Calhoun County recently acquired Green Lake and adjacent property using Coastal Impact Assistance Funding and plan to turn the area into a County park with managed recreational activities that emphasize conservation.

Project Description:

In order to properly manage recreational activities within the future Green Lake County Park and ensure conservation of critical habitats, Calhoun County needs to develop a Master Plan for the Park. Topics for inclusion within the Plan include: public access and control, potential recreational uses, conservation of sensitive areas (including colonial waterbird nesting areas), and water level management.

Next Steps:

Calhoun County is currently in the process of developing a Master Plan for the Green Lake area. Additional support should be provided by partners whenever possible in order to continue the advancement of this effort.

Owner:
Calhoun County

Key Partners:
Calhoun County

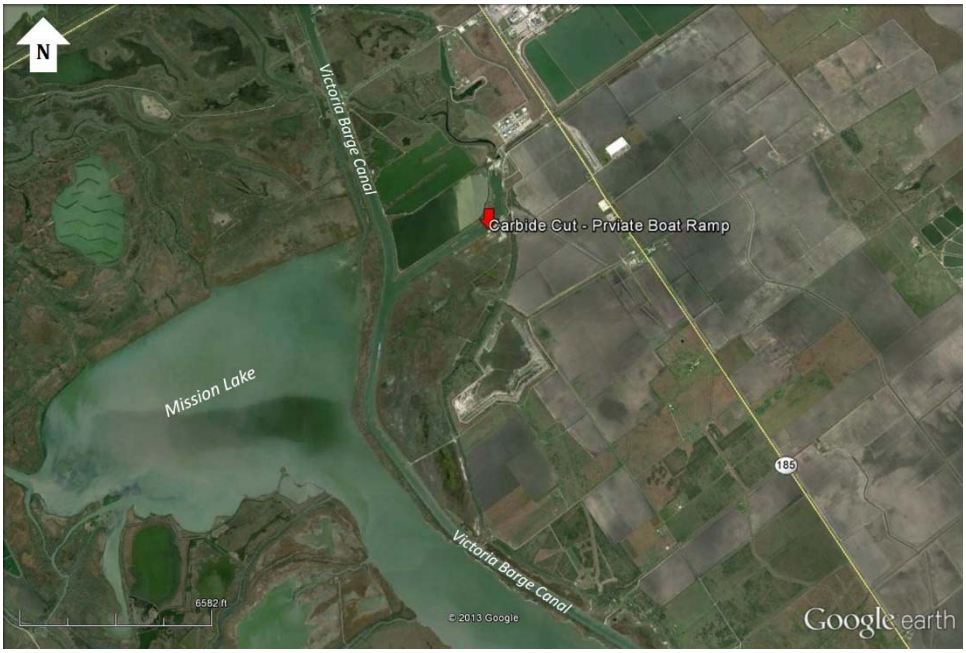
Other Partners:

- Texas Parks and Wildlife Department
- National Park Service

Estimated Cost:
High

Priority:
High

Complexity:
Medium



VICTORIA BARGE CANAL BOAT RAMP: FEASIBILITY STUDY

PUBLIC ACCESS CATEGORY: BOAT RAMP
NUMBER: 21

Current Status:

There is currently no site that provides public boat access to the Victoria Barge Canal. Historically, the Carbide Cut Boat Ramp, which is located in Calhoun County off GBRA Road, was used by the public to access the Canal, but the boat ramp is leased to Dow Chemical and closed to public use due to potential security and safety concerns. In the past, additional boat ramps that required a user fee were available on the Canal, but these locations are also all now closed.

Project Description:

The Victoria Barge Canal is a popular fishing spot, especially during the winter months. Installation of a public boat ramp along the Canal would greatly improve access to an area that is currently difficult to reach.

Next Steps:

The next step in advancing this project is to conduct a feasibility to determine potential locations (e.g., private property, Hwy 35 Right-of-Way) for and issues associated with constructing a boat ramp on the Victoria Barge Canal. Following this assessment, the appropriate partners can be engaged in conversations about how to move the project forward.

Owner:

West Side Calhoun County Navigation District

Key Partners:

- Calhoun County
- West Side Calhoun County Navigation District

Other Partners:

- Dow Chemical
- Texas Department of Transportation
- Private landowners

Estimated Cost:

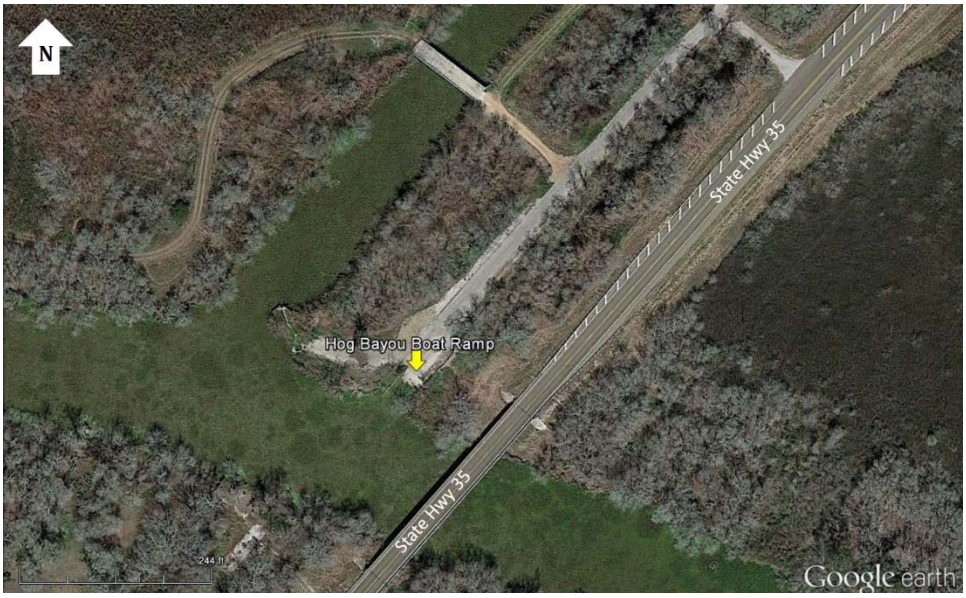
Moderate

Priority:

High

Complexity:

High



Hog Bayou Boat Ramp Improvements

PUBLIC ACCESS CATEGORY: BOAT RAMP

NUMBER: 22

Current Status:

A Texas Parks and Wildlife Department boat ramp is located on the north side of the State Hwy 35 bridge at Hog Bayou. The entrance to the site lies just north of the bridge. Current infrastructure at the site includes a single concrete boat ramp and parking area. The boat ramp offers access to Hog, Schwings, and Goff bayous.

Invasive aquatic plants are problematic in this area and frequently block waterways and limit boat traffic. The San Antonio Bay Foundation has recently undertaken efforts to treat invasive aquatic plants in the San Antonio Bay area. They are also leading an initiative to develop a Cooperative Weed Management Area that would bring additional funding for future invasive species removals.

Project Description:

Several improvements could be made to increase the usability of the boat ramp at Hog Bayou, including installation of infrastructure for the mobility impaired and better access to water and restrooms. Construction of a wooded deck would also help facilitate access to launched boats and kayaks. Finally, control of invasive species is necessary to clear waterways and provide good access for boaters and paddlers.

Next Steps:

The next step in advancing this project is to continue to support the San Antonio Bay Foundation's effort to control invasive aquatic plants in the Guadalupe Delta.

Owner:

Texas Parks and Wildlife Department

Key Partners:

- Texas Parks and Wildlife Department
- San Antonio Bay Foundation

Other Partners:

Calhoun County

Estimated Cost:

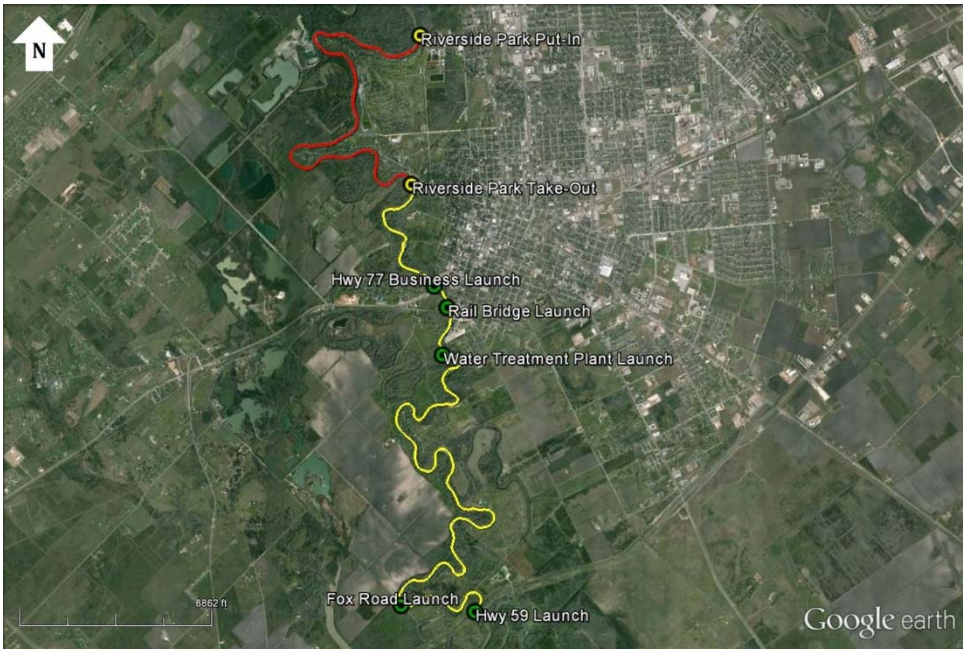
Moderate

Priority:

Medium

Complexity:

Medium



Riverside Park Victoria Paddling Trail Extension to Hwy 59

PUBLIC ACCESS CATEGORY: KAYAKING

NUMBER: 23

Current Status:

The Riverside Park Victoria Paddling Trail is a 4.2 mile kayak trail on the Guadalupe River, sponsored by the City of Victoria and the Guadalupe Blanco River Authority (GBRA). The River is slow moving in this area and is bordered by scenic soft banks. The presence of occasional sandbars provide opportunities for resting or birdwatching. This section of the River also provides good fishing opportunities. The put-in point for the paddling trail is in the northern section of Riverside Park, while the take-out point is in the southern section of the Park. Possibilities for extending the length of the current trail exist, and the City of Victoria is currently working on this expansion.

Project Description:

The existing Trail could be extended down the Guadalupe River from Riverside Park in Victoria to the Hwy 59 right-of-way (ROW). This would add approximately 8-miles to the existing paddling trail. There are additional sites along the trail that could be used for put-in or take-out, including: Highway 77 Business ROW, Rail Bridge, land west of the Water Treatment Plant, and Fox Road ROW. However, further work is needed to investigate the conditions at these sites and their feasibility for kayak launching. While only the proposed takeout point is within the San Antonio Bay Partnership area of interest, this project could attract new stakeholders from the Victoria area.

Next Steps:

The next step in advancing this project is to support the current efforts of the paddling trail sponsors to expand the existing trail.

Owner:

- City of Victoria
- Guadalupe Blanco River Authority

Key Partners:

- City of Victoria
- Guadalupe Blanco River Authority

Other Partners:

Texas Parks and Wildlife Department

Estimated Cost:

Low

Priority:

Medium

Complexity:

Low

Lower Guadalupe River Paddling Trail: Feasibility Study

PUBLIC ACCESS CATEGORY: KAYAKING

NUMBER: 24

Current Status:

The Guadalupe River below the Hwy 59 bridge south of Victoria is mostly undeveloped and offers the opportunity for a scenic paddle with several historical points of interest. However, between the Hwy 59 bridge and State Hwy 35 bridge (approx. 40 miles), the River is bounded by private property and public access is not available. Google Earth imagery indicates limited road access to the River from local industry or private property.

Project Description:

An extended paddling trail could be developed by seeking arrangements with private land owners for access at one or two sites along the River that would accommodate paddlers on extended trips. Problems associated with log jams in certain parts of the River would also need to be considered.

Next Steps:

The next step in advancing this project is to discuss with the City of Victoria and other potential partners the feasibility of such an extended trail that includes access at one to two sites.

Owner:

- City of Victoria
- Victoria County
- Calhoun County
- Guadalupe Blanco River Authority
- Texas Parks and Wildlife Department
- Private Landowners

Key Partners:

- City of Victoria
- Victoria County
- Calhoun County
- Guadalupe Blanco River Authority

Other Partners:

- Texas Parks and Wildlife Department
- Private landowners
- Texas Water Safari

Estimated Cost:

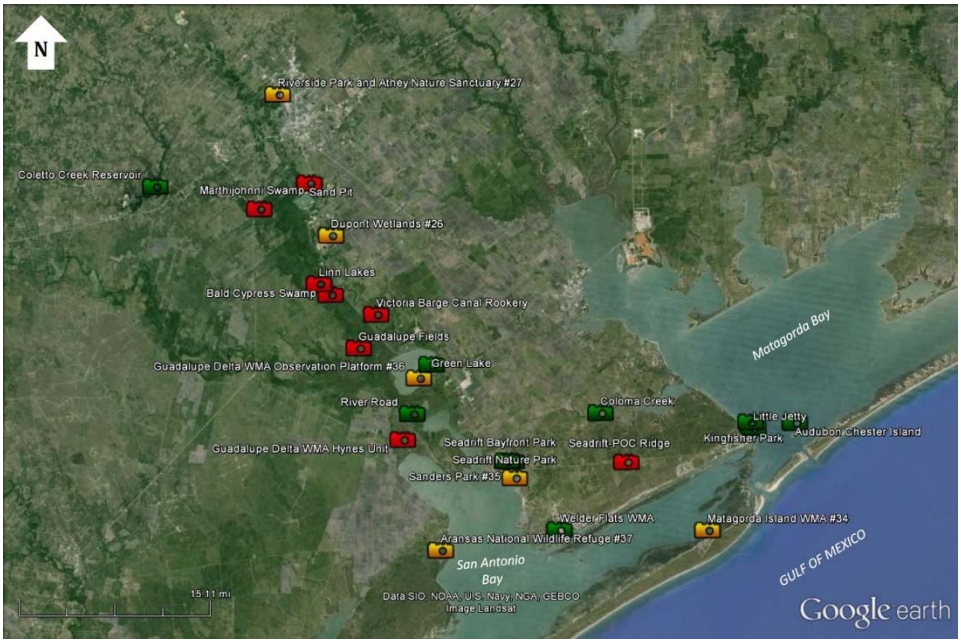
Low

Priority:

Low

Complexity:

High



Regional Birding Trail Feasibility Study

PUBLIC ACCESS CATEGORY: BIRDING
NUMBER: 25

Current Status:

Six sites in the planning area are listed on the Great Texas Coastal Birding Trails: #26 Dupont Wetlands, #27 Riverside Park & Athey Nature Sanctuary, #34 Matagorda Island WMA, #35 Swan Point, #36 Guadalupe Delta Wildlife Management Area, and #37 Aransas National Wildlife Refuge. Several additional locations within the region may meet the criteria for inclusion as additional sites or for the development of a regional trail.

Project Description:

Several sites in Victoria and Calhoun counties were identified for their value as bird rookeries in the San Antonio Bay Partnership inventory of potential conservation, restoration, and protection sites in the San Antonio Bay System. However, there are several sites which could offer the opportunity to develop a future public birding site (or multiple sites) within the County. Further work is needed, however, to determine the feasibility of this type of project at each site and to explore the potential to include these sites in the larger birding site networks.

Next Steps:

The next step in advancing this project is to begin discussions with a group/entity that would be willing to lead this effort and acquire funding to conduct the feasibility study.

Owner:
Private landowners

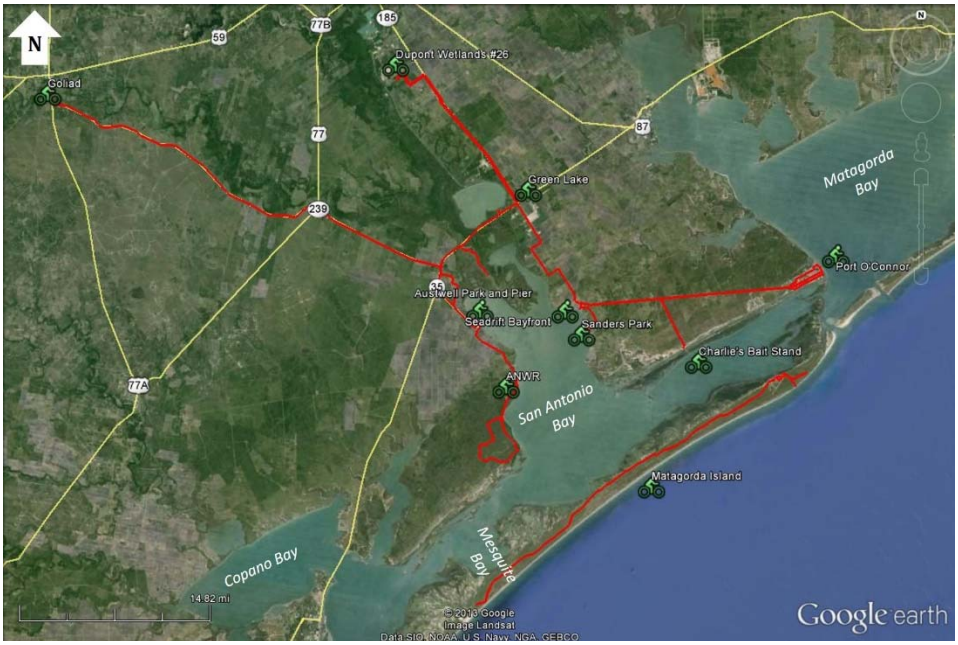
Key Partners:
- Private landowners
- City of Victoria
- Victoria County
- Calhoun County
- Guadalupe Blanco River Authority
- Texas Audubon

Other Partners:
- Texas Parks and Wildlife Department
- Texas Department of Transportation

Estimated Cost:
Low

Priority:
Medium

Complexity:
High



Birds and Bikes: Formation of Hike and Bike Trails

PUBLIC ACCESS CATEGORY: BIRDING, KAYAKING, PARKS, PIERS, BOAT RAMPS

NUMBER: 26

Current Status:

The San Antonio Bay System offers residents and visitors with opportunities to visit fishing piers, parks, historical sites, nature areas, birding sites, and water access points. Most of these sites, however, are stand-alone and are not associated with any larger hike and bike trails within the area that connect these locations and highlight the importance of the larger San Antonio Bay System.

Project Description:

Creating hike and bike trails that connect fishing piers, parks, historical sites, nature areas, birding sites, and water access points within the San Antonio Bay System would leverage these existing resources and increase the overall quality of recreational opportunities offered in this area. The creation of such trails would also highlight areas where additional sites and projects could be added to increase the value of the trail system and attract additional visitors.

A committee consisting of local governments, non-profits, and state/federal agencies would need to be formed in order to pursue this project. The committee would: (1) provide overall vision and planning for the Birds and Bike project, (2) provide recommendations for potential projects to local officials, (3) prioritize projects, (4) develop implementation strategies for projects, including identification of funding sources, and (5) provide ongoing oversight as projects develop. A similar effort called "Aransas Pathways" is already underway in Aransas County and could be used as a template for this project.

Next Steps:

The next step in advancing this project is to approach potential partners about the idea of creating hike and bike trails in the San Antonio Bay System and see if there is enough interest to form the Birds and Bikes committee.

Owner:

n/a

Key Partners:

- Calhoun County
- Aransas County
- Refugio County
- Victoria County
- City of Seadrift
- Port O'Connor Chamber of Commerce
- City of Victoria
- Aransas National Wildlife Refuge
- Texas Audubon
- Biking Organizations

Other Partners:

- Texas Department of Transportation
- Texas Parks and Wildlife Department
- Texas General Land Office
- Texas Master Naturalists

Estimated Cost:

Moderate - High

Priority:

Medium

Complexity:

High

Environmental Education Market Analysis/Needs Assessment for the San Antonio Bay System

PUBLIC ACCESS CATEGORY: EDUCATION

NUMBER: 27

Current Status:

To improve the quality and comprehensiveness of environmental education programs relating to the San Antonio Bay System and reduce overlap, it is important that educators are knowledgeable about the current programs being offered and that they apply that knowledge to the development of their education programs. This will allow for programs to complement one another and avoid unnecessary duplication. It is also important for informal educators to understand the environmental education needs of their target audiences and develop and implement programming based on these needs.

Examples of current environmental education programs within the broader area surrounding the San Antonio Bay System include:

- Alcoa provides funding for 6th grade students from Calhoun County Independent School District (CCISD) to participate annually in the "floating classroom" program aboard the R/V Karma. The R/V Karma is operated by the Texas Sea Grant College Program and provides teachers with the opportunity to immerse their students in hands-on marine science activities.
- A small education facility is run by the Texas Sea Grant Extension Program at Little Chocolate Bayou County Park (Matagorda Bay System).
- The Formosa Tejano Wetlands provide hands-on field experiences in freshwater wetlands for students of the Edna, Industrial, and Calhoun County school districts. The building and on-site educator are maintained by the CCISD, while Formosa Plastics Inc. provides access to the site and funding for the operation and maintenance of the facility.
- The INVISTA Wetland Education Area was formed as a collaborative partnership between the Victoria Independent School District and the INVISTA Victoria, Texas manufacturing site. The Wetlands Area provides students with the opportunity to participate in a Wetland Environmental Science Education Encounter, and they can begin to understand the importance of freshwater wetlands by finding, observing, and identifying plants and animals commonly found in the local area.
- Environmental education programs were previously offered at the Matagorda Island State Park, prior to its conversion to a Wildlife Management Area. Buildings are still present on the site but are in need of repairs.
- The Aransas National Wildlife Refuge offers resources and programs for teachers and students. Programs are designed for school groups of all ages, including high school and university students, environmental education organizations, and the general public. Educational programs focus on wildlife, wildlife habitat management, history and local ecology.

Owner:

- University of Houston - Victoria
- Public School Districts
- Private Schools
- Texas Master Naturalists

Key Partners:

- Public School Districts (Calhoun County, Austwell-Tivoli, Refugio, Industrial, Bloomington, Victoria)
- Private Schools
- Mid-Coast Texas Master Naturalist
- University of Houston – Victoria
- Victoria College
- Coastal Bend Bays & Estuaries Program

Other Partners:

- Texas Sea Grant Calhoun County Extension Agent
- Aransas National Wildlife Refuge
- Friends of Matagorda and Aransas National Wildlife Refuges
- Texas Parks and Wildlife Department
- Mission-Aransas NERR
- Local Foundations

Estimated Cost:

Moderate

Priority:

Medium

Complexity:

Medium

Project Description:

Conducting an environmental education market analysis/needs assessment in the San Antonio Bay System will enhance the quality of the education programs being offered and help educators meet the needs of local students/teachers and the general public. The objectives of the Market Analysis are to survey science-based programs in the region and gather information on the products currently offered, including: teacher trainings, other educational workshops, formal and informal outreach programs, availability of educational materials, and other educational products and services, as well as fees charged for any of the previously mentioned programs or products. Analysis of the information gathered will be used to identify similarities and gaps in programming and services provided by the surveyed groups.

The Needs Assessment will focus on collecting information about the needs of student field experiences (i.e., field trip obstacles, science concepts covered, and permitted travel time and distance), adult education programs (i.e., program availability, science concepts covered, and cost), and public education programs (i.e., facilities available, science concepts covered, and cost). The results will provide valuable insight for local education program providers and help identify areas of duplication, as well as gaps, related to field experiences for students, adult education programs, and public education programs.

Preliminary discussions have already identified some potential options for meeting current needs:

- Broaden access to R/V Karma trips and include other school districts within the San Antonio Bay System.
- Seek access to smaller educational vessels (e.g., Texas A&M University Corpus Christi's Aquatic Education program, Palacios Marine Education Center)
- Construct a saltwater marsh educational facility.
- Construct a mobile education facility or develop partnerships with Texas A&M University Corpus Christi's Aquatic Education Program.
- Provide summer programs, including a camping experience at Matagorda Island Wildlife Management Area, that address coastal ecology and history.
- Texas Master Naturalist offer annual training courses on local ecology that lead to certification.

Next Steps:

The next step in advancing this project is to identify partners and funding opportunities for the completion of the Market Analysis/Needs Assessment. Initial meetings should be conducted with the University of Houston – Victoria.

Literature Cited

Calhoun County. 2012a. Calhoun County Texas Shoreline Access Plan. Prepared by Atkins Coastal Planning and Restoration Group for the Coastal Coordination Council Pursuant to National Oceanic and Atmospheric Administration Award No. NA10NOS4190207. 62 pp.

Calhoun County. 2012b. Calhoun County Preliminary Inventory (Update) of Shoreline Access Infrastructure: Technical Memorandum, Appendix A. Prepared by Atkins Coastal Planning and Restoration Group for the Coastal Coordination Council Pursuant to National Oceanic and Atmospheric Administration Award No. NA10NOS4190207. 83 pp.

Calhoun County. 2012c. Calhoun County Texas Shoreline Access Plan: Geologic History, Physical Processes, Habitat Inventories, and Environmental Recommendations, Appendix B. . Prepared by Atkins Coastal Planning and Restoration Group for the Coastal Coordination Council Pursuant to National Oceanic and Atmospheric Administration Award No. NA10NOS4190207. 36 pp.

Calhoun County. 2012d. Calhoun County Texas Shoreline Access Plan: Distribution of Boat Ramps, Kayaking Sites, Fishing Piers, and Observation Decks in Calhoun County, Texas, Appendix C. . Prepared by Atkins Coastal Planning and Restoration Group for the Coastal Coordination Council Pursuant to National Oceanic and Atmospheric Administration Award No. NA10NOS4190207. 5 pp.

Google. 2010. Google Earth Pro. Google, Inc., Mountain View California. (http://www.google.com/earth/index.html).

Texas General Land Office. 2003. Texas Beach & Bay Access Guide, Second Edition. Prepared by the Texas General Land Office, funded in part through the Statewide Transportation Enhancement Program of the Surface Transportation Program managed by the Texas Department of Transportation for the Federal Highways Administration. 149 pp.

Appendix

National Wetland Inventory (NWI) classification types used to describe habitat types within the San Antonio Bay system

National Wetland Inventory (NWI) Classification 2008-2009		
NWI Acronym	NWI Description	Inventory Description
E1AB3L	(E)Estuarine, (1)Subtidal, (AB)Aquatic Bed, (3)Rooted Vascular, (L)Subtidal	Seagrasses
E2ABM	(E)Estuarine, (2)Intertidal, (AB)Aquatic Bed, (M)Irregularly Exposed	
E2ABMs	(E)Estuarine, (2)Intertidal, (AB)Aquatic Bed, (M)Irregularly Exposed, (s)spoil	
E2ABN	(E)Estuarine, (2)Intertidal, (AB)Aquatic Bed, (N)Regularly Flooded	
E2ABNh	(E)Estuarine, (2)Intertidal, (AB)Aquatic Bed, (N)Regularly Flooded, (h)Diked/Impounded	
E2ABNs	(E)Estuarine, (2)Intertidal, (AB)Aquatic Bed, (N)Regularly Flooded, (s)Spoil	
E1UBL	(E)Estuarine, (1)Subtidal, (UB)Unconsolidated Bottom, (L)Subtidal	Open Water
E1UBLh	(E)Estuarine, (1)Subtidal, (UB)Unconsolidated Bottom, (L)Subtidal, (h)Diked/Impounded	
E2EM1/SS3N	(E)Estuarine, (2)Intertidal, (EM)Emergent, (1)Persistent/(SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (N)Regularly Flooded	Tidal Marsh/Mangrove Mix
E2EM1/SS3P	(E)Estuarine, (2)Intertidal, (EM)Emergent, (1)Persistent/(SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (P)Irregularly Flooded	
E2SS3/EM1P	(E)Estuarine, (2)Intertidal, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen/(EM)Emergent, (1)Persistent, (P)Irregularly Flooded	

NWI Acronym	NWI Description	Inventory Description
E2EM1/USN	(E)Estuarine, (2)Intertidal, (EM)Emergent, (1)Persistent/;(US)Unconsolidated Shore, (N)Regularly Flooded	Tidal Marsh/Flats Mix
E2EM1/USP	(E)Estuarine, (2)Intertidal, (EM)Emergent, (1)Persistent/;(US)Unconsolidated Shore, (P)Irregularly Flooded	
E2US/EM1N	(E)Estuarine, (2)Intertidal, (US)Unconsolidated Shore/(EM)Emergent, (1)Persistent, (N)Regularly Flooded	
E2US/EM1P	(E)Estuarine, (2)Intertidal, (US)Unconsolidated Shore/(EM)Emergent, (1)Persistent, (P)Irregularly Flooded	
E2EM1M	(E)Estuarine, (2)Intertidal, (EM)Emergent, (1)Persistent, (M)Irregularly Exposed	Tidal Marsh
E2EM1Ms	(E)Estuarine, (2)Intertidal, (EM)Emergent, (1)Persistent, (M)Irregularly Exposed, (s)Spoil	
E2EM1N	(E)Estuarine, (2)Intertidal, (EM)Emergent, (1)Persistent, (N)Regularly Flooded	
E2EM1Nh	(E)Estuarine, (2)Intertidal, (EM)Emergent, (1)Persistent, (N)Regularly Flooded, (h)Diked/Impounded	
E2EM1Ns	(E)Estuarine, (2)Intertidal, (EM)Emergent, (1)Persistent, (N)Regularly Flooded, (s)Spoil	
E2EM1Nx	(E)Estuarine, (2)Intertidal, (EM)Emergent, (1)Persistent, (N)Regularly Flooded, (x)Excavated	
E2EM1P	(E)Estuarine, (2)Intertidal, (EM)Emergent, (1)Persistent, (P)Irregularly Flooded	
E2EM1Ph	(E)Estuarine, (2)Intertidal, (EM)Emergent, (1)Persistent, (P)Irregularly Flooded, (h)Diked/Impounded	
E2EM1Ps	(E)Estuarine, (2)Intertidal, (EM)Emergent, (1)Persistent, (P)Irregularly Flooded, (s)Spoil	
E2EM5P	(E)Estuarine, (2)Intertidal, (EM)Emergent, (5)*Phragmites australis*, (P)Irregularly Flooded	

NWI Acronym	NWI Description	Inventory Description
E2SSN	(E)Estuarine, (2)Intertidal, (SS)Scrub-Shrub, (N)Regularly Flooded	Mangrove
E2SS3Ns	(E)Estuarine, (2)Intertidal, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (N)Regularly Flooded, (s)Spoil	
E2SS3P	(E)Estuarine, (2)Intertidal, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (P)Irregularly Flooded	
E2SS3Ps	(E)Estuarine, (2)Intertidal, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (P)Irregularly Flooded, (s)Spoil	
E2SS5P	(E)Estuarine, (2)Intertidal, (SS)Scrub-Shrub, (5)Dead, (P)Irregularly Flooded	
E2USM	(E)Estuarine, (2)Intertidal, (US)Unconsolidated Shore, (M)Irregularly Exposed	Sandbars/Flats
E2USMs	(E)Estuarine, (2)Intertidal, (US)Unconsolidated Shore, (M)Irregularly Exposed, (s)Spoil	
E2USN	(E)Estuarine, (2)Intertidal, (US)Unconsolidated Shore, (N)Regularly Flooded	
E2USNs	(E)Estuarine, (2)Intertidal, (US)Unconsolidated Shore, (N)Regularly Flooded, (s)Spoil	
E2USP	(E)Estuarine, (2)Intertidal, (US)Unconsolidated Shore, (P)Irregularly Flooded	
E2USPr	(E)Estuarine, (2)Intertidal, (US)Unconsolidated Shore, (P)Irregularly Flooded, (r)Artificial	
E2USPs	(E)Estuarine, (2)Intertidal, (US)Unconsolidated Shore, (P)Irregularly Flooded, (s)Spoil	
E2USPx	(E)Estuarine, (2)Intertidal, (US)Unconsolidated Shore, (P)Irregularly Flooded, (x)Excavated	

NWI Acronym	NWI Description	Inventory Description
L1ABH	(L)Lacustrine, (1)Limnetic, (AB)Aquatic Bed, (H)Permanently Flooded	Lakes
L1ABKh	(L)Lacustrine, (1)Limnetic, (AB)Aquatic Bed,(K)Artificially Flooded, (h)Diked/Impounded	
L1ABHh	(L)Lacustrine, (1)Limnetic, (AB)Aquatic Bed, (H)Permanently Flooded, (h)Diked/Impounded	
L1ABHx	(L)Lacustrine, (1)Limnetic, (AB)Aquatic Bed, (H)Permanently Flooded, (x)Excavated	
L1UBKh	(L)Lacustrine, (1)Limnetic, (UB)Unconsolidated Bottom, (K)Artificially Flooded, (h)Diked/Impounded	
L1UBKx	(L)Lacustrine, (1)Limnetic, (UB)Unconsolidated Bottom, (K)Artificially Flooded, (x)Excavated	
L2AB3H	(L)Lacustrine, (2)Littoral, (AB)Aquatic Bed, (3)Rooted Vascular, (H)Permanently Flooded	
L2UBFh	(L)Lacustrine, (2)Littoral, (UB)Unconsolidated Bottom, (F)Semi-permanently Flooded, (h)Diked/Impounded	
L2USA	(L)Lacustrine, (2)Littoral, (US)Unconsolidated Shore, (A)Temporarily Flooded	
L2USAx	(L)Lacustrine, (2)Littoral, (US)Unconsolidated Shore, (A)Temporarily Flooded, (x)Excavated	
L2USC	(L)Lacustrine, (2)Littoral, (US)Unconsolidated Shore, (C)Seasonally Flooded	
L2USCh	(L)Lacustrine, (2)Littoral, (US)Unconsolidated Shore, (C)Seasonally Flooded, (h)Diked/Impounded	
M2RS2P	(M)Marine, (2)Intertidal, (RS)Rocky Shore, (2)Rubble, (P)Irregularly Flooded	Beaches
M2USN	(M)Marine, (2)Intertidal, (US)Unconsolidated Shore, (N)Regularly Flooded	
M2USP	(M)Marine, (2)Intertidal, (US)Unconsolidated Shore, (P)Irregularly Flooded	

NWI Acronym	NWI Description	Inventory Description
PAB3F	(P)Palustrine, (AB)Aquatic Bed, (3)Rooted Vascular, (F)Semi-permanently Flooded	Ponds/Basins
PAB3Fh	(P)Palustrine, (AB)Aquatic Bed, (3)Rooted Vascular, (F)Semi-permanently Flooded, (h)Diked/Impounded	
PAB3Fx	(P)Palustrine, (AB)Aquatic Bed, (3)Rooted Vascular, (F)Semi-permanently Flooded, (x)Excavated	
PAB3H	(P)Palustrine, (AB)Aquatic Bed, (3)Rooted Vascular, (H)Permanently Flooded	
PAB3Hh	(P)Palustrine, (AB)Aquatic Bed, (3)Rooted Vascular, (H)Permanently Flooded, (h)Diked/Impounded	
PAB4F	(P)Palustrine, (AB)Aquatic Bed, (4)Floating Vascular, (F)Semi-permanently Flooded	
PAB4Fx	(P)Palustrine, (AB)Aquatic Bed, (4)Floating Vascular, (F)Semi-permanently Flooded, (x)Excavated	
PAB4H	(P)Palustrine, (AB)Aquatic Bed, (4)Floating Vascular, (H)Permanently Flooded	
PABF	(P)Palustrine, (AB)Aquatic Bed, (F)Semi-permanently Flooded	
PABFh	(P)Palustrine, (AB)Aquatic Bed, (F)Semi-permanently Flooded, (h)Diked/Impounded	
PABFx	(P)Palustrine, (AB)Aquatic Bed, (F)Semi-permanently Flooded, (x)Excavated	
PABH	(P)Palustrine, (AB)Aquatic Bed, (H)Permanently Flooded	
PABHh	(P)Palustrine, (AB)Aquatic Bed, (H)Permanently Flooded, (h)Diked/Impounded	
PABHx	(P)Palustrine, (AB)Aquatic Bed, (H)Permanently Flooded, (x)Excavated	
PABKh	(P)Palustrine, (AB)Aquatic Bed, (K)Artificially Flooded, (h)Diked/Impounded	

NWI Acronym	NWI Description	Inventory Description
PUBF	(P)Palustrine, (UB)Unconsolidated Bottom, (F)Semi-permanently Flooded	Ponds/Basins
PUBFh	(P)Palustrine, (UB)Unconsolidated Bottom, (F)Semi-permanently Flooded, (h)Diked/Impounded	
PUBFx	(P)Palustrine, (UB)Unconsolidated Bottom, (F)Semi-permanently Flooded, (x)Excavated	
PUBFs	(P)Palustrine, (UB)Unconsolidated Bottom, (F)Semi-permanently Flooded, (s)Spoil	
PUBH	(P)Palustrine, (UB)Unconsolidated Bottom, (H)Permanently Flooded	
PUBHh	(P)Palustrine, (UB)Unconsolidated Bottom, (H)Permanently Flooded, (h)Diked/Impounded	
PUBHx	(P)Palustrine, (UB)Unconsolidated Bottom, (H)Permanently Flooded, (x)Excavated	
PUBKh	(P)Palustrine, (UB)Unconsolidated Bottom, (K)Artificially Flooded, (h)Diked/Impounded	
PUBKx	(P)Palustrine, (UB)Unconsolidated Bottom, (K)Artificially Flooded, (x)Excavated	
PUBV	(P)Palustrine, (UB)Unconsolidated Bottom, (V)Permanently Flooded-Tidal	
PEM1/SS1A	(P)Palustrine, (EM)Emergent, (1)Persistant/(SS)Scrub-Shrub, (1)Broad-Leaved Deciduous, (A) Temporarily Flooded	Marsh/Scrub-Shrub Mix
PEM1/SS1C	(P)Palustrine, (EM)Emergent, (1)Persistant/(SS)Scrub-Shrub, (1)Broad-Leaved Deciduous, (C)Seasonally Flooded	
PEM1/SS1J	(P)Palustrine, (EM)Emergent, (1)Persistant/(SS)Scrub-Shrub, (1)Broad-Leaved Deciduous, (J)Intermittently Flooded	
PEM1/SSKx	(P)Palustrine, (EM)Emergent, (1)Persistant/(SS)Scrub-Shrub, (1)Broad-Leaved Deciduous, (K)Artificially Flooded, (x)Excavated	
PEM1/SS3A	(P)Palustrine, (EM)Emergent, (1)Persistant/(SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (A) Temporarily Flooded	

NWI Acronym	NWI Description	Inventory Description
PEM1/SS3C	(P)Palustrine, (EM)Emergent, (1)Persistant/(SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (C) Seasonally Flooded	Marsh/Scrub-Shrub Mix
PEM1/SS3F	(P)Palustrine, (EM)Emergent, (1)Persistant/(SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (F) Semi-permanently Flooded	
PEM1/SS3J	(P)Palustrine, (EM)Emergent, (1)Persistant/(SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (J) Intermittently Flooded	
PSS1/EM1A	(P)Palustrine, (SS)Scrub-Shrub, (1)Broad-Leaved Deciduous/(EM)Emergent, (1)Persistent, (A)Temporarily Flooded	
PSS3/EM1A	(P)Palustrine, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen/(EM)Emergent, (1)Persistent, (A)Temporarily Flooded	
PSS3/EM1C	(P)Palustrine, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen/(EM)Emergent, (1)Persistent, (C)Seasonally Flooded	
PEM1A	(P)Palustrine, (EM)Emergent, (1)Persistant, (A) Temporarily Flooded	Marsh
PEM1Ad	(P)Palustrine, (EM)Emergent, (1)Persistant, (A) Temporarily Flooded, (d)Partly Drained/Ditched	
PEM1Ah	(P)Palustrine, (EM)Emergent, (1)Persistant, (A) Temporarily Flooded, (h)Diked/Impounded	
PEM1As	(P)Palustrine, (EM)Emergent, (1)Persistant, (A) Temporarily Flooded, (s)Spoil	
PEM1Ax	(P)Palustrine, (EM)Emergent, (1)Persistant, (A) Temporarily Flooded, (x)Excavated	
PEM1C	(P)Palustrine, (EM)Emergent, (1)Persistant, (C) Seasonally Flooded	
PEM1Cd	(P)Palustrine, (EM)Emergent, (1)Persistant, (C) Seasonally Flooded, (d)Partly Drained/Ditched	
PEM1Ch	(P)Palustrine, (EM)Emergent, (1)Persistant, (C) Seasonally Flooded, (h)Diked/Impounded	
PEM1Cx	(P)Palustrine, (EM)Emergent, (1)Persistant, (C) Seasonally Flooded, (x)Excavated	

NWI Acronym	NWI Description	Inventory Description
PEM1Cs	(P)Palustrine, (EM)Emergent, (1)Persistant, (C) Seasonally Flooded, (s)Spoil	Marsh
PEM1F	(P)Palustrine, (EM)Emergent, (1)Persistant, (F) Semi-Permanently Flooded	
PEM1Fd	(P)Palustrine, (EM)Emergent, (1)Persistant, (F) Semi-Permanently Flooded, (d)Partly Drained/Ditched	
PEM1Fh	(P)Palustrine, (EM)Emergent, (1)Persistant, (F) Semi-Permanently Flooded, (h)Diked/Impounded	
PEM1Fx	(P)Palustrine, (EM)Emergent, (1)Persistant, (F) Semi-Permanently Flooded, (x)Excavated	
PEM1J	(P)Palustrine, (EM)Emergent, (1)Persistant, (J)Intermittently Flooded	
PEM1Kh	(P)Palustrine, (EM)Emergent, (1)Persistant, (K)Artificially Flooded, (h)Diked/Impounded	
PEM1Kx	(P)Palustrine, (EM)Emergent, (1)Persistant, (K)Artificially Flooded, (x)Excavated	
PEM1R	(P)Palustrine, (EM)Emergent, (1)Persistant, (R)Seasonally Flooded-Tidal	
PEMf	(P)Palustrine, (EM)Emergent, (f)Farmed	
PFO1A	(P)Palustrine, (FO)Forested, (1)Broad-Leaved Deciduous, (A)Temporarily Flooded	Forested/Scrub-Shrub Floodplain
PFO1C	(P)Palustrine, (FO)Forested, (1)Broad-Leaved Deciduous, (C)Seasonally Flooded	
PFO1Ch	(P)Palustrine, (FO)Forested, (1)Broad-Leaved Deciduous, (C)Seasonally Flooded, (h)Diked/Impounded	
PFO1Cx	(P)Palustrine, (FO)Forested, (1)Broad-Leaved Deciduous, (C)Seasonally Flooded, (x)Excavated	
PFO1F	(P)Palustrine, (FO)Forested, (1)Broad-Leaved Deciduous, (F)Semi-Permanently Flooded	
PSS1/3A	(P)Palustrine, (SS)Scrub-Shrub, (1)Broad-Leaved Deciduous/(3)Broad-Leaved Evergreen, (A) Temporarily Flooded	

NWI Acronym	NWI Description	Inventory Description
PSS1A	(P)Palustrine, (SS)Scrub-Shrub, (1)Broad-Leaved Deciduous, (A) Temporarily Flooded	Forested/Scrub-Shrub Floodplain
PSS1C	(P)Palustrine, (SS)Scrub-Shrub, (1)Broad-Leaved Deciduous, (C) Seasonally Flooded	
PSS1Cx	(P)Palustrine, (SS)Scrub-Shrub, (1)Broad-Leaved Deciduous, (C) Seasonally Flooded, (x)Excavated	
PSS1F	(P)Palustrine, (SS)Scrub-Shrub, (1)Broad-Leaved Deciduous, (F) Semi-permanently Flooded	
PSS1Fd	(P)Palustrine, (SS)Scrub-Shrub, (1)Broad-Leaved Deciduous, (F) Semi-permanently Flooded, (d)Partly Drained/Ditched	
PSS1Fh	(P)Palustrine, (SS)Scrub-Shrub, (1)Broad-Leaved Deciduous, (F) Semi-permanently Flooded, (h)Diked/Impounded	
PSS1Fx	(P)Palustrine, (SS)Scrub-Shrub, (1)Broad-Leaved Deciduous, (F) Semi-permanently Flooded, (x)Excavated	
PSS1Kh	(P)Palustrine, (SS)Scrub-Shrub, (1)Broad-Leaved Deciduous, (K)Artificially Flooded, (h)Diked/Impounded	
PSS1Kx	(P)Palustrine, (SS)Scrub-Shrub, (1)Broad-Leaved Deciduous, (K)Artificially Flooded, (x)Excavated	
PSS3A	(P)Palustrine, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (A)Temporarily Flooded	
PSS3Ah	(P)Palustrine, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (A)Temporarily Flooded, (h)Diked/Impounded	
PSS3Ax	(P)Palustrine, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (A)Temporarily Flooded, (x)Excavated	
PSS3C	(P)Palustrine, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (C)Seasonally Flooded	
PSS3Ch	(P)Palustrine, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (C)Seasonally Flooded, (h)Diked/Impounded	
PSS3Cx	(P)Palustrine, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (C)Seasonally Flooded, (x)Excavated	

NWI Acronym	NWI Description	Inventory Description
PSS3F	(P)Palustrine, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (F)Semi-permanently Flooded	Forested/Scrub-Shrub Floodplain
PSS3Fh	(P)Palustrine, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (F)Semi-permanently Flooded, (h)Diked/Impounded	
PSS3J	(P)Palustrine, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (J)Intermittently Flooded	
PSS3Kh	(P)Palustrine, (SS)Scrub-Shrub, (3)Broad-Leaved Evergreen, (K)Artificially Flooded, (h)Diked/Impounded	
PSS4A	(P)Palustrine, (SS)Scrub-Shrub, (4)Needle-Leaved Evergreen, (A)Temporarily Flooded	
PUSA	(P)Palustrine, (US)Unconsolidated Shore, (A)Temporarily Flooded	Flats/Basins
PUSAh	(P)Palustrine, (US)Unconsolidated Shore, (A)Temporarily Flooded, (h)Diked/Impounded	
PUSAx	(P)Palustrine, (US)Unconsolidated Shore, (A)Temporarily Flooded, (x)Excavated	
PUSCh	(P)Palustrine, (US)Unconsolidated Shore, (C)Seasonally Flooded, (h)Diked/Impounded	
PUSCx	P)Palustrine, (US)Unconsolidated Shore, (C)Seasonally Flooded, (x)Excavated	
PUSKh	P)Palustrine, (US)Unconsolidated Shore, (K)Artificially Flooded, (h)Diked/Impounded	
PUSKx	P)Palustrine, (US)Unconsolidated Shore, (x)Excavated	