Prepared by:
Mott MacDonald
802 North Carancahua
Suite 300
Corpus Christi
TX 78401
United States of America

Prepared for:
Port of Corpus Christi Authority
400 Harbor Drive
Corpus Christi, TX 78401

# Waters and Wetlands Delineation Report for the San Jose Island Beneficial Use Site – Corpus Christi Ship Channel Deepening Project

Port of Corpus Christi Authority, Corpus Christi Ship Channel, Aransas County, Texas

January 2022

# Issue and revision record

| Revision | Date | Originator | Checkout | Approver | Descriptor |
|---|---|---|---|---|---|
| V1 | 12/17/2021 | C. Koester | | J. Miner | Draft for Internal Review |
| V2 | 1/14/2022 | C. Koester | | K. Thompson | Draft for Client Review |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Information class: Standard**

# Contents

# Tables



# Figures

# Acronyms

| | |
|---|---|
| AJD | Approved Jurisdictional Determination |
| AMSL | Above Mean Sea Level |
| APT | Antecedent Precipitation Tool |
| CCSC | Corpus Christi Ship Channel |
| CHHA | Coastal High Hazard Area |
| CWA | Clean Water Act |
| BU | Beneficial Use |
| DD | decimal degrees |
| E1AB3L | Estuarine, subtidal, aquatic bed, rooted vascular, subtidal |
| E1UBL | Estuarine, subtidal, unconsolidated bottom, subtidal |
| E1UBLx | Estuarine, subtidal, unconsolidated bottom, subtidal, excavated |
| E2EM1N | Estuarine intertidal emergent persistent regularly flooded |
| E2EM1P | Estuarine intertidal emergent persistent irregularly flooded |
| E2SS3N | Estuarine intertidal scrub-shrub broadleaf evergreen regularly flooded |
| E2USM | Estuarine, intertidal, unconsolidated shore, irregularly exposed |
| E2USN | Estuarine, intertidal, unconsolidated shore, regularly flooded |
| E2USP | Estuarine intertidal unconsolidated shore, irregularly flooded |
| EMST | Ecological Mapping Systems of Texas |
| FEMA | Federal Emergency Management Agency |
| GIS | Geographic Information System |
| GPS | Global Positioning System |
| HI-E | Harbor Island East |
| HTL | High Tide Line |
| LiDAR | Light Detection and Ranging |
| M1UBL | Marine subtidal unconsolidated bottom, subtidal |
| M2USN | Marine intertidal unconsolidated shore, regularly flooded |
| M2USP | Marine, intertidal unconsolidated shore, irregularly flooded |
| Manual | USACE 1987 Wetlands Delineation Manual |
| MAP | Mapping, Assessment, Planning |

| | |
|---|---|
| MHW | Mean High Water |
| MI | Mustang Island |
| NAIP | National Agriculture Imagery Program |
| NASIS | National Soil Information System |
| NAVD 88 | North American Vertical Datum 1988 |
| NFHL | National Flood Hazard Layer |
| NFIP | National Flood Insurance Program |
| NHD | National Hydrography Dataset |
| NOAA | National Oceanic and Atmospheric Administration |
| NRCS | Natural Resources Conservation Service |
| NWI | National Wetlands Inventory |
| OHWM | Ordinary High-Water Mark |
| PA4 | Placement Area 4 |
| PCCA | Port of Corpus Christi Authority |
| PEM1A | Palustrine, emergent, persistent, temporarily flooded |
| PEM1Ah | Palustrine, emergent, persistent, temporarily flooded, diked/impounded |
| PEM1C | Palustrine, emergent, persistent, seasonally flooded |
| PUSA | Palustrine, unconsolidated shore, temporarily flooded |
| PUSC | Palustrine, unconsolidated shore, seasonally flooded |
| PUSCh | Palustrine, unconsolidated shore, seasonally flooded, diked/impounded |
| PSA | Project Study Area |
| QA/QC | Quality Assurance/Quality Control |
| RHA | Rivers and Harbors Act of 1899 |
| RTK | Real-Time Kinematic |
| SAV | Submerged Aquatic Vegetation |
| SFHA | Special Flood Hazard Area |
| SJI | San Jose Island |
| SS1 | Shoreline Stabilization 1 |
| SS2 | Shoreline Stabilization 2 |
| SOP | Standard Operating Procedures |
| SSURGO | Soil Survey Geographic Database |

| | |
|---|---|
| TPWD | Texas Parks and Wildlife Department |
| Triton | Triton Environmental Solutions |
| UD | upland determination sample plot |
| USACE | United States Army Corps of Engineers |
| USDA | United States Department of Agriculture |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| VLCC | Very Large Crude Carriers |
| VRS | Virtual Reference Station |
| WD | wetland determination sample plot |
| WF | wetland boundary flag |
| WOUS | Waters of the United States |

*Remainder of page intentionally left blank.*

# 1 Introduction

## 1.1 General Overview

Mott MacDonald, on behalf of the Port of Corpus Christi Authority (PCCA), conducted field delineation surveys during October 18 through October 25, 2021 and on November 11, 2021, to identify potential "Waters of the United States (WOUS)" as defined by the United States Army Corps of Engineers (USACE) (33 CFR 328.3(a)), wetlands (33 CFR 328.3(c)), submerged aquatic vegetation (SAV), and oyster habitat present within the proposed San Jose Island (SJI) Beneficial Use (BU) project site located in Aransas County north of the Corpus Christi Ship Channel near Port Aransas, Texas. The survey covered the SJI BU project site and a 500-foot buffer around this location, referred to within this report as the Project Study Area (PSA). The PSA surveyed area included the SJI BU project site, approximately 593.16 acres, plus the buffered area, for a total of approximately 1,480.2 survey acres.

Figure 1.1-1 provides an overview map of the project location and configuration of the SJI PSA on the United States Geological Survey (USGS) 7.5-minute topographic quadrangles. Figure 1.1-2 shows the SJI BU PSA overlaid onto recent aerial imagery. This waters and wetlands delineation report has been prepared to support a Draft Environmental Impact Statement (EIS) being prepared USACE for the PCCA Corpus Christi Ship Channel (CCSC) Deepening Project.

The findings included in this report are based on review of publicly available mapping and on-site pedestrian field surveys. Publicly available mapping includes historical and recent aerial photography, 7.5-minute USGS topographic quadrangles, United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) soil survey data, United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) data, USGS National Hydrography Dataset (NHD), topographic Light Detection and Ranging (LiDAR) elevation one-foot contour data, and Texas Parks and Wildlife Department (TPWD) Ecological Mapping Systems of Texas (EMST). The remainder of this report describes the project's purpose and need, a discussion of survey methods used to identify and delineate waterbodies, wetlands, and SAV, results of the delineation surveys, and general conclusion and discussion of the survey results.

## 1.2 Study Area Description

The SJI PSA is comprised of approximately 1,480.2 acres (BU project site approximately 593.16 acres, buffered area approximately 887.04 acres) of gulf beach, upland coastal dunes, dune swale mosaic wetlands, coastal prairie uplands, and estuarine low marsh wetlands located along the Gulf of Mexico beginning at the CCSC and extending north approximately seven miles (See Figure 1.1-3). The SJI PSA varies in width from 1,500 feet wide closer to the CCSC to 2,500 feet wide along the northern part of the PSA. San Jose Island is a natural coastal barrier island that is approximately 21 acres in size and formed by onshore transport of offshore Pleistocene deltaic sands and longshore transport of onshore riverine sands approximately 2,500 years ago (Shew et al., 1981). It is located between the Gulf of Mexico and Aransas Bay. The island is privately-owned except for the beach front portion of the island (waterward from the line of vegetation), which is owned by the state of Texas and open to the general public.

The SJI PSA was significantly altered in several locations when Hurricane Harvey created shoreline breaches in 2017. The shoreline breaches resulted in the formation of unvegetated shallow water ponded areas within and behind the foredune ridge. These ponds have slowly silted in overtime and are significantly reduced in size since the 2017 storm. Habitat types located within the SJI PSA include gulf beach, dune complexes, coastal interdunal wet prairie and upland mosaic wetlands dominated by salt marsh fimbristylis (*Fimbristylis castanea),* saltmeadow cordgrass (*Spartina patens*), and gulfdune paspalum (*Paspalum monostachyum*), coastal prairie uplands dominated by little bluestem (*Schizachyrium scoparium*), partridge pea (*Chamaecrista fasciculata*), four-spike fingergrass (*Eustachys neglecta*), honey mesquite (*Prosopsis glandulosa*), and perennial ragweed (*Ambrosia psilostachya*).

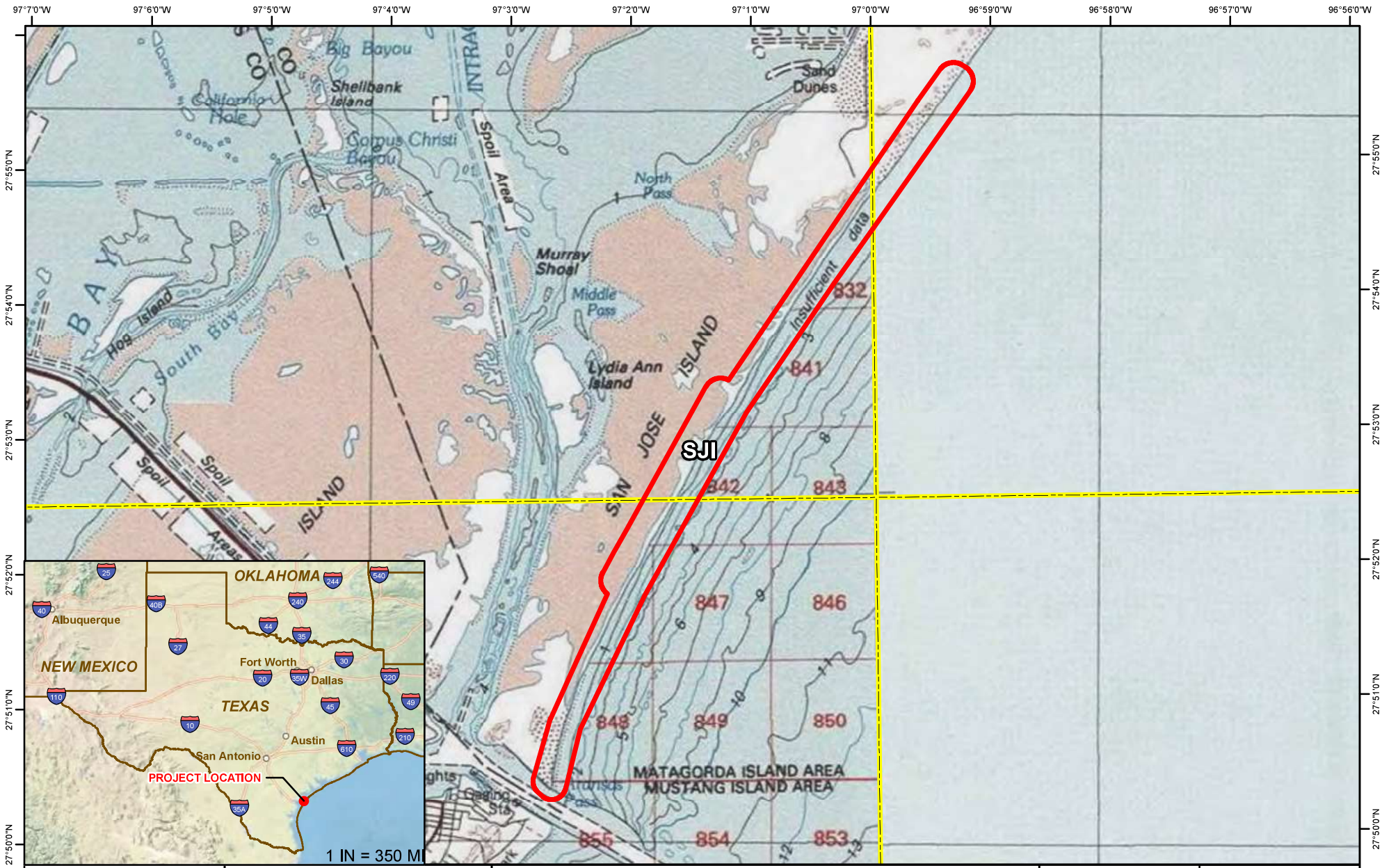
estuarine low marsh wetlands dominated by saltwort (*Batis maritima*), shoregrass (*Distichlis littoralis*), Carolina wolfberry (*Lycium carolinium*), and perennial glassowort (*Sarcocornia ambigua*).

## 1.3 Purpose and Need

PCCA is proposing to deepen an approximate 13.8-mile section of the CCSC beginning at the southern end of Harbor Island near Port Aransas, Nueces County, Texas and extending into the Gulf of Mexico to accommodate the transit of fully laden Very Large Crude Carriers (VLCCs). The existing channel will be deepened from the current authorized depth of -54 feet and -56 feet mean lower low water (MLLW) to a maximum depth of -79 feet MLLW from Station 110+00 to Station −72+50 (-75 feet MLLW plus two feet of advanced maintenance and two feet of allowable overdredge) and -81 feet MLLW from Station −72+50 to Station −330+00 (−77 feet MLLW plus two feet of advanced maintenance and two feet of allowable overdredge). The proposed project includes a 29,000-foot extension of the CCSC from Station -330+00 to Station -620+00 to a maximum depth of -81 MLLW (−77 feet MLLW plus two feet of advanced maintenance and two feet of allowable overdredge) to reach the −80-foot MLLW bathymetric contour in the Gulf of Mexico. The proposed project does not include widening the channel; however, some minor incidental widening of the channel is expected to meet side slope requirements and to maintain stability of the channel.

Approximately 46 million cubic yards (MCY) of new work dredging material (17.1 MCY of clay and 29.2 MCY of sand) will be excavated during project construction. A portion of the dredged material is proposed for placement into the SJI BU site as previously defined under Section 1.2 “Study Area Description” of this report. The purpose of this waters and wetlands delineation report is to evaluate the SJI BU site and a 500-foot buffer around the site for the presence of WOUS and/or wetlands regulated under Section 10 of the Rivers and Harbors Act (RHA) of 1899 and Section 404 of the Clean Water Act (CWA). The waters and wetlands delineation report will support a Draft EIS being prepared for this project by the USACE-Galveston District.

*Remainder of page intentionally left blank.*




Notes:

Legend

- Project Study Area
- USGS Quadrangle Boundary

# PORT OF CORPUS CHRISTI AUTHORITY
# CHANNEL DEEPENING PROJECT
# FIGURE 1.1-1 USGS TOPOGRAPHIC MAP

Project Overview Map
Aransas County, TX

6,000 0 6,000 12,000 Feet

N W E S

ABSOLUTE SCALE: 1:72,000

REFERENCE SCALE: 1 IN = 6,000 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 01/12/2022


| COORDINATE LOCATIONS OF PROJECT STUDY AREAS | | |
|---|---|---|
| PSA NAME | LATITUDE | LONGITUDE |
| SJI | 27° 53' 3.832" N | 97° 1' 12.447" W |

*Latitude/Longitude recorded for the polygon centroid of each PSA*

Notes:

Legend

Project Study Area

# PORT OF CORPUS CHRISTI AUTHORITY
# CHANNEL DEEPENING PROJECT
# FIGURE 1.1-2 AERIAL MAP

Project Overview Map
Aransas County, TX

6,000 0 6,000 12,000 Feet

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE: 1:72,000

REFERENCE SCALE: 1 IN = 6,000 FT

Drawn By: CLB
Date: 01/10/2022


Notes:

Data Sources:
ESRI World Imagery
9/20/2020

Legend

Project Study Area (1482.3 Acres)

# PORT OF CORPUS CHRISTI AUTHORITY
# CHANNEL DEEPENING PROJECT
# SJI - FIGURE 1-1.3

Site SJI Overview Map
Aransas County, TX

6,000 0 6,000 12,000 Feet

N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE:
1:72,000

REFERENCE SCALE:
1 IN = 6,000 FT

Drawn By: CLB
Date: 01/12/2022

# 2 Regulatory Authority

## 2.1 Regulatory Overview

This report presents the findings from field surveys to identify and delineate potential WOUS, including wetlands and SAV, which could be considered jurisdictional by USACE. While this report identifies the boundaries of potential jurisdictional features, USACE is the only entity that can verify the jurisdictional boundaries and issue an Approved Jurisdictional Determination (AJD). Jurisdictional WOUS and wetlands are regulated under Section 10 of the RHA of 1899 and/or Section 404 of the CWA.

USACE regulates excavation, installation of structures and the discharge of dredged material within waters of the U.S. below the Mean High Water (MHW) line of tidal waters or the ordinary high-water mark (OHWM) of non-tidal waters under Section 10 of the RHA. Section 10 of the RHA defines jurisdictional waters as all waters which are currently used, or were used in the past, or may be susceptible to future use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.

USACE regulates the discharge of fill material into all jurisdictional waters of the U.S. and wetlands, including waters below the MHW line or OHWM, under Section 404 of the CWA. The CWA defines jurisdictional waters to include navigable waters, intermittent and ephemeral tributaries of truly navigable waters, and adjacent wetlands. Section 404 of the CWA defines the landward limit of jurisdiction as the High Tide Line (HTL) in tidal waters and the OHWM in non-tidal waters; however, when adjacent wetlands are present, the limit of jurisdiction extends to the limit of the wetland boundary. Adjacent wetlands are those located above the HTL line or OHWM, with at least one of the following connections to a jurisdictional waterbody: biological, hydrological, or biochemical. The 1987 USACE Wetlands Delineation Manual (Manual) defines wetlands as areas that have positive indicators for dominant hydrophytic vegetation, wetland hydrology, and hydric soils or as “areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, “with special exemptions”.

*Remainder of page intentionally left blank.*

# 3 Methods

## 3.1 Field Investigation Methods

The following sections describe the field methods used to identify and delineate WOUS, wetlands, and SAV within the SJI PSA.

### 3.1.1 Field Survey Methods for Delineation of WOUS (Tidal Boundary Survey)

Prior to conducting field work, a waters and wetlands delineation survey workplan was developed for the SJI PSA, along with five additional PSAs, Harbor Island-East (HI-E), Shoreline Stabilization 1 (SS1), Shoreline Stabilization 2 (SS2), Placement Area 4 (PA4), and Mustang Island (MI) (Appendix B). The five additional PSAs were previously surveyed in April and May 2021 and results of these surveys included in a separate waters and wetlands delineation report ("Waters and Wetlands Delineation Report for Five Beneficial Use Sites - Corpus Christi Ship Channel Deepening Project" - issued on June 2021 and revised in October 2021). The SJI PSA was surveyed subsequent to the first five PSAs due to landowner and schedule constraints.

The survey workplan was reviewed and approved by PCCA and the USACE Project Manager prior to initiating field work. In order to delineate WOUS, positional locations of the MHW and HTL tidal elevation lines, were recorded by Triton Environmental Solutions, LLC (Triton) along the SJI PSA shoreline. For the SJI PSA, the MHW elevation is determined to be +1.01 feet North American Vertical Datum 1988 (NAVD88) and the HTL is determined to be +2.76 feet NAVD88. A Triton biologist surveyed the shoreline at discrete point locations to locate the MHW and HTL elevations using a Trimble R8 Real-Time Kinematic (RTK), sub-centimeter hand-held global positioning (GPS) unit. The R8 RTK unit receives real-time sub-centimeter corrections from the Virtual Reference Station (VRS) network to record accurate (i.e., sub-centimeter accuracy) elevations. Once the tidal boundary field survey was complete, positional and elevation data for MHW and HTL tidal boundaries were post-processed in the office and overlaid onto recent aerial imagery.

Non-tidal waterbodies were delineated using visual identification of the OHWM along the waterbody shoreline. The OHWM was visually identified using physical characteristics such a natural impressed bank and shelving, without utilizing a specific elevation. Mott MacDonald and Triton biologists surveyed non-tidal waterbody shorelines at discrete point locations using a GeoXH 6000 Series, sub-meter hand-held GPS unit. Once the field survey was complete, positional data for OHWM boundaries was post-processed in the office and overlaid onto recent aerial imagery.

### 3.1.2 Field Survey Methods for Delineation of Wetlands

Prior to conducting field work, a waters and wetlands delineation survey workplan was developed for the SJI PSA, along with five additional PSAs, HI-E, SS1, SS2, PA4, and MI (Appendix B). The five PSAs were previously surveyed in April and May 2021 and results included in a separate waters and wetlands delineation report ("Waters and Wetlands Delineation Report for Five Beneficial Use Sites - Corpus Christi Ship Channel Deepening Project" - issued on June 2021 and revised in October 2021). The SJI PSA was surveyed subsequent to the first five PSAs due to landowner and schedule constraints. The survey workplan was reviewed and approved by the PCCA and the USACE Project Manager prior to initiating field work. The wetlands delineation was conducted by Mott MacDonald in accordance with the USACE *Corps of Engineers Wetlands Delineation Manual* (USACE, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0)* (USACE,

2010). Wetlands and waterbodies were classified in the field using the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). Wetland indicator classification for vegetation identified to the species level were recorded based on the *National Wetland Plant List: 2020* (USACE, 2020).

Hydrology, soils, and vegetation were examined within the SJI PSA at discreet sampling locations located along transects and within different vegetation communities observed in the field. Sampling locations and aquatic resource boundaries were delineated in the field by recording positional locations using six separate GeoXH 6000 Series, sub-meter hand-held GPS units. As directed by PCCA, the waters and wetlands delineation survey was only conducted to the PSA boundaries and did not extend onto private property, even if the wetland extended beyond the PSA boundaries.

During the wetland field evaluation at the SJI PSA, detailed information at sample locations (typically configured as a 30-foot radius circle for all vegetation types) was recorded in each representative vegetation types that occur along the transects identified in the survey workplan. At sample locations, a USACE Routine Wetland Determination Data Form for the Atlantic and Gulf Coastal Plain Region was completed. These sample locations are considered the Wetland Determination (WD) sample plot type and the Upland Determination (UD) sample plot type for this report. For each wetland identified, the boundary was determined and positions recorded in the field using the Wetland Flagging (WF) GPS plot type. Field notes were recorded for each sample location within a Rite-in-the-Rain® field logbook. USACE Wetland Determination Data Forms completed at WD and UD plot locations are provided in Appendix C. Site photos taken at sample locations are included in this report as Appendix D.

In order to identify and delineate coastal interdunal wet prairie and upland mosaic wetlands, procedures and methods detailed in the Wetland/Non-Wetland Mosaics section of the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region (Version 2.0) were utilized. Both field identification mapping with a GPS GeoXH600 series, sub-meter hand-held GPS unit and in-office aerial interpretation of coastal interdunal wet prairie and upland mosaic wetlands boundaries was accomplished. As per the Atlantic and Gulf Coastal Regional Supplement, the following delineation procedures were utilized to delineate coastal interdunal wet prairie and upland mosaic wetlands at the SJI PSA:

1. Once a potential mosaic wetland was identified, five continuous 100-foot transects were selected between each of the previously identified wetland delineation survey transects identified within the waters and wetlands delineation survey workplan discussed in Section 3.1.2 above. A 100-foot measuring tape was stretched along each 100-foot transect to determine distances (in linear feet) of uplands and wetlands. A GPS GeoXH600 series, sub-meter hand-held GPS unit was utilized to mark the beginning of each 100-foot transect, beginning and ends of uplands and wetlands along the 100-foot transect, and the end of each 100-foot transect. Percent wetland for each transect was determined by using the following formula:

   *% wetland for each transect = Total wetland distance along each transect x 100*

   The total percent wetland for each mosaic wetland was determined by using the following formula:

$$\text{\% wetland for each separate identified mosaic wetland} = \frac{\text{Total wetland distance along all transects}}{\text{Total length of all transects}} \times 100$$

2. Separate data forms for swales and ridges/hummocks were utilized to document locations of wetlands and uplands. Sampling of vegetation, soil, and hydrology followed the general procedures described in the 1987 USACE Corps of Engineers Wetlands Delineation Manual and the Atlantic and Gulf Coast Regional Supplement.

### 3.1.3 Field Survey Methods for Delineation of SAV and Oyster Habitat

An aquatic resources survey, including the delineation of SAV and oyster habitat, was conducted at the SJI PSA by Triton biologists from October 18 through October 25, 2021. A description of field survey methods for the aquatic resources survey are detailed in Triton's Aquatic Resources Field Survey Plan and Aquatic Resources Report included in Appendix E.

## 3.2 Evaluation of Existing Information Methods

Prior to conducting the field delineation surveys, existing data was acquired and reviewed by Mott MacDonald in order to identify, describe, and document the physical setting and various habitat types within the SJI PSA and to assist in identifying potential locations of waters, wetlands, SAV, and oysters. Background information compiled and reviewed included historical and recent aerial imagery, topography, soils, NWI-mapped wetlands, USGS NHD-mapped streams and waterbodies, Federal Emergency Management Agency (FEMA) mapped flood zones, LiDAR elevation and bathymetric depth data, and TPWD mapped EMST habitats. Results of existing data evaluations are described in Sections 3.2.1 through 3.2.7.

### 3.2.1 Historical and Recent Aerial Imagery

Aerial imagery, both recent and historical, was obtained from Google Earth Pro, ArcGIS World Imagery Layer, and the National Agriculture Imagery Program (NAIP), with the earliest aerial imagery of the SJI PSA acquired in December 1956 (Google Earth) and the most recent imagery acquired in December 2020 (Google Earth). The 1956 imagery reveals that the SJI PSA was a natural barrier island with no residential or commercial development present, except for a privately owned ranch house compound and associated airplane landing strip. Vegetation is present behind the primary dunes and secondary dunes. In subsequent historical aerial photographs dated 1979, 1990, 2003, and 2016, the island remains in a natural state, with a few roads added for the private landowners to access portions of the island for hunting, ranching, and fishing. Historical aerials also show portions of the island being managed for quail hunting and cattle ranching through vegetation manipulation.

NAIP orthorectified aerial imagery (both true-color and color-infrared) is available for the SJI PSA at resolutions of 1.0- and 2.0-$m^2$. NAIP imagery was acquired from 2006 (true-color) for the SJI PSA. The ortho-rectified imagery may be viewed and interpreted using ArcGIS software. NAIP is made available to the public by the USDA NRCS Geospatial Data Gateway at https://datagateway.nrcs.usda.gov/.

Recent true-color orthorectified aerial imagery is available for the SJI PSA at a resolution of 0.5-$m^2$, acquired in 2020. This imagery was acquired by the Maxar satellite system (formerly known as DigitalGlobe) and made available to the public through the World Imagery Layer viewed in ArcGIS software. This imagery, along with Google Earth imagery from August 2020, was used as the mapping base to complete the delineation of WOUS, wetlands and SAV communities within the SJI PSA. Table 3.2-1 summarizes the digital aerial imagery available for the SJI PSA.

**Table 3.2-1: Aerial Imagery Source and Acquisition Years for the SJI Project Study Area**

| Source | Acquisition Years | Type |
|---|---|---|
| Google Earth | 1956, 1979, 1985, 1990, 1995 | Black and white |
| Google Earth | 2003, 2005, 2006, 2008, 2009, 2010, 2011, 2013, 2014, 2016, 2017, 2020 | True-color |
| NAIP | 2002, 2005, 2006, 2008 | Color infrared, true-color |
| ArcGIS | 2020 | True-color |

### 3.2.2 NRCS Soil Survey Geographic (SSURGO) Database

The Soil Survey Geographic (SSURGO) database is a digitized soil mapping GIS dataset developed and maintained by the USDA NRCS. Mapping scales generally range from 1:12,000 to 1:24,000. The SSURGO dataset are digitized duplicates of the original soil survey maps and, therefore, are the most detailed level of soil mapping performed by the NRCS. SSURGO is linked to a National Soil Information System (NASIS) attribute database which provides the proportionate extent of component soils and their properties for each map unit. Map units for the SSURGO database consist of one to three components each. Attribute data in the NASIS database apply to the principal component in each soil mapping unit and were used to identify the SJI PSA soil units including attributes classifying hydric condition and drainage class. Minor components may have hydric conditions or drainage classes that differ from the primary component soils. Table 3.2-2 summarizes the soils mapped by NRCS within the SJI PSA. A map showing locations of soils within the SJI PSA is included as Figure 2, Appendix A.

**Table 3.2-2: NRCS Mapped Soils within the SJI Project Study Area**

| PSA | Soil Code | Soil Name | Drainage Class | Hydric | Area (ac) |
|---|---|---|---|---|---|
| SJI | By | Beaches | Very poorly drained | No | 614.8 |
| | GM | Galveston-Mustang complex, 0 to 3 percent slopes, occasionally flooded, frequently ponded | Moderately well drained | No | 19.3 |
| | Ps | Psamments, rarely flooded | Well drained | No | 60.6 |
| | W | Water | N/A | N/A | 10.3 |
| | W | Water (unmapped open water) | N/A | N/A | 775.2 |
| | | | | **TOTAL** | **1,480.2** |

*Note: Open water areas that are not mapped by NRCS have been included to represent full PSA acreages.*

### 3.2.3 National Wetlands Inventory Mapping

The USFWS is the principal Federal agency that provides information to the public on the extent and status of the Nation's wetland and aquatic resources. The USFWS's NWI Program has developed a series of topical maps that show the extent and character of the Nation's wetlands and deepwater habitats. The NWI wetlands mapping is often available in two forms, non-digital hard-copy paper maps and digital geospatial data for use in GIS.

NWI mapping for the SJI PSA is available to the public as a digital GIS data layer. The NWI mapped 17 resources within the SJI PSA. These include estuarine deepwater habitat, estuarine emergent wetlands, estuarine unconsolidated shore, estuarine intertidal habitat, marine deepwater habitat, marine unconsolidated shore, marine intertidal habitat, and palustrine emergent wetlands. Table 3.2-3 provides a summary of NWI mapping within the SJI PSA. A map

showing locations of NWI-mapped waters and wetlands within the SJI PSA is included as Figure 3, Appendix A.

**Table 3.2-3: NWI Wetlands within the SJI Project Study Area**

| PSA | Resource | NWI Classification | Number of Mapped Resources | Area (ac) |
|---|---|---|---|---|
| SJI | Estuarine and Marine Deepwater and Wetland Habitats | E1UBL | 1 | 12.7 |
| | | E2EM1P | 5 | 19.1 |
| | | E2USN | 1 | <0.1 |
| | | E2USP | 5 | 60.0 |
| | | M1UBL | 1 | 611.7 |
| | | M2USN | 2 | 74.0 |
| | | M2USP | 1 | 260.0 |
| | | PEM1Ah | 1 | 1.9 |
| | | **TOTALS** | **17** | **1,039.4** |

*Note: Uplands and NWI unmapped areas account for 440.8 acres of the SJI PSA, for a total acreage of 1,480.2 acres.*

Estuarine wetlands are described as deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines, there is appreciable dilution of sea water. Offshore areas with typical estuarine plants and animals, such as red mangroves (*Rhizophora mangle*) and eastern oysters (*Crassostrea virginica*), are also included in the Estuarine System. According to NWI mapping, the following are descriptions of the Estuarine habitat classes that occur within the SJI PSA:

- E1UBL (Estuarine, subtidal, unconsolidated bottom, subtidal) – Estuarine deepwater habitats that are continuously covered with tidal water (i.e., located below extreme low water). Includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm), and a vegetative cover less than 30%. In this type of estuarine wetlands, tidal saltwater continuously covers the substrate.
- E2EM1P (Estuarine intertidal persistent emergent wetland, irregularly flooded) – Estuarine wetlands characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants that normally remain standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine systems. Tides flood the substrate less often than daily.
- E2USN (Estuarine, intertidal, unconsolidated shore, regularly flooded) – Estuarine wetlands having two characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders or bedrock and (2) less than 30 percent areal cover of vegetation. The substrate in these habitats is flooded and exposed by tides; includes the associated splash zone. Landforms such as beaches, bars, and flats are included in the Unconsolidated Shore class. Tides alternately flood and expose the substrate at least once daily.

- E2USP (Estuarine intertidal unconsolidated shore, irregularly flooded) – Estuarine wetlands whose substrate is flooded and exposed by tides; includes the associated splash zone. Includes all wetland habitats having two characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders or bedrock and (2) less than 30 percent areal cover of vegetation. Landforms such as beaches, bars, and flats are included in the unconsolidated shore class. Tides flood the substrate less often than daily.

The Marine System consists of the open ocean overlying the continental shelf and its associated high-energy coastline. Marine habitats are exposed to the waves and currents of the open ocean, and the Water Regimes are determined primarily by the ebb and flow of oceanic tides. Salinities exceed 30 parts per thousand (ppt), with little or no dilution except outside the mouths of estuaries. Shallow coastal indentations or bays without appreciable freshwater inflow, and coasts with exposed rocky islands that provide the mainland with little or no shelter from wind and waves, are also considered part of the Marine System because they generally support typical marine biota. According to NWI mapping, the following are descriptions of the Marine habitat classes that occur within the SJI PSA:

- M1UBL (Permanently flooded, open ocean deepwater habitat) - The substrate in these habitats is continuously covered with tidal water (i.e., located below extreme low water). Includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm), and a vegetative cover less than 30%. Tidal salt water continuously covers the substrate.

- M2USN (Marine intertidal unconsolidated shore, regularly flooded) - The substrate in these habitats is flooded and exposed by tides; includes the associated splash zone. Includes all wetland habitats having two characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders or bedrock and; (2) less than 30 percent areal cover of vegetation. Landforms such as beaches, bars, and flats are included in the Unconsolidated Shore class. Tides alternately flood and expose the substrate at least once daily.

- M2USP (Marine intertidal unconsolidated shore, irregularly flooded) - The substrate in these habitats is flooded and exposed by tides; includes the associated splash zone. Includes all wetland habitats having two characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders or bedrock and (2) less than 30 percent areal cover of vegetation. Landforms such as beaches, bars, and flats are included in the Unconsolidated Shore class. Tides flood the substrate less often than daily.

The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 hectares (ha) (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 m (8.2 ft) at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt. According to NWI mapping, the following is a description of the Palustrine habitat class that occurs within the SJI PSA:

- PEM1Ah (Palustrine, emergent, persistent, temporarily flooded, diked/impounded) - Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. Dominated by species that normally remain standing at least

until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine systems. Surface water is present for brief periods (from a few days to a few weeks) during the growing season, but the water table usually lies well below the ground surface for most of the season. These wetlands have been created or modified by a man-made barrier or dam that obstructs the inflow or outflow of water.

### 3.2.4 National Hydrography Dataset

The USGS NHD is developed to identify surface water systems throughout the United States primarily at the 7.5-minute topographic quadrangle scale (i.e., 1:24,000 scale). The NHD represents the drainage network with features such as rivers, streams, canals, lakes, ponds, coastline, dams and stream gages. The mapped drainage network is designed to be used for general reference, water resource naming, and in the flow analysis of surface water systems and watersheds. Table 3.2-4 summarizes waterbodies mapped by the USGS NHD within the SJI PSA. A map showing the locations of NHD-mapped waterbodies within the SJI PSA is included as Figure 4, Appendix A.

**Table 3.2-4: USGS NHD Streams and Waterbodies within the SJI Project Review Area**

| Named Resource | Length (linear feet) |
|---|---|
| Coastline - Corpus Christi Ship Channel | 1,149 |
| Coastline - Gulf of Mexico | 37,862 |
| **TOTAL** | **39,011** |

### 3.2.5 FEMA Flood Hazard Data

The National Flood Hazard Layer (NFHL) is a geospatial database that contains current effective flood hazard data. FEMA provides the flood hazard data to support the National Flood Insurance Program (NFIP). Review of FEMA flood hazard mapping for Aransas County identifies that the SJI PSA is located within three different flood zones, including Zone AE, Zone VE, and Zone X. Below is a description of each flood zone within the SJI PSA:

- Zone X – Moderate and Minimal Risk Areas. Zone X is the flood insurance rate zone that corresponds to areas of minimal risk outside the 1-percent and 0.2-percent-annual-chance floodplains. No Base Flood Elevations (BFEs) or base flood depths are shown within these zones. Buildings in these zones could be flooded by severe, concentrated rainfall coupled with inadequate local drainage systems. Flood insurance is available in participating communities but is not require by regulation in this zone.
- Zone X with 0.2 Pct Annual Chance Flood Hazard – Areas of minimal flood hazards outside 0.2-percent-annual-chance floodplain.
- Zone AE – Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. BFEs are shown on floodplain maps. Mandatory flood insurance purchase requirements and floodplain management standards apply.
- Zone VE – Coastal High Hazard Areas (CHHA) – High Risk. Zone VE is the flood insurance rate zone that corresponds to areas within the 1-percent-annual-chance coastal floodplain that have additional hazards associated with storm waves. Base Flood Elevations derived from the detailed hydraulic coastal analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply. Structures located within the CHHA have a 26-percent chance of flooding during the life of a standard 30-year mortgage.

Table 3.2-5 provides a summary of the FEMA flood hazard zone mapping within the SJI PSA. A map showing the locations of FEMA flood hazard zones within the SJI PSA is included as Figure 5, Appendix A.

**Table 3.2-5: FEMA Flood Hazard Zones within the SJI Project Review Area**

| Flood Hazard Zone | Area (ac) |
|---|---|
| Zone X AREA OF MINIMAL FLOOD HAZARD | 10.5 |
| Zone X with 0.2 PCT ANNUAL CHANCE FLOOD HAZARD | 24.0 |
| Zone AE | 414.9 |
| Zone VE | 1,029.3 |
| Open Water | 1.5 |
| **TOTAL** | **1,480.2** |

### 3.2.6 TPWD EMST Data

The EMST is an interactive GIS mapping tool which was developed and is maintained by TPWD. The EMST is utilized for identifying and categorizing various habitat types relating to soils, hydrology, ecoregion layers, and vegetative communities. The EMST data is separated into habitat types with correlating vegetation descriptions and ecological interpretations provided in the TPWD Texas Vegetation Classification Project: Interpretive Booklet for Phase 3 (TPWD, 2014). Table 3.2-6 summarizes different EMST habitat types and acreage amounts within the SJI PSA. A map showing the locations of EMST-mapped habitats within the SJI PSA is included as Figure 6, Appendix A.

According to EMST mapping, dominant habitat types within the SJI PSA include Active Sand Dune (4.2 acres), Central and Lower Coastal: Beach (90.4 acres), Coastal and Sandsheet: Deep Sand Grassland (75.8 acres), Coastal: Salt and Brackish High Tidal Marsh (0.6 acres), Coastal: Sea Ox-eye Daisy Flats (8.4 acres), Coastal: Tidal Flat (0.3 acres), Gulf Coast: Salty Prairie (245.9 acres), Native Invasive: Baccharis Shrubland (0.3 acres), Native Invasive: Common Reed (0.4 acres), South Texas: Wind Tidal Flats (338.1 acres), Open Water (9.2 acres), and Open Water (Unmapped) (706.6).

Active Sand Dune is described as barren to sparsely vegetated deep sands where active sand movement is occurring. These sites may sometimes be 15 meters (approximately 50 feet) more in height and offer the greatest degree of topographic relief in the region.

Central and Lower Coastal Beach is described as unvegetated to sparsely vegetated sandy shorelines adjacent to the Gulf of Mexico and bays interior to the barrier islands. Species such as goat-foot morning-glory (*Ipomoea pescaprae*), beach morning-glory (*Ipomoea imperati*), and searockets (*Cakile* spp.) provide sparse vegetative cover. These areas generally lie near mean sea level and are often found between foredunes and tidal waters.

Coastal and Sandsheet: Deep Sand Grassland is described as upland, grass-dominated vegetation on deep sands. Dunes are often dominated by sea oats (*Uniola paniculata*), with other species such as Gulf croton (*Croton punctatus*), bitter panicum (Panicum amarum), goat-foot morning glory, beach morning-glory, shoreline purslane (*Sesuvium portulacastrum*) also present. Upland grasslands are often dominated by seacoast bluestem (*Schizachyrium littorale*) and gulfdune paspalum (*Paspalum monostachyum*).

Coastal: Salt and Brackish High Tidal Marsh is described as irregularly flooded marsh dominated by graminoids such as marshhay cordgrass (*Spartina patens*), saltgrass (*Distichlis spicata*), and bulrushes (*Schoenoplectus* spp.).

Coastal: Sea Ox-eye Daisy Flats are described as irregularly flooded sites dominated by sea ox-eye daisy (*Borrichia frutescens*). These flats become extensive from Corpus Christi Bay southward.

Coastal: Tidal Flats are described as described as unvegetated or sparsely vegetated flats affected by tidal fluctuations.

Gulf Coast: Salty Prairie is described as vegetation occupying saline soils, generally near-coast, on level topography of the Beaumont Formation. Sites may be nearly monotypic stands of Gulf cordgrass (*Spartina spartinae*), little bluestem (*Schizachyrium scoparium*), bushy bluestem (*Andropogon glomeratus*), switchgrass (*Panicum virgatum*), and marshhay cordgrass (*Spartina patens*).

Native Invasive: Baccharis Shrubland is described as shrubland on salty or sandy soils and *Baccharis* spp., honey mesquite (*Prosopis glandulosa*), salt cedar (*Tamarix* spp.), shrubby sumpweed (*Iva frutescens*) are the most common dominants. Other shrubs may include Chinese tallow (*Triadica sebifera*), sea ox-eye daisy, Macartney rose (*Rosa bracteata*), swamp privet (*Forestiera acuminata*), and colima (*Zanthoxylum fagara*). Grasses may include Gulf cordgrass (*Spartina spartinae*), saltgrass, bermudagrass (*Cynodon dactylon*), and rat-tail smut grass (*Sporobolus indicus*).

Native Invasive: Common Reed is described as areas often dominated by common reed (*Phragmites australis*) on formerly disturbed soils.

South Texas: Wind Tidal Flats are described as typically unvegetated flats that lack significant development of blue-green algae (*Lyngbya* spp.) on their surface. Some of these areas may develop substantial herbaceous cover, but typically they are unvegetated or very sparsely vegetated with species mentioned in the system description.

Open Water and Open Water (unmapped) are described as large lakes, rivers, marine water, and ephemeral ponds. Some areas may support vegetation with pioneering species such as black willow (*Salix nigra*), eastern cottonwood (*Populus deltoides*), Chinese tallow, seepweeds (*Suaeda* spp.), sea ox-eye daisy, saltwort (*Batis maritima*), rushes (*Juncus spp.),* sedges, cattails (*Typha* spp.), and spikerushes (*Eleocharis* spp.).

*Remainder of page intentionally left blank.*

**Table 3.2-6: EMST Habitat Types within the SJI Project Review Area**

| PSA | EMST Habitat Type | Area (ac) |
|---|---|---|
| SJI | Active Sand Dune | 4.2 |
| | Central and Lower Coastal Beach | 90.4 |
| | Coastal and Sandsheet: Deep Sand Grassland | 75.8 |
| | Coastal: Salt and Brackish High Tidal Marsh | 0.6 |
| | Coastal: Sea Ox-eye Daisy Flats | 8.4 |
| | Coastal: Tidal Flat | 0.3 |
| | Gulf Coast: Salty Prairie | 245.9 |
| | Native Invasive: Baccharis Shrubland | 0.3 |
| | Native Invasive: Common Reed | 0.4 |
| | South Texas: Wind Tidal Flats | 338.1 |
| | Open Water | 9.2 |
| | Open Water (unmapped) | 706.6 |
| | **TOTAL** | **1,480.2** |

### 3.2.7 LiDAR Data

LiDAR is a remote sensing method that uses light in the form of a pulsed laser to measure ranges of variable distances to the Earth's surface. These light pulses, combined with other data recorded by the airborne system, generate precise, three-dimensional information about the shape of the Earth and its surface characteristics. LiDAR data was obtained from the USGS National Map Download Client. LiDAR data for the SJI PSA is included within the Figure 8 Map Series in Appendix A.

### 3.2.8 Antecedent Precipitation Tool (APT) Data

The Antecedent Precipitation Tool (APT) is an automation tool that the USACE developed following implementation of the Navigable Water Protection Rule (NWPR) in 2020. The APT is used to facilitate the comparison of antecedent or recent rainfall conditions for a given location to the range of normal rainfall conditions that occurred during the preceding 30 years. In addition to providing a standardized methodology to evaluate normal precipitation conditions, the APT can also be used to assess the presence of drought conditions, as well as the approximate dates of the wet and dry seasons for a given location. The APT was used to evaluate rainfall conditions at the SJI PSA during the wetland delineation survey time periods of October 18 - October 25, 2021. APT rainfall results for the SJI PSA is included within Appendix G. The APT determined that normal rainfall conditions were present during the SJI survey period.

## 3.3 Digital Mapping Methods and Process

The process of conducting a digital vegetation mapping inventory requires an ortho-rectified imagery base, ancillary data layers such as elevation, hydrography (i.e., streams and watersheds), field data (i.e., GPS location points, field notes, and site photographs) and the software to analyze and interpret those data layers. The mapping process utilizes the GPS data collected in the field to delineate wetland boundaries, SAV habitat boundaries, and other surface water features (i.e., lakes, ponds, streams, and ditches). Classification systems utilized in the field and entered into GPS point locations are utilized to identify mapped habitat types, characteristics, and other attributes such as dominant species, water regimes, and water depths. For the SJI PSA, waters, wetlands, and SAV habitat mapping polygons were created using ESRI ArcGIS 10.7.1 software packages. The mapping process described herein includes information on

vegetation interpretation techniques, application of the classification systems, and discusses quality assurance/quality control (QA/QC) measures.

### 3.3.1 Interpretation Techniques

The mapping process used for the SJI PSA was a manual interpretation and delineation of the vegetation communities. Manual interpretation of the imagery provides for an accurate delineation of the major vegetation communities, provides statistics on their extent, and nature of their composition. The delineations are completed on-screen, within the GIS mapping environment. This delineation process is known as "heads-up digitizing." There are no inaccuracies created through a transfer process or software image recognition process; the delineations are as accurate as the ortho-rectified imagery and GPS points allow. All waters, wetlands, and SAV boundaries within the five PSAs were recorded using sub-meter accuracy GPS units. The flagged waterbody, wetland and SAV boundaries were digitized in GIS using the GPS location information.

MHW and HTL elevations were recorded in the field using a sub-centimeter accuracy RTK unit at discreet plot locations along the shoreline of the SJI PSA. Within the project GIS, these elevations points were digitized into line features indicating the MHW and HTL elevation contours between surveyed plot locations.

Wetland boundary flag locations were digitized in the project GIS into polygon features to identify the location and extent of the wetland habitats. No aerial imagery interpretation was performed for the delineation of the wetland boundaries. The wetland boundary locations are as accurate as the sub-meter GPS points allow. SAV habitat boundaries were recorded in the field and mapped using methods described in Triton's Aquatic Resources Survey Workplan and Report included in Appendix E.

## 3.4 Quality Control Measures

Quality control measures are in place to check the field data collected and the field forms completed as well as to assure the integrity and accuracy of the digital mapping data. Digital mapping quality control measures include semi-automated GIS systems and senior scientist review. To ensure the integrity of the GIS digital line work, the files are validated through a semi-automated GIS model. This model evaluates the GIS mapping data and inspects for data gaps, slivers, overlapping polygons, duplicate polygons, and multi-part polygons. All data errors are flagged and corrected as needed. This semi-automated quality control process provides for accurate summary statistics such as acreages reported.

The senior scientist review occurred collaboratively with the scientists who conducted the wetland, waterbody, and SAV field surveys. Additionally, field GPS data and field forms were collaboratively reviewed following completion of the field surveys. GIS mapping data was reviewed by senior scientists for consistency and to determine that resources were correctly identified according to the field data collected. The senior scientist review involves manually reviewing each mapped polygon individually across all coded attributes. Discrepancies between the field data collected and the delineated vegetation unit within the GIS are further inspected and rectified by the senior scientists.

After completion of the senior scientist review the mapping file is passed through the semi-automated GIS model once again to identify and rectify any physical discrepancies with the data. Upon a clean pass through the QA/QC model the data is considered final and made available for statistical analysis.

### 3.4.1 GPS Equipment Used and Quality Control

Field sample positional locations were collected using six Trimble GeoXH 6000 Series, sub-meter hand-held GPS units and a Trimble R8 RTK, sub-centimeter hand-held GPS unit with the capability of recording elevation data. The R8 RTK unit receives real-time sub-centimeter corrections from the VRS network. GPS units are equipped with Terrasync software used for data collection. Prior to mobilizing for field work, GPS units are setup with a Terrasync Data Dictionary to collect specific sample types and to record site characteristics using standard classification systems. Additionally, GPS units are setup with background files to delimit the SJI PSA boundaries and predetermined survey transects to assist field crews with navigation and data collection across the full extent of the SJI PSA.

For quality control, post-processing differential correction of field collected GPS data was completed using Pathfinder Office software. Post-processing was completed individually for each day field surveys were conducted. The differential correction process used to complete the post-processing for this survey is as follows:

Pathfinder Office GPS Differential Correction

Process Used: Automatic Carrier and Code Processing

Single Base Station

GPS and GNSS Enabled (5 second rate)

*Remainder of page intentionally left blank.*

# 4 Waterbodies, Wetlands, SAV, and Oyster Delineation Results

## 4.1 Introduction

Waterbody, wetlands, and SAV delineations were conducted from October 18 through October 25, 2021 and on November 11, 2021 to identify potential WOUS as defined by the USACE (33 CFR 328.3(a)), wetlands (33 CFR 328.3(c)), SAV, and oyster habitat present within the SJI PSA located just north of the Corpus Christi Ship Channel in Aransas County, Texas. The locations and extent of these features are shown in the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Results of the field delineation surveys document five waterbody types (M1UBL, M2USN, E1UBL, E2USN, and PUB1H), one type of estuarine wetland habitat (E2EM1N1), and two types of palustrine wetland habitats (PEM1C and PEM1C1) within the SJI PSA. No SAV or oyster habitat were identified within the SJI PSA. Locations and acreage amounts of identified waters and wetlands by site are included in Table 4.5-1 (waters) and Table 4.6-1 (wetlands) within Section 4 "Waterbodies, Wetlands, SAV, and Oyster Delineation Results. Table 5.1-1 provides a summary of waters and wetlands delineated within the SJI PSA combined.

## 4.2 General Waterbody Description

Within the SJI PSA, the field survey identified five waterbody types comprised of marine open water-subtidal (M1UBL), marine unconsolidated shore-intertidal (M2USN), estuarine open water-subtidal (E1UBL), estuarine unconsolidated shore-intertidal (E2USN), and palustrine open water (PUB1H). A description of each waterbody type identified during the surveys, as well as locations of these waterbodies within the SJI PSA is included in section 4.2.1 through 4.2.3 below.

Table 4.5-1 lists waterbodies identified at the SJI PSA and include an acreage summary for each waterbody type. For reference, GPS attribute tables for the MHW, HTL, and OHWM boundary points collected in the field are provided in Appendix F.

### 4.2.1 Marine Waterbodies

The Marine System consists of the open ocean overlying the continental shelf and its associated high-energy coastline. Marine habitats are exposed to the waves and currents of the open ocean and the water regimes are determined primarily by the ebb and flow of oceanic tides. Salinities exceed 30 parts per thousand (ppt), with little or no dilution except outside the mouths of estuaries. Shallow coastal indentations or bays without appreciable freshwater inflow, and coasts with exposed rocky islands that provide the mainland with little or no shelter from wind and waves, are also considered part of the Marine System because they generally support typical marine biota.

#### 4.2.1.1 Marine Open Water – Subtidal

The one marine open water- subtidal waterbody identified in the field within the SJI PSA included the Gulf of Mexico (M1UBL). According to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), M1UBL is described as Marine, Subtidal, Unconsolidated Bottom, Subtidal. Marine open water bodies were associated with deep water bays, channels, and ocean located along the shoreline of the SJI PSA. Marine open waterbodies are classified by the TPWD EMST Interpretive Booklet for Phase 3 (TPWD, 2014) as Open Water, which includes lakes, rivers, marine water, and ephemeral ponds.

Regulatory limits of the one marine open waterbody are shown within the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Under Section 10 of the RHA, the USACE regulates

excavation, installation of structures, and the discharge of dredged material below the MHW elevation of tidal waterbodies, determined to be +1.01 feet NAVD88. Under Section 404 of the CWA, USACE regulates the discharge of dredged or fill material within a WOUS up to the landward limit of jurisdiction for a tidal water as defined by the HTL elevation, determined to be +2.7 feet NAVD88.

#### 4.2.1.2 Marine Unconsolidated Shore - Intertidal

The one marine unconsolidated shore-intertidal water (M2USN) identified in the field within the SJI PSA included the Gulf of Mexico shoreline. According to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), M2USN is described as Marine, Intertidal, Unconsolidated Shore, Regularly Flooded. Marine unconsolidated shore-intertidal mapped within the SJI PSA is classified by the TPWD EMST (TPWD, 2014) as Texas Coastal Beach-Gulf and is described as unvegetated to sparsely vegetated shorelines adjacent to the Gulf of Mexico and bays interior to the barrier islands.

Regulatory limits of the one marine unconsolidated shoreline-intertidal are shown on the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Under Section 10 of the RHA, the USACE regulates excavation, installation of structures, and the discharge of dredged material below the MHW elevation of tidal waterbodies, determined to be +1.01 feet NAVD88. Under Section 404 of the CWA, USACE regulates the discharge of dredged or fill material within a WOUS up to the landward limit of jurisdiction for a tidal water as defined by the HTL elevation, determined to be +2.7 feet NAVD88.

### 4.2.2 Estuarine Waterbodies

The Estuarine System consists of deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines, there is appreciable dilution of sea water. Offshore areas with typical estuarine plants and animals, such as red mangroves (*Rhizophora mangle*) and eastern oysters (*Crassostrea virginica*), are also included in the Estuarine System.

#### 4.2.2.1 Estuarine Open Water – Subtidal

One estuarine open water – subtidal waterbody (E1UBL) was delineated in the field and includes the portion of the CCSC that flows into the Gulf of Mexico along the southern end of the SJI PSA. According to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), E1UBL is described as Estuarine, Subtidal, Unconsolidated Bottom, Subtidal. The estuarine open water body mapped within the SJI PSA is classified by the TPWD EMST (TPWD, 2014) as Open Water, which includes lakes, rivers, marine water, and ephemeral ponds.

Regulatory limits of the estuarine open water-subtidal waterbody are shown on the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Under Section 10 of the RHA, the USACE regulates excavation, installation of structures, and the discharge of dredged material below the MHW elevation of tidal waterbodies, determined to be +1.01 feet NAVD88. Under Section 404 of the CWA, USACE regulates the discharge of dredged or fill material within a WOUS up to the landward limit of jurisdiction for a tidal water as defined by the HTL elevation, determined to be +2.7 feet NAVD88.

#### 4.2.2.2 Estuarine Unconsolidated Shore – Intertidal

Three estuarine unconsolidated shore-intertidal waterbodies (E2USN) were delineated within the SJI PSA. According to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), E2USN is described as Estuarine, Intertidal, Unconsolidated Shore, Regularly Flooded and includes all sand areas located between the MHW and HTL elevation contours. The three unconsolidated shore-intertidal areas at the SJI PSA included estuarine shoreline area along the CCSC between the existing jetty and adjacent coastal dune uplands and grasslands.

The three estuarine unconsolidated shore-intertidal areas mapped within the SJI PSA were observed to include the Texas Coastal Beach-Bay habitat type identified by the TPWD EMST (TPWD, 2014). This habitat type is described as unvegetated to sparsely vegetated shorelines adjacent to the Gulf of Mexico and bays interior to the barrier islands.

Regulatory limits of the three estuarine unconsolidated shore-intertidal waterbodies are shown on the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Under Section 10 of the RHA, the USACE regulates excavation, installation of structures, and the discharge of dredged material below the MHW elevation of tidal waterbodies, determined to be +1.01 feet NAVD88. Under Section 404 of the CWA, USACE regulates the discharge of dredged or fill material within a WOUS up to the landward limit of jurisdiction for a tidal water as defined by the HTL elevation, determined to be +2.7 feet NAVD88.

### 4.2.3 Palustrine Waterbodies

The Palustrine System includes all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation, but with all four of the following characteristics: (1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 m (8.2 ft) at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt.

#### 4.2.3.1 Palustrine Open Water

Seventeen (17) palustrine unconsolidated bottom-open waterbody ponds (PUB1H) were identified in the field within the SJI PSA. According to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), PUB1H is described as Palustrine, Unconsolidated Bottom, Cobble-Gravel, Permanently Flooded. Palustrine open waterbodies mapped within the SJI PSA are classified by the TPWD EMST (TPWD, 2014) as Open Water, which includes lakes, rivers, marine water, and ephemeral ponds. It should be noted that the 17 palustrine ponds identified in the field were created by the effects of Hurricane Harvey along the SJI PSA shoreline in 2017. The 17 palustrine open waterbodies do not contain vegetation (SAV or hydrophytic vegetation) and are reducing in size over time as water- and wind-driven sand continue to fill in these areas.

Regulatory limits of the palustrine open waterbodies were identified in the field and shown on the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Under Section 404 of the CWA, USACE regulates the discharge of fill material non-tidal waterbodies below the OHWM. The OHWM boundary for the three palustrine waterbodies was visually identified along the ponds' shoreline using physical characteristics such a natural impressed bank and shelving, without utilizing a specific elevation.

## 4.3 General Wetland Descriptions

Delineated wetlands within the SJI PSA consisted of estuarine and palustrine wetlands. Estuarine wetlands are described by the USFWS NWI as consisting of deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land, but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines, there is appreciable dilution of sea water. Offshore areas with typical estuarine plants and animals, such as red mangroves (*Rhizophora mangle*) and eastern oysters (*Crassostrea virginica*), are also included in the Estuarine System (Cowardin et al., 1979). This survey used the HTL elevation contour as the break between estuarine tidal wetlands and palustrine non-tidal wetlands.

Palustrine wetlands are described by the USFWS NWI as including all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. The system also includes wetlands that are lacking vegetation but exhibit the four following characteristics: (1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 m (8.2 ft) at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt (Cowardin et al., 1979).

Locations and extents of delineated wetlands for the SJI PSA are shown in the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Table 4.6-1 lists wetlands identified at the SJI PSA.

The USACE Wetland Determination Data Forms completed at WD and UD plot locations are provided in Appendix C. Site photos taken at WD and UD plot locations are included in this report as Appendix D. For reference, the attribute tables for the WD, UD and WF GPS points collected in the field are provided in Appendix F.

Wetlands identified during field surveys are described below and grouped according to NWI Cowardin classifications:

### 4.3.1 Estuarine Emergent Wetlands

#### 4.3.1.1 Estuarine Low Marsh

Estuarine low marsh wetlands were delineated within the SJI PSA and are classified as Estuarine, Intertidal, Emergent Persistent, Regularly Flooded, Hyperhaline (E2EM1N1) according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). Low marsh wetlands occurred primarily along low-lying portions of the backside of the SJI PSA and are associated with a larger complex of low marsh wetlands (located outside of the SJI PSA) that fringe the Lydia Ann Channel and Aransas Bay.

Low marsh wetlands classified as E2EM1N1 were dominated by saltwort (*Batis maritima*), shoregrass (*Distichlis littoralis*), Carolina wolfberry (*Lycium carolinianum*), and perennial glasswort (*Sarcocornia ambigua*). Typical hydric soil indicators found during delineations within low marsh wetlands included sandy redox. Typical hydrological indicators found during delineations within low marsh areas included algal mat, aquatic fauna, drainage patterns, FAC-neutral test, and geomorphic position.

Estuarine low marsh wetlands mapped within the SJI include one distinct habitat type identified by the TPWD EMST (TPWD, 2014). This habitat type includes Coastal: Salt and Brackish Low Tidal Flats, which are described by the TPWD EMST as a system that occurs on flats induced by

tidal fluctuations in water level, primarily driven by winds rather than diurnal or semidiurnal tidal fluctuations. Due to the nearly level conditions of these flats, small fluctuations in tidal level may result in extensive changes in inundation patterns. Some sites may have sparse vegetation consisting of dwarf glasswort (*Salicornia bigelovii*), Virginia glasswort (*Salicornia depressa*), saltwort (*Batis maritima*), annual seepweed (*Suaeda linearis*) shoreline seapurslane (*Sesuvium portulacastrum*), shoregrass (*Distichlis littoralis),* and saltgrass*, (Distichlis spicata)*, but are typically unvegetated or covered by a layer of blue-green algae (*Lyngbya* spp).

### 4.3.2 Palustrine Emergent Wetlands

#### 4.3.2.1 Coastal Wet Prairie Wetlands

Coastal wet prairie wetlands were delineated within the SJI PSA and are classified as Palustrine, Emergent Persistent, Seasonally Flooded (PEM1C) and Palustrine, Emergent Persistent, Seasonally Flooded, Hyperhaline (PEM1C1) according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). Palustrine emergent wetlands were located above the HTL elevation and are not tidally influenced.

Coastal prairie wetlands were typically located along the backside of primary and secondary dune complexes as large, continuous interdunal wetlands (PEM1C) or occurred as coastal interdunal wet prairie and upland mosaic wetlands (PEM1C/Upland). Large, contiguous interdunal wetlands were dominated by sea ox-eye daisy (*Borrichia frutescens*), saltgrass (*Distichlis spicata*), marsh fimbrystilis (*Fimbristylis castanea*), bigleaf marsh-elder (*Iva frutescens*), saltmeadow cordgrass (*Spartina patens*), and gulfdune paspalum (*Paspalum monostachyum*).

Wetlands located within the coastal interdunal wet prairie and upland mosaics were dominated by marsh fimbristylis, saltgrass, saltmeadow cordgrass, and gulfdune paspalum. Coastal dune uplands and grasslands located within the mosaic wetland complex were dominated by little bluestem (*Schizachyrium scoparium*), Dallas grass (*Paspalum dilatatum*), and Corpus Christi fleabane (*Erigeron procumbens*). Large expanses of mosaic wetlands were delineated at the northern and southern portions of the SJI PSA, as well as smaller mosaic wetlands interspersed within middle interior portions of the PSA. Mosaic wetlands were observed to have small (one to two feet in diameter)-medium sized (eight to ten feet in diameter) upland mounds, mostly associated with the dune complex, and small (one to two feet in width-medium sized (eight to ten feet in width) interspersed interdunal swale wetlands. Wetland percentages for delineated mosaic wetlands ranged between 27.5% - 68.8% (see notes included in Table 4.6-1 for wetland percentages of each delineated mosaic wetland).

Coastal prairie wetlands were also identified as vegetated saline flats (PEM1C1) located above HTL within interior portions of the SJI PSA. The saline vegetated flats are part of a larger estuarine low marsh complex located below HTL that fringes the Lydia Ann Channel and Aransas Bay. Dominant vegetation within the PEM1C wetlands included saltwort (*Batis maritima*), shoregrass (*Distichlis littoralis*), Carolina wolfberry (*Lycium carolinianum*), and perennial glasswort (*Sarcocornia ambigua*), sea purslane (*Sesuvium portulacastrum*), and annual sea blite (*Suaeda linearis*). Typical hydric soil indicators found during delineations within low marsh wetlands included sandy redox. Typical hydrological indicators found during delineations within low marsh areas included algal mat, aquatic fauna, drainage patterns, FAC-neutral test, and geomorphic position.

Palustrine emergent coastal prairie wetlands were observed to include two distinct habitat types identified by the TPWD EMST (TPWD, 2014) as Southeastern Coastal Plain Interdunal Wetlands, and Texas Salty Prairie (vegetated flats above HTL). Southeastern Coastal Plain Interdunal Wetlands are described by the TPWD EMST as wetlands that occur on topographic lows in nearly

level to steeply rolling landscapes on sands and deep sands along the coast and inland on the South Texas Sand Sheet. They are alternatively wet and dry due to seasonal rainfall events and typically lack tidal influence but may contain halophytic species due to the influence of salt spray and repeated inundation and evaporation. Texas Salty Prairie is described as a typically herbaceous system that occupies soils of relatively high salinity. Soil salinity of sites occupied by this system result from the deposition of salts from the surrounding landscapes into alluvial sites where repeated flooding and evaporation bring salts to the surface.

## 4.4 General Upland Descriptions

### 4.4.1 Coastal Prairie Uplands

Coastal prairie uplands were present at the SJI PSA. Coastal prairie uplands were typically located behind primary and secondary dune complexes and were dominated by little bluestem *(Schizachyrium scoparium)*, partridge pea (*Chamaecrista fasciculata*), four-spike fingergrass (*Eustachys neglecta*), honey mesquite (*Prosopsis glandulosa*), and perennial ragweed (*Ambrosia psilostachya*).

Coastal Prairie uplands are classified by the TPWD EMST (TWPD, 2014) as Texas-Louisiana Coastal Prairie. This habitat is described as mid- to tall grass prairie that occupies Pleistocene surfaces of the Texas and Louisiana coast, on non-saline soils of level to gently rolling topography. It is dominated by graminoid species such as little bluestem, Indiangrass (*Sorghastrum nutans*), brownseed paspalum (*Paspalum plicatulum*), switchgrass (*Panicum virgatum*), and tall dropseed (*Sporobolus compositus*). Honey mesquite and huisache (*Acacia farnesiana*), amongst other woody species, may also be present.

### 4.4.2 Coastal Dune Uplands and Grasslands

Coastal dune uplands and grasslands were also present within the SJI PSA. Coastal dune uplands and grasslands were located on the higher elevations of active primary and secondary sand dunes, beginning on the Gulf beach side and traversing over the dunes to the backdune landscape. Coastal grasslands were observed interspersed with interdunal swale wetlands described as PEM1C under Section 4.3.6 above. Dominant vegetation present within coastal dune uplands and grasslands include beach morning glory (*Ipomea pes-caprae*), bitter panicum (*Panicum amarum*), coastal groundcherry (*Physalis angustifolia*), Gulf croton (*Croton punctatus*), shoreline sea purslane (*Sesuvium portulacastrum*), and sea oats (*Uniola paniculata*).

Coastal dune uplands and grasslands are classified by the TPWD EMST (TWPD, 2014) as Texas Coast Dune and Coastal Grassland. This habitat system includes upland, grass dominated vegetation on deep sands. Dunes are often dominated by sea oats (*Uniola paniculata*), with other species such as Gulf croton, bitter panicum, beach morning glory, shoreline sea purslane and searocket (*Cakile* spp). Coastal dune uplands and grasslands occur within the primary and secondary dunes, as well as relatively level areas, where deep sands are deposited. Significant local topography, in the form of swales and pothole wetlands, may be present but are excluded from this system.

### 4.4.3 Other Types of Upland Habitats

Other typical upland habitats observed include upland sand flats and upland beach. Upland sand flat areas included sandy unvegetated areas (less than five percent vegetative cover) located above HTL. Upland beach habitat included sandy unvegetated areas (less than five percent vegetative cover) above HTL along the Gulf beach.

## 4.5 Summary Table of Waters Delineated Within the SJI PSA

The following tables list marine, estuarine, and palustrine waterbodies identified at the SJI PSA.

**Table 4.5-1: Waters Delineated Within the SJI PSA**

| Count | Waters Name | Cowardin | Acres within PSA[1] | No. of Waters Polygons | TPWD EMST Classification | Date Surveyed | Latitude[2] (DD) | Longitude[2] (DD) |
|---|---|---|---|---|---|---|---|---|
| **Section 10/404 Tidal Waters** | | | | | | | | |
| 1 | WAT01 | E1UBL | 13.195 | 1 | Estuarine Open Water - Corpus Christi Ship Channel | 10/21/2021 | 27.839352 | -97.046660 |
| 2 | WAT02 | M1UBL | 542.604 | 1 | Marine Open Water-Gulf Coast | 10/19/2021 | 27.885003 | -97.017592 |
| **Section 10/404 Subtotal** | | | **555.799** | **2** | | | | |
| **Section 404 Tidal Waters** | | | | | | | | |
| 3 | WAT03 | M2USN | 51.359 | 1 | Texas Coastal Beach-Marine | 10/19/2021 | 27.880107 | -97.022133 |
| 4 | WAT04 | E2USN | 0.355 | 3 | Texas Coastal Beach-Estuarine | 10/21/2021; 10/26/2021 | 27.841313 | -97.047881 |
| **Section 404 Tidal Subtotal** | | | **51.714** | **4** | | | | |
| **Section 404 Non-Tidal Waters** | | | | | | | | |
| 5 | WAT05 | PUB1H | 0.138 | 1 | Open water - Pond | 10/26/2021 | 27.868622 | -97.035442 |
| 6 | WAT06 | PUB1H | 0.883 | 1 | Open water - Pond | 10/26/2021 | 27.868895 | -97.034217 |
| 7 | WAT07 | PUB1H | 1.955 | 1 | Open water - Pond | 10/21/2021 | 27.872435 | -97.032070 |
| 8 | WAT08 | PUB1H | 3.305 | 1 | Open water - Pond | 10/21/2021 | 27.876353 | -97.029526 |
| 9 | WAT09 | PUB1H | 1.066 | 1 | Open water - Pond | 10/25/2021 | 27.877970 | -97.027988 |
| 10 | WAT10 | PUB1H | 0.039 | 1 | Open water - Pond | 10/21/2021 | 27.877578 | -97.027293 |
| 11 | WAT11 | PUB1H | 14.274 | 1 | Open water - Pond | 10/25/2021 | 27.882650 | -97.025185 |
| 12 | WAT12 | PUB1H | 0.466 | 1 | Open water - Pond | 10/25/2021 | 27.887089 | -97.021330 |
| 13 | WAT13 | PUB1H | 4.537 | 1 | Open water - Pond | 10/25/2021 | 27.888733 | -97.021112 |
| 14 | WAT14 | PUB1H | 1.787 | 1 | Open water - Pond | 10/20/2021 | 27.889572 | -97.019255 |
| 15 | WAT15 | PUB1H | 0.285 | 1 | Open water - Pond | 10/20/2021 | 27.891344 | -97.017867 |
| 16 | WAT16 | PUB1H | 0.299 | 1 | Open water - Pond | 10/20/2021 | 27.891998 | -97.018388 |
| 17 | WAT17 | PUB1H | 0.050 | 1 | Open water - Pond | 10/20/2021 | 27.892759 | -97.017908 |
| 18 | WAT18 | PUB1H | 1.574 | 1 | Open water - Pond | 10/20/2021 | 27.893132 | -97.017071 |
| 19 | WAT19 | PUB1H | 0.994 | 1 | Open water - Pond | 10/20/2021 | 27.898095 | -97.012793 |
| 20 | WAT20 | PUB1H | 0.196 | 1 | Open water - Pond | 10/22/2021 | 27.902450 | -97.009349 |
| 21 | WAT21 | PUB1H | 0.092 | 1 | Open water - Pond | 10/22/2021 | 27.905410 | -97.007974 |
| **Section 404 Non-Tidal Subtotal** | | | **31.942** | 17 | | | | |
| **TOTALS** | | | **639.455** | **23** | | | | |

*Notes:*

*[1] Difference between the totals reported and the sum of the individual records are due to rounding. The totals reported were derived from GIS data.*

*[2] Latitude/longitude recorded for the polygon centroid of the delineated water. For resources with multiple polygons delineated; a single polygon centroid has been recorded.*

Below is a summary of waters delineated within the SJI PSA:

- A total of 555.799 acres of waterbodies are located below the MHW elevation and are therefore subject to both Section 10 and Section 404 regulations. These include a total of 13.195 acres of estuarine subtidal waterbodies (E1UBL) and 542.604 acres of marine subtidal waterbodies (M1UBL).
- A total of 51.714 acres of waterbodies occur between the MHW and HTL elevation contours, and are therefore subject to Section 404 (tidal) regulation. These include 51.359 acres of marine intertidal unconsolidated shores (E2USN) and 0.355 acres of estuarine intertidal unconsolidated shore (M2USN).
- A total of 31.942 acre of waterbodies are located above HTL elevation contours and are therefore subject to Section 404 (non-tidal) regulation. These include 31.942 acres of palustrine unconsolidated bottom-open water ponds (PUB1H).

*Remainder of page intentionally left blank.*

*Remainder of page intentionally left blank.*

## 4.6 Summary Table of Wetlands Delineated Within the SJI PSA

The following table lists estuarine and palustrine wetlands identified within the SJI PSA.

**Table 4.6-1: Wetlands Delineated Within the SJI PSA**

| Count | Wetland Name | Cowardin | Acres Within PSA[1] | No. of Wetland Polygons | TPWD EMST Classification | Date Surveyed | Latitude[2] (DD) | Longitude[2] (DD) |
|---|---|---|---|---|---|---|---|---|
| **Section 404 Tidal Wetlands** | | | | | | | | |
| 1 | WET01 | E2EM1N1 | 0.019 | 1 | Texas Salt and Brackish Tidal Flats | 10/21/2021 | 27.840984 | -97.047322 |
| 2 | WET08 | E2EM1N1 | 0.231 | 1 | Texas Salt and Brackish Tidal Flats | 10/26/2021 | 27.870976 | -97.034832 |
| 3 | WET14 | E2EM1N1 | 2.723 | 1 | Texas Salt and Brackish Tidal Flats | 10/21/2021 | 27.873920 | -97.032605 |
| 4 | WET23 | E2EM1N1 | 0.068 | 1 | Texas Salt and Brackish Tidal Flats | 10/25/2021 | 27.886879 | -97.024708 |
| **Section 404 Tidal Subtotal** | | | **3.041** | **4** | | | | |
| **Section 404 Non-tidal Wetlands** | | | | | | | | |
| 5 | WET02 | PEM1C | 0.008 | 1 | Coastal Plain Interdunal Wetland | 10/21/2021 | 27.845535 | -97.045597 |
| 6 | WET03 | PEM1C | 0.148 | 2 | Coastal Plain Interdunal Wetland | 10/25/2021 | 27.849236 | -97.044098 |
| 7 | WET04 | PEM1C | 24.287 | 2 | Coastal Plain Interdunal Wetland | 10/26/2021 | 27.864565 | -97.037210 |
| 8 | WET05 | PEM1C1 | 1.969 | 1 | Texas Salty Prairie | 10/26/2021 | 27.867288 | -97.037042 |
| 9 | WET06 | PEM1C1 | 4.693 | 1 | Texas Salty Prairie | 10/26/2021 | 27.869897 | -97.035276 |
| 10 | WET07 | PEM1C | 4.368 | 1 | Coastal Plain Interdunal Wetland | 10/26/2021 | 27.869695 | -97.034646 |
| 11 | WET09 | PEM1C1 | 0.925 | 1 | Texas Salty Prairie | 10/26/2021 | 27.871450 | -97.034371 |
| 12 | WET10 | PEM1C | 0.061 | 1 | Coastal Plain Interdunal Wetland | 10/26/2021 | 27.871406 | -97.034706 |
| 13 | WET11 | PEM1C1 | 0.326 | 1 | Texas Salty Prairie | 10/26/2021 | 27.872022 | -97.034071 |
| 14 | WET12 | PEM1C | 25.093 | 1 | Coastal Plain Interdunal Wetland | 10/21/2021 | 27.876637 | -97.029931 |
| 15 | WET13 | PEM1C1 | 8.499 | 1 | Texas Salty Prairie | 10/21/2021 | 27.875032 | -97.031569 |
| 16 | WET15 | PEM1C1 | 0.044 | 1 | Texas Salty Prairie | 10/21/2021 | 27.872598 | -97.031524 |
| 17 | WET16 | PEM1C1 | 22.539 | 1 | Texas Salty Prairie | 10/25/2021 | 27.882495 | -97.027057 |
| 18 | WET17 | PEM1C | 0.011 | 1 | Coastal Plain Interdunal Wetland | 10/25/2021 | 27.878305 | -97.030256 |
| 19 | WET18 | PEM1C1 | 0.021 | 1 | Texas Salty Prairie | 10/25/2021 | 27.878115 | -97.028269 |
| 20 | WET19 | PEM1C | 27.410 | 2 | Coastal Plain Interdunal Wetland | 10/25/2021 | 27.885666 | -97.024150 |
| 21 | WET20 | PEM1C1 | 0.007 | 1 | Texas Salty Prairie | 10/25/2021 | 27.881838 | -97.026236 |
| 22 | WET21 | PEM1C1 | 0.052 | 1 | Texas Salty Prairie | 10/19/2021 | 27.885024 | -97.022928 |
| 23 | WET22 | PEM1C | 0.087 | 1 | Coastal Plain Interdunal Wetland | 10/19/2021 | 27.884968 | -97.022534 |
| 24 | WET24 | PEM1C1 | 0.019 | 1 | Texas Salty Prairie | 10/19/2021 | 27.886058 | -97.021675 |
| 25 | WET25 | PEM1C1 | 0.027 | 1 | Texas Salty Prairie | 10/19/2021 | 27.886735 | -97.021668 |
| 26 | WET26 | PEM1C1 | 4.001 | 1 | Texas Salty Prairie | 10/25/2021 | 27.888077 | -97.023207 |
| 27 | WET27 | PEM1C1 | 0.007 | 1 | Texas Salty Prairie | 10/25/2021 | 27.888768 | -97.021345 |
| 28 | WET28 | PEM1C1 | 0.010 | 1 | Texas Salty Prairie | 10/25/2021 | 27.888915 | -97.021325 |

| Count | Wetland Name | Cowardin | Acres Within PSA[1] | No. of Wetland Polygons | TPWD EMST Classification | Date Surveyed | Latitude[2] (DD) | Longitude[2] (DD) |
|---|---|---|---|---|---|---|---|---|
| 29 | WET29 | PEM1C1 | 0.005 | 1 | Texas Salty Prairie | 10/25/2021 | 27.889366 | -97.021152 |
| 30 | WET30 | PEM1C1 | 0.213 | 1 | Texas Salty Prairie | 10/25/2021 | 27.889827 | -97.022034 |
| 31 | WET31 | PEM1C | 0.120 | 4 | Coastal Plain Interdunal Wetland | 10/25/2021 | 27.889301 | -97.020625 |
| 32 | WET32 | PEM1C | 0.085 | 1 | Coastal Plain Interdunal Wetland | 10/25/2021 | 27.889094 | -97.020601 |
| 33 | WET33 | PEM1C1 | 0.022 | 1 | Texas Salty Prairie | 10/25/2021 | 27.889799 | -97.020808 |
| 34 | WET34 | PEM1C | 6.085 | 1 | Coastal Plain Interdunal Wetland | 10/20/2021 | 27.898543 | -97.012739 |
| 35 | WET35 | PEM1C | 0.096 | 1 | Coastal Plain Interdunal Wetland | 10/20/2021 | 27.896855 | -97.014627 |
| 36 | WET36 | PEM1C | 0.153 | 1 | Coastal Plain Interdunal Wetland | 10/22/2021 | 27.902718 | -97.009293 |
| 37 | WET37 | PEM1C | 0.043 | 1 | Coastal Plain Interdunal Wetland | 10/22/2021 | 27.904750 | -97.008531 |
| 38 | WET38 | PEM1C | 0.013 | 1 | Coastal Plain Interdunal Wetland | 10/22/2021 | 27.905936 | -97.007258 |
| 39 | WET39 | PEM1C | 0.262 | 1 | Coastal Plain Interdunal Wetland | 10/22/2021 | 27.905783 | -97.006954 |
| 40 | WET40 | PEM1C | 1.188 | 1 | Coastal Plain Interdunal Wetland | 10/20/2021 | 27.907702 | -97.006124 |
| 41 | WET41 | PEM1C | 0.218 | 1 | Coastal Plain Interdunal Wetland | 10/20/2021 | 27.908147 | -97.004722 |
| 42 | WET42 | PEM1C | 0.485 | 1 | Coastal Plain Interdunal Wetland | 10/20/2021 | 27.909154 | -97.003963 |
| 43 | WET43 | PEM1C | 0.334 | 1 | Coastal Plain Interdunal Wetland | 10/20/2021 | 27.909945 | -97.003242 |
| 44 | WET44 | PEM1C | 0.435 | 1 | Coastal Plain Interdunal Wetland | 10/20/2021 | 27.910503 | -97.003296 |
| **Mosaic Wetlands[3] (*wetland percent acreage reported*)** | | | | | | | | |
| 45 | MOS01 | PEM1C | 10.075 | 1 | Coastal Plain Interdunal Wetland | 10/21/2021 | 27.842516 | -97.046573 |
| 46 | MOS02 | PEM1C | 7.746 | 1 | Coastal Plain Interdunal Wetland | 10/21/2021 | 27.852203 | -97.043098 |
| 47 | MOS03 | PEM1C | 2.927 | 1 | Coastal Plain Interdunal Wetland | 11/11/2021 | 27.855693 | -97.040841 |
| 48 | MOS04 | PEM1C | 4.171 | 1 | Coastal Plain Interdunal Wetland | 10/26/2021 | 27.864671 | -97.035854 |
| 49 | MOS05 | PEM1C | 1.908 | 1 | Coastal Plain Interdunal Wetland | 10/26/2021 | 27.869446 | -97.033620 |
| 50 | MOS06 | PEM1C | 1.225 | 1 | Coastal Plain Interdunal Wetland | 10/21/2021 | 27.873225 | -97.030720 |
| 51 | MOS07 | PEM1C | 2.570 | 1 | Coastal Plain Interdunal Wetland | 10/25/2021 | 27.886432 | -97.021966 |
| 52 | MOS08 | PEM1C | 3.645 | 1 | Coastal Plain Interdunal Wetland | 10/25/2021 | 27.890649 | -97.019022 |
| 53 | MOS09 | PEM1C | 2.599 | 1 | Coastal Plain Interdunal Wetland | 10/20/2021 | 27.894549 | -97.015561 |
| 54 | MOS010 | PEM1C | 1.844 | 1 | Coastal Plain Interdunal Wetland | 10/22/2021 | 27.903520 | -97.009006 |
| 55 | MOS011 | PEM1C | 0.878 | 1 | Coastal Plain Interdunal Wetland | 10/20/2021 | 27.907064 | -97.005694 |

| Count | Wetland Name | Cowardin | Acres Within PSA[1] | No. of Wetland Polygons | TPWD EMST Classification | Date Surveyed | Latitude[2] (DD) | Longitude[2] (DD) |
|---|---|---|---|---|---|---|---|---|
| 56 | MOS012 | PEM1C | 64.078 | 1 | Coastal Plain Interdunal Wetland | 10/19/2021 | 27.920256 | -96.995310 |
| **Section 404 Non-tidal Subtotal** | | | **238.040** | **58** | | | | |
| **TOTALS** | | | **241.081** | **62** | | | | |

*Notes:*

*[1] Difference between the totals reported and the sum of the individual records are due to rounding. The totals reported were derived from GIS data.*

*[2] Latitude/longitude recorded for the polygon centroid of the delineated water. For resources with multiple polygons delineated; a single polygon centroid has been recorded.*

*[3] Calculated wetland percentage within each mosaic polygon is presented below:*

*MOS01 – Wetland Percentage 57.4%*
*MOS02 – Wetland Percentage 68.8%*
*MOS03 – Wetland Percentage 50.6%*
*MOS04 – Wetland Percentage 47.5%*
*MOS05 – Wetland Percentage 37.0%*
*MOS06 – Wetland Percentage 40.0%*
*MOS07 – Wetland Percentage 27.5%*
*MOS08 – Wetland Percentage 54.2%*
*MOS09 – Wetland Percentage 52.4%*
*MOS10 – Wetland Percentage 29.4%*
*MOS11 – Wetland Percentage 43.6%*
*MOS12 – Wetland Percentage 58.4%*

Below is a summary of wetlands delineated within the SJI PSA:

- There are no estuarine wetlands located below the MHW elevation within the SJI PSA. Therefore, there are no estuarine wetlands subject to both Section 10 and Section 404 regulations.
- Estuarine wetlands subject to Section 404 jurisdiction (i.e., tidally influenced wetlands occurring between MHW and HTL elevations) occupy 3.041 acres. Tidal wetlands subject to Section 404 only include 3.041 acres of estuarine emergent low marsh flats (E2EM1N1).
- Non-tidal, palustrine wetlands subject to Section 404 account for 238.040 acres, which include 194.656 acres of palustrine emergent coastal prairie wetlands (PEM1C) and 43.384 acres of palustrine emergent hyperhaline vegetated flats located above HTL (PEM1C1). Of the 194.656 acres of PEM1C wetlands, approximately 103.666 acres are classified as coastal interdunal wet prairie and upland mosaic wetlands with percent wetland ranging between 27.5% and 68.8%.

*Remainder of page intentionally left blank.*

# 5 Discussion and Conclusions

## 5.1 Discussion of Results and General Conclusions

Field delineation surveys were conducted from October 18 through October 25, 2021 and on November 11, 2021 to identify potential WOUS as defined by the USACE (33 CFR 328.3(a)), wetlands (33 CFR 328.3(c)), SAV, and oyster habitat present within the SJI PSA located just north of the Corpus Christi Ship Channel in Aransas County Texas. Results of the field delineation surveys document five waterbody types (M1UBL, M2USN, E1UBL, E2USN, and PUB1H), one type of estuarine wetland habitat (E2EM1N1), and two types of palustrine wetland habitats (PEM1C and PEM1C1) within the SJI PSA. No SAV or oyster habitat were identified within the SJI PSA. Locations and acreage amounts of identified waters and wetlands by site are included in Table 4.5-1 (waters) and Table 4.6-1 (wetlands) within Section 4 "Waterbodies, Wetlands, SAV, and Oyster Delineation Results." Table 5.1-1 provides a summary of waters and wetlands delineated within the SJI PSA.

**Table 5.1-1: Summary of Waters and Wetlands Delineated Within the SJI PSA**

| Cowardin | No. of Mapped Polygons | Acres within PSA | TPWD EMST Classification |
|---|---|---|---|
| **Section 10/404 Waterbodies** | | | |
| E1UBL | 1 | 13.195 | Estuarine Open Water |
| M1UBL | 1 | 542.604 | Marine Open Water |
| **Section 10/404 Waterbodies Subtotal** | | **555.799** | |
| **Section 404 Tidal Waterbodies** | | | |
| E2USN | 3 | 0.355 | Texas Coastal Beach-Estuarine |
| M2USN | 1 | 51.359 | Texas Coastal Beach-Marine |
| **Section 404 Tidal Waterbodies Subtotal** | | **51.714** | |
| **Section 404 Non-tidal Waterbodies** | | | |
| PUB1H | 17 | 31.942 | Palustrine -Open Water Pond |
| **Waterbodies Total** | | **639.455** | |
| **Section 404 Tidal Wetlands** | | | |
| E2EM1N1 | 4 | 3.041 | Texas Salt and Brackish Tidal Flats |
| **Section 404 Non-tidal Wetlands** | | | |
| PEM1C | 40 | 194.659 | Coastal Plain Interdunal Wetland |
| PEM1C1 | 18 | 43.381 | Texas Salty Prairie |
| **Section 404 Non-tidal Wetlands Subtotal** | | **238.040** | |
| **Wetlands Total** | | **241.081** | |
| **Uplands Total** | | **599.650** | |
| **TOTALS** | | **1,480.186** | |

*This page intentionally left blank.*

# 6 References

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Office of Biological Services, U.S. Fish and Wildlife Service, U.S. Department of the Interior. Washington, D.C. 104 p.

Environmental Laboratory (1987). Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Environmental Laboratory. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0.

Keith, Guthrie, "Aransas Harbor Terminal Railway," *Handbook of Texas Online*, accessed June 03, 2021, https://www.tshaonline.org/handbook/entries/aransas-harbor-terminal-railway.

NOAA. 2020. Bathymetric Data Viewer. https://maps.ngdc.noaa.gov/viewers/bathymetry/ Accessed June 2020.

NRCS. 2018. Web Soil Survey. Internet: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed June 2020.

Perkins, Zach. 2019. "Dredging Up History". Port Aransas South Jetty Newspaper. September 18, 2019. Available at: Dredging up history | Port Aransas South Jetty (portasouthjetty.com). Accessed: June 3, 2021.

Shew, D.M., R.H. Baumann, T.H. Fritts, L.S. Dunn, J.B. Johnston, and M.W. Young. 1981. Texas barrier islands region ecological characterization: environmental synthesis papers. FWS/OBS-81/32. U.S. Fish and Wildlife Service, Biological Services Program, Washington, D.C. 413 pp.

Texas Sea Grant Program. 2016. *Effects of Erosion and Accretion on Coastal Landforms.* Texas Sea Grant Program. Published 2016. 6 p.

Texas Seagrass Monitoring Program. 2019. http://www.texasseagrass.org/index.html. Accessed June 2020.

TPWD. 2014. Ecological Mapping Systems of Texas. Interpretive Booklet for Phase 3: https://tpwd.texas.gov/gis/programs/landscape-ecology/supporting-documents/final-summary-report. Accessed June 2021.

TPWD. 2020. Ecological Mapping Systems of Texas. Internet: https://tpwd.texas.gov/landwater/land/programs/landscape-ecology/ems/. Accessed June 2021.

TPWD. 1999. Seagrass Conservation Plan for Texas. Published by Texas Parks and Wildlife Department, Resource Protection Division. 84 p.

Triton Environmental Solutions, LLC (Triton). 2021. Corpus Christi Ship Channel Deepening Project Waters of the United States Delineation Report: Aquatic Resources. June 2021.

USACE. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-20. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USACE. 2020. National Wetland Plant List, version 3.5. http://wetland_plants.usace.army.mil/. Accessed December 2021.

USDA, NRCS. 2010. Field Indicators of Hydric Soils in the United States, Version 7.0. L.M. Vasilas, G.W. Hurt, and C.V. Noble (eds.) USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

USFWS. 2018. National Wetlands Inventory Wetlands Mapper. Available at: http://www.fws.gov/wetlands/ Accessed June 2020.

USGS. 2016. Atlantic Coastal Plain physiographic provinces. Internet: https://www.usgs.gov/media/images/atlantic-coastal-plain-physiographic-provinces. Accessed June 2020.

USGS. 2019. LiDAR data. Internet: https://viewer.nationalmap.gov/basic/. Accessed June 2020,

USGS. 2019. National Hydrography Dataset. Internet: https://www.nhd.usgs.gov. Accessed June 2020.

# 7 Appendices

# A. Map Figures (2-9)


| SOIL | DESCRIPTION |
|---|---|
| Ps | Psamments, rarely flooded |
| GM | Galveston-Mustang complex, 0 to 3 percent slopes, occasionally flooded, frequently ponded |
| By | Beaches |
| W | Water |

Notes:

Data Sources:
NRCS SSURGO Soils

Legend
- Project Study Area (1482.3 Acres)
- NRCS Soil Unit

# PORT OF CORPUS CHRISTI AUTHORITY
# CHANNEL DEEPENING PROJECT
# SJI - FIGURE 2

Site SJI NRCS Soils Map
Aransas County, TX

6,000 0 6,000 12,000 Feet

N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE: 1:72,000

REFERENCE SCALE: 1 IN = 6,000 FT

Drawn By: CLB
Date: 01/12/2022