

## Quarterly Report for Matagorda Bay Mitigation Trust March 31, 2022

### **Project:**

Colorado River Delta Ecosystem Assessment: Gathering Key Baseline Data to Guide Future Habitat Restoration in Matagorda Bay

### **Organizations:**

<sup>1</sup>Center for Sportfish Science and Conservation (CSSC) at Harte Research Institute for Gulf of Mexico Studies Texas A&M University at Corpus Christi

<sup>2</sup>BIOWEST, INC.

### **Investigators:**

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**Contract No.:** 0015

**Project Term:** 03/01/2021 – 07/31/2023

**Reporting Period:** 3/1/2021 – 2/29/2022 (4)

The contracted project with the Matagorda Bay Mitigation Trust was initiated as of March 1, 2021. After this date, we identified and got approval for a subcontractor with expertise in areas not covered by researchers at Texas A&M University-Corpus Christi. Areas for subcontract expertise include Benthic Habitat Characterization, and a portion of the Hydrological and Ecological Assessment work. The chosen contractor was BIOWEST, Inc. and a subaward was issued to this group in April 2021 (with a start date of March 1) in the amount of \$230,000.

**Task 1 - Benthic Habitat Mapping:** Perform a detailed benthic habitat characterization of the Colorado River Delta study area to provide an updated habitat baseline.

Status: Ongoing

Spring '21

- BIO-WEST conducted project management, internal project team meetings, task coordination, and invoicing.
- BIO-WEST conducted a site reconnaissance with CSSC scientist on May 25<sup>th</sup>, 2021.
- BIO-WEST initiated map preparation and conducted site selection analysis to facilitate ecological sampling.

Summer '21

- BIO-WEST initiated benthic habitat mapping during this quarter, this included
  - 1) an evaluation of existing aerial imagery for the Colorado River Delta project area and
  - 2) field surveys using side-scan sonar to map benthic habitats including oyster reefs, submerged aquatic vegetation and open bay bottom. Benthic habitat field mapping activities will continue to be conducted as the project progresses.

## Fall '21

- BIO-WEST continued benthic habitat mapping in the Colorado River Delta during this quarter when tidal conditions were appropriate. Field surveys involved side-scan sonar to map benthic habitats including oyster reefs, submerged aquatic vegetation and open bay bottom. Benthic habitat mapping will continue this winter and into the spring as tidal conditions are appropriate.

## Winter '22

- BIO-WEST continued benthic habitat mapping in the Colorado River Delta using side-scan sonar during this quarter when tidal conditions were appropriate. Benthic habitat field mapping completed to date is highlighted in Figure 1. Benthic habitat mapping will continue this spring as tidal conditions are appropriate.
- BIO-WEST conducted aerial oyster reef mapping in the Colorado River Delta. These surveys were initiated in February 2022 and performed during low tide conditions when oyster reefs were most visible. A completed drone map is shown in Figure 2. As weather and tidal conditions permit, aerial oyster reef mapping will continue this spring.

**Task 2 – Ecological Assessment:** Conduct a comprehensive ecological assessment linking the distribution of species and their habitats spatially within the Colorado River Delta study area.

Status: Ongoing

## Spring '21

- BIO-WEST conducted the Spring 2021 coastal bird surveys for the six established study sites in the delta on May 26-27, 2021.
- BIO-WEST initiated analysis of species and habitat data collected during Spring 2021 coastal bird surveys.
- CSSC conducted first of two sampling events for Spring on June 2<sup>nd</sup>, 2021. Three epibenthic sled samples were taken at six sampling sites. In addition, water quality was taken at two additional sites, see map.
- CSSC conducted the second Spring sampling event on June 11<sup>th</sup>, 2021. Three epibenthic sled samples were taken at six sampling sites along with water quality at sentinel sites. At present, CSSC has 36 samples in house representing Spring samples.

## Summer '21

- BIO-WEST continued data reduction and analysis for the Avian Survey conducted in Spring '21.
  - Examined acoustic recordings from six sites for the presence of Eastern Black Rails (*Laterallus jamaicensis*), and Whooping Cranes (*Grus americana*).
- CSSC conducted two summer sampling events on August 27<sup>th</sup> and September 8<sup>th</sup>. This included the usual three epibenthic tows at each site except for site 6

which we were unable to reach due to very low water levels typical of the summer months.

- CSSC also deployed three HOBO ware data loggers designed to monitor Temperature and Water Levels at three locations (see map).

#### Fall '21

- BIO-WEST conducted Fall avian point count surveys from October 13-15, 2021, with a team of two biologists covering all six study sites established within the Colorado River Delta. Timed point count surveys (8 points per site) were conducted for each site, with two sites completed per day. In addition to other relevant climate parameters, salinity (ppt) was recorded at the time of each survey. Additionally, acoustic recorders were deployed and set to record continuously at each of the six sample sites. Recorders were set prior to the onset of avian point counts and retrieved at the conclusion of the full survey effort.
- BIO-WEST initiated data reduction and analysis for the Avian point count surveys conducted in October. Acoustic analysis for fall sampling was also initiated by reviewing recordings for evidence of calling Eastern Black Rails (*Laterallus jamaicensis jamaicensis*) and Whooping Crane (*Grus americana*).
- CSSC conducted the first Fall sampling event on November 1<sup>st</sup>. This included three epibenthic tows at sites 1-5. Site 6 was still too shallow to sample due to low tides. Water level data loggers were downloaded from sites 1,2, and 5. Our air pressure data logger from site 1 was stolen. Salinity loggers were deployed at sites 2 and 5. PVC mounting poles for data loggers were revamped with a slip-on design.
- CSSC conducted the second Fall sampling event November 8<sup>th</sup>. The same five sites were sampled for a total of 15 samples. Water levels at data loggers were measure at sites 1, 2, and 5.

#### Winter '22

- BIO-WEST conducted Winter avian point count surveys from February 9-11, 2022. This included 8 timed point counts at six established sites and acoustic recordings for the full survey. Relevant climate parameters in addition to salinity (ppt) were recorded.
- BIO-WEST observed over 4,000 individual birds represented by 89 species, with the highest diversity and abundance present along exposed mud flats and oyster beds. Among these, several iconic species were observed including Magnificent Frigatebird, Clapper Rail, and American Avocet. Species largely considered to be indicators of marsh ecosystem stability (i.e., Seaside Sparrow) were also commonly recorded during surveys.
- BIO-WEST initiated data reduction and analysis for the Avian point count surveys conducted in February. Acoustic analysis for Winter sampling was also initiated by reviewing recordings for evidence of calling Eastern Black Rail and Whooping Crane.
- CSSC conducted the first Winter sampling event on February 15<sup>th</sup>. The tide was extremely low on this day and most of our sites were unreachable. In addition, marsh edge habitat was non-existent at all sites. We did manage to pull three

samples at our first site which was largely exposed oyster reef. Water level data loggers were downloaded from sites 1 and 5, site 2 was unreachable.

- CSSC conducted the second Winter sampling event on February 22<sup>nd</sup>. The tide was higher, and we were able to sample our regular five sites for a total of 15 samples. Site 6 is still unreachable. Water levels at data logger sites 1, 2, and 5 were measured.

**Task 3 – Hydrological Assessment:** Complete a hydrological assessment to better understand water availability, flow paths, and topography in the Colorado Delta.

Status: Ongoing

Spring '21

- Nothing to report for this quarter.

Summer '21

- Nothing to report for this quarter.

Fall '21

- BIO-WEST initiated the hydrological assessment via data compilation and review of existing imagery and topography of the Colorado River delta study area. BIO-WEST also initiated an examination of flow paths within the Colorado River delta region.

Winter '22

- BIO-WEST continued the hydrological assessment and review of existing imagery and topography of the Colorado River delta study area. Activities associated with this assessment will continue this spring.

**Task 4 – Data Analysis, Compilation and Reporting:** Collective data analysis, interim/quarterly reporting, input solicitation, and final reporting.

Status: Ongoing

Spring '21

- 06/30/2021 - Quarterly report No. 1 completed for project.

Summer '21

- 09/30/2021 - Quarterly report No. 2 completed for project.
- CSSC has 66 marsh edge epibenthic samples in house.

Fall '21

- 12/30/2021 - Quarterly report No. 3 completed for project.
- CSSC has 96 marsh edge epibenthic samples in house.

Winter '22

- 3/17/2022 – Quarterly report No. 4 completed for project.
- CSSC has 114 marsh edge epibenthic samples in house.

Figure 1.



Figure 2.



