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# *SUBMERGED AQUATIC VEGETATION SURVEY*
## *(Original Survey Conducted by Hanson Inc. March 2018)*

## *1.368± ACRE PARADISE FISHING PIER MARINE TRACT*
## *13317 SOUTH PADRE ISLAND DRIVE*
## *CORPUS CHRISTI, NUECES COUNTY, TEXAS*

***SWG-2003-01790***

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***November 22, 2021***

Received 11/22/2021

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***(Original Survey Conducted by Hanson Inc. March 2018)***

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***CORPUS CHRISTI, NUECES COUNTY, TEXAS***

## INTRODUCTION AND PROJECT OVERVIEW

The 1.368± acre marine tract (Paradise Fishing Pier Tract) is located at 13317 South Padre Island Drive (SPID) within the Marker 37 Marina, along the southeastern side of the Paradise Fishing Pier, in Corpus Christi, Nueces County, Texas. The property lies just south of the John F Kennedy Memorial Causeway in the Laguna Madre and is bordered to the northwest by the Intercoastal Waterway. Approximate UTM NAD 83 (meters) coordinates for this site are Northing 3057615.00, Easting 673562.00 off the Paradise Fishing Pier.

The purpose of this report is to present the findings from field investigations of a 1.368± acre marine tract submerged aquatic vegetation resurvey performed by Coastal Environments, Inc. (CEI) at the request of the U.S. Army Corps of Engineers (USACE) to assess whether damage has occurred to submerged aquatic vegetation that was originally reported prior to the installation and utilization of a jet-ski launch. This report will present and compare the findings of CEI's resurvey with the findings of the original seagrass survey performed by Hanson in 2018.

On September 15th and 16th, 2021, at the request of Sunset Island, LLC and Marker 37, LLC, CEI performed a submerged aquatic vegetation survey of 1.368± acre marine tract (Paradise Fishing Pier Tract) located at 13317 South Padre Island Drive (SPID) Corpus Christi, Nueces County, Texas. This submerged aquatic vegetation survey was a resurvey of a portion of survey that was originally conducted by Hanson in March of 2018. Hanson's original survey was a combined delineation of potential waters of the U.S., a wetland delineation, a seagrass survey and an oyster survey covering an area of 73.4 acres (Appendix A). The resurvey was requested by the USACE to find out whether a previously installed jet ski launch caused damage to existing seagrass. The methods and findings of CEI's submerged aquatic vegetation evaluation are discussed below.

Seagrass meadows qualify as special aquatic sites under 40 CFR 230.10(c)(3) of the CWA. As per 40 CFR 230.3(q-1), special aquatic sites are geographic areas large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region.

## METHODOLOGY

On September 2, 2021, CEI made a site visit to get a better idea of the state of the project area. The submerged aquatic vegetation survey was performed on September 15th and 16th, 2021 by Sandi Hart, M.S., Heather Perez, and Hope Bridgeman of CEI. Prior to conducting the field investigation, a review

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of Hanson's previous survey was performed to recreate the previous survey, within the area the USACE requested, as closely as possible. In addition, CEI mapped available information and characteristics of the site at acommon scale. Mapped information sources reviewed included USGS 7.5-minute topographic maps, the Texas Parks and Wildlife Seagrass Viewer (Appendix B), and color infraredaerial photography from 1950s to 2021.

Development of the field investigation strategy began by reviewing and recreating the re-survey area. A new project boundary was established and reviewed by the USACE prior to fieldwork. CEI re-established sampling transects and sample placement within the project review area in or as closely as possible to the original Hanson transects and sample points. Hanson's original sample points and transects files were uploaded onto a Trimble Geo 7x and transects were placed in 50 ft. intervals, as well as sample points taken every 20 feet, just as the original survey had. A total of 66 sample points were re-taken.

CEI had originally planned to perform the survey at an earlier date but had to postpone due to a hurricane in the Gulf of Mexico. Initially CEI attempted to recreate the survey utilizing a hand auger just as Hanson had done. However, the auger failed to lift and hold any biomass in a way that it could be examined. Instead CEI opted to do manual hand grabs on the floor to access and collect seagrass samples. Each sample location was shot in using the Trimble Geo 7x. Samples were noted if seagrass was absent or present and what type of seagrass was present. In addition, representative photographs were taken of seagrasses found within the project area and the general vicinity (Appendix D).

**FIELD INVESTIGATION RESULTS**

CEI took a total of 66 sample points throughout the 1.368± acre review area (Appendix C). Of that, there were 51 sample locations with seagrass present and 9 locations absent of seagrass. Interestingly, there were a total of 6 sample points that contained drift algae (2) and oyster shell hash (4) rather than seagrass. CEI found that seagrass meadows make up for 1.057 acres, or 77.27%, of the project review area, while 0.187 acres, or 13.64%, are lacking seagrass presence. Sample locations with drift algae and no seagrass make up for 0.041 acres or 3.03%, and oyster shell hash sample locations without seagrass make up for 0.083 acres, or 6.06%, instead of seagrass. See Table 1 for a detailed log of sample data.

The project area is within shallow waters, less than 6 feet deep. This habitat is where seagrass meadows are located. Seagrass within the project area was predominantly shoalgrass (*Halodule wrightii*), followed by manatee grass (*Syringodium filiforme*), and a very small amount of peanut grass (*Halophilla engelmanni*). A portion of the seagrass sampled appeared to be somewhat stressed, which could be attributed to several factors included previous storms, the February freeze, and presence of noted drift algae throughout some of the beds. Photographs of a representative sample of the seagrass found can be seen in Appendix D.

Hanson's original survey, in March 2018, covered a total of 629 sample points within a 73.4 acres project area. However, when we look at only the 66 samples taken within the 1.368± acre review area (Appendix B), there were a total of 61 locations present with seagrass and 5 locations absent. This tells us that 1.264 acres (92.4%) of seagrass meadows were present, while 0.104 acres (7.6%) were lacking in seagrass presence. At the time of the original survey, predominantly shoalgrass (*Halodule*

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*wrightii)* was present with less than one percent being manatee grass (*Syringodium filiforme*).

In comparison, CEI's 2021 survey shows a 6.06% increase in the absence of seagrass, or 0.0829 acres loss in seagrass presence since Hanson's original survey in 2018. Most of the loss seems to be occurring along the northern corner of the pier running just southwest of and along the boardwalk, adjacent to the merge of the marina to the intercoastal waterway. Here there are an additional six locations (1-4 to 1-9) showing seagrass absence since 2018 and one location (1-1) where oyster shell hash has replaced the seagrass. There is one sample location (2-12) that is within 50-80ft southwest of the pier that was absent of seagrass and an additional four locations where seagrass was replaced by either drift algae (4-22 and 4-23) or oyster shell hash (4-25 and 8-38). In addition, there is one location (13-61) at the far end of the pier which contains oyster shell hash instead of seagrass.

It is also worth noting that in Hanson's 2018 survey there were a total of five sample locations that were absent of seagrass. Of those five, two (1-2 and 1-3) are still absent of seagrass while three (4-24, 9-42, and 9-45) are now showing a presence of seagrass. In addition, Hanson only noted only observing shoalgrass (*Halodule wrightii*) and manatee grass (*Syringodium filiforme*), while CEI did note a small presence of peanut grass (*Halophilla engelmanni*) as well as a presence of drift algae and oyster shell hash throughout the project area.

## CONCLUSION

In September 2021, CEI performed a submerged aquatic vegetation re-survey of a portion of a site previously investigated by Hanson in March 2018. The results show a 6.06% increase in the absence of seagrass, or 0.187 acres loss in seagrass presence. CEI and Hanson both observed predominantly shoalgrass (*Halodule wrightii*), followed by manatee grass (*Syringodium filiforme*). However, in 2021, CEI also observed peanut grass (*Halophilla engelmanni*) as well as a notable amount of drift algae and oyster shell hash.

Only two sample locations were absent of seagrass in both surveys and they both lie next to on another atop the old jet ski launch. There were three locations that were absent of seagrass in 2018 are now showing presence of seagrass. A total of seven sample locations are absent of seagrass: six along the corner of the boardwalk extending southeast and one approximately 80 ft south from the corner of the pier and boardwalk. There was a total of six sample locations where either drift algae (two) or oyster shell hash (four) had replaced the seagrass.

The degradation and loss of seagrass could be attributed to several factors included a multitude of previous storms within the Gulf of Mexico, the Winter Freeze of 2021, and a presence of noted drift algae and oyster shell hash which is known to smother and block sunlight from seagrass beds and meadows. Due to the extreme nature of these events, the seagrasses within the area could have been detrimentally affected. In addition, abundant amounts of seagrasses were noted floating atop the water after the most recent hurricane came into the gulf. If there was a significant loss in seagrass, the area has rebounded well since the initial Hanson survey in 2018.

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**Table 1. Seagrass Sample Point Log.**

| Transect # | Sample Point # | Seagrass Present (CEI 2021) | Species | Common Name | Notes | Seagrass Presence (Hanson 2018) |
|---|---|---|---|---|---|---|
| 1 | 1 | No | | | oyster shell hash | Yes |
| 1 | 2 | No | | | | No |
| 1 | 3 | No | | | | No |
| 1 | 4 | No | | | | Yes |
| 1 | 5 | No | | | | Yes |
| 1 | 6 | No | | | | Yes |
| 1 | 7 | No | | | | Yes |
| 1 | 8 | No | | | | Yes |
| 1 | 9 | No | | | | Yes |
| 2 | 10 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 2 | 11 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 2 | 12 | No | | | | Yes |
| 2 | 13 | Yes | *Halodule beaudettei*<br>*Halophilla engelmannii* | Shoal Grass<br>Peanut Grass | oyster shell hash | Yes |
| 2 | 14 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 2 | 15 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 2 | 16 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 2 | 17 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 3 | 18 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 3 | 19 | Yes | *Halodule beaudettei* | Shoal Grass | drift algae | Yes |
| 3 | 20 | Yes | *Halodule beaudettei*<br>*Halophilla engelmannii* | Shoal Grass<br>Peanut Grass | drift algae | Yes |
| 3 | 21 | Yes | *Halodule beaudettei* | Shoal Grass | drift algae | Yes |
| 4 | 22 | No | | | drift algae | Yes |
| 4 | 23 | No | | | drift algae | Yes |
| 4 | 24 | Yes | *Halodule beaudettei* | Shoal Grass | drift algae | No |
| 4 | 25 | No | | | oyster shell hash | Yes |
| 5 | 26 | Yes | *Halodule beaudettei* | Shoal Grass | oyster shell hash | Yes |
| 5 | 27 | Yes | *Halodule beaudettei* | Shoal Grass | drift algae<br>oyster shell hash | Yes |
| 5 | 28 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 5 | 29 | Yes | *Halodule beaudettei* | Shoal Grass | drift algae | Yes |
| 6 | 30 | Yes | *Halodule beaudettei* | Shoal Grass | drift algae | Yes |
| 6 | 31 | Yes | *Halodule beaudettei* | Shoal Grass | oyster shell hash | Yes |
| 6 | 32 | Yes | *Halodule beaudettei* | Shoal Grass | drift algae | Yes |
| 6 | 33 | Yes | *Halodule beaudettei*<br>*Halophilla engelmannii* | Shoal Grass<br>Peanut Grass | drift algae<br>oyster shell hash | Yes |
| 7 | 34 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 7 | 35 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 7 | 36 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 7 | 37 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 8 | 38 | No | | | oyster shell hash | Yes |
| 8 | 39 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8 | 40 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 8 | 41 | Yes | *Cymodocea filiformis* | Manatee Grass | | Yes |
| 9 | 42 | Yes | *Cymodocea filiformis* | Manatee Grass | | No |
| 9 | 43 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 9 | 44 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 9 | 45 | Yes | *Halodule beaudettei* | Shoal Grass | drift algae<br>oyster shell hash | No |
| 10 | 46 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 10 | 47 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 10 | 48 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 10 | 49 | Yes | *Cymodocea filiformis* | Manatee Grass | | Yes |
| 11 | 50 | Yes | *Halodule beaudettei* | Shoal Grass<br>Peanut Grass | | Yes |
| 11 | 51 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 11 | 52 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 11 | 53 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 12 | 54 | Yes | *Cymodocea filiformis* | Manatee Grass | | Yes |
| 12 | 55 | Yes | *Halodule beaudettei*<br>*Cymodocea filiformis* | Shoal Grass<br>Manatee Grass | | Yes |
| 12 | 56 | Yes | *Halodule beaudettei* | Shoal Grass | oyster shell hash | Yes |
| 12 | 57 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 13 | 58 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 13 | 59 | Yes | *Halodule beaudettei*<br>*Cymodocea filiformis* | Shoal Grass<br>Manatee Grass | | Yes |
| 13 | 60 | Yes | *Halodule beaudettei* | Shoal Grass | oyster shell hash | Yes |
| 13 | 61 | No | | | oyster shell hash | Yes |
| 14 | 62 | Yes | *Halodule beaudettei*<br>*Cymodocea filiformis* | Shoal Grass<br>Manatee Grass | | Yes |
| 14 | 63 | Yes | *Cymodocea filiformis* | Manatee Grass | | Yes |
| 14 | 64 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |
| 14 | 65 | Yes | *Halodule beaudettei*<br>*Halophilla engelmannii* | Shoal Grass<br>Peanut Grass | | Yes |
| 14 | 66 | Yes | *Halodule beaudettei* | Shoal Grass | | Yes |

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## LITERATURE CITED

Hanson. 2018. *Waters and Wetlands Delineation Report for a 73.4-Acre Project Review Aerea Associated with Marker 37 Marina and Pier*. Prepared for Marker 37, LLC, Corpus Christi, Nueces County, Texas.

Texas Parks and Wildlife Online, "Seagrass Types", accessed September 27, 2021, https://tpwd.texas.gov/landwater/water/habitats/seagrass/seagrass-types.

Texas Parks and Wildlife Online, "TPWD Seagrass Viewer", accessed October 30, 2021, https://tpwd.maps.arcgis.com/apps/webappviewer/index.html?id=af7ff35381144b97b38fe553f2e7b562.

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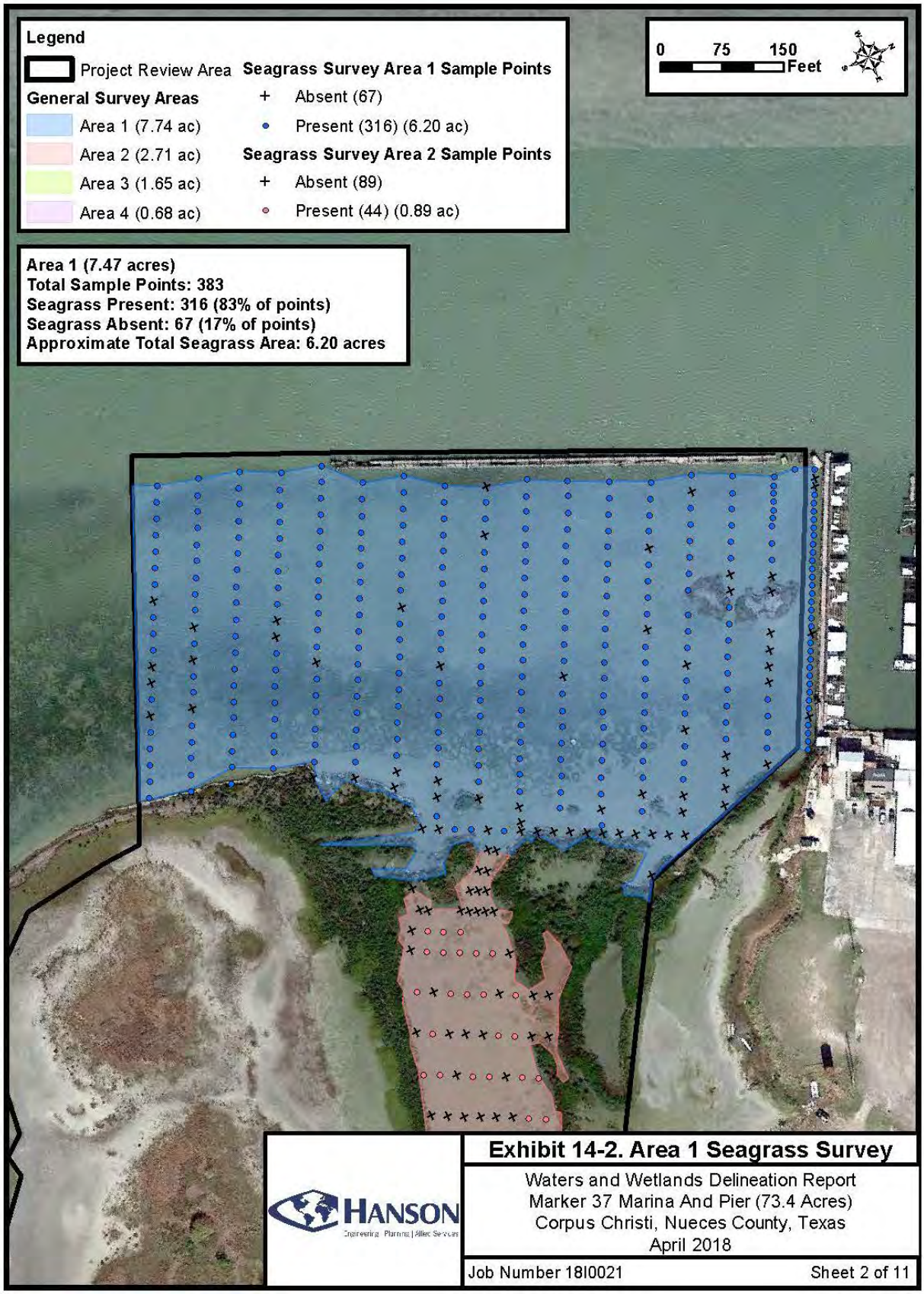
# Appendix A

## Original Hanson Seagrass Survey Map 2018


Legend
Project Review Area
General Survey Areas
Area 1 (7.74 ac)
Area 2 (2.71 ac)
Area 3 (1.65 ac)
Area 4 (0.68 ac)
Seagrass Survey Area 1 Sample Points
Absent (67)
Present (316) (6.20 ac)
Seagrass Survey Area 2 Sample Points
Absent (89)
Present (44) (0.89 ac)
0 75 150 Feet
Area 1 (7.47 acres)
Total Sample Points: 383
Seagrass Present: 316 (83% of points)
Seagrass Absent: 67 (17% of points)
Approximate Total Seagrass Area: 6.20 acres
I:\18jobs\18I0021\CADD\GIS\MXD\Exhibits\Exhibit 14-2. Area 1 Seagrass.mxd
HANSON
Exhibit 14-2. Area 1 Seagrass Survey
Waters and Wetlands Delineation Report
Marker 37 Marina And Pier (73.4 Acres)
Corpus Christi, Nueces County, Texas
April 2018
Job Number 18I0021
Sheet 2 of 11

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# Appendix B

# TPWD Seagrass Viewer Map

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# TPWD Seagrass Viewer


10/31/2021, 11:20:23 AM

1:9,028

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

TCEQ Segments

Seagrass NOAA

Seagrass TPWD

Bathymetry

-10 - -9

-8 - -7

-6 - -5

-4 - -3

-2 - -1

GeographicNames

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus

ArcGIS Online

Aerial photo interpretation and groundtruthing by Texas Parks and Wildlife Department Coastal Fisheries Division. | Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri

# Appendix C

# CEI – Hanson Survey Comparison Maps

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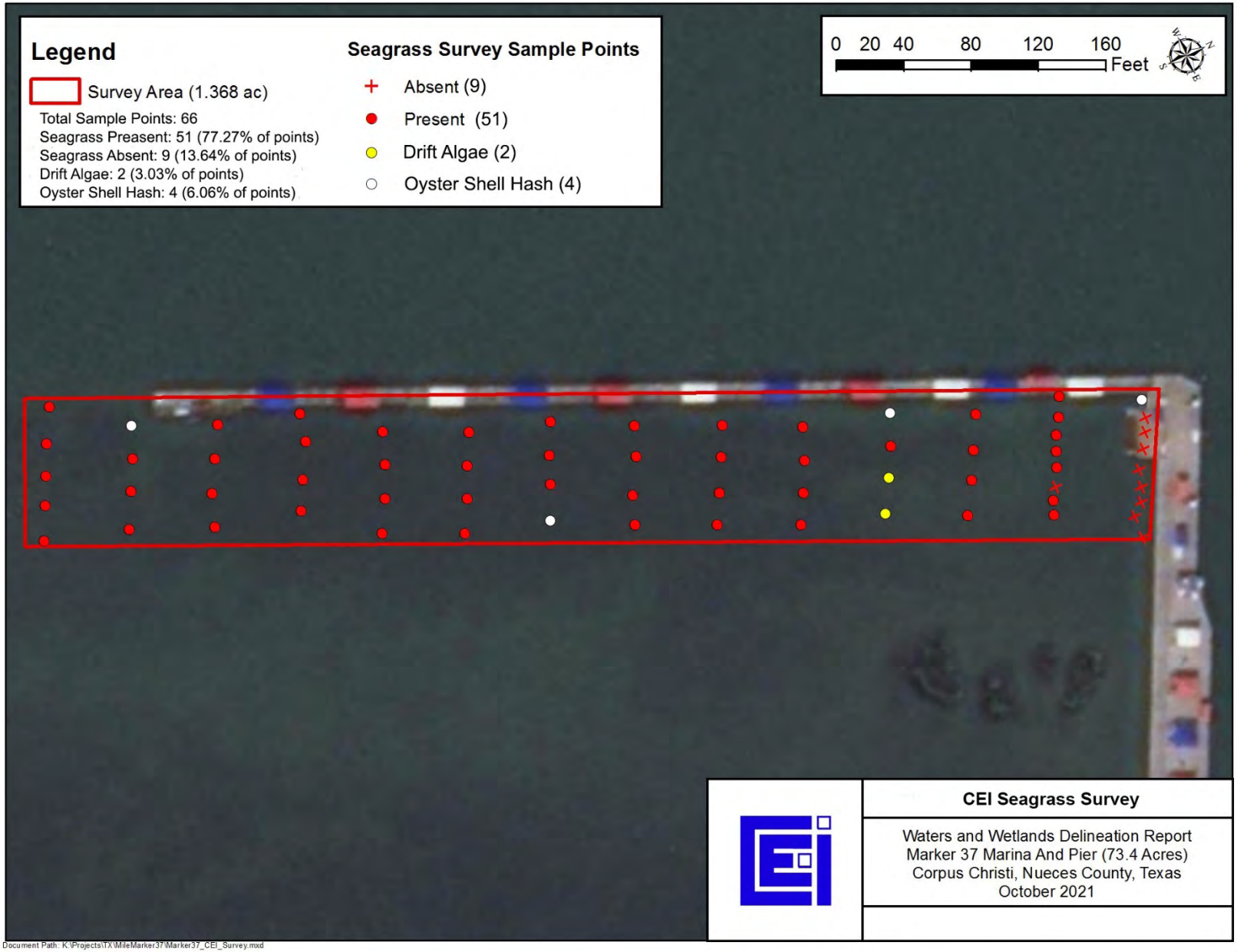

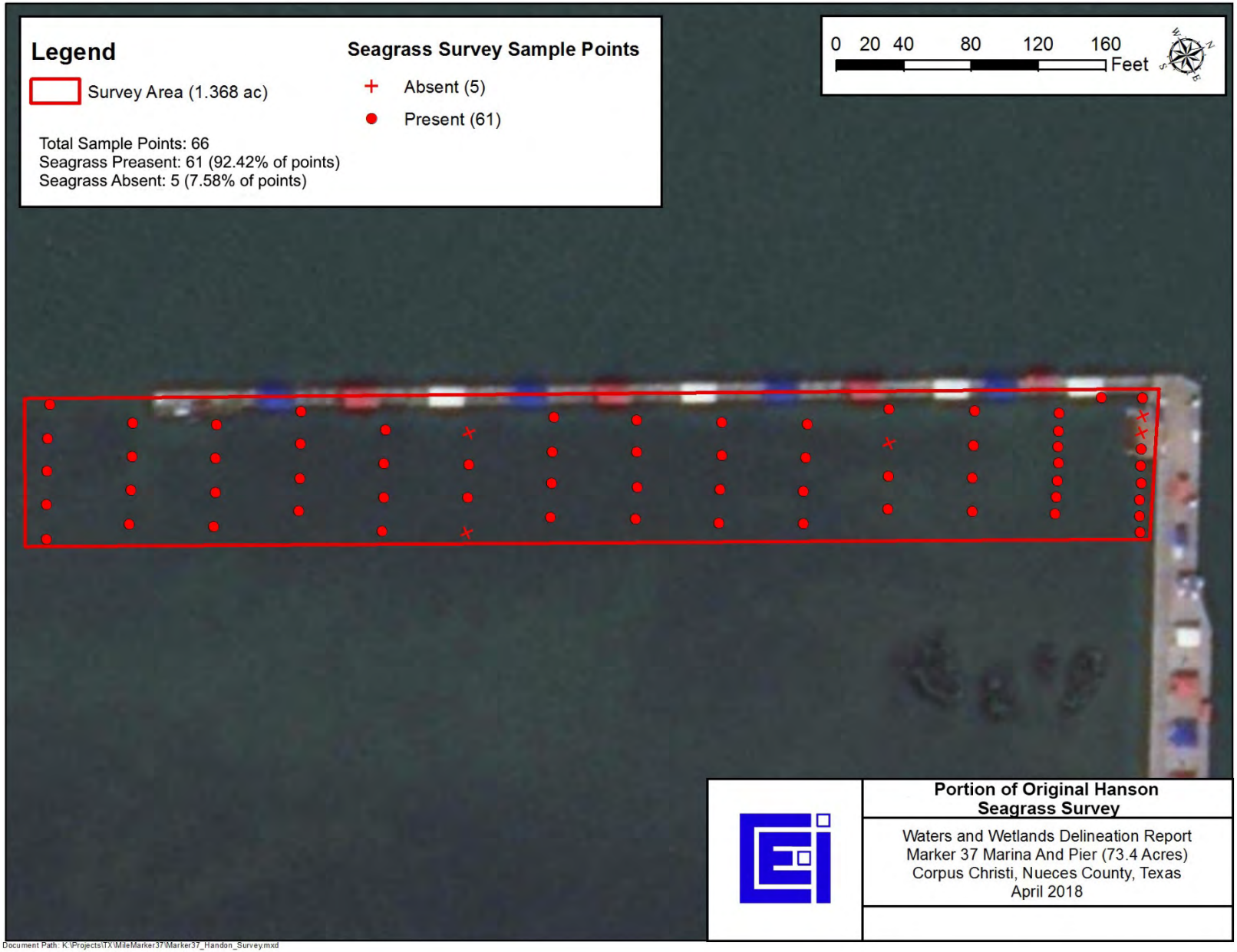

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# Appendix D

# Photographic Documentation

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| Photo # | Description | Direction Facing | Date |
|---|---|---|---|
| 1 | View of the Marker 37 Marina after Hurricane Nicholas passed through the Gulf of Mexico. Note the seagrass floating atop the surface due to being pulled up from hurricane turbulence. | NW | 9/15/2021 |
| 2 | View of the Marker 37 Marina after Hurricane Nicholas passed through the Gulf of Mexico. Note the seagrass floating atop the surface due to being pulled up from hurricane turbulence. | N | 9/15/2021 |
| 3 | View of the Marker 37 Marina after Hurricane Nicholas passed through the Gulf of Mexico. Note the seagrass floating atop the surface due to being pulled up from hurricane turbulence. | NE | 9/15/2021 |
| 4 | View of the Paradise Pier and project area from atop the Sunset Boardwalk. | W | 9/15/2021 |
| 5 | View of the Paradise Pier and project area from atop the Sunset Boardwalk. Note the seagrass floating at the surface, as well as oyster and seagrass beds subsurface. | SW | 9/15/2021 |
| 6 | Representative sample of peanut grass (*Halophilla engelmanni*) found within the project area. | - | 9/15/2021 |
| 7 | Representative sample of shoal grass (*Halodule wrightii*) observed within the project area. | - | 9/15/2021 |
| 8 | Closeup of shoalgrass (*Halodule wrightii*) specimen. | - | 9/15/2021 |
| 9 | Representative sample of manatee grass (*Syringodium filiforme*) found within the project area. | - | 9/15/2021 |
| 10 | Close up of manatee grass (*Syringodium filiforme*) specimen. | - | 9/15/2021 |
| 11 | Close up of manatee grass (*Syringodium filiforme*) specimen. | - | 9/15/2021 |
| 12 | Representative sample of various species of drift algae found within the project area. | - | 9/15/2021 |
| 13 | Seagrass meadows seen from Paradise Pier. | SE | 9/16/2021 |
| 14 | Seagrass meadows seen from atop the Paradise Pier, note the use of an orange filter to improve visibility in the photo. | SE | 9/16/2021 |
| 15 | View of Paradise Pier from the entrance of Sunset Boardwalk. | NW | 9/16/2021 |
| 16 | View of the entry to the Sunset Boardwalk. | NW | 9/16/2021 |
| 17 | View of the Sunset Boardwalk. | NW | 9/16/2021 |
| 18 | View of the Sunset Boardwalk from the end. | SE | 9/16/2021 |
| 19 | View of the entryway to the Paradise Pier. | SW | 9/16/2021 |
| 20 | View of the area where the previously installed jet ski launch was located. | SE | 9/16/2021 |
| 21 | Another view of the area where the previously installed jet ski launch was located. | SW | 9/16/2021 |
| 22 | Another view of the previously installed jet ski launch from atop the Paradise Pier. | NE | 9/16/2021 |
| 23 | View of the intercoastal waterway with the JFK Causeway in the background. | N | 9/16/2021 |
| 24 | View of the kayak launch located at the end of Paradise Pier. | SW | 9/16/2021 |
| 25 | View of the kayak launch located at the end of Paradise Pier. | S | 9/16/2021 |
| 26 | View of the end of the Paradise Pier. | SW | 9/16/2021 |
| 27 | View from the end of Paradise Pier. | NE | 9/16/2021 |
| 28 | View of the project area from atop the kayak launch located at the end of Paradise Pier. Note the seagrass that is visible from the surface. | NE | 9/16/2021 |

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**Figure 1.** **View of the Marker 37 Marina after Hurricane Nicholas passed through the Gulf of Mexico. Note the seagrass floating atop the surface due to being pulled up from hurricane turbulence, looking to the northwest (CEI: 9/15/2021).**

**Figure 2.** **View of the Marker 37 Marina after Hurricane Nicholas passed through the Gulf of Mexico. Note the seagrass floating atop the surface due to being pulled up from hurricane turbulence, looking to the north (CEI: 9/15/2021).**


**Figure 3.** **View of the Marker 37 Marina after Hurricane Nicholas passed through the Gulf of Mexico. Note the seagrass floating atop the surface due to being pulled up from hurricane turbulence, looking to the northeast (CEI: 9/15/2021).**

**Figure 4.** **View of the Paradise Pier and project area from atop the Sunset Boardwalk, looking to the west (CEI: 9/15/2021).**

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**Figure 5.** **View of the Paradise Pier and project area from atop the Sunset Boardwalk, looking to the southwest. Note the seagrass floating at the surface, as well as oyster and seagrass beds subsurface (CEI: 9/15/2021).**

**Figure 6.** **Representative sample of peanut grass (*Halophilla engelmanni*) found within the project area (CEI: 9/15/2021).**

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**Figure 7. Representative sample of shoal grass (*Halodule wrightii*) observed within the project area (CEI: 9/15/2021).**

**Figure 8. Closeup of shoalgrass (*Halodule wrightii*) specimen (CEI: 9/15/2021).**

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**Figure 9. Representative sample of manatee grass (*Syringodium filiforme*) found within the project area (CEI: 9/15/2021).**

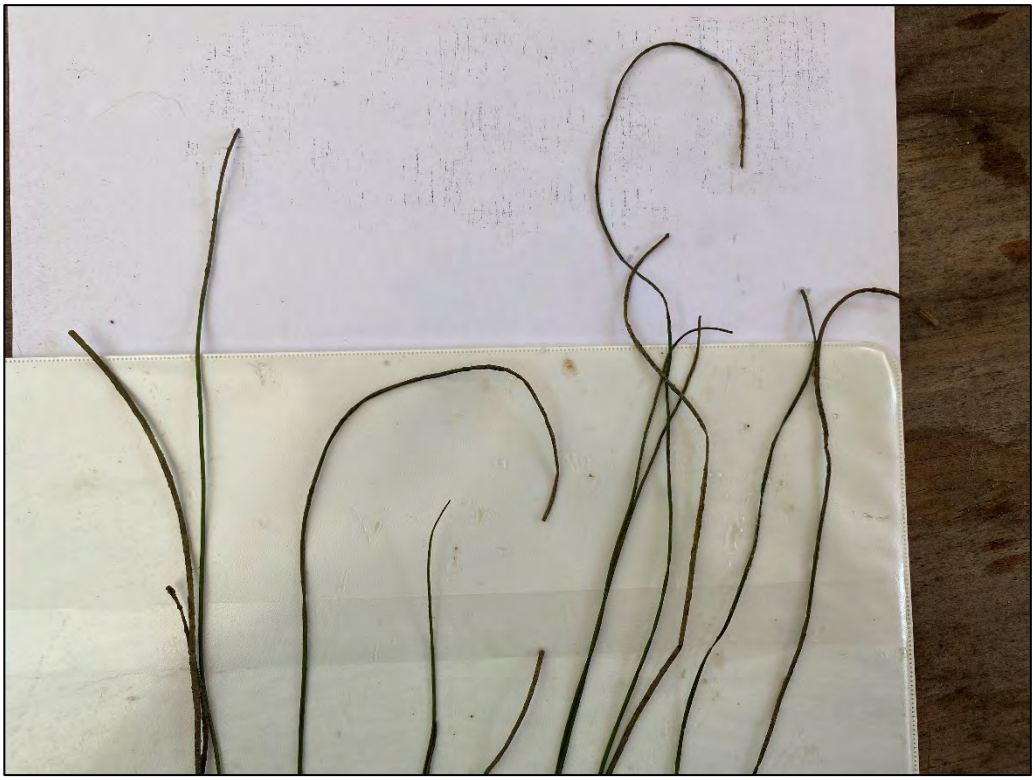

**Figure 10. Close up of manatee grass (*Syringodium filiforme*) specimen (CEI: 9/15/2021).**

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**Figure 11. Close up of manatee grass (*Syringodium filiforme*) specimen (CEI: 9/15/2021).**

**Figure 12. Representative sample of various species of drift algae found within the project area (CEI: 9/15/2021).**

**Figure 13. Seagrass meadows seen from Paradise Pier, view to the southeast (CEI: 9/16/2021).**

**Figure 14. Seagrass meadows seen from atop the Paradise Pier, note the use of an orange filter to improve visibility in the photo, view to the southeast (CEI: 9/16/2021).**

**Figure 15. View of Paradise Pier from the entrance of Sunset Boardwalk, looking to the northwest (CEI: 9/16/2021).**


**Figure 16. View of the entry to the Sunset Boardwalk, looking to the northwest (CEI: 9/16/2021).**

**Figure 17. View of the Sunset Boardwalk, looking to the northwest (CEI: 9/16/2021).**

**Figure 18. View of the Sunset Boardwalk from the end, looking to the southeast (CEI: 9/16/2021).**


**Figure 19. View of the entryway to the Paradise Pier, looking to the southwest (CEI: 9/16/2021).**

**Figure 20. View of the area where the previously installed jet ski launch was located, looking to the southeast (CEI: 9/16/2021).**

**Figure 21. Another view of the area where the previously installed jet ski launch was located, looking to the southwest (CEI: 9/16/2021).**

**Figure 22. Another view of the previously installed jet ski launch from atop the Paradise Pier, looking to the northeast (CEI: 9/16/2021).**

**Figure 23. View of the intercoastal waterway with the JFK Causeway in the background, looking to the north (CEI: 9/16/2021).**

**Figure 24. View of the kayak launch located at the end of Paradise Pier, looking to the southwest (CEI: 9/16/2021).**

**Figure 25. View of the kayak launch located at the end of Paradise Pier, looking to the south (CEI: 9/16/2021).**

**Figure 26. View of the end of the Paradise Pier, looking to the southwest (CEI: 9/16/2021).**

**Figure 27. View from the end of Paradise Pier looking to the northeast (CEI: 9/16/2021).**

**Figure 28. View of the project area from atop the kayak launch located at the end of Paradise Pier, looking to the northeast. Note the seagrass that is visible from the surface (CEI: 9/16/2021).**