



State of Louisiana

**Coastal Protection and Restoration
Authority of Louisiana (CPRA)**

2021/2022 Annual Inspection Report

for

EAST MARSH ISLAND MARSH CREATION PROJECT (TV-21)

State Project Number TV-21
Priority Project List 14

November 17, 2021
Iberia Parish

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I. Introduction

The East Marsh Island Marsh Creation (TV-21) project is located approximately 14 miles (22.53 km) southeast of Cypremort Point in Iberia Parish, Louisiana, and is part of the larger (77,000 acres) uninhabited Marsh Island which is bordered on the north by Vermilion Bay, West Cote Blanche Bay, East Cote Blanche Bay and to the south by the Gulf of Mexico. (Appendix A). The total project area which is situated on the northeast corner of Marsh Island comprises approximately 362 acres of marsh creation and 665 acres of nourished marsh.

The East Marsh Island Marsh Creation Project was authorized by Section 303(a) of Title III Public Law 101-646, the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) enacted on November 29, 1990 as amended and approved on the fourteenth Priority Project List. The East Marsh Island Marsh Creation Project has a twenty year (20 year) economic life, which began in December 2010. A revised budget and spending schedule has modified the Operations, Maintenance and Monitoring

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the East Marsh Island Marsh Creation Project (TV-21) is to evaluate the constructed project features to identify any deficiencies and prepare a report detailing the condition of project features and recommended corrective actions needed. Should it be determined that corrective actions are needed, CPRA shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs. The annual inspection report also contains a summary of maintenance projects which were completed since completion of constructed project features and an estimated projected budget for the upcoming three (3) years for operation, maintenance and rehabilitation. The three (3) year projected operation and maintenance budget is shown in Appendix C. A summary of past operation and maintenance projects completed since completion of the East Marsh Island Marsh Creation Project are outlined in Section IV.

An inspection of the East Marsh Island Marsh Creation Project (TV-21) was held on November 17, 2021 under sunny skies, mild temperatures, and choppy seas. In attendance were Jody White, Stan Aucoin, Glenn McNeese and Phillip Parker from CPRA, Tyson Crouch and Cody Foster from LDWF, Richard Evely, Carol Clement, Michael Harry and Kyle Cappotto from NRCS. Parties met at the Quintana Boat launch at Cypremort Point at 10:30 AM and traveled to the Northeast corner of Marsh Island. WLF and CPRA provided boat transportation.

The field inspection included a visual inspection of the project site. Staff gauge readings were not available to determine approximate elevations of water level. Photographs were taken at project feature (see Appendix B) and Field Inspection notes were completed in the field to record measurements and deficiencies (see Appendix D).

III. Project Description and History

Marsh Island is an uninhabited island and is owned by the State of Louisiana and constitutes the Marsh Island Wildlife Refuge, which was established by the Louisiana Department of Wildlife and Fisheries as a sanctuary for migratory birds. Past aerial surveys have documented approximately 30,000 geese and 50,000 ducks utilizing the island (Martin 2008).

Between 1930 and the present, the hydrology of Marsh Island has changed due to tidally influenced erosion, subsidence, and oil and gas exploration (Barrilleaux 2004 and 2005). As a result of oil exploration in the 1950's, oil field canals were constructed and the spoil was deposited along these canals to form continuous banks. The newly created banks disrupted the surface water flow and created ponding in the interior marshes (Barrilleaux 2004 and 2005).

In 2001, the Marsh Island Hydrologic Restoration (TV-14) project was constructed to help restore the historical hydrology of Marsh Island by stabilizing the northeastern shoreline of Marsh Island and plugging nine oilfield access canals (Barrilleaux 2004 and 2005). Average marsh loss rates within the project area were historically low (-0.29% per year); however, after Hurricane *Lili* in 2002, aerial photography revealed that substantial areas of interior emergent marsh had been converted to open water (Martin 2008). Hurricanes *Rita* in 2005 and Hurricane *Ike* in 2008 further aggravated this erosion problem. To help stabilize this area, the EPA, NRCS and CPRA proposed to create and nourish 362 acres of marsh in two containment cells. During construction, the amount of unobligated CWPPRA construction funds and an abundance of borrow material available allowed nourishment of 665 acres of additional marsh north and west of the original containment cells. The TV-21 project has worked synergistically with the previously completed TV-14 project to help reduce the effects of lateral erosion in existing marsh areas.

The objectives of the East Marsh Island Marsh Creation (TV-21) project are to re-create brackish marsh in the open water and mud flat areas of the interior marsh primarily formed by hurricane damage and to nourish additional adjacent marsh (Gillen 2008). The use of dredged material for marsh creation has been an important technique in restoration for decades in the United States.

The principal project features include:

1. 362 acres of marsh creation in two confined cells referenced as Fill Areas No. 1 & 2.
2. An earthen plug located at the end of the North-South Pipeline Canal within the northern boundary of the Fill Area No. 2 containment dike.
3. 665 acres of marsh nourishment in four different partially confined areas referenced as Additional Fill Areas No. 1-4 which were located north and west of the original marsh creation cells.
4. 55,000 vegetative plantings within the two confined cells (3,257 actually planted during the construction phase of the project)

IV. Summary of Past Operation and Maintenance Projects

General Maintenance: Below is a summary of completed maintenance tasks performed since December 2010.

2011-2014 Survey and Maintenance Event –

T. Baker Smith Year 1 Survey (2011-2012):

Elevation Survey of the marsh creation areas, borrow area, and CRMS-like stations

Professional Construction Services, Inc.

Post Construction Maintenance Event (2014-2015):

- Excavation of four interior plugs left from original construction in Marsh Nourishment Areas No.1 & 2
- Removal of a timber mat plug in the Marsh Creation Cell No. 2 containment dike near Hawkins Lake with creation of a 100 foot gap
- Degrading of an existing Gap “N” between Marsh Creation Cell No. 2 and Nourishment Area No. 3
- Repair and installation of articulated concrete mat armoring of 890 feet of containment dike on the East End of the East-West Pipeline Canal along the Gulfward shoreline.

In conjunction with this maintenance event, the existing rock plug at the West end of the East-West Canal was removed and replaced with improvements to repair erosion occurring around the plug as part of TV-14 maintenance. In addition, LAWLF installed a PVC sheetpile plug on the interior containment dike at the East end of the East-West Canal. This coinciding work was not paid out of the CWPPRA TV-21 budget.

Construction	\$1,260,374.32
Year 1 Surveying, E&D, Construction Oversight, Asbuilts	\$250,774.45
Project Total	\$1,511,148.77

2017 Year 5 Survey – T. Baker Smith

The task included topographic surveys of the marsh creation containment areas and containment dikes, nourishment areas, and bathymetric surveys of the borrow area. The survey was a duplicate of the 2011 Survey where elevations could be compared and changes could be documented.

Project Total	\$ 88,535.80
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Structure Operations:

There are no active operations associated with this project.

V. Inspection Results

Site 1—Marsh Creation Cells (Containment Areas No. 1&2)

Unlike previous inspections, due to the siltation in the North-South Canal, MC area cell No. 2 was not observable from the plug at the end of the canal. However both MC Areas 1 and 2 were observable from the southeast shoreline. As observed during the previous 2016-2017 O&M Inspection, the two marsh creation containment areas are in good condition since constructed in 2010. Vegetation is thriving since curbing the nutria population.

The most recent, available Topographic Survey completed in 2017 by T. Baker Smith provided a good comparison of elevation data from 2011 to 2017 within the marsh creation areas. The containment areas were surveyed on transect line spaced 500ft apart with shots taken every 50ft. Survey data showed that the average marsh elevation within the containment areas was approximately +1.33 ft NAVD88. This is a decrease in marsh elevation of an average of 1.73 ft, from construction completion, which is consistent with the original settlement curve projections.

The 2017 survey revealed that the remnant containment dike is at an average elevation of +3.37ft NAVD88 with 15 gaps to allow tidal exchange. Vegetation had expanded on the dikes which negated the need to plant.

In addition, from 2017 topographic survey information the borrow channel on the interior of the containment dike which was excavated to repair the breach has infilled to -2.5ft NAVD88.

The concrete articulated mats placed in March 2015 on the Northeast corner of the island in Marsh Creation Containment Area No. 1 at the East-West Pipeline Canal have continued to settle at the original breach location since the 2016-2017 O & M inspection. However, those remaining above the waterline continue to break the wave action approaching the shoreline. Also, the PVC sheet pile wall installed by the LDWF on the interior of the containment dikes around the same time as the mats were installed has been breeched.

(Photos: Appendix B, Photo 3-8)

Site 2—Nourished Areas (Additional Fill Areas No. 1-4)

Only Nourished Areas No. 3 & 4 were visible during the site visit. Located on the Northeast tip of the island, shoreline erosion continues to degrade the point. The vegetation is thriving since the nutria population is under control.

The 2017 Topographic Survey, previously mentioned, incorporated elevation data at specific points within each Nourished Area, rather than along transect lines at incremental spacing. The locations observed were repeated sites from the prior survey tasks in order to make comparisons over time. Nourished Area No. 1 being relatively small had three (3) point surveys taken. In Nourished Area No. 2, nineteen (19) points were surveyed.

Nourished Area No. 3 had three (3) point locations, and Nourished Area No. 4 had four (4) locations.

Comparing the 2011 and the 2017 Topographic Surveys, Nourished Area No.1 has seen a minor decrease in elevation ranging from 0 in. to 6 in. Note that Nourished Area No. 1 was a prior oilfield canal infilled during construction. After the initial fill material consolidated, this area drained poorly and was holding water. During the post construction maintenance event (2014), gaps were constructed to allow proper drainage.

Nourished Area No. 2 showed a positive elevation trend in the nineteen locations ranging from a 1 in. to a 7 in. increase and an average of 3.8 in. increase between observations taken in 2011 and 2017.

Nourished Areas No. 3 & 4 experienced relatively minor net change. Despite one location with a 10 in. decrease, each other location observed in Nourished Area No. 3 had a 1.2 in. elevation increase. Nourished Area No. 4 had an elevation change ranging from -2.4 in. to +2.4in.

(Photos: Appendix B, Photo 1-2)

Site 3—Earthen Plug

Due to the water levels on the day of the inspection and the siltation at the mouth of the North-South Pipeline Canal, the earthen plug at its southern end could not be closely observed. However viewed from afar, this plug appears to remain intact.

Site 4—Vegetation plantings

The vegetation in the marsh creation cells and containment dikes has propagated well despite the nutria damage seen in prior years. The Nutria Program implemented by LAWLF has effectively controlled the nutria population giving the vegetation time to reestablish itself. At this time, no additional plantings are planned.

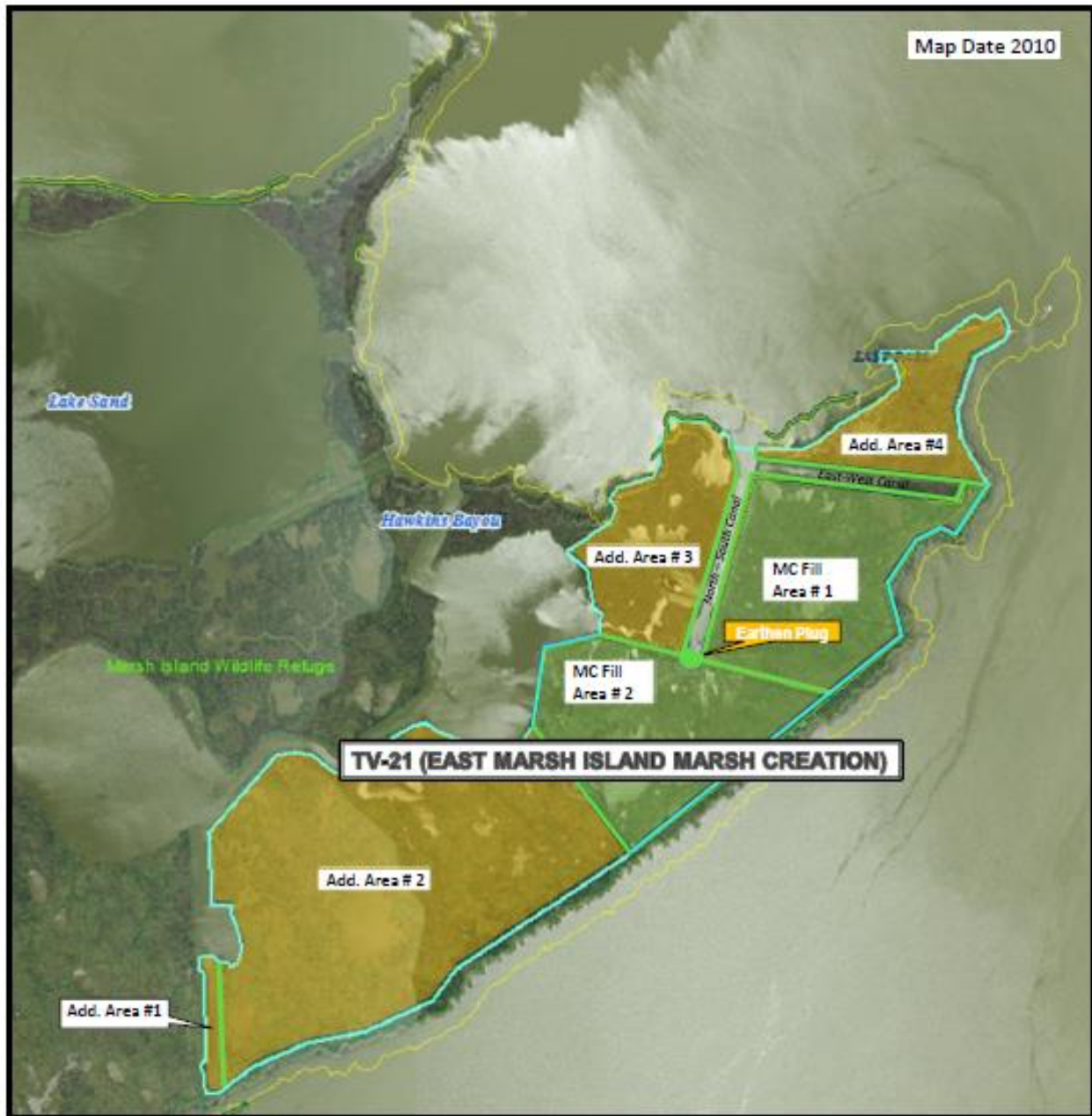
VI. Conclusions and Recommendations

The East Marsh Island Marsh Creation Project is in good condition. The vegetation is thriving in all areas of the project. Per the data obtained from the most recent elevation survey in 2017, the contained marsh creation cells have settled within the originally predicted settlement curve projections. The nourished areas have held a steady elevation with Nourishment Area No. 2 showing a slight elevation gain. A planned elevation survey in 2023 will provide additional information with regard to marsh and containment dike settlement for comparison to the 2017 elevation survey data.

The 2015 maintenance performed to address the breaches near the East-West Canal has experienced settling due to the soil quality and site conditions during construction. It however is still protecting the area of concern.

For future consideration, in projects where containment dikes are left in place along a gulf or bay shoreline, it has been found that containment dikes fared better if constructed further from the shoreline where vegetation and a parcel of land can act as a buffer to wave action.

Appendix A
Project Features Map



Appendix B

Photographs



Photo No. 1, MC Cell No.1 & Nourished Area No. 4 (Plug, TV-14 Project, West end of East-West Canal)



Photo No. 2, Nourished Area No. 4, (Plug, TV-14 Project - West End of East West Canal Looking Northeast)



Photo No. 3, MC Area No. 1, (Plug tie in, TV-14 Project - West End of East West Canal Looking Southeast)



Photo No. 4, MC Cell No. 1, Articulated Concrete Mat (2015 Maintenance Event)



Photo No. 5, MC Cell No. 1, Articulated Concrete Mat (2015 Maintenance Event) & LDWF PVC Sheet Pile Wall



Photo No. 6, MC Cell No. 1, Viewed from the Southeast Side of the Island



Photo No. 7, MC Cell No. 2, Viewed from the Southeast Side of the Island



Photo No. 8, MC Cell No. 2, Viewed from the Southeast Side of the Island

Appendix C

Three Year Budget Projection

EAST MARSH ISLAND MARSH CREATION/ TV-21 / PPL 14
Three-Year Operations & Maintenance Budgets 07/01/2022 - 06/30/2025

<u>Project Manager</u>	<u>O & M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
Phillip Parker	Phillip Parker	NRCS	Jody White

	2022/2023(-11)	2023/2024 (-12)	2024/2025 (-13)
Maintenance Inspection			\$ 8,148.00
Structure Operation			
State Administration	\$ 2,500.00	\$ 10,000.00	\$ 7,560.00
Federal Administration	\$ 1,000.00	\$ 2,000.00	\$ 2,000.00

Maintenance/Rehabilitation

22/23 Description:

E&D	
Construction	
Construction Oversight	
Sub Total - Maint. And Rehab.	\$ -

23/24 Description: Final Survey of MC Area

Survey	\$ 55,000.00
Construction	
Construction Oversight	
Sub Total - Maint. And Rehab.	\$ 55,000.00

24/25 Description:

E&D	
Construction	
Construction Oversight	
Sub Total - Maint. And Rehab.	\$ -

	2022/2023(-11)	2023/2024 (-12)	2024/2025 (-13)
Total O&M Budgets	\$ 3,500.00	\$ 67,000.00	\$ 17,708.00

O & M Budget (3 yr Total)	\$ 88,208.00
Unexpended O & M Budget	\$ 88,819.07
Remaining O & M Budget (Projected)	\$ 611.07

OPERATION AND MAINTENANCE BUDGET WORKSHEET

EAST MARSH ISLAND MARSH CREATION / PROJECT NO. TV-21 / PPL NO. 14 / 2022/2023

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	0	\$0.00	\$0.00
General Structure Maintenance	LUMP	0	\$0.00	\$0.00
Engineering and Design	LUMP	0	\$0.00	\$0.00
Operations Contract	LUMP	0	\$0.00	\$0.00
Construction Oversight	LUMP	0	\$0.00	\$0.00

ADMINISTRATION

CPRA Admin.	LUMP	1	\$2,500.00	\$2,500.00
FEDERAL SPONSOR Admin.	LUMP	1	\$1,000.00	\$1,000.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$3,500.00

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:	Finalize Survey of Borrow Area and Project Area				
	Secondary Monument	EACH	0	\$0.00	\$0.00
	Staff Gauge / Recorders	EACH	0	\$0.00	\$0.00
	Marsh Elevation / Topography	LUMP	0	\$0.00	\$0.00
	TBM Installation	EACH	0	\$0.00	\$0.00
	OTHER				\$0.00
	TOTAL SURVEY COSTS:				\$0.00

GEOTECHNICAL

GEOTECH DESCRIPTION:					
	Borings	EACH	0	\$0.00	\$0.00
	OTHER				\$0.00
	TOTAL GEOTECHNICAL COSTS:				\$0.00

CONSTRUCTION

CONSTRUCTION DESCRIPTION:					
	Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE
	Rock Dike	0	0.0	0	\$0.00
	Bank Paving	0	0.0	0	\$0.00
		0	0.0	0	\$0.00
	Filter Cloth / Geogrid Fabric		SQ YD	0	\$0.00
	Navigation Aid		EACH	0	\$0.00
	Signage		EACH	0	\$0.00
	General Excavation / Fill		CU YD	0	\$0.00
	Dredging		CU YD	0	\$0.00
	Sheet Piles (Lin Ft or Sq Yds)			0	\$0.00
	Timber Piles (each or lump sum)			0	\$0.00
	Timber Members (each or lump sum)			0	\$0.00
	Hardware		LUMP	0	\$0.00
	Materials		LUMP	0	\$0.00
	Mob / Demob		LUMP	0	\$0.00
	Contingency		LUMP	0	\$0.00
	General Structure Maintenance (25%)		LUMP	0	\$0.00
	Vegetative Plantings		LUMP	0	\$0.00
	OTHER		LUMP	0	\$0.00
	OTHER				\$0.00
	TOTAL CONSTRUCTION COSTS:				
	\$0.00				

TOTAL OPERATIONS AND MAINTENANCE BUDGET:

\$3,500.00

Appendix D

Field Inspection Form

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: TV-21 East Marsh Island Marsh Creation

Date of Inspection: November 17, 2021 Time: Approximately 10:30am

Structure No.	N/A
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Inspector(s): Phillip Parker, Jody White (CPRA), Stan Aucoin and Glenn McNee;
Tyson Crouch and Cody Foster (LDWF),
Richard Evelyn, Carol Clement, Michaela Harry and Kyle Cappotti

Structure Description: Marsh Creation Cells, Nourishment Areas, Earthen Plug

Water Level:

Salinity Readings:

Weather Conditions: Partly Cloudy, Breezy and Mild

Type of Inspection: Annual

[illegible]