



State of Louisiana

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

**2014/2015 Annual Inspection
Report**

for

**EAST MARSH ISLAND MARSH
CREATION PROJECT (TV-21)**

State Project Number TV-21
Priority Project List 14

March 30, 2015
Iberia Parish

Prepared by:

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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.

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 March 30, 2015 under sunny skies, mild temperatures, and calm seas. In attendance were Darrell Pontiff, Dion Broussard, and Jody White from CPRA, Cassidy Lejeune and Lance Campbell from LDWF, Adrian Chavarria from EPA, and Phillip Chauvin and Jeffrey Beuche from T. Baker Smith. Parties met at the Quintana Boat launch at Cypremort Point and traveled to the Northeast corner of Marsh Island. The annual inspection was conducted in conjunction with the final construction inspection for the Year 1 Post Construction Maintenance Event. WLF provided boat and airboat 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 each 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. Recent 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 projects and operation tasks performed since December 2010, the construction completion date of the East Marsh Island Marsh Creation Project.

2014 Maintenance Project – Professional Construction Services, Inc.

This maintenance project included Year 1 Surveying (marsh creation, nourishment, containment dike, borrow area, CRMS stations), 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, degradation of an existing Gap “N” between Marsh Creation Cell No. 2 and Nourishment Area No. 3, and repair and installation of articulated concrete mat armoring of 890ft 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

Structure Operations:

There are no active operations associated with this project.

V. Inspection Results

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

The two marsh creation cells are in good condition since the project was completed in 2010. It is estimated that there is seventy per cent (70%) natural vegetation cover despite the large nutria population. The one year post construction surveys completed by T. Baker Smith in December 2011 indicated that the marsh platform is settling as expected and is near the target healthy marsh elevation of +1.7 NAVD88 on average. The northern end of the Marsh Creation Cell No. 1 appears to be settling at a greater pace than the remainder of the cell.

The majority of the remaining containment dike is stable and the natural vegetation continues to expand. Two areas of concern were located at each end of the East-West Pipeline Canal located in Marsh Creation Cell No. 1. Breaches at these locations would make the northeast corner of the project vulnerable to deterioration from the interior. To address these areas, work to repair the breaches were included in the maintenance event recently completed in March 2015. In addition, upon removal of the timber mat plug at Hawkins Lake, an additional gap was excavated. This gap was to supplement tidal exchange to the existing 14 gaps remaining from original construction. (Photos: Appendix B, Photo 1, 3, 4, 5, 6, 8 & 9)

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

The vegetation in Nourished Areas No. 3 & 4 appear to be in good condition. Nourished Areas No. 1 & 2 were not visited during this inspection. However, site visits performed by CPRA monitoring staff indicated that the vegetation had reestablished itself after being devastated by nutria.

Four interior plugs identified by the Louisiana Wildlife and Fisheries in Nourishment Areas No. 1 & 2 have been excavated to marsh elevation to allow water exchange. (Photos: Appendix B, Photo 4, 5 & 7)

Site 3—Earthen Plug

The earthen plug at the end of the North-South Pipeline Canal was not visited during this site visit. However, prior site visits associated with the 2014/2015 maintenance event showed no signs of deterioration.

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.

NRCS has proposed plantings in future years on the remaining containment dikes pending budget approval by the CWPPRA Task Force.

VI. Conclusions and Recommendations

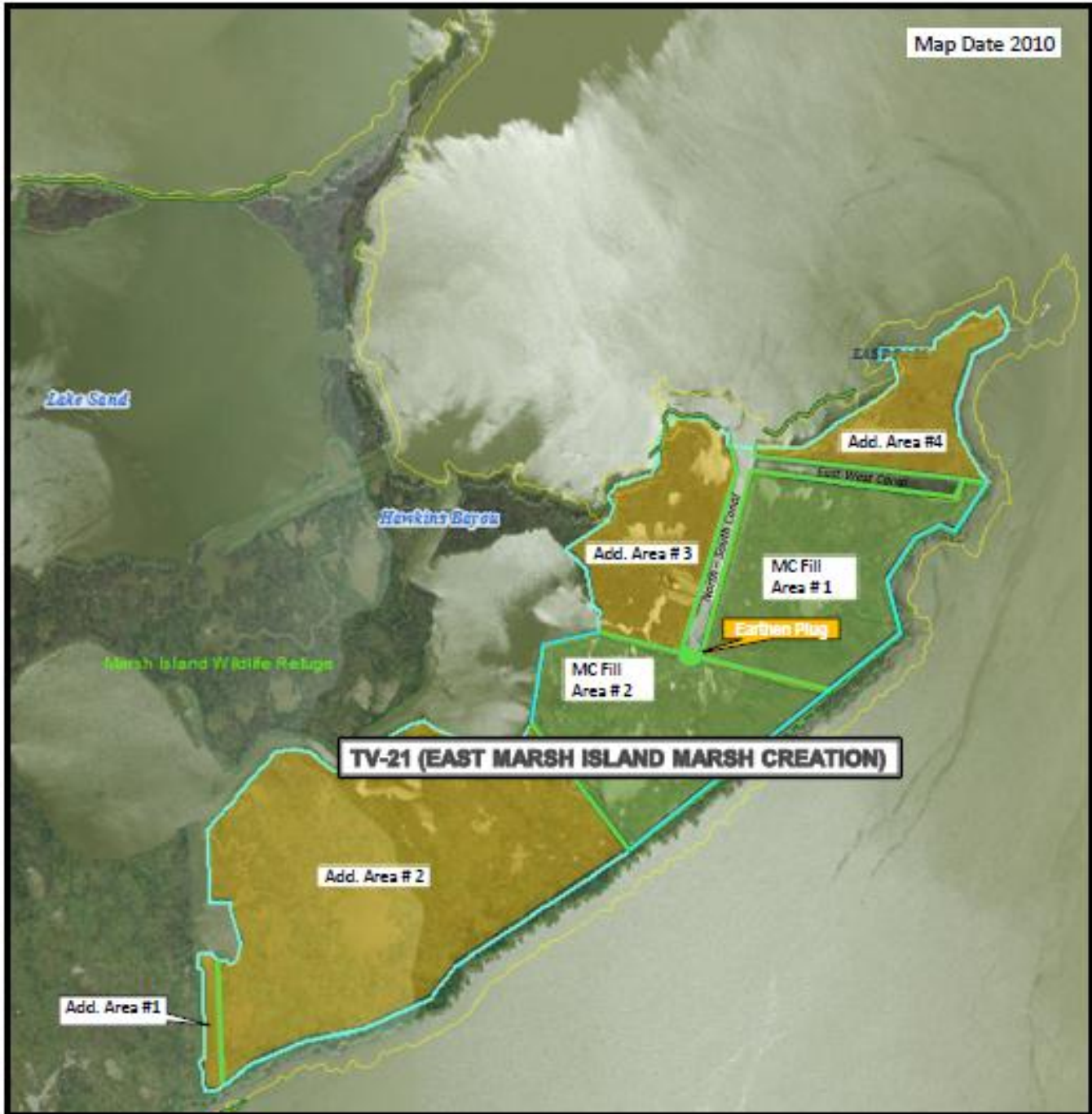
The East Marsh Island Marsh Creation Project is in good condition. The northeast corner of the island remains a concern. The recent maintenance performed to address the breaches near the East-West Canal has experienced settling due to the soil quality and site conditions during construction. Generally where vegetation provided a buffer to the wave action, the mats are stable.

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

Additional surveys are scheduled for 2016 to determine the settlement of the marsh creation and marsh nourishment areas as well as the accumulation of material in the borrow area.

Appendix A
Project Features Map

Map Date 2010



TV-21 (EAST MARSH ISLAND MARSH CREATION)



**TV-21 East Marsh Island
Marsh Creation**



Project Completion Date December 2010

Appendix B

Photographs



Photo No. 1, Containment Dike along N-S Canal/ Marsh Creation Cell No.1 (Looking South)



Photo No.2, TV-14 Rock Plug replacement - West end of the E-W Canal at Intersection of N-S Canal



Photo No. 3, Marsh Creation Cell No.1



Photo No. 4, Gap N- Marsh Creation Cell No.2 & Nourishment Area No. 3 (Looking North)



Photo No. 5, Marsh Creation Cell No. 2 & Nourishment Area No.3, Containment Dike at Timber Mat location (Prior to Removal - Looking East)



Photo No. 6, Containment Dike Excavation at Timber Mat location (Looking West towards Hawkins Lake)



Photo No. 7, Nourished Area No. 2 at Eastern Plug No. 2 removal



Photo No. 8, Shoreline Protection, Articulated Concrete Mats on Gulfward Shoreline/ MC Cell No. 1



Photo No. 9, Shoreline Protection, Articulated Concrete Mats on Gulfward Shoreline/ MC Cell No. 1

Appendix C

Three Year Budget Projection

EAST MARSH ISLAND MARSH CREATION/ TV-21 / PPL 14
Three-Year Operations & Maintenance Budgets 07/01/2015 - 06/30/2018

<u>Project Manager</u> Pat Landry	<u>O & M Manager</u> Jody White	<u>Federal Sponsor</u> NRCS	<u>Prepared By</u> Jody White
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	2015/2016(-4)	2016/2017 (-5)	2017/2018 (-6)
Maintenance Inspection	\$ 6,851.00	\$ 7,057.00	\$ 7,269.00
Structure Operation			
State Administration		\$ 10,000.00	\$ 10,000.00
Federal Administration		\$ 18,383.00	\$ 20,258.00

Maintenance/Rehabilitation

15/16 Description:

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

16/17 Description: Vegetative plantings, engineering monitoring, surveying.

E&D	Incl. \$126,104 of Engr. Mon. & Surveying (State)	\$ 178,199.00	
Construction	NRCS	\$ 281,106.00	Includes 25% Contingency
Construction Oversight	NRCS	\$ 23,424.00	
Sub Total - Maint. And Rehab.		\$ 482,729.00	

17/18 Description: Vegetative plantings, engineering monitoring, surveying.

E&D	Incl. \$30,000 of Engr. Mon. (State)	\$ 98,565.00	
Construction	NRCS	\$ 301,250.00	Includes 25% Contingency
Construction Oversight	NRCS	\$ 35,136.00	
Sub Total - Maint. And Rehab.		\$ 434,951.00	

	2015/2016(-4)	2016/2017 (-5)	2017/2018 (-6)
Total O&M Budgets	\$ 6,851.00	\$ 518,169.00	\$ 472,478.00

O & M Budget (3 yr Total)	\$ 997,498.00
Unexpended O & M Budget	\$ 1,097,320.00
Remaining O & M Budget (Projected)	\$ 99,822.00

OPERATION AND MAINTENANCE BUDGET WORKSHEET
EAST MARSH ISLAND MARSH CREATION / PROJECT NO. TV-21 / PPL NO. 14 / 2016/2017

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$7,057.00	\$7,057.00
General Structure Maintenance	LUMP	0	\$0.00	\$0.00
Engineering and Design	LUMP	1	\$178,199.00	\$178,199.00
Operations Contract	LUMP	0	\$0.00	\$0.00
Construction Oversight	LUMP	1	\$23,424.00	\$23,424.00

ADMINISTRATION

STATE Admin.	LUMP	1	\$10,000.00	\$10,000.00
FEDERAL SPONSOR Admin.	LUMP	1	\$18,383.00	\$18,383.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$28,383.00

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:				
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:	Vegetative plantings, and engineering monitoring.				
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
Rock Dike	0	0.0	0	\$0.00	\$0.00
Bank Paving	0	0.0	0	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00
Filter Cloth / Geogrid Fabric	SQ YD	0		\$10.00	\$0.00
Navigation Aid	EACH	0		\$0.00	\$0.00
Signage	EACH	0		\$0.00	\$0.00
General Excavation / Fill	CU YD	0		\$0.00	\$0.00
Dredging	CU YD	0		\$0.00	\$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	\$0.00	\$0.00
Timber Piles (each or lump sum)			0	\$0.00	\$0.00
Timber Members (each or lump sum)			0	\$0.00	\$0.00
Hardware	LUMP	0		\$0.00	\$0.00
Materials	LUMP	0		\$0.00	\$0.00
Mob / Demob	LUMP	0		\$0.00	\$0.00
Contingency	LUMP	0		\$0.00	\$0.00
General Structure Maintenance (25%)	LUMP	0		\$0.00	\$0.00
Vegetative Plantings	LUMP	1		\$281,106.00	\$281,106.00
OTHER	LUMP	0		\$0.00	\$0.00
OTHER				\$0.00	\$0.00
TOTAL CONSTRUCTION COSTS:					\$281,106.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: \$518,169.00

OPERATION AND MAINTENANCE BUDGET WORKSHEET
EAST MARSH ISLAND MARSH CREATION / PROJECT NO. TV-21 / PPL NO. 14 / 2017-2018

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$7,269.00	\$7,269.00
General Structure Maintenance	LUMP	0	\$0.00	\$0.00
Engineering and Design	LUMP	1	\$98,565.00	\$98,565.00
Operations Contract	LUMP	0	\$0.00	\$0.00
Construction Oversight	LUMP	1	\$35,136.00	\$35,136.00

ADMINISTRATION

STATE Admin.	LUMP	1	\$10,000.00	\$10,000.00
FEDERAL SPONSOR Admin.	LUMP	1	\$20,258.00	\$20,258.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$30,258.00

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
	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:	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
	Borings	EACH	0	\$0.00	\$0.00
	OTHER				\$0.00
TOTAL GEOTECHNICAL COSTS:					\$0.00

CONSTRUCTION

CONSTRUCTION DESCRIPTION:	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
	Vegetative plantings, and engineering monitoring.				
	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	\$10.00	\$0.00
	Navigation Aid	EACH	0	\$0.00	\$0.00
	Signage	EACH	0	\$0.00	\$0.00
	General Excavation / Fill	CU YD	0	\$0.00	\$0.00
	Dredging	CU YD	0	\$0.00	\$0.00
	Sheet Piles (Lin Ft or Sq Yds)		0	\$0.00	\$0.00
	Timber Piles (each or lump sum)		0	\$0.00	\$0.00
	Timber Members (each or lump sum)		0	\$0.00	\$0.00
	Hardware	LUMP	0	\$0.00	\$0.00
	Materials	LUMP	0	\$0.00	\$0.00
	Mob / Demob	LUMP	0	\$0.00	\$0.00
	Contingency	LUMP	0	\$0.00	\$0.00
	General Structure Maintenance (25%)	LUMP	0	\$0.00	\$0.00
	Vegetative Plantings	LUMP	1	\$301,250.00	\$301,250.00
	OTHER	LUMP	0	\$0.00	\$0.00
	OTHER			\$0.00	\$0.00
TOTAL CONSTRUCTION COSTS:					\$301,250.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **\$472,478.00**

Appendix D

Field Inspection Form

MAINTENANCE INSPECTION REPORT CHECK SHEET

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

Date of Inspection: March 30, 2015 Time: Approximately 9:00am

Structure No. N/A

Inspector(s): Darrell Pontiff, Dion Broussard, and Jody White (CPRA)
Cassidy Lejeune and Lance Campbell (LDWF),
T. Baker Smith, PCS Inc., Adrian Chavarria (EPA)

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

Water Level:
Salinity Readings:
Weather Conditions: Sunny and Mild

Type of Inspection: Annual

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Earthen Plug (End of N-S Canal)	Good	No			Good Condition.
Nourished Areas (1-4)	Good	Yes		4,5,7	Nourished Areas No. 3 & 4 are in good condition. Nourished Area No. 2 has recovered from nutria damage.
Vegetation	Good			1-7	Vegetation continues to expand within the cells and on the containment dikes. WLF nutria program has been effective in controlling the nutria population.
Settlement Plates	Good				
Marsh Creation Cells (1 & 2)	Good			1 & 3	In good condition. The north end of Marsh Creation Cell No. 1 appears to have settled more than Cell No. 2.
Containment Dikes	Good			1, 2,8,9	Majority of the containment dikes are in good condition. Vegetation has spread over several areas. Some bare spots remain. Two areas of concern were addressed with the 2015 maintenance event. (N-S Canal at the rock plug and two sections of the Gulfward Shoreline in the area proposed for armoring).

What are the conditions of the existing levees?

Are there any noticeable breaches?

Settlement of rock plugs and rock weirs?

Position of stoplogs at the time of the inspection?

Are there any signs of vandalism?

The articulated mats placed along the gulfward shoreline have settled.

The replaced rock plug has settled slightly in the center.

N/A

N/A