



Coastal Protection and  
Restoration Authority of Louisiana

State of Louisiana  
Coastal Protection and Restoration Authority

## 2014 Operations, Maintenance, and Monitoring Report

for

### Goose Point / Point Platte Marsh Creation (PO-33)

State Project Number PO-33  
Priority Project List 13

July 23, 2014  
St. Tammany Parish

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## Preface

The Goose Point/Point Platte Marsh Creation (PO-33) project was funded through the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) on the 13<sup>th</sup> Priority Project List with the United States Fish and Wildlife Service as the federal sponsor. This report includes monitoring data collected through May 2014, and Annual Maintenance Inspections through July 2014. The 2014 Operations, Maintenance, & Monitoring (OM&M) Report is the first in a series of reports. These reports will be made available for download at the following website:

[http://sonris.com/direct.asp?path=/sundown/cart\\_prod/cart\\_bms\\_avail\\_documents\\_f](http://sonris.com/direct.asp?path=/sundown/cart_prod/cart_bms_avail_documents_f)

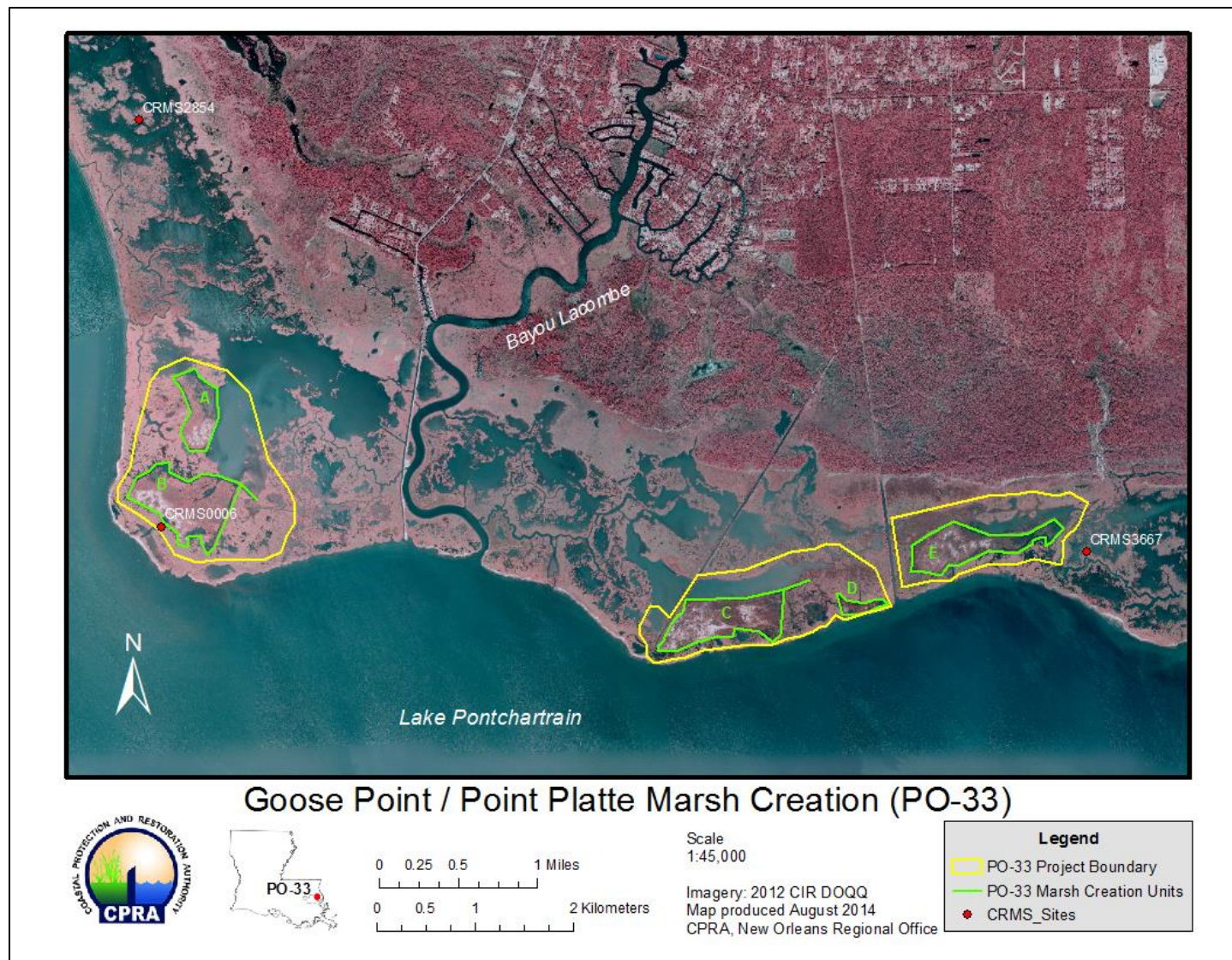
## I. Introduction

The Goose Point/Point Platte Marsh Creation (PO-33) project is located in St. Tammany Parish, Louisiana. The project follows the northern rim of Lake Pontchartrain between Fontainebleau State Park and Hwy 11, within the Big Branch Marsh National Wildlife Refuge (Figure 1).

Major contributing factors to wetland loss in the area include interior ponding and shoreline erosion (Segura 2003). In 2000, the 1,384-ac (560-ha) project area consisted of 715 acres of brackish marsh and 669 acres of open water (Segura 2003). Wetland loss rates from 1956 to 1978 were estimated at 31.3 acres/year and 10.42 acres/year for Goose Point and Point Platte, respectively (McCarty 2001). Those estimates were the highest rates recorded to date and can be contributed to hydrologic alterations such as the construction of Lake Road and two large pipeline canals. These alterations allowed saltwater to penetrate the sawgrass marshes creating ponds as the community transitioned to a brackish marshhay cordgrass (*Spartina patens*) wetland (McCarty 2001). More recently, McCarty (2001) estimated loss rates around 6.42 acres/year and 5.54 acres/year for Goose Point and Point Platte, respectively, during 1978 to 1995.

The extensive wetland loss in the project area had led to the formation of large open water areas and, in several locations, the Lake Pontchartrain shoreline was in danger of breaching into interior ponds. The objective of the PO-33 project is to replace eroded marsh, nourish existing marsh, and to prevent breaching of the lake rim shoreline. To achieve these objectives, sediment was hydraulically dredged from borrow areas in Lake Pontchartrain and placed in open water areas to create approximately 417 acres of emergent marsh. Marsh creation areas were built to an initial target elevation of +2.5 ft NAVD-88. After compaction, dewatering, and settlement, the marsh platform is anticipated to reach an elevation of +1.08 ft NAVD-88 approximately three years post-construction, and to remain above the mean low water elevation of +0.48 ft NAVD-88 for the remainder of the 20-year project life (Simoneaux 2006). Created marsh areas were planted with smooth cordgrass (*Spartina alterniflora*) after settlement and dewatering for the purpose of stabilizing the marsh platforms.

The as-built principal project features include approximately 417 acres of new marsh fill which was placed in 5 Marsh Fill Areas (Figure 1, Table 1) designated as A, B, C, D, and E, along with 49,577 linear feet of earthen perimeter containment dikes. Fill materials were dredged from two designated borrow areas in Lake Pontchartrain, while containment dikes were constructed using



**Figure 1.** Goose Point/Point Platte Marsh Creation (PO-33) project location and features



in situ materials from the fill areas. In addition to the marsh created within the fill areas, approximately 195 acres outside of the containment dikes benefitted from marsh nourishment.

In these areas, dredged slurry was allowed to flow uncontained into areas of broken marsh or shallow open water. This marsh nourishment is meant to introduce additional sediment in order to increase surface elevation to enhance and sustain existing marsh.

**Table 1.** Volume of dredged material and acreages of marsh creation/nourishment for fill areas A-E of the Goose Point/Point Platte Marsh Creation (PO-33) project.

Fill Area	Dredge Material (yd <sup>3</sup> )	Marsh Created (ac.)	Marsh Nourished (ac.; approximate)
A	479,903	64	23
B	949,700	125	77
C	863,176	120	49
D	149,370	13	6
E	658,770	95	40
Total	3,100,919	417	195

Project construction began on April 1, 2008 and was completed on January 27, 2009. Project life is estimated to be 20 years.

## II. Maintenance Activity

### a. Inspection Purpose and Procedures

The purpose of the annual inspection is to evaluate the constructed project features, to identify any deficiencies, and to prepare a report detailing the condition of the features and recommended corrective actions needed. Should it be determined that corrective actions are required, 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 (OM&R Plan February 1, 2012). This annual inspection report also contains a summary of possible maintenance projects 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. The summary of any past maintenance projects completed since completion of the initial construction of the Goose Point/Point Platte Marsh Creation Project in 2009, if any, will be outlined in Section IIb.

This annual inspection of the PO-33 project was held on July 9, 2014 on a partly cloudy and mild day with winds out of the southeast at 2 mph. In attendance were Luke Prendergast and Bryan Gossman (CPRA), along with Danny Breaux (FWS). The inspection was made using an airboat furnished by FWS. Photographs of that inspection are included in Appendix B of this report.

## **b. Summary of Past Operation and Maintenance Projects**

Shallow open-water areas in Fill Areas A, B, C, and E were selected for a vegetative planting project with *Spartina alterniflora*. This effort was completed in early 2014 at a cost of \$194,778.50. The condition of the marsh plantings was documented during the 2014 annual inspection, and looked very good overall. A few plugs in the northern portion of Fill Area A failed to root, but this appeared to be limited to an isolated area. A majority of the observed plantings had taken root, and new shoots were propagating around many of the grass plugs. Photographs of the project results are included in Appendix B.

## **c. Inspection Results**

A description of the existing condition for each of the project features is listed below, as well as on the Field Inspection form provided in Appendix C.

Fill Area A - Much of the interior containment borrow area has subsided below the water surface elevation; this condition was anticipated prior to construction, and results in a more diverse marsh habitat. Grass plantings performed in the spring of 2014 looked good generally, although some plantings on the north end of the fill cell failed to root and were overturned.

Fill Area B - Some of the interior containment borrow area has subsided below the water surface elevation; this condition was anticipated prior to construction and was deemed acceptable. Marsh plantings performed in the spring of 2014 appeared vigorous and showed healthy new growth.

Fill Area C - This area has vegetated very well. The perimeter containment borrow area has subsided, but no open water areas were visible. This marsh creation area and the containment berms were nearly 100% vegetated.

Fill Area D - Some of the vinyl sheet piles along the lake shore showed signs of damage, probably vandalism from hunters attempting to access the marsh creation areas. Marsh conditions behind the sheet pile wall appeared to be healthy, but some scour was visible behind the damaged wall sections.

Fill Area E - Low water conditions at the time of inspection prevented a thorough evaluation of this fill cell; however, the marsh creation area as viewed from the northwest containment berm looked healthy. The containment area was almost 100% vegetated.

## **III. Operation Activity**

### **a. Operation Plan**

There are no water control structures associated with this project; therefore a Structure Operation Plan is not required.

**b. Actual Operations**

There are no water control structures associated with this project; therefore, there are no required structure operations.

**IV. Monitoring Activity**

**a. Monitoring Goals**

The goals of PO-33 are to create 417 acres of intertidal habitat suitable for marsh establishment at construction and to nourish 149 acres of existing emergent marsh.

The introduction and placement of sediments through the use of dedicated dredging is consistent with Louisiana's Comprehensive Master Plan for a Sustainable Coast (CPRA 2012).

**b. Monitoring Elements**

**Elevation Survey**

An as-built elevation survey was conducted at the end of project construction in November 2008. Elevation transects were established in each of the 5 Marsh Creation Areas and marsh nourishment areas. A subset of these transects were resurveyed in 2014. Data points were surveyed at 100-ft intervals along each transect line. Additionally, grade stake locations which were established during construction were resurveyed for comparison purposes. The Louisiana Coastal Zone Secondary GPS monument PO-33-SM-01 was used for horizontal and vertical control. Marsh Creation Area D was removed from post-construction monitoring surveys as a cost saving measure. Elevation surveys are funded through Operations and Maintenance funds. Elevation surveys were conducted as built (2008) and post-construction (2014). Additional post-construction surveys are planned for 2019 and 2029.

**Aerial Photography**

In order to evaluate land/water ratios in the project area, land/water data will be obtained from digital imagery (Z/I Imaging digital mapping camera) with 1-meter resolution. The photography will be georectified using standard operating procedures described in Steyer et al. (1995, revised 2000), and land/water ratios will be determined. Aerial photography will be captured using CRMS coastwide flights in 2012, 2020, and 2029 (or approximate project years 3, 10, and 20).

**CRMS Supplemental**

Additional data were collected at CRMS-Wetlands stations, which can be used as supporting or contextual information for this project. Data types collected at CRMS sites include hydrologic, emergent vegetation, physical soil characteristics, discrete porewater salinity, marsh surface elevation change, vertical accretion, and land:water analysis of the 1-km<sup>2</sup> area encompassing the station (Folse et al. 2012). There is one CRMS monitoring station, CRMS0006, located within the PO-33 project area. CRMS0006 is located



immediately adjacent to Marsh Creation Area B. CRMS3667 is located outside of the PO-33 project boundary to the east of Marsh Creation Area E. While neither of these CRMS stations fall within the Marsh Creation Areas, the 1-km<sup>2</sup> areas evaluated for land:water ratios at these stations encompass portions of the project area and will therefore be useful for evaluation. There is an additional CRMS station, CRMS2854, located north of Goose Point that will be useful as a reference site (Figure 1).

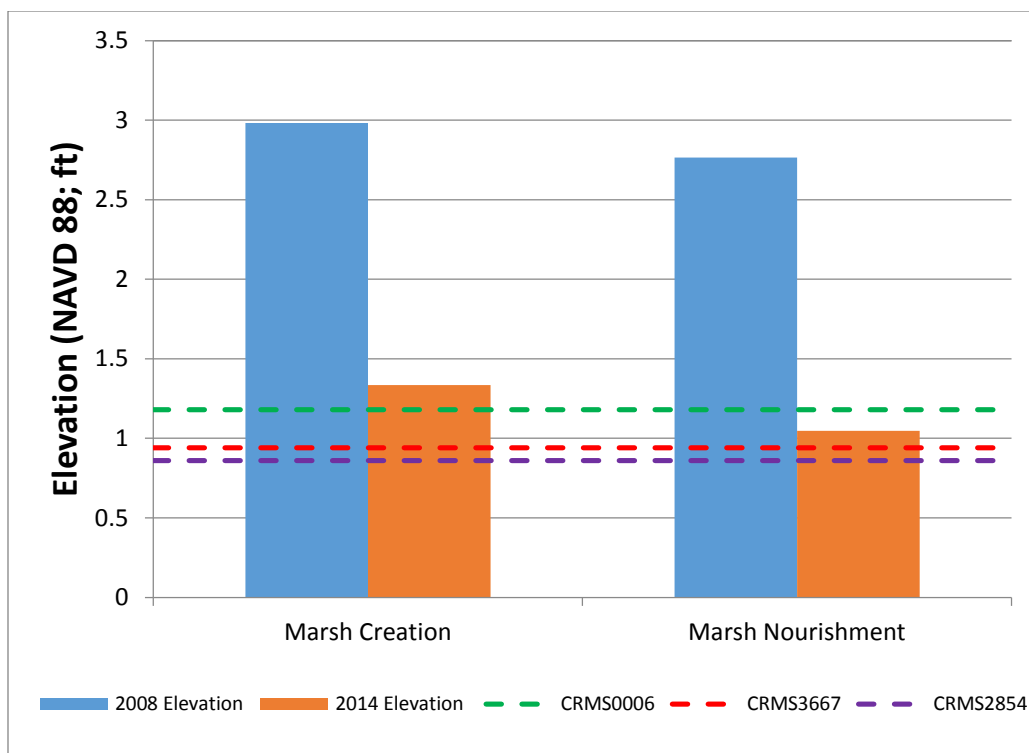
### **c. Monitoring Results and Discussion**

#### **Elevation Survey**

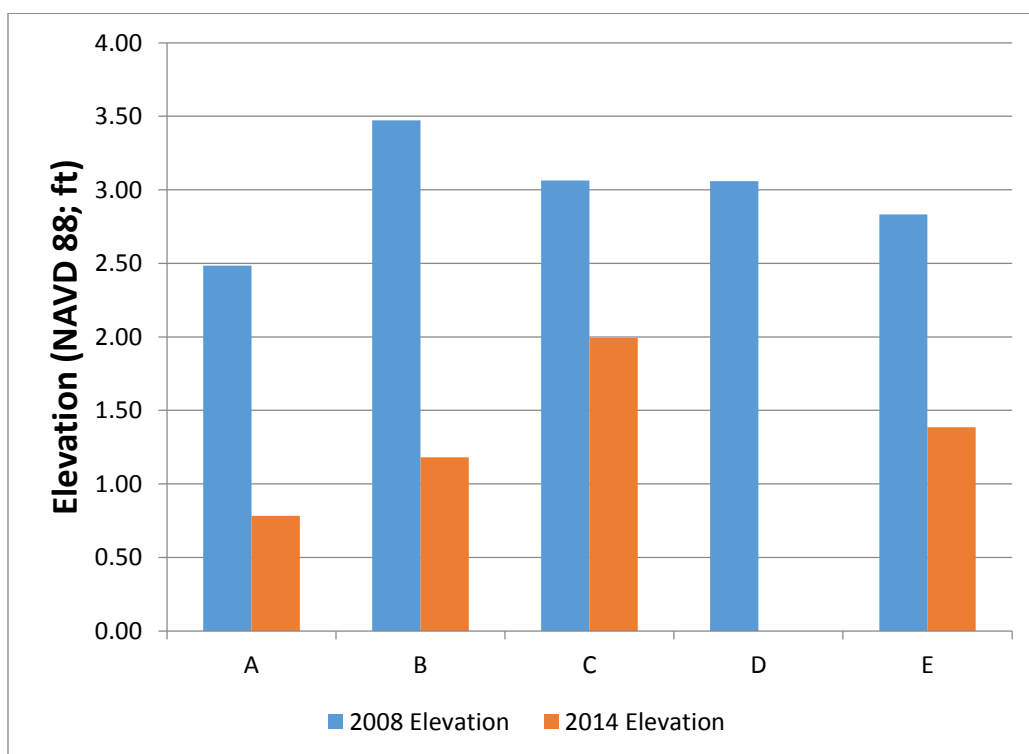
Average elevation in the marsh creation areas was 2.98 ft in the 2008 as-built survey (NAVD88, Figure 2) and 1.34 ft in 2014, a decline of 1.64 ft over the 5.5-yr period between surveys. Likewise, average elevation in the marsh nourishment areas changed from 2.77 ft in 2008 to 1.05 ft in 2014, a decline of 1.72 ft. Within the marsh creation areas, elevation change ranged from -1.07 ft (Area C) to -2.29 ft (Area B; Figure 3).

Based on pre-construction settlement calculations, it was expected that the marsh creation areas built to an initial elevation of 2.5 ft NAVD88 would settle to an elevation of 1.08 ft NAVD88 at year 3, with most of the settlement occurring in the first 2 years. The average 2014 survey elevation for the marsh creation areas (1.34 ft) slightly exceeds the pre-construction target. Average elevation at the marsh creation areas also exceeded marsh elevations at the 3 CRMS sites in the vicinity of the project. Average elevation within the marsh nourishment areas (1.05 ft NAVD88) is equivalent to the pre-construction target elevation for the project and higher than 2 of the 3 CRMS sites in the vicinity. The marsh elevation at CRMS0006 is slightly higher than those at CRMS2854 and CRMS3667. This is likely due to the proximity of this site to the Lake Pontchartrain shoreline.

Marsh Creation Area C had the highest average elevation in 2014 (1.99 ft NAVD88) while Area A had the lowest (0.78 ft NAVD88). The lower elevation at Area A may be attributable to several factors. In addition to having a lower as-built elevation, this area was identified through pre-construction soil borings as having native soil conditions that could result in high rates of foundation settlement (Simoneaux 2006).



**Figure 2.** Average elevation of PO-33 marsh creation areas and marsh nourishment areas in 2008 and 2014.



**Figure 3.** Average elevation of PO-33 marsh creation areas in 2008 and 2014.

## **Aerial Photography**

Land-water analysis of the 2012 aerial photography indicates that there are 979 ac of land and 403 ac of water within the 1,382-ac project area (70.8% land, 29.2 % water; Figure 4). The project area for PO-33 is divided into 3 areas which encompass the 5 marsh creation areas, as well as the marsh nourishment areas outside of the containment, and surrounding marsh and open water areas. Therefore, the project area is considerably larger than the marsh creation areas themselves.

Within the marsh creation areas, the 2012 land-water analysis indicates that there are 359 ac of land (84.3%) and 67 ac of water (15.7%). At an individual level, Areas C and D had the highest percentages of land at 99.1% and 85.7%, respectively (Figure 5). Area A had the lowest percentage of land with 60%. Within several of the marsh creation areas, particularly areas A, B, and E, shallow, narrow canals have formed just inside the containment dikes where sediment for the creation of the dikes was excavated during construction. This phenomenon is not entirely unexpected and has been observed in other marsh creation projects where fill material for containment dikes was excavated from within the marsh creation footprint (e.g. BA-36 Dedicated Dredging on the Barataria Basin Landbridge; BA-37 Little Lake Shoreline Protection/Dedicated Dredging Near Round Lake).

There are several large, un-vegetated mudflats within the marsh creation areas, most notably an approximately 17-ac area in the northeastern part of Area A, an approximately 11-ac area on the eastern end of Area E, and several smaller mudflats within Area B (Fig. 5). The methodology used for land-water analysis classifies mudflats as water, therefore accounting for the larger percentages of water within Areas A, B, and E. These areas were targeted with a planting of *Spartina alterniflora* in the spring of 2014. The conditions within the planting areas are conducive for vegetative growth and it is anticipated that these areas will vegetate rapidly within the coming years.

CRMS land-water analysis took place in 2005 (pre-construction), 2008 (during construction), and 2012 (post construction). The 1-km<sup>2</sup> areas for land-water analysis at CRMS0006 and CRMS3667 both capture portions of the PO-33 project. CRMS2854 did not receive any influence from the PO-33 project and will therefore serve as a reference for conditions in the surrounding area. The southern end of Area B is visible in the 2008 and 2012 aerial photography for CRMS0006 (Figure 6). Likewise, the eastern end of Area E is visible in the 2008 and 2012 aerial photography for CRMS3667 (Figure 7). In both cases, the 2008 photography acquired during project construction shows the extent of sediment brought into the area for marsh creation and nourishment.

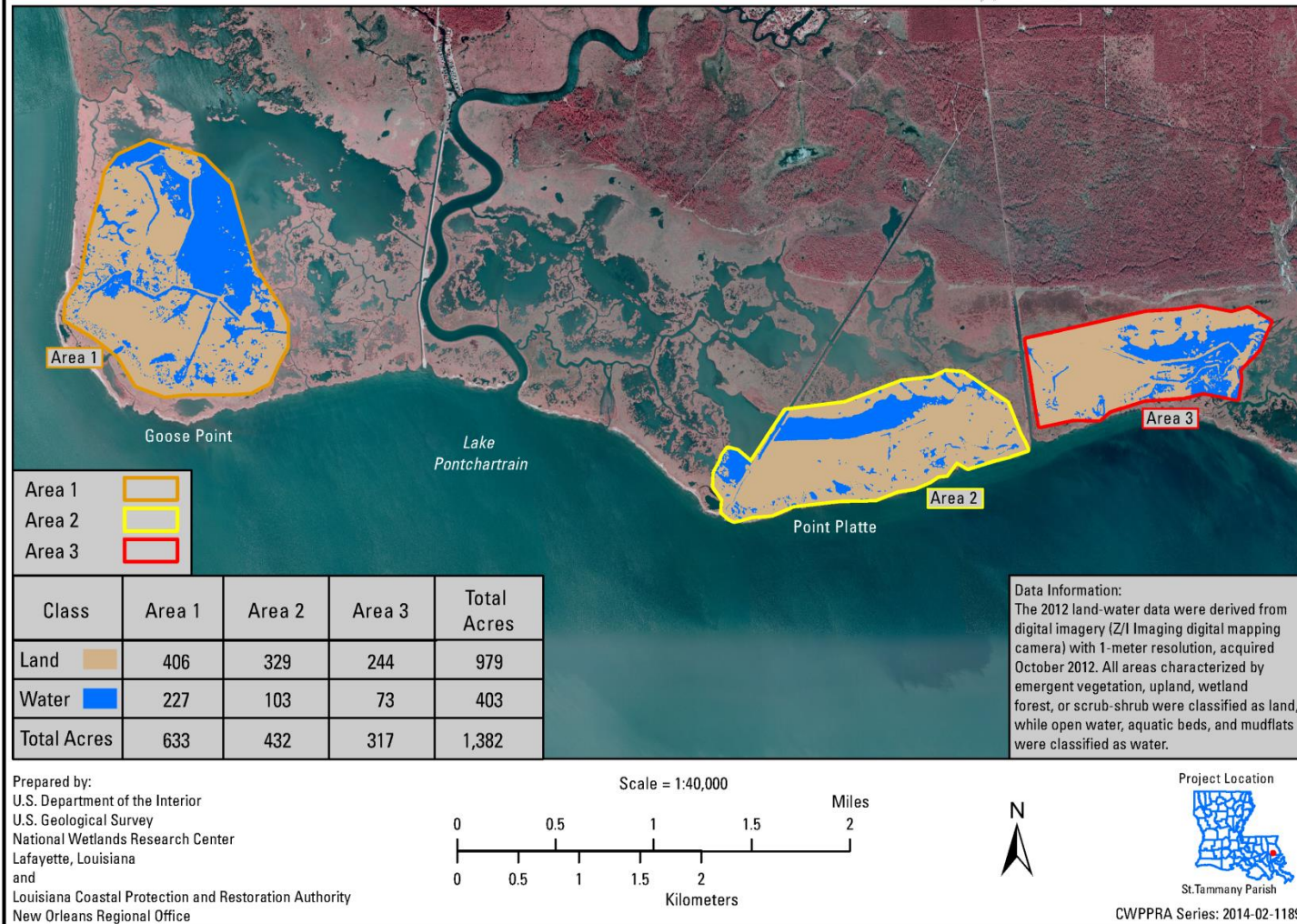
Trends in land-water percentage for the 2 CRMS sites influenced by PO-33 are mixed. At CRMS0006, the percentage of land has increased in each subsequent analysis, while at CRMS3667 land percentage has decreased (Table 2). Although land percentage at CRMS3667 has decreased despite the presence of PO-33, it should be noted that the majority of the decrease occurred between 2005 and 2008, before the completion of the project. Additionally, it appears that a large portion of the land loss has occurred in the

southeastern corner of the 1-km<sup>2</sup> area which is isolated from the project via a bayou that runs east-west below Area E and did not receive sediment from the project (Figure 5). Land-water ratios at CRMS2854 have remained relatively constant; decreasing slightly in 2008 and rebounding again in 2012 (Figure 8; Table 2).

**Table 2.** Percent land and water at CRMS0006, CRMS3667, and CRMS2854 in years 2005, 2008, and 2012.

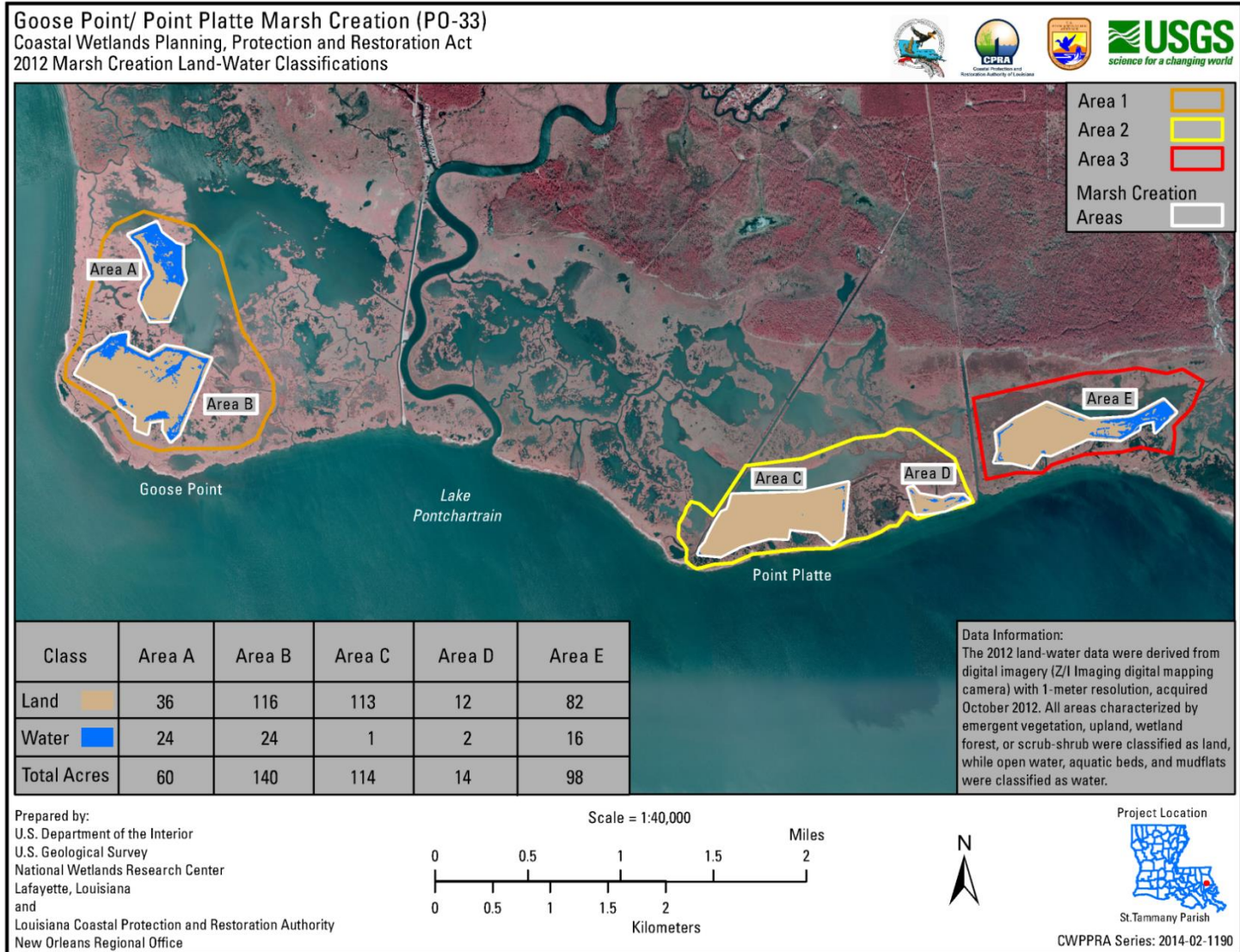
Year	CRMS0006		CRMS3667		CRMS2854	
	% Land	% Water	% Land	% Water	% Land	% Water
<b>2005</b>	35.5	64.5	54.4	45.6	59.3	40.7
<b>2008</b>	46.0	54.0	49.2	50.8	57.3	42.7
<b>2012</b>	47.2	52.8	48.4	51.6	59.7	40.3

Goose Point/ Point Platte Marsh Creation (PO-33)  
Coastal Wetlands Planning, Protection and Restoration Act  
2012 Land-Water Classification

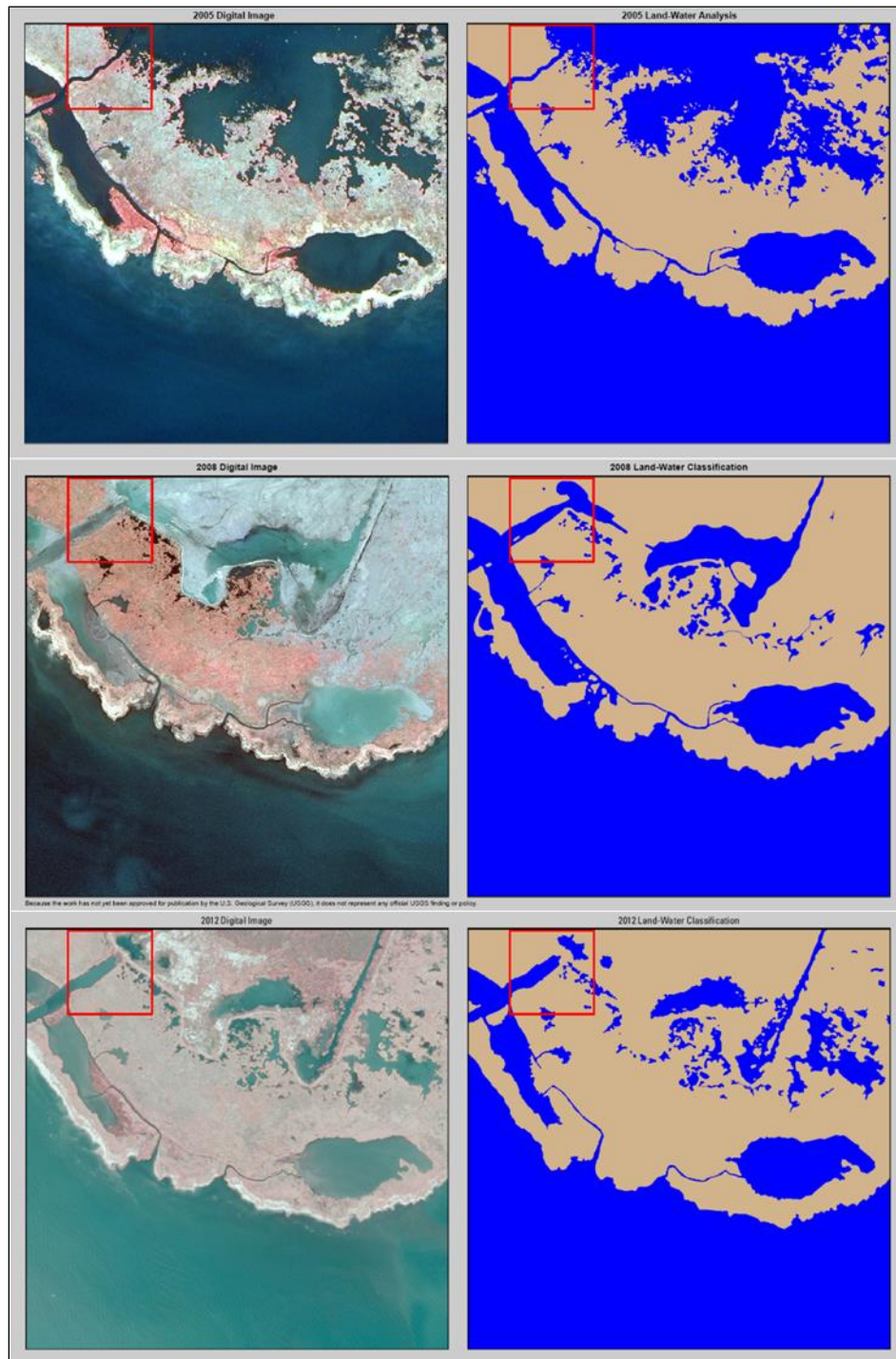


**Figure 4.** Land-water analysis of 2012 aerial photography for the PO-33 project area.



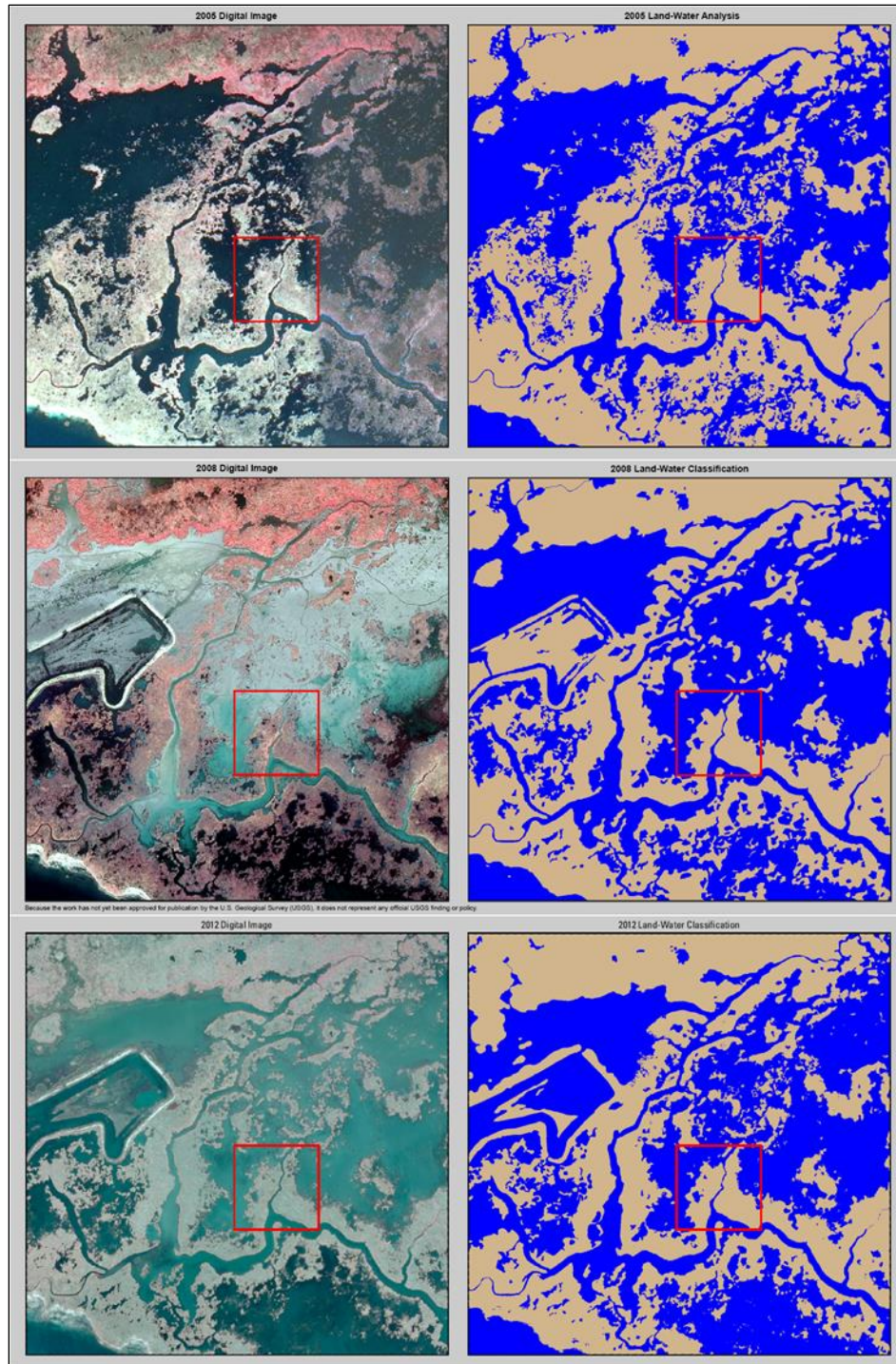


**Figure 5.** Land-water analysis of the 5 Marsh Creation Areas within the PO-33 project area.



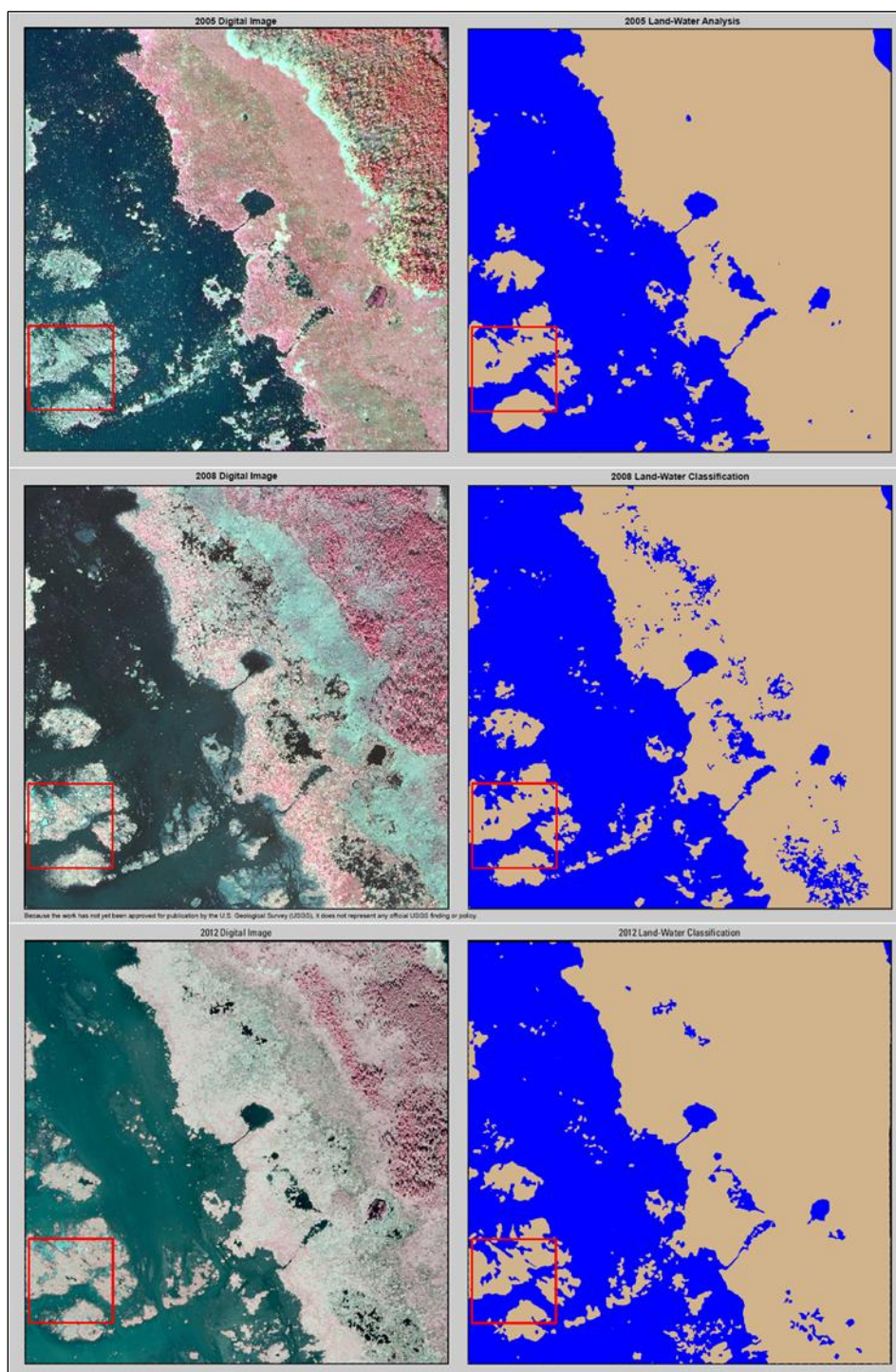
**Figure 6.** Color infrared aerial imagery and land-water analysis of 1-km<sup>2</sup> area at CRMS0006 for years 2005 (top), 2008 (middle), and 2012 (bottom).





**Figure 7.** Color infrared aerial imagery and land-water analysis of 1-km<sup>2</sup> area at CRMS3667 for years 2005 (top), 2008 (middle), and 2012 (bottom).





**Figure 8.** Color infrared aerial imagery and land-water analysis of 1-km<sup>2</sup> area at CRMS2854 for years 2005 (top), 2008 (middle), and 2012 (bottom).

## V. Conclusions

### a. Project Effectiveness

The goals of the PO-33 project were to create 417 ac of intertidal habitat suitable for marsh establishment and to nourish 149 ac of existing emergent marsh. The footprint of the marsh creation areas is 426 ac according to 2012 land-water analysis. Within the marsh creation areas mean elevation in 2014 was 1.34 ft NAVD88, an elevation which is suitable for the establishment of emergent marsh. The 2012 land-water analysis for the PO-33 marsh creation areas classified 359 ac as land and 67 ac as water. A comparison of the total acres of land listed in the project goals (417 ac) to the acres of land from the land-water analysis (359 ac) demonstrates that the goals have nearly been met. Land acreage within the marsh creation areas is expected to increase as vegetation from recent plantings becomes established and expands. The total acreage of marsh nourishment is somewhat more difficult to quantify. During project design, boundaries for marsh nourishment areas were developed based on the location of existing marsh and expectations of where sediment slurry would reach within these areas. The 2008 CRMS aerial photography taken during construction, as well as subsequent aerial photography and annual project inspections, suggests that sediment reached well beyond areas that were designated for marsh nourishment during project design. Sediments from marsh nourishment benefitted not only degraded marsh but also open water areas. For example, an approximately 40-ac area of shallow open water to the north of Area E received sediment from the project and has been converted to marsh after natural colonization by *Schoenoplectus sp.* Similarly, a large open water area to the northeast of Area B received sediment from the project, raising elevation to the point that the area was suitable for planting with *Spartina alterniflora* and *Schoenoplectus californicus* in the spring of 2014.

### b. Recommended Improvements

The goal for this project was to recreate marsh habitat in open water behind the existing shoreline. Based on findings from this inspection, the design goal of the project is being met. Recommendation: Continue to inspect the project features annually to document and assess site conditions. If a maintenance need is identified on a future inspection, the project team will determine the necessary corrective action(s) at that time.

### c. Lessons Learned

The PO-33 project is providing valuable empirical evidence for upcoming marsh creation projects, such as the CWPPRA Bayou Bonfouca Marsh Creation (PO-104) project planned to the immediate southeast of the Goose Point/Point Platte area. The PO-33 borrow area is being studied to evaluate dissolved oxygen levels and benthic organism population health; this feedback will serve as a design reference to help evaluate potential impacts on future dredge borrow areas.



## VI. References

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## **Appendix A**

### **3-Year O&M Budget Projection**

[illegible]

## **Appendix B**

### **2014 Annual Inspection Photographs**



Area A – *Spartina alterniflora* plantings with vegetated fill area beyond



Area A – Containment degraded for tidal exchange at north end of fill area





**Area B** – Shallow water in containment borrow area with fill area beyond



**Area B** – Recent *Spartina alterniflora* plantings with marsh nourishment area in background



**Area C – North containment berm with marsh creation in background**



**Area C – Interior marsh viewed from north containment rim**





**Area D – Marsh infill behind vinyl sheet pile wall**



**Area D – Apparent vandalism; sheet piles appear to have been cut**



**Area E – Vegetated containment berm at northwest end of fill cell**



**Area E – Shallow water in containment borrow area with marsh fill beyond**

## **Appendix C**

### **2014 Field Inspection Notes**



FIELD INSPECTION CHECK SHEET						
<b>Project No. / Name:</b>	Goose Point / Point Platte M.C. (PO-33)			<b>Date:</b>	7/9/2014	<b>Time:</b> 9:30 AM
<b>Structure No. :</b>	n/a			<b>Inspector(s):</b>	Prendergast, Gossman, Breaux	
<b>Description:</b>	Marsh creation fill areas			<b>Water Level:</b>	0.40' NAVD88 (USACE Mandeville gage)	
<b>Type of Inspection:</b>	Annual			<b>Weather Cond:</b>	Partly Cloudy, wind SE at 2 mph	
Project Features	Overall Condition	Physical Damage	Containment Dikes	Marsh Fill Area	Observations and Remarks	
<b><u>Fill Area "A"</u></b>	Good	None	Very Good Gaps remain open	Good	Much of the interior containment borrow area has subsided below the water surface elevation; this condition was anticipated prior to construction. Marsh plantings performed in the spring of 2014 look good generally, although some plantings have failed to root and are overturned.	
<b><u>Fill Area "B"</u></b>	Very Good	None	Very Good Gaps remain open	Very Good	Some of the interior containment borrow area has subsided below the water surface elevation; this condition was anticipated prior to construction and is acceptable. Marsh plantings performed in the spring of 2014 look very good and show healthy new growth.	
<b><u>Fill Area "C"</u></b>	Very Good	None	Very Good Gaps remain open	Very Good	This area has vegetated very well. The perimeter containment borrow area has subsided, but no open water areas are visible. This marsh creation area and the containment berms are nearly 100% vegetated.	
<b><u>Fill Area "D"</u></b>	Good	See Remarks	Very Good	Very Good	Some of the vinyl sheet piles along the lake shore show signs of damage, probably vandalism from hunters attempting to access the marsh creation areas. Marsh conditions behind the sheet pile wall appeared to be very good, but some scour was visible behind the damaged wall sections.	
Vinyl Sheet Pile 504 ft.						
<b><u>Fill Area "E"</u></b>	Very Good	None	Very Good	Very Good	Low water conditions prevented a thorough inspection of this fill cell, however the marsh creation area as seen from the northwest containment berm looked very good. Containment area was almost 100% vegetated.	
Vinyl Sheet Pile 110 ft.						

## **Appendix D**

### **Monitoring Budget**

PO-33 Goose Point/Point Platte Marsh Creation																						
Infl. Rate			Monitoring Budget		\$	111,665																
Price Level	2012																					
	Round Trip Mileage																					
		Expended																				
	Rates	Dollars	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<u>Daily Rate Items</u>																						
Base Field Equipment																						
14' Pirogue																						
20' Aluminum																						
Three Man Crew																						
3 Man Lodging																						
3 Man Per Diem																						
Vehicle																						
<u>Annual Rate Items</u>																						
Misc. Supplies																						
Computer Database																						
Monitoring Progress Report																						
Comprehensive Monitoring Report																						
TAG Meetings																						
Quality Assurance																						
*Aerial Photography					1								1								1	
Monitoring Plan Dev.																						
	Rates	Expended Dollars	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<u>Daily Rate Items</u>																						
Base Field Equipment																						
14' Pirogue																						
20' Aluminum																						
Three Man Crew																						
3 Man Lodging																						
3 Man Per Diem																						
Vehicle																						
<u>Annual Rate Items</u>																						
Misc. Supplies																						
Computer Database																						
Monitoring Progress Report																						
Comprehensive Monitoring Report																						
TAG Meetings																						
Quality Assurance																						
*Aerial Photography					\$29,891								\$36,704								\$45,071	
Monitoring Plan Dev.																						
DNR Expenditures To Date																						
*Other Federal Expenditures																						
Total		0.00	0.00	0.00	29,890.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36,704.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45,070.75	0.00
Projected - Running Total			0.00	0.00	29,890.76	29,890.76	29,890.76	29,890.76	29,890.76	29,890.76	29,890.76	29,890.76	66,594.97	66,594.97	66,594.97	66,594.97	66,594.97	66,594.97	66,594.97	66,594.97	111,665.73	111,665.73
Projected Grand Total		111,665.73																				