State of Louisiana

Coastal Protection and Restoration Authority of Louisiana

Monitoring Plan

for

North Lake Mechant Landbridge Restoration - Construction Unit 2 (TE-44)

State Project Number TE-44
Priority Project List 10

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Terrebonne Parish

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The Coastal Protection and Restoration Authority (CPRA) and the United States Department of Interior/Fish and Wildlife Service (FWS) agree to carry out the terms of this Monitoring Plan (hereinafter referred to as the "Plan") of the accepted, completed project features in accordance with the Cost Sharing Agreement DNR No. 2511-01-24 and amendments, dated August 7, 2007. The FWS will be included as part of the plan as a reviewing federal sponsor.

The project features covered by this plan are inclusive of and are identified as the North Lake Mechant Landbridge Restoration (TE-44) hereinafter referred to as the North Lake Mechant Landbridge Restoration Project. The intention of the provisions of this plan is to monitor the project using standardized data collection techniques and to analyze that data to determine whether the project is achieving the anticipated benefits. Reports will be generated and recommendations made to adaptively manage the project. There is no requirement that this project functions to any standard beyond the economic life, except that it is not left as a hazard to navigation or a detriment to the environment.

Construction of the North Lake Mechant Landbridge 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. This project was approved on the 10th Priority Project List.

1. PROJECT DESCRIPTION, PURPOSE, GOALS, and FEATURES

Description

The North Lake Mechant Landbridge Restoration project is located within lower Terrebonne Parish, south of Bayou Decade and north of Lake Mechant (Figure 1). The project area encompasses approximately 7,572 acres (3,064 ha) of predominantly open water (>70%) and marsh, of which most is classified as intermediate (Belhadjali, 2002).

The North Lake Mechant land bridge consists of the Small Bayou la Pointe natural levees and the north shore of Lake Mechant. The north Lake Mechant marshes, Raccourci Bay and Lake Pagie are primarily freshwater with occasional spikes into moderate salinities. In contrast, due to the large opening at Grand Pass, Lake Mechant is intermediately salinewith spikes of salinity up to 15-20 ppt. The land bridge serves as a buffer between the tidally dominated processes of Lake Mechant and the North Lake Mechant marshes and surrounding waterways.

The TE-44 project design uses the following features to preserve the landbridge: marsh creation north of Lake Mechant; vegetative plantings along the eroding lakeshore; hard shoreline protection along containment dikes; plugging of several oil-field canals; and, the replacement of a fixed-crest weir with a sheet pile weir (USFWS 2010). It has been determined that construction of the project may have an impact on oyster leases identified within Lake Mechant. The difficulties and associated delays in oyster lease compensation/relocation have prompted the federal and local sponsors to divide the

project into construction units (CU). This action enabled more timely construction of those project features that will not impact nearby oyster leases.

The vegetative planting component of CU1 is analyzed in the 2008 Operations, Maintenance and Monitoring Report for North Lake Mechant Landbridge Restoration – Construction Unit 1 (Folse and Hubbell, 2008), and entailed the planting and monitoring of 44,307 linear feet of *Spartina alterniflora* (smooth cordgrass). This Monitoring Plan focuses exclusively on CU2, which is composed of hard structures and marsh creation components.

Purpose:
The project's purpose is to protect and restore the North Lake Mechant Landbridge and Small Bayou LaPointe Ridge. Approximately 790 acres of marsh will be created using dredged material.

Goals:
The specific project goals as stated in the August 26, 2004 Ecological Review for North Lake Mechant Landbridge Restoration, Construction Unit 2 are:

1. Create 790 acres of intertidal habitat suitable for intermediate marsh establishment at construction and nourish 40 acres of existing marsh.
2. Maintain interior marsh vegetation type as intermediate for the duration of the project life of 20 years.

Features:
The creation of 790 acres of intermediate marsh will be achieved through the confined placement of dredged material at an average elevation of 3.0 feet NAVD-88 and the nourishment of 40 acres of existing marsh will be achieved through the placement of 1 foot of dredged material (Figure 2).

The interior marsh vegetation type will remain intermediate for the duration of the project life of 20 years through the construction of 2,362 linear feet of armored earthen dike, the placement of three earthen plugs, three sheet pile plugs, two rock plugs, and the replacement of a fixed crest weir with a sheet pile weir (Figure 2).

Project construction for CU1 began on July 1, 2003. Final completion of CU2 was on Dec 16, 2009. The projected project life is 20 years.

Figure 1. North Lake Mechant Landbridge Restoration project area and nearby Coastwide Reference Monitoring System – Wetlands sites.

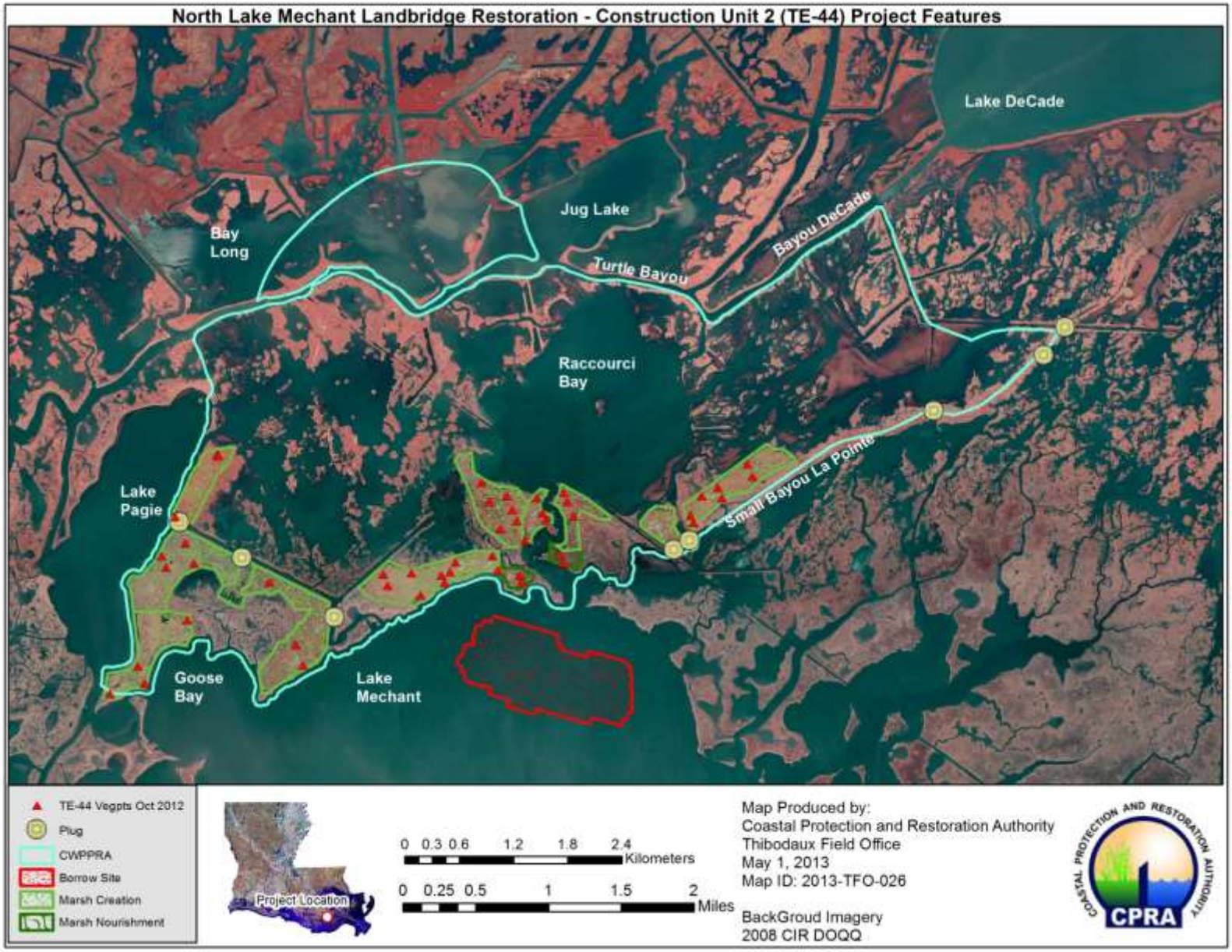

Figure 2. Map of North Lake Mechant Landbridge Restoration project features.

2. ITEMS REQUIRING MONITORING

The Coast-wide Reference Monitoring System (CRMS) - *Wetlands* is a network of 392 monitoring sites distributed throughout the coastal zone of Louisiana. Hydrographic, vertical accretion, elevation change, vegetation, soils, and aerial photography data are collected at each CRMS site.

There are no CRMS monitoring stations located within the project area; however, there are several CRMS monitoring stations located within five (5) miles of the "center" of the project area. CRMS stations located on the western side of the project area are CRMS0354 and CRMS4045. CRMS stations located on the eastern side of the project area are CRMS0398, CRMS0395, and CRMS0396. Another three CRMS stations are found five (5) miles or greater from the center of the project area. CRMS stations CRMS0294 and CRMS0296 are to the north and CRMS4455 is to the south (Figure 1). Data from these sites shall be used to characterize conditions in the vicinity of the project area, and land loss data may be used for comparison to the land loss rates within the project area.

Project-specific monitoring for TE-44 includes forty-eight (48) randomly-selected long-term vegetation monitoring stations established in the fall of 2012 along 19 transects and divided amongst the 13 marsh creation and marsh nourishment areas (Figure 2). These stations will allow for comparison to the aforementioned CRMS stations outside the project area. CRMS methods are described in detail in Folse et al. (2008, revised 2012). Additionally, CRMS coastwide flights will be utilized to estimate project-specific land/water changes over time.

The following monitoring strategies will provide the information necessary to evaluate the specific monitoring goal:

A. Vegetation - Species composition, percent cover, and relative abundance will be sampled using the Braun-Blanquet methodology within 2m x 2m stations located along transects. Forty-eight (48) vegetation plots will be sampled. Vegetation sampling will occur in years 3, 12 and 18 (calendar years 2012, 2021 and 2027). The vegetation sampling and aerial photography flights will occur within the same year.

B. Aerial Photography/Analysis - 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 a 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 obtained in post-construction years 3, 12 and 18 (estimated calendar years of 2012, 2021 and 2027) in conjunction with CRMS coastwide flights.

3. MONITORING BUDGET

The cost associated with project-specific monitoring variables outlined in Section 2 of this plan for the twenty (20) year project life is included and summarized in Attachment 1. Funding for Phase 2 monitoring was approved by the CWPPRA task force on August 7, 2002.

4. RESPONSIBILITIES

A. CPRA will:

1. Coordinate and oversee all scientific data collection.

2. Ensure that all data goes through quality control procedures and is entered into the public database.

3. Analyze the data and report on the status of the project after data collection events (years 4, 13 and 19). Should the data indicate that the project is not meeting the goals and objectives, adaptive management recommendations will be made to improve the response.

4. Conduct joint site inspections with USWFS of the project site at least annually and after major storm events if determined to be necessary by CPRA and/or USWFS.

5. Review the monitoring plan and budget annually with the USFWS to determine that the data being collected adequately evaluates the project effectiveness.

B. USFWS will:

1. Review the monitoring plan and budget annually with the CPRA to determine that the data being collected adequately evaluates the project.

2. Conduct joint site inspections with CPRA of the project site at least annually and after major storm events if determined to be necessary by CPRA or USWFS.

3. Review the reports and provide concurrence on any corrective action or operational changes for the project.

References

Belhadjali, K. 2004. Ecological Review—North Lake Mechant landbridge Restoration, Construction Unit 2. Coastal Protection and Restoration Authority of Louisiana. Baton Rouge, Louisiana. 14 pp.

Folse, T. M., Hubbell, T. F., 2008. 2008 Operations, Maintenance and Monitoring Report for North Lake Mechant Landbridge Restoration – Construction Unit 1, Coastal Protection and Restoration Authority of Louisiana. Baton Rouge, Louisiana. 31pp.

Folse, T. M., J. L. West, M. K. Hymel, J. P. Troutman, L. A. Sharp D. Weifenbach, T. McGinnis, and L. B. Rodrigue 2008. A Standard Operating Procedures Manual for the Coast-wide Reference Monitoring System-Wetlands: Methods for Site Establishment, Data Collection, and Quality Assurance/Quality Control. Louisiana Coastal Protection and Restoration Authority. Office of Coastal Protection and Restoration. Baton Rogue, LA. 191pp.

Steyer, G. D., R. C. Raynie, D. L. Stellar, D. Fuller, and E. Swenson. 1995, (revised 2000). Quality Management Plan for Coastal Wetlands Planning, Protection, and Restoration Act Monitoring Program. Open-file series no. 95-01. Baton Rouge: Louisiana Department of Natural Resources, Coastal Restoration Division. 97 pp.

United States Fish and Wildlife Service (USFWS). 2010. North Lake Mechant Landbridge Restoration (TE-44) - Project Information Sheet. Prepared for the Louisiana Department of Natural Resources. Baton Rouge, Louisiana. www.LaCoast.gov 2 pp.

Attachment 1
Project Monitoring Budget

Project Name	North Lake Mechant Landbridge Restoration																						
Infl. Rate	2.60%		Sondes to Install			0			Monitoring Budget	$271,789													
Price Level	2010		Feldspar Sites			0																	
Round Trip Mileage		100	SET Installation			0																	
		Expended																					
	Rates	Dollars	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Daily Rate Items																							
Base Field Equipment	$ 56.18				5									5						5			
Camera	$ 25.00				5									5						5			
Handheld GPS	$ 17.00				5									5						5			
Differential GPS	$ 220.00				5									5						5			
Air Boat Rental	$ 1,050.00				5									5						5			
Four Man Crew	$ 1,800.00				5									5						5			
4 Man Lodging	$ 400.00				5									5						5			
4 Man Per Diem	$ 200.00				5									5						5			
Data Processing & QA	$ 450.00				5									5						5			
Vehicle	$ 0.51				500									500						500			
Annual Rate Items																							
Misc. Supplies	$ 400.00				5									5						5			
Comprehensive Report	$ 12,000.00					1									1						1		
Aerial Photography	$ 33,248.60				1									1						1			
		Expended																					
	Rates	Dollars	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Daily Rate Items																							
Base Field Equipment					$ 300									$ 378						$ 441			
Camera					$ 134									$ 168						$ 196			
Handheld GPS					$ 91									$ 114						$ 134			
Differential GPS					$ 1,176									$ 1,481						$ 1,728			
Air Boat Rental					$ 5,611									$ 7,069						$ 8,246			
Four Man Crew					$ 9,619									$ 12,118						$ 14,136			
4 Man Lodging					$ 2,138									$ 2,693						$ 3,141			
4 Man Per Diem					$ 1,069									$ 1,346						$ 1,571			
Data Processing & QA					$ 2,405									$ 3,030						$ 3,534			
Vehicle					$ 268									$ 338						$ 394			
Annual Rate Items																							
Misc. Supplies					$ 2,105									$ 2,652						$ 3,094			
Comprehensive Report						$ 12,961									$ 16,329						$ 19,047		
Aerial Photography					$ 35,000									$ 44,096						$ 51,437			
Total		$ -	$ -	$ -	$ 59,915	$ 12,961	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 75,485	$ 16,329	$ -	$ -	$ -	$ -	$ 88,053	$ 19,047	$ -	
Projected - Running Total		$ -	$ -	$ -	$ 59,915	$ 72,875	$ 72,875	$ 72,875	$ 72,875	$ 72,875	$ 72,875	$ 72,875	$ 72,875	$ 148,360	$ 164,689	$ 164,689	$ 164,689	$ 164,689	$ 164,689	$ 252,742	$ 271,789	$ 271,789	