



**State of Louisiana**

**Coastal Protection and Restoration Authority  
of Louisiana**

## **Monitoring Plan**

for

**Dedicated Dredging on the Barataria  
Basin Landbridge (BA-36)**

State Project Number BA-36  
Priority Project List 11

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The Coastal Protection and Restoration Authority of Louisiana (CPRA) and the United States Fish and Wildlife Service (USFWS) 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 (CSA) No. 2511-02-17 dated April 3, 2002, with amendments effective December 6, 2007 and February 10, 2014. The Monitoring Plan will be available on the CPRA Document Referencing System accessible through the CPRA website.

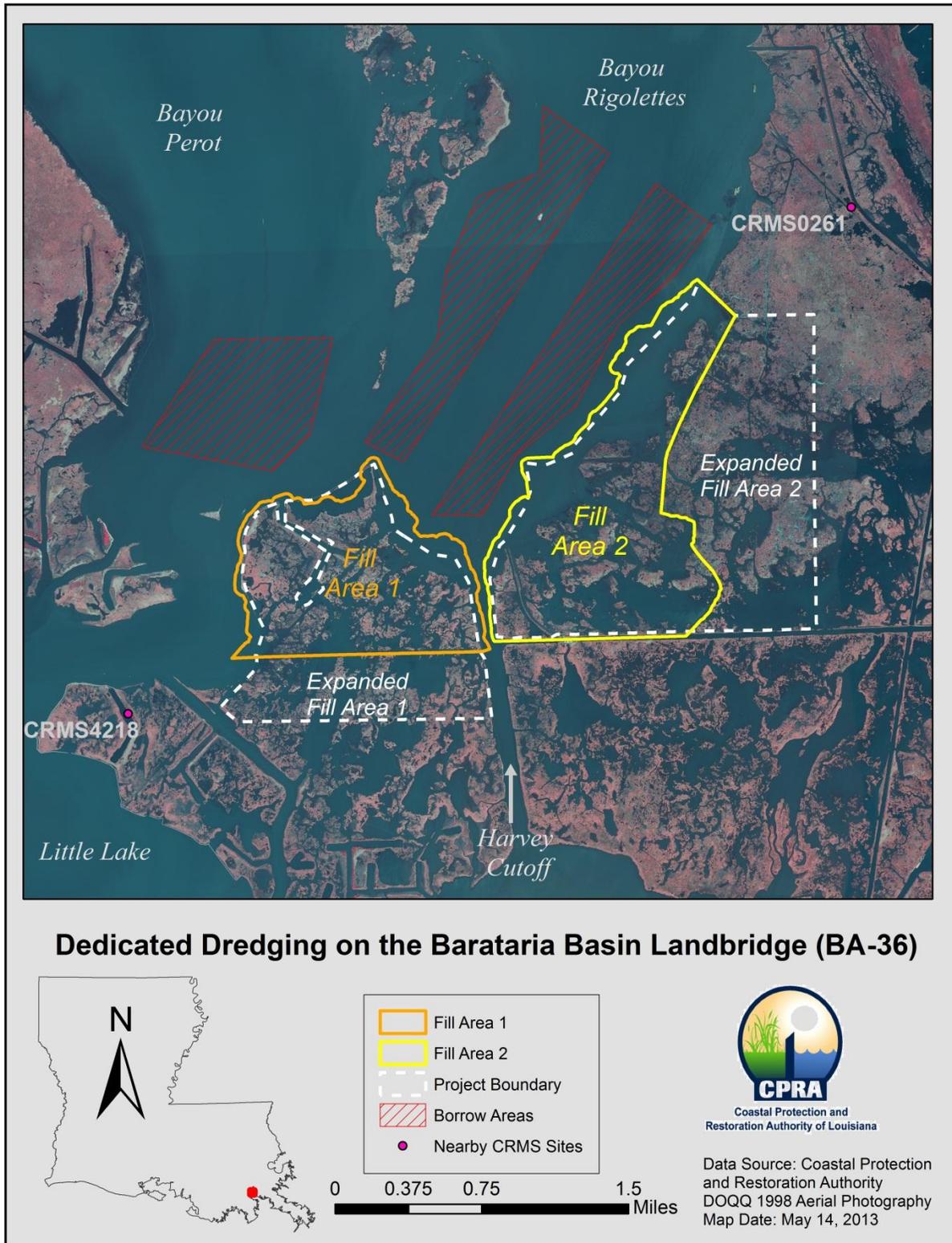
The project features covered by this plan are inclusive of and are identified as the Dedicated Dredging on the Barataria Basin Landbridge (BA-36) project. The intention of the provisions of this Plan is to monitor the project using standardized data collection techniques and to analyze that data to determine whether the project is achieving the anticipated benefits. Based on the collected data, reports will be generated and recommendations made to adaptively manage the project.

Construction of the Dedicated Dredging on the Barataria Basin Landbridge (BA-36) 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. The Dedicated Dredging on the Barataria Basin Landbridge (BA-36) project was approved on CWPPRA’s 11<sup>th</sup> Priority Project List. Additional funding for the BA-36 project was also provided by the State of Louisiana’s Coastal Impact Assistance Program (CIAP), as well as the State of Louisiana’s Surplus Funds.

## **1. PROJECT DESCRIPTION, PURPOSE, GOALS, and FEATURES**

### **Description**

The Dedicated Dredging on the Barataria Basin Landbridge (BA-36) project is located at the southern end of Bayou Rigolettes and Bayou Perot (Figure 1) in Jefferson Parish, Louisiana. This project was proposed to create new emergent marsh and to nourish existing marsh using hydraulically dredged sediments in an area of critical land loss within the Barataria Basin. The Barataria Basin, which consists primarily of intermediate marsh and open water habitat (Chabreck and Linscombe 1997), is bounded on the north and east by the Mississippi River, on the west by Bayou Lafourche, and on the south by the Gulf of Mexico. The upper portion of the Barataria Basin is largely a freshwater-dominated system of natural levee ridges, baldcypress - water tupelo swamps, and fresh to intermediate marsh habitats. The lower portion of the basin is dominated by marine/tidal processes, with barrier islands, saline/brackish marshes, tidal channels, and large bays and lakes. Historically, a landmass extending southwest to northeast across the basin provided limited hydrologic connection between the freshwater dominated upper basin and the tidally influenced lower basin. However, with the leveeing of the Mississippi River, the closure of Bayou Lafourche, and the creation of the Barataria Bay



**Figure 1.** Dedicated Dredging on the Barataria Basin Landbridge (BA-36) project location and features.

Waterway and Harvey Cut, the basin gradually began deteriorating due to sediment deprivation, saltwater intrusion, subsidence, and increased wave action. Substantial erosion and interior marsh loss occurred along the shorelines of Bayou Perot and Bayou Rigolettes, which transformed from meandering, riverine waterways to wide, high wave-energy water bodies separated by only a thin peninsula of marsh. From 1932 to 1990, the basin lost nearly 360,000 acres (145,687 ha) of marsh (Louisiana Coastal Wetlands Conservation and Restoration Task Force and Wetlands Conservation and Restoration Authority 1998) and from 1978 to 1990 the basin experienced the highest rate of wetland loss along the entire Louisiana coast (Barras et al. 2003).

The original CWPPRA project footprint contained approximately 1,245 acres within Fill Areas 1 and 2 (Figure 1). Additional funding for Fill Site 2 was later provided by the State of Louisiana's Coastal Impact Assistance Program (CIAP). During construction, the project area was expanded through the application of surplus dredge material to two adjacent, unconfined areas (Expanded Fill Areas 1 and 2, Figure 1). These expansions were jointly funded through CWPPRA, CIAP, and the State of Louisiana's Surplus Funds. The expanded footprint increased the constructed marsh acreage to a total of 2,789 acres.

## **Purpose**

The purpose of the BA-36 project was to create emergent wetlands by hydraulically dredging sediments from Bayous Perot and Rigolettes, and depositing that material in shallow open water areas. In addition, fragmented marsh habitat in the project area was nourished by adding a layer of sediment to the marsh surface to increase elevation and improve vegetative health and marsh productivity. The benefits provided by the project include the creation of important wetland habitat and the enhancement of storm protection for inland areas. Additionally, this project will serve to demonstrate the feasibility of using dredged sediment to create sustainable marsh.

The Dedicated Dredging on the Barataria Basin Landbridge project is considered a 'marsh creation' project within the CWPPRA classification. Additional descriptive information regarding this project can be found in documents prepared by the USFWS and LDNR, including an Environmental Assessment (Roy 2005) and Ecological Review (Belhadjali 2003).

Another CWPPRA project, the Barataria Basin Landbridge Shoreline Protection Project (BA-27), was approved on Priority Project Lists 7, 8, 9, and 11, as a critical first step in maintaining the Barataria Basin landbridge. Upon completion, the BA-27 project will provide approximately 119,290 ft (36,360 m) of shoreline protection to the Barataria Basin landbridge area. Together the BA-27 and BA-36 projects aim to maintain the hydrologic and ecological integrity of the Barataria Basin. The BA-27 project will protect the marsh shoreline from the high wave energy of Bayou Perot and Bayou Rigolettes, while the BA-36 project will restore the marsh interior in a critical section of the landbridge.

## Goals

The following goals apply to the original CWPPRA/CIAP-funded project area (Fill Areas 1 and 2, Figure 1):

1. Within the 1,245-acre project area, create 1,217 acres of emergent marsh by filling open-water areas and fragmented marsh with dredged material. The remaining 28 acres are to remain as open water.
2. Of the 1,217 acres created, maintain 995 acres of emergent marsh at the end of the 20-year project life.

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), specifically, the Barataria Marsh Creation Component.

## Features

Construction on the BA-36 project began in September 2008 and was completed in April 2010. Construction activities within the original CWPPRA/CIAP-funded project area (Fill Areas 1 and 2) consisted of constructing and maintaining 67,700 linear feet of containment dikes, pumping 5,367,500 cubic yards of borrow material from Bayous Perot and Rigolettes, and placing it in the two contained marsh creation areas to construct approximately 1,211 acres of intertidal marsh at a final elevation of +2.5 feet NAVD 88. This elevation is expected to decrease over time due to subsidence, settlement, shrinkage, and dewatering of dredged material. In addition to the two contained fill areas, approximately 3,901,500 cubic yards of borrow material was placed in unconfined fill areas to the south of Fill Area 1 and to the east of Fill Area 2 (Figure 1) to create and nourish approximately 1,578 acres of marsh.

**Table 1.** As-built features for sub-areas within the BA-36 project.

|  |  |
|--|--|
| <b>Fill Area 1</b>   | <b>Fill Area 2</b>   |
| <ul style="list-style-type: none"> <li>• ~500 acres of marsh created/nourished</li> <li>• ~32,507 linear feet of containment</li> <li>• ~2,023,000 yd<sup>3</sup> dredge material</li> </ul> | <ul style="list-style-type: none"> <li>• ~711 acres of marsh created/nourished</li> <li>• ~35,151 linear feet of containment</li> <li>• ~3,337,500 yd<sup>3</sup> dredge material</li> </ul> |
| <b>Expanded Fill Area 1</b>  | <b>Expanded Fill Area 2</b>  |
| <ul style="list-style-type: none"> <li>• ~404 acres of marsh created/nourished</li> <li>• ~907,000 yd<sup>3</sup> dredge material</li> </ul>   | <ul style="list-style-type: none"> <li>• ~1,174 acres of marsh created/nourished</li> <li>• ~2,636,500 yd<sup>3</sup> dredge material</li> </ul>   |

## 2. ITEMS REQUIRING MONITORING

CWPPRA projects authorized for construction after April 16, 2003 were to be monitored only with Coast-wide Reference Monitoring System (CRMS) stations, other existing data collection, and any additional data-collection specifically added to the project and funded separately from the normal monitoring budget. Initially, no additional monitoring funds were added to the BA-36 project budget for project-specific monitoring. However, a funding request was approved by the CWPPRA Task Force in 2011 for additional project-specific monitoring which will allow for more accurate determination of project success. There are no CRMS monitoring sites located within the project area, however, there are two CRMS sites (CRMS0261 and CRMS4218) located in the surrounding marsh (Figure 1). Data parameters collected at the CRMS stations will include surface water depth and salinity, soil porewater, sediment accretion, and emergent vegetation. Though these CRMS stations fall outside of the project boundaries, their proximity to the project areas will allow them to aid in evaluation.

The following monitoring strategies will provide information necessary to evaluate the BA-36 project goals:

- A. 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. Aerial photography will be captured using CRMS coast-wide flights, which are conducted every 3 years, in project years 10 and 20 (approximately 2020 and 2030). The photography will then be georectified using standard operating procedures described in Steyer et al. (1995, revised 2000), and land/water ratios will be determined. In addition, high resolution (1:6,000) aerial photography of the project area was acquired through the BA-27 project in the pre-construction period (2008). BA-36 monitoring funds will be used to analyze additional frames that were collected but not analyzed for the BA-27 project.
- B. Surveys - To monitor soil settlement within the project area, topographic surveys shall be performed at post-construction years 3, 5, and 20 (2013, 2015, and 2030). These surveys will occupy a subset of the as-built survey transects for consistency. Twelve settlement plates, which were placed in the marsh creation areas during construction, shall also be surveyed.

## 3. MONITORING BUDGET

The cost associated with the Monitoring of this project, as outlined in Section 2 of this plan for the 20 year project life is summarized in Attachment I.

#### 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 every three years. 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. Review the monitoring plan and budget annually to determine that the data being collected adequately evaluates the project.

B. USFWS will:

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

## REFERENCES

- Barras, J., Beville, S., Britsch, D., Hartley, S., Hawes, S., Johnston, J., Kemp, P., Kinler, Q., Martucci, A., Porthouse, J., Reed, D., Roy, K., Sapkota, S., and J. Suhayda 2003. Historical and projected coastal Louisiana land changes: 1978-2050: USGS Open File Report 03-334, 39 pp.
- Belhadjali, K. 2003. Ecological Review: Dedicated Dredging on the Barataria Basin Landbridge. Louisiana Department of Natural Resources. Baton Rouge, Louisiana, 11 pp.
- Chabreck, R. H., and G. Linscombe 1997. Vegetative type map of Louisiana coastal marshes. Louisiana Department of Wildlife and Fisheries. Baton Rouge, Louisiana.
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- Louisiana Department of Natural Resources 2001. Monitoring Plan: Project No. BA-27, Barataria Basin Landbridge Shoreline Protection Project (Phases 1, 2, and 3). Louisiana Department of Natural Resources. Baton Rouge, Louisiana, 10 pp.
- Roy, K. J. 2005. Environmental Assessment: Dedicated Dredging on the Barataria Basin Landbridge, BA-36. United States Fish and Wildlife Service. Lafayette, Louisiana, 28 pp, plus appendices.
- Steyer, G. D., R. C. Raynie, D. L. Steller, 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.

**ATTACHMENT I  
PROJECT BUDGET**

| Project Name: BA-36 Dedicated Dredging on the Barataria Basin Landbridge |          |      |              |        |        |          |        |          |          | Total Monitoring Budget: \$466,382 |        |        |          |          |          |         |         |         |         |         |         |         |         |           |          |                  |
|--|----------|------|--------------|--------|--------|----------|--------|----------|----------|------------------------------------|--------|--------|----------|----------|----------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|----------|------------------|
| Monitoring Items   | 2008     | 2009 | Construction | Year 1 | Year 2 | Year 3   | Year 4 | Year 5   | Year 6   | Year 7                             | Year 8 | Year 9 | Year 10  | Year 11  | Year 12  | Year 13 | Year 14 | Year 15 | Year 16 | Year 17 | Year 18 | Year 19 | Year 20 | Year 21   |          |                  |
|  |          |      | 2010         | 2011   | 2012   | 2013     | 2014   | 2015     | 2016     | 2017                               | 2018   | 2019   | 2020     | 2021     | 2022     | 2023    | 2024    | 2025    | 2026    | 2027    | 2028    | 2029    | 2030    | 2031      |          |                  |
| Topographic Survey   |          |      |              |        |        | \$73,398 |        | \$77,264 |          |                                    |        |        |          |          |          |         |         |         |         |         |         |         |         | \$113,550 |          |                  |
| Aerial Photo/Land:Water Reporting  | \$26,305 |      |              |        |        |          |        |          |          | \$10,915                           |        |        | \$50,384 |          | \$12,409 |         |         |         |         |         |         |         |         | \$63,951  | \$15,634 |                  |
| Reporting, Oversight & Admin   | \$0      | \$0  | \$0          | \$0    | \$0    | \$4,404  | \$0    | \$4,636  | \$0      | \$0                                | \$0    | \$0    | \$0      | \$0      | \$0      | \$0     | \$0     | \$0     | \$0     | \$0     | \$0     | \$0     | \$0     | \$6,813   | \$0      | \$0              |
| <b>Total, Monitoring</b>   | \$26,305 | \$0  | \$0          | \$0    | \$0    | \$77,802 | \$0    | \$81,900 | \$10,915 | \$0                                | \$0    | \$0    | \$50,384 | \$12,409 | \$0      | \$0     | \$0     | \$0     | \$0     | \$0     | \$0     | \$0     | \$0     | \$184,314 | \$15,634 | <b>\$459,663</b> |

