



Coastal Protection and
Restoration Authority of Louisiana

**State of Louisiana
Coastal Protection and Restoration
Authority**

2012 Annual Inspection Report

for

**LAKE CHAPEAU SEDIMENT INPUT
AND HYDROLOGIC RESTORATION
PROJECT**

State Project Number TE-26
Priority Project List 3

July 10, 2012
Terrebonne Parish

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I. Introduction

The Lake Chapeau Sediment Input and Hydrologic Restoration Project encompasses 13,549 acres of intermediate and brackish marsh and open water on Point au Fer Island, in the vicinity of Lake Chapeau, located approximately 30 miles south of Morgan City, Louisiana, in Terrebonne Parish. The project area is bounded by Four League Bay to the north, Atchafalaya Bay to the west, Locust Bayou and a network of canals to the south, and Wildcat Bayou and an oil field canal to the east (Project Features Map - Appendix A).

The Lake Chapeau Marsh Creation and Hydrologic Restoration (TE-26) project is a marsh creation and hydrologic restoration project consisting of the creation of approximately 168 acres of marsh using dredge material from the Atchafalaya Bay and construction of seven (7) rock weirs across various oil field canals within the project area. The project was designed to restore the marshes west of Lake Chapeau by re-establishing a hydrologic separation between Locust Bayou and the Alligator Bayou watersheds. This was partially accomplished by hydraulically dredging sediments from the Atchafalaya Bay and filling large open water areas on the interior island near Lake Chapeau. Another objective of the Lake Chapeau project was to restore the islands natural hydrologic flow patterns by constructing weirs, spoil bank gapping and maintenance dredging of natural bayous within the project area.

The Lake Chapeau Marsh Creation and Hydrologic Restoration (TE-26) project is co-sponsored by the National Marine Fisheries Service (NMFS) and the Coastal Protection and Restoration Authority (CPRA) of Louisiana. The 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. The Lake Chapeau Project was approved on the third (3rd) Priority Project List (LDNR O&M Plan, 2002).

The property associated with the Lake Chapeau Project is owned by the Terrebonne Parish School Board, Point au Fer LLC, and the Roman Catholic Church - Arch Diocese of New Orleans.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Lake Chapeau Sediment Input and Hydrologic Restoration (TE-26) project is to evaluate the constructed project features and identify any deficiencies, 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 report form, a detailed cost estimate for engineering, design, supervision, inspection, construction, and contingencies and an assessment of the urgency of such repairs (O&M Plan, 2002). The annual inspection report also contains a summary of past projects completed in the maintenance phase 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 undertaken since the completion of the Lake Chapeau Project are outlined in Section IV.

The annual inspection of the Lake Chapeau Sediment Input and Hydrologic Restoration Project (TE-26) took place on two separate days. The first trip was held on April 11, 2012 to inspect the weir sites located in the interior of the island (Site No. 1, 5, 6, 7, & 9) and the corridor closure along the east shoreline of the Atchafalaya Bay. In attendance were Brian Babin, Shane Triche, and Elaine Lear of CPRA. The second trip was held on May 3, 2012 to inspect Site No. 4 and observe the removal of Site No. 3, which had been degraded to below the water line since the last inspection. In attendance of the second trip were Adam Ledet and Shane Triche from CPRA, and Richard Hartman of NOAA.

The field inspection included a complete visual inspection of the hydrologic restoration features of the project. The interior marsh creation feature of the project was not inspected due to the remote location of the fill area and difficulty in accessing the area. The crest elevations of the rock weirs on the interior of the island were not measured because the timber barricade system in front of the structures prevented access to the rock weirs. Where available, staff gauge readings were used to determine water elevations at the time of the inspection. Photographs taken during the inspection are compiled in Appendix B.

III. History and Project Description

Marsh loss rates throughout Point au Fer Island between 1932 and 1974 peaked at 45 acres per year and occurred as a direct result of oil exploration activities (NMFS, n.d.). The rate of interior marsh loss has decreased since that time and is currently estimated to be approximately 20 acres per year (NMFS, n.d.). Shoreline erosion along Lake Chapeau was estimated to be approximately 3 ft/yr. between 1932 and 1983 (NMFS, n.d.). Oil and gas access canals cut into the interior of Point au Fer Island have deteriorated the hydrologic separation between the Locust Bayou and Alligator Bayou watersheds and dramatically altered the island's natural drainage pattern. Sheet flow and over bank flow were drastically reduced by artificial levees, which in turn impounded marsh and led to degradation due to soil water logging (NMFS, n.d.). Due to unnatural hydrologic patterns, the abundant sediment load generated by the Atchafalaya River circulating through the island's interior have not been effectively utilized. Some other causes of land loss in this area can be contributed to natural subsidence and natural shoreline erosion (NMFS, n.d.).

The Lake Chapeau Hydrologic Restoration and Marsh Creation Project (TE-26) project was designed to restore the marshes west of Lake Chapeau and partially re-establish a hydrologic separation (land bridge) between the Locust Bayou and Alligator Bayou watersheds by utilizing sediment input by means of dredging and fill operations and restoring the islands hydrology through the construction of plugs/weirs, spoil bank gapping, and maintenance dredging of a natural bayou (NMFS, n.d.).

The final design of the Lake Chapeau project consisted of three (3) components, with additional project features added to address problems encountered during and after construction:

1. To re-establish a land bridge between Locust Bayou and Alligator Bayou, the first component was to hydraulically dredge approximately 721,931 cubic yards of material from the Atchafalaya Bay and spread to an average of two (2) feet thick to create

approximately 168 acres of marsh between these two bayous (D. Burkholder, Final Report n.d.).

2. The second component of the project (hydrologic restoration) consisted of the construction of seven (7) rock weirs in manmade canals around the perimeter of Lake Chapeau and gapping existing spoil banks in one channel. The rock weirs and spoil bank gappings are designed to help restore the natural circulation and drainage pattern within the central portion of Point au Fer Island (D. Burkholder, Final Report n.d.). The principle project features of this component are:

- Site No. 1 – Rock weir – 150 linear feet (LF)
- Site No. 3 – Rock weir – 229 LF
- Site No. 4 – Rock weir – 174 LF
- Site No. 5 – Rock weir – 70 LF
- Site No. 6 – Rock weir – 145 LF
- Site No. 7 – Rock weir – 157 LF
- Site No. 9 – Rock weir – 240 LF

3. The third component of the project consisted of dredging a 6,700 foot long silted section of Locust Bayou to its original navigable depth. This was done to accommodate the increase flows resulting from the re-establishment of the island's natural drainage patterns. A total of 59,218 cubic yards of material was dredged and placed in 1.5 ft. high by 80 ft. wide spoil banks on both sides of the bayou. The spoil banks were gapped periodically so not to impede the flow of natural waterways and drainage (D. Burkholder, Final Report n.d.)

Engineering, Design and Construction Administration for the Lake Chapeau project was performed by Burk-Kleinpeter (BKI) of New Orleans, La. under contract to the Department of Natural Resources (LDNR). BKI utilized two subcontractors during the design phase of the project. T. Baker Smith, Inc. of Houma, La. performed the field surveys and Eustice Engineering Company, Inc. of Metairie, La. performed the geotechnical investigation of the weir sites. The sediment coring and geotechnical analysis of the borrow site in the Atchafalaya Bay were performed by C-K Associates, Inc. of Baton Rouge, La. and was completed through an indefinite delivery contract with NMFS. Landrights necessary for construction of the project were obtained by the LDNR and included servitude agreements with three (3) landowners: Point au Fer LLC/Archdiocese of New Orleans; Terrebonne Parish School Board; and the Louisiana Department of Wildlife and Fisheries. A letter of no objection was also obtained from the Louisiana State Lands Office for the dredging and placement of spoil material on state lands (D. Burkholder, Final Report n.d.).

Below is a timeline of significant events:

September 1995	Engineering design activities began.
September 1996	Preliminary design report and deliverables submitted by BKI
June 1997	Final Design Completed
April 1998	All landrights necessary to proceed with construction completed.

June 1998	Advertising for bids.
July 1998	Bids for construction opened.
September 1998	Notice to Proceed with construction issued to River Road Construction.
January 1999	Breach 3 repaired/ safety buoy installed (Change Order)
October 1999	Notice of Acceptance was issued by LDNR.

IV. Summary of Past Operation and Maintenance Projects

Below is a summary of maintenance projects completed since October 1999, the Notice of Acceptance date for the Lake Chapeau Sediment Input and Hydrologic Restoration Project (TE-26).

June 2000 – Repair of spoil bank breach by constructing a rock weir (breach site 3) and the repair and maintenance of five spoil bank areas by bucket dredging material in a canal located southwest of Lake Chapeau just west of plug Site No. 9. This work was performed by Johnny F. Smith Truck & Dragline Service, Inc. of Slidell, LA as part of the Point au Fer Project (TE-22) Phase III construction contract. Notice of Acceptance for this work was issued by LDNR in September 2000.

October 2004 – the first maintenance project on the Lake Chapeau project consisted of the removal and replacement of existing warning buoy system. The purpose of this project was to provide a more rigid barricade system at six (6) of the seven (7) weir sites for navigation safety and to prevent passage around the structure. The timber barricade system included timber piles driven every 20 ft across the existing channel with 4” diameter horizontal steel piping connecting the vertical timber piling. Each structure was marked with warning signs and reflective tape to allow visibility at night. The project was designed by Piciolla and Associates of Larose, La. and constructed by Dupre Brothers Construction Co., Inc. of Houma, La. The project was completed in October 2004 at a total cost of \$330,745.50 (Includes: Engineering, Design, Bidding, Construction Administration, Inspection and Construction)

September 2005 – the second maintenance project included a breach repair on the south side of Structure No.3. The purpose of the project was to extend the rock weir by 50 linear feet on the south side of the structure. Articulated concrete mats were also used on the south side to slow future shoreline erosion and potential breaching. This work was performed in conjunction with maintenance work on the Point au Fer Project (TE-22), which consisted of breach closures adjacent to the rock dikes along Mobil and Transco Canals and the extension of the bulkhead at Structure No. 8. This work was performed by Luhr Bros., Inc. with construction oversight services provided by Picciolla and Associates, Inc. of Larose.

May 2011 – The third maintenance project involved the demolition of the rock weir at Site No. 3. Due to the high rate of erosion along the shoreline in the area of Site No. 3, a large breach formed around the north end of the rock dike. The breach made the structure ineffective to the project goals and no longer feasible to maintain, in addition to becoming a navigational hazard. The purpose of this maintenance project was to degrade the structure to an elevation of -8.0 NAVD88 to remove any navigational hazard the weir may pose to boat

traffic in the area. The work was performed by Great Southern Dredging, Inc. with construction oversight provided by Royal Engineers and Consultants, LLC. The project was completed in May 2011 at a total cost of \$188,872.72 (including construction, engineering & design, surveys, and administration costs).

Other Non-Maintenance Projects constructed within the Lake Chapeau project area

November 2007 – Dedicated Dredge Program – Point au Fer Island

The Department of Natural Resources Dedicated Dredge Program was initiated in FY 98/99 and is funded 100% by the State of Louisiana through its statutorily dedicated Wetlands Conservation and Restoration Fund. The goal of this program is to use a small, mobile hydraulic dredge to move sediment from small inland waterways within the coastal zone of Louisiana and deposit the material to nourish and/or rebuild the threatened coastal marsh that are located immediately adjacent to those waterways.

The Point au Fer Island Dedicated Dredge Project is located on Point au Fer Island between the Atchafalaya Bay and Lake Chapeau in Terrebonne Parish. The project consisted of dredging approximately 295,000 cubic yards to fill a 60 acre site adjacent to the original Lake Chapeau dredge site and the linear corridor connecting the proposed fill area to the Atchafalaya Bay. Below is the construction cost estimate involved with the Point au Fer Island Dedicated Dredge Project:

Construction Cost:	\$2,461,650
Construction Administration:	<u>\$ 107,000</u>
Total:	\$2,568,650

V. Inspection Results

Site No. 1 – Rock Weir

A close inspection of Site No. 1 was not possible due to access constraints. There is a floating gate approximately 500' southwest of the rock weir, preventing access to the canal. Using the camera to zoom in from a distance, it appears the structure is in good overall condition. There are no signs of breaching or erosion around the embankment tie-ins. Also, the timber barricade and warning signs show no signs of damage. Two (2) timber piles were identified in the 2009 Annual Inspection to be missing their protective galvanized cap. Due to the floating gate, we were unable to get close enough to the structure to determine if these timber piles have experienced any deterioration due to weathering. The latest elevation data available from the 2004 survey profile of the structure indicates that the crest of the rock weir has settled approximately 1.39' since 1999. (See Appendix B, Photos # 1-2)

Site No. 3 – Rock Weir with Boat Bay

With erosion rates in the area exceeding 60 ft/year, this structure which was constructed in the canal leading from Fourleague Bay to Lake Chapeau is no longer tied into the canal. The shoreline has eroded so that the structure is in open water, making it no longer effective to the project goals or feasible to maintain, in addition to becoming a danger to boat traffic. In May 2011 this rock weir was degraded to an elevation of -8.0' NAVD88 to remove any navigation

hazard the remaining weir may pose. Now that the weir has been degraded and no longer visible above the water line, it will not be included in further annual inspections. (See Appendix B, Photos # 25-26)

Site No. 4 – Rock Weir

The rock weir appeared to be in good condition with no breaching around the ends. As in previous inspections, we found that the existing marsh connecting the structure to land on the south side of the weir was thin. However it didn't seem that there was any significant erosion since the last inspection. The timber barricade system appears to be in good condition. As previously reported, the two (2) center pilings are slightly unstable thought to be due to inadequate embedment and poor soil conditions. Also, a 10' section of pipe was cut by vandals on the northwest side of the structure. We do not believe the instability or cut section will have a detrimental effect to the structure, therefore there will be no recommendations for repair at this time, but will continue to monitor the situation on future inspections. (See Appendix B, Photos # 21-24)

Site No. 5 – Rock Weir

Site No.5 rock weir is in good overall condition. The embankment tie-ins showed no signs of marsh erosion or breaching. The barricade system and timber piles show no sign of damage or corrosion. The warning signs and supports are also in good condition. The latest elevation data from the 2004 survey profile of Structure No.5 indicates that the structure has settled on average of 0.14' from the designed elevation. (See Appendix B, Photos # 17-20)

Site No. 6 – Rock Weir

It was discovered during the 2008 Annual Inspection that the timber barricade system in front of the structure had been vandalized. Large sections (approximately 10 feet) on both of the steel pipe cross members had been cut with a torch and are missing. It remains our opinion that an attempt to repair the damage would be unsuccessful; therefore there are no recommendations for corrective actions at this time. Other than the cut sections, the barricade system is in good condition with no signs of damage. The rock weir appeared to be in good overall condition with no signs of erosion or breaching around the embankment tie-ins. The warning signs and supports are also in very good condition. The timber barricade system is in good overall condition with some minor rust and corrosion on the timber pile caps. From the 2004 profile survey of the structure, it was determined that the rock weir had settled an average of approximately 1.1 ft. (See Appendix B, Photos # 14-16)

Site No. 7 – Rock Weir

The Site No. 7 rock weir is in good overall condition. There are no visual signs of breaching or erosion around the embankment tie-ins. The timber barricade is in good condition with slight corrosion on the timber pile caps. The warning signs and their supports have no apparent damage and appear to be in good condition also. Based on a survey profile of the rock weir in 2004, the structure has settled approximately 1.7' from its designed elevation. (See Appendix B, Photos # 8-12)

Site No. 9 – Rock Weir

The Site No.9 rock weir was in good overall condition. There are no visual signs of erosion or breaching around the embankment tie-ins. A few of the galvanized pile caps are missing and

several have visual corrosion and rust. The rest of the timber barricade system shows no sign of corrosion or deterioration due to weathering. The warning signs and supports have no apparent damage and appear to be in good condition. Based on a survey profile of the rock weir in 2004, the structure has settled approximately 1.7' from its designed elevation. There is a small breach in the south canal bank near Site No.9 (located at point N29° 17m 4.4s W91° 17m 1.7s). Due to the location and the size of the breach, it not believed to be detrimental to the structure and that the rock weir is operating as designed. At this time there are no recommendations for corrective actions, but this site will continue to be monitored during future inspections to determine if the breach enlarges and requires maintenance. (See Appendix B, Photos # 3-7)

VI. Conclusions and Recommendations

The structural components of the sites in the interior of the island (Site No. 1, 5, 6, 7 & 9) appear to be in overall good condition. The rock weirs look to be in good condition with no indication of settlement, displacement, or erosion around the structures. The timber barricades and warning signs were also in good condition, except for the two sections of pipe that were missing from Site No.6.

Site No.4 rock weir appears to be in overall good condition. By comparing the current and past assessments, there seems to be no noticeable erosion along the shoreline. Based on the current short-term shoreline erosion rates, there is a chance Site No.4 will remain intact for the remainder of the project life, barring any extreme storm events. Based on these observations there are no recommendations for corrective actions at this time, but we will continue to monitor the condition of the marsh surrounding Site No.4 to determine the extent of the shoreline degradation.

At the time of the 2012 annual inspection, the degrading of the Site No. 3 rock weir was complete. The structure was deemed ineffective due to the extreme erosion around the north end of the rock weir. It was decided to the best course of action was to degrade the weir to a - 8.0' NAVD88 so that it is no longer a navigational hazard. Since the degrading has been completed, Site No. 3 will no longer be monitored or maintained as part of project TE-26.

References:

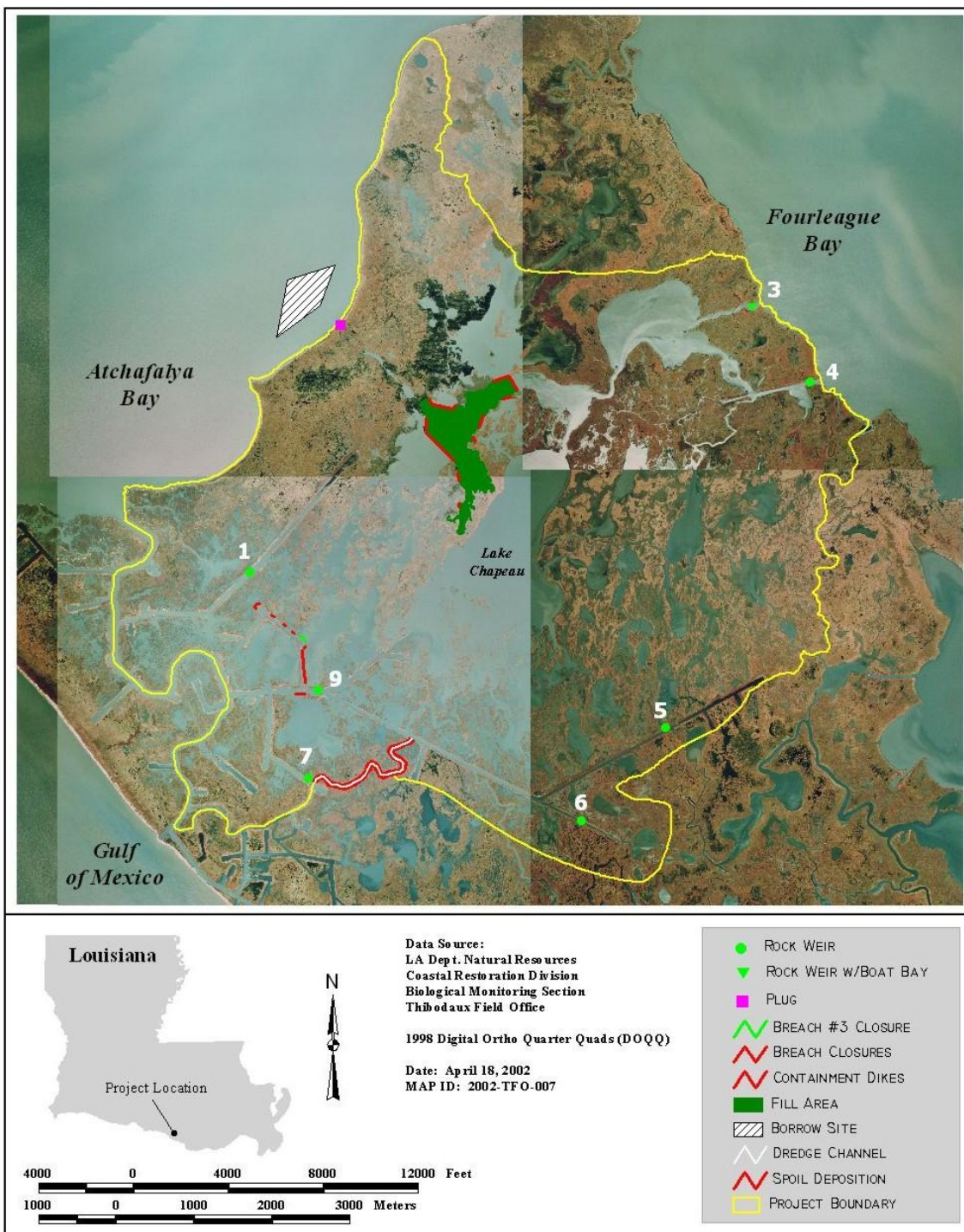
D. Burkholder, n.d., Final Report, the Louisiana Department of Natural Resources, Baton Rouge, Louisiana.

Lear, E., T. Folse, and B. Babin. 2007. *2007 Operations, Maintenance, and Monitoring Report for Lake Chapeau Sediment Input and Hydrologic Restoration, Point Au Fer Island (TE-26), Louisiana Department of Natural Resources, Coastal Restoration Division and Coastal Engineering Division, Thibodaux, Louisiana. 48 pp. plus appendices.*

National Marine Fisheries n.d., Coastal Wetlands Planning, Protection, and Restoration Act: Proposed Project Information Sheet. 9 pp.

Appendix A

Project Features Map



Appendix B

Photographs



Photo #1: View of Site No. 1 from afar, access blocked by floating barrels, looking northeast



Photo #2: View of Site No. 1 from afar, access blocked by floating barrels, looking northeast



Photo #3: View of barricade and embankment tie-ins on north side of Site No. 9, looking northeast



Photo #4: View of barricade and embankment tie-ins on south side of Site No. 9, looking southeast



Photo #5: Overall view of warning signs and barricades of Site No. 9, looking east



Photo #6: Visible corrosion of galvanized end caps on the timber barricade supports in Site No. 9



Photo #7: Visible corrosion of galvanized end caps on the timber barricade supports in Site No. 9



Photo #8: Overall view of warning signs and barricade system of Site No. 7, looking southeast



Photo #9: View of barricade and embankment tie-in on northeast end of Site No. 7, looking east



Photo #10: View of barricade and embankment tie-in on southwest end of Site No. 7, looking south



Photo #11: View of warning signs and barricade system of Site No. 7, looking southeast



Photo #12: View of barricade and embankment tie-in on northeast end of Site No. 7, looking east

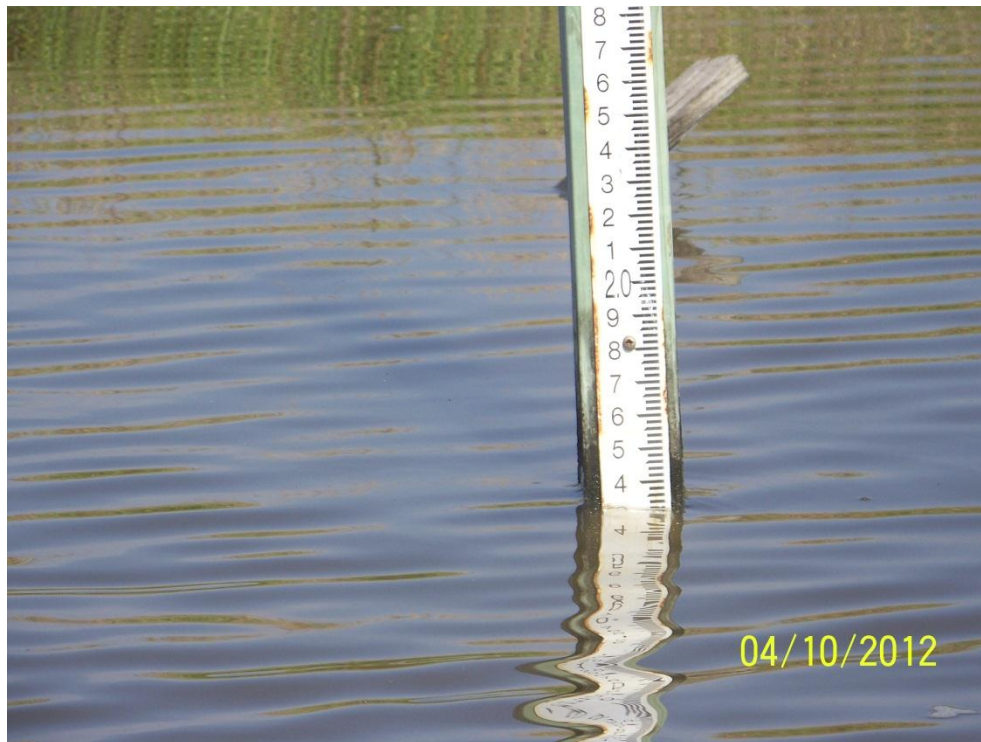


Photo #13: View of Staff Gage TE-26-05 reading +1.35' NAVD during the annual inspection



Photo #14: Overall view of barricades and warning signs of Site No. 6, looking southeast



Photo #15: View of the embankment tie-in on the south side of Site No. 6, looking south



Photo #16: View of the embankment tie-in on the north side of Site No. 6, looking northeast



Photo #17: Overall view of Site No. 5, looking southeast



Photo #18: View of barricade and warning signs of Site No. 5, looking south



Photo #19: View of embankment tie-in on the west side of Site No. 5, looking southwest



Photo #20: View of embankment tie-in on the east side of Site No. 5, looking southeast



Photo #21: View of the barricade system and embankment tie-in on the south side of Site No. 4



Photo #22: Close up view of the embankment tie-in on the south side of Site No. 4, looking west



Photo # 23: View of retreating shoreline on south side of Site No. 4, looking west



Photo #24: View of missing section on interior barricade system of Site No. 4, looking west.



Photo #25: The degraded structure of Site No. 3 no longer visible, looking west



Photo #26: The degraded structure of Site No. 3 no longer visible, looking west

Appendix C

Three Year Budget Projection

**Lake Chapeau Marsh Creation/ Hydrologic Restoraion/ TE-26 / PPL 3
Three-Year Operations & Maintenance Budgets 07/01/2012 - 06/30/15**

<u>Project Manager</u>	<u>O & M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
Brian Babin	Shane Triche	NMFS	Brian Babin

	2012/2013	2013/2014	2014/2015
Maintenance Inspection	\$ 6,456.00	\$ 6,649.00	\$ 6,848.00
Structure Operation			
OCPR Administration			
Federal S&A	\$2,319.00	\$ 2,389.00	\$ 2,461.00

Maintenance/Rehabilitation

11/12 Description: Annual Inspection

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

12/13 Description: Annual Inspection

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

13/14 Description: Annual Inspection

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

	2011/2012	2012/2013	2013/2014
Annual O&M Budgets	\$ 8,775.00	\$ 9,038.00	\$ 9,309.00

O & M Budget (3 yr Total)	\$ 27,122.00
Unexpended O & M Funds	\$ 1,026,037.00
Remaining O & M Budget (Projected)	\$ 998,915.00

OPERATIONS & MAINTENANCE BUDGET WORKSHEET

Project: TE-26 Lake Chapeau Marsh Creation and Hydrologic Restoration

FY 12/13 –

Administration	\$ 2,319
O&M Inspection & Report	\$ 6,456
Operation:	\$ 0
Maintenance:	\$ 0

Operation and Maintenance Assumptions:

2011/2012 Annual Inspection and Report

NMFS administration: \$2,251 from Beast Report.

FY 13/14 –

Administration	\$ 2,389
O&M Inspection & Report	\$ 6,649
Operation:	\$ 0
Maintenance:	\$ 0

Operation and Maintenance Assumptions:

2012/2013 Annual Inspection and Report

NMFS Administration: \$2,319 from Beast Report

FY 14/15 –

Administration	\$ 2,461
O&M Inspection & Report	\$ 6,848
Operation:	\$ 0
Maintenance:	\$ 0

Operations and Maintenance Assumptions:

2013/2014 Annual Inspection and Report

NMFS Administration: \$2,389 from Beast Report

O&M Accounting:

Unexpended funds from Lana Report:	\$ 1,341,289.85
FY12 Expenditures by LDNR (Not Reimbursed)	<u>\$ 315,252.85</u>
Estimated Unexpended Funds:	\$ 1,026,037.00