



**Coastal Protection and Restoration
Authority of Louisiana**

**Office of Coastal Protection and
Restoration**

**2007/2008 Annual Inspection
Report**

for

**CAMERON/CREOLE
WATERSHED HYDROLOGIC
RESTORATION PROJECT
(CS-17)**

State Project Number CS-17
Priority Project List 1

December 12, 2007
Cameron Parish

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I. Introduction

The Cameron Creole Watershed Hydrologic Restoration Project (C/S-17) is located in the Cameron Creole Watershed area in Cameron Parish. The project consists of two sheet pile plugs in the lakeshore borrow canal on the east side of Calcasieu Lake. The objective of the Cameron/Creole Watershed project is to reduce the salt water intrusion and ponding within the Cameron Creole Watershed area with an estimated 850 acres of marsh protection (See Appendix A).

The Cameron/Creole Watershed 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 first Priority Project List. The Cameron/Creole Project has a twenty –year (20 year) economic life, which began in February 1997.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Cameron/Creole Watershed Project (CS-17) 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, LDNR 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 (O&M Plan, 2002). 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 Cameron/Creole Project are outlined in Section IV.

An inspection of the Cameron/Creole Watershed Project (CS-17) was held on December 12, 2007 under partly cloudy skies and mild temperatures. In attendance were Dewey Billodeau and Herb Juneau from LDNR, and Jim Ashfield with USFWS. All parties met at the Big Pasture boat launch in Cameron Parish, LA. The annual inspection began at approximately 11:00 a.m. at the Grand Bayou structure.

The field inspection included a complete visual inspection of the entire project site. Staff gauge readings and existing temporary benchmarks where available were used to determine approximate elevations of water, steel bulkhead structures and other project features. 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

The Cameron-Creole Watershed consists of 64,000 acres (25,900 ha) of brackish, intermediate, and fresh marsh located in the Calcasieu/Sabine Basin in Cameron Parish, Louisiana (figure 1). This area is part of the Sabine National Wildlife Refuge. Since the original 30 ft (9.15 m) deep dredging of the Calcasieu Ship Channel in the 1940's, salt water intrusion from the Gulf of Mexico into the interior marshes via Calcasieu Lake has caused high rates of marsh loss. As a result, approximately 63,000 acres (25,496 ha) of brackish, intermediate, and fresh marsh on the east side of Calcasieu Lake were lost between 1950 and 1970, and replaced by brackish and saline marsh (Delany 1991). In 1989, a levee and five (5) water control structures (three variable-crest and two fixed crest) with vertical slots were constructed by the United States Fish and Wildlife Service (USFWS) and the Soil Conservation Service (SCS) along the east shore of Calcasieu Lake to reduce the movement of salt water into the watershed. A borrow canal was also constructed along the wetland side of the levee. Management of the five water control structures is controlled by the USFWS and is designed to retard the introduction of saltwater into the Cameron-Creole Watershed.

The five water control structures along Calcasieu Lake are scheduled for operation in two phases. Phase I emphasizes curtailing marsh erosion and reclaiming emergent marsh by implementing a partial drawdown of 0.5 ft (0.15 m) below marsh elevation from February 15-July 15. At least one of the vertical slots in each structure remains open during this time. Phase II, or the maintenance phase, primarily emphasizes curtailing marsh erosion with secondary emphasis on improving fisheries habitat, maintaining and improving wildlife habitat, and increasing species diversity in emergent marsh plants. The crests of all structures are set at 0.5 ft (0.15 m) below marsh level with all slots and the boat bay at Grand Bayou open. Temporary closures of the boat bay and slots are dependent on maintaining salinities below the 5 ppt limit at the east end of East Prong.

Changes in the water movement patterns on the Cameron-Creole Watershed since the water control structures were installed and the management plan was implemented in 1989 have not occurred as anticipated. Saline water continues to move through the structures, and through the borrow canal, resulting in excessive pooling of saline water in the southern end of the watershed (Delany 1991). In the northern project area, water moves rapidly in a counter-clockwise circulation pattern through the Peconi (Bois Connine) Bayou system.

The Cameron-Creole Watershed Borrow Canal Plug project (C/S-17) installed two sheet pile plugs in the lakeshore borrow canal, one south of Grand Bayou and one south of Mangrove Bayou (figure 2) to isolate management areas and improve hydrologic control. The two C/S-17 plugs require no operations, and will remain at their as-built elevations. The plug south of Mangrove Bayou, set at 1.5 ft (0.46 m) National Geodetic Vertical Datum (NGVD), will affect 2,500 acres (1,012 ha) in the northern project area. The vegetated marsh in this area is composed of *Spartina patens* (marshhay cordgrass), *Scirpus americanus* (Olney's three-cornered grass), *Paspalum vaginatum* (joint grass), *Typha* spp. (cattail), and *Phragmites australis* (roseau cane). Soils over the majority of the northern project area are comprised of

Bancker and Clovelly soil types, except in the northern project area, where a small percentage of Gentilly Muck is present (USDA 1995).

The plug south of Mangrove Bayou will also affect 1,750 acres (708 ha) of broken marsh and shallow open water ponds from 0.5 ft to 2 ft (0.15-0.61 m) deep vegetated by *Ruppia maritima* (widgeon grass), *Myriophyllum spicatum* (Eurasian watermilfoil), and *Ceratophyllum demersum* (coontail). The broken emergent marsh, composed of *S. patens*, is subject to shoreline erosion caused by wind driven wave action across long fetches of open water.

The plug south of Grand Bayou, set at 1.0 ft (0.3 m) NGVD, will allow separate operation of the Grand Bayou and Lambert Bayou structures, affecting 8,000 acres (3,238 ha) of brackish marsh in the southern project area. The vegetated marsh in this area is composed of *S. patens*, *Distichlis spicata* (saltgrass), and *Spartina alterniflora* (smooth cordgrass).

Construction was completed on February 1, 1997. The project objectives are to enhance and improve marsh condition in the northern, southern, and eastern project areas, and to improve present structural management capabilities. The specific project goals are to reduce duration of flooding in the southern project area, reduce water flow in the borrow canal in the northern project area, increase coverage of emergent marsh plants in both the northern and southern project areas, and to increase the relative frequency of occurrence of SAV in the eastern project area.

The principal project features include:

- Structure #1/Mangrove Bayou Structure – interlocking sheetpile plug with boat bay
- Structure #2/Grand Bayou Structure - interlocking sheetpile plug with boat bay

IV. Summary of Past Operation and Maintenance Projects

General Maintenance: Below is a summary of completed maintenance projects and operation tasks performed since February 1997, the construction completion date of the Cameron Creole Watershed Project (CS-17).

2005 – Cameron Creole Maintenance Project – LDNR: (M & M Electric) This maintenance project included the removal and replacement of existing handrails with hot dipped galvanized handrails, and installation of a boat guide in the existing boat bay. Construction was completed in May 2006. The cost associated with the engineering, design and construction of the Cameron Creole Watershed Maintenance Project is as follows:

Construction:	\$ 67,777.00
Engineering & Design:	\$ 4,292.40
Construction Administration:	\$ 3,000.00
Construction Oversight/As built:	<u>\$ 2,841.17</u>
Project Total:	\$ 77,910.57

Structure Operations: There are no active operations associated with this project.

V. Inspection Results

Structure #2—Grand Bayou structure

The structure is in fair condition since the maintenance repair project in 2005; however there is bank erosion on both ends of the sheet pile wall which will need to be addressed with rock rip rap. Water is beginning to circumvent the structure on the east side. This bank should be hardened with rip rap. The structure has been vandalized. Two (2) sections of 8"x12" Seatimber Composite Marine Timber have been removed from the boat guide and need to be replaced along with the stainless steel Hardware. (Photos: Appendix B, Photos 1 & 2).

Structure #1—Mangrove Bayou structure

This structure is also in fair condition. There is bank erosion on both ends of the sheet pile wall which will need to be addressed with rock rip rap. Water is beginning to circumvent the structure on the east side. This bank should be hardened with rip rap. (Photos: Appendix B, Photos 3 & 4).

VI. Conclusions and Recommendations

Overall, the structures of the Cameron-Creole Watershed Project are still in fair condition however some maintenance is required as listed below. Plans and specifications are being prepared by Acadian Engineers & Environmental Consultants Inc. to address these 2007 conditions.

- Grand Bayou structure – repair bank erosion with rock rip rap on both ends of the structure and harden the bank on the east side of the structure. Replace the boat guide marine timbers.
- Mangrove Bayou structure – repair bank erosion with rock rip rap on both ends of the structure, harden the bank on the east side of the structure and replace the boat guide marine timber.

Appendix A
Project Features Map



Appendix B

Photographs



Photo 1, Grand Bayou Structure



Photo 2, Erosion at east end Grand Bayou Structure



Photo 3, Erosion at West End Of Mangrove Plug



Photo 4, Erosion at East End Of Mangrove Plug

Appendix C

Three Year Budget Projection

CAMERON-CREOLE/ CS-17/ PPL 1
Three-Year Operations & Maintenance Budgets 07/01/2008 - 06/30/2011

<u>Project Manager</u> Pat Landry	<u>O & M Manager</u> Dewey Billodeau	<u>Federal Sponsor</u> USFWS	<u>Prepared By</u> Dewey Billodeau
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	2008/2009	2009/2010	2010/2011
Maintenance Inspection	\$ 5,570.00	\$ 5,737.00	\$ 5,909.00
Structure Operation			
Administration	\$ 5,404.00	\$ 2,431.00	\$ 2,458.00

Maintenance/Rehabilitation

08/09 Description: Repair bank erosion at Mangrove and Grand Bayou, replace composite marine timber.
 Construction cost estimate includes 20 % contingency.

E&D	\$ 20,620.00
Construction	\$ 163,560.00
Construction Oversight	\$ 20,000.00
<i>Sub Total - Maint. And Rehab.</i>	<u>\$ 204,180.00</u>

09/10 Description

E&D	\$ -
Construction	\$ -
Construction Oversight	\$ -
<i>Sub Total - Maint. And Rehab.</i>	<u>\$ -</u>

10/11 Description:

E&D	\$ -
Construction	\$ -
Construction Oversight	\$ -
<i>Sub Total - Maint. And Rehab.</i>	<u>\$ -</u>

	2008/2009	2009/2010	2010/2011
<u>Total O&M Budgets</u>	\$ 215,154.00	\$ 8,168.00	\$ 8,367.00

<u>O & M Budget (3 yr Total)</u>	<u>\$ 231,689.00</u>
<u>Unexpended O & M Budget</u>	<u>\$ 136,309.00</u>
<u>Remaining O & M Budget (Projected)</u>	<u>\$ (95,380.00)</u>

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OPERATION AND MAINTENANCE BUDGET WORKSHEET
CAMERON-CREOLE / PROJECT NO. CS-17 / PPL NO. 1

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$5,570.00	\$5,570.00
General Structure Maintenance	LUMP	1	\$0.00	\$0.00
Engineering and Design	LUMP	1	\$20,620.00	\$20,620.00
Operations Contract	LUMP	1	\$0.00	\$0.00
Construction Oversight	LUMP	1	\$20,000.00	\$20,000.00

ADMINISTRATION

LDNR / CRD Admin.	LUMP	1	\$2,984.00	\$2,984.00
FEDERAL SPONSOR Admin.	LUMP	1	\$2,420.00	\$2,420.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
TOTAL ADMINISTRATION COSTS:				\$5,404.00

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:					
Repair bank erosion at Grand Bayou & Mangrove structures, replace composite marine timber at Mangrove boat guide.					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
Bank Paving (30 #) Mangrove	0	0.0	366	\$150.00	\$54,900.00
Bank Paving (30 #) Grand Bayou	0	0.0	378	\$100.00	\$37,800.00
	0	0.0	0	\$0.00	\$0.00
Filter Cloth / Geogrid Fabric	SQ YD	1,300		\$7.00	\$9,100.00
Navigation Aid	EACH			\$0.00	\$0.00
Signage	EACH			\$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	1		\$0.00	\$0.00
Materials	LUMP	1		\$0.00	\$0.00
Mob / Demob	LUMP	1		\$22,000.00	\$22,000.00
Contingency (20%)	LUMP	1		\$27,260.00	\$27,260.00
General Structure Maintenance	LUMP	2		\$6,250.00	\$12,500.00
OTHER				\$0.00	\$0.00
OTHER				\$0.00	\$0.00
OTHER				\$0.00	\$0.00
TOTAL CONSTRUCTION COSTS:					\$163,560.00

TOTAL OPERATIONS AND MAINTENANCE BUDGET: \$215,154.00

Appendix D

Field Inspection Form

Annual Inspection Report
 CAMERON/CREOLE WATERSHED
 State Project No. CS-17

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-17 Cameron Creole

Date of Inspection: December 12, 2007 Time: 11:00 am

Structure No. 2

Inspector(s): Herb Juneau & Dewey Billodeau (LDNR)
 James Ashfield (USFWS)

Structure Description: Fixed crest weir at Grand Bayou

Water Level 1.1' NAVD88

Type of Inspection: Annual

Weater Conditions: Partly cloudy and mild

Item	Condition	Pysical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	Fair			1	
Steel Grating	N/A				
Stop Logs	N/A				
Hardware	Fair				
Timber Piles	Good				
Timber Wales	N/A				
Galv. Pile Caps	Fair				
Cables	N/A				
Signage /Supports	Good			1	
Rip Rap (fill)	N/A				
Eathern Embankment	Poor			2	Erosion occuring on both ends of the sheet pile wall.

What are the conditions of the existing levees?
 Are there any noticable breaches?
 Settlement of rock plugs and rock weirs?
 Position of stoplogs at the time of the inspection?
 Are there any signs of vandalism?

Fair
 In the marsh east of the structure
 None
 N/A
 Removal of boat bay guide

Annual Inspection Report
 CAMERON/CREOLE WATERSHED
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MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-17 Cameron Creole

Date of Inspection: December 12, 2007

Time: 11:30 am

Structure No. 1

Inspector(s): Herb Juneau & Dewey Billodeau (LDNR)
 James Ashfield (USFWS)

Structure Description: Fixed crest weir at Mangrove Bayou

Water Level 0.9' NAVD88

Type of Inspection: Annual

Weather Conditions: partly cloudy and mild

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	Fair			3	
Steel Grating	N/A				
Stop Logs	N/A				
Hardware	Fair				
Timber Piles	N/A				
Timber Wales	N/A				
Galv. Pile Caps	Fair				
Cables	N/A				
Signage / Supports	Good			3	
Rip Rap (fill)	N/A				
Eathern Embankment	Poor			4	Erosion occuring at both ends of sheetpile wall.

What are the conditions of the existing levees?
 Are there any noticable breaches?
 Settlement of rock plugs and rock weirs?
 Position of stoplogs at the time of the inspection?
 Are there any signs of vandalism?

Fair
 In the marsh east of the structure
 None
 N/A
 None

Appendix E

Locations to be Monitored