



**State of Louisiana**

**Coastal Protection and Restoration Authority  
of Louisiana**

**Office of Coastal Protection and Restoration**

## **2011 Operations, Maintenance, and Monitoring Closeout Report.**

for

### **SWEET LAKE/WILLOW LAKE HYDROLOGIC RESTORATION**

State Project Number CS-11B  
Priority Project List 5

June 2011  
Cameron Parish

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2011 Operations, Maintenance, and Monitoring Closeout Report  
For  
Sweet Lake/Willow Lake Hydrologic Restoration (CS-11b)

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## I. Introduction

The Sweet Lake/Willow Lake shoreline protection project is composed of approximately 6,000 ac (2,428 ha) of open water and freshwater wetlands surrounding Sweet Lake and Willow Lake in northeastern Cameron Parish (figure 1). The project area is bounded on the south and west by the Gulf Intracoastal Waterway (GIWW), and on the north and east by Pleistocene prairie formations along La. Hwy. 384 and La. Hwy. 27.

The three soil types occurring in the project area are Allemands muck, Aquents, and Udifluvents (U.S. Department of Agriculture, Soil Conservation Service [USDA/SCS] 1995; USDA/Natural Resources Conservation Service [USDA/NRCS] 1997). Allemands muck is a very poorly drained organic soil found in freshwater marshes, making up 90% of the project area. The remaining 10% consists of frequently flooded Aquents Series and Udifluvents Series soils that comprise the dredged spoil along GIWW.

The plant community in the project area is fresh marsh is dominated by *Sagittaria lancifolia* (bulltongue), with lesser amounts of *Panicum hemitomon* (maiden cane), *Schoenoplectus californicus* (California bullwhip), *Spartina patens* (marshay cordgrass), *Typha* sp. (cattail), *Phragmites australis* (common reed), *Colocasia esculenta* (elephant ear), and *Alternanthera philoxeroides* (alligator weed). A canopy layer of *Sesbania drummondii* (rattlebox), *Salix nigra* (black willow), *Sapium sebiferum* (Chinese tallow tree), and *Cephalanthus occidentalis* (buttonbush) is present on higher ground and on the remains of ridges formed by old levees and spoil banks in the area. Shallow open water areas support a number of aquatic plants, with stands of *Nelumbo lutea* (American lotus) and *Potamogeton diversifolius* (common pondweed) dominant. *Eichhornia crassipes* (water hyacinth) is also prevalent, with large floating mats often developing in open water areas by the summer.

When the GIWW was constructed in the early 1900's, its route lay just south of the southern shorelines of both lakes, but the high energy associated with the navigation channel has and continues to impact the lakes and surrounding marshes. Erosion of the banks of the GIWW has occurred, caused by the water level drawdown effect and wave wash from the wakes created by passing boats and barges (Good et al. 1995), along with the widening and deepening of the channel from its original dimensions of 40 ft (12.2 m) wide x 5 ft (1.5 m) deep to 125 ft (38 m) wide x 12 ft (3.7 m) deep in the 1940's (United States Army Corps of Engineers [USACE] 1978). This erosion has resulted in the breaching of the narrow strip of marsh and spoil bank between the canal and the southern shoreline of both lakes.

These hydrologic connections have led to increased mechanical erosion of the lake shorelines and the surrounding organic marsh soils, followed by the suspension and transport of organic and mineral sediments from the lakes and surrounding marshes into the deeper water of the GIWW channel, resulting in a significant loss of fresh marsh in the project area. Such "blowouts," where direct connections between a channel and inland water body form, expose fragile organic marsh soils to high energy and increased erosion, are a common problem along navigation channels in coastal Louisiana (Good et al. 1995).

Land loss studies by Britsch (1994) indicate that in 1956, approximately 19 percent of the project area was classified as open water, and 61 percent was classified as fresh emergent

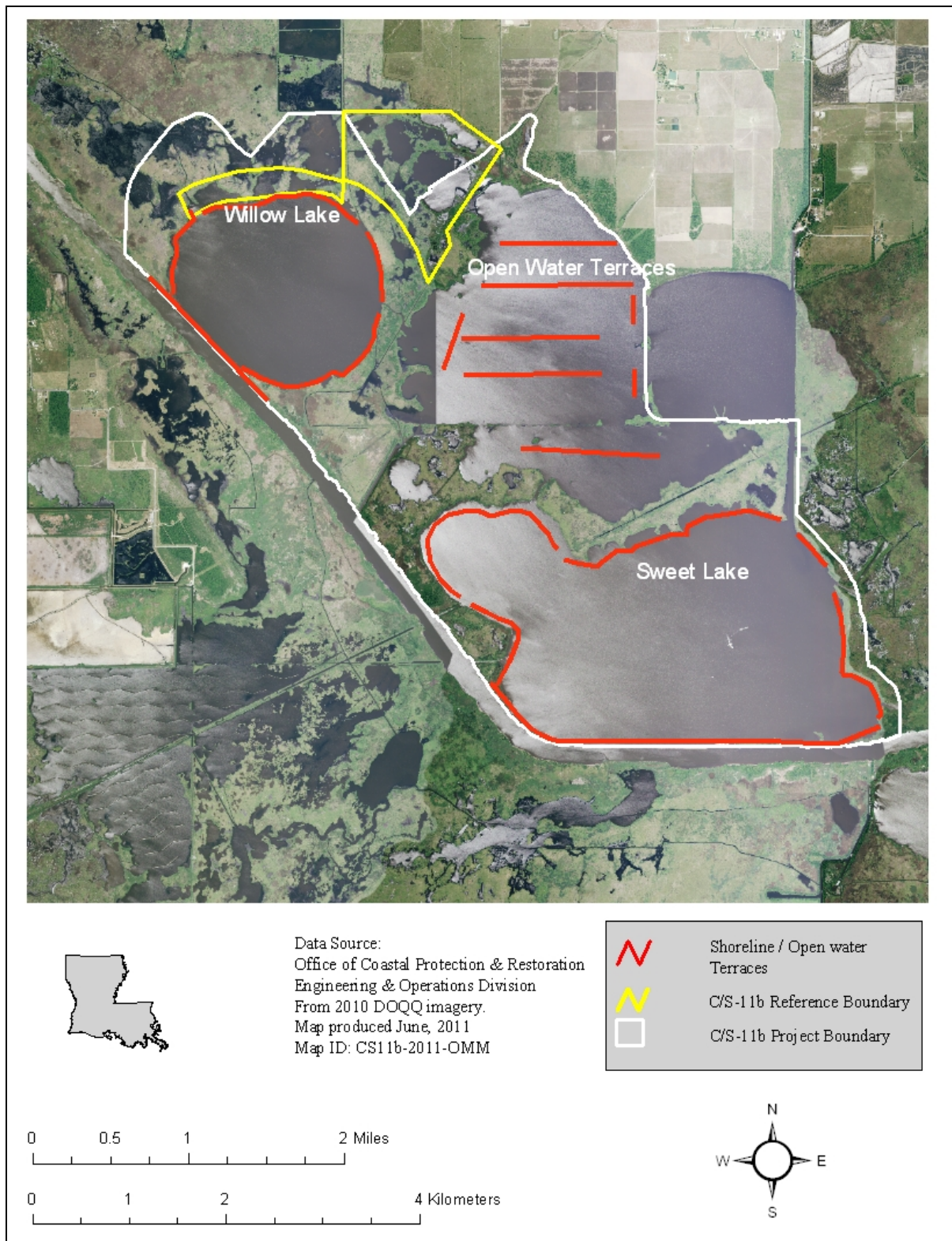


marsh. By 1993, approximately 74 percent of the project area was classified as open water, and only 26 percent as fresh emergent marsh, most of which was deteriorated and converting to open water (Britsch 1994).

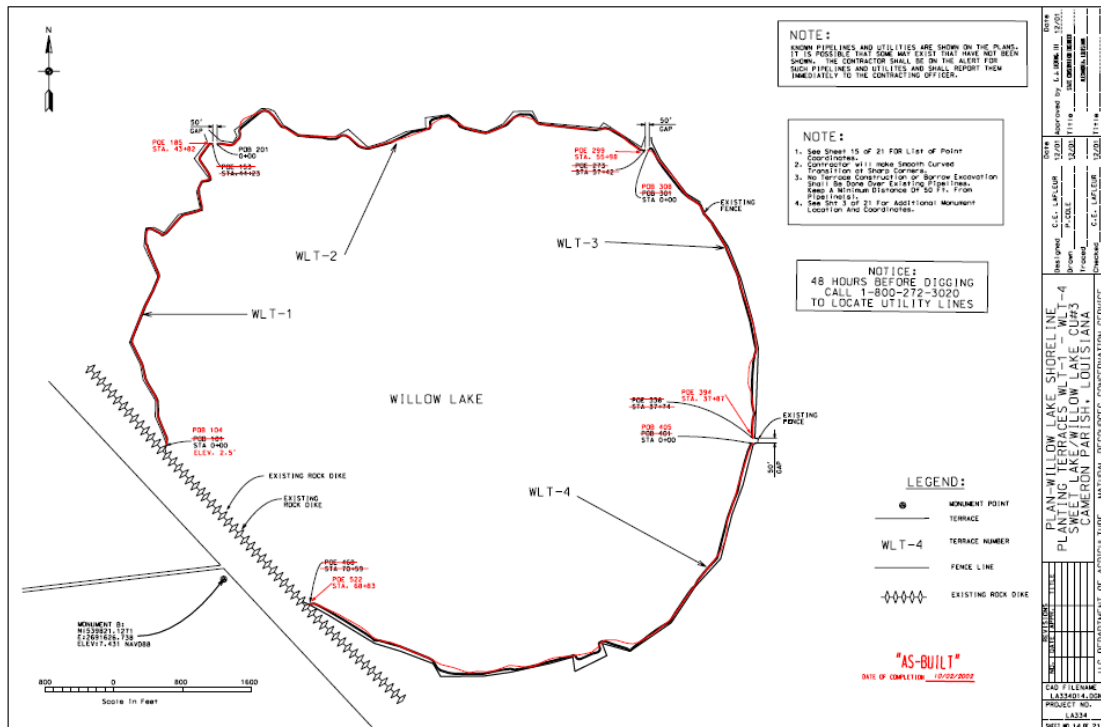
Between 1952 and 1975, the average shoreline erosion rate was 3.8ft/yr (1.2 m/yr) at Willow Lake and 2.6 ft/yr (0.8 m/yr) at Sweet Lake (Adams et al. 1978). Between 1978 and 1990, this rate increased to 11ft/yr (3.4 m/yr) along the northern and eastern shorelines of Willow Lake, and averaged 22 ft/yr (6.7 m/yr) along the Sweet Lake shoreline (Brown & Root 1992).

In May 2001, the placement of 17,460 linear feet (5,322 m) of foreshore rock dike was completed along the GIWW. In August 2001, construction of 25,931 linear feet (7,904 m) of open water terraces north of Sweet Lake was initiated; however due to complications with the contractor, timing of the installation of plants and inclement weather, the contract was terminated in October 2001, after only partial completion of the terraces (figure 1). In June 2002, the construction of 20,650 linear feet (6,924 m) of shoreline terraces along the Willow Lake shoreline (figure 1 and 2) was initiated. After completion of the Willow Lake terraces, construction began on the terraces in Sweet Lake. In October 2002, construction of 29,897 linear feet (9,113 m) of shoreline terraces in Sweet Lake (figure 1 and 3), was completed.

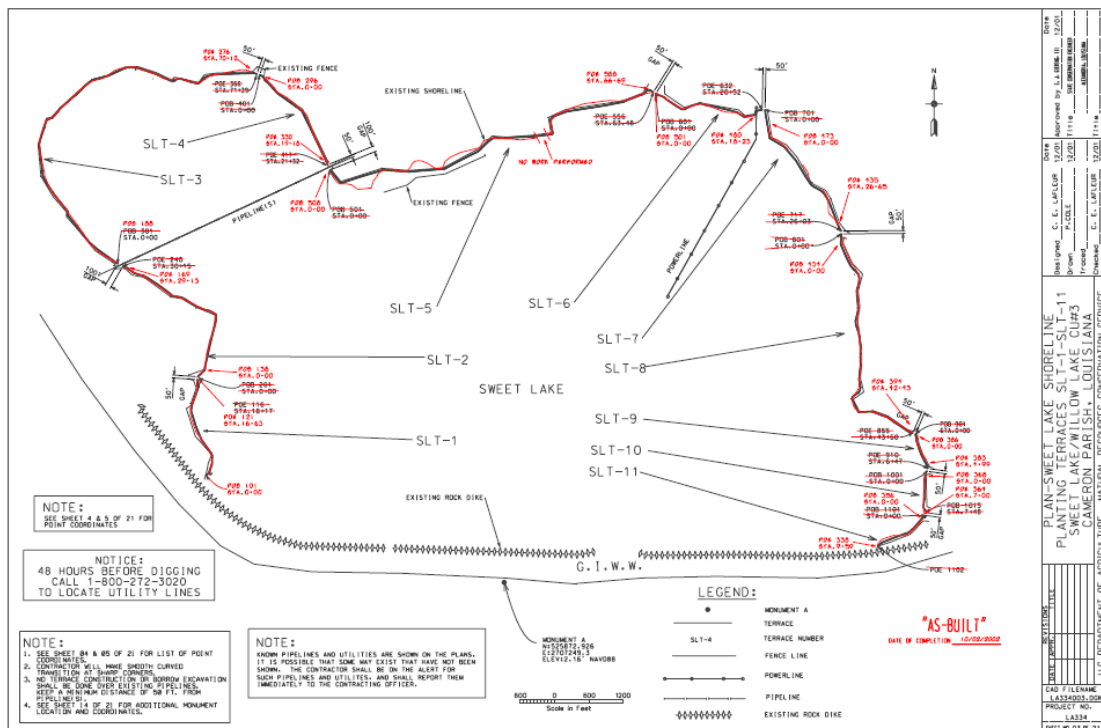




**Figure 1.** Sweet/Willow Lake (CS-11b) project features, project area boundaries and reference area boundaries. (Refer to as-built diagrams (figures 2 and 3) for exact dimensions and features.)



**Figure 2.** As-built location of shoreline terraces within the Willow Lake area of the Sweet/Willow Lake Hydrologic Restoration (CS-11b) project area.



**Figure 3.** As-built location of shoreline terraces within the Sweet Lake area of the Sweet/Willow Lake Hydrologic Restoration (CS-11b) project area.

## **II. Maintenance Activity**

### **a. Project Feature Inspection Procedures**

The purpose of the annual inspection of the Sweet Lake/Willow Lake Hydrologic Restoration Project (CS-11b) 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, OCPR 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. The annual inspection report also contains a summary of maintenance projects, if any, which were completed since completion of the 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 B.

An inspection of the Sweet Lake/Willow Lake Hydrologic Restoration Project (CS-11b) was held on March 24, 2011. In attendance were Mel Guidry and Dion Broussard from OCPR, Dale Garber and Charles Slocum from NRCS. The annual inspection began at approximately 10:00 a.m. on the eastern boundary of the project area.

The field inspection included a complete visual inspection of the entire rock dikes from the GIWW. Staff gauge readings were not available to be used to determine approximate elevations of water and rock dikes. Photographs were taken (see Appendix A) and a Field Inspection form was completed in the field to record measurements and deficiencies (see Appendix C).

### **b. Inspection Results**

The dikes are in reasonably good condition. There are a few low places along the length of the rock dike with the most significant stretches along the open water areas adjacent to Sweet Lake along with an area approximately 50 feet wide along the very eastern end of the project area in which the dike appears to have been “pushed back” 10-12 feet apparently by a barge. There is another area approximately 4 feet wide in which the dike appears to have been removed by hunters or fishermen. It was discussed that maintenance repairs to these areas mentioned above may be incorporated into the CS-49 Freshwater Introduction Project such that the two projects are very near to each other and rock work along the GIWW is a feature of the CS-49 project. Several settlement plates are either broken or leaning and are of no use. No gauges were available in the vicinity to determine water levels. The condition of the shallow water terraces feature of the project was unable to be determined due to high water conditions in Sweet Lake and Willow Lake. (Photos: Appendix B, Photo 1, 2).

## **II. Maintenance Activity (continued)**

### **c. Maintenance Recommendations**

#### **i. Immediate/ Emergency Repairs**

None





**ii. Programmatic/ Routine Repairs**

None

**d. Maintenance History**

There has been no maintenance performed on this project.

**III. Operation Activity**

**a. Operation Plan**

There is no water control structures associated with this project; therefore no structural operation plan is required.

**b. Actual Operations**

There are no water control structures associated with this project; therefore no structural operations are required.

## IV. Monitoring Activity

Pursuant to a CWPPRA Task Force decision on August 14, 2003 to adopt the Coastwide Reference Monitoring System-Wetlands (CRMS-Wetlands) for CWPPRA, updates were made to the CS-11b Monitoring Plan to merge it with CRMS-Wetlands and provide more useful information for modeling efforts and future project planning while maintaining the monitoring mandates of the Breau Act. This report is a closeout report for monitoring activity associated with the CS-11b project and includes the summaries of all data collected.

### a. Monitoring Goals

The objectives of the Sweet/Willow Lake Hydrologic Restoration Project are to protect the emergent marsh by reducing shoreline erosion and to increase the acreage of emergent and submerged aquatic vegetation (SAV) within the project area.

The following specific goals will contribute to the evaluation of the above objectives:

1. Reduce the erosion rate along the lake shorelines adjacent to the terraces with vegetative plantings of *Zizaniopsis miliacea*.
2. Decrease the rate of marsh loss in the project area.
3. Increase the coverage of emergent wetland vegetation and submerged aquatic vegetation (SAV) in the shallow open water areas in the terracing/vegetative planting section of the project.

### b. Monitoring Elements

#### Aerial Photography:

In order to evaluate shoreline movement and the extent of interior emergent marsh creation (direct and indirect) in the project area, near-vertical, color-infrared aerial photography (1:12,000 scale) was obtained once prior to construction in 1998. The original photography was checked for flight accuracy, color correctness, and clarity and was subsequently archived. Aerial photography was scanned, mosaicked, and georectified by USGS/NWRC personnel according to standard operating procedures (Steyer et al. (1995, revised 2000). Photography originally scheduled for 2009 and 2016 was eliminated due to project ineffectiveness and budgetary constraints.

#### Shoreline Change:

To document movement of the Sweet Lake and Willow Lake shorelines, GPS surveys of a sample of each lake's shoreline adjacent to the planted terraces was conducted in August 2001, at the vegetative edge of the shoreline. A survey monument established in the vicinity of the rock dike was used to establish a GPS control point at the beginning and end of each day of surveying. GPS readings taken at this control point were used as an accuracy check and for determining error associated with each GPS shoreline survey. Shoreline surveys scheduled for 2005, 2009, and 2016 were eliminated due to project ineffectiveness and budgetary constraints.



### **Vegetative Plantings**

In order to determine planting success, and to estimate the amount (acreage) of emergent vegetation that becomes established on the terraces, random sampling plots of 16 plants were established to include a 3% sub-sample of the *Z. miliacea* plantings on the open water terraces and a 5% sub-sample on the Sweet Lake and Willow Lake terraces. The open water terraces were monitored in years 2001, 2002 and 2005 while the Sweet/Willow lake terraces were monitored in years 2002 and 2005. Each plot included 16 plants, and the area of each plot was determined by measuring the length and width of the terrace at each plot. Ocular estimates of percent canopy cover were recorded for each plot. The percent cover for each plot was broken down into the percent cover provided by the *Z. miliacea* plantings and percent cover by other wetland and upland species in each plot. The percent survival was determined as a percentage of the number of live *Z. miliacea* plants to the number planted (percent survival = no. plants/no. planted x 100), after Mendelssohn and Hester (1988) and Mendelssohn et al. (1991). Species Richness was calculated from the total species occurring within each sampling plot during each sampling period.

### **Submerged Aquatic Vegetation (SAV)**

The rake method (Nyman and Chabreck 1996) was used to document changes in the relative frequency of SAV in the project and reference areas. Transects were established in the shallow open water area north of Sweet Lake where the terraces and plantings were installed. For comparison and use as a reference, transects were similarly established in an open water area in the marsh northeast of Willow Lake. Open water areas were sampled for presence or absence of SAV at 25 to 100 random points along each transect line, depending on the size of the water body. Species composition and relative frequency of occurrence (frequency = number of occurrences/number of samples taken x 100) were determined. Because extensive colonies of *Eichhornia crassipes* are likely to be present in the open water areas during the fall season, SAV was monitored pre-construction in May 2000. Based on recommendations from the CRMS review, SAV sampling originally scheduled for 2004, 2009, and 2016 was cancelled.

### **CRMS Supplemental**

No CRMS stations were available within the project vicinity, therefore NO CRMS supplemental data will be used in this report.

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

### **Aerial Photography:**

Land to water analysis for pre-construction photography, collected on December 17, 1998 indicated 23.0% land and 77.0% water within the project area versus 44.0% land and 56.0% water within reference area (figure 4). Due to project ineffectiveness and budgetary constraints post construction land to water analysis was eliminated.

### **Shoreline Change:**

DGPS readings to document shoreline position were collected in August 2001 (pre-construction) as baseline data (figure 5). Due to elevated water levels and constant wave poundings, a rapid deterioration of the terraces occurred within the first year. The shoreline

terraces were deemed ineffective and the 2004, 2009 & 2016 post construction shoreline measurements were eliminated.

### **Vegetative Plantings:**

Mean % survival of *Z. miliacea* plantings on the open water terraces from 1 month post planting in 2001, 1 year post planting in 2002 and 3 year post planting in 2005 decreased from 78.1 %, 35.0 % to 21.7 % respectively (figure 6). Mean % survival of *Z. miliacea* plantings on the Sweet Lake and Willow Lake terraces from 1 month post planting in 2002 and 3 year post planting in 2005 decreased from 87.2 %, to 26.7 % and 94.0 % to 37.5 % respectively (figure 6). The decrease in % survival was attributed to elevated water levels, poor soils, and constant wave poundings, causing the terraces to deteriorate rapidly and the plantings to be washed away. Vegetative sampling was discontinued after the 2005 sampling period.

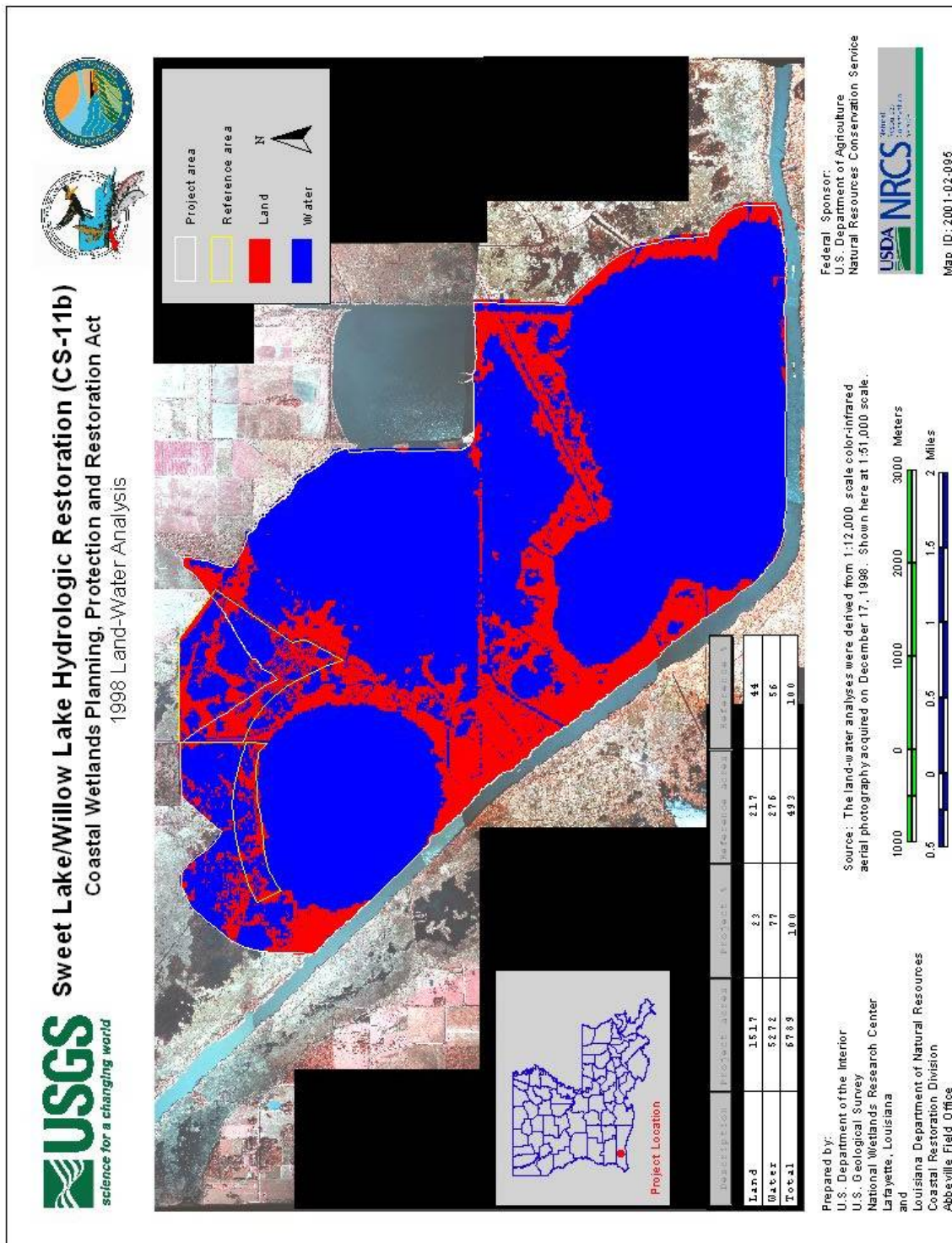
Mean % cover on the open water terraces in 2001, 2002 and 2005 increased from 6.15 %, 14.3 % to 21.3% (figure 7). Mean % cover on the Sweet Lake terraces in 2002 and 205 increased from 14.9 % to 33.7 % while the Willow Lake terraces showed a slight decrease of 28.6 % to 24.5 % (figure 7)

The species richness on the open water terraces in 2001, 2002 and 2005 increased slightly from 1.0%, 0.8% to 2.6% respectively (figure 8). The Sweet Lake and Willow Lake terraces showed an increase in richness of 1.0 % to 3.4% and 1.0% to 2.7 % respectively (figure 8). The increase in % cover and species richness was attributed to the growth of less desirable species occurring within the sampling plots after the *Z. miliacea* plantings were washed away.

Due to elevated water levels, constant wave poundings, and rapid deterioration of the terraces, most of the plantings were washed away within the first year. The large open water fetches across Sweet Lake and Willow Lake caused the terraces and plantings to be ineffective at meeting the goals of reducing shoreline erosion and decreasing marsh loss within the project area.

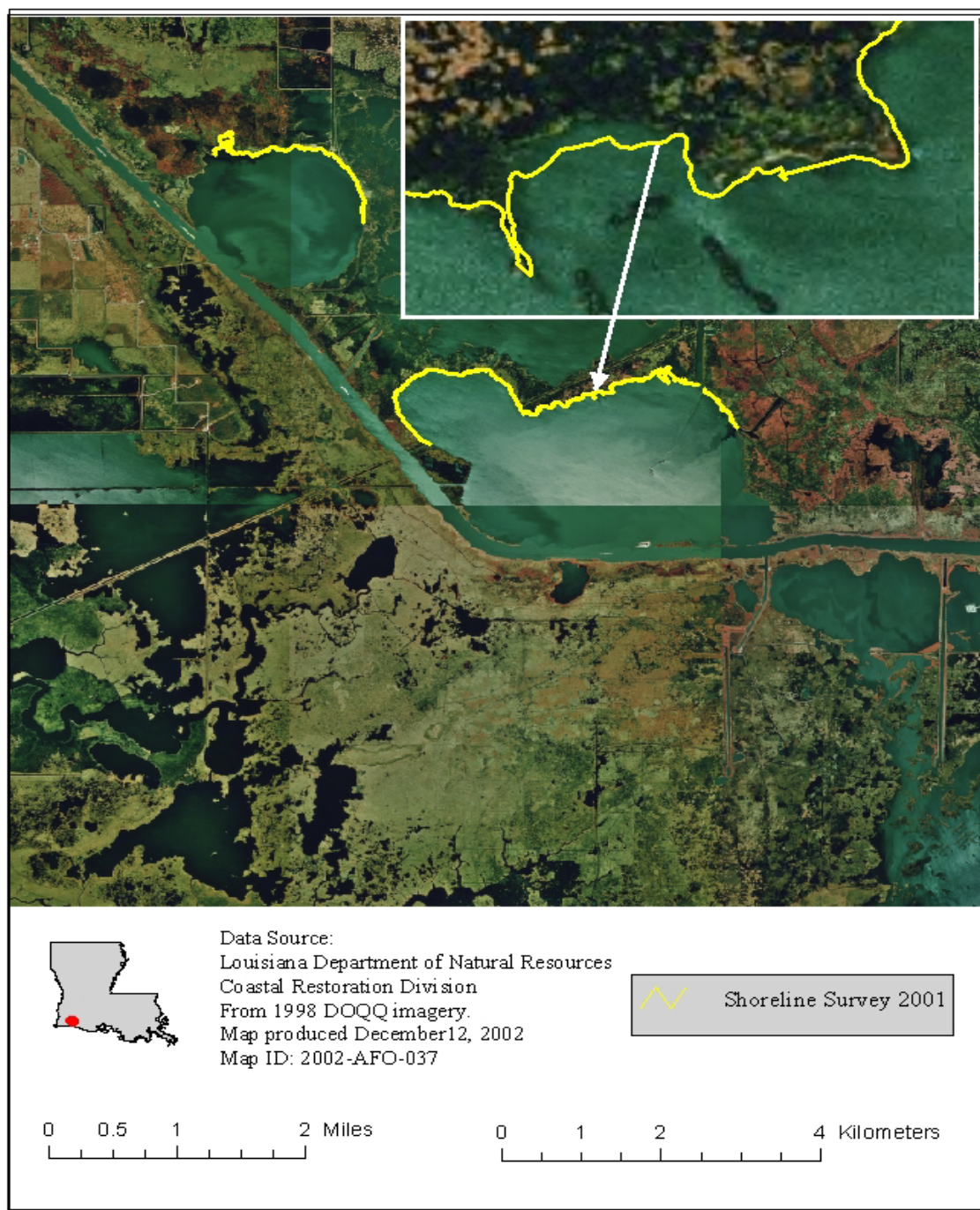
### **Submerged Aquatic Vegetation:**

Data collected pre-construction in May 2000 indicated unvegetated areas within the project and reference areas were 50.9 % and 27.2 %, respectively (figure 9). *Ruppia maritima* (widgeon grass) was found only in the project area while *Nelumbo lutea* (water lily) was found only in the reference area. Species present in both the project and reference area included *Vallisneria americana* (water celery), *Ceratophyllum demersum* (coontail) and an unidentified green alga (figure 9). Based on recommendations from the CRMS review, SAV sampling originally scheduled for 2004, 2009, and 2016 was cancelled. Due to the limited data set and rapid deterioration of the terraces within the first year it is assumed that the project did not meet its goal of increasing SAV.

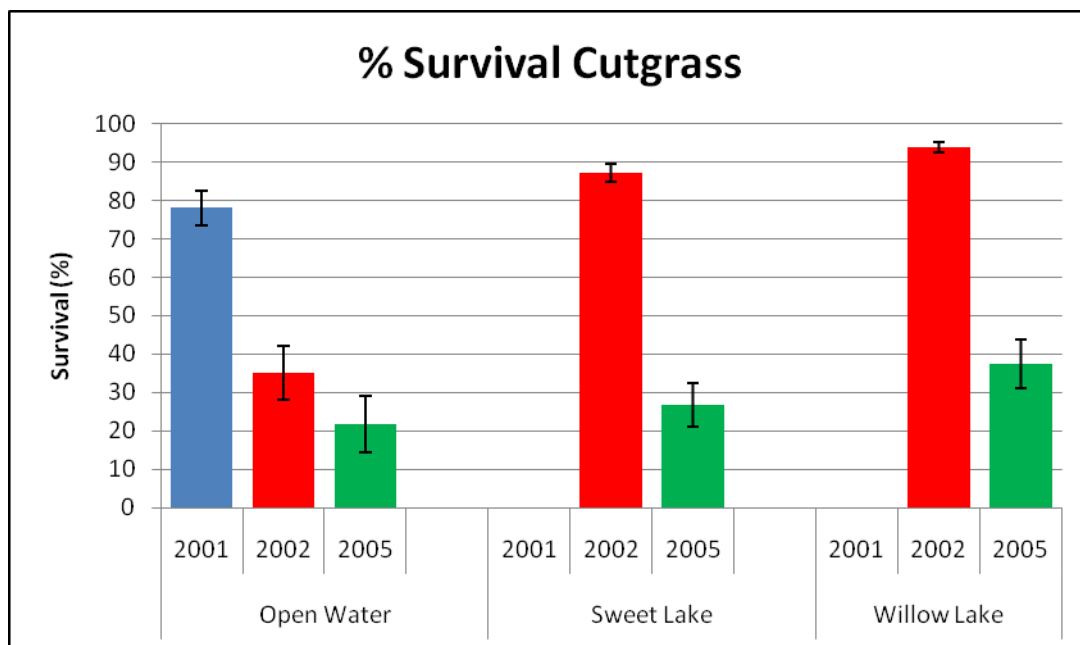


**Figure 4. .** Land to Water analysis of the Sweet/Willow Lake Hydrologic Restoration (CS-11b) project area from photography obtained December 17, 1998.

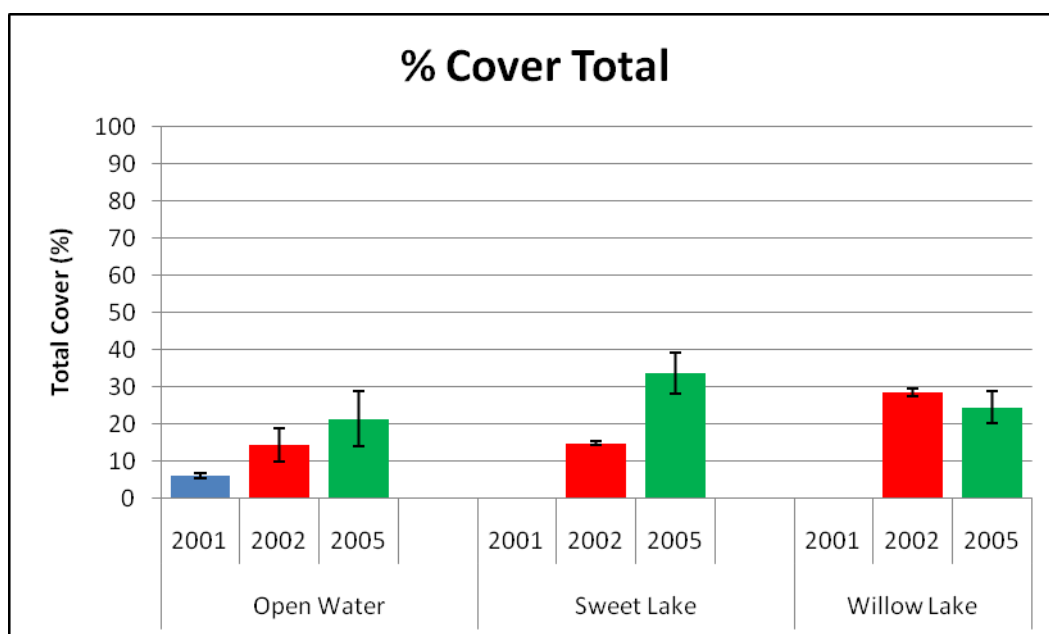




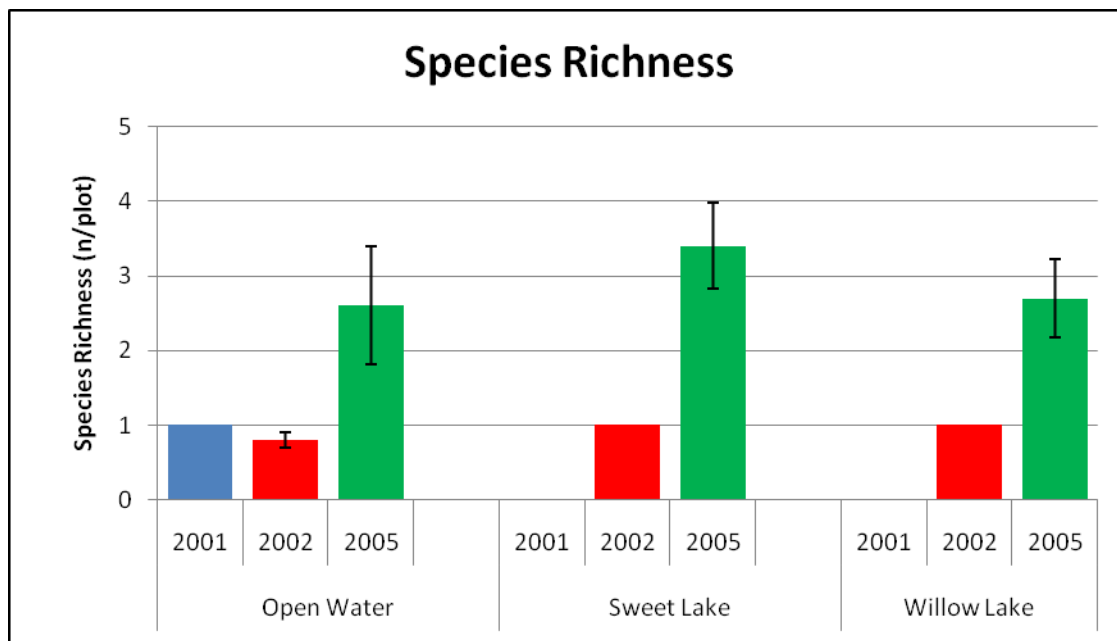
**Figure 5.** Baseline shoreline position survey of the Sweet/Willow Lake Hydrologic Restoration (CS-11b) project area from data obtained August 2001.



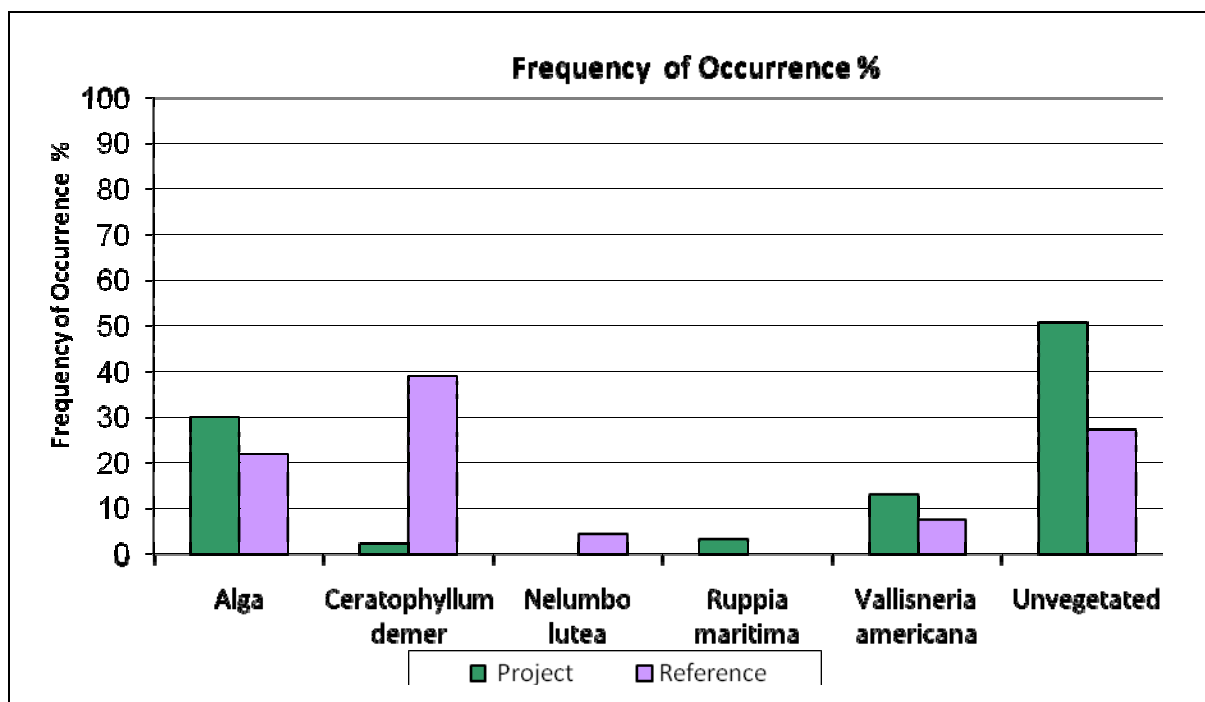
**Figure 6.** Mean Percent survival of cutgrass (*Zizaniopsis miliacea*) plantings on the Open Water, Sweet Lake and Willow Lake terraces for 2001, 2002 and 2005 sampling periods. (Mean Survival = # alive / # planted x 100)



**Figure 7.** Mean Percent Total Cover of cutgrass (*Zizaniopsis miliacea*) plantings on the Open Water, Sweet Lake and Willow Lake terraces for 2001, 2002 and 2005 sampling periods.



**Figure 8.** Species Richness of vegetation occurring within the Open Water, Sweet Lake and Willow Lake terraces for 2001, 2002 and 2005 sampling periods.



**Figure 9.** 2000 preconstruction data for frequency of occurrence % of submerged aquatic vegetation within the Sweet/Willow Lake Hydrologic Restoration (CS-11b) project and reference areas. (% Occurrence = number of occurrences/number of samples taken x 100).

## **V. Conclusions**

### **a. Project Effectiveness**

The rock portion of the Sweet Lake/Willow Lake Hydrologic Restoration Project is in good condition and functioning as designed. The rock dike is very effective at restraining the volume of water and suspended sediments that once flowed into the GIWW. This will allow interior sediment deposition over time thus allowing for the interior marshes to be revived.

The open water terraces north of Sweet Lake were ineffective at reducing wave energy. The lack of consolidated material and high water events during construction caused the terraces to deteriorate rapidly, leaving little or no sub-aerial mass to buffer waves. The vegetative plantings installed along the unconsolidated open water terraces did not grow well. The lack of suitable planting medium and rapid terrace deterioration did not allow enough time for the plantings to become established. The shoreline terraces in Sweet Lake and Willow Lake were moderately effective at reducing wave energy for a short time period. High water during construction and the long fetch across the lakes generated constant wave erosion, causing the crowns of the terraces to deteriorate until the water levels subsided. Once the water subsided, waves across the long fetch continued and a gradual degradation of the toe of the levee continued until the plantings were washed away. Overall the terraces were ineffective at combating shoreline erosion within the Sweet/Willow Lake project area.

### **b. Recommended Improvements**

Establish staff gages in the project area.

### **c. Lessons Learned**

Vegetation plantings should be installed as early as possible within the growing season to allow time for the plantings to become established. The open water terraces north of Sweet Lake experienced significant erosion due in large part to the water depth at the site location. Also contributing to the erosion was the terraces being spaced too far apart and the typical section of the terrace (crown, side slopes) not being large enough. These factors should be considered in the design of any future terraces. Terraces built along the rim of Sweet Lake and Willow Lake experienced gradual degradation from the large fetch across each lake. Sacrificial terraces built in front of the proposed terraces could be beneficial in decreasing wave erosion and allowing ample time for the plantings to become established.

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## **APPENDIX A**

### **(Inspection Photographs)**



**Photo No. 1,** Typical rock dike



**Photo No. 2,** Area where rock dike has been “pushed back”

## **APPENDIX B**

### **(Three Year Budget Projection)**

**SWEET LAKE / CS11b / PPL 5**  
**Three-Year Operations & Maintenance Budgets 07/01/2011 - 06/30/2014**

<u>Project Manager</u>	<u>O &amp; M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
Darrell Pontiff	Mel Guidry	NRCS	Mel Guidry

	2011/2012 (-11)	2012/2013 (-12)	2013/2014 (-13)
<b>Maintenance Inspection</b>	\$ 6,086.00	\$ 6,269.00	\$ 6,457.00
<b>Structure Operation</b>	\$ -	\$ -	\$ -
<b>Administration</b>	\$ -	\$ -	\$ -

**Maintenance/Rehabilitation**

11/12 Description: Staff Gage Installation

E&D	\$ 7,500.00
Construction	\$ -
Construction Oversight	\$ -
Sub Total - Maint. And Rehab.	\$ 7,500.00

12/13 Description:

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

13/14 Description:

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

	2011/2012 (-11)	2012/2013 (-12)	2013/2014 (-13)
<b><u>Total O&amp;M Budgets</u></b>	<b>\$ 13,586.00</b>	<b>\$ 6,269.00</b>	<b>\$ 6,457.00</b>

<b><u>O &amp; M Budget (3 yr Total)</u></b>	<b>\$ 26,312.00</b>
<b><u>Unexpected O &amp; M Budget</u></b>	<b>\$ 446,950.00</b>
<b><u>Remaining O &amp; M Budget (Projected)</u></b>	<b>\$ 420,638.00</b>





**OPERATION AND MAINTENANCE BUDGET 07/01/2011-06/30/2012**  
**SWEET LAKE/CS-11b/PPL5**

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$6,086.00	<b>\$6,086.00</b>
General Structure Maintenance	LUMP	0	<b>\$0.00</b>	<b>\$0.00</b>
Engineering and Design	LUMP	1	\$7,500.00	<b>\$7,500.00</b>
Operations Contract	LUMP	0	<b>\$0.00</b>	<b>\$0.00</b>
Construction Oversight	LUMP	0	\$0.00	<b>\$0.00</b>

**ADMINISTRATION**

LDNR / CRD Admin.	LUMP	0	\$0.00	\$0.00
FEDERAL SPONSER Admin.	LUMP	0	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
<b>TOTAL ADMINISTRATION COSTS:</b>				<b>\$0.00</b>

**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
<b>TOTAL SURVEY COSTS:</b>				<b>\$0.00</b>

**GEOTECHNICAL**

GEOTECH DESCRIPTION:				
Borings	EACH	0	\$0.00	\$0.00
OTHER				\$0.00
<b>TOTAL GEOTECHNICAL COSTS:</b>				<b>\$0.00</b>

**CONSTRUCTION**

CONSTRUCTION DESCRIPTION:					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00
Filter Cloth / Geogrid Fabric	SQ YD	0		\$0.00	\$0.00
Navigation Aid	EACH	0		\$0.00	\$0.00
Signage	EACH	0		\$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		\$0.00	\$0.00
Contingency	LUMP	1		\$0.00	\$0.00
General Structure Maintenance	LUMP	1		\$0.00	\$0.00
OTHER				\$0.00	\$0.00
OTHER				\$0.00	\$0.00
OTHER				\$0.00	\$0.00
<b>TOTAL CONSTRUCTION COSTS:</b>					<b>\$0.00</b>

**TOTAL OPERATIONS AND MAINTENANCE BUDGET:** **\$13,586.00**

**OPERATION AND MAINTENANCE BUDGET 07/01/2012-06/30/2013**  
**SWEET LAKE/CS-11b/PPL5**

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$6,269.00	<b>\$6,269.00</b>
General Structure Maintenance	LUMP	0	\$0.00	<b>\$0.00</b>
Engineering and Design	LUMP	0	\$0.00	<b>\$0.00</b>
Operations Contract	LUMP	0	\$0.00	<b>\$0.00</b>
Construction Oversight	LUMP	0	\$0.00	<b>\$0.00</b>

**ADMINISTRATION**

LDNR / CRD Admin.	LUMP	0	\$0.00	\$0.00
FEDERAL SPONSER Admin.	LUMP	0	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
<b>TOTAL ADMINISTRATION COSTS:</b>				<b>\$0.00</b>

**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:						
	Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
		0	0.0	0	\$0.00	\$0.00
		0	0.0	0	\$0.00	\$0.00
		0	0.0	0	\$0.00	\$0.00
	Filter Cloth / Geogrid Fabric	SQ YD	0	\$0.00	\$0.00	
	Navigation Aid	EACH	0	\$0.00	\$0.00	
	Signage	EACH	0	\$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	\$0.00	\$0.00	
	Contingency	LUMP	1	\$0.00	\$0.00	
	General Structure Maintenance	LUMP	1	\$0.00	\$0.00	
	OTHER			\$0.00	\$0.00	
	OTHER			\$0.00	\$0.00	
	OTHER			\$0.00	\$0.00	
	TOTAL CONSTRUCTION COSTS:					\$0.00

**TOTAL OPERATIONS AND MAINTENANCE BUDGET:** **\$6,269.00**

**OPERATION AND MAINTENANCE BUDGET 07/01/2013-06/30/2014**  
**SWEET LAKE/CS-11b/PPL5**

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	\$6,457.00	<b>\$6,457.00</b>
General Structure Maintenance	LUMP	0	\$0.00	<b>\$0.00</b>
Engineering and Design	LUMP	0	\$0.00	<b>\$0.00</b>
Operations Contract	LUMP	0	\$0.00	<b>\$0.00</b>
Construction Oversight	LUMP	0	\$0.00	<b>\$0.00</b>

**ADMINISTRATION**

LDNR / CRD Admin.	LUMP	0	\$0.00	\$0.00
FEDERAL SPONSER Admin.	LUMP	0	\$0.00	\$0.00
SURVEY Admin.	LUMP	0	\$0.00	\$0.00
OTHER				\$0.00
<b>TOTAL ADMINISTRATION COSTS:</b>				<b>\$0.00</b>

**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:					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00
	0	0.0	0	\$0.00	\$0.00
Filter Cloth / Geogrid Fabric	SQ YD	0		\$0.00	\$0.00
Navigation Aid	EACH	0		\$0.00	\$0.00
Signage	EACH	0		\$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	0		\$0.00	\$0.00
Materials	LUMP	0		\$0.00	\$0.00
Mob / Demob	LUMP	0		\$0.00	\$0.00
Contingency	LUMP	0		\$0.00	\$0.00
General Structure Maintenance	LUMP	0		\$0.00	\$0.00
OTHER				\$0.00	\$0.00
OTHER				\$0.00	\$0.00
OTHER				\$0.00	\$0.00
<b>TOTAL CONSTRUCTION COSTS:</b>					<b>\$0.00</b>

**TOTAL OPERATIONS AND MAINTENANCE BUDGET:** **\$6,457.00**

## **APPENDIX C**

### **(Field Inspection Notes)**

Project No. / Name: Sweet Lake/Willow Lake HR CS-11B

Date of Inspection: 3/24/2011 Time: 10:00 AM

Structure No. \_\_\_\_\_

Inspector(s): Mel Guidry, Dion Broussard (OCPR)

Structure Description: Rock Dike

Dale Garber, Charles Slocum (NRCS)

Water Level: Inside: N/A Outside: N/A

Type of Inspection: Annual

Weather Conditions: Clear and Mild

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	NA				
Steel Grating	N/A				
Stop Logs	N/A				
Hardware	N/A				
Timber Piles	N/A				
Timber Wales	N/A				
Galv. Pile Caps	N/A				
Cables	N/A				
Signage/Support	N/A				
Rip Rap(fill)	N/A				
Earthen Embankment	N/A				
Foreshore Dike	Good			1, 2	300 Linear feet of dike on eastern edge of Willow is low,. Also, there is a 50 foot section of rock dike that has apparently been pushed back. Another 4 foot section is missing in another area.

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?

