



State of Louisiana

**Coastal Protection and Restoration
Authority of Louisiana (CPRA)**

2016/2017 Annual Inspection Report

for

EAST SABINE LAKE HYDROLOGIC RESTORATION PROJECT (CS-32)

State Project Number CS-32
Priority Project List 10

September 29, 2014 (Terraces)
July 14, 2016 (Structures)
Cameron Parish



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I. Introduction

The proposed project is located in the western third of the Sabine National Wildlife Refuge (NWR) in Cameron Parish, Louisiana. The project area is bounded on the east by the Burton Sutton Canal, to the south by Starks South Canal, to the west by the eastern Sabine Lake shoreline, and to the north by the approximate northern boundary of Sabine NWR. (See Appendix A).

The East Sabine Lake Hydrologic Restoration 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 tenth Priority Project List. The East Sabine Lake Hydrologic Restoration Project has a twenty-year (20 year) project life, which began in August 2009.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the East Sabine Lake Hydrologic Restoration Project (CS-32) 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, CPRA 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 East Sabine Lake Hydrologic Restoration Project are outlined in Section IV.

A separate site inspection of the structures for the East Sabine Lake Hydrologic Restoration Project (CS-32) was held on July 14, 2016. The conditions were cloudy skies with mild temperatures and water elevations approximately a foot above normal. In attendance were Jody White from CPRA and Darryl Clark and Billy Leonard from USFWS. USFWS provided boat transportation. The trip began at the Deep Bayou Road public launch at approximately 11:50am. The terrace field was not inspected in this fiscal year.

The field inspection included a visual inspection of the project features. Staff gage readings where available were used to determine approximate elevations of water, rock breakwater, and rock weir features. Photographs were taken (see Appendix B) and Field Inspection notes were completed during the inspection to record measurements and deficiencies (see Appendix D).

III. Project Description and History

The lower salinity marshes in the project area are converting to shallow, open water due to elevated salinity events, storms, and subsidence. Navigation channels provide a direct route for

salt water to infiltrate the marsh, disrupt natural water circulation, and allow rapid runoff of fresh water. The larger Sabine-Neches Waterway and the Gulf Intracoastal Waterway (GIWW) have allowed saltwater intrusion into the project area's fresh and intermediate marshes. Elevated tidal fluctuations in these channels have led to increased water flow, which has increased the conversion of marsh to open water. Marsh loss within the project area is also caused by wave action along Sabine Lake and interior marsh shorelines and other natural causes (i.e., subsidence).

To prevent further marsh loss and restore intermediate and brackish marshes, the project features include: a 40-foot wide rock weir at Pines Ridge Bayou; three 24-inch culverts with flap gates (on Sabine Lake side) at Bridge Bayou and Grey's Ditch; a 3,000 foot-long segmented rock breakwater along the Sabine Lake shoreline at Willow Bayou; a weir (replaced as a plug) at the opening at Starks South Canal Section 16 levee; and 232,222 linear feet of vegetated earthen terraces in the vicinity of Green's Lake.

Project Objectives

1. Protect and restore intermediate and brackish marshes within the project area.

Specific Goals

The following measurable goals were established to evaluate project effectiveness:

1. Reducing excessive elevated salinities within the Double Island Gully, Pines Ridge, and Green's Lake portions of the project area.
2. Reducing water level variability within the Double Island Gully and Pines Ridge portions of the project area.
3. Stopping erosion of the Sabine Lake shoreline from the mouth of Willow Bayou to a point approximately 2,955 feet to the north.
4. Creating 68 acres of marsh in shallow open water areas by the end of the 20 year project life via earthen terraces.
5. Increase fisheries and estuarine organism egress without adversely affecting salinity levels in the western portion of Sabine NWR.

IV. Summary of Past Operation and Maintenance Projects

General Maintenance: Below is a summary of completed maintenance projects and operation tasks performed since June 2009, the construction completion date of the East Sabine Lake Hydrologic Restoration Project (CS-32).

2007 - Hurricane Rita Repairs to Pines Ridge Bayou Weir and Willow Bayou Rock Realignment & Gapping– F. Miller Construction - This maintenance project included placing 146 tons of R-300 rock rip-rap along with 794 LF of PVC sheet pile wall at Pines Ridge Bayou Weir. Rock realignment was performed at each end of the foreshore rock dike and rock gaps were placed in two other locations along the Sabine Lake shoreline. This maintenance project was a result of damages sustained from Hurricane Rita in 2005 and other maintenance work required. The costs associated with the engineering, design and construction of the Pines Ridge Bayou and Willow Bayou Maintenance Project are as follows:

Construction (CWPPRA)	\$ 74,700.00
Construction (FEMA)	\$143,032.00
E & D, construction oversight, as-builts	\$ 35,026.65
Project Total	\$252,758.65

2015 (August) – Installation of Warning Signs along the Rock Dike at Willow Bayou Breakthrough – Simon & Delaney Resource Management, LLC. – Four fourteen foot 4x4 posts with red reflectors and Refuge signs on two sides.

Total Construction Cost	\$2850
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Structure Operations: There are no active operations associated with this project.

V. Inspection Results

Earthen Terraces

Last Inspection Results - September 2014

The inspection began on the north end of the terrace field and proceeded south. Each air boat took a row of terraces meeting up along the way to discuss what was seen. The northern section of terraces (CU1) had a variety of vegetation, i.e. smooth cordgrass, roseau cane, baccharis, iva, and a few cattails. The terraces narrowed heading south (CU1A), but there was still good cordgrass spread beyond the terrace width. There were skips in vegetation coverage noted, averaging 5%-7% bare areas. (See Appendix B, Photos 1-5)

The salinity was also recorded at three locations as follows:

CU - Row # - Terrace #	Salinity - ppt
CU1 - R1 - 1	8.1ppt
CU1 - R14A - 1	7.4ppt
CU1A - R6	6.2ppt

Google Earth Image 2017

The terraces were not inspected in the 2016-2017 fiscal year. There haven't been any negative reports from the USFWS refuge staff about excessive deterioration. A recent 2017 Google Earth image shows new vegetation in the northwestern most terraces. The terraces have narrowed in some areas further south but they are still reducing the fetch across the open water.

Foreshore Rock Dike

The water level was approximately a foot higher than normal. Although there were low areas of the rock dike noted between the south warning sign up to just south of the bend in Willow Bayou, the foreshore rock dike was in good condition and performing as intended. The higher water level contributed to the low appearance of the rock dike and there were no signs of damage to the original marsh behind the rock dike. This area will continue to be monitored.

Smooth cordgrass has filled in nicely behind several segments of the rock dike. Willow Bayou however has broken through the marsh to the rock dike. At high water levels a section of rock dike in this area is submerged and can be mistaken by boaters as a route out of the Willow Bayou. Four signs were installed in August 2015 to mark the submerged rock. The existing warning signs along the rock dike were in place and intact. (See Appendix B, Photos No. 6-13)

Rock Weir at Pines Ridge

The Pines Ridge Weir is still functioning as intended. The water level on the staff gauge adjacent to the outside of the weir was at 2ft. 1.5 in. Normal water levels average 1.2ft. Due to the higher than normal water levels, there was little rock visible above the water. Probing the area revealed rock approximately 3.5 ft. below the water at center and the weir appeared to be intact. The warning sign was struck by something but was still intact. (See Appendix B, Photos No. 14)

Double Island Gully Plug

The Cameron Parish Gravity Drainage District No. 7 replaced the rock plug located on the Southline Canal that they had previously removed to facilitate drainage after Hurricane Ike.

Bridge Bayou Culverts

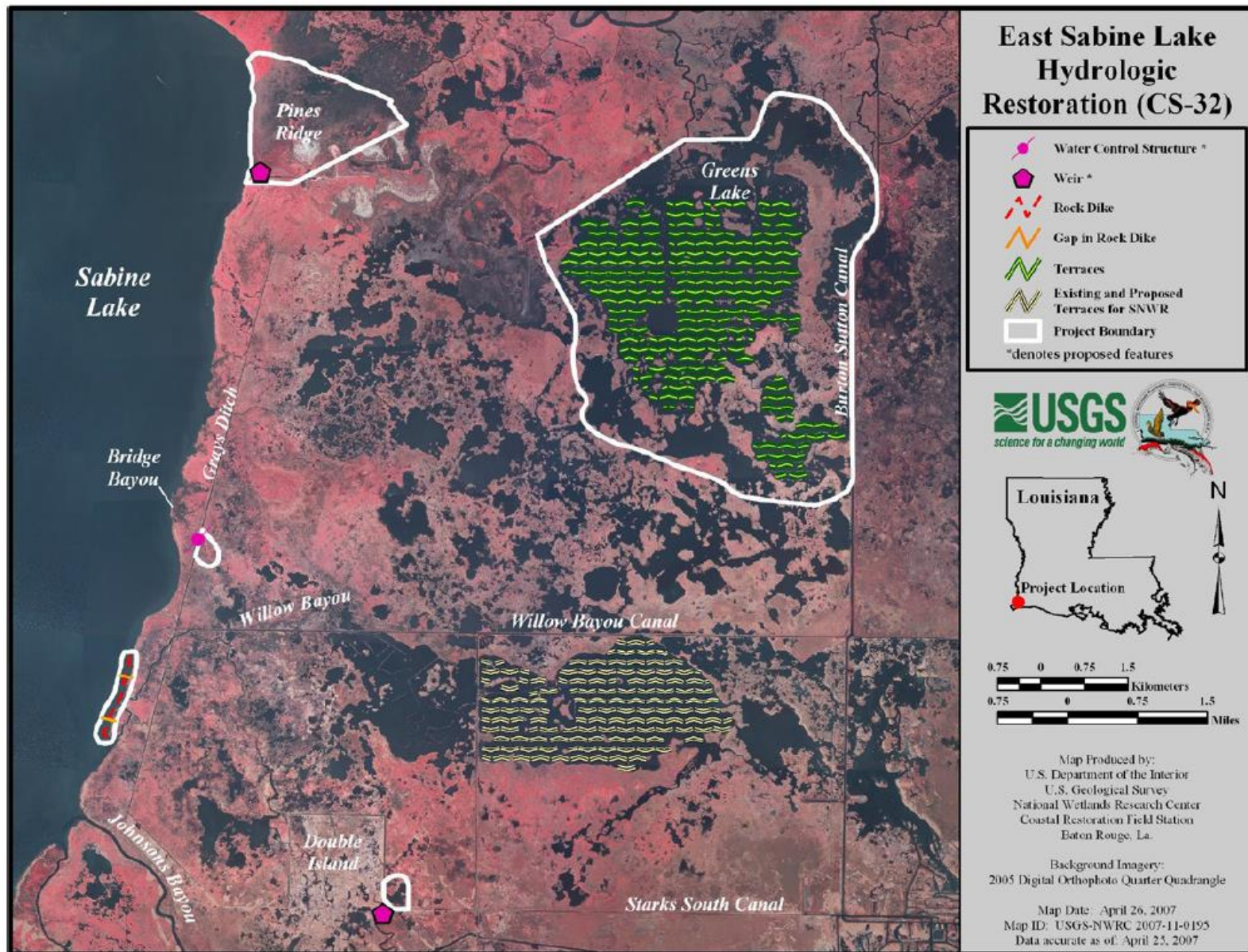
The culverts were intact and appeared to be functioning.

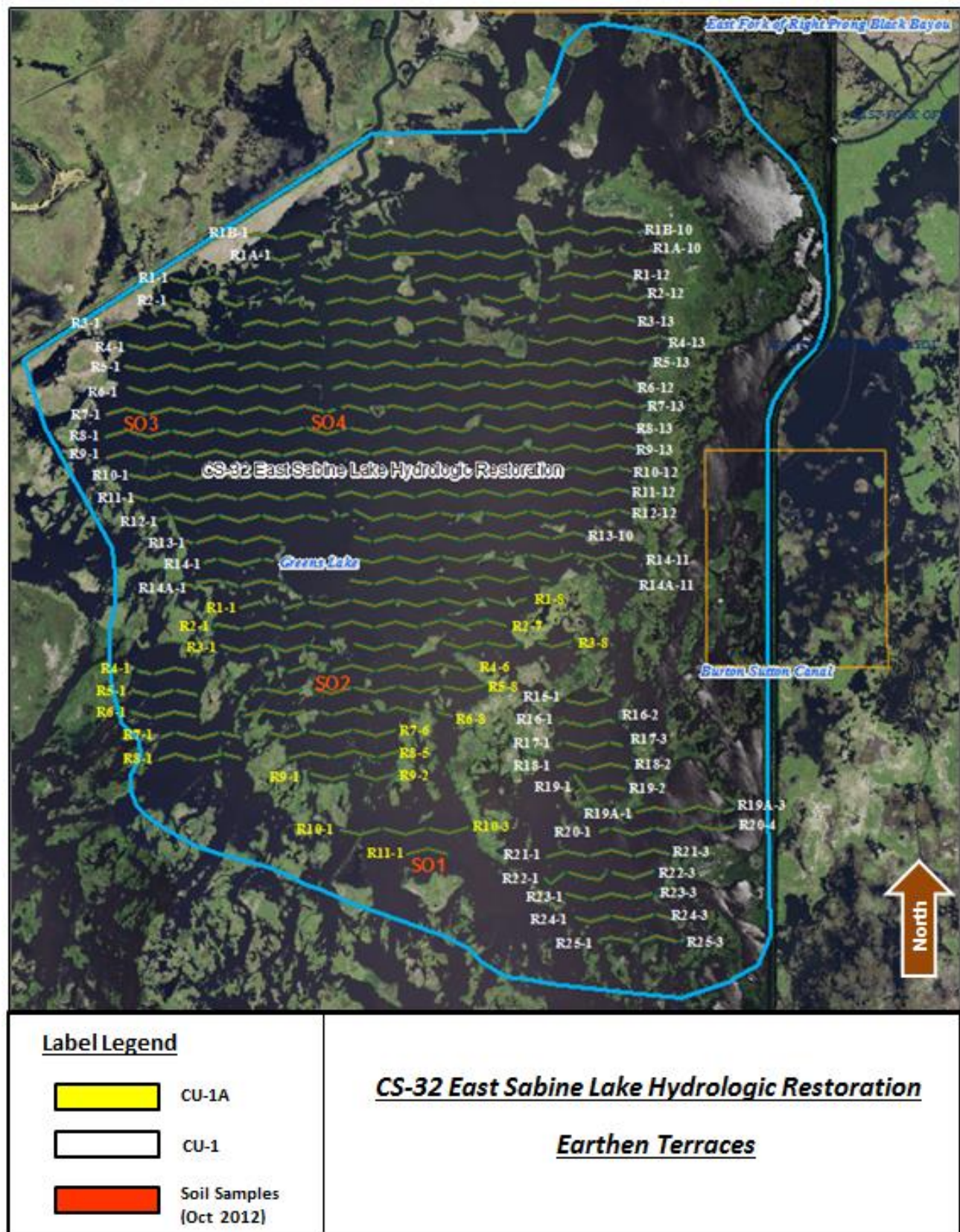
VI. Conclusions and Recommendations

Overall, the project is in good condition. The vegetation has filled in very well behind the foreshore rock dike. Although there appears to be low areas of foreshore rock dike at the southern end, the dike is still providing protection to the east shoreline of Sabine Lake. The lower segments of rock will be monitored for a potential maintenance event in the future.

The Double Island Gully Plug is again functioning as a plug as originally intended.

Appendix A
Project Features Map





Appendix B

Photographs



Photo No.1 –Northern Section of Terraces – Variety of Vegetation (2014)



Photo No. 2 –Northern Section of Terraces – Expansion (2014)



Photo No. 3 – Some Narrowing of Terraces Going South (2014)



Photo No. 4 – Southern Terraces (2014)



Photo No. 5 – Southern Terraces



Photo No. 6 – South End of Sabine Lake Foreshore Rock Dike



Photo No. 7 – Sabine Lake Foreshore Rock Dike, South of Southern Warning Sign



Photo No. 8– Sabine Lake Foreshore Rock Dike, Low area of Rock



Photo No. 9– Sabine Lake Foreshore Rock Dike, Low area of Rock

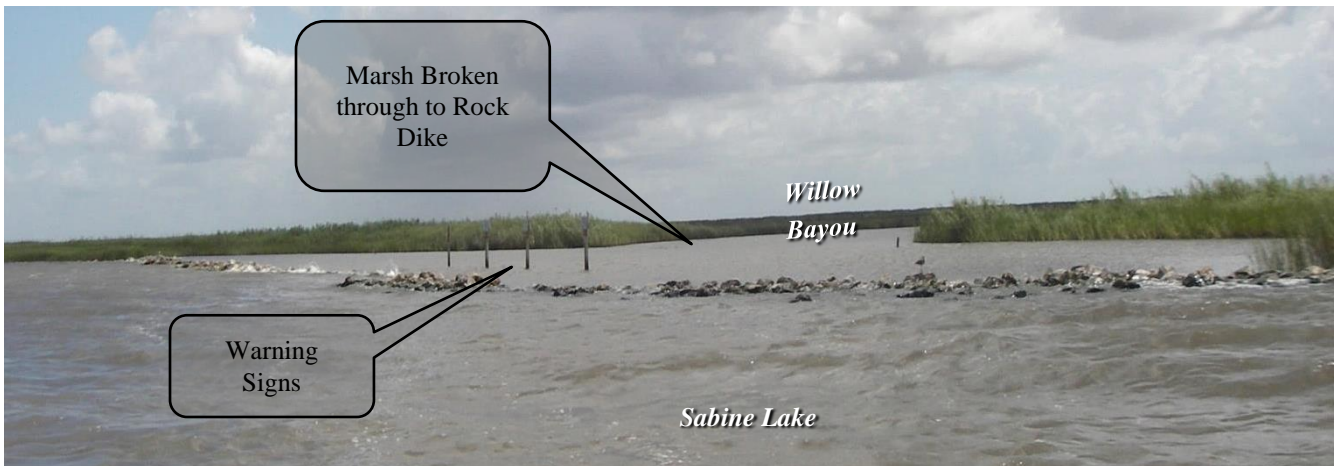


Photo No. 10– Sabine Lake Foreshore Rock Dike,
Low area at Willow Bayou bend (looking northeast) - Warning Signs



Photo No. 11– Sabine Lake Foreshore Rock Dike,
Low area at Willow Bayou bend (Same Location as Photo 10, looking west) - Warning Signs



Photo No. 12– Sabine Lake Foreshore Rock Dike, near North Warning Sign



Photo No. 13– Sabine Lake Foreshore Rock Dike, North End



Photo No. 14– Pines Ridge Weir, from Project Exterior



Photo No. 15– Bridge Bayou Culverts in Grey's Ditch



Photo No. 16– Double Island Gully Plug

Appendix C

Three Year Budget Projection

EAST SABINE LAKE HR/ CS-32 / PPL 10
Three-Year Operations & Maintenance Budgets 07/01/2017 - 06/30/2020

<u>Project Manager</u>	<u>O & M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
Pat Landry	Jody White	USFWS	Jody White

	2017/2018 (-8)	2018/2019 (-9)	2019/2020 (-10)
Maintenance Inspection	\$ 7,269.00	\$ 7,487.00	\$ 7,712.00
Structure Operation			
State Administration		\$ -	\$ -
Federal Administration		\$ -	\$ -

Maintenance/Rehabilitation

17/18 Description:

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

18/19 Description:

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

19/20 Description:

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

	2017/2018 (-8)	2018/2019 (-9)	2019/2020 (-10)
Total O&M Budgets	\$ 7,269.00	\$ 7,487.00	\$ 7,712.00

O & M Budget (3 yr Total)	\$ 22,468.00
Unexpended O & M Budget	\$ 198,604.00
Remaining O & M Budget (Projected)	\$ 176,136.00

Appendix D

Field Inspection Form

Annual Inspection Report
EAST SABINE LAKE HR
State Project No. CS-32

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name:CS-32 East Sabine Lake HR

Date of Inspection: 07-14-16 Structures

Time: 11:50 am

Structure No. N/A

Inspector(s): Jody White (CPRA) Darryl Clark and Billy Leonard (USFWS)

Structure Description: Rock Dike, Culverts, Rock Weir, & Rock Plug

Water Level Inside: Outside: 2.1 ft

Type of Inspection: Annual

Weather Conditions: Cloudy and Mild

[illegible]

What are the conditions of the existing levees?	N/A
Are there any noticeable breaches?	N/A
Settlement of rock plugs and rock weirs?	No
Position of stoplogs at the time of the inspection?	N/A
Are there any signs of vandalism?	No

Annual Inspection Report
EAST SABINE LAKE HR
State Project No. CS-32

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name:CS-32 East Sabine Lake HR

Structure No.

Structure Description: Terraces

Type of Inspection: Annual

Date of Inspection: 09-29-2014 Terrace Field Time: 11:20 am

Inspector(s): Jody White and Mike Miller (CPRA)

Dale Garber and Brandon Samson (NRCS)

Darryl Clark and Billy Leonard (USFWS)

Water Level Inside: Outside:

Salinity range: 6.2ppt South to 8.1ppt North

Weather Conditions: Partly Cloudy and Mild

[illegible]

What are the conditions of the existing levees?	N/A
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Are there any noticeable breaches?	N/A
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Settlement of rock plugs and rock weirs?	N/A
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Position of stoplogs at the time of the inspection?	N/A
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Are there any signs of vandalism? No

Appendix E

GPS Log of Low Areas in Rock Dike

CS-32 East Sabine Lake Hydrologic Restoration Foreshore Rock Dike – Low Areas

