State of Louisiana

Coastal Protection and Restoration Authority of Louisiana (CPRA)

2017/2018 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)
October 24, 2017 (Structures)
Cameron Parish

Prepared by:

Jody Roger-White, PE, Engineer 4
CPRA
Lafayette Field Office
635 Cajundome Blvd.
Lafayette, LA 70596

Table of Contents

Appendices

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 October 24, 2017. The conditions were cool, sunny, windy, choppy, and water elevations were above normal. In attendance were Jody White from CPRA, Dale Garber from NRCS, and Darryl Clark and Billy Leonard from USFWS. USFWS provided boat transportation. The trip began at the Deep Bayou Road public launch at approximately 11:30am. 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**

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 2017-2018 fiscal year. There haven't been any negative reports from the USFWS refuge staff about excessive deterioration. A December 2017 Google Earth image shows new SAVs between terraces R9 and R11 North & East of Greens Lake and R19 and R25 to the Southeast. There are other smaller areas but not quite as visible from the satellite image. 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 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. Approximately two feet of rock extended above the water level over 80% of the dike length and there were no signs of damage to the original marsh behind the rock dike. This area will continue to be monitored.

The four signs installed in August 2015 to mark the submerged rock near Willow Bayou are leaning likely due to the high water from Hurricane Harvey earlier in the year. They are still functional at this time, but may need to be repaired in the future. (See Appendix B, Photos No. 6-12)

Rock Weir at Pines Ridge

The Pines Ridge Weir is still functioning as intended. Water was flowing rapidly out of the northern marsh into the Pines Ridge Canal. The head differential appeared to be 1.5ft across the weir. The flow was too swift to obtain probe the rock weir and obtain depth measurements. The warning sign was still intact. (See Appendix B, Photos No. 13)

Double Island Gully Plug

The plug was not visited during this field inspection. (See Appendix B, Photo No. 14)

Bridge Bayou Culverts

The culverts were not visited during this field inspection. (See Appendix B, Photo No. 15)

VI. Conclusions and Recommendations

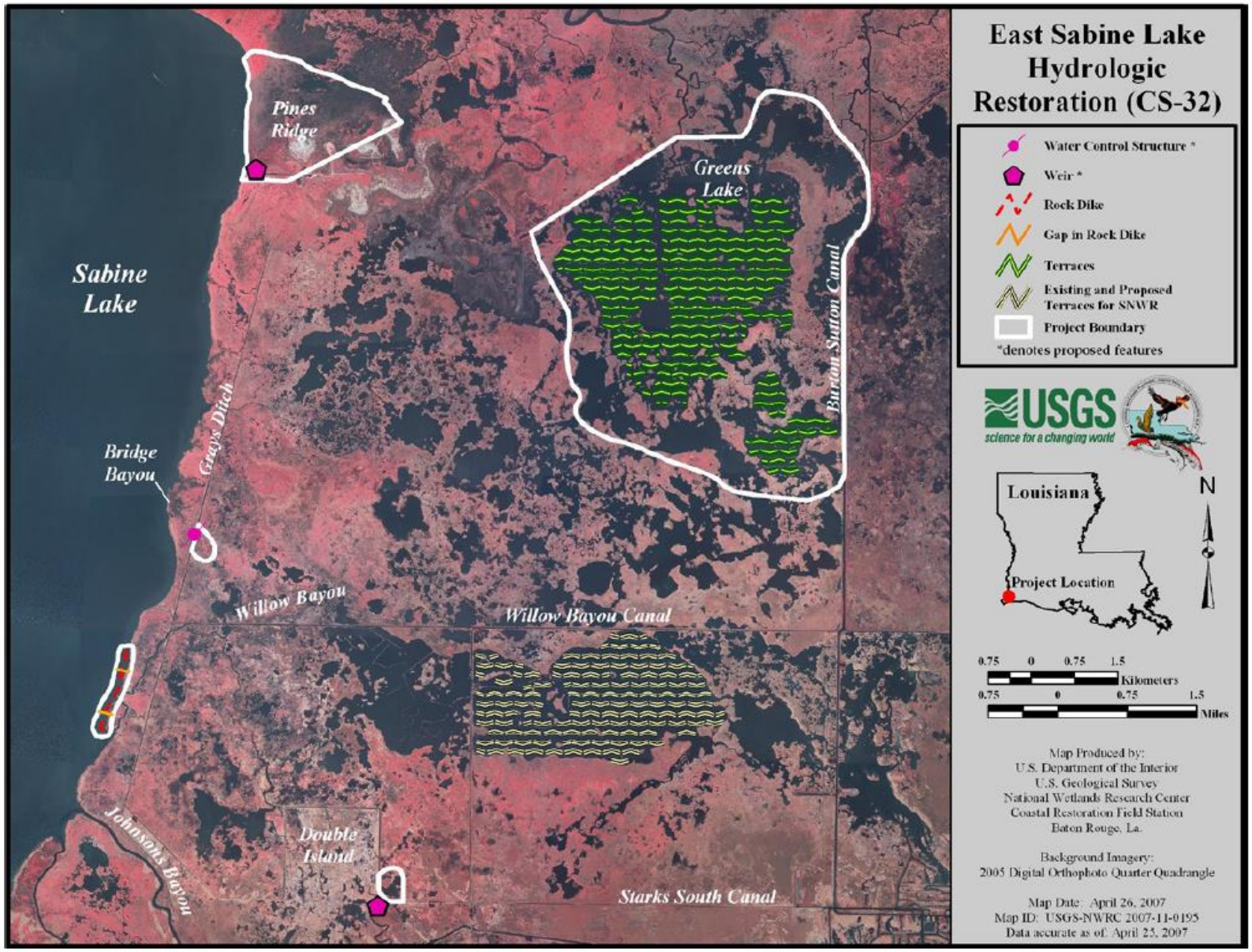
Overall, the project is in good condition. The vegetation has filled in very well behind the foreshore rock dike. Although there appears to be low areas of foreshore rock dike at the southern end, the dike is still providing protection to the east shoreline of Sabine Lake. The lower segments of rock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

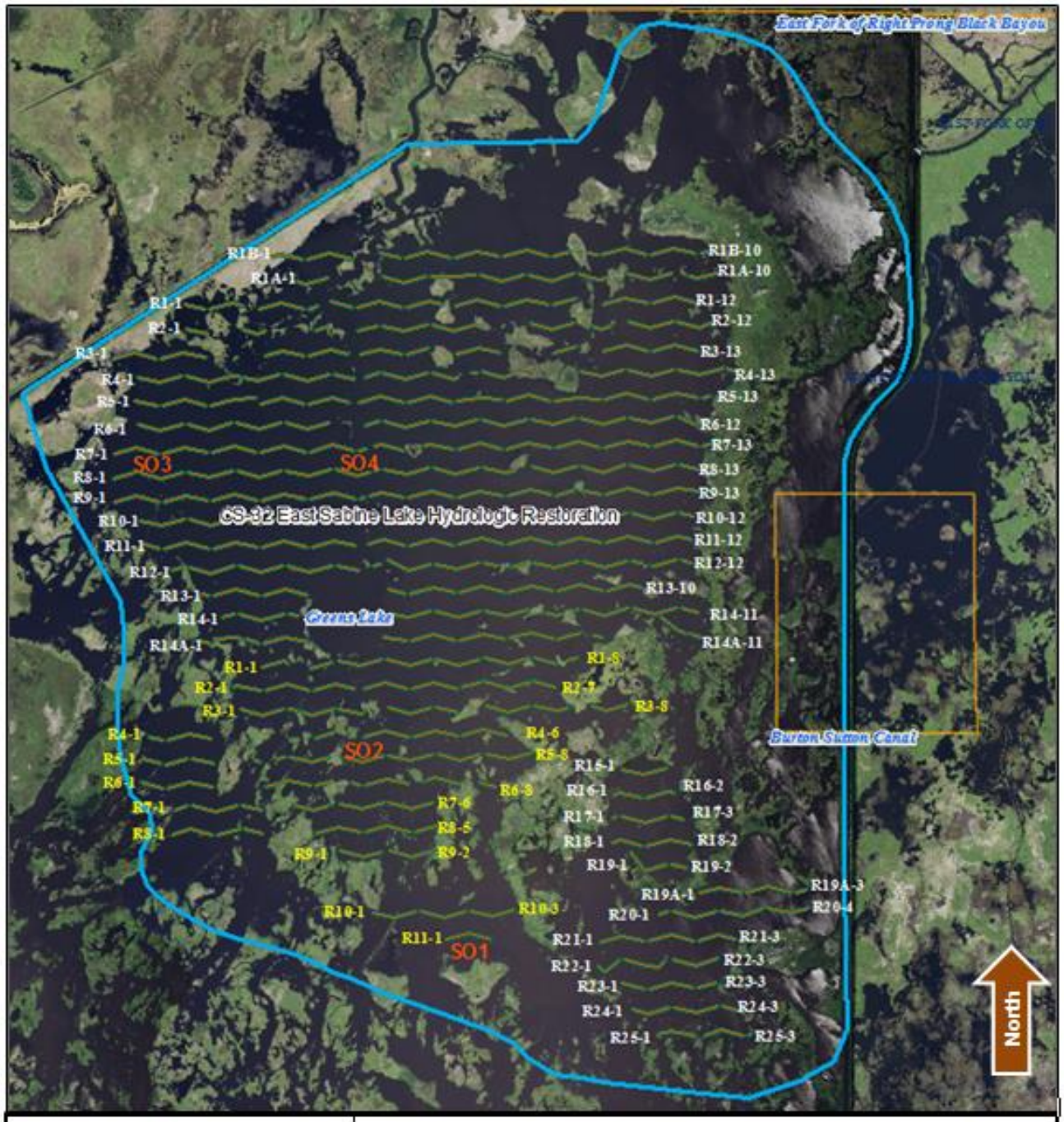
The warning signs marking Willow Bayou will be monitored in the future for repair.

The conditions during this period have been conducive to SAV growth within the interior water bodies and terrace field.

Appendix A

Project Features Map


Pines Ridge
Greens Lake
Sabine Lake
Burton Sutton Canal
Greys Ditch
Bridge Bayou
Willow Bayou
Willow Bayou Canal
Johnsons Bayou
Double Island
Starks South Canal
East Sabine Lake Hydrologic Restoration (CS-32)
Water Control Structure *
Weir *
Rock Dike
Gap in Rock Dike
Terraces
Existing and Proposed Terraces for SNWR
Project Boundary
*denotes proposed features
USGS
science for a changing world
Louisiana
Project Location
N
0.75 0 0.75 1.5
Kilometers
0.75 0 0.75 1.5
Miles
Map Produced by:
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Coastal Restoration Field Station
Baton Rouge, La.
Background Imagery:
2005 Digital Orthophoto Quarter Quadrangle
Map Date: April 26, 2007
Map ID: USGS-NWRC 2007-11-0195
Data accurate as of: April 25, 2007



Label Legend

- CU-1A
- CU-1
- Soil Samples (Oct 2012)

CS-32 East Sabine Lake Hydrologic Restoration

Earthen Terraces

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 (2014)

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 (East) - Warning Signs

Photo No. 11– Sabine Lake Foreshore Rock Dike, near North Warning Sign

Photo No. 12– Sabine Lake Foreshore Rock Dike, North End

Photo No. 13– Pines Ridge Weir, from Project Exterior

Photo No. 14– Bridge Bayou Culverts in Grey's Ditch (2016)

Photo No. 15– Double Island Gully Plug (2016)

Appendix C

Three Year Budget Projection

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

EAST SABINE LAKE HR/ CS-32 / PPL 10

Three-Year Operations & Maintenance Budgets 07/01/2018 - 06/30/2021

Project Manager	O & M Manager	Federal Sponsor	Prepared By
Pat Landry	*Jody White*	*USFWS*	*Jody White*

	2018/2019 (-9)	2019/2020 (-10)	2020/2021 (-11)
Maintenance Inspection	$ 7,487.00	$ 7,712.00	$ 7,943.00
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.	$ -

	2018/2019 (-9)	2019/2020 (-10)	2020/2021 (-11)
Total O&M Budgets	**$ 7,487.00**	**$ 7,712.00**	**$ 7,943.00**

O &M Budget (3 yr Total)	**$ 23,142.00**
Unexpended O & M Budget	**$ 159,917.00**
Remaining O & M Budget (Projected)	**$ 136,775.00**

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: 10-24-17 Structures Time: 11:30 am

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

Structure No. N/A

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

Water Level Inside: Outside: higher than normal due to Hurricane Harvey

Type of Inspection: Annual

Weather Conditions: Cool, sunny, windy and choppy

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Foreshore Rock Dike	Good			6-13	The rock dike is functioning as intended. There are low areas identified along the dike between the south warning sign and the Willow Bayou Bend which will continue to be monitored. The temporary refuge signs installed along the rock dike in the vicinity of Willow Bayou have been pushed over to a 45 deg angle.
Pines Ridge Weir/ Warning Sign	Good			14	The weir is in tact. The water elevation was approximately above normal at the time of the inspection. Water was rushing out of the marsh. During a prior inspection probing showed the center of the weir to be at approximately 3.5ft depth. The warning sign is still in place.
Hardware					
Staff Gauge at Pine Ridge	Good				Still legible
Double Island Gully Plug	N/A				Last inspected in 2016.
Signage /Supports	Good				The warning signs along the foreshore rock dike in Sabine Lake were intact.
Bridge Bayou Culverts	N/A				The culverts were intact during the last inspection in 2016.

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 Last Inspection 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

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Earthen Terraces	Good				Vegetation was well established on the northern terraces with a variety of smooth cordgrass, roseau cane, baccharis, iva, and cattails. The cordgrass spread out beyond the terrace width. There were approximately 5%-7% bare areas. The terraces widths narrowed as traveling south due to wave action.

What are the conditions of the existing levees?	N/A
Are there any noticeable breaches?	N/A
Settlement of rock plugs and rock weirs?	N/A
Position of stoplogs at the time of the inspection?	N/A
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