



State of Louisiana

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

2015/2016 Annual Inspection Report

For

FRESHWATER INTRODUCTION SOUTH OF HWY 82 PROJECT (ME-16)

State Project Number ME-16
Priority Project List 9

November 05, 2015
Cameron and Vermilion Parishes

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I. Introduction

The Freshwater Introduction South of Hwy 82 project was proposed on the 9th priority list of the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA). The project area is located in the central and eastern portions of Rockefeller State Wildlife refuge, on the eastern end of the Grand Chenier ridge, approximately 10 miles (16.09 km) east of the community of Grand Chenier in Cameron and Vermilion Parishes, La. It is bounded to the west by a canal west of Little Constance Bayou south of Deep Lake, to the south by the Gulf shoreline of the unmanaged marsh south of Unit 6, to the east by Rollover Bayou to a line from Flat Lake to the western boundary of Unit 15 and to the north by Louisiana Hwy 82. The project will benefit some 19,988 acres (8,088.87 ha) of which 15,835 acres (6,408.21 ha) are marsh and the remaining 4,153 acres (1,680.66 ha) are open water (Clark 1999). (See Appendix A)

The “Lakes” subbasin of the Mermentau Basin is experiencing high water levels (>2 ft MLG) due to the existence of locks and gates to control water levels and prevent saltwater intrusion into Grand and White Lakes. The Chenier subbasin of the Mermentau Basin is experiencing saltwater intrusion due to the lack of freshwater flow caused by the presence of the hydrologic barriers consisting of Hwy 82 and the Lakes subbasin gates and locks. Marsh loss is occurring in the Chenier subbasin due to saltwater intrusion and in the Lakes subbasin due to high freshwater levels which stress *Spartina patens* (marshhay cordgrass) and certain fresh marsh species and cause increased shoreline erosion along White Lake and Grand Lake (Clark). The objective of this project is to gravitationally move water from Grand and White Lakes (when adequate head differential exists) to marsh areas south of Hwy 82, in order to moderate elevated salinities in the project area, and will create 14 acres (5.67 ha) of marsh through the construction of terraces.

The Freshwater Introduction South of Hwy 82 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 ninth Priority Project List. The Freshwater Introduction South of Hwy 82 Project has a twenty –year (20 year) project life, which began in December 2006.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Freshwater Introduction South of Hwy 82 Project (ME-16) is to evaluate the constructed project features, 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. The annual inspection report also contains a summary of maintenance

projects, if any, 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.

An inspection of the Freshwater Introduction South of Hwy 82 Project (ME-16) was held on November 05, 2015 under clear skies and cool temperatures. In attendance were Dion Broussard and Mark Mouledous of CPRA; Darryl Clark of USFWS; Chance Baccigalipi and William Strong of LDWF. All parties met at the boat launch on the northern end of Unit 14 at LA Hwy 82. The annual inspection began at approximately 9:30 a.m.

The field inspection included a complete visual inspection of all project features. Staff gauge readings, where available, were used to determine approximate elevations of water, earthen terraces, rock dike, 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 any notable deficiencies (see Appendix D).

III. Project Description and History

The Freshwater Introduction South of Hwy 82 Project (ME-16) consists of several project features, including channel excavation, new control structures, modifying an existing structure and terracing. The project was completed in December 2006. The purpose of this project is to reduce salinities in the marshes south of Hwy 82 and reduce turbidities between Units 6 and 14. The principle project features of the Freshwater Introduction South of Hwy 82 Project include the following:

- A. **Louisiana Hwy 82 Channel Enlargement:** Widen and deepen the existing 8 ft. wide X 1 ft. deep trenasse connecting Superior Canal to the LA Hwy 82 Northern Borrow Canal to 20 ft. bottom width, 44 ft. top width X 4 ft. deep. Enlarge the LA Hwy 82 Northern Borrow Canal to 44 ft. top width X 4 ft. deep X 13,565 ft. long.
- B. **Grand Volle North Channel Enlargement and Barricade Construction:**
 - 1) Grand Volle Ditch to Grand Volle Lake Enlargement – Widen and deepen 12,650 lf. of the Grand Volle Canal on the north side of LA Hwy 82 from 10 ft. wide X 1 to 2 ft. deep to 4 ft. bottom width, 28 ft. top width X 4 ft. deep.
 - 2) Barricade Construction – A 100 ft. long timber barricade with 12 in. diameter piles placed 10 ft. apart and boat access gate constructed at the intersection of Grand Volle Ditch and Lake.

- C. **Grand Volle South Channel Enlargement:** Deepen the existing Grand Volle Canal channel on the south side of LA Hwy 82 from 50-60 ft. wide X 1 to 2 ft. deep to 4 ft. bottom width, 28 ft. top width X 4 ft. deep X 3,400 ft. long.
- D. **Earthen Terraces:** Approximately 26,000 lf. of 1,000 ft. long by 36 ft. wide vegetated “duck wing” shaped terraces will be placed in shallow open water between Units 6 and 14.
- E. **Removal of Boundary Line Canal Earthen Plug:** Remove the existing plug in the Superior Canal branch that forms the eastern boundary of Rockefeller Refuge Unit 13 at the NE portion of Unit 13/Unit 6 Boundary Line Canal.
- F. **Little Constance Structure Alteration:** Replace the existing 3-bay radial arm gate structure with four (4) – 4’8” X 6’8” flap gates on the south side and stop logs on the north side to allow fresh water to flow southward when conditions permit.
- G. **New Dyson Structure:** Install a new structure with four 48 in. diameter culverts with flapgates and stoplogs north of the existing Dyson Bayou structure.
- H. **New Cop Cop Structure:** Install a new structure with four 48 in. diameter culverts with flapgates and stoplogs near the plugged Cop Cop Bayou adjacent to the existing Cop Cop Bayou structure.
- I. **Structure No. 10:** Install a new structure with three 48 in. diameter culverts with flapgates in the Boundary Line Levee south of Unit 14.
- J. **Structure No. 12:** Install a new structure with three 48 in. diameter culverts with flapgates and stoplogs in the Boundary Line Levee south of Unit 14.
- K. **Boundary Line Channel Enlargement:** Deepen the existing 60 ft. X 1 ft. deep boundary line channel near the Cameron-Vermilion Parish line to 13,850 ft. long X 30 ft. wide X 5 ft. deep.

The specific goal of the project is:

- 1. Protect and restore intermediate and brackish marshes within the project area over the 20 year project life.

The project strategies are:

1. Introduce fresh water from north to south across Hwy 82, via channel improvements and water control structures to reduce salinities and increase SAV's within Areas A, B, and C.
2. Construct earthen terraces in open water areas of Area B to reduce fetch and wave energy, retain sediments and maintain SAV habitat.

IV. Summary of Past Operation and Maintenance Projects

General Maintenance: Below is a summary of completed maintenance projects and operation tasks performed since December 2006, the construction completion date of the Freshwater Introduction South of Hwy 82 Project (ME-16).

2011 – Hurricane Ike Repairs to New Cop Cop, Structure No. 12, Structure No. 12, New Dyson Structure, and Little Constance water control structures – B & J Marine Services – This maintenance project included placing rock revetment at all five water control structures within the project boundary.

- New Cop Cop – approximately 94 tons of rip rap placed
- Structure No. 12 – approximately 377 tons of rip rap placed
- Structure No. 10 – approximately 159 tons of rip rap placed
- New Dyson Structure – approximately 198 tons of rip rap placed
- Little Constance – approximately 467 tons of rip rap placed

At the time of construction, the contractor uncovered sinkholes above pipes at the New Cop Cop and New Dyson structures. The sinkholes were created by water infiltrating through breeches in the seal between the pipe and headwall. A change order was issued and the contractor repaired the breeches by excavating soil around the pipe, sealing the pipe and headwall with Wet Dry 700 and redi-mix concrete, and then backfilling.

This maintenance project was a result of damages sustained from Hurricane Ike's storm surge in September 2008. The state was reimbursed for this maintenance project by FEMA in 2011.

Construction Costs	\$300,484.44
Engineering and Design, Construction Oversight	\$79,202.27
Total Cost	\$379,686.71

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Structure Operations:

Operation Plan Control Structure	Structure Type	Area Controlled	Salinity Target Level	Water Target Level	Operation
Little Constance Control Structure Note: no change to Big Constance Structure	Existing structure modified from 3 - 10 ft wide X 8 ft deep radial arm gates to flapgates on the south side and stoplogs on the north side.	Unit 6 and Area A Unmanaged-unit	5/10 ppt @ Superior Canal-Hwy 82 Bridge	3" below marsh level (0.75 feet NAVD88)	<u>Maintenance</u> – All flapgates open and stop logs removed when target levels not exceeded. <u>Salinity Target</u> – 2 bays closed (i.e., flapgates lowered) when 5 ppt salinity target level reached, stoplogs removed; all bays closed (all 3 flapgates lowered) when 10 ppt salinity reached, stoplogs removed. <u>Water Level Target</u> – Stoplogs set at marsh level to 0.5 feet below marsh level when water levels reach target levels (3 inches BML or 0.75 ft NAVD88) or less.
Existing Dyson Bayou and Bayou Josephine WCSs	4 – 48 inch diameter culverts with flapgates on south and stop logs on north (Unit 6) side.	Unit 6 and Area A	5/10 ppt @ Superior Canal-Hwy 82 Bridge	3" below marsh level (0.75 feet NAVD88)	<u>Maintenance</u> – All gates flapping, stop logs at 2 ft below marsh level <u>Water Level Target</u> – Stop logs set at marsh level to 0.5 ft below marsh level when water levels approach target levels (0.75 ft NAVD88) @ Superior Canal.
New Dyson Bayou WCS	4 – 48 inch diameter culverts with flapgates on south and stop logs on north (Unit 6) side.	Unit 6 and Area A	5/10 ppt @ Superior Canal-Hwy 82 Bridge	3" below marsh level (0.75 feet NAVD88)	<u>Maintenance</u> – All gates flapping, stop logs at 2 ft below marsh level <u>Water Level Target</u> – Stop logs set at marsh level to 0.5 ft below marsh level (1.0 ft to 0.5 ft) when water levels approach target levels (0.75 ft NAVD88) @ Superior Canal.
Existing Cop-Cop Bayou WCS	4 – 48 inch diameter culverts with flapgates on south and stop logs on north side.	Area A and Areas B and C	6 ppt @ Area A at Unit 14 station	3" below marsh level (0.75 feet NAVD88)	<u>Maintenance</u> – All gates flapping, stop logs at 2 ft below marsh level <u>Ingress Period</u> (May-June) – Flapgates raised; Stop logs at 2 ft below marsh level or lower <u>Water Level Target</u> – Stop logs set at marsh level to 0.5 ft below marsh level (1.0 ft to 0.5 ft) when water levels approach target levels (0.75 ft NAVD88) @ Superior Canal.
New Cop-Cop Bayou, New Structures 10 and No. 12 WCS	4 – 48 inch diameter culverts with flapgates on south and stop logs on north side.	Area A and Areas B and C	6 ppt @ Area A at Unit 14 station	3" below marsh level (0.75 feet NAVD88)	<u>Maintenance (Always)</u> – All gates flapping, stop logs at 2 ft or greater below marsh level <u>Water Level Target</u> – Stop logs set at marsh level to 0.5 ft below marsh level (1.0 ft to 0.5 ft) when water levels approach target levels (0.75 ft NAVD88) @ Superior Canal.

V. Inspection Results

New Cop-Cop Structure

The structure is in good condition. Rock revetment looks good. (Photos: Appendix B, Photos 1 & 2)

Perry Bayou Structure (Formerly Structure No. 12)

Overall this structure is in good condition. Rock revetment looks good. (Photos: Appendix B, Photo 3 & 4)

McNeese Bayou Structure (Formerly Structure No. 10)

Overall this structure is in good condition. Rock revetment looks good. (Photos: Appendix B, Photo 5 & 6)

Earthen Terraces

The terraces were not inspected during this field trip.

Grand Volle South Channel Enlargement

This area was not inspected during this field trip.

Hess' Cut (Formerly New Dyson Structure)

Overall this structure is in good condition. Rock revetment looks good. (Photos: Appendix B, Photo 7 & 8)

Little Constance Structure

Overall this structure is in good condition. Rock revetment looks good. (Photos: Appendix B, Photo 9 & 10)

Louisiana Highway 82 Channel Enlargement

This area was not inspected during this field trip.

Grand Volle North Channel Enlargement and Marine Barrier

This area was not inspected during this field trip.

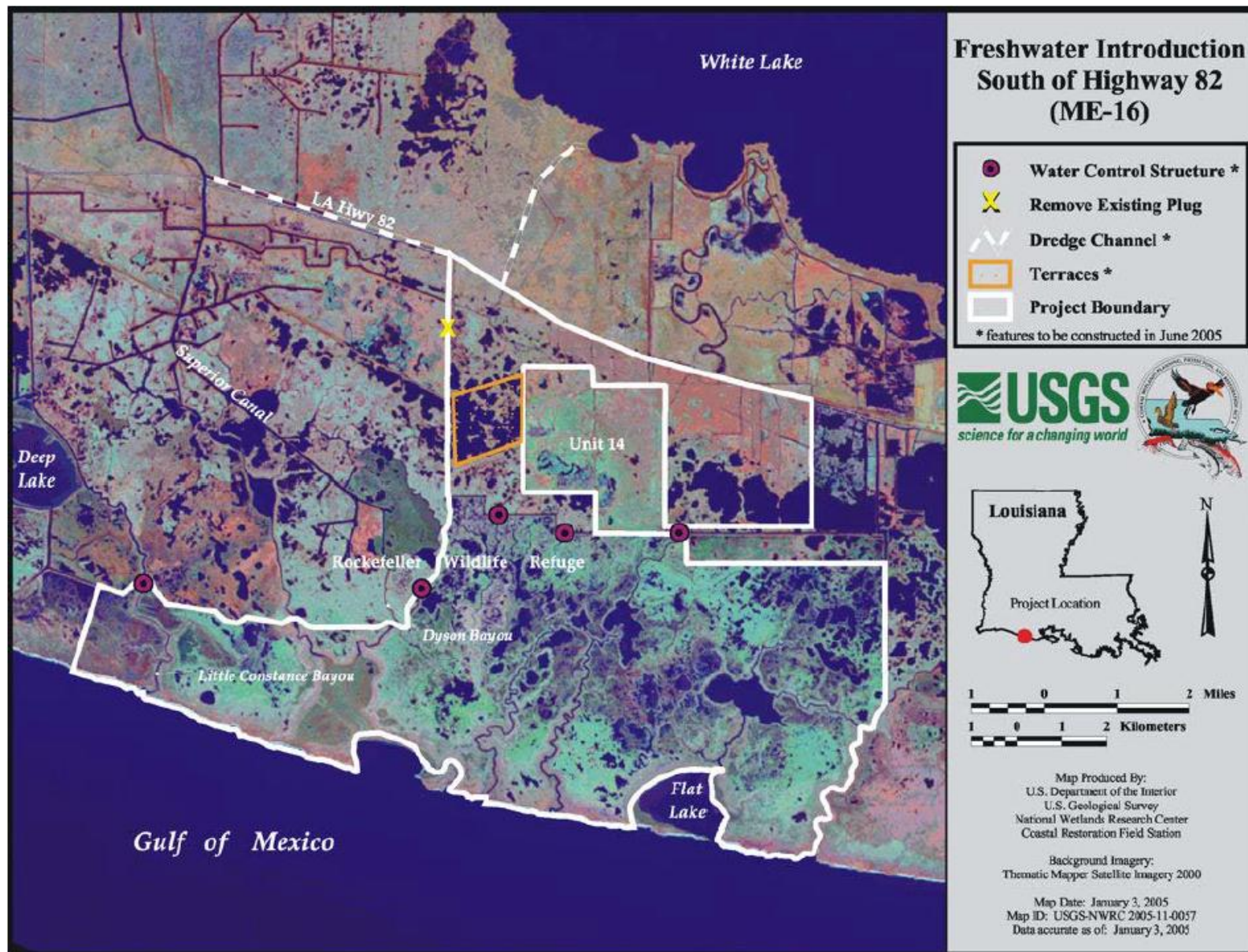
Boundary Line Channel Enlargement and Earthen Plug Removal

This area was not inspected during this field trip.

VI. Conclusions and Recommendations

Overall the Freshwater Introduction South of Hwy 82 Project is in good condition and functioning as intended.

Appendix A
Project Features Map



Appendix B

Photographs



Photo No. 1, New Cop-Cop Structure, outlet side of structure.



Photo No. 2, New Cop-Cop Structure, inlet side of structure.



Photo No. 3, Perry Bayou Structure, outlet side of structure.



Photo No. 4, Perry Bayou Structure, inlet side of structure.



Photo No. 5, McNeese Bayou Structure, inlet side of structure.



Photo No. 6, McNeese Bayou Structure, outlet side of structure.



Photo No. 7, Hess' Cut Structure, outlet side of structure.



Photo No. 8, Hess' Cut Structure, inlet side of structure.



Photo No. 9, Little Constance Structure



Photo No. 10, Little Constance Structure, west side of structure.

Appendix C

Three Year Budget Projection

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FRESHWATER INTRODUCTION S. OF HWY 82/ ME-16 / PPL 9
Three-Year Operations & Maintenance Budgets 07/01/2016 - 06/30/2019

<u>Project Manager</u>	<u>O & M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
Darrell Pontiff	Dion Broussard	USFWS	Dion Broussard

	2016/2017 (-10)	2017/2018 (-11)	2018/2019 (-12)
Maintenance Inspection	\$ 7,057.00	\$ 7,269.00	\$ 7,487.00
Structure Operation			
State Administration		\$ -	\$ -
Federal Administration		\$ -	\$ -

Maintenance/Rehabilitation

16/17 Description:

E&D	\$0.00
Construction	\$0.00
Construction Oversight	\$0.00
Sub Total - Maint. And Rehab.	\$ -

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.	\$ -

	2016/2017 (-10)	2017/2018 (-11)	2018/2019 (-12)
Total O&M Budgets	\$ 7,057.00	\$ 7,269.00	\$ 7,487.00

O & M Budget (3 yr Total)	\$ 21,813.00
Unexpended O & M Budget	\$ 29,332.00
Remaining O & M Budget (Projected)	\$ 7,519.00

Appendix D
Field Inspection Form

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MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: ME-16 Freshwater Intro. S of Hwy 82

Date of Inspection: November 05, 2015

Time: 11:00 am

Structure No. Little Constance

Inspector(s): Dion Broussard and Mark Mouledous (CPRA), Darryl Clark (USFWS)
 Chance Baccigalipi and William Strong (LDWF)

Structure Description: Variable crest concrete control structure
 Four 4'-8" X 6'-8" flapgates w/ stop logs

Water Level Inside Outside:

Type of Inspection: Annual

Weather Conditions: clear and cool

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Concrete Control Structure	Good				
Flap Gates	Good				
Stop Logs	Good				
Hardware	Good				
Timber Piles	N/A				
Timber Walkway	N/A				
Timber Wales	N/A				
Galv. Pile Caps	N/A				
Cables	Good				
Signage /Supports	N/A				
Staff Gages	N/A				
Rip Rap (fill)	Good			9 & 10	
Earthen Embankment	N/A				

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

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MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: ME-16 Freshwater Intro. S of Hwy 82

Date of Inspection: November 05, 2015

Time: 10:30 am

Structure No. Hess' Cut

Inspector(s): Dion Broussard and Mark Mouledous (CPRA), Darryl Clark (USFWS)
 Chance Baccigalipi and William Strong (LDWF)

Structure Description: Variable crest aluminum culverts
 Four 48" diameter culvs. w/ flapgates and stop logs

Type of Inspection: Annual

Water Level Inside: Outside:
 Weather Conditions: clear and cool

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Flapgates	Good				
Steel Grating	Good				
Stop Logs	Good				
Hardware	Good				
Timber Piles Timber Walkway	Good				
Timber Wales	Good				
Galv. Pile Caps	Good				
Culverts	Good				
Signage /Supports Staff Gages	N/A				
Rip Rap (fill)	Good			7 & 8	
Earthen Embankment	Good			7 & 8	

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

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MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: ME-16 Freshwater Intro. S of Hwy 82

Date of Inspection: November 05, 2015 Time: 9:30 am

Structure No. New Cop Cop

Inspector(s): Dion Broussard and Mark Mouldous (CPRA), Darryl Clark (USFWS)
Chance Baccigalipi and William Strong (LDWF)

Structure Description: Variable crest aluminum culverts
Four 48" diameter culvs. w/ flapgates and stop logs

Water Level Inside: Outside:
Weather Conditions: clear and cool

Type of Inspection: Annual

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Flapgates	Good				
Steel Grating	Good				
Stop Logs	Good				
Hardware	Good				
Timber Piles	Good				
Timber Walkway					
Timber Wales	Good				
Galv. Pile Caps	Good				
Culverts	Good				
Signage /Supports	N/A				
Staff Gages					
Rip Rap (fill)	Good			1 & 2	
Earthen Embankment	Good				

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

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MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: ME-16 Freshwater Intro. S of Hwy 82

Date of Inspection: November 05, 2015

Time: 10:15 am

Structure No. McNeese Bayou

Inspector(s): Dion Broussard and Mark Mouledous (CPRA), Darryl Clark (USFWS)
Chance Baccigalipi and William Strong (LDWF)

Structure Description: Variable crest aluminum culverts
Three 48" diameter culvs. w/ flapgates and stop logs

Water Level Inside: Outside:

Type of Inspection: Annual

Weather Conditions: clear and cool

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Flapgates	Good				
Steel Grating	Good				
Stop Logs	Good				
Hardware	Good				
Timber Piles	Good				
Timber Walkway					
Timber Wales	Good				
Galv. Pile Caps	Good				
Cables	N/A				
Signage /Supports	N/A				
Staff Gages					
Rip Rap (fill)	Good			5 & 6	
Earthen Embankment	Good			5 & 6	

What are the conditions of the existing levees?

Are there any noticeable breaches?

Settlement of rock plugs and rock weirs?

Position of stoplogs at the time of the inspection?

Are there any signs of vandalism?

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MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: ME-16 Freshwater Intro. S of Hwy 82

Date of Inspection: November 05, 2015

Time: 10:00 am

Structure No. Perry Bayou

Inspector(s): Dion Broussard and Mark Mouledous (CPRA), Darryl Clark (USFWS)
Chance Baccigalipi and William Strong (LDWF)

Structure Description: Variable crest aluminum culverts
Three 48" diameter culvs. w/ flapgates and stop logs

Water Level Inside: Outside:

Type of Inspection: Annual

Weather Conditions: clear and cool

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	Good				
Stop Logs	Good				
Hardware	Good				
Timber Piles	Good				
Timber Wales	Good				
Galv. Pile Caps	Good				
Cables	N/A				
Signage /Supports Staff Gages	N/A				
Rip Rap (fill)	Good			3 & 4	
Earthen Embankment	Good			3 & 4	

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