



**State of Louisiana
Coastal Protection and Restoration Authority**

2016 Annual Inspection Report

for

**CAERNARVON OUTFALL
MANAGEMENT
(BS-03a)**

State Project Number BS-03a
Priority Project List 2

July 2016
Plaquemines Parish

Prepared by:

Kathleen Eubanks and
David Chambers, P.E.
Coastal Protection and Restoration Authority
New Orleans Regional Office
CERM, Suite 309
2045 Lakeshore Drive
New Orleans, LA 70122



**2016 Annual Inspection Report
for
Caernarvon Outfall Management
(BS-03a)**

Table of Contents

I. Introduction.....	1
II. Inspection Purpose and Procedures	2
III. Project Description and History.....	1
IV. Summary of Past Operations and Maintenance Projects	5
V. Inspection Results	6
VI. Conclusions and Recommendations.....	8

Appendices

Appendix A	Project Features Map
Appendix B	Photographs
Appendix C	Three Year Operations & Maintenance Budgets Projection
Appendix D	Field Inspection Form



I. Introduction

The Caernarvon Outfall Management Project (State Project No. BS-03a) was approved on the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) Second Priority Project List. The project is located to the south and west of Big Mar, a body of water which formed as the result of a failed agricultural impoundment. The project features are located entirely in Plaquemines Parish, and the project outfall area encompasses 15,556 acres in Plaquemines Parish. Project features are located on a number of streams in the outfall area. A map of the project area is included in Appendix A.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Caernarvon Outfall Management Project (BA-03a) is to evaluate the constructed project features to identify any deficiencies and to prepare a report detailing the condition of project features and recommending corrective actions needed. Should it be determined that corrective actions are needed, CPRA shall provide a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs (O&M Plan May 15, 2003). The annual inspection report also contains a summary of maintenance projects 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 Caernarvon Outfall Management Project are outlined in Section IV.

This annual inspection of the Caernarvon Outfall Management Project (BA-03a) was performed on July 5th, 2016. Weather consisted of mostly cloudy skies, a temperature of approximately 84°F, and winds out of the SSE at around 6 knots. Taking part in the inspection were: David Chambers, Erin Plitsch, and Kathleen Eubanks of CPRA, the non-federal sponsor; Loland Broussard of NRCS, the federal sponsor; and Rob Buck of SeaTow, the operations and maintenance contractor. On the date of the inspection, the diversion structure was closed. The Marsh Gage reading was -0.50 feet NGVD and the River Gage reading was approximately +3.40 feet NGVD, although the numbers and markings on the gage near the water surface were illegible due to fouling from the river. The water level in the channel is +0.20 feet (Photo 26). Except as otherwise noted, the photographs included in Appendix B were taken at the time of the inspection.

Note: R. E. Buck Inc. DBA SeaTow Westbank, the O & M contractor for this diversion and the outfall project are often called upon to conduct specific inspections and perform maintenance tasks periodically between these annual inspections.



III. Project Description and History

The Caernarvon Freshwater Diversion Structure on the east bank of the Mississippi River near Big Mar, was placed into operation in August 1991. The Caernarvon structure was funded by the Water Resources Development Act and constructed for the purpose of diverting Mississippi River water through Big Mar into the marshes to the south and west of Big Mar. Since the early 1900's, these marshes had deteriorated, largely due to being isolated from direct river influxes by the construction of levees. This isolation, with the resultant absence of minerals and nutrients formerly regularly deposited during high river stages, caused a net loss of the organic soils prevalent in the project area. The specific mechanisms causing the soil loss included natural subsidence, erosion, salt water intrusion and oxidation.

In addition to the losses due to Mississippi River levee construction, the increased construction of navigation and oil/gas canals in the project area contributed to the problem. These straight canals provided a perfect avenue for saltwater intrusion, and the canals' high water velocity led to increased erosion rates.

An earlier hurricane also contributed to the loss of wetlands in the project area. In 1965, storm surges from Hurricane Betsy traveled over the above-discussed canals, and the forested swamp area in the northern part of the project area was destroyed by salt stress as the salt water from the storm surge became trapped behind Tigers Ridge.

From 1932 to 1990, approximately 5,550 acres of land in the project area were converted to open water via the above-discussed mechanisms. By 1978, saltwater intrusion had transformed the project area from a primarily intermediate marsh to primarily a brackish marsh. In addition, Hurricane Katrina (2005) caused significant damage to the entire project area.

The Caernarvon Freshwater Diversion Structure was intended to counter some of the mechanisms causing wetlands loss in the project area, primarily saltwater intrusion. Specifically, the Caernarvon structure was intended to increase wildlife and fisheries productivity, enhance emergent marsh vegetation growth, and reduce marsh loss.

The structure has a design discharge capacity of approximately 8,000 cubic feet of freshwater per second. Presently, 90% of the diversion water exits to the southeast via Bayou Mandeville into Lake Lery. With 90% flowing to the southeast of Big Mar, only 10 % flows to the more-deteriorated marshes to the southwest of Big Mar. Prior to Hurricane Katrina, Gustav (2008) and Ike (2008), those percentages were closer to 66%—34%, respectively. An additional problem is that, prior to the present Caernarvon Outfall Management Project, much of the flow of water to the southwest channeled rapidly to the lower reaches of the basin and did not inundate the interior marshes as was originally intended. The present project promotes better utilization and distribution of water from the Caernarvon Freshwater Diversion Structure. As designed, project features allow water from the channels to flow into the marsh interior and cause the water to be retained in the marsh for a longer period of time.



The Caernarvon Diversion Outfall Management Project took one year to complete, starting on June 11, 2001 and completing on June 14, 2002. Because of change orders and other contractual issues, the Final Acceptance was not made until September 10, 2002. The Outfall Project receives fresh water from the Mississippi River through the Caernarvon Diversion Structure located on the east bank of the Mississippi River near the St. Bernard / Plaquemines Parish line. The Outfall Project benefit area consists of 18,200 acres and is bounded by the Forty Arpent Canal levee to the north and west, and by Lake Lery, Bayou Mandeville, and the Caernarvon Canal to the east. The southern boundary is a composite of undifferentiated marsh, Reggio Canal, the Pipeline Canal, and River aux Chenes.

The objective of the Outfall Project is to promote better utilization and distribution of freshwater and nutrients from the Mississippi River, introduced in the project area by the Caernarvon Structure, during low-diversion discharge periods. Management of the outfall will allow the water from existing channels into the interior of the marshes. Placement of plugs and culverts along with designated spoil bank restoration is expected to enhance water retention and distribution within the project area.

The project features are listed below:

Inspection photos of the features are shown in Appendix B of this report. Elevations are NAVD 88.

A. Site/Structure # 13 – Earthen channel plug with riprap armor located along the west bank of Bayou Mandeville. The plug is set at an elevation of +4.0 ft. and is 100 ft. long x 100 ft. wide with 18 inches of riprap armor. The crest of the structure is 10 ft. wide. The plug includes a one (1) 48” diameter corrugated aluminum pipe which passes through the rock fill plug at an elevation of -3.5 ft. with an aluminum combination gate attached to the pipe on the interior side of the marsh. A timber walkway to the gate is at elevation +4.0.

B. Site/Structure # 25 - Earthen channel plug with riprap armor located on the Forty Arpent Canal near Big Mar. The plug is set at an elevation of +4.0 ft. and is 169 ft. long and 100 ft. wide with 18 inches of riprap armor. The crest of the structure is 10 ft. wide. The plug includes two (2) 48” diameter corrugated aluminum pipes which pass through the rock fill (and are supported by the rock fill) at an elevation of -4.0 ft. Earth fill has been placed on each side of the rock fill. Aluminum canal gates are attached to the end of each pipe on the exterior side of the marsh. A timber walkway to the gates is at elevation +4.0.

C. Site/Structure # 26 – Earthen channel plug with riprap armor plate located along Reggio Canal spoil bank. The plug is set at a crest elevation of +4.0 ft. and is 154 ft. long and 100 ft. wide and is capped with 18 inches of riprap rock. The crest of the structure is 10 ft. wide. The plug includes four (4) 48” corrugated aluminum pipe which pass through the earthen material at an elevation of -4.0 ft. Aluminum canal gates are attached to the end of each pipe on the exterior side of the marsh. The pipe and gates are supported by a timber pile system. A timber walkway is installed at elevation +4.0 ft.



D. Site/Structure # 32 – Riprap channel plug across an unnamed channel which flowed into Lake Lery at the west end of the lake. The plug is 117 ft. long and the 6 ft. wide plug crest is set at +4.0 ft. The 70 ft. stretch of channel from the plug eastward to Lake Lery has 2 feet thick riprap placed on both channel banks. Upon implementation of the BS-16 CWPPRA Project, this structure site will be completely covered with the spoil bank restoration feature of that project and will no longer be a component of the BS-03a Project. Construction of the BS-16 Project began in March 2015 and is still in progress as of July 2016. It is scheduled to be completed before the end of the year.

E. Site/Structure # 40 – Earthen channel plug with riprap armor along the Reggio canal spoil bank. The plug is 142 ft. long and 100 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes 2- 48” diameter corrugated aluminum pipes which pass through the rock fill at an elevation of -4.0 ft. Earth fill was placed on each side of the rock fill. The entire structure is capped with an 18” thick layer of rip-rap. Aluminum canal gates are attached to the ends of the aluminum pipes on the exterior side of the marsh. The pipe and gates are supported by a timber pile system, and a timber walkway to the gates is installed at elevation +4.0 ft.

F. Site/Structure # 50 – Earthen channel plug with riprap armor along the west bank of Bayou Mandeville. The plug is 55 ft. long and 100 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes one (1) 48” diameter corrugated aluminum pipe through an aggregate embankment at an elevation of -3.5 ft. The embankment is capped with an 18” thick layer of rip-rap. The pipe has a combination gate attached on the pipe end on the interior side of the marsh. The pipe and gate are supported by a timber pile system, and a timber walkway to the gate is installed at elevation +4.0.

G. Site/Structure #51 – Riprap plug across a pipeline channel that flows into Bayou Mandeville. The plug is approximately 150 ft. long x 30 ft. wide. The plug crest is set at elevation +4.0 ft. This was an existing structure during the construction of the BS-03a Project and will be maintained by the pipeline company.

H. Site/Structure # 52 – Earthen channel plug with riprap armor along DP Canal spoil bank. The plug is 100 ft. long and 100 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes two (2) 36” diameter corrugated aluminum pipes through the embankment at -3.0 ft. The embankment is capped with a 18” thick layer of riprap. Aluminum combination gates are attached to the end of each pipe on the interior side of the marsh. The two pipes are supported by a timber pile system, and a timber walkway to the gates is installed at elevation +4.0.

I. Site/Structure # 54 – Earth fill channel plug with riprap armor located at the intersection of Reggio Canal and Promised Land Canal. The plug is 140 ft. long and 150 ft. wide. The crest of the structure is 10 ft. wide and is set at an elevation of +4.0 ft. The plug includes two (2) 48” diameter corrugated aluminum pipes through the rock fill portion of the embankment at an elevation of -4.0 ft. Earth fill was placed on each side of the rock fill. The entire embankment is capped with a 18” thick layer of riprap. Aluminum canal gates are attached to the end of each



pipe on the exterior side of the marsh. The pipes and gates are supported by a timber pile system, and a timber walkway to the gates installed at elevation +4.0 ft.

As a maintenance event following the installation of Structure #54, the existing spoil bank on the south side of Promised Land Canal was degraded in three locations on the west side of Structure # 54. The excavated material was placed on the south side behind the existing spoil bank.

J. Site/Structure # 56 - Rock riprap channel plug across an unnamed channel on the east side of the Reggio Canal. The plug is 208 ft. long and the side slopes of the plug are 3 horizontal to 1 vertical. The crest of the structure is 6 ft. wide and is set at an elevation of +4.0 ft.

K. Site #57 – Consists of 5,315 linear feet of spoil bank restoration along the east side of the Reggio Canal between the Delacroix Canal and Site # 54. The spoil bank restoration consists of an earth fill embankment placed on existing spoil to an elevation of +4.0 ft. with a 12 ft. top width and 3 horizontal to 1 vertical side slopes. The entire length of embankment was seeded to permanent vegetation

L. Site # 58 – Consists of 5,244 linear ft. of spoil bank restoration along the west side of Bayou Mandeville between the Delacroix Canal and Site # 13. The spoil bank restoration consists of an earth fill embankment placed on existing spoil to an elevation of +4.0 ft. with a 12 ft. top width and 3 horizontal to 1 vertical slope. The entire length of embankment was seeded to permanent vegetation.

M. Site/Structure # 60 – Rock fill channel plug at the intersection of Reggio Canal and an existing pipeline canal. The plug is 200 ft. long and 100 ft. wide. The crest of the structure is 10 ft. wide and set at an elevation of +4.0. The adjacent earthen plug with riprap armor includes two (2) 36” diameter corrugated aluminum pipes through the earthen plug at an elevation of -3.0 ft. The entire length of the plug is capped with an 18” layer of riprap. Aluminum combination gates are attached to the end of each aluminum pipe on the interior side of the marsh. The pipes and gates are supported by a timber pile system, and a timber walkway to the gates is installed at elevation +4.0 ft.

IV. Summary of Past Operation and Maintenance Projects

General Maintenance

Flow meters were originally installed at structures #26, #40, and #54, to monitor the flow of fresh water into the interior marshes and determine if it was necessary to maintain the associated channels to increase flow through these structures. These flow meters were damaged during Hurricane Katrina in August 2005 and replaced in July 2011. Due to storms and malfunctioning equipment, the first full and complete set of flow data was not received until March 2012.

In September 2012, the flow meter at structure #26 was removed after the sensor was damaged. The decision was made to discontinue the flow monitoring at this site rather than to replace the damaged instrument.

Although the flow data collected since the initiation of this flow monitoring effort is sporadic due to storm damages and equipment malfunctions, the quantity of data collected to date was sufficient to determine that flow through the structure was adequate, and no further maintenance events would be necessary. Therefore, ongoing continuous monitoring of flows at these sites was no longer required, and the flow meters were removed in December 2014.

The inspection team recorded no breaches in the spoil banks at the time of the 2016 inspection. However, there has been noticeable erosion along the banks as a result of increased boat traffic. This is evidenced by the occasions of soil being washed from the roots of small trees and shrubs that then fall inward to the water. Site #52 has a breach on the east side of the structure that has been growing since it was last plugged in 2011. The contractor has plugged breaches at Sites #13 and #60 using material from Site #32 which is no longer operational and is now under the jurisdiction of the Lake Lery Shoreline Protection Project (BS-16).

The O & M Contractor implements a maintenance schedule that keeps the project features in good operating condition. Some of the O & M tasks include: lubricating and periodic operation of each structure, cleaning and maintaining the wooden platforms, and spraying of the area for unwanted vegetation and insects. Periodic inspections of all project features also are performed and deficiencies are corrected.

2016 Structure Operations

The structure operation calls for sluice gates to remain open except during waterfowl season, when the gates at structures #52 and #60 may be operated at the discretion of the landowner. Combination gates are to operate passively as designed year-round; however, some were not in the lowered position, probably because adjacent breaches and/or low areas have rendered the structures ineffective. The contractor continues to perform periodic O & M of each of the gated structures; this includes cleaning and maintaining the timber platforms and periodic inspections as directed by CPRA.

In May 2014, the contract for operation of the main diversion structure was re-bid, with the operation and maintenance of the outfall structures included. That contract went into effect on July 1, 2014 and has been renewed for 2015. Upon agreement with both parties, the contract may be renewed annually over a three year period. The current three year period will end on June 30th, 2017.

V. Inspection Results (See Appendix B for photos of each site)

The diversion structure was flowing at 0 cfs, providing no additional flow throughout the project area. When flowing, the diverted waters exit Big Mar through Delacroix Canal to the southwest and Bayou Mandeville to the southeast. Due to previous unsuccessful efforts to inspect structure #25, the inspection team excluded it from the report. Additionally, structure #32 was excluded from the inspection as it is now under the jurisdiction of the Lake Lery Shoreline Protection



Project (BS-16). The spoil created by the Delacroix Canal dredging in 2011 has vegetated with willow trees, shrubs, and tall grasses.

- A. **Site/Structure # 13** –The combination gate was in the up/open operating position to allow maximum uninterrupted tidal exchange into the marsh. The gate has a slight tilt, but it is not affecting the function. The timber walkway still lays separated from its support beam at one end and the boards are uneven. There is a wood plank in place connecting the rock dike to the wooden platform. The rock from Site #32 used to plug the breach in the rock dike remains in place and at proper elevation. (See Photos 1 - 3)
- B. **Site/Structure # 25** – The inspection team did not attempt to inspect this feature. (See Photos 4-6 from a site visit in 2015)
- C. **Site/Structure # 26** – The gates were in the open position allowing water flow. There is vegetation covering about 30% of the earthen/rock closure, some has been cleared since the last inspection. The flow meter at this site was damaged during Isaac in September 2012. The decision was made to no longer monitor flow at this gate. The structure and outfall appear to be in good condition. The boardwalk on the back side of the structure is partly covered with water hyacinth. (See Photos 7 & 8)
- D. **Site/Structure # 32** – The team did not inspect this feature. Katrina devastated that portion of the lake rim rendering this structure ineffective. It is now under the jurisdiction of the Lake Lery Shoreline Protection Project (BS-16). (No Photo)
- E. **Site/ Structure # 40** – The gates remain in the open position. The structure is in good condition. Dead water hyacinth covers the boardwalk on the back side of the structure. The flow meter at this site was removed in December 2014 based on the decision to discontinue flow monitoring at this structure.(See Photos 9 & 10)
- F. **Site/Structure # 50** – The combination gate was in the up/open position. The breach in the rock dike was repaired with material from Site #32 and remains intact. The boardwalk remains bowed with one plank that is not attached to the support beams. There is vegetation covering about 70% or the rock dike. (See Photos 11 – 13)
- G. **Site/Structure #51** – Plug is heavily vegetated. Maintenance is not required at this structure. (See Photo 14)
- H. **Site/Structure #52** – The two combination gates were in the open position. A breach previously repaired by the dredging contractor has been re-opened and is between 20-25feet in width and estimated to be about 7 feet deep. The breach is allowing unimpeded flow between the channel and marsh. The boards are uneven when walked on and detached in some areas. (Photos 15 - 17)
- I. **Site/Structure # 54** – The gates remain in the open position. No flow was visible through the culverts. The flow meter at this site was removed in December 2014 based on the decision to



discontinue flow monitoring at this structure. The rocks have been cleared of most vegetation. There are some barnacles on the gate and pilings, although they appear to be dead. (See 2012 Photos 18 & 19)

- J. Site/ Structure # 56** –There are large shrubs on about 20% of the rock dike. The water is slightly below the crest of the rock dike and there is no water exchange. One warning sign is still severely leaning and needs to be up righted and cleaned (Hurricane Katrina damage). (See Photos 20 & 21)
- K. Site # 57** – The spoil bank along the side of Reggio Call is well vegetated with trees, shrubs, and grasses. No gaps were noticed, however, erosion was noticed along the spoil bank, washing soil off the roots of trees. (No Picture)
- L. Site # 58** –The vegetation on the spoil bank along the sides of the Bayou Mandeville includes grasses, shrubs, and trees. No gaps were noticed, but there was one noticeable low spot, possibly from boats being pulled over at that point. Erosion was noticed along the spoil bank, likely caused by increased boat traffic. This has resulted in soil being washed off the roots of trees and the trees falling into the bayou. (See Photo 22)
- M. Site/Structure # 60** – The two combination gates were in the up/open position. Overall condition of the structure is good. The small breach on the east side of the structure has been repaired using material from Site #32. There is a low area of rocks on the east side of the backside of the structure where it appears rocks have been moved from the dike into the adjacent water. (See Photos 23 - 25)

VI. Conclusions and Recommendations

Project Condition

CPRA concludes that the outfall management project needs evaluation by both federal and state parties to determine the effectiveness of the culverts and plugs. Many of the sectors outlined in the original project no longer have distinct borders. A maintenance event of this project would include using rock or sheet piling to close gaps and fill failure areas to reestablish the sector boundaries.

The CWPPRA project South Lake Lery Marsh Creation and Shoreline Restoration (BS-16) is currently under construction. Although budget constraints have modified the Lake Lery shoreline rehabilitation for the western shoreline, the rock closure (structure #32) will be incorporated into this project. The project modification removed the marsh fill cell located behind the western shoreline.

Priority Gap Closures

There is a gap at Site #52 which has been growing in size over the past few years. It is estimated to be 20 to 25 feet in width and the depth of the water is estimated to be around 7 feet. CPRA



and NRCS discussed with the contractor the possibility of using material from site #32 to plug the breach.

Structures

Another recommendation is to repair the decks at structures #13 and #50. The deck at structure #13 is not attached to the supports at one end, and the deck at structure #50 is bowed with one plank detached. The operator mentioned his plan to drill a new hole and nail down the detached plank at structure #50.

The warning sign on the west end of site #56 needs to be cleaned and the piling needs to be re-driven in an upright position.

APPENDIX A

Project Features Map



Caernarvon Diversion Outfall Management (BS-03a)



Date: 2011-04-25
Map ID: OCPR-NOFO-SM0066

- Rock Riprap Plug
- Culvert with Interior Combination Gate
- ▲ Culvert with Exterior Sluice Gates
- Spoil Bank Restoration
- - - Strata_Boundaries
- - - BS-03a Project Boundary
- Reference Areas

Data Source:
Office of Coastal Protection and Restoration
GIS Spatial Database Engine

2008 DOQQ Satellite Imagery
GCS_North_American_1983



APPENDIX B

Photographs



Photo No. 1, Site 13



Photo No. 2, Site 13



Photo No. 3, Site 13



Photo No. 4, Site 25 (6-23-15)



Photo No. 5, Site 25 (6-23-15)



Photo No. 6, Site 25 (6-23-15)



Photo No. 7, Site 26



Photo No. 8, Site 26



Photo No. 9, Site 40



Photo No. 10, Site 40



Photo No. 11, Site 50



Photo No. 12, Site 50



Photo No. 13, Site 50



Photo No. 14, Site 51



Photo No. 15, Site 52



Photo No. 16, Site 52



Photo No. 17, Site 52



Photo No. 18, Site 54



Photo No. 19, Site 54



Photo No. 20, Site 56



Photo No. 21, Site 56



Photo No. 22, Site 58



Photo No. 23, Site 60



Photo No, 24, Site 60



Photo No. 25, Site 60



Photo No. 26, Channel Water Level

Appendix C

Three-Year Operations & Maintenance Budgets

Appendix D
Field Inspection Form

FIELD INSPECTION CHECK SHEET

Project No. / Name:	Caernarvon Outfall Management BS-03a			Date of Inspection:	7/5/2016	Time:	10:30 AM
Structure No.	See Report Section III			Inspector(s):	CPRA: David Chambers, Erin Plitsch, Kathleen Eubanks		
Structure Description:	See Report Section III			Water Level:	Marsh: -0.5 NAVD88	River:	+3.40 NAVD88
Type of Inspection:	2016 Annual Inspection			Weather Conditions:	Cloudy and Warm, Wind Calm (0 cfs Diversion)		
Item	Condition	Physical Damage	Corrosion	Photo	Observations and Remarks		
CMP Culverts	Good	Minor	None	Appendix B	Culverts appear to be clear. Water surface elevations were mostly at the crest of the structures. Scale of scouring at tie-ins needs to be reviewed and level of severity determined. Breach of about 20-25 feet wide is present at site #52.		
Earthen / Rock							
Embankment							
Water Control Gates	Good	None	Moderate	Appendix B	All water Control Gates appear to be in good condition. The O&M contractor has been reportedly lubricating, cleaning, and operating all gates on a scheduled basis. Gears on the gates are clean. Bolts holding gearbox to the gate structure are stainless steel.		
Rock Canal Closures	Good	See Remarks	N/A	Appendix B	One of the warning signs at structure #56 is leaning severely and needs to be cleaned.		
Timber Piling at Culverts	Good	None	None	Appendix B	Structure #13 is tilting as the timber piles settle unevenly. All other timber pilings are in good condition.		
Timber walkways at Culverts	Good	See Remarks	N/A	Appendix B	Structure #50 has a wood plank that is detached from structure on one end. Minor damage consists of bowing deck boards.		
Spoilbank Restoration	Fair	Minor	N/A	Appendix B	Vegetation (grasses, shrubs, and trees) has flourished along the banks. Moderate scouring is evident at shoreline/water surface interface due to increased boat traffic.		
Flow Meters	N/A	N/A	N/A	Appendix B	Flow meters installed at structures No. 26, 40, and 54 were removed in 2011 and 2014 due to damage and not replaced.		