



Coastal Protection and
Restoration Authority of Louisiana

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

2016 Annual Inspection Report

for

**GIWW/ CLOVELLY HYDROLOGIC
RESTORATION**

State Project Number BA-02
Priority Project List 1

May 03, 2016
Lafourche Parish

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I. Introduction

The GIWW to Clovelly Hydrologic Restoration Project encompasses approximately 14,948 acres of marsh habitat located in the Barataria Basin near the Gulf Intracoastal Waterway (GIWW) in Lafourche Parish, Louisiana. The project is bounded to the north by an arbitrary line through the marsh from the shoreline of Little Lake to the hurricane protection levee northwest of Clovelly Farms, to the west by the South Lafourche hurricane protection levee, to the south by Breton Canal and Superior Canal, and the east by Little Lake and Bay L' Ours. (Appendix A – Project Features Map).

The GIWW to Clovelly (BA-02) project is a hydrologic restoration project consisting of four (4) fixed crest weirs, one (1) variable crest weir, four (4) canal plugs, one (1) channel plug with culvert and flap-gate, 5,665 linear feet of lake rim restoration and approximately 5,023 linear feet of earthen bank stabilization. The purpose of the project is to protect and nourish intermediate marsh in the project area by restoring natural hydrologic conditions, promote greater use of available freshwater and nutrients, limit rapid water level exchange, slow water exchange through over-bank flow, and reduce rapid salinity spikes and saltwater intrusion (Lear, E. 2003).

The GIWW to Clovelly Hydrologic Restoration Project (BA-02) is co-sponsored by the Natural Resource Conservation Service (NRCS) and the Coastal Protection and Restoration Authority (CPRA) of Louisiana. The project was authorized by Section 303(a) of Title III Public Law 101-646, the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) and enacted on November 29, 1990 as amended. The GIWW to Clovelly (BA-02) project was approved on the first (1st) Priority Project List. (CPRA O&M Plan, 2002). CPRA and NRCS have agreed that the 20 year life of the project would begin at the end of Construction Unit No.2 (CU#2).

II. Inspection Purpose and Procedures

The purpose of performing an annual inspection is to evaluate the constructed project features, identify any deficiencies, prepare a report detailing the condition of such features, and to recommend corrective actions needed, if any. Should it be determined that corrective actions are needed, CPRA shall provide, in report form, a detailed cost estimate for engineering, design, supervision, inspection, 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 undertaken since the constructed features were completed and an estimated project budget for the upcoming three (3) years for operation, maintenance and rehabilitation. The three (3) year budget projections for operation and maintenance of the GIWW to Clovelly Hydrologic Restoration (BA-02) project are shown in Appendix C. A summary of past operation and maintenance projects undertaken since the completion of the project are outlined in Section IV of this report.

An inspection of the GIWW to Clovelly Hydrologic Restoration Project (BA-02) was held on May 3rd, 2016. In attendance were Adam Ledet, Elaine Lear, Benjamin Hartman, and Brian

Babin with CPRA, and Quin Kinler with NRCS. All attendees met at the Clovelly Canal Boat Launch and the inspection began at approximately 9:30am and concluded at 12:00pm. The water level at the time of the inspection was recorded from gauge BA-02-57 located in Superior Canal and was determined to be 2.00' NAVD88 at 09:35am.

The field inspection included a complete visual inspection of all constructed features within the project area. Photographs of all project features were taken during the field inspection and are shown in Appendix B. Staff gauge readings, where available, were documented and used to estimate approximate water elevations, elevations of rock weirs, earthen embankments, lake-rim dike and other project features.

III. Project Description and History

Within the GIWW to Clovelly Hydrologic Restoration (BA-02) project, the average rate of change from marsh habitat to non-marsh habitat (including wetland loss to both open water and commercial development) has been increasing since the 1950's (Lear, 2003). The main reasons for wetland deterioration in the project area as reported by NRCS in the Wetlands Value Assessment (WVA) summary are saltwater intrusion, oil field activities, subsidence, lack of sedimentation, and reduced freshwater influx.

The purpose of the GIWW to Clovelly (BA-02) project is to protect intermediate marsh in the project area by restoring natural hydrologic conditions that promote greater use of available freshwater and nutrients. This will be accomplished by limiting rapid water level changes, slowing water exchange through over-bank flow, reducing rapid salinities increases, and reducing saltwater intrusion (Lear, 2003). The project objectives and specific goals outlined in the 2003 Monitoring Plan prepared by CPRA are as follows:

Project Objectives are:

- Protect and maintain approximately 14,948 acres of intermediate marsh. This will be achieved by restoring natural hydrologic conditions that promote greater freshwater retention and utilization, prevent rapid salinity increases, and reduce the rate of tidal exchange.
- Reduce shoreline erosion through shoreline stabilization

The specific goals for the project are:

- Increase or maintain marsh to open water ratios.
- Decrease salinity variability in the project area.
- Decrease the water level variability in the project area.
- Increase or maintain the relative abundance of intermediate marsh plants.
- Promote greater freshwater retention and utilization in the project area.
- Reduce shoreline erosion through shoreline stabilization.
- Increase or maintain the relative abundance of submerged aquatic vegetation (SAV).

The GIWW to Clovelly Hydrologic Restoration project involves the installation and maintenance of structures in two (2) construction units. Construction Unit No.1 and

Construction Units No.2 were completed in November 1998 and October 2000, respectively. These structures were designed to reduce the adverse tidal effects in the project area and promote freshwater introduction to better utilize available freshwater and sediment. If these objectives are met, it is anticipated that the rate of shoreline erosion will be reduced and a hydrologic regime, conducive to sediment and nutrient deposition, will encourage the re-establishment of emergent and submergent vegetation in eroded areas and promote a more historic low energy environment. (Lear, 2003)

The principle project features of Construction Unit No.1 include:

- Structure 2 – Fixed crest rock weir with boat bay.
- Structure 4 – Fixed crest rock weir with boat bay.
- Structure 7 – Fixed crest rock weir with boat bay.
- Structure 8 – Rock rip rap channel plug.
- Structure 43 – Rock rip rap channel plug.
- Structure 91 – Rock plug with culvert and flap gate.

The principle project features of Construction Unit No.2 include:

- Structure 1 – Fixed crest rock weir with boat bay.
- Structure 4B – Rock rip rap channel plug.
- Structure 14A – Fixed crest rock weir with barge bay.
- Structure 35 – Variable crest weir, water control structure.
- Structure 90 – Rock rip rap channel plug.
- 5,665 linear ft. of Lake Rim Restoration
- 5,023 linear ft. of Rock Bank Stabilization
- 11,711 linear ft. of Earthen Bank Stabilization.

Structure 35 has an operation component which consists of a ten (10) ft. wide variable crest section housing twelve (12) timber stop logs. As outlined in the special conditions of project permits, Structure 35 is operated in accordance with the following operation schedule:

- Variable Crest Weir – the stop logs will be set at 0.5 ft. BML from April to November and removed from November to April (weir sill level = 2.0 ft. BML) to allow for sediment and nutrient inflow during spring.

Construction of project features occurred in two construction units. Construction Unit No. 1 was completed in October 1997, and Construction Unit No. 2 was completed in October 2000. CPRA and NRCS have agreed that the twenty-year (20-yr) project life would be based on the end of construction date for Construction 2 in October 2000.

IV. Summary of Past Operation and Maintenance Projects

Structure Operations: In accordance with the operation schedule outlined in the Operations and Maintenance Plan and the special conditions of the permit, Structure 35 has been operated during the months of April and November of each year since April 3, 2002. Operations were

temporarily suspended in November 2005 due to marsh damage behind the structure following Hurricane Katrina; however, since that time, the marsh material blocking the structure has degraded and settled to the bottom of the channel creating an opening to the interior marsh which enabled structure operations to resume in November 2007.

Navigation Aids Maintenance: Below is a short description of repairs, dates and cost associated with the service of the navigational aids located at Structure 14A:

5/16/02 – Automatic Power of Larose, La. performed maintenance and service to repair navigation lights at Structure 14A. Seventeen (17) flash bulbs were replaced at a total cost of \$421.50.

12/16/03 – Automatic Power performed maintenance and service to repair navigation lights at Structure 14A. The battery and flash bulbs were replaced in all four (4) navigation lights at a total cost of \$2,189.80.

11/4/04 – Automatic Power performed maintenance and service to repair navigation lights at Structure 14A. One (1) lamp changer, one (1) battery and flash bulbs were replaced at a total cost of \$922.23.

11/29/06 – CPRA received public bids for a state-wide maintenance contract for inspection, diagnostic testing, and maintenance of twenty-seven (27) navigational aid systems at ten (10) separate locations state-wide. Four (4) of the twenty-seven (27) navigational aid structures included in this contract are located within the GIWW to Clovelly project area at Structure 14A. The state-wide contract was awarded to the lowest bidder, Automatic Power, Inc. of Larose, La., in the amount of \$83,424. This contract is a one (1) year contract with an option to extend for another two (2) years. The notice to proceed with inspections, diagnostic testing and maintenance was issued in February 2007. This contract was rebid in 2009 for another three (3) year extension, and was again awarded to the lowest bidder, Automatic Power, Inc. of Larose, LA. The contract bid again in 2013 and has been awarded to Wet Tech Energy, Inc. of Milton, La.

2012 Maintenance Project: This project is the first major maintenance event since the completion of the original project. Since the 2008 Annual Inspection of the GIWW to Clovelly Hydrologic Restoration (BA-02) project, a number of deficiencies had been documented that required corrective actions and/or refurbishment. In February 2010, CPRA initiated maintenance of the GIWW to Clovelly Hydrologic Restoration - 2012 Maintenance Project by contracting MWH Americas, Inc. of Baton Rouge to perform the design. Prior to beginning the design, John Chance Surveyors, Inc. of Lafayette was contracted to perform the necessary design surveys to supplement the data obtained from the 2008 surveys. The plans and specifications for the project were completed in May 2011 and have been reviewed by both CPRA and NRCS. The modification to the overall maintenance permit obtained in 2007 to include the breach closure between Structures 4A and 4 has been approved and is included the final bid package. The final bid documents were submitted to the Louisiana Office of State Purchase to be bid. The bid process took place in August 2011 and the maintenance project contract along with the bid alternate was awarded to DQSI, Inc. The construction administration and inspection services are being handled by Providence/GSE of Houma, LA.

Mobilization of DQSI to the jobsite and work on the breach repairs began in December 2011. Construction of the project was completed in June 2012 and final acceptance was on July 24, 2012. The 2012 Maintenance Project was completed for a total cost of \$3,435,923.58, which includes construction by DQSI, surveys by John Chance, E&D by MWH, and administration and inspection by Providence/GSE. A summary of the work completed in the 2012 Maintenance Project is found below:

- Four (4) timber pile clusters and navigational aids replaced on Structure 1
- Three (3) timber pile clusters and navigational aids replaced on Structure 14A
- Approximately 10,600 linear feet of the Lake Rim rock dike refurbished
- Approximately 1,000 linear foot rock dike extension created from Structure 4 to Structure 4A & 4B
- Structure 4A & 4B recapped to original design elevation
- Structure 4 and Structure 2 recapped to original design elevation
- Structure 14A barge bay recapped to original design elevation
- Five (5) breach closures along existing oilfield canals in southern section of the project area

V. Inspection Results

CONSTRUCTION UNIT NO.1

Structure 2 – Fixed Crest Rock Weir with Boat Bay

Structure 2 is a three (3) level Fixed Crest Weir constructed of rock riprap material. This structure was recapped with 130# class riprap to its original design elevation as part of the 2012 Maintenance Project. Soundings taken during the inspection along the center section of weir averaged 7.1'. Based on the staff gauge reading in Superior Canal and soundings taken over the structure, an average elevation is estimated between -5.0 and -6.0' NAVD. The as-built drawings show a final constructed elevation of -5.0' NAVD, which would indicate the center section had settled nearly 0.7' since completion of the 2012 Maintenance Project. The sections located closest to the banks on each side of the structure appeared to be stable and no obvious settlement was observed. The warning signs on Structure 2 are in good condition and do not require replacement. The overall structure was in good condition and no maintenance will be required at this time. (See Appendix B, Photos 20 through 23)

Structure 4 – Fixed Crest Rock Weir with Boat Bay

Structure 4 is also a three (3) level fixed crest weir constructed of rock riprap material. The structure was recapped with 130# class rip-rap to its original design elevation as part of the 2012 Maintenance Project. We did note that the marsh on the southern tie-in continues to erode and has detached from the rock weir. We recently completed the plans and specifications to extend the rock dike from the southern end of Structure 2 to the north end of Structure 4; construction is anticipated to begin in mid to late June 2016. Once completed, the shoreline will be protected and erosion should be halted. The signs along the structure; as part of the 2016 Maintenance Project, we will replace signs installed during the 2012 maintenance event with new aluminum signs. Overall, the structure is in good condition with

exception of the breach on the south side and the missing signs. These deficiencies will be repaired during the upcoming 2016 Maintenance Project. (See Appendix B, Photos 17 through 20)

Structure 7– Fixed Crest Rock Weir w/ Boat Bay

Structure 7 appeared to be in fair condition with some settlement of the rock riprap material but no visual damage to the weir or erosion around the embankment tie-ins. The settlement of Structure 7 has been uniform with no breaches of the bank tie-ins. Soundings indicate a depth of 7.0' which would correspond to an elevation of -5.0' NAVD88. We are not recommending maintenance of Structure 7 at this time. All warning signs and their supports appear to be in good condition. (See Appendix B, Photos 6 through 8)

Structure 8– Rock Riprap Weir

Structure 8 is a small rock weir with a boat bay located just north of Structure 7. This structure appears to be in fair condition with minimal settlement of the riprap material and no erosion or washouts around the bank tie-ins. This structure was originally constructed with a steel gate to prevent access into the interior marsh, but this gate was destroyed during Hurricanes Gustav and Ike. Since the gate was destroyed, the landowner has installed a series of floating barrels to restrict access. During the inspection, it was observed that some of the barrels were either sunken or removed. There are no plans to replace the gate at this time. (See Appendix B, Photos 9 through 11)

Structure 43 – Rock Riprap Channel Plug

We were unable to visually inspect Structure 43 due to the woody vegetation and floating water hyacinth blocking access and the visibility of the structure. During prior inspections, there was a small breach identified on the eastern end of the rock plug which allowed water to flow around the structure. As in the 2015 inspection, we did not notice the breach or water bypassing the structure. It's possible that the vegetation has plugged the breach, thereby reducing the flow of water around the structure. Since the breach has been identified on previous inspections, we will continue to look for water flow around the structure on future inspections. All warning signs and support structures appear to be in good condition, and at this time, there are no recommendations for maintenance. (See Appendix B, Photo 41)

Structure 91 – Rock Plug with Culvert and Flapgate

Structure 91 rock plug appeared to be in good overall condition. It was also difficult to inspect this structure due to the thick woody vegetation covering the entire structure. Additionally, thick marsh vegetation has covered the backside of the marsh area. From what we were able to view, it appears that the structure was in good condition with no obvious settlement or breaches around the structure. The timber piles supporting the corrugated metal pipe and flap gate was in good condition as well. New galvanized timber pile caps were installed as part of the 2012 Maintenance project to protect the head of the piling. Also, the warning sign for the structure has been damaged by vandals as it appears the sign has endured several shots from a shotgun. Because the sign is still legible, there are no recommendations for replacement at this time, but it will continue to be monitored on future inspections for further damage. (See Appendix B, Photos 32 and 33)

CONSTRUCTION UNIT NO.2

Structure 1 – Fixed Crest Rock Weir w/ Barge Bay

Structure 1 appeared to be in good overall condition with no obvious settlement or displacement of the rock riprap material or erosion along the bank tie-ins of the structure. The four (4) timber dolphin structures at the entrance of the barge bay opening were replaced during the 2012 Maintenance Event and are currently in good condition. The directional arrow signs are knocked down or turned inward and will need to be replaced during the next maintenance event. (See Appendix B, Photos 37 through 38)

Structure 4A & 4B – Rock Riprap Channel Plug

As part of the 2012 Maintenance Project, Structure 4, 4A & 4B was recapped to its original design elevation and rock dike closure was extended to Structure 4. The existing structures and 1,000 linear feet dike closure were built to an elevation of +3.5' NAVD88 using 130# class rock riprap. Structures 4 and 4A/4B, and the dike closure appear to be in very good condition with no noticeable settlement or degradation of riprap material. Currently, there is some erosion near the start of the rock while the backside of the tie-in has some overtopping. At the time of the inspection, we did notice that several of the wooden signs installed along the structure were missing or in poor shape. Under the 2016 Maintenance Project schedule to begin mid to late June 2016 we have included provisions for the replacing all wood signs with aluminum signs. There are no recommendations additional maintenance at this time. (See Appendix B, Photos 12 through 17)

Structure 14A – Fixed Crest Rock Weir with Barge Bay

Structure 14A was also rehabilitated during the 2012 Maintenance Project. The structure was recapped with a heavier 250# class rock riprap to the original design elevation of -6.5' NAVD 88 at the barge bay to prevent further scouring of the channel bottom, and +4.0' NAVD88 along the crest of the weir. Depth soundings were taken along the center of the barge bay which indicated that the average depths ranged from 5.0' on the north side to 6.0' on the south side. Based on these depths, the average bottom sill elevation of the barge bay ranged between -4.0' to -5.0 NAVD 88, a questionable measurement that suggests shoaling. Soundings will be repeated next inspection to measure an accurate depth. Based on our observations, the structure appears to be in good condition, as there is no visible settlement of the rock since the end of construction. Also, three (3) of the navigation aid timber pile supports and daymark signs were replaced under the 2012 Maintenance Project and are in good condition with the exception of direction arrow signs missing or turned 180 degrees. The rock weir and navigation aid structures are in good condition and the only recommendation for maintenance at this time is for replacing the erroneous sign. (See Appendix B, Photos 1 through 5)

Structure 35 – Variable Crest Weir, Water Control Structure

Overall, Structure 35 has moderate corrosion on the bulkhead cap, handrails and deck. The stop logs, cables, signs and supports appear to be in good condition and operable. At the time of inspection the channel from the weir to the interior marsh was open and there appeared to be adequate flow through the interior marsh and structure. The embankment tie-ins also appear to be in good condition with no erosion or washouts. We are not recommending any repairs or corrective actions at this time. (See Appendix B, Photos 25 through 27)

Structure 90 – Rock Riprap Channel Plug

Structure 90 appears to be in good condition with no obvious rock settlement/ displacement or erosion around the embankment tie-ins. The structure and surrounding area are vegetated with 1.0' of freeboard. All warning signs and supports are in good condition also. There are no recommended corrective actions at this time. (See Appendix B, Photos 34 through 36)

Lake Rim Restoration

The Lake Rim structure was recapped as part of the 2012 Maintenance Project. The project included the recapping of the entire lake rim with 130# class rock riprap to its original design elevation of +3.0' NAVD88 from the north bank along Breton Canal to southern embankment tie-in of Structure 2. During construction, the Lake Rim structure did not settle from the weight of the extra rock as much as anticipated, which left the contractor with an excess bid quantity of rock riprap. This additional rock was used to place a second lift of rock along the north bank of Breton Canal, Structure 4, and the Lake Rim structure. The 2012 Maintenance Project as-built drawings show the constructed elevation of the Lake Rim structure to be approximately +3.5' NAVD88 to +4.0' NAVD88 after the second lift. At the time of the inspection, there appeared to be no further settlement of the structure since the end of 2012 maintenance project. There are no recommendations for maintenance at this time. (See Appendix B, Photos 24)

Earthen Bank Stabilization

There were five (5) breaches repaired during the 2012 Maintenance Project. Breach 1 was located along the north bank of Breton Canal just southwest of the first location canal from Bay L' Ours and is approximately 20' wide. Breach 2 was located along the northeast bank of the second location canal north of Breton Canal and was approximately 10' wide. Breach 3 was located on the south bank of the same location canal as Breach 2 and was approximately 25' wide. Breach 4 was located on the west bank of an oilfield canal that intersects Breton Canal east of Structure No. 1 and was approximately 30' wide. Another breach, designated as Breach 5, was discovered at the end of a dead end oilfield slip south of Breach 4. The breaches were closed by using material from the adjacent canal bottoms to reconstruct the earthen dike. The material was allowed to dry before it was shaped, seeded, and fertilized. At the time of the inspection, all of the breach repairs appeared to be in good condition with full vegetation and no signs of settlement. Breach 1 did show some signs of erosion on its northeast side facing Breton Canal. Due to the minor erosion, not affecting the overall stability of the breach repair, there are no recommendations for maintenance at this time; however this location will continue to be monitored on future inspections. (See Appendix B, Photos 28 through 31)

VI. Conclusions and Recommendations

Overall, the GIWW to Clovelly Hydrologic Restoration (BA-02) Project appears to be in good condition with only a few minor deficiencies noted during the inspection. Deficiencies included approximately five (5) damaged warning signs located in the vicinity of Structures 4, 4A-4B, and along the newly constructed breach closure between Structures 4 and 4A. There were also 3 daymark signs that were missing or improperly oriented at Structure 14 and 1. The existing wooden warning signs were rotting and falling apart. We have included the replacement of the wooden signs with aluminum signs under the 2016 Maintenance Project currently proceeding to construction. Structure 91 has vegetation covering a bullet-hole ridden warning sign, while structure 35 has moderate corrosion on bulkhead; both structures require close observation. However, there are no other issues that will require maintenance as a result of the 2016 Annual Inspection.

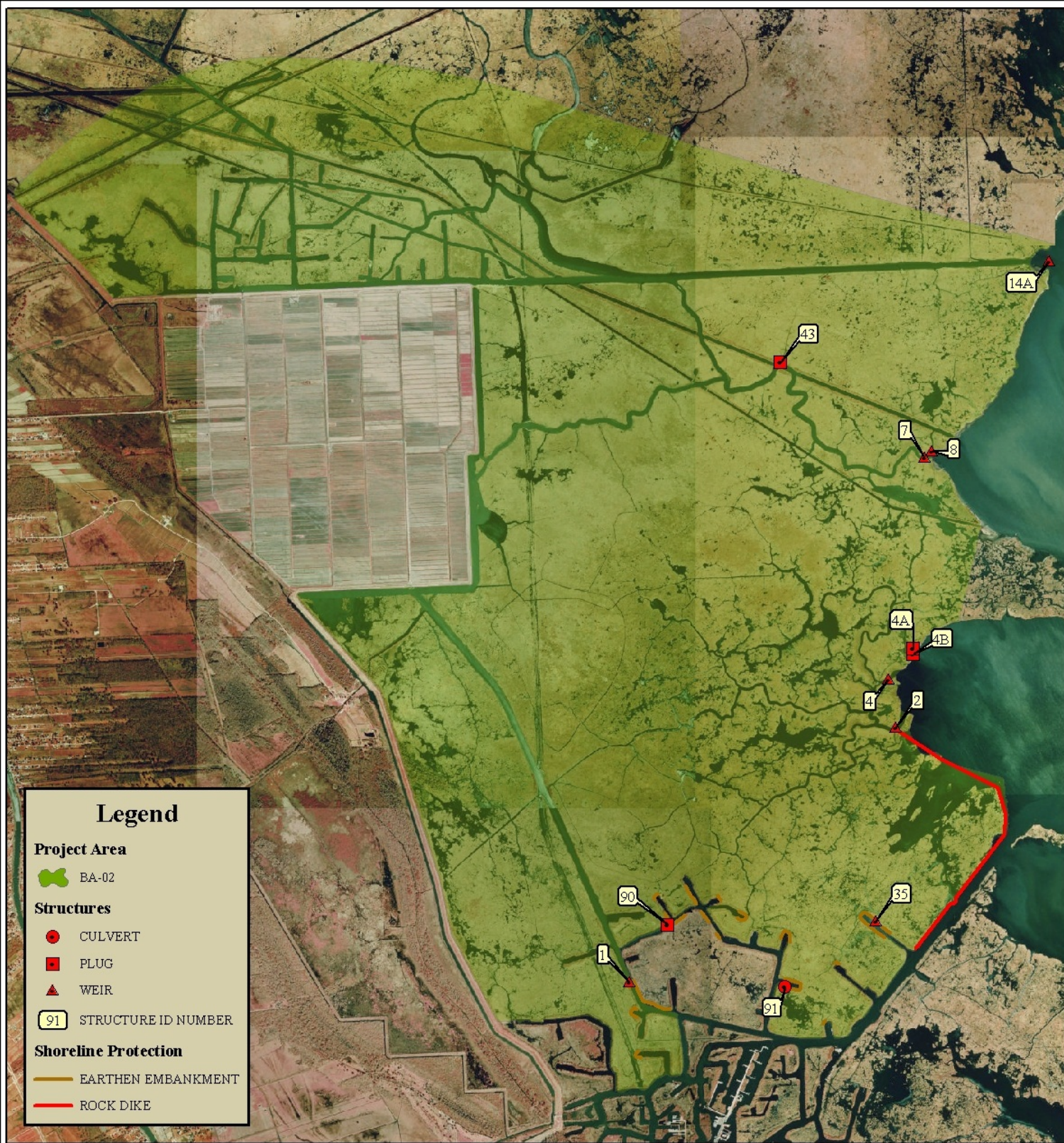
References:

Lear, E. 2003. *Monitoring Plan for the GIWW (Gulf Intracoastal Waterway) to Clovelly Project (BA-02)*, Louisiana Department of Natural Resources, Coastal Restoration Division, 24 pp.

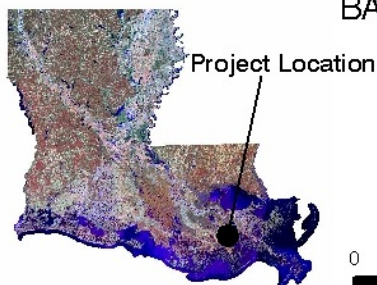
CPRA, Pyburn & Odom, Inc. 2002. *Operation, Maintenance and Rehabilitation Plan for the GIWW to Clovelly Hydrologic Restoration Project (BA-02)*. Louisiana Department of Natural Resources, Coastal Restoration Division. Baton Rouge, Louisiana, Pyburn & Odom, Inc. Baton Rouge. 8 pp plus Attachments.

Kinler, 2006. *Memorandum, GIWW to Clovelly (BA-02) – Inspection of Little Lake Shoreline South of Site 14A*. Natural Resource Conservation Service, Baton Rouge, La. 5 pp.

Appendix A
Project Features Map



BA02 - GIWW to Clovelly Hydrologic Restoration



PROJECT FEATURES MAP

0 1 2 Miles

0 2.5 5 Kilometers



Data Source:

LA Dept. Natural Resources
Coastal Engineering Division
Thibodaux Field Office

1998 DOQQ

Date: May 26, 2005

Map ID: 2005-TFO-029

Appendix B

Photographs



Photo 1: View of navigational aid on SW side of Structure 14 A and rock weir in background.



Photo 2: View of rock weir on the south side of the barge bay on Structure 14A.



Photo 3: View of rock Weir at the barge bay on the north side of Structure 14A.



Photo 4: View of navigation aid lights on the NE side of Structure 14a and rock weir in background.

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Photo 5: view of the rock weir on the south side of Structure No. 14A.



Photo 6: View of the rock weir on the north side of the boat bay on Structure No7.

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Photo 7: View of rock weir on the south side of boat bay on Structure No.7.



Photo 8: Overall view of the rock weir with boat bay of Structure No.7.



Photo 9: View of rock weir and floating barrel gate at Structure No. 8.



Photo 10: View of rock weir and floating barrel gate at Structure No.8.



Photo 11: View of the north end of rock plug tie-in at Structures 4A and 4B.



Photo 12: rock plug (Structure 4A & 4B) and rock dike extension to Structure 4 construction in 2012.

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Photo 13: rock plug (Structure 4A & 4B) and rock dike extension to Structure 4 construction in 2012.



Photo 14: View of rock dike closure between Structure No.4B and Structure No.4 constructed in 2012.



Photo 15: View of rock dike closure between Structure 4B and Structure 4 constructed in 2012.



Photo 16: View of rock dike closure between Structure 4B and Structure 4 constructed in 2012.



Photo 17: View of rock dike closure tie-in to the north side of Structure No.4 constructed in 2012.



Photo 18: Overall view of rock weir with boat bay at Structure No.4.

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Photo 19: View of the rock weir on the south side of the boat bay of Structure No.4.



Photo 20: View of the rock weir on the south side of the boat bay of Structure No.4.



Photo 21: View of the rock weir on the north side of the boat bay of Structure No.2.



Photo 22: Overall view of the rock weir with boat bay at Structure No.2

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Photo 23: View of the south side of the rock weir at Structure No.2



Photo 24: View of the rock dike lake rim along the south shoreline of Bay L' Ours.

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Photo 25: View of variable crest weir Structure No.35 on north bank of location canal off of Breton Canal.



Photo 26: view of sheet pile weir and bank tie-in on the SW side of Structure No.35.



Photo 27: View of steel sheet pile weir and bank tie-in on the NE side of Structure No.35.



Photo 28: Breach location (Identified in as-built drawings as Breach 2) repaired in 2012 along the second location canal from Bay L' Ours via Breton Canal.



Photo 29: Breach repaired in 2012 (identified as Breach 3) off of third location along Breton Canal from
By L' Ours.



Photo 30: Breach repaired in 2012 (labeled Breach 4) off of third location along Breton Canal from Bay L'
Ours.



Photo 31: - Breach repaired in 2012 (labeled Breach 5) off of third location along Breton Canal from Bay L' Ours.



Photo 32: View of rock weir (Structure 91) with corrugated metal pile and flap gate through embankment.



Photo 33: View of corrugated metal pipe support and flap gate at Structure No.91.



Photo 34: Overall View of Structure 90, a rock rip rap channel plug located in the second location canal on the east bank of Superior Canal from the Hurricane Protection Levee.



Photo 35: View of rock dike plug and warning signs at Structure No.90.



Photo 36: View of rock dike plug and warning signs at Structure No.90.

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Photo 37: View of rock weir on the west side, warning signs and barge bay opening at Structure No.1 located along Superior Canal.



Photo 38: view of the rock weir on the east side of Structure No.1 and warning signs.

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Photo 39: View of barge bay opening and timber warning signs at Structure No.1.



Photo 40: View of CRMS Station BA-02-57 staff gauge located north of Structure No.1 @ 2.1' NAVD88

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Photo 41: View rock rip rap channel plug (Structure 43) located along Bayou Des Amoreaux.

Appendix C

Three Year Budget Projection

GIWW TO CLOVELLY, PHASES 1 & 2 / BA-O2 / PPL1
Three-Year Operations & Maintenance Budgets 07/01/2016 - 06/30/19

<u>Project Manager</u>	<u>O & M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
	<i>A. Ledet</i>	<i>NRCS</i>	<i>B.Babin</i>

	2016/2017	2017/2018	2018/2019
Maintenance Inspection			
Nav. Aid Inspection/Maint.	\$ 4,000.00	\$ 5,000.00	\$ 5,000.00
Structure Operation	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00
State Administration	\$ 40,000.00	\$ 24,054.00	\$ 24,775.00
Federal Administration	\$ -	\$ -	

Maintenance/Rehabilitation

16/17 Description	2012 Maintenance Project, Structure Operations and Nav Aid Maintenance
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<i>E&D</i>	\$ -
<i>Construction</i>	\$ 1,457,850.00
<i>Construction Oversight</i>	\$ 127,053.00
<i>Sub Total - Maint. And Rehab.</i>	<u>\$ 1,584,903.00</u>

17/18 Description:	Navigation aid maintenance and structure operations
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<i>E&D</i>	\$ -
<i>Construction</i>	\$ -
<i>Construction Oversight</i>	\$ -
<i>Sub Total - Maint. And Rehab.</i>	<u>\$ -</u>

18/19 Description:	Navigation aid maintenance and structure operations
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<i>E&D</i>	\$ -
<i>Construction</i>	\$ -
<i>Construction Oversight</i>	\$ -
<i>Sub Total - Maint. And Rehab.</i>	<u>\$ -</u>

	2016/2017	2017/2018	2018/2019
Total O&M Budgets	<u>\$ 1,638,903.00</u>	<u>\$ 39,054.00</u>	<u>\$ 39,775.00</u>
Total O&M Budget 2016 through 2019			<u>\$ 1,717,732.00</u>
Unexpended O&M Budget			<u>\$ 1,746,754.00</u>
Remaining O&M Budget (Projected)			<u>\$ 29,022.00</u>

Unexpended budget includes a deduction for NRCS M IPR in the amount of \$86,456

OPERATIONS & MAINTENANCE BUDGET WORKSHEET

Project: BA-02 GIWW to Clovelly Hydrologic Restoration Ph. 1 &2

FY 16/17 –

CPRA Administration (2016 Maintenance Project)	\$ 40,000 (est. remaining)
Structure Operations:	\$ 10,000
Maintenance:	\$1,588,903
E&D:	\$ 0
Construction:	\$1,457,850
Construction Oversight:	\$ 127,053
General Maintenance:	\$ 4,000

Operation and Maintenance Assumptions:

Structure Operations: water control structure operated twice annually for a total of \$5,000 per operation. (2)(\$5,000) = **\$10,000**

General Maintenance: Water control structure, navigation aids repair. Construction: **\$4,000.**

2014 Maintenance Project – Composite Rock Dike along shoreline between Structures 2 and 4. Below is the estimated project cost this maintenance project:

Construction Cost:

DQSI Bid: \$1,457,850.16

Engineering, Design, Construction Oversight

Engineering/Design:	\$Completed
Surveying:	\$Completed
Permitting:	\$Completed
Construction Inspection/Oversight: (Stanley Consultants proposal)	\$ 127,053

Total E&D and Construction Oversight: \$ 127,053

Estimated Budget Remaining: **\$ 1,584,903**
(2016 Maintenance Project)

CPRA Direct Costs

Structure Operations and General Maintenance:

Engineer 4 – 30 hrs @ \$60/hr. =	\$ 1,800
Engineer 6 – 5 hrs @ \$73/hr. =	<u>\$ 365</u>

	\$ 2,165
<u>2016 Maintenance Project:</u>	
Engineer 4 – 200 hrs. @ \$60/hr. =	\$12,000
Engineer 6 – 50 hrs. @ \$73/hr. =	\$ 3,650
Engineer 7 – 20 hrs @ \$79/hr. =	<u>\$ 1,580</u>
	\$17,230
Inspection:	
CPRA Engineer 3 – 12 hrs@ \$60/hr.:	\$ 720
CPRA Engineer 6 – 12 hrs @ \$73/hr.	\$ 876
CPRA Scientist 4 – 10 hrs @ \$50/hr.	<u>\$ 500</u>
	\$ 2096
Report:	
CPRA Engineer 6 – 60 hrs. @ \$73/hr.	\$ 4,380
Total Direct CPRA Costs:	\$25,871

CPRA Indirect Costs

Structure Operations and General Maintenance:

Engineer 4 – 30 hrs @ \$127.30/hr. =	\$ 3,819
Engineer 6 – 5 hrs @ \$154.88/hr. =	<u>\$ 774</u>
	\$ 4,593

2016 Maintenance Project:

Engineer 4 – 200 hrs. @ \$127.30/hr. =	\$25,460
Engineer 6 – 50 hrs. @ \$154.88/hr. =	\$ 7,744
Engineer 7 – 20 hrs @ \$167.61/hr. =	<u>\$ 3,352</u>
	\$36,556

Inspection:

CPRA Engineer 3 – 12 hrs@ \$127.30/hr.:	\$ 1,528
CPRA Engineer 6 – 12 hrs @ \$154.88/hr.	\$ 1,856
CPRA Scientist 4 – 10 hrs @ \$167.61/hr.	<u>\$ 1,676</u>
	\$ 5,060

Report:

CPRA Engineer 6 – 60 hrs. @ \$154.88/hr.	\$ 4,380
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Total Indirect CPRA Costs:	\$50,589
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FY 17/18 –

OCPR Administration		\$ 24,054
Structure Operations:		\$ 10,000
Maintenance:		\$ 5,000
E&D:	\$ 0	
Construction:	\$ 0	
Construction Oversight:	\$ 0	
General Maintenance:	\$ 5,000	

Operation and Maintenance Assumptions:

Structure Operations: water control structure operated twice annually for a total of \$5,000 per operation. $(2)(\$5,000) = \$10,000$

General Maintenance: Water control structure, navigation aids repair. Construction: \$5,000.

CPRA Direct Costs

Structure Operations and General Maintenance:

\$2,230 x 3% inflation = \$2,297

Inspection:

\$2,159 x 3% inflation = \$2,224

Report:

\$4,511 x 3% = \$4,646

Total Direct CPRA Costs: **\$9,167**

CPRA Indirect Costs

Structure Operations and General Maintenance:

\$4,731 x 3% = \$4,873

Inspection:

\$5,212 x 3% = \$5,368

Report:

\$4,511 x 3% = \$4,646

Total Indirect CPRA Costs: **\$14,887**

FY 18/19 –

OCPR Administration		\$ 24,775
Structure Operations:		\$ 10,000
Maintenance:		\$ 5,000
E&D:	\$ 0	
Construction:	\$ 0	
Construction Oversight:	\$ 0	
General Maintenance:	\$ 5,000	

Operation and Maintenance Assumptions:

Structure Operations: water control structure operated twice annually for a total of \$5,000 per operation. $(2)(\$5,000) = \$10,000$

General Maintenance: Water control structure, navigation aids repair. Construction: \$5,000.

CPRA Direct Costs**Structure Operations and General Maintenance:**

$\$2,297 \times 3\% \text{ inflation} = \$2,366$

Inspection:

$\$2,224 \times 3\% \text{ inflation} = \$2,291$

Report:

$\$4,646 \times 3\% = \$4,785$

Total Direct CPRA Costs: \$9,442

CPRA Indirect Costs**Structure Operations and General Maintenance:**

$\$4,873 \times 3\% = \$5,019$

Inspection:

$\$5,368 \times 3\% = \$5,529$

Report:

$\$4,646 \times 3\% = \$4,785$

Total Indirect CPRA Costs: \$15,333

2016-2019 Accounting

Current O&M Funding (Lana Report)	\$5,102,119
Expenditures from LAGov	\$3,268,909
NRCS MIPR	\$ 86,456

Unexpended O&M Budget: \$1,746,754