



Coastal Protection and
Restoration Authority of Louisiana

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

2012 Annual Inspection Report

for

**GIWW/ CLOVELLY HYDROLOGIC
RESTORATION**

State Project Number BA-02
Priority Project List 1

May 14, 2012
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. (LDNR O&M Plan, 2002).

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 February 8th, 2012 under clear skies and windy conditions. In attendance were Brain Babin, Shane Trice, Adam Ledet, and Elaine Lear from CPRA, Quin Kinler from NCRS, and Randy Moertle representing the landowner. All attendees met at the Clovelly Canal Public Boat

Launch for the inspection that began at approximately 10:00 am and ended at 1:30 pm. 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 0.75' NAVD at 9:30 am.

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 LDNR 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 Unit No.1 has a twenty-year (20 year) project life beginning in November 1997. The twenty-year (20 year) project life of Construction Unit No.2 began 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.

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. According to the as-built drawings, the sill elevation closest to the bank was constructed to an elevation of +3.9' NAVD, the section between the bank and the boat bay was constructed to +2.3' NAVD, and the boat bay was constructed to -5.1' NAVD. At the time of the inspection, the water depth in the boat bay was recorded to be 9.1' from the surface. As previously reported, there was some moderate settlement observed between the bank and boat bay (approximately 1.3' to 1.5') and severe settlement observed in the boat bay (approximately 4'). The refurbishment of the rock weir has been included in the 2012 Maintenance Project. All warning signs and supports are in good condition and do not require maintenance. (See Appendix B, Photos 33 through 37)

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. According to the as-built drawings, the sill elevation closest to the bank was constructed to an elevation of +3.8' NAVD, the section between the bank and the boat bay was constructed to +2.4' NAVD, and the boat bay was constructed to -3.9' NAVD. At the time of the inspection, the water depth in the boat bay was recorded to be 7.0' from the surface. As previously reported, there was some moderate settlement observed on the north side of the structure (approximately 1.5' to 2.0') and more severe settlement observed on the south side of the structure (approximately 6' to 7') including a breach on the south bank tie-in. The refurbishment of this rock weir has been included in the 2012 Maintenance Project. The warning signs and supports on the north side of the structure are missing and will be replaced during the maintenance event. (See Appendix B, Photos 39 through 42)

There was a breach identified in the western shoreline of Bay L'Ours between Structure 2 and Structure 4. The breach is believed to be caused by the retreating shoreline reaching the edge of an interior pond. There are no recommendations for repair at this time; however, this breach will continue to be monitored on future inspections. (See Appendix B, Photo 38)

Structure 7– Fixed crest rock weir w/ boat bay

Structure 7 looked to be in fair condition with some settlement of the rock riprap material but no visual damage to the weir or erosion around the bank tie-ins. The as-built drawings show the weir was constructed to a height of -4.4 NAVD in the boat bay and +2.4' NAVD on the north and south sides between the bank and boat bay. The water depth in the boat bay was recorded as 6.4' at the time of the inspection. These observations and supporting data from previous surveys show this structure has settled uniformly along the entire length of the structure approximately 1.0' to 1.5'. Since the settlement of Structure 7 is uniform and relatively minor, we are not recommending corrective actions at this time, but the structure will continue to be monitored during future inspections. All other signs and supports appear to be in good condition. (See Appendix B, Photos 5 through 7)

Structure 8– Rock rip-rap 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, thus there is no need to replace the gate at this time. (See Appendix B, Photos 8 through 9)

Structure 43 – Rock rip-rap channel plug

We were unable to visually inspect Structure 43 due to vegetation blocking the visibility of the structure. There is a small breach that has formed around the eastern end of the rock plug allowing water to flow around the structure. This breach has been identified and will be monitored during future visits to determine the magnitude of its effects to the structure. 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, Photos 1 through 4)

Structure 91 – Rock plug with culvert and flap gate

Structure 91 rock plug structure appeared to be in good condition without any signs of rock settlement or erosion around embankment tie-ins. The warning signs and timber supports were also in good overall condition. As previously noted, the sheet metal covering the timber piles supporting the corrugated metal pipe are rusted and corroded. To prevent these timbers from rotting, the replacement of the sheet metal caps are included in the 2012 Maintenance Project. (See Appendix B, Photos 17 through 20)

CONSTRUCTION UNIT NO.2

Structure 1 – Fixed crest rock weir w/ barge bay

Structure 1 appeared to be in good overall condition with no observable settlement or displacement of the rock riprap material. According to the as-built drawings, the weir was constructed to a height of -6.4' NAVD at the barge bay and +4.0' NAVD along the crest on both sides of the weir between the barge bay and bank line. At the time of the inspection the water depth in the barge bay was recorded as 7.6' from the surface. As previously reported, there is considerable damage to the four (4) timber pile dolphins at the entrance of the barge bay. This damage is believed to be caused by oilfield service barges accessing the opening. The damage includes the vertical piles splitting, piles displaced from original position, scarring on the surface of the piles, and the complete destruction of one of the four dolphin structures. Due to the poor condition of the timber dolphins, we have included provisions in the 2012 Maintenance Project to replace all four (4) dolphin structures. Also, as a preventative measure, we are recommending the structures be relocated approximately 6' further apart towards the bank to allow barges to move more freely through the barge bay without damaging the timber pile dolphins. (See Appendix B, Photos 10 through 14)

Structure 4 A & 4B – Rock rip-rap channel plug

Structures 4A & 4B appear to be in poor condition with average crest elevations approximately +1.5' NAVD. According to the as-built drawings, the plug was originally constructed to a height of +3.0 NAVD. Based on these observations and supporting data from the 2008 survey profile, it is estimated the rock plug has settled approximately 1.5' to 2.0' along the entire length of the structure. In addition to the settlement, and partially caused by Hurricanes Gustav and Ike, the marsh around the plug has suffered extensive erosion. On the south side of the plug there is very large opening in the shore line approximately 1,000 feet wide. Due to the high cost of mobilizing a dredge to rebuild the marsh, it is more cost efficient to construct a rock dike across the opening. The new rock dike and the recapping of structures 4A & 4B were included in the 2012 Maintenance Project. (See Appendix B, Photos 43 through 45)

Structure 14A – Fixed crest rock weir with barge bay

According to the as-built drawings, the crest of the weir was constructed to a height of +4.0' NAVD and the scour pad at the bottom of the barge bay was constructed to a height of -6.5' NAVD. It is estimated the rock material settlement at the crest of the weir is minimal, less than 1.0' on both sides of the barge bay. The most severe settlement and scour is near the bottom of the barge bay where previous survey data indicated bottom depths ranged between -6.5' and -15.0'. Based on the severity of the washout of the scour pad beneath the barge bay, the scour pad will be reconstructed in the 2012 Maintenance Project. The method of repair is

outlined in the conclusion of this report. The timber sub-structures supporting the navigational aids are in poor condition; there are cracks and surface damage visible on the timber pile dolphins and one of the navigational arrow signs is down. The timber pile dolphin on the southeast side of the barge bay was replaced in 2006 and remains in good condition. (See Appendix B, Photos 46 through 56)

Structure 35 – Variable crest weir, water control structure

Structure 35 is in overall good condition with some signs of minor 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 27 through 29)

Structure 90 – Rock rip-rap channel plug

Structure 90 appears to be in overall good condition with no rock settlement/ displacement or erosion around the embankment tie-ins. All warning signs and supports are in good condition also. There are no recommended corrective actions at this time. (See Appendix B, Photos 21 through 23)

Lake Rim Restoration

The lake rim structure was constructed between a +2.0' and +3.0' NAVD with six (6) fish dips at various locations along the structure. As indicated on previous inspections and surveys, the rock dike has displayed minor to moderate settlement along the entire length of the structure. The most notable segments include segments between Stations 7+00 and 13+00, 36+00 and 41+00, and the intersection near the mouth of Breton Canal. Due to the current condition of the rock dike, the entire length of the lake rim including the reach along Breton Canal has been included in the 2012 Maintenance Project. Its repairs include recapping the structure with rock riprap to its original design elevation. (See Appendix B, Photos 30 through 32)

Earthen bank stabilization

There are five (5) breaches included in the 2012 Maintenance Project that were in the process of being repaired at the time of the inspection. Breach 1 is 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 is located along the northeast bank of the second location canal north of Breton Canal and is approximately 10' wide. Breach 3 is located on the south bank of the same location canal as Breach 2 and is approximately 25' wide. Breach 4 is located on the west bank of a location canal that intersects Superior Canal east of Structure No. 1 and is approximately 30' wide. Another breach, designated as Breach 5, was discovered at the end of a dead end oil field slip south of Breach 4. The recommended method of repair for these breaches is included in the conclusion of this report. (See Appendix B, Photos 15 through 16 & 24 through 25)

VI. Conclusions and Recommendations

Since the 2008 Annual Inspections of the GIWW to Clovelly Hydrologic Restoration (BA-02) project, a number of deficiencies have been documented that will require 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 and plan preparations for the deficiencies outline in Section V of this report. This project will be the first major maintenance event since the completion of the original project. 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 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. At the time of the 2012 annual inspection, work to be performed in the 2012 Maintenance Project was in progress and is expected to last until May 2012. Maps showing the work plan for the proposed 2012 Maintenance Project can be found under Appendix D.

Below is a summary of the identified deficiencies and methods of repair that are included in the 2012 Maintenance Project:

Structure No.1

The deficiencies at Structure No.1 were limited to the four (4) timber cluster piles near the entrance of the barge bay. The timber structure on the southwest side of the barge bay was completely destroyed and no longer exists, the remaining three (3) cluster piles were severely damaged with large splits down the middle of the piles, the batter piles were off center and the surface of all the timbers were worn or scarred from marine vessels rubbing the timbers while accessing the barge bay. Under the 2012 Maintenance Project, all four (4) timber pile clusters will be removed and replaced with new material including hardware, cables and signage. With concurrence from NRCS, we are also recommending that the new structures be relocated slightly outwards (6" to 1'), towards the bank, to allow for additional clearance for barge vessels to move through the barge opening without interference.

Structure No.2

The documented deficiencies at Structure No.2 were primarily due to settlement of the rock weir with the most severe settlement on the south side of the structure between the boat bay and existing bank. Under the 2012 Maintenance Project, the boat bay section and fixed crest sections will be raised to the original design elevations using rock riprap.

Structure No.4

Structure No.4 was found to be in fair to poor condition with severe settlement and/or displacement of the rock material on the south side of the structure and moderate settlement of the rock lining the boat bay and rock weir section on the north side. The warning sign on the

north side of the structure was also missing. Under the upcoming 2012 Maintenance Project, Structure No. 4 will be refurbished with rock riprap to restore the structure to the original design elevation. The missing warning sign will also be replaced.

Structure No. 4A & 4B

The rock plug structures appeared to be in poor condition with substantial settlement ranging between 1.5' to 2.0'. The critical area of concern associated with this structure is large breach that has developed on the south side of the structure resulting from the 2008 storms. The marsh on the south side of the structure is completely gone with very little shoreline remaining to facilitate a breach closure by extending the structure. Considering the size of the breach and the vulnerability of the interior marsh in this area, we have included a rock dike closure in the 2012 Maintenance Project that consist of refurbishing Structures 4A & 4B to the original design elevation and extending the rock plug across the breach opening and along the existing shoreline approximately 1,000 linear feet, tying into Structure 4.

Structure 14A

Structure No.14A was in fair to good condition with significant damage to the timber cluster piles supporting the navigational aids and severe settlement and scour of the rock pad below the barge bay opening. We believe that the strong currents moving through the barge bay opening may be responsible for the excessive scour of the rock pad beneath the barge bay. To reduce the scour, we have included provisions in the 2012 Maintenance Project for the existing scour pad to be replaced with a larger stone. We will also be replacing three (3) of the four (4) timber pile clusters supports for the navigational aid lights as well.

Structure 91

The rock plug was in good condition with no obvious settlement or erosion around the bank tie-ins. However, we did identify minor maintenance which included severe corrosion of the metal caps covering the butts of the timber piles supporting the culvert and flap gate. To prevent rotting of the heads of the timber piles the metal sheeting on the top the timber piles will be replaced.

Lake Rim Restoration

As indicated in the inspection results and on previous inspections, a large portion of the rock dike along the lake rim has settled below the constructed crest elevation. To rehabilitate the structure, we will be recapping the entire lake rim with rock riprap under the 2012 Maintenance Project from Structure 2 to the termination point along the north bank of Breton Canal. Based on the water depths obtained during the design surveys, we do not anticipate that access dredging will be required.

Earthen bank stabilization

In all, a total of five (5) breaches ranging from 10' to 30' wide were identified within the southern portion of the project area which will be included in the 2012 Maintenance Project. Breach locations are shown in the Work Plan Map of Appendix D. The method of repair for breach closures consist of utilizing in situ material from adjacent channel bottoms to reconstruct the earthen dike. Upon completion of the earthen embankment construction, the surface of the earthen dikes will be seeded to protect against erosion.

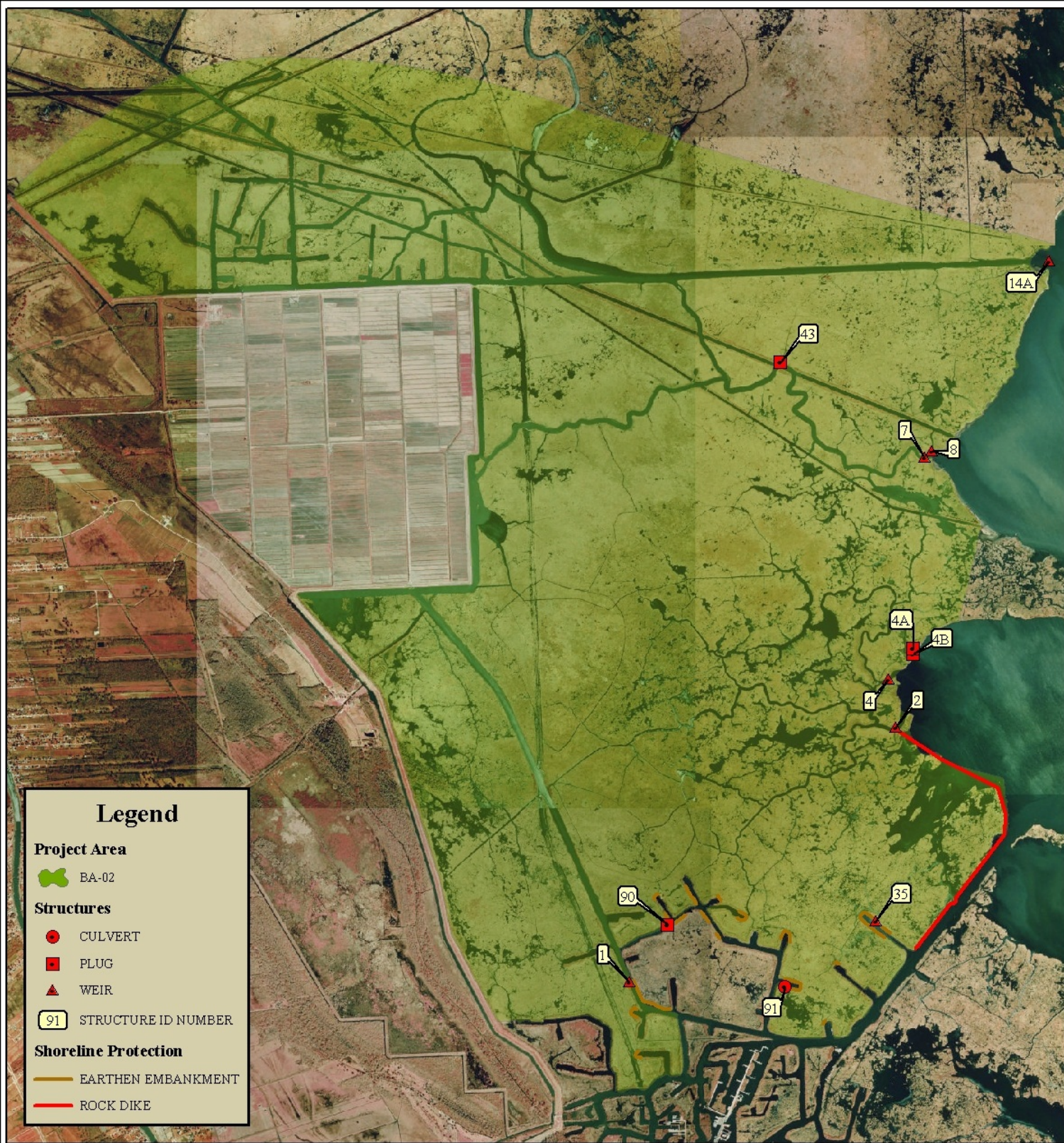
References:

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.

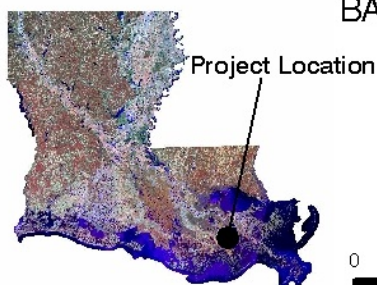
LDNR, Pyburn & Odom, Inc. 2002. *Operation, Maintenance and Rehabilitation Plan for the GIWW to Clovelly Hydrologic Restoration Project (BA-02)*. Louisiana Department of Natural Resources, Coastal Restoration Division. Baton Rouge, Louisiana, Pyburn & Odom, Inc. Baton Rouge. 8 pp plus Attachments.

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 Structure 43 looking north. The rock riprap plug is not visible through the vegetation.



Photo #2: View of Structure 43 looking northwest. The rock riprap plug is not visible through the vegetation.



Photo #3: Close up view of breach around the east side of Structure 43, looking northwest.



Photo #4: View of the breach in relation to Structure 43, looking northwest.



Photo #5: Overall view of Structure 7 from the canal, looking east



Photo #6: View of the embankment tie-in on the north side of Structure 7, looking northeast



Photo #7: View of the embankment tie-in on the south side of Structure 7, looking southeast



Photo #8: View of the embankment tie-in on the west side of Structure 8, looking north.



Photo #9: View of the embankment tie-in on the east side of Structure 8, looking north.



Photo #10: Overall view of Structure 1 rock riprap weir, looking southeast.



Photo #11: View of warning signs and navigational aids on the east side of structure 1, looking southeast



Photo #12: Close up view of damaged timber dolphin at Structure 1 to be replaced in the 2012 Maintenance Project



Photo #13: Close up view of the embankment tie-ins on the west side of Structure 1, looking southwest



Photo #14: Close up view of the embankment tie-ins on the east side of Structure 1, looking southeast



Photo #15: View of progress being made on Breach 5 in the 2012 Maintenance Project



Photo #16: View of progress being made on Breach 4 in the 2012 Maintenance Project



Photo #17: Overall view of Structure 91 flap gate culvert, looking south



Photo #18: Close up view of Structure 91 culvert protruding above the waterline



Photo #19: View from standing on top of Structure 91, looking east



Photo #20: View from standing on top of Structure 91, looking west



Photo #21: Overall view of Structure 90 rock riprap plug, looking southwest



Photo #22: View of warning signs and embankment tie-in on the northwest side of Structure 90



Photo #23: View of warning signs and embankment tie-in on the southeast side of Structure 90



Photo #24: View of progress being made on Breach 3 in the 2012 Maintenance Project



Photo #25: View of progress being made on Breach 1 in the 2012 Maintenance Project



Photo #26: Overall view of Structure 35 variable crest weir, looking northeast



Photo #27: View of embankment tie-in on the northwest end of Structure 35



Photo #28: View of embankment tie-in on the southeast end of Structure 35



Photo #29: Close up view of pilings, decking and hoist of Structure 35, looking northeast



Photo #30: View of low area in rock dike along Brenton Canal, looking northwest



Photo #31: View of rock dike when entering Little Lake from Brenton Canal, looking northwest



Photo #32: View of warning signs and fish dip in rock dike along the lake rim, looking west



Photo #33: Overall view of Structure 2 rock weir from Little Lake, looking west

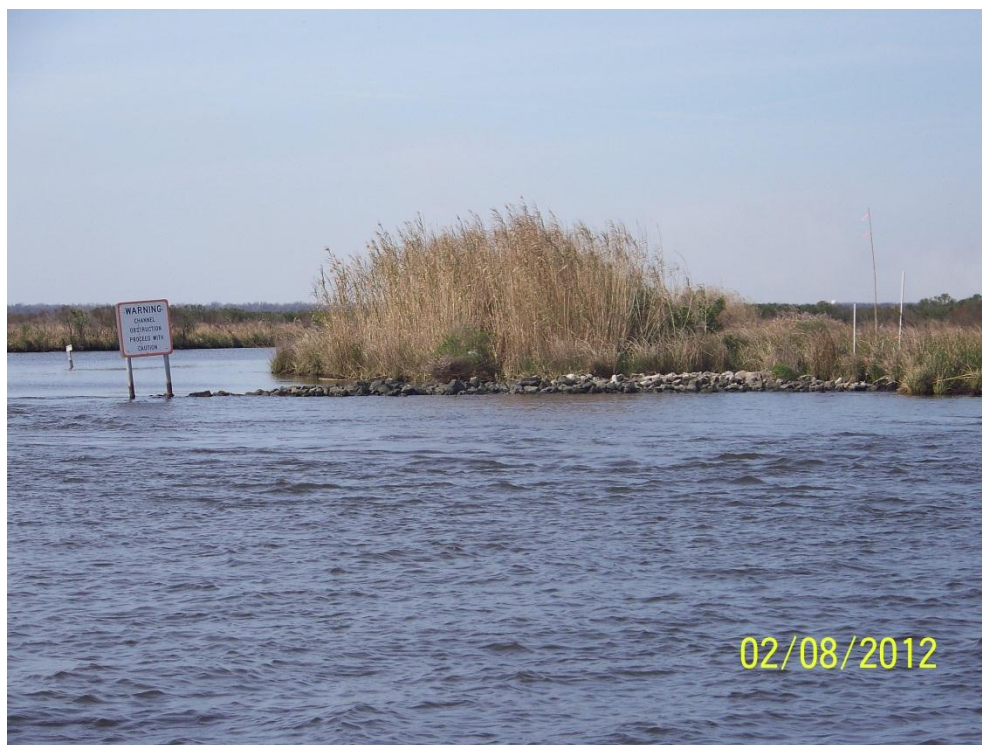


Photo #34: View of warning signs and embankment tie-in on the north end of Structure 2, looking west



Photo #35: View of warning signs and embankment tie-in on the south end of Structure 2, looking west



Photo #36: Close up view of embankment tie-in on the north side of Structure 2, looking northwest



Photo #37: Close up view of embankment tie-in on the south side of Structure 2, looking southwest



Photo #38: Breach identified along the lake rim located in the proximity of "N29.51274; W90.23242"



Photo #39: Overall view of Structure 4 rock weir from Little Lake, looking west



Photo #40: View of the warning sign and embankment tie-in on the south side of Structure 4, looking west



Photo #41: Close up view of the warning sign and embankment tie-in on the south side of Structure 4, looking west



Photo #42: View of the embankment tie-in on the north side of Structure 4, looking west



Photo #43: View of the southern end of Structure 4A/B, looking northeast



Photo #44: View of the warning signs and supporting timbers of Structure 4A/B, looking north



Photo #45: View of the northern end of Structure 4A/B, looking west



Photo #46: View of Structure 14A rock weir from Clovelly Canal, looking east



Photo #47: View of northern end of Structure 14A from Clovelly Canal, looking east



Photo #48: View of northern end of Structure 14A from Clovelly Canal, looking east



Photo #49: View of southern end of Structure 14A from Clovelly Canal, looking east



Photo #50: View of southern end of Structure 14A from Clovelly Canal, looking east



Photo #51: View of navigational aids and warning signs of Structure 14A, looking east

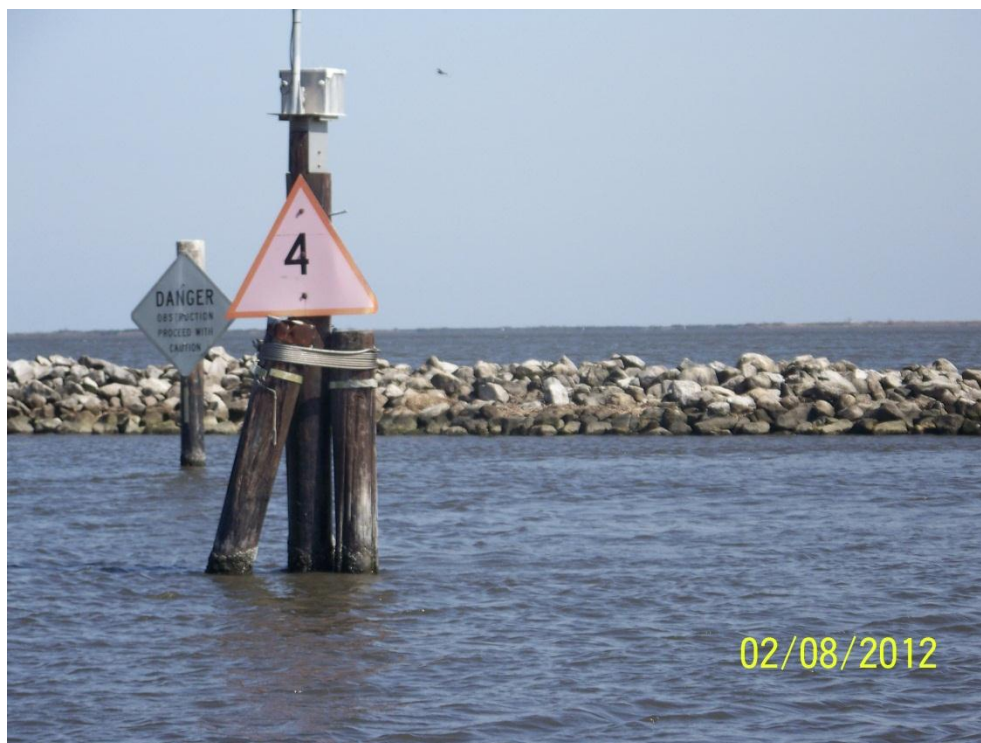


Photo #52: View of navigational aids and warning signs of Structure 14A, looking east



Photo #53: View of Structure 14A from on top of the rock weir, looking north



Photo #54: View of Structure 14A from on top of the rock weir, looking south



Photo #55: View of southern end of structure 14A along the lake rim, looking west



Photo #56: View of northern end of structure 14A along the lake rim, looking west

Appendix C

Three Year Budget Projection

GIWW TO CLOVELLY, PHASES 1 & 2 / BAO2 / PPL1
Three-Year Operations & Maintenance Budgets 07/01/2012 - 06/30/15

<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>A. Ledet</i>

	2012/2013	2013/2014	2014/2015
Maintenance Inspection	\$ 6,268.00	\$ 6,456.00	\$ 6,649.00
Nav. Aid Inspection/Maint.	\$ 4,000.00	\$ 4,000.00	\$ 4,000.00
Structure Operation	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00
State Administration	\$ 3,000.00	\$ 3,000.00	\$ 3,000.00
Federal Administration	\$ -	\$ -	

Maintenance/Rehabilitation

12/13 Description: Routine maintenance of navigational aids and structure operations

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

13/14 Description: Routine Maintenance: navigation aid maintenance and structure operations

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

14/15 Description: Routine Maintenance: navigation aid maintenance and structure operations

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

	2012/2013	2013/2014	2014/2015
<u>Total O&M Budgets</u>	\$ 23,268.00	\$ 23,456.00	\$ 23,649.00
Total O&M Budget 2009 through 2012			\$ 70,373.00
Unexpended O&M Budget			\$ 351,008.00
Remaining O&M Budget (Projected)			\$ 280,635.00

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 12/13 –

OCPR Administration		\$ 3,000*
O&M Inspection & Report		\$ 6,268
Structure Operations:		\$ 10,000
Maintenance:		\$ 4,000
E&D:	\$ 0	
Construction:	\$ 0	
Construction Oversight:	\$ 0	
General Maintenance:	\$ 4,000	

Operation and Maintenance Assumptions:

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

General Maintenance: Water control structure, navigation aids repair. Construction: \$4000. Administration: \$1,000*

FY 13/14 –

OCPR Administration		\$ 3,000*
O&M Inspection & Report		\$ 6,456
Structure Operations:		\$ 10,000
Maintenance:		\$ 4,000
E&D:	\$ 0	
Construction:	\$ 0	
Construction Oversight:	\$ 0	
General Maintenance:	\$ 4,000	

Operation and Maintenance Assumptions:

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

General Maintenance: Water control structure, navigation aids repair. Construction: \$4,000. Administration: \$1,000*

FY 14/15 –

OCPR Administration		\$ 3,000*
O&M Inspection & Report		\$ 6,649
Structure Operations:		\$ 10,000
Maintenance:		\$ 4,000
E&D:	\$ 0	
Construction:	\$ 0	
Construction Oversight:	\$ 0	
General Maintenance:	\$ 4,000	

Operation and Maintenance Assumptions:

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

General Maintenance: Water control structure, navigation aids repair. Construction: \$4,000. Administration: \$1,000*

2012-2015 Accounting

Unexpended from Lana Report	\$3,065,831.68
Expenditures from DNR Accounting	\$ 143,227.71
NRCS MIPR	\$ 86,456.00
Unexpended O&M Budget:	\$2,836,147.96

Budget Analysis after the 2012 Project is complete:

2012 Maintenance Project Total:	\$2,616,072 (less Surplus)
	<u>\$130,933 (Project payments to date)</u>
	\$2,485,139 (Remaining to be billed)
Unexpended O&M Budget:	\$2,836,147
	\$2,485,139 (Remaining to be billed: 2012)
	\$ 351,008 (Remaining after 2012 Maintenance)

Unexpended budget (Sept 2012): \$351,008 (est.)

Appendix D

2012 Maintenance Project Work Plan

