



**State of Louisiana
Department of Natural Resources
Coastal Restoration Division and
Coastal Engineering Division**

**2005 Operations, Maintenance,
and Monitoring Report**

for

**POINT AU FER ISLAND
HYDROLOGIC RESTORATION**

State Project Number TE-22
Priority Project List 2

August 2005
Terrebonne Parish

Prepared by:

Louisiana Department of Natural Resources
(LDNR)/Coastal Restoration and Management
LDNR/Monitoring Section
LDNR/Field Engineering Section
Thibodaux Field Office
1440 Tiger Dr.
Thibodaux, LA 70301

Suggested Citation:

Louisiana Department of Natural Resources 2005. *2005 Operations, Maintenance, and Monitoring Report for Point Au Fer Island Hydrologic Restoration (TE-22)*. Louisiana Department of Natural Resources, Coastal Restoration Division and Coastal Engineering Division, Thibodaux, Louisiana.



2005 Operations, Maintenance, and Monitoring Report
for
Point Au Fer Island Hydrologic Restoration (TE-22)

Table of Contents

I. Introduction	1
II. Maintenance Activity	10
a. Project Feature Inspection Procedures.....	10
b. Inspection Results.....	10
c. Maintenance Recommendations.....	12
i. Immediate/Emergency	12
ii. Programmatic/Routine.....	13
III. Operation Activity	13
a. Operation Plan	13
b. Actual Operations.....	13
IV. Monitoring Activity.....	14
a. Project Objective and Goals	14
b. Monitoring Elements.....	14
c. Preliminary Monitoring Results and Discussion	14
V. Conclusions	14
a. Project Effectiveness	14
b. Recommended Improvements	15
c. Lessons Learned	15
VI. References	17
VII. Appendices	18
a. Appendix A (Inspection Photographs)	18
b. Appendix B (Three-Year Budget Projection)	30
c. Appendix C (Field Inspection Notes).....	34



I. Introduction

The Point Au Fer Island Hydrologic Restoration (TE-22) project area is 5,120 acres (2,072 ha) of brackish/saline marsh and a latticework of oil and gas canals with their associated spoil banks (figure 1). Phase I (figure 2) is 3,408 acres (1,379 ha) and Phases II and III (figure 3) are collectively 1,712 acres (693 ha) (Rapp et al. 2001). The project is located on Point Au Fer Island approximately 30 mi (48.3 km) south of Morgan City, Louisiana, in Terrebonne Parish. The project is bound to the northwest and west by Atchafalaya Bay, to the northeast and east by Four League Bay, and to the south by the Gulf of Mexico. It is located approximately 13 mi (20.9 km) southeast of the mouth of the Atchafalaya River in Terrebonne Parish (figure 1).

Construction of the Point Au Fer Island Hydrologic Restoration Project was authorized by Section 303(a) of Title III Public Law 101-646, the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) enacted on November 29, 1990, as amended. The project was approved on the second Priority Project List.

The property associated with the Point Au Fer Island Hydrologic Restoration Project is owned by the Terrebonne Parish School Board, Point au Fer LLC, and the Roman Catholic Church - Archdiocese of New Orleans.

Approximately 8% of Louisiana's coastal marshes have been converted to open water canals and their associated spoil banks (Neill and Turner 1987). Canal construction likely alters wetland hydrology and contributes to wetland loss in coastal Louisiana (Turner et al. 1984). Similar alterations to the natural drainage pattern at Point Au Fer Island have occurred from the dredging of oil and gas access canals through the interior of the island. Strong tidal flows occur between Locust Bayou in the southwest and Four League Bay in the northeast (National Marine Fisheries Service [NMFS] n.d.). Point au Fer Island has experienced decreased salinities as sediments and fresh water from Atchafalaya Bay have circulated through the islands' interior marshes. Increased freshwater flow and sediment input have not been effectively utilized due to changes in hydrologic patterns and the presence of artificial levees (NMFS n.d.).

The marsh habitat on Point Au Fer Island is predominately brackish marsh with intermediate marsh in the interior of the island. In the years leading up to construction of the project, certain areas of Point Au Fer Island had become weakened with avenues for saltwater intrusion from the Gulf of Mexico threatening (Louisiana Department of Natural Resources-Coastal Restoration Division [LDNR-CRD] 1998). The Mobil Canal levee (Phase II area) had been breached during Hurricane Andrew, and the southern end of Transco Canal (Phase I area) had almost been breached by the Gulf of Mexico.

The project was designed and constructed in order to reduce marsh loss and the potential for saltwater intrusion from storm surges and high tides (Phase I), to restore hydrologic circulation close to conditions present before dredging of the pipeline canals (Phase I), and to



reduce the chance of breaching of the shoreline between the Gulf of Mexico and Mobil Canal during over wash events (Phase II and III). The specific goals established to evaluate the effectiveness of the project were to (1) reduce the rate of marsh loss (Phase I), (2) reduce the rate of canal widening (Phase I), and (3) maintain or decrease local shoreline erosion rate within the project area (Phase II and III) (Rapp et al. 2001).

The Point Au Fer Island Hydrologic Restoration Project was constructed in three (3) phases. Phase I consisted of seven (7) canal plugs located in two pipeline canals (figure 2). Four (4) timber plugs, Plugs No. 1, 2, 7, and 8, were constructed in Hester Canal (east-west). One (1) timber plug, Plug No. 6, and two (2) reef shell plugs, Plugs No. 3A and 4, were constructed in Transco Canal (north-south). Construction of the Phase I canal plugs was completed in December 1995. Phase II consisted of approximately 3,600 linear feet (LF) (1,097.3 m) of rock shoreline protection of Areas 1, 2, and 3 along the Gulf of Mexico adjacent to the Mobil Canal (figure 3). Phase II construction was completed in May 1997. Phase III consisted of extending the rock shoreline protection 3,037 LF (925.7 m) to the east (Area 4) and 625 LF (190.5 m) to the west (Area 5). Prior to construction, a change order added an additional lift of rock over 388 LF (118.3 m) of the Phase II shoreline protection to compensate for a previous breach area located near the east end of Phase II. Additionally, Plug No. 4 was rebuilt with dredged material, and Petraflex mats (articulated concrete mats, 8 ft x 20 ft x 9" [2.4 m x 6.1 m x 0.2 m) were placed along the gulf shoreline to the west and east of the existing Transco Canal steel bulkhead/rock plug (Plug No. 4A) at the gulf. A total of 67 mats were placed on the west side and 58 mats were placed on the east side of Plug No. 4A. Phase III construction was completed in June 2000 (Picciola and Associates, Inc. 2000).

The principle project features include:

Phase I: Construction of timber and shell plugs in Hester and Transco Canals.

- Plug No. 1 – 200 LF (61 m), Timber bulkhead plug in the Hester Canal located near Mosquito Bay.
- Plug No. 2 – 270 LF (82.3 m), Timber bulkhead plug in Hester Canal just west of Transco Canal.
- Plug No. 3A – 240 LF (73.1 m), Reef shell construction located in the Transco Canal north of Hester Canal.
- Plug No. 4 – 225 LF (68.6 m), Reef shell construction located in Transco Canal at the Gulf of Mexico.
- Plug No. 6 – 180 LF (54.9 m), Timber bulkhead plug located in Transco Canal just south of Hester Canal.
- Plug No. 7 – 200 LF (61 m), Timber bulkhead plug located in Hester Canal just east of Transco Canal.
- Plug No. 8 – 180 LF (54.9 m), Timber bulkhead plug located at the east end of Hester Canal near Bay Castagnier.



Phase II: 3,600 LF (1,097.3 m) of rock shoreline protection of the beach separating the Gulf of Mexico from the Mobil Canal.

- Area 1 – 1,800 LF (548.6 m) of rock dike protecting the beach along the Gulf of Mexico separating Mobil Canal and the Gulf.
- Area 2 – 400 LF (122 m) of rock dike protecting the beach along the Gulf of Mexico near the west end of Mobil Canal.
- Area 3 – 1,400 LF (426.7 m) of rock dike along the shoreline of the Gulf between Area 1 and Area 2, constructed with funds provided by Mobil Oil Company.

Phase III: Modifications/additions to the rock shoreline protection of the beach separating the Gulf of Mexico from the Mobil Canal.

- Area 4 – 3,037 LF (925.7 m) extension of the Phase II rock structure on the east end.
- Area 5 – 625 LF (190.5 m) extension of the Phase II rock structure on the west end.
- Additional 16-in. (0.4-m) lift of rock placed over 388 ft (188.2 m) of the Phase II rock structure near the east end of Phase II.
- Plug No. 4A (Transco Canal Gulf Bulkhead) – 67 Petraflex Mats placed on west side and 58 mats placed on east side of Plug No. 4A.

The Point Au Fer Island Hydrologic Restoration (TE-22) project has a 20-year economic life which began in December 1995 (Phase I), May 1997 (Phase II), and June 2000 (Phase III).



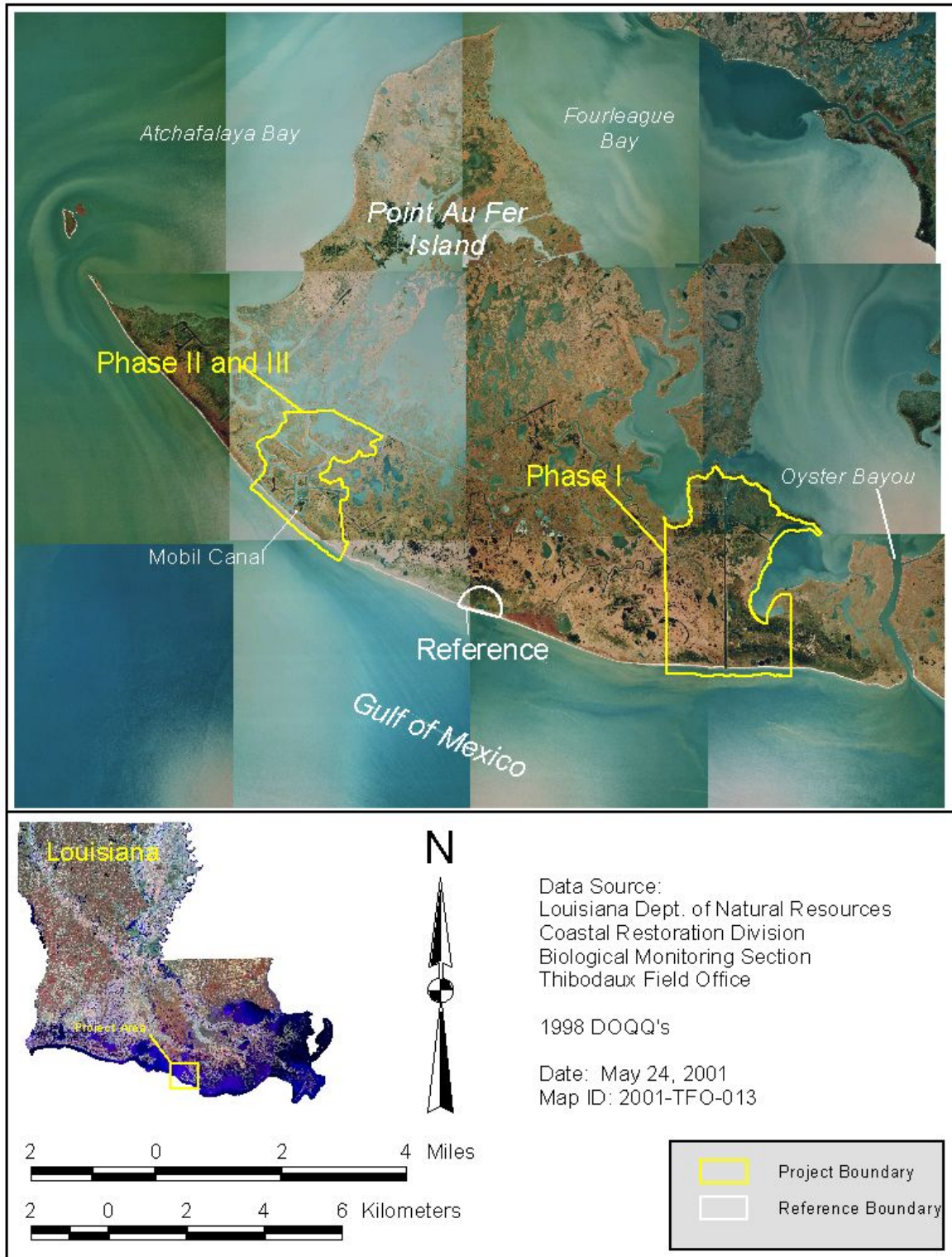


Figure 1. Point Au Fer Island Hydrologic Restoration (TE-22) project boundaries.

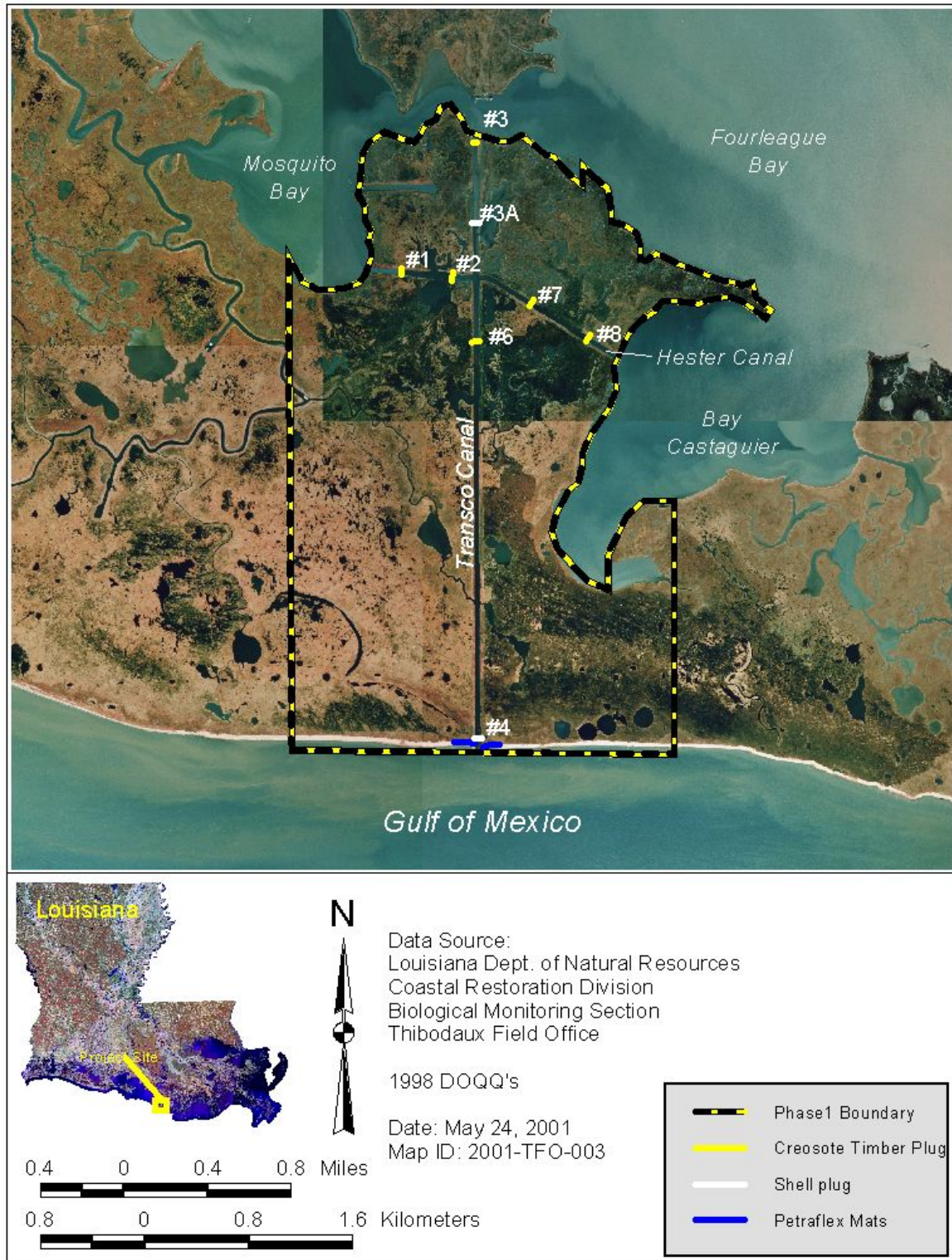




Figure 3. Point Au Fer Island Hydrologic Restoration (TE-22) - Phase II and III project boundary and features.

II. Maintenance Activity

a. Project Feature Inspection Procedures

The purpose of the annual inspection of the Point Au Fer Island Hydrologic Restoration (TE-22) project is to evaluate the constructed project features in order to identify any deficiencies. The inspection results are used to prepare a report detailing the condition of the project features and recommending any corrective actions considered necessary. Should it be determined that corrective actions are needed, LDNR shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, construction, and contingencies and an assessment of the urgency of such repairs (LDNR-CED 2002). The report also contains a summary of maintenance projects which were completed since completion of constructed project features and an estimated projected budget for the upcoming three (3) years for operation, maintenance, and rehabilitation. Photographs taken as part of the inspection are presented in Appendix A. The detailed cost estimate of any needed maintenance project along with other costs for operation and maintenance of the project for the next three years can be found in Appendix B.

The field inspection includes a complete visual inspection of the hydrologic restoration features of the project. A hand-held GPS unit is used to mark observed breaches along canal spoil banks which may require corrective actions or inspections on future site visits. Photographs are taken at each project feature, and field inspection notes are completed in the field to record measurements and deficiencies. Field inspection notes are compiled on the Maintenance Inspection Report Checklists, which can be found in Appendix C.

b. Inspection Results

The annual inspection of the Point Au Fer Island Hydrologic Restoration (TE-22) project took place on April 12, 2005. In attendance were Daniel Dearmond, Shane Triche, and Elaine Lear from LDNR, and Cheryl Brodnax representing NMFS. All parties met at Bob's Bayou Black Marina in Bayou Black, Louisiana. The weather conditions included clear skies and mild temperatures with some moderate winds. The annual inspection began at approximately 9:30 a.m. at rock weir site 4, continued through some of the remaining rock weir sites, and ended at 2:00 p.m. at the east end of Phase III rock (Area 4).

The results from the annual inspection are as follows:

Plug No. 1 – Timber Bulkhead Plug

This site was not visited due to time constraints. No changes since last year's inspection are anticipated.



Plug No. 2 – Timber Bulkhead Plug

This site was not visited due to time constraints. No changes since last year's inspection are anticipated.

Plug No. 3A – Shell Plug

This site was not visited due to time constraints. No changes since last year's inspection are anticipated.

Plug No. 4 – Shell Plug

The reef shell plug designated on the plans as Plug No. 4 is located near the southern end of Transco Canal and is eroded in the center of the structure. The crest elevation along most of the plug was below water elevation at the time of inspection. Due to access constraints to Plug No. 4, maintenance efforts are being concentrated on the Transco Canal Gulf bulkhead (Plug No. 4A) located approximately 200 ft (61 m) south of Plug No. 4 at the gulf.

Plug No. 4A – Transco Canal Gulf Bulkhead

The Transco Canal bulkhead consists of steel sheetpile with timber whalers and rock armoring/plug (constructed by others). Articulated concrete mats were installed on the west and east sides of the bulkhead during Phase III of the project. The steel sheet pilings were rusty the entire length of the bulkhead, and some of the tie rods were corroded through and disconnected from the sheetpile wall. However, the bulkhead was well-aligned and not leaning. It was noted that there is a small breach around the bulkhead and on top of the rock where, during high tides, the water can flow into Transco Canal. Also it seems that, during high tides, the water will overflow the weir near the center and flow into the canal. The rock armoring/plug appeared to be in good condition. The articulated concrete mats on the east side were in poor condition with apparent overall and differential settlement of the mats along the length. We also observed erosion behind the mats due to over wash from the Gulf of Mexico and flow around the breach at the end of the structure which could eventually lead to a breach into the Transco Canal through the marsh. The articulated concrete mats on the west side appeared to be in good condition. Pictures acquired during the inspection are in Appendix A, Photos 7 – 15.

Plug No. 6 – Timber Bulkhead Plug

The timber bulkhead plug located across Transco Canal south of Hester Canal appeared to be in fair condition. The timber bulkhead was bowed in the center, off alignment approximately 6 to 7 feet. The tie-ins at the banks had no apparent signs of erosion. The warning signs and supports were also in good condition. Pictures acquired during the inspection are in Appendix A, Photos 5 and 6.

Plug No. 7 – Timber Bulkhead Plug

This site was not visited due to time constraints. No changes since last year's inspection are anticipated.



Plug No. 8 – Timber Bulkhead Plug

The timber bulkhead plug across Hester Canal east of Transco Canal appeared to be in good condition with no noticeable structural defects. The breach around the south tie-in is still active and may have become a little larger since last year's inspection. The north tie-in at the canal bank had no apparent signs of erosion. The warning signs and supports were in good condition. The breach around the south side has been surveyed, and a breach repair is being designed as noted earlier. No other maintenance will be required at this site. Pictures acquired during the inspection are in Appendix A, Photos 1 - 4.

Phase II – Areas 1, 2 & 3, Rock Dike

This site was not visited due to time constraints. No changes since last year's inspection are anticipated.

Phase III – Area 4, Rock Dike

The rock dike along Area 4 of Phase III appeared to have some noticeable settlement of the structure. The average height of the dike is approximately 1 ft (0.3 m) above marsh level and it seems that during high tidal events and/or high wave action that the dike is being over washed. The breach around the east end of the dike does not seem to be any worse than last year. Pictures acquired during the inspection are in Appendix A, Photos 16 – 21.

Phase III – Area 5, Rock Dike

This site was not visited due to time constraints. No changes since last year's inspection are anticipated.

c. Maintenance Recommendations

i. Immediate/Emergency

The Point Au Fer Island Hydrologic Restoration (TE-22) - Breach repairs project has been designed and construction is scheduled to begin some time this summer (2005). Included in this project is the extension of the Plug No. 8 bulkhead (approximately 60 LF [18.2 m]) to close off an existing breach; the capping of approximately 400 ft (122 m) of articulated mats on the east side of Plug No. 4A with limestone rip rap and a marsh tie-in to prevent the possible breaching from the gulf into Transco Canal; and a marsh tie-in using limestone rip rap from the east end of the Area 4 rock dike to close off an existing breach from the gulf into Mobil Canal.



ii. Programmatic/Routine

Overall, the Point Au Fer Island Hydrologic Restoration (TE-22) project appeared to be in fair condition with the following deficiencies noted in the inspection results.

In the Phase I area, reef shell Plugs No. 3A and 4 were washed away in the center. No maintenance is recommended for Plug No. 3A because of the construction access constraints. No maintenance is recommended for Plug No. 4 as maintenance efforts are being concentrated on the Transco Canal Gulf bulkhead (Plug No. 4A) located to the south. The timber bulkhead Plug No. 6 was out of alignment in the center of the structure. Since the structure is still intact, no maintenance is recommended at this time.

In Phase III - Area 4 the rock dike appears to have settled and is being over washed during high tidal and wave action events. A survey of the rock dike should be conducted to verify the elevation of the dike and to determine if any action is necessary.

The following table lists the project features where deficiencies were observed and the recommended actions.

Feature	Observation	Recommendation
<i>Phase I</i>		
Plug No. 3A – reef shell	Washed away at center	No maintenance; access constraints; monitor only
Plug No. 4 – reef shell	Washed away at center	No maintenance; efforts focused on Plug No. 4A
Plug No. 6 – timber bulkhead	Out of alignment at center of structure	Monitor on future visits
<i>Phase III</i>		
Area 4 rock dike	Rock Dike appears to have settled and is being over washed	Survey of rock dike should be done to determine level of settlement

III. Operation Activity

There are no features in this project that require operations therefore, there is no operation activity.



IV. Monitoring Activity

a. Project Objective and Goals

The objectives of the Point Au Fer Island Hydrologic Restoration (TE-22) Phase I project are to reduce marsh loss and the potential for saltwater intrusion from storm surges and high tides, and restore hydrologic circulation close to historical conditions before access and pipeline canals were dredged. The objective of Phases II and III is to reduce the chance of breaching between the Gulf of Mexico and Mobil Canal during over wash events, consequently reducing the potential for interior marsh loss via shoreline breaching and beach over washing.

The following goals will contribute to the evaluation of the above objectives:

1. Reduce the rate of marsh loss (Phase I);
2. Reduce the rate of canal widening (Phase I);
3. Maintain or decrease local shoreline erosion rate within the project area (Phases II and III)

b. Monitoring Elements

Monitoring has halted as a result of a joint meeting between the state and federal sponsor in 2003 due to the structural problems with the project features and the difficulties measuring and attributing any effects to the project.

c. Preliminary Monitoring Results and Discussion

No monitoring has taken place since completion of the 2001 Comprehensive Report and discussions of data analysis can be found within that report (Rapp et al. 2001).

V. Conclusions

a. Project Effectiveness

The land/water analysis conducted in 2001 showed that the project areas (Phases I and II) experienced land gains. However, Rapp et al. (2001) theorized that due to the drought that southern Louisiana was experiencing at the time, the distinction between land and water on the aerial photographs was made difficult by exposed mud flats. They believed there was a “strong possibility that the calculated acreage of land was artificially inflated” (Rapp et al. 2001). Therefore the monitoring data collected at this time does not allow LDNR to fully assess the effectiveness of the project. The next sampling period will be in 2006 and may allow LDNR to more effectively assess the status of the project.



Although no monitoring data have been analyzed on gulf shoreline erosion rates, visual inspections have been performed on a yearly basis. From these visual inspections of the project area it seems as though the erosion of the shoreline behind the structures has ceased, but at the same time the erosion rate at the ends of the structures seems to have remained high or accelerated. This is especially evident at the end of the Area 4 rock near Mobil Canal and on the ends of the petroflex mats at Plug No. 4A.

b. Recommended Improvements

Repairs to the damaged and breached structures should be completed as soon as possible to enable the project to function as intended. Also, analysis of the land /water data from aerial photography is needed to quantify erosion rates on the shoreline sections we are interested in.

c. Lessons Learned

Several structures on this project can only be accessed by small boats due to their location. The isolation of these structures (i.e., Plugs 2, 3A, 4, and 7) causes maintenance to these structures to be unfeasible, therefore disallowing any needed maintenance projects to be performed. When designing a project of this nature, consideration should be given to the ability to access the structures for maintenance once construction is complete.

Plugs No. 3A and 4 were constructed using lightweight aggregate over geotextile material. Very soon after construction these plugs were “blown out” by high tidal surges in the area. Therefore, the use of lightweight aggregate to construct plugs should be discouraged in areas where the plugs may be introduced to over wash and severe wave action due to storms.

In the case where shoreline protection is used to prevent the breaching of open water bays, lakes or the gulf into canals (e.g., Area 4 rock and Plug 4A), the shoreline protection should be extended well beyond the canal (approximately 1000 ft.[304.8 m]) or the canal should be filled with dredged material to prevent the wrap-around breaching that is occurring on this project.

The sampling design used to assess the goal of reducing the rate of canal widening is questionable and may be recommended to cease after the 2006 sampling. The sampling is limited in area and scope and has no references. During the last sampling conducted in 2001 a shoreline position was established with a sub-meter DGPS to provide better shoreline positions adjacent to the plugs. However, this still will not provide great information since all sites are immediately adjacent to plugs instead of on both sides. Future projects should have better designs and more sampling locations along with references if possible. LDNR recommends a design more like that conducted for the



Gulf Intracoastal Waterway (GIWW) to Clovelly Hydrologic Restoration (BA-02) projects shoreline erosion goal.

Additionally, gulf shoreline structures were a large component of this project and only aerial photography is available to determine shoreline position. While this technique is good for long-term comparisons (decade time frames), we do not feel it is sufficient for quick response analysis in periods of 3 to 5 years post-construction when maintenance needs will be initially accessed. LDNR suggests surveys be conducted as needed for short time frames where shoreline positions are needed to manage project effects.



VI. References

Louisiana Department of Natural Resources – Coastal Engineering Division. 2002. Operation, maintenance, and rehabilitation plan for the Point Au Fer Island hydrologic restoration project (TE-22). Louisiana Department of Natural Resources, Thibodaux, Louisiana.

Louisiana Department of Natural Resources – Coastal Restoration Division. 1998. Monitoring plan for Project No. TE-22 Point Au Fer Island hydrologic restoration. Louisiana Department of Natural Resources, Baton Rouge, Louisiana.

National Marine Fisheries Service. n.d. Coastal Wetlands Planning, Protection, and Restoration Act: Proposed project information sheet. National Marine Fisheries Service, Baton Rouge. 9 pp.

Neill, C., and R. E. Turner. 1987. Backfilling canals to mitigate wetland dredging in Louisiana coastal marshes. *Environmental Management* 11:823-836.

Picciola & Associates, Inc. 2000. Final report – Lake Chapeau sediment input/hydrologic restoration project and Point Au Fer Island/hydrologic restoration project. Houma, Louisiana.

Rapp, J. M., N. M. Clark, and S. Kane. 2001. Comprehensive Monitoring Report No. 1 – Point Au Fer Island hydrologic restoration (TE-22), Terrebonne Parish, Louisiana. Louisiana Department of Natural Resources – Coastal Restoration Division, Thibodaux. 24 pp.

Turner, R. E., K. L. McKee, W. B. Sikora, J. P. Sikora, I. A. Mendelssohn, E. Swenson, C. Neill, S. G. Leivowitz, and F. Pedrazini. 1984. The impact and mitigation of man canals in coastal Louisiana. *Water Science and Technology* 16:497-504.



Appendix A

Inspection Photographs





Photo 1. *Plug No. 8 – View of plug looking west, date: 4/12/05*



Photo 2. *Plug No. 8 – View of plug looking west, date: 4/12/05*



Photo 3. *Plug No. 8 – View of south tie-in, date: 4/12/05. Breach to be repaired under TE-22 O&M Project.*



Photo 4. *Plug No. 8 – View of north tie-in, date: 4/12/05*





Photo 5. *Plug No. 6 – View of plug deformation from centerline of plug looking east, date: 4/12/05*



Photo 6. *Plug No. 6 – View of centerline of plug looking west, date: 4/12/05*



Photo 7. *Plug No. 4A – View of east petraflex mats looking east, date: 4/12/05. Mats will be capped with limestone rip rap under TE-22 O&M Project.*



Photo 8. *Plug No. 4A – View of east end of limestone rip rap plug looking east, date: 4/12/05.*



Photo 9. *Plug No. 4A – View of east end of bulkhead looking southwest, date: 4/12/05.*



Photo 10. *Plug No. 4A – View of west end of bulkhead looking southwest, date: 4/12/05.*



Photo 11. *Plug No. 4A – View of west end of limestone rip rap plug looking west, date: 4/12/05*



Photo 12. *Plug No. 4A – View of west petraflex mats looking northwest, date: 4/12/05*



Photo 13. *Plug No. 4A – View of west petraflex mats looking west, date: 4/12/05*



Photo 14. *Plug No. 4A – View of the end of the west petraflex mats looking west, date: 4/12/05. Shoreline adjacent to mats is beginning to erode behind mats.*



Photo 15. *Plug No. 4A – View of bulkhead looking south, date: 4/12/05. Small breach just behind bulkhead where water is exchanging with Transco Canal at high tidal events. Also lower middle section of bulkhead can be seen where bulkhead is being overtopped in high tidal events.*



Photo 16. *Area 4 Rock Dike – View of breach tie-in with Mobil Canal behind rock dike looking northeast, date: 4/12/05*



Photo 17. *Area 4 Rock Dike – View of breach behind rock dike looking southwest, date: 4/12/05*



Photo 18. *Area 4 Rock Dike – View of rock dike from end of Mobil Canal looking northwest, date: 4/12/05*



Photo 19. *Area 4 Rock Dike – View of rock dike from end of Mobil Canal looking southeast, date: 4/12/05. Rock dike elevation appears to be very low.*



Photo 20. *Area 4 Rock Dike – View of east end of rock dike looking southeast, date: 4/12/05. Adjacent shoreline is eroded approximately 50 – 75 feet behind rock dike.*



Photo 21. *Area 4 Rock Dike – View of breach behind rock dike looking northwest, date: 4/12/05*



Appendix B

Three-Year Budget Projection



POINT AU FER ISLAND HYDROLOGIC RESTORATION, PPL 2				
Three-Year Operations & Maintenance Budgets 07/01/2005 - 06/30/08				
Project Manager	O & M Manager	Federal Sponsor	Prepared By	
	B. Babin	NMFS	S. Triche	
	2005/2006	2006/2007	2007/2008	
Maintenance Inspection	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	
Structure Operation	\$ -	\$ -	\$ -	
Administration	\$ 23,240.00	\$ -	\$ -	
Maintenance/Rehabilitation				
05/06 Description: Major maintenance: breach repairs to plug 4A, 8 and Mobil Canal Rock				
E&D	\$ -			
Construction	\$ 440,500.00			
Construction Oversight	\$ 35,448.00			
Sub Total - Maint. And Rehab.	\$ 475,948.00			
06/07 Description				
E&D		\$ -		
Construction		\$ -		
Construction Oversight		\$ -		
Sub Total - Maint. And Rehab.		\$ -		
07/08 Description:				
E&D			\$ -	
Construction			\$ -	
Construction Oversight			\$ -	
Sub Total - Maint. And Rehab.			\$ -	
	2005/2006	2006/2007	2007/2008	
Total O&M Budgets	\$ 504,188.00	\$ 5,000.00	\$ 5,000.00	
		31		



OPERATIONS & MAINTENANCE BUDGET WORKSHEET

Project: TE-22 Point Au Fer Island Hydrologic Restoration

FY 05/06 –

Administration	\$	23,240
O&M Inspection & Report	\$	5,000
Operation:	\$	0
Maintenance:	\$	0
E&D:	\$	0
Construction:	\$	440,500
Construction Oversight:	\$	35,448

Operation and Maintenance Assumptions:

Major Maintenance: breach repairs for plugs 4A and 8, Mobil Canal Rock and Weir 3 (TE-26). The bid price for construction cost is outlined below:

Mobilization & Demob:	\$	54,875	
Rip Rap (250 Class):	\$	269,100	
Geotextile Fabric:	\$	16,140	
Timber Pilings (40' L):	\$	15,400	
Piling Caps:	\$	210	
Vinyl Sheet Piling Bulkhead:	\$	15,250	
2" x 8" Timber Whaler (0.8CCA):	\$	3,660	
2" x 8" Timber Whaler (2.5CCA):	\$	3,904	
2" x 12" Timber Cap (0.8CCA):	\$	2,135	
Galvanized Hardware for Bulkhead:	\$	1,400	
Articulated Mats:	\$	18,200	
Total Construction:			\$ 400,274
Construction Contingency:			\$ 40,226
(10% x \$400,274)			
Construction Oversight:	\$	35,448	
LDNR Admin:	\$	23,240	
			\$ 58,688
Total Maintenance Budget:			\$ 499,188



FY 06/07 –

Administration	\$ 0
O&M Inspection & Report	\$ 5,000
Operation:	\$ 0
Maintenance:	\$ 0

Operation and Maintenance Assumptions:

None

FY 07/08 –

Administration	\$ 0
O&M Inspection & Report	\$ 5,000
Operation:	\$ 0
Maintenance:	\$ 0

Operation and Maintenance Assumptions:

None



Appendix C

Field Inspection Notes



MAINTENANCE INSPECTION REPORT CHECKSHEET

Project No. / Name: Point Au Fer Island Hydrologic Restoration

Date of Inspection: 4/18/2005 **Time:** N/A

Structure No: Plug 1 - Phase I

Inspector(s): S. Triche, D. Dearmond, E. Lear, and C. Brodnax

Structure Description: 200 linear ft. timber plug

Water Level: **Inside:** _____ **Outside:** _____

Type of Inspection: Annual

Weather Conditions: Sunny and Breezy **Temp:** 70°

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Timber Piles	Good	None	N/A		Observation: Site was not visited due to time constraints. No changes from last year are expected.
Timber Whalers Sheetpile	Good	None	N/A		
Galvanized Pile Caps	Good	None	N/A		
Signs/Supports	Good	None	N/A		
Shell Backfill	Good	None	N/A		
Earthen Embankment	Good	None	N/A		
					Structure Description: Approximately 200 linear feet of Creosote-timber bulkhead plug with reef shell tie-ins at both ends and banklines.



MAINTENANCE INSPECTION REPORT CHECKSHEET

Project No. / Name: Point Au Fer Island Hydrologic Restoration

Date of Inspection: 4/18/2005 **Time:** N/A

Structure No: Plug 2 - Phase I

Inspector(s): S. Triche, D. Dearmond, E. Lear, and C. Brodnax

Structure Description: 270 linear ft. timber plug

Water Level: Inside: Outside:

Type of Inspection: Annual

Weather Conditions: Sunny and Breezy **Temp:** 70°

Item	Condition	Pysical Damage	Corrosion	Photo #	Observations and Remarks
Timber Piles	Good	None	N/A		Observation: Site was not visited due to time constraints. No changes from last year are expected.
Timber Whalers Sheetpile	Good	None	N/A		
Galvanized Pile Caps	Good	None	N/A		
Signs/Supports	Good	None	N/A		
Shell Backfill	Good	None	N/A		
Earthen Embankment	Good	None	N/A		
					Structure Description: Approximately 270 linear feet of Creosote-timber bulkhead plug with reef shell tie-ins at both ends and banklines.



MAINTENANCE INSPECTION REPORT CHECKSHEET

Project No. / Name: Point Au Fer Island Hydrologic Restoration

Date of Inspection: 4/18/2005 **Time:** N/A

Structure No: Plug 3A - Phase I

Inspector(s): S. Triche, D. Dearmond, E. Lear, and C. Brodnax

Structure Description: 240 linear ft. shell plug

Water Level: Inside: Outside:

Type of Inspection: Annual

Weather Conditions: Sunny and Breezy **Temp:** 70°

Item	Condition	Pysical Damage	Corrosion	Photo #	Observations and Remarks
Shell Plug	Fair	None	N/A		Observation: Site was not visited due to time constraints. No changes from last year are expected.
Signs/Supports	Good	None	N/A		
Earthen Embankment	Good	None	N/A		
					Structure Description: Approximately 240 linear feet of shell plug on geotextile fabric.



MAINTENANCE INSPECTION REPORT CHECKSHEET

Project No. / Name: Point Au Fer Island Hydrologic Restoration

Date of Inspection: 4/18/2005 **Time:** 11:20 AM

Structure No: Plug 4A - Phase I

Inspector(s): S. Triche, D. Dearmond, E. Lear, and C. Brodnax

Structure Description: Existing Bulkhead with Concrete Mats

Water Level: Inside: Outside:

Type of Inspection: Annual

Weather Conditions: Sunny and Breezy **Temp:** 70°

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Sheet Piling	Good	None	Yes	11, 12, 13, 14, 15, 16, 17, 18, 19,	Observation: The eastern Articulated Concrete Mats have settled and are being constantly overwashed by gulf wave action. The shoreline behind the eastern mats has eroded back approximately 50' from the mats, and is in danger of eventually connecting with Transco Cana
Articulated Concrete Mats (East)	Fair	None	N/A	20, 21, 22, 23, 24, 25, 26	
Articulated Concrete Mats (West)	Good	None	N/A		
Limestone Rip Rap	Good	None	N/A		
Earthen Embankment	Fair	Eroded	N/A		
					Structure Description: Existing steel bulkhead lined with rip rap with approximately 536' of articulated concrete mats to the west of the bulkhead and approximately 464' of articulated concrete mats to the east of the bulkhead.



MAINTENANCE INSPECTION REPORT CHECKSHEET

Project No. / Name: Point Au Fer Island Hydrologic Restoration

Date of Inspection: 4/18/2005 **Time:** 10:45 AM

Structure No: Plug 6 - Phase I

Inspector(s): S. Triche, D. Dearmond, E. Lear, and C. Brodnax

Structure Description: 180 linear ft. timber plug

Water Level: Inside: Outside:

Type of Inspection: Annual

Weather Conditions: Sunny and Breezy **Temp:** 70°

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Timber Piles	Good	None	N/A	8, 9, 10	Observation: Site in good condition despite still being bowed. Both tie-ins are in good condition.
Timber Whalers Sheetpile	Good	None	N/A		
Galvanized Pile Caps	Good	None	N/A		
Signs/Supports	Good	None	N/A		
Shell Backfill	Good	None	N/A		
Earthen Embankment	Good	None	N/A		
					Structure Description: Approximately 180 linear feet of Creosote-timber bulkhead plug with reef shell tie-ins at both ends and banklines.



MAINTENANCE INSPECTION REPORT CHECKSHEET

Project No. / Name: Point Au Fer Island Hydrologic Restoration

Date of Inspection: 4/18/2005 **Time:** N/A

Structure No: Plug 7 - Phase I

Inspector(s): S. Triche, D. Dearmond, E. Lear, and C. Brodnax

Structure Description: 200 linear ft. timber plug

Water Level: Inside: Outside:

Type of Inspection: Annual

Weather Conditions: Sunny and Breezy **Temp:** 70°

Item	Condition	Pysical Damage	Corrosion	Photo #	Observations and Remarks
Timber Piles	Good	None	N/A		Observation: Site was not visited due to time constraints. No changes from last year are expected.
Timber Whalers Sheetpile	Good	None	N/A		
Galvanized Pile Caps	Good	None	N/A		
Signs/Supports	Good	None	N/A		
Shell Backfill	Good	None	N/A		
Earthen Embankment	Good	None	N/A		
					Structure Description: Approximately 200 linear feet of Creosote-timber bulkhead plug with reef shell tie-ins at both ends and banklines.



MAINTENANCE INSPECTION REPORT CHECKSHEET

Project No. / Name: Point Au Fer Island Hydrologic Restoration

Date of Inspection: 4/18/2005 **Time:** 9:30 AM

Structure No: Plug 8 - Phase I

Inspector(s): S. Triche, D. Dearmond, E. Lear, and C. Brodnax

Structure Description: 180 linear ft. timber plug

Water Level: Inside: Outside:

Type of Inspection: Annual

Weather Conditions: Sunny and Breezy **Temp:** 70°

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Timber Piles	Good	None	N/A	1, 2, 3, 4, 5, 6, 7, 8	Observation: The timber bulkhead is in good condition. South tie-in is still breached, but the breach does not appear to be any larger than last year. North tie-in is in good condition.
Timber Whalers Sheetpile	Good	None	N/A		
Galvanized Pile Caps	Good	None	N/A		
Signs/Supports	Good	None	N/A		
Shell Backfill	Good	None	N/A		
Earthen Embankment	Fair	Eroded	N/A		
					Structure Description: Approximately 180 linear feet of Creosote-timber bulkhead plug with reef shell tie-ins at both ends and banklines.



MAINTENANCE INSPECTION REPORT CHECKSHEET

Project No. / Name: Point Au Fer Island Hydrologic Restoration

Date of Inspection: 4/18/2005 **Time:** N/A

Structure No: Phase II - Rock

Inspector(s): S. Triche, D. Dearmond, E. Lear, and C. Brodnax

Structure Description: 3600 linear ft. of Rock Dike

Water Level: Inside: Outside:

Type of Inspection: Annual

Weather Conditions: Sunny and Breezy **Temp:** 70°

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Area 1 Rock Dike	Good	None	N/A		Observation: Site was not visited due to time constraints. No changes from last year are expected.
Area 2 Rock Dike	Good	None	N/A		
Area 3 Rock Dike	Good	None	N/A		
					Structure Description: Phase II rock dike consists of three Areas: Area 1 - 1800' of 250 pound class on geotextile fabric, 25 - 53 ft wide and 2' high above existing ground; Area 2 - 400' of 250 pound class on geotextile fabric, 33 ft wide and 2' high above existing ground; Ar



MAINTENANCE INSPECTION REPORT CHECKSHEET

Project No. / Name: Point Au Fer Island Hydrologic Restoration

Date of Inspection: 4/18/2005 **Time:** N/A

Structure No: Phase III - Rock

Inspector(s): S. Triche, D. Dearmond, E. Lear, and C. Brodnax

Structure Description: 3362 linear ft. of Rock Dike

Water Level: Inside: Outside:

Type of Inspection: Annual

Weather Conditions: Sunny and Breezy **Temp:** 70°

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Area 4 Rock Dike	Fair	None	N/A	27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37	Observation: The breach around the east end of Area 4 rock dike seems to be getting larger and the shoreline is eroding farther back from the end of the dike. The east end of Area 4 rock dike has settled and is now approximately 1' above the marsh level. It appears
Area 5 Rock Dike	Good	None	N/A		
					Structure Description: Phase III rock dike consists of two Areas: Area 4 - 3037' of 250 pound class on geotextile fabric, 25 ft wide and 32" high above existing ground; Area 5 - 325' of 250 pound class on geotextile fabric, 25 ft wide and 32" high above existing ground.

