# LAKE CHAPEAU SEDIMENT INPUT AND HYDROLOGIC RESTORATION (TE-26)

## I. INTRODUCTION

### I.1. Project Description

The Lake Chapeau Sediment Input and Hydrologic Restoration project was included in the Louisiana Coastal Wetlands Restoration plan and the third Priority Project List Report. The project area encompasses 13,549 acres (5483 ha) on Point au Fer Island in the vicinity of Lake Chapeau (Figure 1). Prior to project construction, the project area consisted of 9,006 acres (3645 ha) (66.5%) marsh and 4,543 acres (1839 ha) (33.5%) open water. Of the marsh, 56% was brackish and 44% was intermediate (NMFS 1994). The project boundary did not change through selection and implementation of the project.

Two features were used to reach the two project goals. Eight plugs positioned in man-made channels around the fringes of the project area were installed to re-establish natural drainage patterns and reduce water level variability. This component of the project has not been selected as part of this review. The project review focuses on the dredge material component of this project. Material was mined from Atchafalaya Bay and pumped into the project area to convert open water to marsh (LDNR revised 1998, NMFS 1994). Construction ended February of 1999. Plantings were added to the project and completed by May 2000.

### I.2. Project Personnel

| Project Phase | Name | Position | Agency |
|---|---|---|---|
| Planning & Implementation | Erik Zobrist | Project Manager | NMFS |
| Planning & Implementation | David Burkholder | Project Manager | LDNR |
| Planning | Tom Minello | Biologist | NMFS |
| Planning | Terry McTigue | Biologist | NMFS |
| Monitoring | Vincent Cheramie | Monitoring Manager | LDNR |
| Monitoring | Lori Ziehr | Monitoring Manager | LDNR |
| Monitoring | Marc Fugler | Monitoring Manager | LDNR |
| Monitoring | Elaine Lear | Monitoring Manager | LDNR |
| Monitoring | Chris Cretini | DAS Assistant | LDNR |

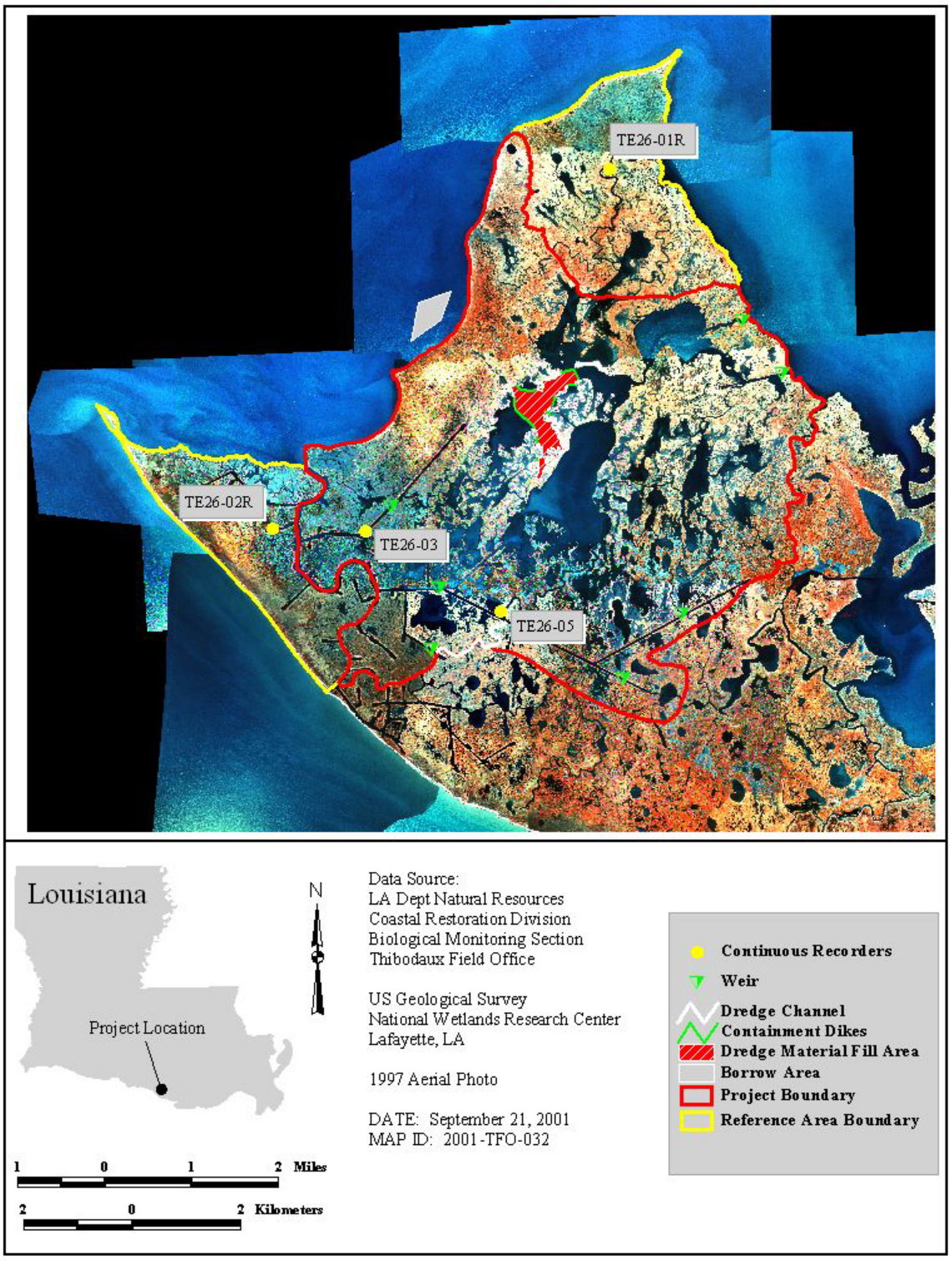



Figure 1. Lake Chapeau Sediment Input and Hydrologic Restoration Project Location and Features (TE-26)

## II. PLANNING

### II.1. Causes of Loss

Loss rates occurred in the interior of Point au Fer since 1930's. Loss rates between 1932 and 1974 peaked at 45.45 ac/yr (0.4-0.5%/yr) as a result of hydrologic changes attributed to canal dredging for oil exploration. Loss rates have decreased and were estimated to at be 20.124 ac/yr (0.1-0.2%/yr) during project planning in 1998-1999. The Wetland Value Assessment (WVA) used a land loss rate of 0.22% for brackish marsh (NMFS 1993 (SEPT)). It is not clear what land loss rates have been in the project area or what land loss rates were based on from the WVA and monitoring reports. Land loss rates for the Vermilion basin were 4.8% between 1956-1978 and 0.9% from1978-1990 (Barras et al. 1994).

Since 1973, Point au Fer Island has experienced freshening as a result of the circulation of sediments and freshwater from Atchafalaya Bay into the project area. This freshwater flow and sediment source has not been as effective as possible in naturally restoring the marsh due to man made changes in hydrologic patterns and presence of artificial levees.

*What was assumed to be the major cause of land loss in the project area?*
The Project Information Sheet states oil and gas access canals cut into the interior of Point au Fer Island dramatically altering the natural drainage pattern. Strong tidal flows occurred between Locust Bayou in the southwest and Four League Bay in the northwest. Sheet flow and over bank flow were drastically reduced by artificial levees, which in turn impounded marsh and led to degradation due to soil water logging.

The Environmental Assessment (NMFS 1998) says "numerous oil and gas access and pipeline canals have been constructed primarily in the southwestern portion of the island, although several long canals have been constructed in the east and northeast section. These canals provide maritime access to numerous well sites and have caused extensive hydrologic modification. These modifications include shoreline erosion, the increased flushing of inland marshes, unintentional impoundment and the advancement of saline water into existing intermediate-brackish marshes. These influences may have adversely impacted physical marsh integrity and resulted in the conversion of inland marsh to open water."

*What were assumed to be the additional causes of land loss in the project area?*
Natural subsidence and natural shoreline erosion; oil/gas canal construction; impoundment and natural hydrologic pattern disruption by artificial levees associated with oil/gas canals; and pipeline canals breaching the Gulf shoreline (NMFS 1993 (OCT)).

## II.2. Background

Mining of sediment in Atchafalaya Bay and spreading the sediment on the island could be done without adversely impacting the bay, while aiding the natural restoration of the marsh (NMFS 1993 (OCT)). Dredge material used for marsh creation/restoration is an accepted restoration technique. The U.S. Army Corps of Engineers is using this technique in Atchafalaya Bay as "beneficial use of dredged material" projects. Area soils contain mineral concentrations to aid restoration success.

## II.3. Project Goals and Objectives

The goal stated in the project's Environmental Assessment (NMFS 1998) was to partially re-establish a hydrologic separation of two watersheds in the project area by utilizing sediment input by means of dredging and fill operations and to restore island hydrology by means of plugs/weirs, spoil bank gapping, and maintenance dredging a natural bayou. The monitoring plan states the goals to be:

- Create approximately 260 ac (105 ha) of marsh west of Lake Chapeau.
- Decrease the water level variability within the project area.

*How were the goals and objectives for the project determined?*
The goals of the project were based on the estimated acres that could be created (area of open water) for a reasonable cost determined through the WVA and Engineering Work Group cost estimates.

*Are the goals and objectives clearly stated and unambiguous?*
Creating 260 acres of marsh is a clearly stated goal. However, the type of marsh is left to interpretation. The hydrologic separation was a goal of the project not addressed in the monitoring plan. This dredged material was to "partially re-establish the hydrologic separation" of the watersheds to the north and south of the dredge fill area (NMFS 1994, NMFS 1998).

*Are the goals and objectives attainable?*
The goal of creating 260 acres of marsh is attainable, but may require more than one dredging event to attain.

*Do the goals and objectives reflect the causes of land loss in the project area?*
The goal of creating marsh in this project area is to replace marsh lost, while re-establishing the natural hydrology. The hydrologic restoration component of the project, not being reviewed in this report, reflects the assumed cause of land loss.

## III. ENGINEERING

### III.1. Design Feature(s)

*What construction features were used to address the major cause of land loss in the project area?*
Project components (LDNR revised 1998):

- Sediment hydrologically dredged from Atchafalaya Bay, 300 yards (274 m) off the west central shoreline of Point au Fer Island, was to be pumped over the broken marsh west of Lake Chapeau creating approximately 260 ac (105 ha) of marsh at a mean elevation 1.0 ft (0.3 m) NGVD (figure 1).
- Eight earthen plugs were to be constructed in canals around the fringes of the project area (figure 1).

The sediment input component of the project consisted of restoring marshes west of Lake Chapeau and re-establishing a hydrologic separation between two existing bayous. The conceptual design of the project called for dredging 500,000 cubic yards of sediment from Atchafalaya Bay and spreading the dredged material over the marshes west of Lake Chapeau (LDNR 2001 (APR)).

*What construction features were used to address the additional causes of land loss in the project area?*
The hydrologic restoration component of the project consisted conceptually of eight plugs installed in manmade canals around the perimeter of the Lake Chapeau project area. The plugs helped to restore the natural circulation and drainage patterns within the central portion of Point au Fer Island (LDNR 2001 (APR)).

*What kind of data was gathered to engineer the features?*
Engineering design was performed by Burk-Kleinpeter, Inc. (BKI) under contract to the Department of Natural Resources. BKI utilized two subcontractors during the design phase. T. Baker Smith and Son, Inc. performed field surveys of the project area. Eustis Engineering Company, Inc. performed a geotechnical investigation of the plug sites (LDNR 1996 (JULY)). Sediment coring and geotechnical analysis of the borrow areas in Atchafalaya Bay were preformed by C-K Associates, Inc. of Baton Rouge, LA. This work was completed under subcontract to GOTECH, Inc. through their indefinite delivery contract with the National Marine Fisheries Service (LDNR 2001 (APR)).

*What engineering targets were the features trying to achieve?*
The project's final design specified that dredged material was to be placed to an initial elevation of +1.5 feet NGVD with an allowance for settlement of 1.0 foot, for a final elevation of 0.5 feet (LDNR 1997). The initial elevation was set at 1.0 feet above the existing average marsh elevation (+0.5 feet NGVD) as determined from survey cross sections of the fill area. A marsh elevation determination per the CWPPRA monitoring protocols was not done during engineering design. The settlement allowance was based on a rule-of-thumb estimate that the portion of

fill above mean tide level would experience approximately 50% reduction in height due to consolidation and dewatering. No engineering analyses were made to support this estimate. The engineering target was to achieve an elevation close to the existing marsh after consolidation and dewatering of the fill material was complete (personal communication from David Burkholder, Project Manager, LDNR).

### III.2. Implementation of Design Feature(s)

*Were construction features built as designed? If not, which features were altered and why?*

Significant portions of the dredged fill material were placed below the target elevation. The major problem encountered in the placement of soft, gray clays mined on this project was the construction of the earthen dikes needed to contain the pumped slurry and dewater it. In the deeper water areas it was difficult to build and maintain the dikes using marsh buggy backhoes. Some of the dikes failed during dredging operations necessitating an additional, parallel line of dikes to be built. Other dikes failed after dredging resulting in the lower elevations on the northern end of the project area. Existing marsh worked very well for containment but did limit the elevation to which the material could be placed (LDNR 2001 (APR)).

Two additional deviations from the project design were observed during the project's final inspection in May 1999. The dredge discharge pipeline corridor was found to be in unsatisfactory condition and in need of repair. Marsh buggy transit had damaged the existing vegetation and formed a tidal channel connecting the interior of the island with the bay. The shell ridge previously present on the shoreline had eroded at the month of this new channel. Second, very little new vegetative growth was present in the dredge fill area (LDNR 2001 (APR)).

While there was disagreement regarding who was responsible for the repairs needed to the dredge discharge pipeline corridor, it was felt that immediate action was needed to prevent tidal flows from eroding the newly placed fill which was still very soft. At DNR's request, BKI developed a scope of work for a rip rap plug at the shoreline end of the pipeline corridor. The construction contractor completed this repair work in August 1999 under change order to their contract. At the request of NMFS plans and specifications for vegetative plantings in the fill area were prepared by the DNR and advertised for public bidding. Planting began in April 2000 (LDNR 2001 (APR)). A total of 46,980 *Spartina alterniflora* (smooth cordgrass) plugs were installed in the fill area (Coastal Environments, 2000). At the time of planting, some natural recruitment of *S. alterniflora* and *Scripus olneyi* (olney bulrush) had begun (personal communication from Richard Hartman, NMFS).

### III.3. Operation and Maintenance

*Were structures operated as planned? If not, why not?*
The plugs were designed as passive structures and no operation was planned.

*Are the structures still functioning as designed? If not, why not?*
Only a preliminary evaluation of the hydrologic component of this project is possible at this time. The plugs have been observed several times since construction was completed under different flow conditions and they appear to be functioning exactly as they were intended to be. Apparently the structures are stable; the crests all appear to be uniform in elevation (LDNR 2001 (APR)).

*Was maintenance performed?*
The only maintenance completed to date was minor repairs to the supplemental safety buoy system installed at six of the plug locations to provide additional warning to boaters. The dredge discharge pipeline corridor may need further repairs in the near future. Portions of it have become open water and there is a concern that the riprap placed on the Atchafalaya Bay shoreline may eventually be washed around, providing a hydrologic connection between the fill area and Atchafalaya Bay.

## IV. PHYSICAL RESPONSE

### IV.1. Project Goals

*Do monitoring goals and objectives match the project goals and objectives?*
See V.1 for project goals. Yes, the monitoring goals formalized statements from the Environmental Assessment (NMFS 1998).

### IV.2. Comparison to adjacent and/or healthy marshes

#### IV.2.1. Elevation

*What is the range of elevations that support healthy marshes in the different marsh types?*
It has not been established if the marshes in the project area are "healthy".

*Does the project elevation fall within the range for its marsh type?*
The Environmental Assessment (NMFS 1998) says that the average marsh elevation in the area is +0.5 feet NGVD.

*Did the project meet its target elevation?*
The desired final fill elevation was +0.55 feet NGVD.
Post-construction monitoring data indicated that the dredged fill areas were slightly lower than adjacent marsh. The surrounding marsh elevation ranged 0.41-0.71 m, with the fill area ranging from 0.03 to 0.39 m. The benchmarks used

for these elevations have not been tied into the coastal area elevation network. Therefore elevations mentioned are only relative to the area benchmarks used.

*What is the subsidence rate and how long will the project remain in the correct elevation range?*
The information sheet estimates the subsidence rate to be 1.0 cm/yr. No direct measurements are available but the rate for the Atchafalaya is 1.3 cm/yr (Van Heerdan, 1983) and for Leeville to the east, 0.67 cm/yr (Penland et al, 1988).

### IV.2.2. Hydrology

*What is the hydrology that supports healthy marshes in the different marsh types?*
The hydrology of the target can be compared to the surrounding marshes. A determination of the hydrology that supports "healthy marshes" has not been determined.

*Does the project have the correct hydrology for its marsh type?*
No, the dredged spoil area is at a lower elevation and is flooded more often and deeper than surrounding marshes (Figure 2). Roughly 30% of the dredged fill area was flooded more than 60% of the time (Table 1).

*What were the hydrology targets for the project and were they met?*
Eight earthen plugs were installed to reduce water level variability. Water level variability does appear to have been reduced at one of the two monitoring stations within the project (TE 26-05), but this data has not been analyzed to determine any statistical difference. The establishment of the hydrologic separation may or may not have been accomplished. It is not clear what was intended by the hydrologic separation. There does appear to be a separation of the large open water bodies to the northeast and southwest of the fill area (Figure 2). Because target elevations were not met throughout the project area, the separation was not complete to the east and west.

### IV.2.3. Salinity

*What is the salinity regime that supports healthy marshes in the different marsh types?*
Brackish marshes have an average salinity of 8.2 ppt with a maximum of 18.4 ppt. Intermediate marshes average 3.3 ppt with a maximum of 8.3 ppt (Chabreck et al. 1989).

*Does the project have the correct salinity for its marsh type?*
The average salinities in the project area are within the range of brackish and intermediate marsh salinities.

Table 1. Acreage within each flood duration class based on hourly water level readings at station TE 26-05 (LDNR).

| Elevation Class | ACRES | HECTARES |
|---|---|---|
| NOT FLOODED | 0.00 | 0.00 |
| 0 - 10% | 26.69 | 10.80 |
| 10 - 20% | 23.68 | 9.58 |
| 20 - 30% | 21.08 | 8.53 |
| 30 - 40% | 17.44 | 7.06 |
| 40 - 50% | 22.19 | 8.98 |
| 50 - 60% | 27.02 | 10.94 |
| 60 - 70% | 19.56 | 7.94 |
| 70 - 80% | 13.55 | 5.48 |
| 80 - 90% | 7.04 | 2.85 |
| 90 - 100% | 12.08 | 4.89 |
| CONTINUOUSLY FLOODED | 1.61 | 0.65 |
| **TOTAL** | **191.95** | **77.68** |

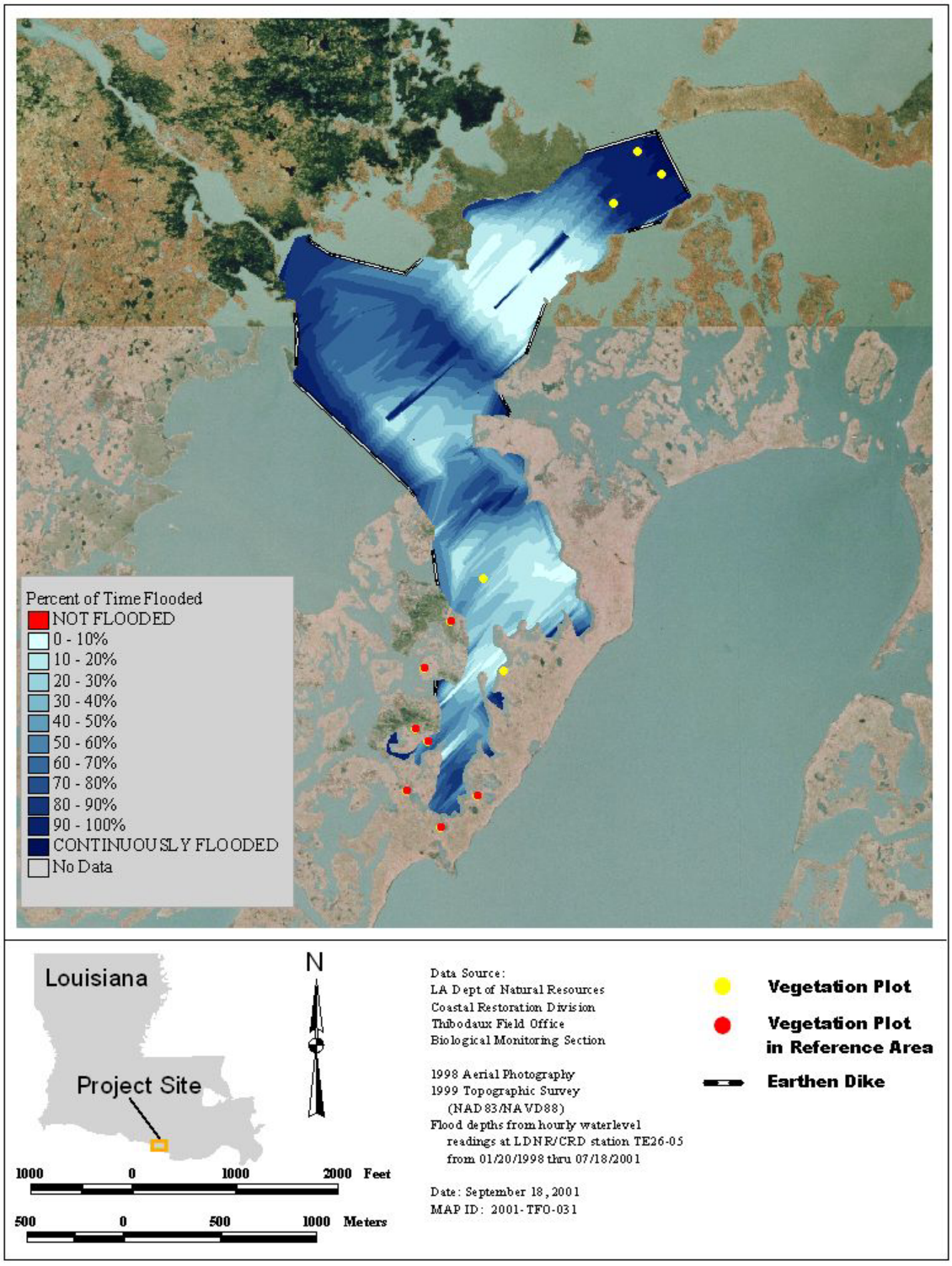



Figure 2. Percent of Time Flooded for Lake Chapeau Sediment Input and Hydrologic Restoration (TE-26).

*What were the salinity targets for the project and were they met?*
Altering salinity in the project area was not a direct goal of the project. The WVA claims that the brackish marsh area may decrease in salinity from 7 ppt to 6 ppt over the 20-year life of the project and that the intermediate areas of the marsh are freshening due to proximity of the project area to the Atchafalaya River. In August of 1978, Chabreck and Linscombe mapped the entire area as brackish marsh. By 1988, the area was classified by 40-50% intermediate marsh. The freshening trend is expected to continue as long as the discharge down the lower Atchafalaya River is not decreased (NMFS 1994).

Average salinity in the project area pre-construction is 5.98 ppt and 10.10 ppt post-construction. Average salinity in the reference areas pre-construction is 5.18 ppt and 8.25 ppt post-construction. A drought during years of construction is likely to have caused the increase in salinity.

### IV.2.4. Soils

*What is the soil type that supports healthy marshes in the different marsh types?*

*Does the project have the correct soil for its marsh type?*
Soil borings drilled in 1996 of the dredge material source location showed that the top stratum was composed of highly organic soils for a depth of a few feet below the mud line, and the remainder of the sample was gray clay. The draft of Terrebonne Parish soils for Point au Fer (NRCS) indicates soils in the project area are Lafitte Muck, a slightly saline, tidal soil that supports wetland plants. There was no other information about soils for the project area (personal communication with Marty Floyd, NRCS).

### IV.2.5. Other

Subsidence rates and elevations for the reference areas could help compare the dredge material placement to marshes in the area.

## IV.3. Suggestions for physical response monitoring

*Are there other variables that could be monitored to substantially increase the ability to understand the results of the project?*
Vertical accretion rates, subsidence rates, movement of the dredge spoil after placement, elevation surveys and, soil analysis could all help determine what impact dredged material has on marsh vegetation over time and the ability of plants to add organics and build soil.

# V. BIOLOGICAL RESPONSE

## V.1. Project Goals

The goal was to partially reestablish a hydrologic separation of the two watersheds in the project area by utilizing sediment input by means of dredging and fill operations and to restore island hydrology by means of plugs, spoil bank gapping, and maintenance dredging a natural bayou (NMFS 1998). The monitoring plan more clearly states the goal to create approximately 260 ac (105 ha) of marsh west of Lake Chapeau via dedicated dredging. The Final Report says dredged material was placed an average of two feet in depth creating 168 acres of marsh. This acreage was lower than originally planned due to the increased depth of fill required. The project conceptual design was based on the placement of a one-foot thickness of dredged material, while the preliminary design showed the average required depth of fill to be two feet. The original 260 acres would have been constructed if the bids had fallen within the construction budget; however, the bidder's total price was about 8% over the approved construction budget (LDNR 2001 (APR), LDNR 1997 (JULY)).

## V.2. Comparison to adjacent and/or healthy marshes

### V.2.1. Vegetation

*What is the range in species composition and cover for healthy marshes in each type?*

The natural marsh in the project area in 1999 and 2001 was predominately (84%) *Spartina patens* (marshhay cordgrass) with *Distichlis spicata* (salt grass) and *Scirpus americanus* (American bulrush) represented. *S. alterniflora* was not present in 1999, but appears at roughly 15-20% cover in 2001.

Percent cover of species combined is around 80% in the natural marsh. Percent cover in the reference plots of the fill area was around 40 % (Figure 3), which is half the coverage of the natural marsh. However, the reference plot locations were randomly selected prior to construction. Three of the five reference plots are in the north fill area that is flooded more than 80% of the time (Figure 2). Of the fill area above water, cover is similar to surrounding marshes at 80% cover (personal communication from Rick Hartman, NMFS and Darin Lee, LDNR).

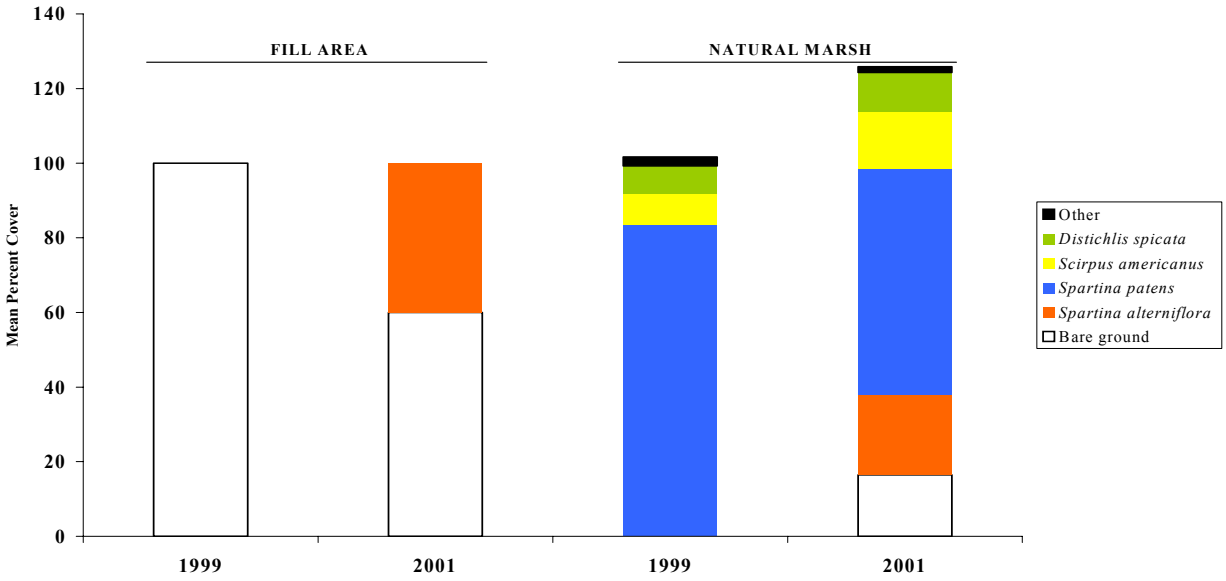
*Does the project have the correct species composition and cover for its type?*

No. *S. alterniflora* was planted in April 2000 and was the only species present in the fill area in 2001 vegetative plots (Figure 1). So the species composition is different from the natural marsh for the first year after planting (Figure 3).

*What were the vegetation targets for this project and were they met? If not, what is the most likely reason?*

The 168 acres of land created by fill does not yet represent the natural marsh. *S. alterniflora* plugs were added when the project failed to rapidly naturally vegetate.

**Figure 3. Mean Percent Cover of Selected Species on the Dredge Material Fill Area at Lake Chapeau Hydrologic Restoration (TE-26) Project for 1999 and 2001 (LDNR)**




### V.2.2. Landscape

*What is the range in landscapes that supports healthy marshes in different marsh types?*
Marsh plants have different composition than surrounding marsh as mentioned in section V.2.1.

*Is the project changing in the direction of the optimal landscape? If not, what is the most likely reason?*
The land: water ratio for the project area was monitored in 1994 and 1997 pre-construction and will be obtained in 2001 and 2010 post-construction. The land: water ratio was 59:41 in 1994 and 43:57 in 1997. This compares with a land: water estimate of 66:34 obtained from the project information sheet. The rate of land loss between 1994 and 1997 in the project area was significantly greater than the reference areas. The reference areas changed from a land: water ratio of 81:19 in 1994 to 78:22 in 1997.

Habitat classification of the project area in 1994 pre-construction identified 7,870 acres of brackish marsh, 308 acres of mud flat, and 138 acres of upland scrub-shrub as the predominant classes. Habitat classification of the project area in 1997 pre-construction identified 7,604 acres of brackish marsh, 232 acres of mud

flat, and 181 acres of upland scrub-shrub as the predominant classes. Habitat classification post-construction from 2001 is in preparation and will be completed in June 2002. Chabreck-Linscombe habitat classifications conducted in 1988, 1997 and 2001 covered the project area. The 1988 classification identified the project area as 67% brackish marsh and 33% intermediate marsh. The 1997 classification identified the project area as 55% brackish marsh and 45% intermediate marsh. The 2001 classification showed that over 99% of the project area was brackish marsh. Salinity data suggest that the change in classification is consistent with an increase in salinities. Salinities post-construction in the drought years of 1999 and 2000 were higher on average than previous years.

#### V.2.3. Other

Fish access/use, submersed aquatics and turbidity would provide characteristics of the projects influence on biological systems, but would provide more information about the hydrologic restoration component of the project than the dredge fill component alone. Fisheries use may have been preserved/increased as a result of the dredge placement not completing the hydrologic separation. Shorebird habitat would have been larger if the 36% of material placed was completed as planned.

### V.3. Suggestions for biological response monitoring

*Are there other variables that could be monitored to substantially increase the ability to understand the results of the project?*
None have been suggested.

## VI. ADAPTIVE MANAGEMENT

### VI.1. Existing improvements

*What has already been done to improve the project?*
Plantings were added to the project as previously mentioned, in order to vegetate the fill area.

### VI.2. Project effectiveness

*Are we able to determine if the project has performed as planned? If not, why?*
The project created marsh, but not as much as originally planned.

*What should be the success criteria for this project?*
Creation of marsh is the success criteria for the component being reviewed.

### VI.3. Recommended improvements

*What can be done to improve the project?*
Another dredge placement may be done to increase the elevation to that of the surrounding marsh elevation and establish the hydrologic separation. Then, seed the new fill areas, and back fill the pipeline canal.

### VI.4. Lessons learned

1. Consideration needs to be made of any damage that may occur to the marsh as a result of pipeline corridors to the dredge fill areas.
2. Containing the slurry is very difficult and multiple dredge placements may be needed to attain marsh elevation.
3. Contractors are paid by the amount of materials moved, not the benefits (acres in this case) attained. Therefore, the goal for the contractor is to move material, while the project goal is to create marsh. This leads to compromising the goal of creating marsh to fit budget constraints and complicates estimating marsh creation costs.

## SUPPORTING DOCUMENTATION

### VII.1. Published References


Barras, J. A., P. E. Bourgeios and L. R. Handley. 1994. Land Loss in Coastal Louisiana 1956-90. National Wetlands Research Center Open File Report 94-01. January.

Chabreck, R.H., T. Joanene and S.L. Paulus. 1989. Southern Coastal Marshes and Lakes. IN Habitat Management for Migrating and Wintering Waterfowl in N. America. pg 249-277

Chabreck, R.H. and G. Lindscomb.

Coastal Environments. 2000. Lake Chapeau Vegetation Planting; State project No. TE-26, Federal Project NO. PTE-23/26. Final Report. 1260 Main Street, Baton Rouge, LA 70802

Louisiana Department of Natural Resources (LDNR). Revised July1998. Monitoring plan. Project No. TE-26: Lake Chapeau Sediment Input and Hydrologic Restoration. Unpublished report. Baton Rouge: Coastal Restoration Division. 7 pp.

National Marine Fisheries Service (NMFS). 1998. Environmental Assessment of Lake Chapeau Sediment Input and Hydrologic Restoration CWPPRA Project PTE-23/26a. Prepared by Gotech, Inc and C-K Associates, Inc Baton Rouge, Louisiana.

Penland, S., K.E. Ramsey, R.A. McBride, T.F. Moslow, and K.A. Westphal. 1989. Relative sea level rise and subsidence in Louisiana and the Gulf of Mexico. Coastal Geology Technical Report No. 3. Louisiana Geological Survey, Baton Rouge, LA. 65 pp.

Van Heerden, 1983. Deltaic Sedimentation in Eastern Atchafalya Bay, Louisiana. Louisiana Sea Grant College Program, Center for Wetland Resources. Louisiana State University, Baton Rouge, Louisiana. 117pp.

### VII.2. Unpublished Sources

| AGENCY | Year (Month) | Agency Contact | Document type | Short description | Pages |
|---|---|---|---|---|---|
| NMFS | 1993 (SEPT) | Patrick Williams | WVA (Wetland Value Assessment) | Lake Chapeau Marsh Creation and Hydrologic Restoration (PTE-23/26a/33) | 12 |
| LDNR | 1996 (JULY) | David Burkholder | Geotechnical Investigation | Lake Chapeau Sediment Input and Hydrologic Restoration DNR contract No. 25085-95-23 Report by Eustis Engineering Company, Inc for Burk-Klienpeter, Inc. New Orleans, LA | 34 |
| NMFS | 1994 | Richard Hartman | Project Information Sheet | CWPPRA Proposed Project Information Sheet for Lake Chapeau Sediment Input and Hydrologic Restoration | 9 |
| LDNR | 1997 (JULY) | David Burkholder | Letter | Letter to Erik Zobrist about Proposed Project Scope Revisions | 2 |
| LDNR | 2001 (APR) | David Burkholder | Final Report | Lake Chapeau Sediment Input and Hydrologic Restoration (PTE-23/26a) Grant no. NA57FZ0177 | 7 |
| NMFS | 1993 (OCT) | Erik Zobrist | Project Description: Lake Chapeau Sediment Input and Hydrologic Restoration | Candidate Project for the Priority Project List 3 of the CWPPRA | 6 |
| LDNR | 1997 | David Burkholder | Final Plans and Specs for Lake Chapeau Sediment Input and Hydrologic Restoration Project PTE-23/26a | Prepared by Burk-Kleinpeter, Inc New Orleans, LA | |

## VIII. PROJECT REVIEW TEAM

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Hilary Thibodaux, LDNR

## APPENDIX A. PROJECT INFORMATION SHEET

Project Name and Number: TE-26 Lake Chapeau
Date: March 11, 2002

| INFORMATION TYPE | YES | NO | N/A | SOURCE |
|---|---|---|---|---|
| Fact Sheet | X | | | PPL, Web, Joy Merino/Erik Zobrist (NMFS) |
| Project Description | X | | | Joy Merino/Erik Zobrist (NMFS) |
| Project Information Sheet | X | | | Joy Merino/Erik Zobrist (NMFS) |
| Wetland Value Assessment | X | | | Joy Merino/Erik Zobrist (NMFS), (DNR) |
| Environmental Assessment | X | | | David Burkholder (DNR) |
| Project Boundary (no change from original) | X | | | Joy Merino/Erik Zobrist (NMFS), GIS lab |
| Planning Data | X | | | Geotech, soil borings; David B. (DNR) |
| Permits | X | | | Joy Merino/Erik Zobrist (NMFS), (DNR?) |
| Landrights | X | | | Issues; changed hydro. features (NMFS, DNR?) |
| Cultural Resources | X | | | In EA, David Burkholder (DNR) |
| Preliminary Engineering Design | X | | | David Burkholder (DNR) |
| Geotechnical | X | | | David Burkholder (DNR) |
| Engineering Design | X | | | David Burkholder (DNR) |
| As-built Drawings | X | X | | No as-built, but before/after surveys were done; David Burkholder (DNR) |
| Modeling Output | | X | | |
| Construction Completion Report | X | | | David Burkholder (DNR) |
| Engineering Data | X | | | David Burkholder (DNR) |
| Monitoring Plan | X | | | DNR, web www.saveLAwetlands.org |
| Monitoring Reports | X | | | DNR, web www.saveLAwetlands.org , Data and Summary Graphics |
| Supporting Literature | X | | | |
| Monitoring Data | X | | | Brown Marsh photography, water level and veg data from LSU, post Andrew/nutria excluder device (Jenneke Visser) |
| Operations Plan | | X | | |
| Operations Data | | X | | |
| Maintenance Plan: O&M Plan | X | | | In development/ review (DNR) |
| Maintenance Data | X | | | Back-filling of access canal issue (DNR) |
| O&M Reports: Annual inspection rpts | X | | | O&M Plan being revised (Van Cook, DNR) |
| Other | | | | |
| Cost Share Agreement | X | | | DNR |
| | | | | |
| | | | | |
| Data Needs: | | | | |
| Tie in elevations to network | | | | |
| Survey elevation across dredge materials | | | | |