

REGION IV

Coastal Wetlands Planning, Protection and Restoration Act

20th Priority Project List



Region 4 Regional Planning Team Meeting



January 26, 2010
Rockefeller Refuge, LA

1. Welcome and Introductions



RPT Region 4
Leader:
Darryl Clark –USFWS

Announcements

- PPL 20 Selection Process Packages
- PPL 20 RPT meetings to accept project nominees:
 - **Region IV, Rockefeller Refuge, Jan. 26, 2010, 1:00 pm**
 - Region III, Houma Municipal Auditorium, Jan. 27, 2010, 9:00 am
 - Region II, New Orleans Corps of Engineers, Jan 28, 9:00 am
 - Region I, New Orleans Corps of Engineers, Jan 28, 1:00 pm
- Coast-wide Voting meeting to select project nominees for all basins:
February 24, 2010, 9:30 am
LA Department of Wildlife and Fisheries, 2000 Quail Dr. Baton Rouge
- Parish representatives must identify themselves during the RPT meetings and fill out a voting registration form, including contact information for the primary and secondary voting representatives that will cast votes at the coast-wide voting meeting.
- CWPPRA agencies will be assigned responsibilities for preparing nominee fact sheets after the coast-wide voting meeting.

Region 4 Parishes

Eligible parishes for basins in Region 4 include:

Calcasieu-Sabine Basin

Cameron Parish

Calcasieu Parish

Mermentau Basin

Cameron Parish

Vermilion Parish

2. PPL 20 Process and Ground Rules



RPT Meetings

- Jan. 26-28, 2010 to accept project and demo proposals in 4 coastal regions broken into 9 basins (no limit on number of projects that can be proposed).
- Project proposals should support a Coast 2050 Regional or Coast-wide Strategy.
- A project can only be nominated in one basin.
- Proposals that cross multiple basins or coast wide projects shall be nominated in one basin only based on majority area of project influence.
- Project presenters can split multi-basin or coast-wide projects into multiple individual projects. This must occur during the RPT meeting the project is first presented in. If a presenter does not choose what basin to propose a project in, the RPT leaders will decide collectively after the RPT meetings but before the Coast-wide Voting Meeting.
- Public comments on project proposals will be accepted orally during the RPT meetings and in writing by February 12, 2010.

Coast-wide Voting Meeting

- Feb. 24, 2010, Coast Wide Voting Meeting.
- RPTs, consisting of CWPPRA Agencies and Coastal Parishes, will select 2 nominees per basin, except 3 each in Barataria, Terrebonne, and Pontchartrain and one in the Atchafalaya Basin. Six demonstration projects will also be selected.
- Selection will be by consensus if possible. If not CWPPRA agencies and parishes will submit ranked votes by basin.
- Parishes vote in basins they occupy and on all demonstration projects.
- No public comments taken during CWV meeting (Public comments will be heard today and written comments should be submitted by 2/12/2010 to the CWPPRA Program Manager)

Nominee Project Evaluations

- Following the coast-wide voting meeting, an agency will be assigned to each project to prepare a Nominee Project fact sheet (1 page + map).
- CWPPRA Engineering & Environmental Workgroups develop features and preliminary cost and benefit ranges
- Work groups will also review demo projects and verify that they meet demo criteria.
- CWPPRA Planning and Evaluation Subcommittee prepares cost/benefit summary matrix for Technical Committee.

PPL 20 Candidate Project Selection

- CWPPRA Technical Committee meeting, April 20, 2010 at 9:30 am, New Orleans Corps of Engineers
- Technical Committee ranks nominees and votes to select 10 candidate projects and up to 3 demos.
- Written public comments should be submitted to Corps of Engineers prior to TC meeting by April 3, 2010
- Public comments also accepted orally during meeting.
- Technical Committee will assign CWPPRA agencies to develop Phase 0 candidate projects.

PPL 20 Candidate Project Evaluation

- Candidates evaluated between May and October
- CWPPRA Workgroups
 - Workgroups conduct site visits to establish baseline and identify needs
 - Mapping workgroup meetings to establish project boundaries
 - Environmental Workgroup WVA meetings to calculate benefits
 - Engineering Workgroup meetings to refine features and project costs
 - Engineering Workgroup meetings to develop demonstration project scope and costs.
 - Economics Workgroup conducts economic analyses to develop fully funded cost estimates for 20 year project

CWPPRA PPL 20 Selection

- 2 Public meetings to present Phase 0 Evaluation results:
 - Abbeville, Courthouse, Nov. 16, 2010, 7:00 pm
 - New Orleans, Corps of Engs, Nov. 17, 2010, 7:00 pm
- Technical Committee votes to select up to 4 candidate projects and up to 1 demo to recommend for Phase 1.
 - Dec. 1, 2010, Baton Rouge, 9:30 am
- Task Force final decision end of January 2011.

3. Region 4 Coast 2050 Regional Strategies



Projects nominated should be:

- consistent with the Coast 2050
Regional Ecosystem or
Coastwide Strategies

Restore and Sustain Wetlands

- Operate locks in Mermentau basin to evacuate excess water
- Operate Calcasieu Lock to evacuate water after building new lock on a parallel channel for navigation.
- Manage Mermentau watershed to reduce rapid inflow to Lakes Subbasin
- Move water N to S across Hwy 82 in Mermentau Basin

Restore and Sustain Wetlands

- Restore connection of original Mermentau River to Gulf and constrict Ship Channel to authorized dimensions
- Dedicated dredging of sediment for wetland creation in Region 4
- Maintain Atchafalaya River water and sediment inflow thru the GIWW into the Mermentau Basin

Salinity Control in Calcasieu/Sabine Basin

- Control Calcasieu Ship Channel between Gulf and Calcasieu Lake
- Maintain Sabine River inflow
- Salinity control at Sabine Pass
- Salinity reduction in Sabine Lake at the Causeway
- Salinity control on east shoreline of Sabine Lake
- Salinity control of GIWW east of Sabine River

Restore, Protect and Maintain All Shorelines in Calcasieu/Sabine Basin

- Stabilize Grand/White Lake shorelines
- Stabilize Gulf shoreline in vicinity of Rockefeller Refuge
- Stabilize Gulf shoreline from Calcasieu Pass to Johnson's Bayou
- Maintain Atchafalaya mudstream in Gulf
- Restore longshore sediment flow across mouth of Calcasieu Pass
- Restore longshore sediment flow across mouth of Mermentau River Ship Channel

Maintain critical landforms

- Prevent coalescence of Grand and White Lakes
- Prevent coalescence of Grand Lake and GIWW

Coast 2050 Coastwide Strategies



- Beneficial Use of Dredged Material
- Dedicated Dredging for Wetland Creation
- Herbivory Control
- Stabilization of Major Navigation Channels
- Management of Bay/Lake Shoreline Integrity
- Management of Pump Outfall
- Vegetative Planting
- Maintain or Restore Ridge Function
- Terracing

4. PPL 20 Project Nominations



Demonstration Projects

- Demonstrates a new technology
- Demonstrates a technology which can be transferred to other areas in coastal Louisiana
- Are unique and not duplicative in nature
- Engineering/Environmental Workgroups will select sites for proposed demonstration projects
- The RPTs will select 6 demos at the Feb. 24th coast-wide voting meeting. The Tech. Comm. will select up to 3 demos in April 10
- Previous demo candidates must be *re-nominated* for PPL 20

5. Announcement of Coast-wide Voting Meeting



Coast-wide Voting Meeting

- Feb. 24, 2010 in Baton Rouge to choose 2 nominees per basin (3 in Barataria, Terrebonne, and Pontchartrain), (1 in Atchafalaya), and 6 demos. If only 1 project is nominated for the Mississippi River Basin, 3 nominees will be assigned to Breton Sound.
- Parishes within each basin are asked today to identify who will vote at the coast-wide meeting.
- No additional projects can be nominated after the RPTs
- No significant changes to projects proposed at the first round of RPT meetings will be allowed (this includes combining projects).
- No public comments accepted at the coast-wide meeting (public comments will be heard today and written comments can be submitted by 2/12/2010).

Coast-wide Voting Meeting

- Each officially designated parish representative, each Federal agency, & the State (OCPR) will have one vote.
- Voting will be by ranked vote.
- Each voting entity will be provided a ballot.
- Each voting entity will provide a ranked score for all projects – the highest ranking project will receive the highest vote and the lowest will receive a vote of “1”.
- Points will be totaled for all projects within each basin.

Coast-wide Voting Meeting

- The two nominees per basin (three in Barataria, Terrebonne and Pontchartrain, & Breton sound if only 1 in MR) receiving the highest vote will be included in the list of 20 nominee projects.
- All demo projects will be voted upon in same manner with one coast-wide ballot.
- 15 minutes will be allowed for voting in each basin and for demos.

6. Announcements of Upcoming Meetings



PPL 20 Upcoming Meetings

Coast-wide Voting Mtg, Feb 24, 2010, Baton Rouge
20 nominees and 6 demos selected

Technical Committee Mtg, 20 Apr 10, New Orleans
Selection of 10 candidates and up to 3 demos

Public Meetings

16 Nov 10, Abbeville

17 Nov 10, New Orleans

Technical Committee Mtg, 1 Dec 10, New Orleans
Recommend up to 4 projects for Phase I funding

Task Force Mtg, 19 Jan 11, New Orleans
Final selection of projects for Phase I funding

**Written Comments on Projects
Proposed Today Should be Sent to
the CWPPRA Program Manager
(Deadline: February 12, 2010)**

Melanie Goodman
CWPPRA Program Manager
U.S. Army Corps of Engineers
P.O. Box 60267
New Orleans, Louisiana 70160

Fax to 504-862-1892
Attn: Melanie Goodman

Email: Melanie.L.Goodman@usace.army.mil

7. Adjourn





ATTENDANCE RECORD



| | | |
|--|---|--|
| DATE(S) January 26, 2010 1:00 P.M. | SPONSORING ORGANIZATION COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT | LOCATION Rockefeller Refuge Grand Cheniere, LA |
|--|---|--|

PURPOSE

MEETING OF THE REGIONAL PLANNING TEAM REGION IV

PARTICIPANT REGISTER*

| NAME | JOB TITLE AND ORGANIZATION | PHONE NUMBER/EMAIL |
|----------------------|---|--------------------|
| MARTY FLOYD | CONSULTANT FLOYD CONSULTANTS LA. WILDLIFE FEDERATION | 318-346-7581 |
| Nicole Waguespack | Floating Island Environmental Solutions | 225-923-2194 |
| Ted Martin | Floating Island Envir. Sol. | 225-923-2194 |
| Michelle Fischer | USGS | 225-578-7473 |
| Chad Courville | Miami Corporation | 337.264.1695 |
| Troy Malrael | Biologist NRES | 337/291-3064 |
| Ron Bourtang | NRES | 337 291 3067 |
| JOHN FORET | NOAA/NMFS | 337-291 2107 |
| D. Charles Skamarost | USDA NRES | 737-893-5664 |
| Wayne Syron | U.S. Fish & Wildlife Service | 337/774-5923 |
| KEVIN O. LONG | LAKE ARTHUR CLUB | 318-221-3516 |
| STAFFORD COMEGYS | LAKE ARTHUR CLUB | 318-422-1066 |
| BARRY HEBERT | LDWF | 225 765 0233 |
| Joe Maryman | LDWF | 225 765-2380 |
| JACQUES BAEUR | Golf Engineer | 225 672-4161 |
| Chris Allen | OCPR | 225-342-4736 |
| Kelley Temple | OCPR | 225-342-1592 |
| KEITH O'CARROLL | USACE - ED | 504-862-2746 |
| Thomas Wright | Dore Energy | 337-502-5227 |
| Donna Clark | USFWS | 337-291-3111 |
| Sherrill Johnson | San Millin | 337 652 2636 |
| Nic Mathem | Leveche Parish | 985-632-4666 |

| | | |
|--|---|--|
| DATE(S) January 26, 2010 1:00 P.M. | SPONSORING ORGANIZATION COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT | LOCATION Rockefeller Refuge Grand Cheniere, LA |
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MEETING OF THE REGIONAL PLANNING TEAM REGION IV

PARTICIPANT REGISTER*

| NAME | JOB TITLE AND ORGANIZATION | PHONE NUMBER/EMAIL |
|-------------------|--|---|
| ERICK SWENSON | Research associate Louisiana State University | 225 570 2730 eswenswe@lsu.edu |
| DAVID RICHARD | Stream Co. | 337-433-1055 drichard@streamco.com |
| BILL DOHAND | Self | 337-538-2293 |
| Dale Garber | NRCS | 337-783-1257 dale.garber@la.usda.gov |
| Chris Hewelley | US EPA | 214-665-7239 hewelley.chris@epa.gov |
| GERALD BUTAD | Vermilion Parish P.C. | 337 898 4300 |
| Chris Theriot | Vermilion Parish Police Jury | 337 898 4300 |
| Tina Hou | Cameron Parish Police Jury | 337-175-5718 |
| Maurel Cormier | Calcasieu Parish Police Jury | 337-721-3654 |
| Ken Teague | EPA | 214-665-6687 |
| KIRK BURRISH | CAMERON POLICE JURY | 337-513-8240 |
| Dora Weisenbach | OCPR | 337 482 0688 |
| Pat Landry | OCPR | 337 482-0680 |
| Frank Chapman | NRCS | 337436 5020 |
| Atlanta Ensminger | Wetlands & Wildlife Mgmt. Co. | 337 462 0762 904 571 2819 |
| TOM SCHARZE | Coastal Res. Practice LEADER, JTG | tom.scharze@jtg.com |
| MIKE DEUSER | PROVIDENCE | 337-842-3858 |
| Jen Pelto | NRCS | jen.pelto@la.usda.gov |
| W.P. Edwards | Vermilion Corporation | 337-893-0268 |
| Bruce Wade | Vermilion Corporation | 337-893-0268 |
| Jane Rowan | The Bioengineering Group | jrowan@bioengineering.com 610 592 7674 |
| Agaha Brass | The Bioengineering Group | 225 768 1505 abrass@bioengineering.com |

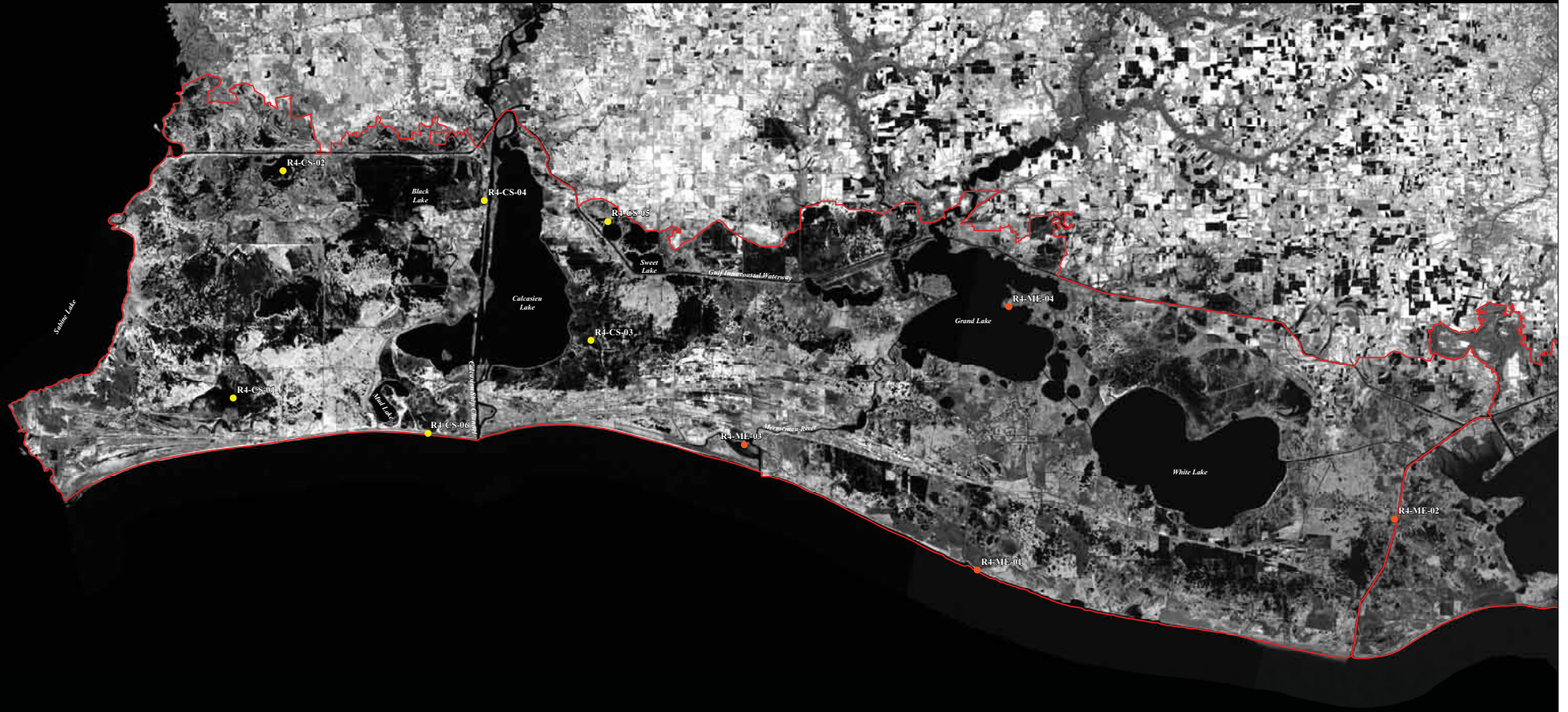
Region 4 - MERMENTAU BASIN

| Project Number | Proposed Project Name |
|----------------|---|
| R4-ME-01 | Rockefeller Gulf of Mexico Shoreline Stabilization, Joseph's Harbor East Project |
| R4-ME-02 | Big Marsh Restoration at Freshwater Bayou |
| R4-ME-03 | Lower Mud Lake Terracing and Bankline Stabilization |
| R4-ME-04 | Grand Lake Shoreline Protection at Umbrella Bay and Lacassine Point (Combined) |

Region 4 - CALCASIEU-SABINE BASIN

| | |
|----------|--|
| R4-CS-01 | Cameron Meadows Marsh Creation and Wetland Restoration Project |
| R4-CS-02 | Black Bayou Terraces |
| R4-CS-03 | Cameron-Creole Watershed Grand Bayou Marsh Creation |
| R4-CS-04 | Kelso Bayou Marsh Creation and Hydrologic Restoration |
| R4-CS-05 | North Willow Lake Restoration |
| R4-CS-06 | Hollynd Beach Breakwaters |

Region 4 PPL20 Proposed Projects



● Calcasieu-Sabine Basin Project

- R4-CS-01 Cameron Meadows Marsh Creation and Wetland Restoration Project
- R4-CS-02 Black Bayou Terracing Project
- R4-CS-03 Cameron-Creole Watershed Grand Bayou Marsh Creation Project
- R4-CS-04 Kelso Bayou Marsh Creation
- R4-CS-05 North Willow Lake Restoration Project
- R4-CS-06 Hollynd Beach Breakwaters

● Mermentau Basin Project

- R4-ME-01 Rockefeller Gulf of Mexico Shoreline Stabilization Joseph's Harbor East
- R4-ME-02 Big Marsh Restoration of Freshwater Bayou
- R4-ME-03 Lower Mud Lake Terracing and Bankline Stabilization
- R4-ME-04 Grand Lake Shore Protection at Lacassine Point and Umbrella Bay



Region 4 PPL18
 Regional Planning Team Meeting
 Held at Rockefeller Refuge
 Grand Cheniere, LA
 January 26, 2010
 Background Image:
 2009 Landsat Thematic Mapper 5 Mosaic

Region 4 - MERMENTAU BASIN

R4-ME-01- Rockefeller Gulf of Mexico Shoreline
Stabilization, Joseph's Harbor East

R4-ME-01

Region 4-RPT
PPL20 PROJECT NOMINEE FACT SHEET
January 26, 2010

Project Name:

Rockefeller Gulf of Mexico Shoreline Stabilization, Joseph's Harbor East, ME-25.

Coast 2050 Strategy:

Regional: Dedicated dredging or beneficial use of sediment for wetland creation or protection (6) and Stabilize Gulf of Mexico Shoreline from Old Mermentau River to Dewitt Canal (16). Coast-wide Common: Maintenance of Gulf, Bay and Lake shoreline Integrity, and Maintain, Protect or Restore Ridge Functions.

Project Location:

Region 4, Mermentau Basin, Cameron/Vermilion Parish, LA. Along the Gulf shoreline from eastern bank of Joseph's Harbor (Rockefeller Refuge) eastward 10,000 feet.

Problem:

The project will be designed to address Gulf shoreline retreat averaging 35' per year (Byrnes, McBride et al., 1995) with subsequent direct loss of saline emergent marsh.

Goal:

1) Reduce Gulf shoreline retreat and direct marsh loss at areas of need identified from Rockefeller Refuge east to Region 4 boundary, 2) protect saline marsh habitat, 3) Enhance fish and wildlife habitat.

Proposed Solution:

The project would entail construction of a near-shore break-waters along the Gulf of Mexico shoreline. The break-water would extend from the eastern bank of Joseph's Harbor canal eastward for 10,000 feet. The proposed structure would be tied into the present shoreline at the point of beginning and ending. It would be designed to attenuate shoreline retreat along this stretch of Gulf shoreline, as well as promote shallowing, settling out, and natural vegetative colonization of over-wash material landward of the proposed structure. The resultant design would be placed offshore along the -5' contour. The crest height of the proposed structure would be 8.5 feet above the Gulf floor (i.e., +3.5 ft above average water level), with an 18 foot crown and 1:2 slope on both sides. The proposed structure would consist of neutral buoyancy material encapsulated by 2,200 lb. class stone. The proposed design would include openings every 1000' to facilitate material and organism linkages. Excavation material for construction access would be placed on the landward side of the structures.

Preliminary Project Benefits:

1) The project is expected to influence approximately 125 acres directly. 2) 120 protected, 5 created, and a portion of 4,900 acres indirectly (Rockefeller Refuge Unit 5). This project is anticipated to benefit 125 acres (10K ln ft X 35 ft/yr X 20 yrs) X 0.75. The reduction efficiency was estimated by using 90% of the average wave transmission rates listed in the Rockefeller Refuge gulf Shoreline Stabilization Feasibility Study produced by Shiner Mosely and Associates (Table 6, page 4-19, methodology of Seabrook and Hall, 1998). Estimates for excavation are as follows; at the -5' contour, an additional 4' of material will be moved at a width of 80', for the 10,000 linear feet of the project or 118,500 cubic yards will be placed behind the rock structure. 3) Anticipated loss rate reduction for the segmented breakwater is 75%. 4) The project would protect and maintain chenier and beach function. 5) The project would have a net positive impact on non-critical infrastructure. This project would protect five existing pipelines that come ashore within the project area from continued erosion of the cover, which when uncovered, become a public and environmental hazard. This project would also protect properly plugged, land-based wellheads from erosion of the cover, thus becoming a public and environmental hazard. 6) The proposed project is designed as an eastward extension of the ME-18 (Rockefeller Refuge Gulf Stabilization Project).

Identification of Potential Issues:

There are potential issues with pipelines. There are 5 pipelines in the area

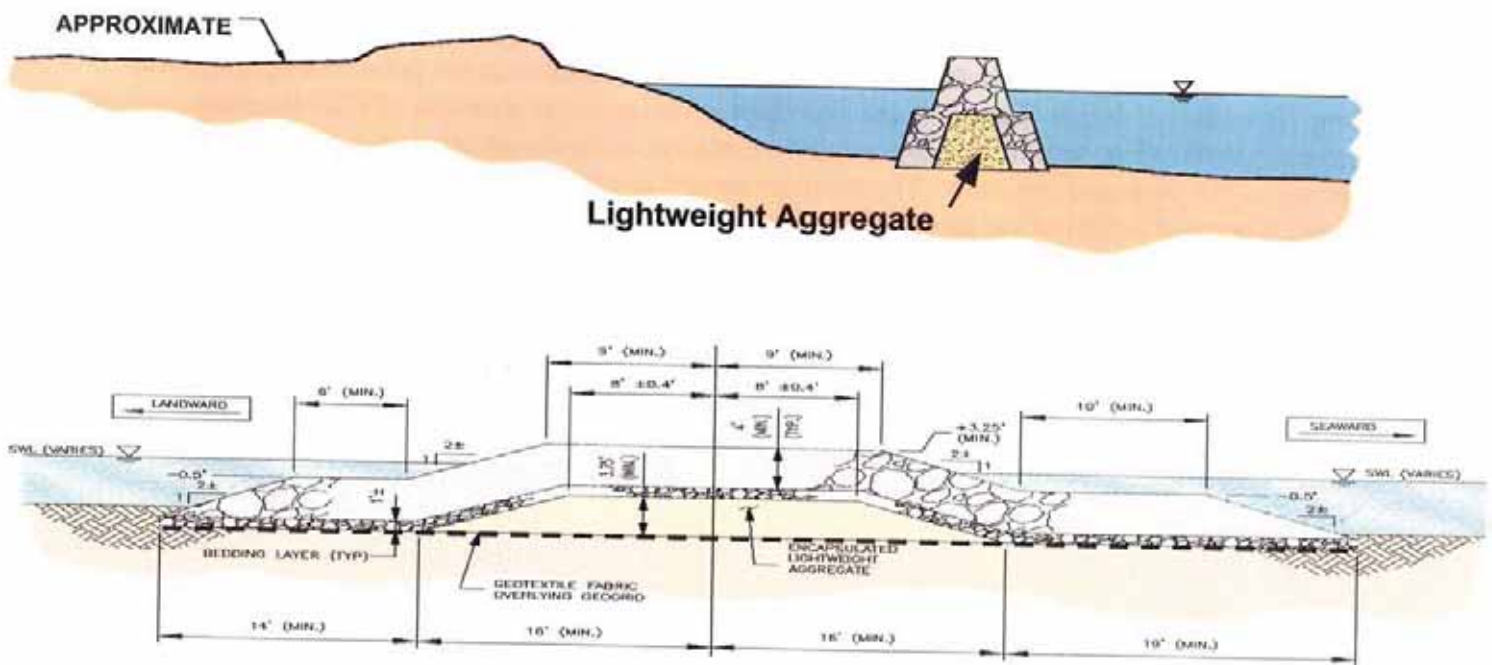
Preliminary Construction Costs:

The construction cost including 25% contingency is approximately \$17,722,418.

The estimated fully-funded cost range is \$35M - \$40M.

Preparer of Fact Sheet:

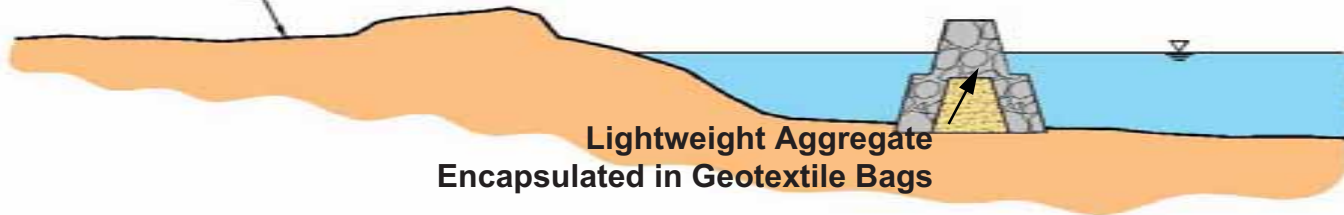
John D. Foret, NOAA Fisheries Service, 337/291-2107; john.foret@noaa.gov

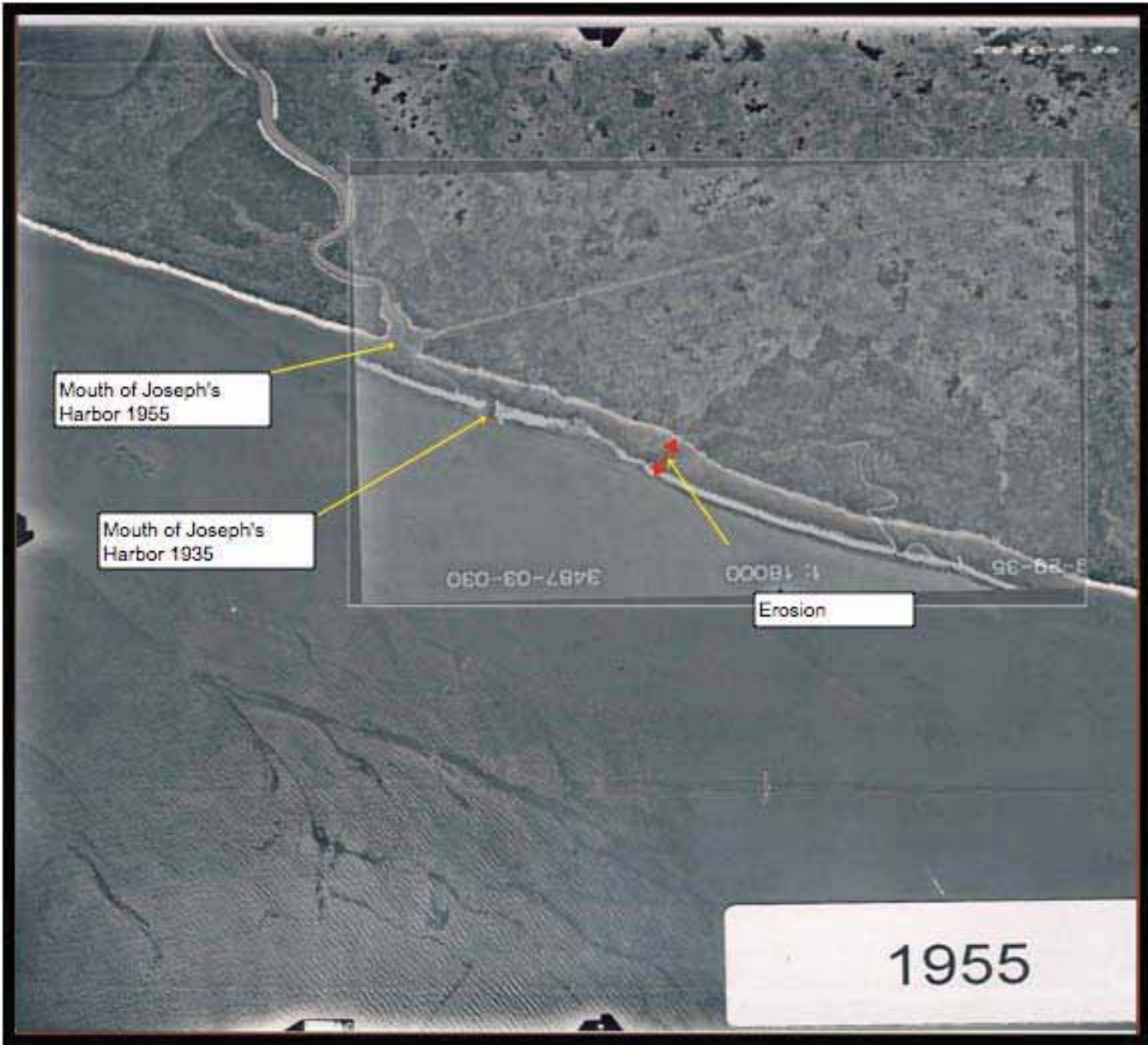


PPL 20 Joseph's Harbor East



APPROXIMATE
EXISTING GRADE



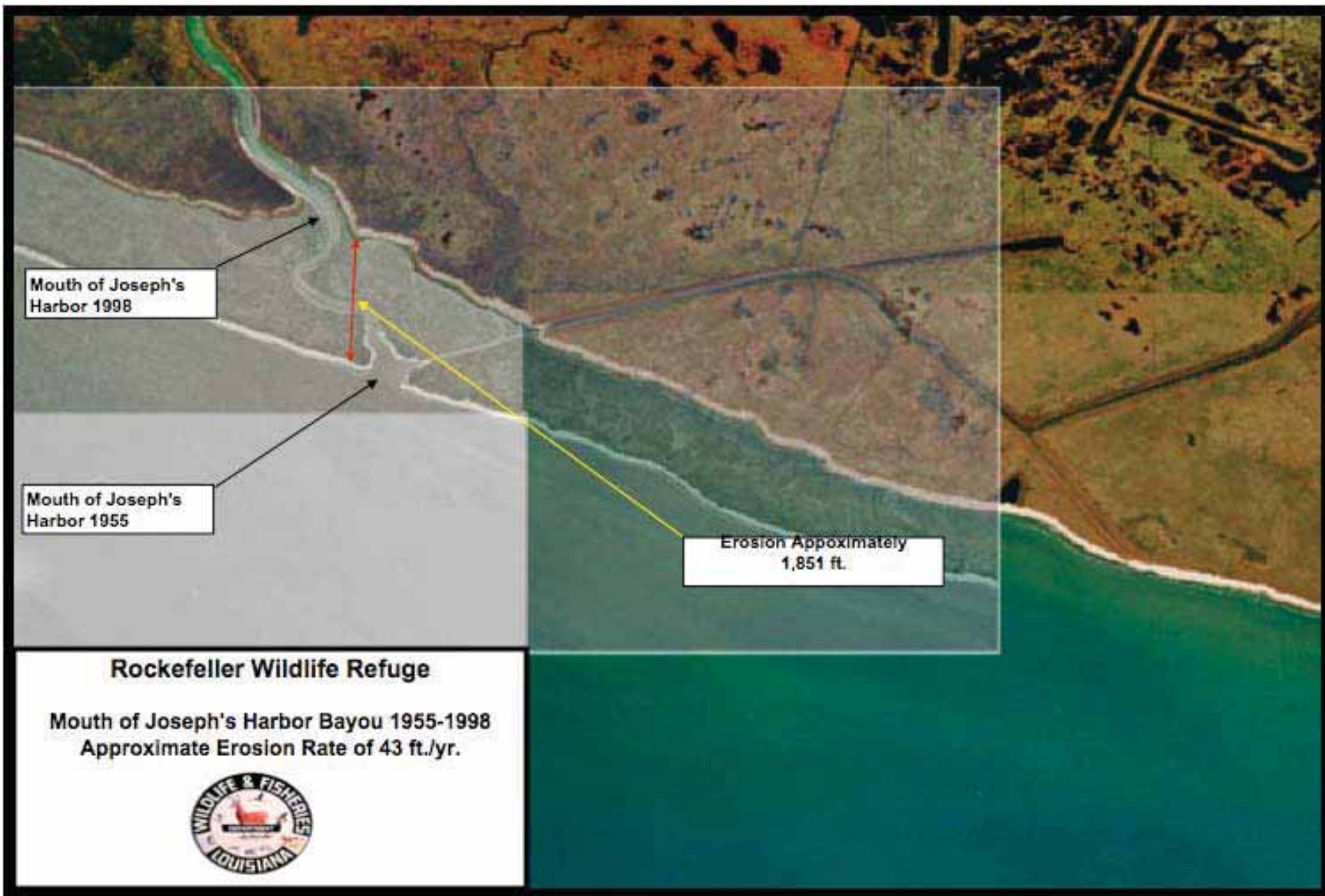


Mouth of Joseph's Harbor 1955

Mouth of Joseph's Harbor 1935

Erosion

1955



R4-ME-02-Big Marsh Restoration at Freshwater
Bayou

R4-ME-02

PPL 20 PROJECT NOMINEE FACT SHEET
1/26/2010

Project Name

Big Marsh Restoration at Freshwater Bayou

Coast 2050

Strategic Goal 1: *Assure vertical accumulation to achieve sustainability*

For established marshes, vertical accumulation occurs through periodic, gentle marsh flooding and drainage that promote healthy vegetation and large rates of organic production. It is also important to protect otherwise self-sustaining wetlands from excessive erosional forces.

Regional Strategy: *Recover the ecosystem by reversing the loss process*

Return wetlands to self-maintaining conditions by recreating the system integrity.

State Master Plan Strategy

Maintain or establish natural landscape features and hydrologic processes that are critical to sustainable ecosystem structure and function, including dissipation of storm energy.

Project Location

Region 4, Mermentau Basin, Vermilion Parish, Big Marsh Mapping Unit, area west of Freshwater Bayou and north of the Freshwater Bayou lock.

Problem

This area has degraded from wave energy, salt water intrusion, and erosion associated with boat traffic and tidal exchange through the Freshwater Bayou Channel. Shoreline protection projects have effectively stopped erosion along the channel. However, numerous breaches into the interior marshes allow hydrologic exchange between interior marshes and Freshwater Bayou. Salt water entering into Freshwater Bayou from Little Vermilion Bay is circumventing the Leland-Bowman Lock and entering into the Mermentau Basin. Salt water intrusion continues to degrade interior marshes through erosion and reduced vegetation productivity.

Proposed Project Features

Costs for the proposed project are based on dedicate dredge material to rebuild approximately 112 acres of ridge and marsh. Potential sediment sources include Freshwater Bayou, the Gulf of Mexico, and Little Vermilion Bay.

Preliminary Project Benefits

The proposed project would create/nourish approximately 112 acres of ridge and marsh and return approximately 18,000 acres of interior marsh to a self-maintaining condition by reducing erosion and existing vegetation stresses.

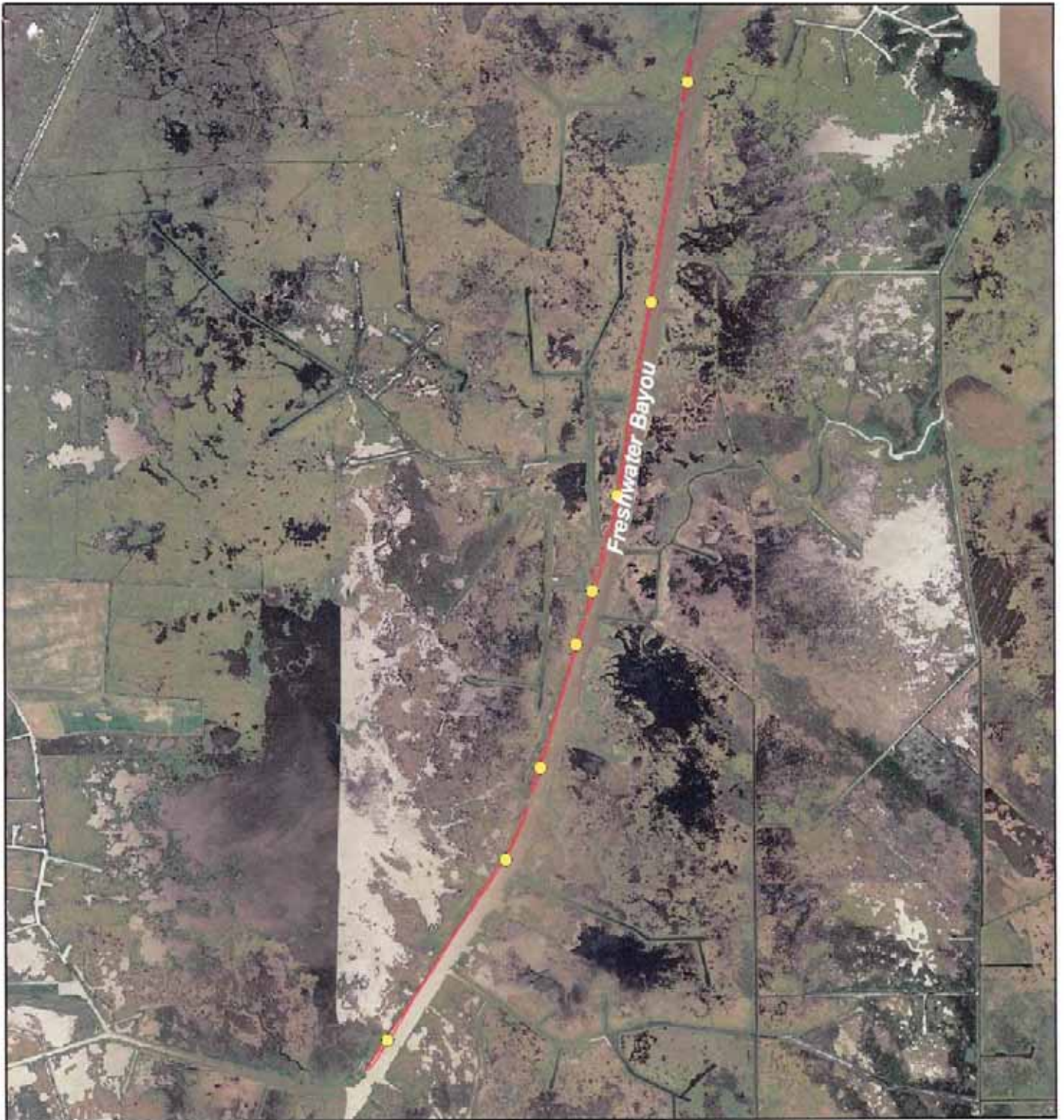
Preliminary Construction Costs

\$10 million



Preparer of Fact Sheet

Troy Mallach, NRCS, (337) 291-3064, troy.mallach@la.usda.gov

Judge Edwards, Vermilion Corporation, vermilioncorporation@connections-lct.com



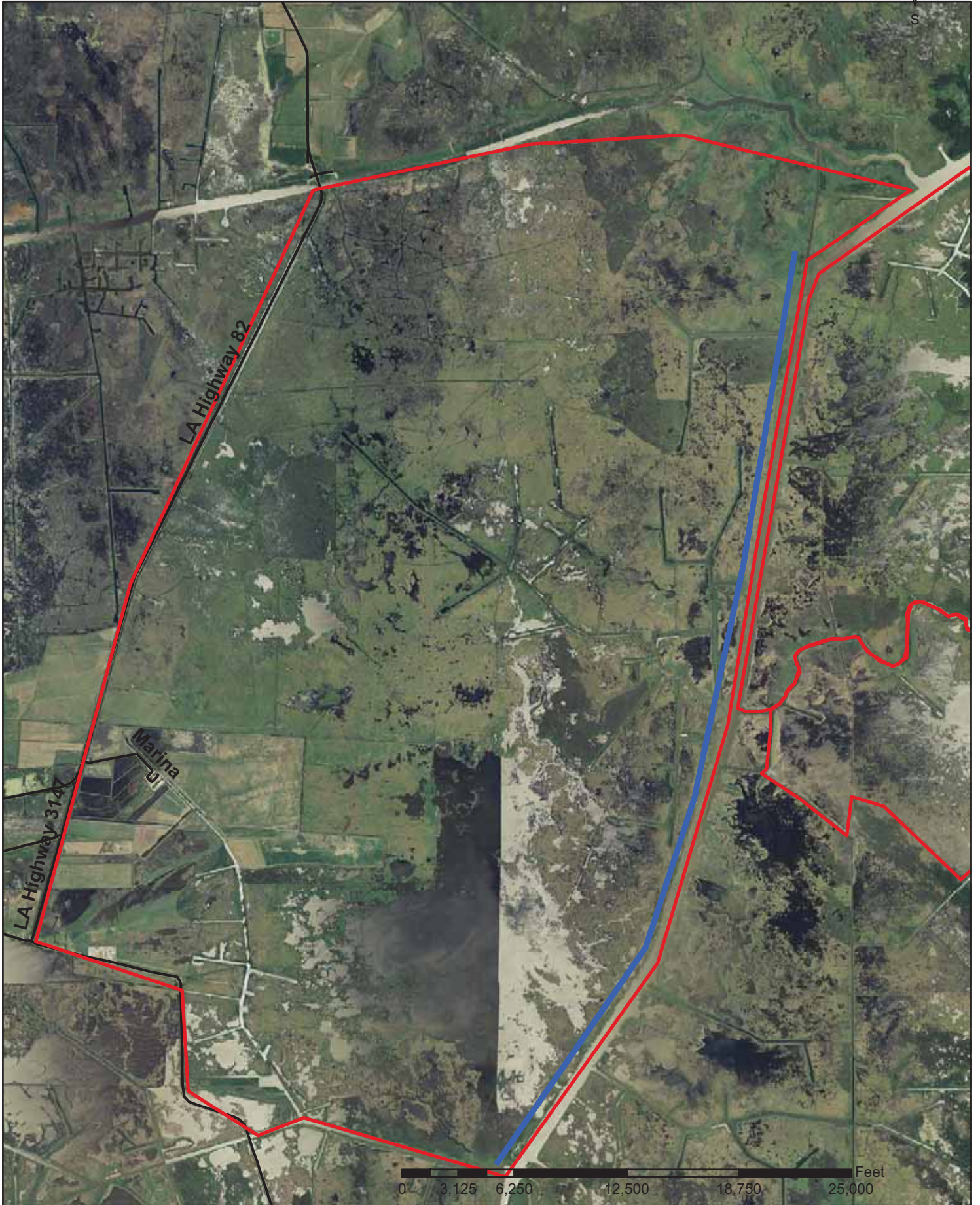
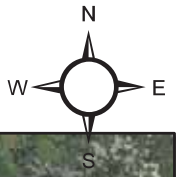
Legend

-  Sediment_Input_Pipes
-  Marsh_Creation

Big Marsh Restoration at Freshwater Bayou
Vermilion Parish, Louisiana
PPL 20



Freshwater Bayou Beneficial Dredge



R4-ME-03-Lower Mud Lake Terracing and
Bankline Stabilization

PPL 20 PROJECT NOMINEE FACT SHEET
1/26/2010

Project Name

Lower Mud Lake Sediment Trapping

Coast 2050 Strategy

Use of sediment for wetland creation.

State Master Plan Strategy

Encourage the retention of inflowing sediment

Project Location

Region 4, Mermentau Basin, Cameron Parish, Lower Mud Lake Mapping Unit, area just northwest of the Mermentau Ship Channel.

Problem

The large area of fetch and associated wave energies prevent sediments from the Mermentau River from being deposited. Therefore, much of the sediment is being exported out of the Mermentau Ship Channel. SAV habitat is also limited by the sediment load and energy associated with the large open water fetch.

Proposed Project Features

The project would construct sediment trapping terraces similar to those used at Little Vermilion Bay (TV-12) and the Jaws (TV-15). Those terraces would dissipate wave energy and allow sediment to drop out of the water column and increase accretion, which would permit emergent vegetation to establish. Tributaries would be dredged to direct sediments to the project and distribute that sediment throughout the project area.

Preliminary Project Benefits

The proposed terracing project will establish emergent marsh and maximize sedimentation within the project area.

Preliminary Construction Costs

\$5-10 million

Preparer of Fact Sheet

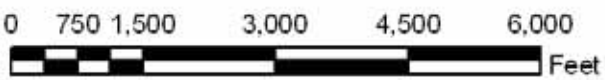
Troy Mallach, NRCS, (337) 291-3064, troy.mallach@la.usda.gov



Legend

— Terraces

Lower Mud Lake Sediment Trapping
Cameron Parish, Louisiana
PPL 20



R4-ME-04-Grand Lake Shoreline Protection at
Umbrella Bay and Lacassine Point

PPL20 PROJECT NOMINEE FACT SHEET
January 26, 2010

Grand Lake Shoreline Protection at Umbrella Bay and Lacassine Point

Coast 2050 Strategy

Coastwide Strategy – Maintenance of bay and lake shoreline integrity

Regional Strategies – Stabilization of the Grand Lake shoreline Prevent the Coalescence of Grand Lake and the GIWW

Mapping Unit Strategy – Shoreline stabilization along Umbrella Bay in Grand Lake

Project Location

Region 4, Cameron Parish, eastern and northwestern Grand Lake at Umbrella Bay and Lacassine Point.

Problem

Umbrella Bay experienced an estimated shoreline erosion of 15 feet per year (4 feet to 30 feet/year, based on 1952 to 2008 GIS analysis). Approximately 275 acres of marsh will be lost in the Umbrella Bay area over the next 20 years at that rate. Shoreline breaches have caused small interior lakes to be eroded into Grand Lake and continued shore loss will increase connectivity with Grand Lake and introduce greater energy to the interior marsh.

Lacassine Point's shoreline erosion rate was 9 feet/year (1978-1988). At that rate, 69 acres of wetland habitat would be lost over the next 20 years at Lacassine Point. The combined shoreline loss rates for the two areas at the above rates would be 344 acres.

Goals

- 1) Reduce or halt shoreline erosion along eastern and northwestern Grand Lake at the Umbrella Bay and Lacassine Point shorelines. 2) Prevent shoreline breaches into interior ponds.

Proposed Project Features

The proposed project consists of installing a total of 55,350 linear feet (10.5 miles) of foreshore segmented rock breakwater [40,000 feet (7.5 miles) at Umbrella Bay and 15,350 feet (2.9 miles) at Lacassine Point]. The rocks would be placed at the 1 to 2 foot depth contour with 50-foot-wide gaps every 1,000 feet and access channel dredged material placed shoreward to restore marsh. The Lacassine Point component would also include Giant Cutgrass plantings on the dredged material between the rock and shoreline (2 rows on 5 foot centers).

Preliminary Project Benefits

- 1) The total marsh acreage benefited directly would be 275 acres at Umbrella Bay (at a rate of 15 ft/yr.), and 69 acres at Lacassine Point (at a rate of 9 ft/yr), for a total benefit of 344 acres over 20 years. 2) Shoreline erosion along the Umbrella Bay and Lacassine Point would be reduced by 100% because the breakwaters would be 100% effective at stopping wave erosion. The breakwaters would also prevent breaches from Grand Lake to interior ponds. 3) The project would maintain a portion of the Grand Lake-Umbrella Bay-Lacassine Point shorelines which are structural components of the Grand Lake ecosystem. 4) The project would prevent the coalescence of northwestern Grand Lake with the GIWW at Lacassine Point. 5) The Umbrella

Bay component would have synergistic effects with the Grand-White Lakes Landbridge Shoreline Protection Project to the south.

Identification of Potential Issues

At this time, no significant issues have been identified for this project.

Preliminary Construction Costs

The estimated construction cost (assuming \$300 per linear foot) is \$16,600,000.

Preparers of Fact Sheet

Darryl Clark, U.S. Fish and Wildlife Service, 337-291-3111 Darryl_Clark@fws.gov

Kevin Long, Lake Arthur Hunting Club, landowner, 318-221-3517

Wayne Syron, U.S. Fish and Wildlife Service, Lacassine NWR, 337-774-5923

Bayou Lacassine

Gulf Intracoastal Water Way

Project Area

Grand Lake

Northwestern Grand Lake Shoreline Stabilization Project at Lacassine Point

2007 USGS DOQQ





Umbrella Bay Shoreline Protection

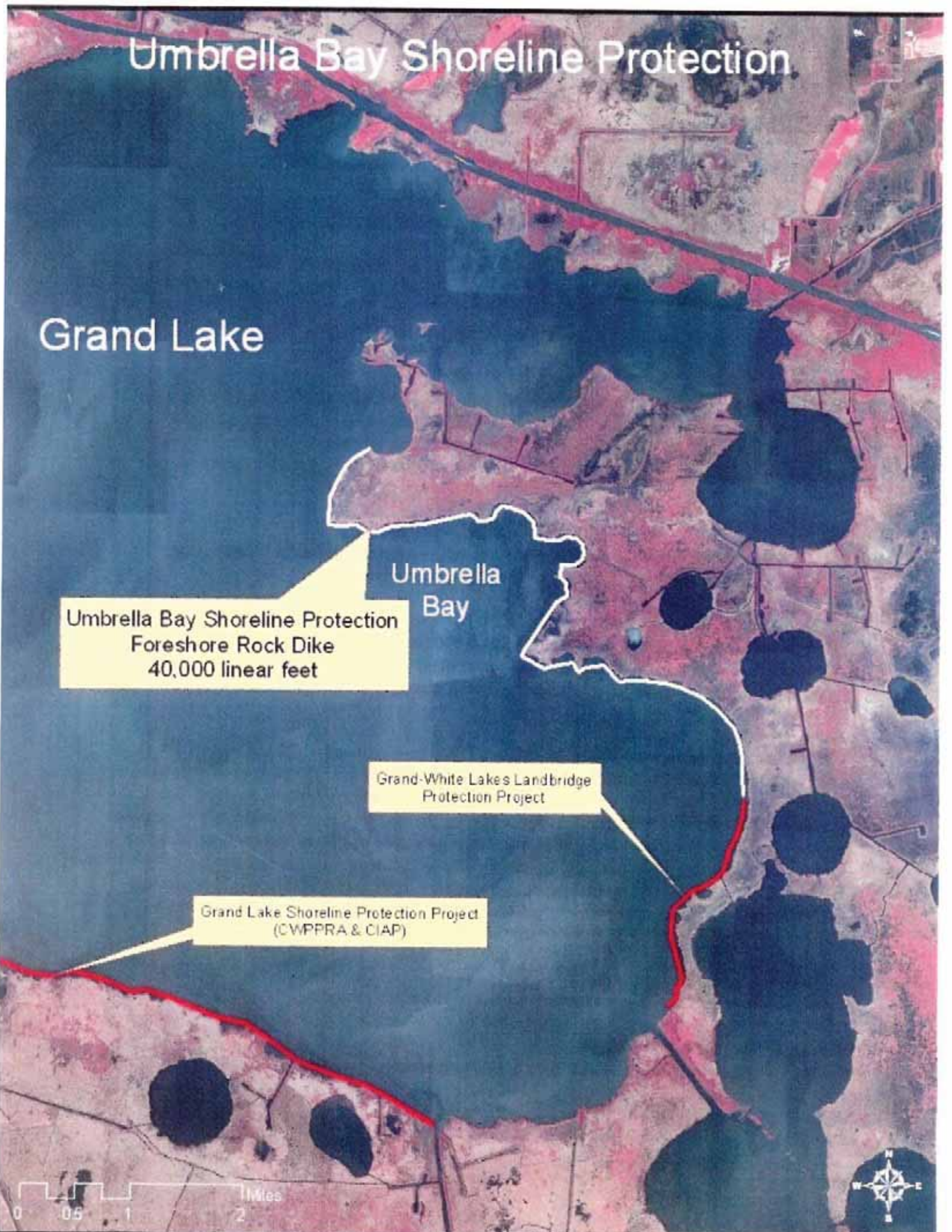
Grand Lake

Umbrella Bay

Umbrella Bay Shoreline Protection
Foreshore Rock Dike
40,000 linear feet

Grand-White Lakes Landbridge
Protection Project

Grand Lake Shoreline Protection Project
(CWPPRA & CIAP)



Region 4 - CALCASIEU-SABINE BASIN

R4-CS-01-Cameron Meadows Marsh Creation
and Wetland Restoration Project

Region 4-RPT
PPL20 PROJECT NOMINEE FACT SHEET
January 26, 2010

Project Name:

Cameron Meadows Marsh Creation and Wetland Restoration Project

Coast 2050 Strategy:

Restore and Sustain Wetlands (*Regional Ecosystem Strategy*)

Dedicated Dredging for Wetlands Creation (*Coastwide Common Strategy*)

Terracing (*Coastwide Common Strategy*)

Vegetative Plantings (*Coastwide Common Strategy*)

Restore Hydrology in the Burton-Sutton Canal (*Mapping Unit Strategy*)

Project Location:

Region 4, Calcasieu/Sabine, Cameron Parish, approximately 18 miles West of Cameron, 5 miles north of Gulf of Mexico shoreline, northeast of Johnsons Bayou, immediately south of Cameron Meadows Gas Field.

Problem:

Significant marsh loss is attributed to rapid fluid and gas extraction beginning in 1931, Hurricanes Rita, Gustav and Ike. Rapid fluid and gas extraction resulted in a surface down warping of the marsh surface along distinguished geologic fault lines. In the decades that followed, organic matter filled the low area and an emergent marsh community became established. During the hurricanes of 2005 and 2008, the physical removal of the marsh coupled with low rainfall after Hurricane Ike has resulted in the conversion of intermediate to brackish emergent marsh to approximately 7,000 acres of shallow open water. In addition to these direct losses, significant interior marsh loss has resulted from saltwater intrusion and hydrologic changes associated with storm damage and blocked drainages. Habitat shifts and hydrologic stress reduce marsh productivity, a critical component of vertical accretion in intermediate wetlands. It is unlikely that many of these areas will recover unaided.

Goals:

- (1) Create approximately 610 acres of marsh with dredge material and terraces,
- (2) Restore coastal marsh habitat, and
- (3) Reverse the conversion of wetlands to shallow open water in the project area through reestablishment of hydrologic connectivity.

Proposed Solutions:

Construct 600 acres of marsh in two adjacent areas utilizing dredge material from the Gulf of Mexico. Target marsh elevation is 1.5'. Construct 10,000 linear feet of earthen terraces, oriented in such a way as to reduce wind generated wave fetch. Terraces would be constructed with +3', 20' crown width and planted. Terrace construction is estimated to create about 20 acres. Project features would include cleaning out approximately 50,000 linear feet of drainage canals of filled in as a result of the hurricanes. In addition,

the project would build upon an existing HD model to assist in the identification of those canal reaches that need clearing to restore this system back to an intermediate/brackish system. Water depths throughout the project area average 0.6-1.0 deep. In addition, the marsh creation areas would be planted with appropriate species of wetland vegetation to reestablish the plant productivity.

Preliminary Project Benefits:

- 1) *What is the total acreage benefited both directly and indirectly?* Throughout the area of direct benefits, approximately 608 acres of marsh would be created from initial dredge placement and terrace construction. Indirect benefits could occur over approximately 18,000 acres of marsh and open water habitats as a result of re-established water regimes.
- 2) *How many acres of wetlands will be protected/created over the project life?* A 50% loss rate reduction in the background loss rate of -0.8% (1932-1990, East Sabine Lake Hydrologic Restoration, CU-1,CS-32) terracing and marsh creation would result in 512 net acres after 20 years. Note that recent losses are attributed to the 2005 and 2008 hurricanes, and it is anticipated that the background loss rate could increase. In the event that benefits associated with the hydrologic connectivity are calculated, there could be an increase in anticipated net acres.
- 3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life?* A 50% loss rate reduction is assumed for the terraces and marsh creation (from -0.8%/year to -0.4%/year). In the event that benefits associated with the hydrologic connectivity are calculated, there could be a minor decrease in anticipated loss rates for some portion of the 18,000-acre project area.
- 4) *Do any project features maintain or restore structural components of the coastal ecosystem such as barrier islands, natural or artificial levee ridges, beach and lake rims, cheniers, etc.?* No
- 5) *What is the net impact of the project on critical and non-critical infrastructure?*
The project would provide positive impacts to non-critical (i.e., minor oil and gas facilities) infrastructure. Two oil and gas companies have facilities and pipelines in this area, which would benefit from an increase in marsh acreage. The loss of wetlands in this area exposes those facilities to open water wave energies resulting in expensive damages and oil spills. Protecting/creating wetlands in this area would also assist in reducing storm damages to oil and gas infrastructure. In addition, US Fish and Wildlife Service's Sabine Refuge borders the project area to the north, and it would benefit from an increase in marsh acreage.
- 6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?* This project would provide a synergistic effect with the Holly Beach Sand Management Project (CS-31), which constructed approximately 300 acres of beach dunes on the Gulf of Mexico shoreline. The project would also provide a synergistic effect with the East Sabine Lake Hydrologic Restoration Project (CS-32), by increasing marsh acreage south of the CS-32 project.

Identification of Potential Issues:

Oil and gas infrastructure is within the project area and would need to be avoided by dredge/fill activities.

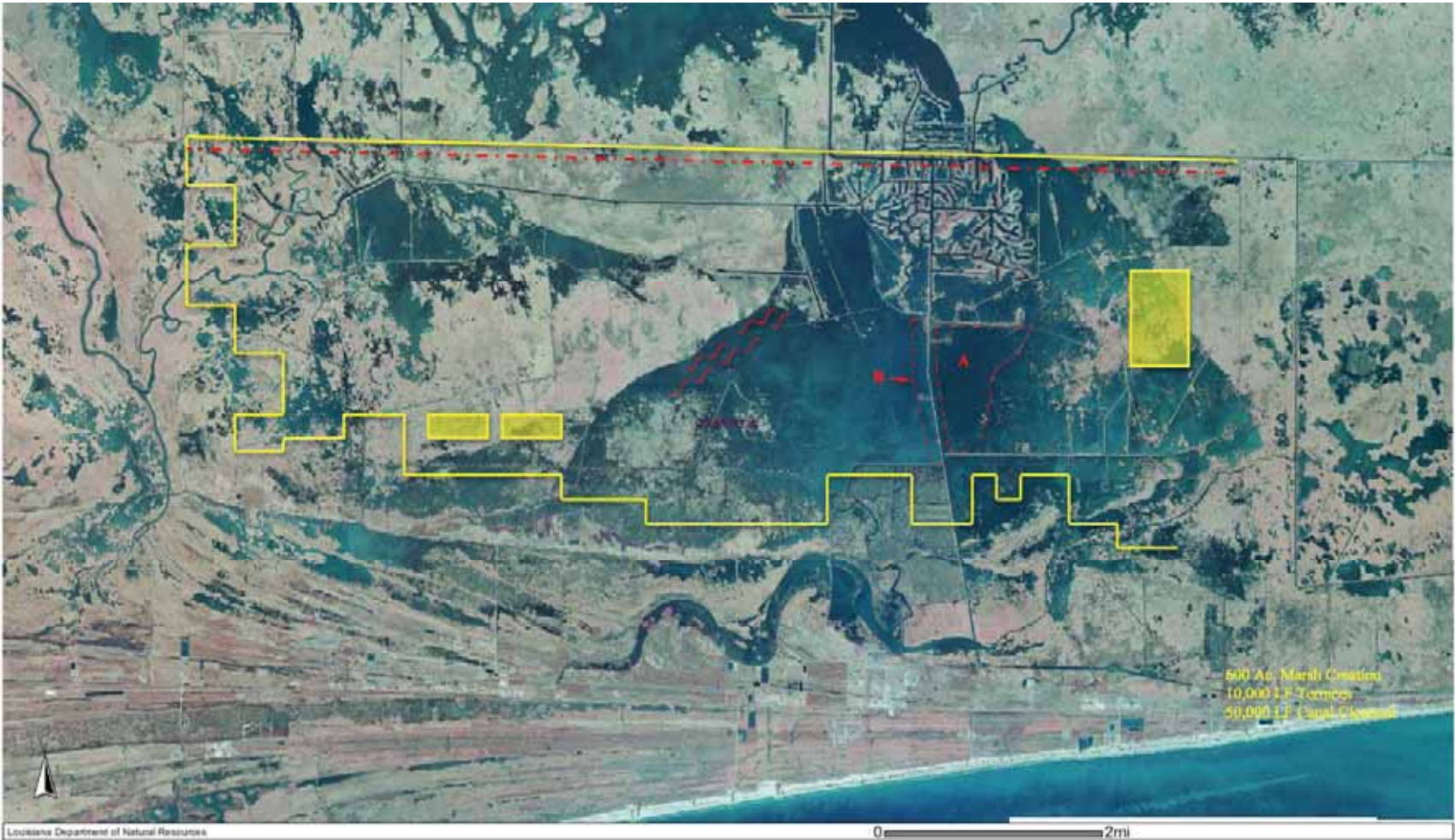
Preliminary Construction Costs:

Estimated construction costs plus 25% contingency = \$27,188,015.

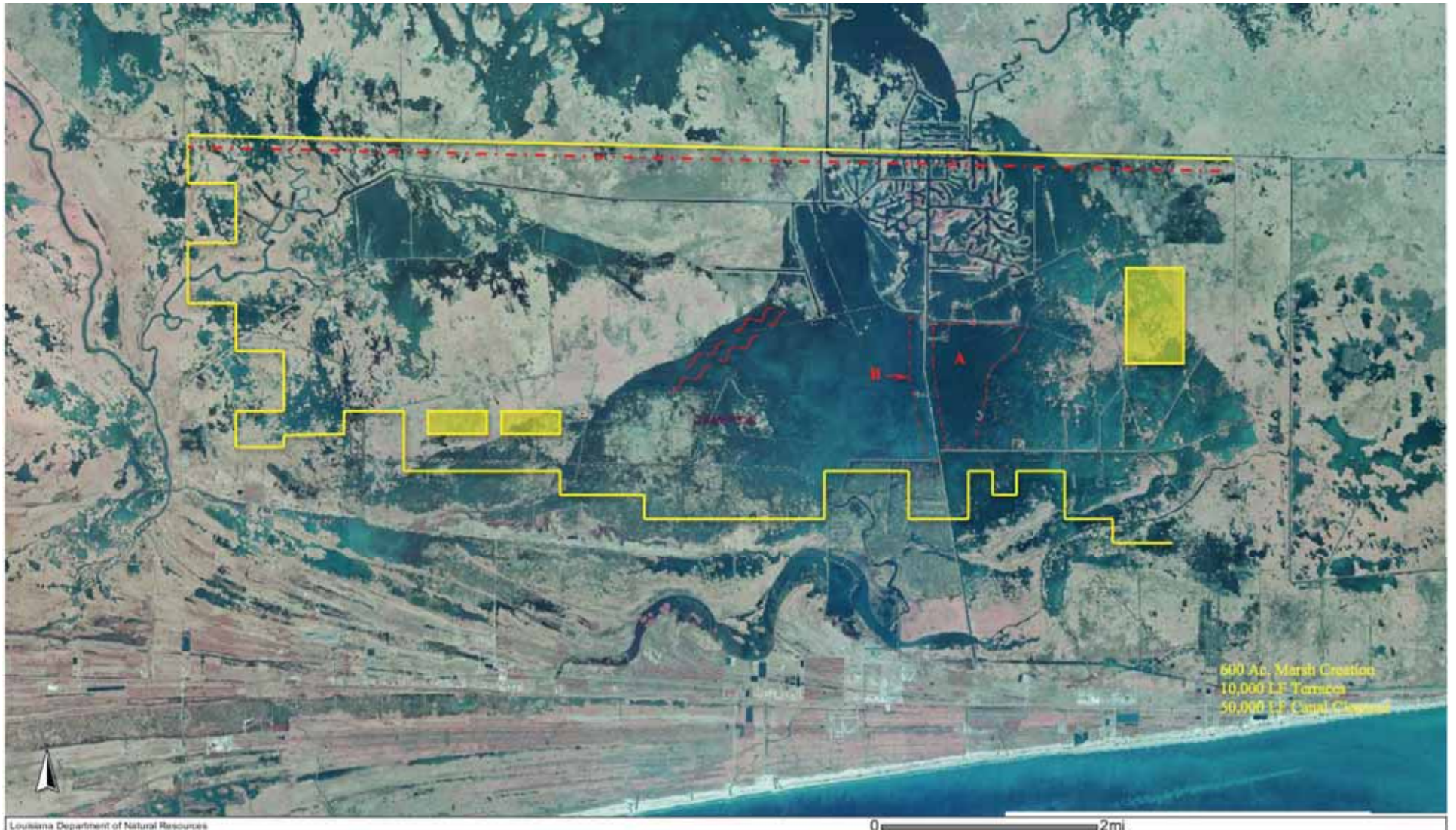
If approved for construction, the landowner has pledged \$1,000,000 towards the construction of this project.

Preparer of Fact Sheet:

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Cameron Meadows Marsh Creation and Wetland Restoration Project





Louisiana Department of Natural Resources



Louisiana Department of Natural Resources

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R4-CS-02-Black Bayou Terraces

Region 4-RPT
PPL20 PROJECT NOMINEE FACT SHEET
January 26, 2010

Project Name:

Black Bayou Terraces (R4-CS-01)

Coast 2050 Strategy:Restore and Sustain Wetlands (*Regional Ecosystem Strategy*)Terracing (*Coastwide Common Strategy*)Vegetative Plantings (*Coastwide Common Strategy*)**Project Location:**

Region 4, Calcasieu/Sabine Basin, Calcasieu and Cameron Parish, South side of the GIWW, West of Gum Cove Ridge

Problem:

Saltwater intrusion into the surrounding marsh and canals from the GIWW coupled with erosion caused by wave action from nearby boats, wind, and tides has caused the historical land loss within this area. Aerial photography since the late 1930's documents the conversion of approximately 2,700 acres of emergent marsh to open water within the proposed project area, or approximately 75% of the emergent marsh has converted to open water over the last 70 years within this proposed project area (ocular estimate from historical photography). The CWPPRA sponsored Black Bayou Hydrologic Restoration Project (CS-27) features addressed the saltwater intrusion problem, however the expansive open water area identified by this project continues to experience shoreline erosion and coalescence of smaller water bodies into one 2,700 acre pond. This expansion is threatening the integrity of the western levee boundary at this time. The CWPPRA sponsored Plowed Terrace Demonstration Project (CS-25), coupled with mitigation terraces within this area has shown the usefulness of terracing to reduce wave fetch, however more terraces are needed.

Goals:

- (1) Restore coastal marsh habitat, and
- (2) Reverse the conversion of wetlands to shallow open water in the project area.

Proposed Solutions:

Construct up to 261,000 linear feet of earthen terraces, oriented in such a way as to reduce wind generated wave fetch. Water depths throughout the project area average 1-1.5 deep. In addition, the terraces would be planted with appropriate species of wetland vegetation to reestablish the plant productivity needed to rebuild the organic peat for marsh vertical accretion and expansion. Planting density is projected to be double rows of plugs on each side of the terrace on a 5' spacing.

Preliminary Project Benefits:

- 1) *What is the total acreage benefited both directly and indirectly?* At 261,000 LF; 15 foot crown, 1:5 side slopes, 3' out of water; $261,000 \text{ LF} * 35' = 9,135,000 \text{ square feet} / 43,560 = 210 \text{ acres}$ initially constructed, and approximately 500 acres of brackish to intermediate emergent marsh surrounding the open water will be benefited indirectly. Therefore, a total acreage potentially impacted would be 710 acres.
- 2) *How many acres of wetlands will be protected/created over the project life?* No loss to terraces, thus 210 acres created. A 50% loss rate reduction is assumed for the indirect

275,000

(15' crown)

- acres benefited or; (-0.82% per year) of the 500 initial indirect benefit acres there would be 65 net acres (FW vs. FWO) after 20 years, thus $210 + 65 = 275$ Total acres net.
- 3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life?* No loss applied to terraces = 100% loss rate reduction over the 20-year life of the project, or >75%.
 - 4) *Do any project features maintain or restore structural components of the coastal ecosystem such as barrier islands, natural or artificial levee ridges, beach and lake rims, cheniers, etc.?* These terraces will maintain the western artificial levee boundary of this 3,200-acre area through the reduction of wave-induced erosion.
 - 5) *What is the net impact of the project on critical and non-critical infrastructure?* The Black Bayou Gas Field is immediately adjacent to the project area, and this project will re-establish and help stabilize the emergent marsh that adjoins this critical infrastructure.
 - 6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?* This project would compliment the results of the Black Bayou Hydrologic Restoration (CS-27) and Plowed Terrace Demonstration (CS-25), as CS-27 reduced saltwater intrusion and CS-25 demonstrated the usefulness of terraces in this area.

Identification of Potential Issues:

No known issues at this time.

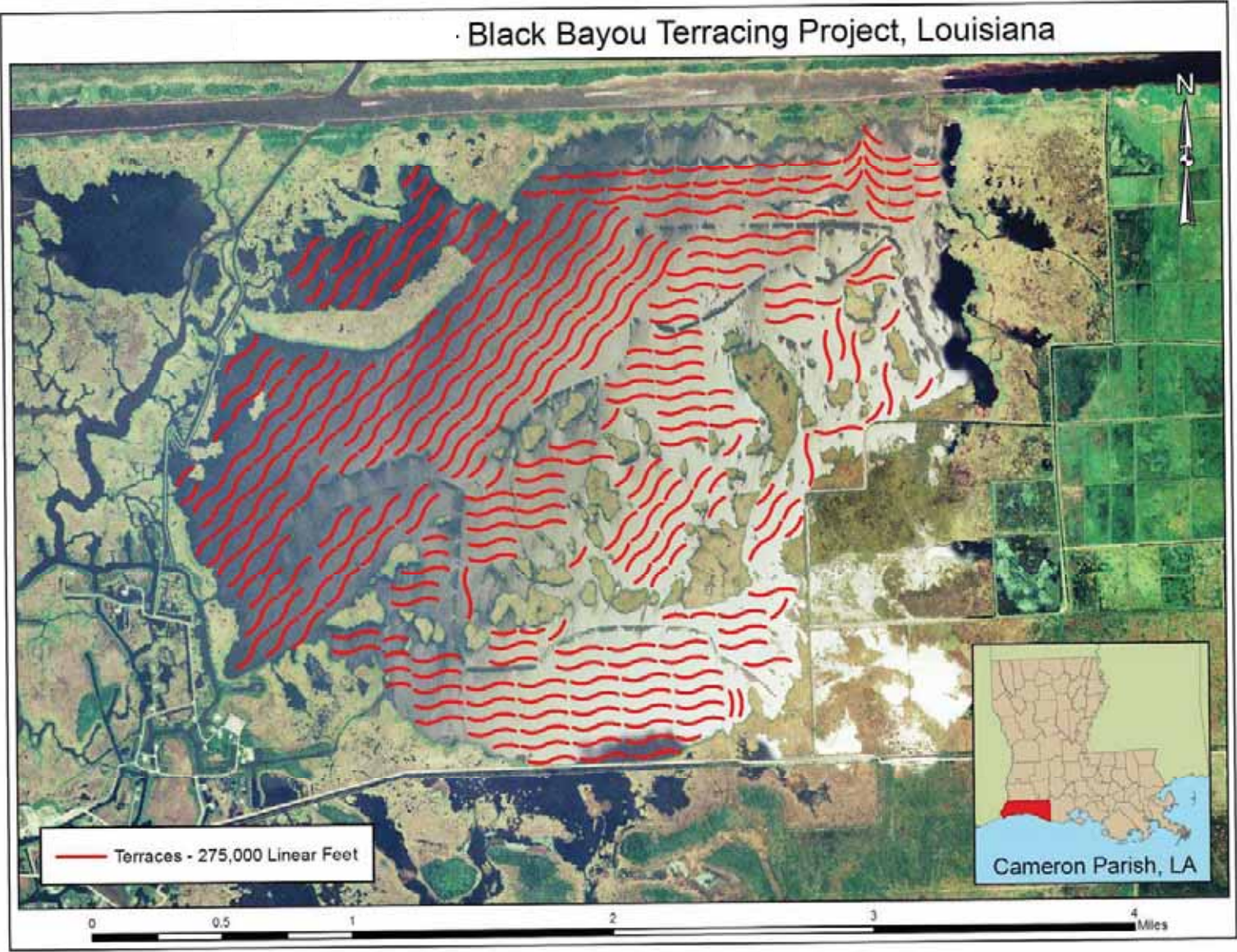
Preliminary Construction Costs:

Estimated construction costs plus 25% contingency = \$6,970,750.

Preparer of Fact Sheet:

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Black Bayou Terracing



R4-CS-03-Cameron-Creole Watershed Grand
Bayou Marsh Creation

PPL20 PROJECT NOMINEE FACT SHEET

January 26, 2010

Project Name:

Cameron-Creole Watershed Grand Bayou Marsh Creation

Coast 2050 Strategy:

Coastwide Strategy – Dedicated Dredging, to Create, Restore, or Protect Wetlands

Project Location:

Region 4, Calcasieu-Sabine Basin, Cameron Parish, 6 miles northeast from Cameron, LA, on the Cameron Prairie NWR and Miami Corporation north of Grand Bayou.

Problem:

Approximately 14,390 acres (32%) of the Cameron-Creole Watershed Project (CCWP) marshes were lost from 1932 to 1990 at an average loss rate of 248 ac/year (0.55%/year) due to subsidence and saltwater intrusion from the Calcasieu Ship Channel. The CCWP was implemented by the NRCS in 1989 to reduce saltwater intrusion and stimulate restoration through revegetation. Hurricanes Rita and Ike in 2005 and 2008 breached the watershed levee scouring the marsh and allowing higher Calcasieu Lake salinities to enter the watershed causing more land loss.

Goals:

Project goals include restoring and nourishing marsh with dedicated dredged material from Calcasieu Lake to benefit fish and wildlife resources within the Cameron Prairie NWR and adjacent brackish marshes. Specific phase 0 goals include creating 604 acres brackish marsh and nourishing 13 acres of brackish marsh.

Proposed Solution:

Place approximately 3 million cubic yards of material dredged from a Calcasieu Lake borrow site located approximately 2,000 feet west of Grand Bayou, away from existing oyster reefs, into two marsh creation areas north of Grand Bayou to restore 604 acres and nourish 13 acres of brackish marsh. Tidal creeks will be constructed prior to placement of dredge material and retention levees would be gapped for estuarine fisheries access and to achieve a functional marsh.

Preliminary Project Benefits:

The project would restore 604 acres and nourish 13 acres of brackish marsh in the 617-acre project area. Approximately 550 acres of brackish marsh would be created and protected over the 20-year project life.

Identification of Potential Issues:

Project managers have and will continue coordinate with the LDWF to locate the borrow area to reduce turbidity impacts to oyster reefs as well as other fishery resources in the southern portion of Calcasieu Lake.

Project Costs:

Preliminary construction costs are estimated at \$23 million, which includes 25% contingency.


Preparer(s) of Fact Sheet:

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Cameron-Creole Watershed Grand Bayou Marsh Creation Project

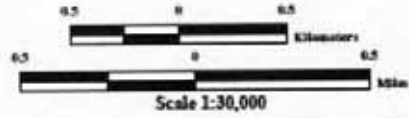


 Marsh Creation *

* denotes proposed features



Produced by
 U.S. Department of the Interior
 U.S. Geological Survey
 National Wetlands Research Center
 Coastal Restoration Field Station
 Baton Rouge, La



Edited 01/25/2010, FWS/ACT
 Map ID: USGS-FWRC 2008-11-0550
 Map Date: August 05, 2009

Image Source:
 2008 Digital Orthophoto Quarter Quadrangles

Cameron Creole Watershed- Grand Bayou Marsh Creation Project



PPL 20

Region 4, Calcasieu-Sabine Basin



U.S. Fish and Wildlife Service




Louisiana Ecological Services Field Office

Cameron Creole Watershed - Grand Bayou Marsh Creation Project PPL 20

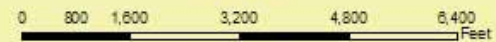


2008 DOQQ

Legend

-  Sorro Area
-  Marsh Creation Cells
-  Tidal Creeks

Cameron Creole Watershed
Grand Bayou Marsh Creation
PPL 20



01/2010

2004 Aerial Photography



2005 Aerial Photography



2008 Aerial Photography



2009 Aerial Photography



R4-CS-04-Kelso Bayou Marsh Creation and
Hydrologic Restoration

PPL 20 PROJECT NOMINEE FACT SHEET
1/26/2010

Project Name

Kelso Bayou Hydrologic Restoration & Marsh Creation

Coast 2050 Strategy

Use of sediment for wetland creation and Restore historic hydrologic and salinity conditions throughout Region 4 to protect wetlands from hydrologic modification.

State Master Plan Strategy

Restore natural hydrology to the Chenier Plain.

Project Location

Region 4, Calcasieu-Sabine Basin, Cameron Parish, West Black Lake Mapping Unit, area east of Gum Cove and south of GIWW.

Problem

The most significant environmental problem affecting this area is salinity intrusion and the conversion of marsh to open water. The construction of the Calcasieu Ship Channel greatly increased the efficiency of water exchange through Calcasieu Pass. Freshwater retention was consequently reduced and saline water was able to enter into Kelso Bayou in greater volumes and penetrate further north through the Alkali Ditch. That altered hydrologic circulation pattern continues to promote marsh loss and tidal scour throughout the project area. SAV habitat in the project area is also limited by salinity and the tidal energy associated with the large amount of water exchange.

Proposed Project Features

- 1) Marsh creation, shoreline protection, and rock armor at Kelso Bayou
- 2) Four 30-inch culverts at Crab Gully
- 3) Barge bay at Alkali Ditch

Preliminary Project Benefits

The project goal is to increase brackish marsh and SAV productivity by creating approximately 275 acres of marsh and by reducing tidal fluctuations and salinity within the project area. The proposed project would utilize marsh creation techniques to create approximately 275 acres of marsh. That created marsh and a portion of the Calcasieu Ship Channel would be protected against erosion with a rock dike. In addition, a barge bay would reduce the cross section at Alkali Ditch to improve SAV habitat and reduce marsh loss resulting from high salinity and tidal scour. Initial estimates of salinity reduction benefits indicate an additional 54 net acres for a total of **329 acres**. Salinity reduction will also benefit existing and future restoration efforts.

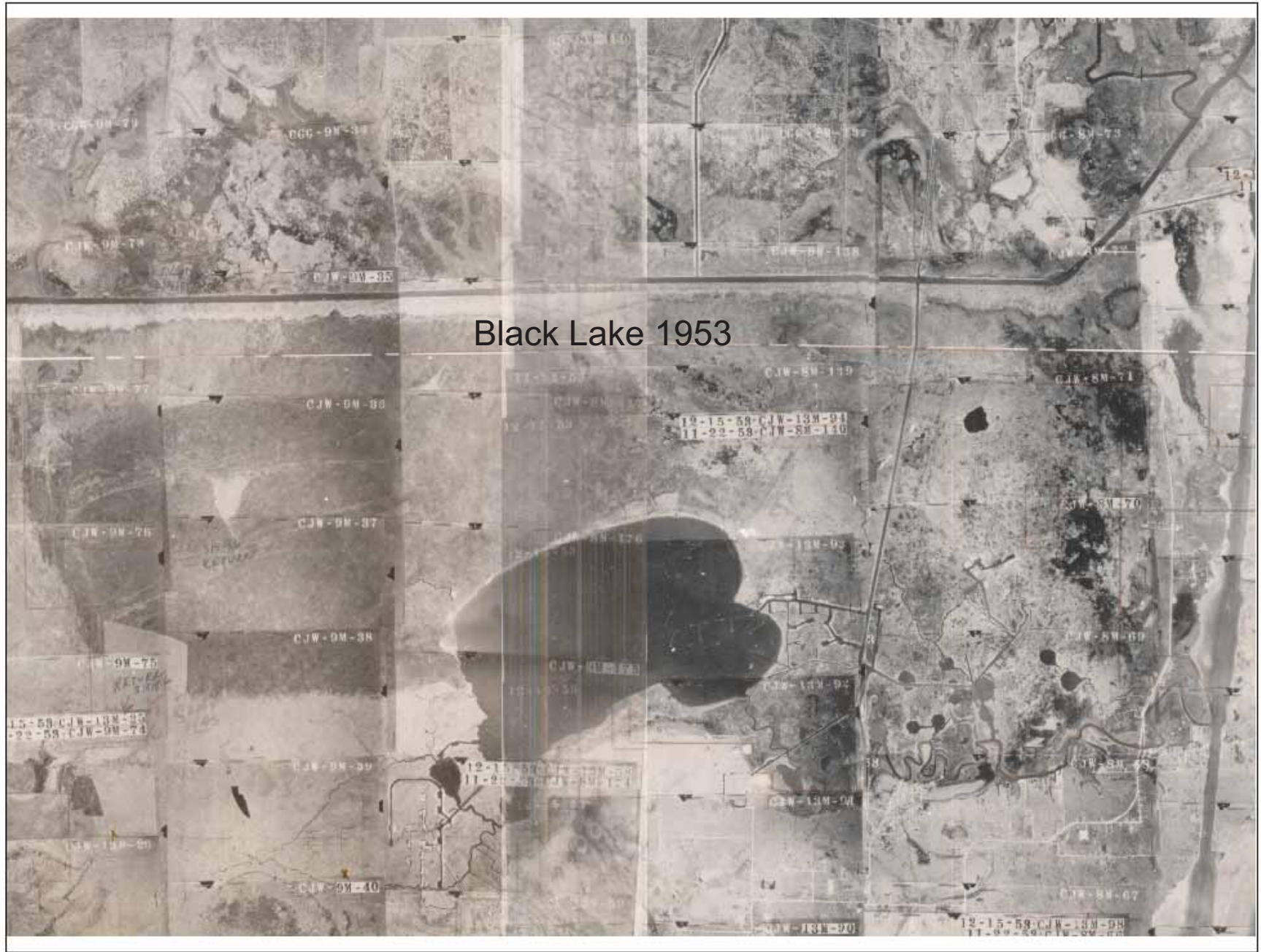
Preliminary Construction Costs:

\$12-15 Million

Preparers of Fact Sheet

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Black Lake 1953

Black Lake 2005



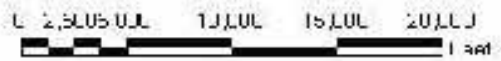


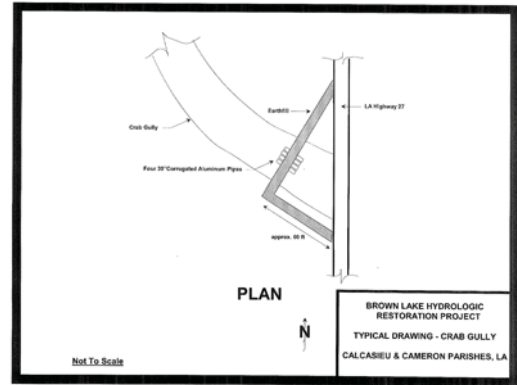
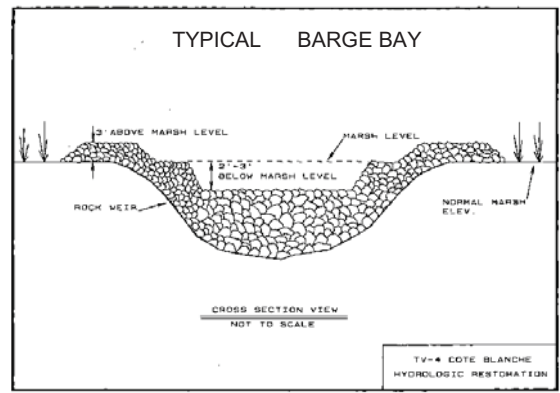
Legend

▲ Locations



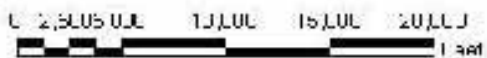
Kelso Bayou Marsh Restoration
 T-18
 Cameron Parish, Louisiana





Legend
Locations

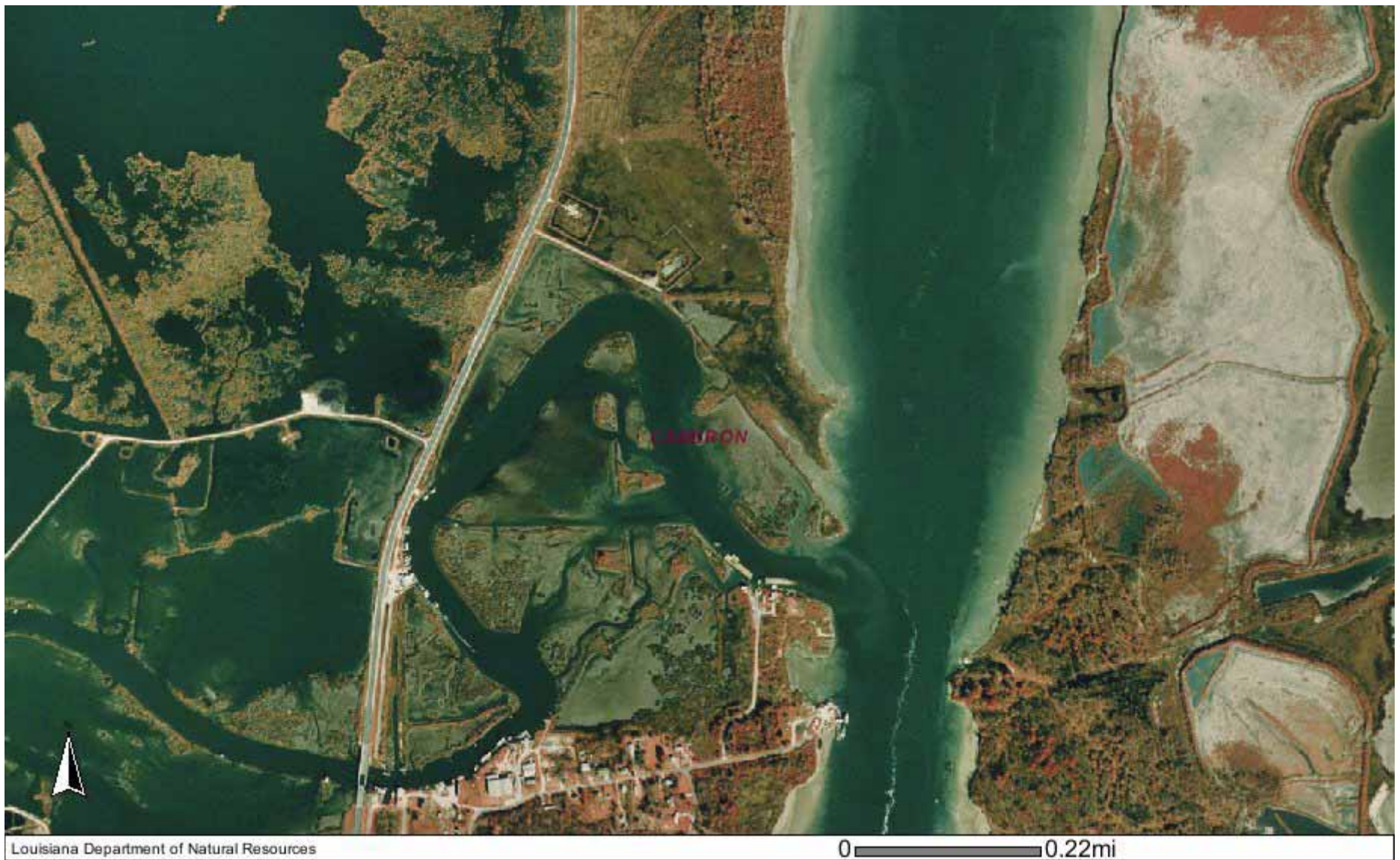
Marsh Restoration
 Project
 Cameron Parish, Louisiana



Kelso Vicinity



Kelso Bayou 1998



Louisiana Department of Natural Resources

0 0.22mi

Kelso Bayou 2005





Legend

- Rock Armored Channel
- Shoreline_Protection
- Marsh_Creation

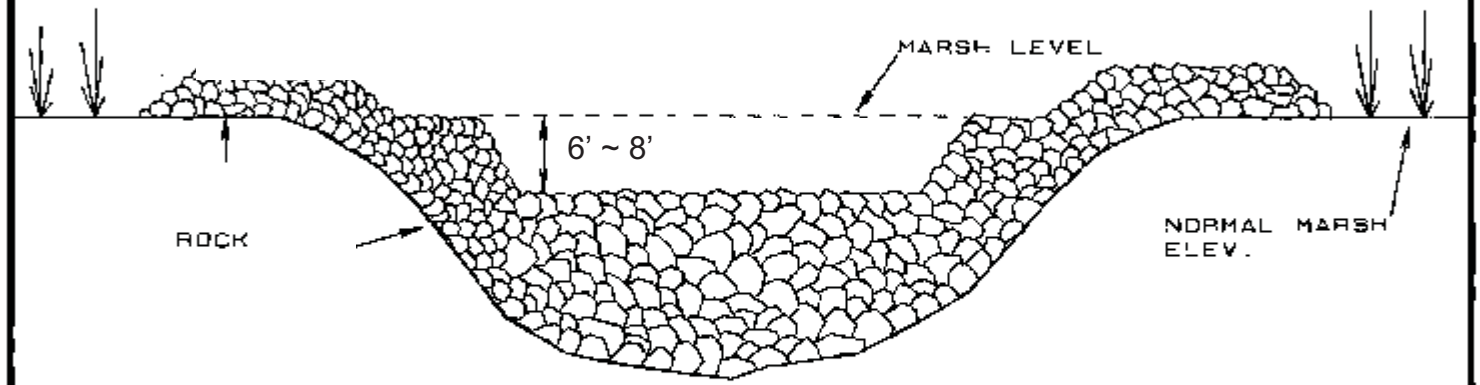


**Kelso Bayou Marsh Creation
Cameron Parish, Louisiana
PPL 20**

Alkali Ditch Vicinity



TYPICAL BARGE BAY



ROCK

MARSH LEVEL

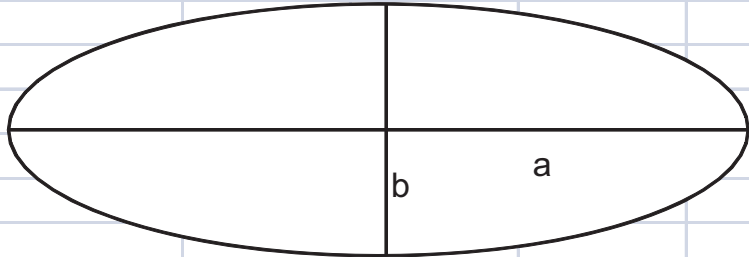
6' ~ 8'

NORMAL MARSH ELEV.

CROSS SECTION VIEW
NOT TO SCALE

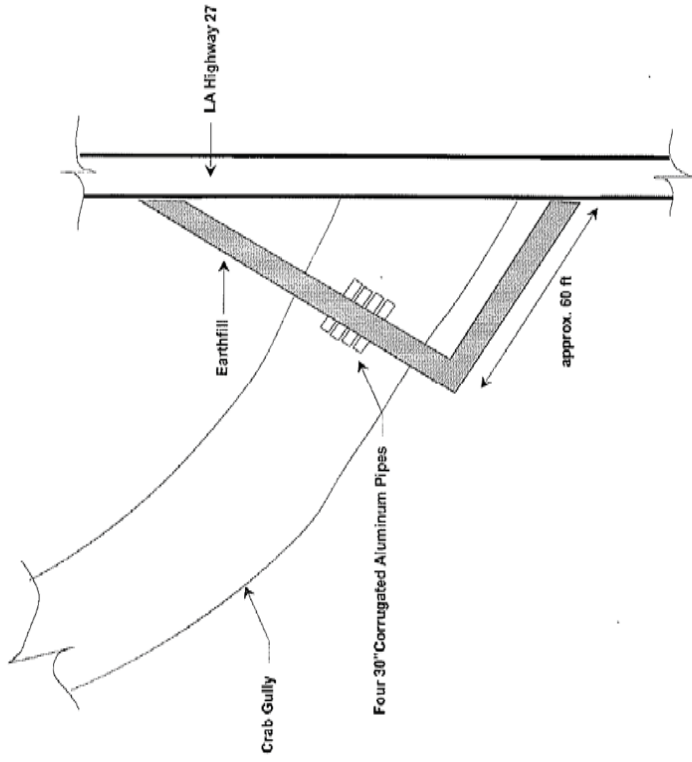
ALKALI DITCH
BARGE BAY

Calculations

| Conversion Calculations | | | | |
|---|------|------------------------|---------------|------------|
| Million Gallons per Day (mgd) to Cubic Ft per Second (cfs) | | | | |
| MGD | CFS | | | |
| 17.5 | 27.1 | | | |
| Channel Cross-Section Area (1/2 Area of ellipse) | | | | |
|  | | 1 | | |
| | | Channel Width | Channel Depth | Area |
| | | 200 | 20 | 3140 |
| | | 2 | | |
| | | Channel Width | Channel Depth | Area |
| | | 60 | 8 | 376.8 |
| | | % Reduction | | 88% |
| | | Rectangular Adjustment | | |
| | | 60 | 8 | 480 |
| Area of Ellipse = $\pi \cdot a \cdot b$ | | | | |
| Channel Cross-section = $1/2(\pi \cdot a \cdot b)$ | | % Reduction | | 85% |

Crab Gully Vicinity





PLAN



Not To Scale

TYPICAL DRAWING - CRAB GULLY
CALCASIEU & CAMERON PARISHES, LA



R4-CS-05-North Willow Lake Restoration

PPL 20 PROJECT NOMINEE FACT SHEET
1/26/2010

Project Name

North Willow Lake Restoration

Coast 2050 Strategy

Use of sediment for wetland creation.

State Master Plan Strategy

Construct marsh and terraces for marsh restoration.

Project Location

Region 4, Calcasieu-Sabine Basin, Cameron Parish, Sweet/Willow Lakes Mapping Unit, area northeast of Calcasieu Lake and north of GIWW.

Problem

The most significant environmental problem affecting the marshes in this area is deterioration and conversion to open water. Additionally, several breaches between Willow Lake and interior open water areas have developed since Hurricane Rita. Those areas were again impacted by Hurricane Ike and rapid deterioration from organic soil export is occurring.

Proposed Project Features

The project will protect approximately 7,000 linear feet of Willow Lake shoreline, construct approximately 150 acres of marsh, and create approximately 60,000 linear feet of terraces with approximately 300 foot spacing.

Preliminary Project Benefits

The proposed project will protect/create/restore approximately **193 acres** by reestablishing the north shoreline of Willow Lake. Approximately 150 acres of emergent marsh would be created with dedicated dredge material and an additional 43 acres would be created with terraces. SAV habitat would be restored by reducing wave energy and tidal scour associated with fetch and water exchange.

Preliminary Construction Costs

\$10 million

Preparer of Fact Sheet

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Willow Lake 1998



Louisiana Department of Natural Resources

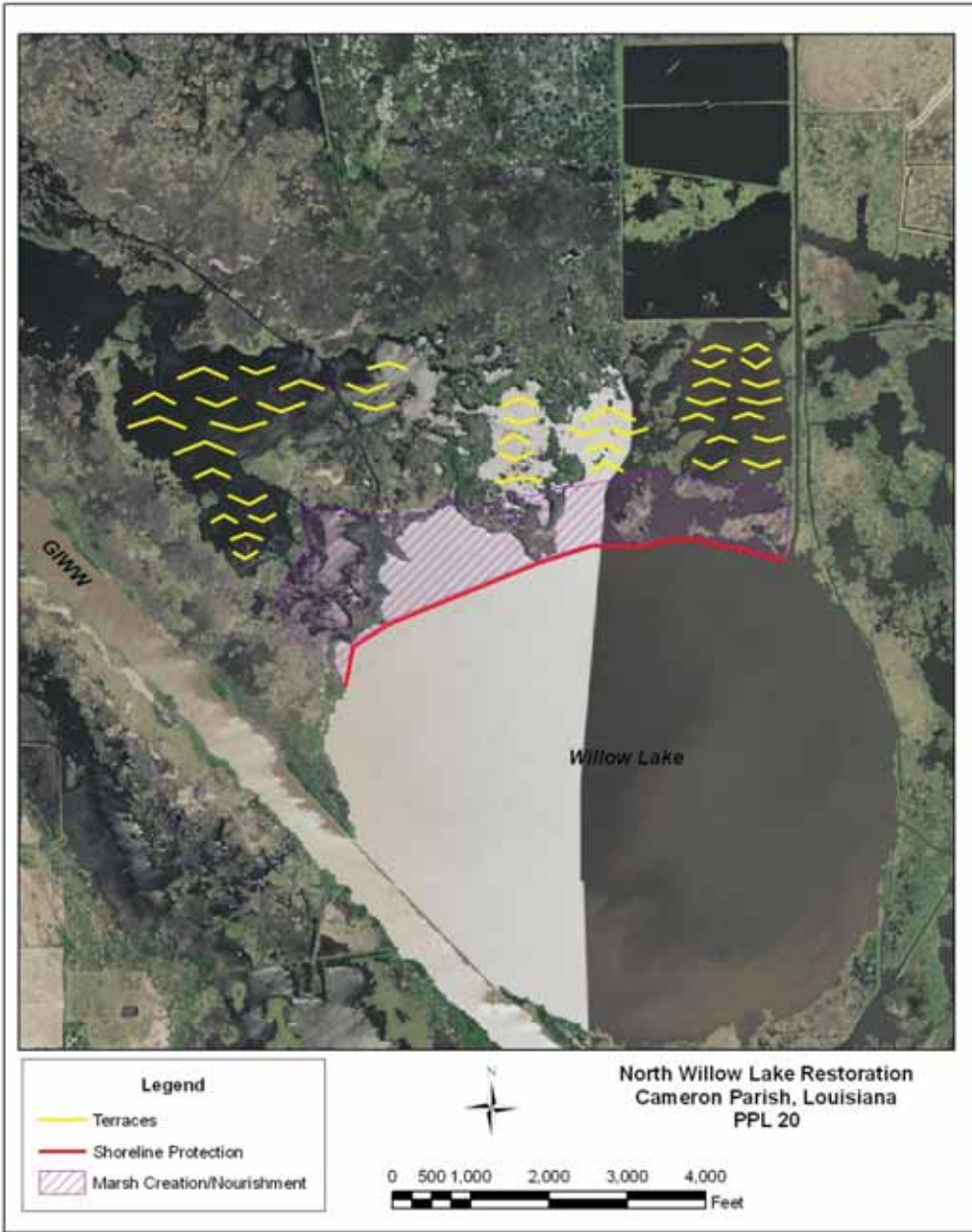
0 0.36mi

Willow Lake 2004



Willow Lake 2005





R4-CS-06-Hollynd Beach Breakwaters

PPL20 PROJECT NOMINEE FACT SHEET
January 26, 2010

Hollynd Beach Breakwaters

Coast 2050 Strategy

Coastwide: Maintain, Protect, or Restore Ridge Functions; Maintenance of Gulf, Bay, and Lake Shoreline Integrity.

Regional: 18. Stabilize Gulf of Mexico shoreline from Calcasieu Pass to Johnson's Bayou.

Project Location

Region 4, Calcasieu-Sabine Basin, Cameron Parish, South of State Highway 82, west of the Calcasieu Ship Channel.

Problem

The project will be designed to reduce erosion of the Gulf Shoreline and protect the State's proposed Beach Nourishment project. Recent loss rates (1998-2008) were calculated from aerial photography at 26.5 ft/yr. In 2008, approximately 55 feet of shoreline remained between Louisiana State Highway 82 and the Gulf of Mexico.

Proposed Project Features

The project proposes approximately 15,000 linear feet (2.8 miles) of breakwaters similar to the Holly Beach Breakwater Project (CS- 01) to protect the most critical shoreline area along Highway 82. Breakwaters will be designed on the CS-01 template, using all the lessons learned from the Holly Beach Breakwater Enhancement and Sand Management Project (CS-31). Approximately 40 round rubble breakwaters (ranging from 150 – 170 ft with 250 - 300 ft gaps), placed 300 – 700 feet offshore and built to 3.8 ft NGVD will be created. This project will protect a proposed state surplus project that will create/nourish this beach using sand from offshore borrow sites.

Preliminary Project Benefits

The project is designed to reduce wave energies on the gulf shoreline west of the Calcasieu Ship Channel and trap sediment between the breakwaters and shoreline. The total area benefited is several hundred acres, with **137 acres** directly protected as a result of 75% reduction in loss rate. This project maintains a beach rim component of the coastal ecosystem and has a positive net impact on critical infrastructure (Highway 82) and would have a synergistic effect on the proposed state surplus project. This project would also protect/restore critical habitat for the piping plover, a threatened/endangered species.

Preliminary Construction Costs (w/25% contingency)

\$17 million

Preparers of Fact Sheet

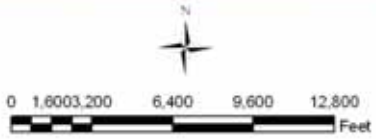
Troy Mallach, NRCS

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Legend

- Breakwaters
- primaryroads



Hollynd Beach Breakwaters
Cameron Parish, Louisiana
PPL 20

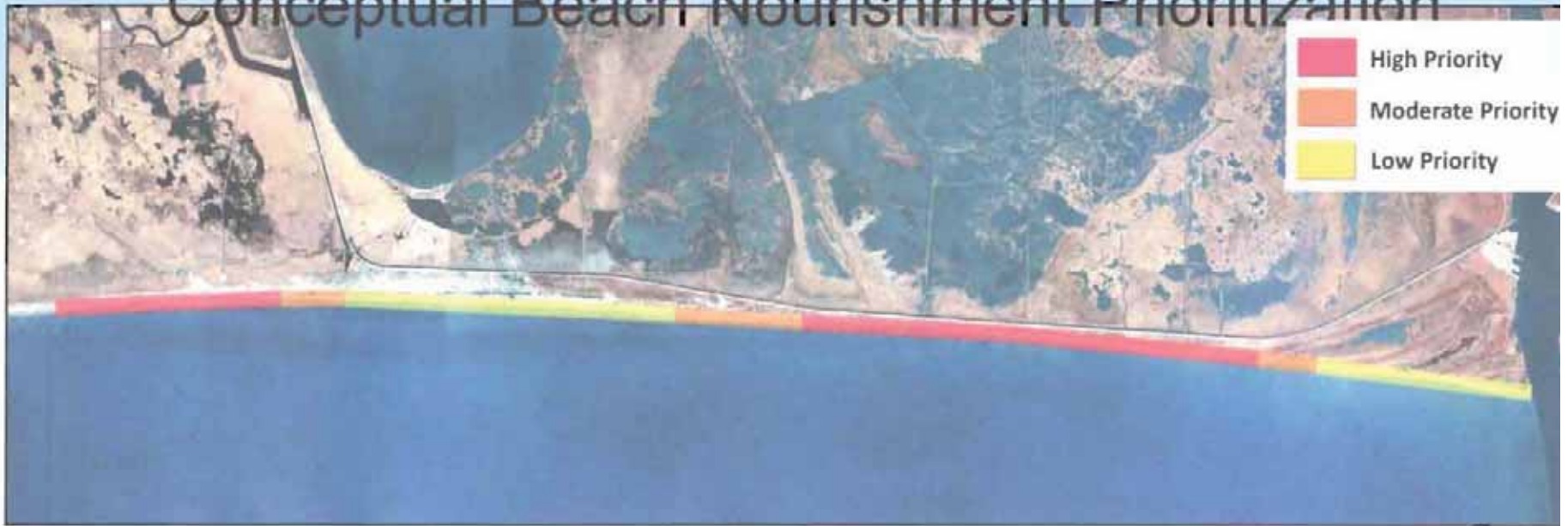
Hollynd Beach 1998 (appr. 585 ft.)



Hollynd Beach 2008 (appr. 55ft)



Conceptual Beach Nourishment Prioritization



| | No Priority (cy/ft) | Berm Width (ft) | Priortized (cy/ft) | Berm Width (ft) |
|-------------------------------------|---------------------|-----------------|--------------------|-----------------|
| HIGH (Length = 21,335) | 75 | 230 | 115 | 285 |
| MODERATE (Length = 7,950) | 75 | 230 | 75 | 230 |
| LOW (Length = 17,215) | 75 | 230 | 25 | 100 |
| Total Length: 46,500 | | | | |