REGION 3

Coastal Wetlands Planning Protection & Restoration Act

27th Priority Project List

Region 3

Regional Planning Team Meeting

February 1, 2017
Morgan City, LA

CWPPRA

1. Welcome and Introductions

- RPT Region 3 Leader: Ron Boustany - NRCS

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Announcements

- Copies of the PPL 27 Selection Process & Schedule available at the sign-in table.
- PPL 27 RPT meetings to accept project nominees:
  - Region IV, Vermilion Parish Library, Jan. 31, 2017, 12:30 pm
  - **Region III, Port of Morgan City - Office, Feb. 1, 2017, 9:30 am**
  - Region II, USFWS SE LA Refuges Complex (Big Branch), Feb. 2, 2017, 10:00 am
  - Region I, USFWS SE LA Refuges Complex, Feb. 2, 2017, immediately following Region II
- For parishes that do not have a voting registration form filled out already - 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 during the Coastwide Electronic Vote.

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Region 3 Parishes

- Eligible parishes for basins in Region 3 include:
- Terrebonne Basin
  - **St. Mary Parish**
  - **Terrebonne Parish**
  - **Assumption Parish**
  - **Lafourche Parish**
  - **Iberia Parish**
  - **St. Martin Parish**
- Atchafalaya Basin
  - **St. Mary Parish**
  - **Iberia Parish**
  - **Terrebonne Parish**
- Teche-Vermilion Basin
  - **St. Mary Parish**
  - **Iberia Parish**
  - **Vermilion Parish**

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RPT Meetings

- Project proposals should be consistent with the 2012 State Master Plan or the DRAFT 2017 State Master Plan.
- A project can only be nominated in one basin except for coastwide projects
- Proposals that cross multiple basins, excluding coastwide projects, shall be nominated in one basin only, based on the majority area of project influence.
- If similar projects are proposed within the same area:
  - RPT representatives (CWPPRA agencies and only the parishes located within the project's basin) will determine if those projects are sufficiently different
    - If sufficiently different:
      - Each project will move forward
    - If not sufficiently different:
      - Projects will be combined
      - Federal sponsor will be determined prior to coastwide vote (March 7th).
  - *This decision will be made at the meeting where the projects are proposed*

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RPT Meetings

- Presenters without factsheets **MUST** complete a PPL 27 Nomination Sign-Up Sheet for <u>each</u> project nominee (demo projects too).
- Presenters with factsheets, please give a factsheet each to Kaitlyn, Michelle & the minutes taker <u>before</u> your presentation.
- Limit project proposals to 5 minutes and Powerpoint presentations to 5 slides.
- Public comments on project proposals will be accepted orally during the RPT meetings and in writing by March 1, 2017.
- Limit comments/questions during meeting to PPL 27 subject proposals and processes.

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Coastwide Projects

- Proposes a technique applicable across the coast (e.g. vegetative planting)
- Nominated at any RPT meeting
- All coastal parishes & agencies will vote on selection of coastwide nominee
- Only one coastwide nominee may be selected from the coastwide nominee pool during the Electronic Coastwide Vote on March 7, 2017.
- The Technical Committee may or may not select a coastwide project in April 2017.

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Demonstration Projects

- Demonstrates a technology which can be transferred to other areas in coastal Louisiana
- Engineering/Environmental Workgroups will validate that demos fit CWPPRA Standard Operating Procedures criteria
- The RPTs select up to 6 demos during the March 7th Coastwide Electronic Vote.
- The Technical Committee selects up to 3 demos in April 2017.
- Workgroups may recommend that no demos move forward to candidate stage
- Previous demo candidates must be ***re-nominated*** for PPL 27.

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Coastwide Electronic Vote (Mar. 7th) to select:

Projects per Basin
(Determined by loss rates, the highest loss rates have the most projects)

4 Barataria
4 Terrebonne
3 Breton Sound
3 Pontchartrain
2 Mermentau
2 Calcasieu/Sabine
2 Teche/Vermilion
1 Atchafalaya
1 Coastwide
22 Total

& up to 6 demos

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Coastwide Electronic Vote

- Each officially designated parish representative, each Federal agency, and the State (CPRA) will have one vote.
- 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).
- Public comments will be heard today and written comments must be submitted by March 1, 2017.

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Coastwide Electronic Voting Process

- USACE will send out voting sheets as both Excel spreadsheet and PDF documents 1 week prior to the Coastwide Electronic Vote. Voters will only receive voting sheets for the basins that they are eligible to vote for & the column that they need to mark their vote will be highlighted. Voting instructions will be provided with the voting sheets.

- Voters must email their voting sheets to kaitlyn.m.carriere@usace.army.mil

All votes must be received by 10:30 am on March 7, 2017.

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Nominee Project Evaluations

- Following the Coastwide Electronic Vote, an agency will be assigned to each project to prepare a Nominee Project factsheet (1 page + map).
- CWPPRA Engineering & Environmental Workgroups review draft features and assign preliminary cost and benefit ranges.
- Work groups will also review demo & coastwide projects and verify that they meet PPL 27 criteria.

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PPL 27 Candidate Project Selection

Candidates evaluated between May and October

- Workgroups conduct site visits and meetings to identify needs and establish project baselines and boundaries.
- Workgroups determine benefits, project features, and cost estimates

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PPL 27 Timeline

- **Coastwide Electronic Vote, Mar. 7, 2017**
  - 21 basin-project nominees, 1 coastwide nominee, and 6 demos selected
- **Technical Committee Mtg, Apr. 27, 2017, New Orleans**
  - Selection of 10 candidates and up to 3 demos
- **Technical Committee Mtg, Dec. 7, 2017, Baton Rouge**
  - Typically recommend up to 4 projects for Phase 1 funding
- **Task Force Mtg, Jan. 2018, New Orleans**
  - Final Selection of projects for Phase 1 funding

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Written Comments

- Send written comments on projects & demos proposed today to the CWPPRA program manager
- **Deadline: March 1, 2017**

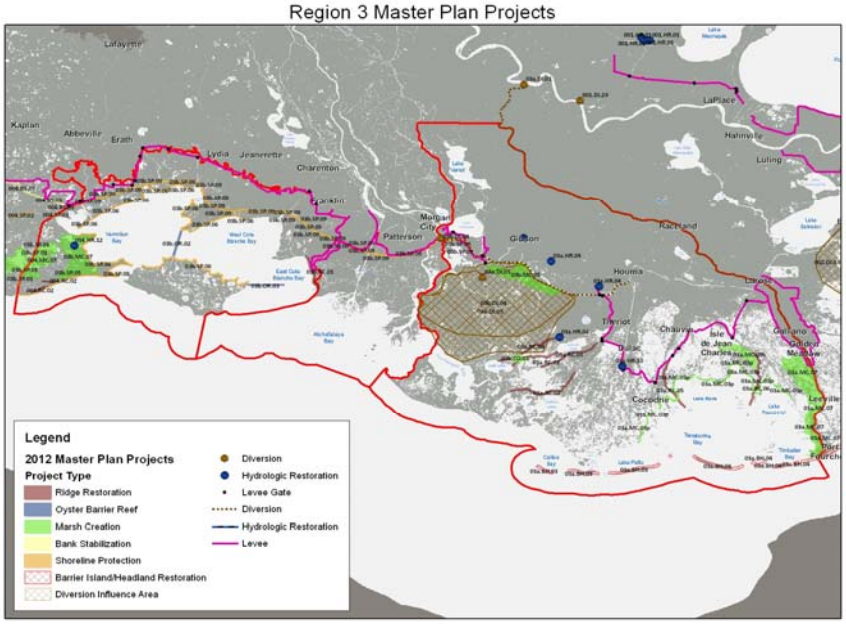
Brad Inman
CWPPRA Program Manager
U.S. Army Corps of Engineers
7400 Leake Avenue
New Orleans, Louisiana 70118

Email: Brad.L.Inman@usace.army.mil

(this information is on the back of the agenda)

CWPPRA

2012 State Master Plan
Region 3 Master Plan Projects



CWPPRA

Project Type	Project Name	Project Costs	Project No.
Barrier Island/Headland Restoration	Isles Dernieres Barrier Island Restoration: Restoration of the Isles Dernieres barrier islands to provide dune, beach, and back barrier marsh habitat and to provide storm surge and wave attenuation in the Terrebonne Basin.	$343M	03a.BH.03
Barrier Island/Headland Restoration	Timbalier Islands Barrier Island Restoration: Restoration of the Timbalier barrier islands to provide dune, beach, and back barrier marsh habitat and to provide storm surge and wave attenuation in the Terrebonne Basin.	$524M	03a.BH.04
Hydrologic Restoration	Central Terrebonne Hydrologic Restoration: Modification of structure on Liners Canal to improve freshwater flow to Lake Decade and installation of a structure in Grand Pass to restrict the opening to Lake Mechant.	$14M	03a.HR.02
Hydrologic Restoration	Chacahoula Basin Hydrologic Restoration: Installation of three water control structures (culverts) to increase hydraulic connectivity in the Chacahoula Basin on either side of Highway 182.	$7M	03a.HR.04
Hydrologic Restoration	HNC Lock Hydrologic Restoration: Construction of a lock on the Houma Navigation Canal and operation to reduce saltwater intrusion and distribute freshwater to the surrounding wetlands.	$180M	03a.HR.10
Marsh Creation	Terrebonne Bay Rim Marsh Creation Study: Planning, engineering and design to develop marsh creation along the northern rim of Terrebonne Bay (approximately 3,370 acres). PLANNING AND DESIGN ONLY.	$91M	03a.MC.03p
Marsh Creation	Belle Pass-Golden Meadow Marsh Creation (1st Period Increment): Creation of approximately 14,420 acres from Belle Pass to Golden Meadow to create new wetland habitat, restore degraded marsh, and reduce wave erosion.	$732M	03a.MC.07

CWPPRA

Project Type	Project Name	Project Costs	Project No.
Marsh Creation	North Terrebonne Bay Marsh Creation-Component B: Creation of approximately 4,940 acres of marsh south of Montegut between Bayou St. Jean Charles and Bayou Pointe au Chien to create new wetland habitat, restore degraded marsh, and reduce wave erosion.	$1555M	03a.MC.09b
Marsh Creation	Terrebonne GIWW Marsh Creation: Creation of approximately 1,190 acres of marsh along the GIWW in Terrebonne Basin to create new wetland habitat, restore degraded marsh, and reduce wave erosion.	$37M	03b.MC.05
Marsh Creation	Belle Pass-Golden Meadow Marsh Creation (2nd Period Increment): Creation of approximately 14,420 acres from Belle Pass to Golden Meadow to create new wetland habitat, restore degraded marsh, and reduce wave erosion.	$2,927M	03a.MC.07
Marsh Creation	North Lost Lake Marsh Creation: Creation of approximately 850 acres of marsh between Lake Pagie and Bayou Decade to create new wetland habitat, restore degraded marsh, and reduce wave erosion.	$125M	03b.CO.01
Oyster Barrier Reef	West Cote Blanche Bay Oyster Barrier Reef Restoration: Creation of approximately 28,000 feet of oyster barrier reef in West Cote Blanche Bay from Dead Cypress Point (near Cypremort Point) to near Bayou Michael (NW corner of Marsh Island) to provide oyster habitat, reduce wave erosion, and prevent further marsh degradation.	$20M	03b.OR.02
Oyster Barrier Reef	East Cote Blanche Bay Oyster Barrier Reef Restoration: Creation of approximately 30,000 feet of oyster barrier reef in East Cote Blanche Bay from Marone Point to Lake Point (NE corner of Marsh Island) to provide oyster habitat, reduce wave erosion, and prevent further marsh degradation.	$22M	03b.OR.03
Ridge Restoration	Bayou DeCade Ridge Restoration: Restoration of approximately 47,000 feet (110 acres) of historic ridge along Bayou DeCade from Lake Decade to Raccourci Bay to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation.	$38M	03a.RC.01

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Project Type	Project Name	Project Costs	Project No.
Ridge Restoration	Bayou DuLarge Ridge Restoration: Restoration of approximately 106,000 feet (240 acres) of historic ridge along Bayou DuLarge to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation.	$56M	03a.RC.02
Ridge Restoration	Small Bayou LaPointe Ridge Restoration: Restoration of approximately 55,000 feet (130 acres) of historic ridge along Small Bayou LaPointe to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation.	$29M	03a.RC.03
Ridge Restoration	Mauvais Bois Ridge Restoration: Restoration of approximately 60,000 feet (140 acres) of historic ridge at Mauvais Bois to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation.	$37M	03a.RC.04
Ridge Restoration	Bayou Terrebonne Ridge Restoration: Restoration of approximately 55,000 feet (130 acres) of historic ridge along the southern portions of Bayou Terrebonne to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation.	$38M	03a.RC.05
Ridge Restoration	Bayou Pointe au Chien Ridge Restoration: Restoration of approximately 57,000 feet (130 acres) of historic ridge along the southern portions of Bayou Pointe au Chien to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation.	$30M	03a.RC.06
Ridge Restoration	Bayou Sale Ridge Restoration: Restoration of approximately 36,000 feet (80 acres) of historic ridge along Bayou Sale to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation.	$22M	03b.RC.01
Sediment Diversion	Atchafalaya River Diversion (150,000 cfs): Sediment diversion off of the Atchafalaya River into or to benefit Penchant and southwest Terrebonne marshes, 150,000 cfs capacity (modeled at 60% of southward Atchafalaya flow exceeding 50,000 cfs).	$783M	03a.DI.05

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Project Type	Project Name	Project Costs	Project No.
Ridge Restoration	Bayou Long Ridge Restoration: Restoration of approximately 49,000 feet (110 acres) of historic ridge along Bayou Long/Bayou Fontanelle to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation.	$37M	002.RC.01
Ridge Restoration	Spanish Pass Ridge Restoration: Restoration of approximately 53,000 feet (120 acres) of historic ridge along the banks of Spanish Pass near Venice to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation.	$43M	002.RC.02
Ridge Restoration	Bayou LaLoutre Ridge Restoration: Restoration of approximately 117,000 feet (270 acres) of historic ridge along Bayou LaLoutre to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation.	$61M	001.RC.01
Sediment Diversion	Mid-Barataria Diversion (250,000 cfs- 1st Period Increment): Sediment diversion into mid-Barataria in the vicinity of Myrtle Grove to build and maintain land, maximum capacity 50,000 cfs (modeled at 50,000 cfs when the Mississippi River flow exceeds 600,000 cfs, at 8% of river flows between 200,000-600,000 cfs, and no operation below 200,000 cfs). NOTE: This project is the first implementation period component of a 250,000 cfs diversion to mid-Barataria. The influence area shown is for the total 250,000 cfs project upon completion in the second implementation period.	$275M	002.DI.03
Sediment Diversion	Mid Barataria Diversion (250,000 cfs- 2nd Period Increment): Sediment diversion into Mid-Barataria in the vicinity of Myrtle Grove to build and maintain land, 250,000 cfs capacity. NOTE: This project represents the incremental expansion of the 50,000 cfs diversion (002.DI.03) to mid-Barataria (constructed in the 1st Implementation Period) for a total capacity of 250,000 cfs (modeled at 250,000 cfs when Mississippi River flow exceeds 900,000 cfs, at 50,000 cfs for river flows between 600,000-900,000 cfs, at 8% of river flows between 200,000-600,000 cfs, and no operation when river flow is below 200,000 cfs).	$820M	002.DI.03a
Sediment Diversion	Lower Barataria Diversion (50,000 cfs): Sediment diversion into lower Barataria Bay in the vicinity of Empire, 50,000 cfs capacity (modeled at capacity when Mississippi River flow exceeds 600,000 cfs; modeled at 8% of river flow from 600,000 cfs down to 200,000 cfs; no operation below 200,000 cfs).	$203M	002.DI.15
Sediment Diversion	Lower Breton Diversion (50,000 cfs): Sediment diversion into lower Breton Sound in the vicinity of Black Bay to build and maintain land, 50,000 cfs capacity (modeled at 50,000 cfs when Mississippi River flow exceeds 600,000 cfs, at 8% of river flows between 200,000-600,000 cfs, and no operation when river flow is below 200,000 cfs).	$212M	001.DI.02

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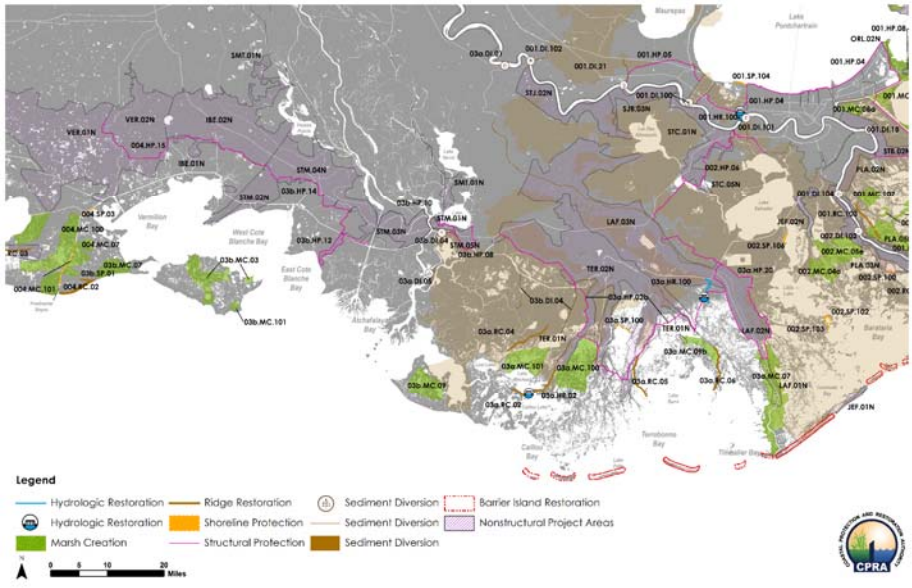
Project Type	Project Name	Project Costs	Project No.
Sediment Diversion	Increase Atchafalaya Flow to Eastern Terrebonne: Dredging of the GIWW east of the Atchafalaya and installation of a bypass structure at the Bayou Boeuf Lock to increase freshwater and sediment flows from Atchafalaya River to Terrebonne marshes (modeled to maintain a minimum of 20,000 cfs east along GIWW towards HNC).	$292M	03b.DI.04
Shoreline Protection	Vermilion Bay and West Cote Blanche Bay Shoreline Protection (Critical Areas): Shoreline protection through rock breakwaters of approximately 83,000 feet of shoreline along Vermilion Bay and West Cote Blanche Bay to preserve shoreline integrity and reduce wetland degradation from wave erosion.	$86M	03b.SP.06a
Shoreline Protection	GIWW Shoreline Protection (Intracoastal City to Amelia): Shoreline protection of approximately 690,000 feet of GIWW shoreline between Intracoastal City and Amelia to preserve shoreline integrity and reduce wetland degradation from wave erosion.	$765M	03b.SP.09

Region 3 Master Plan Projects



ATTENDANCE RECORD

DATE	SPONSORING ORGANIZATION	LOCATION
February 1, 2017 9:30 A.M.	COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT	Port of Morgan City - Office 7327 Highway 182 Morgan City, LA

PURPOSE

MEETING OF THE REGIONAL PLANNING TEAM REGION III

PARTICIPANT REGISTER

NAME	JOB TITLE AND ORGANIZATION	PHONE NUMBER
Adrian Chevarrie	EPA	214-665-3103
Sharon Osowski	EPA	214-665-7506
Lonnie Fontenot	JESCO (minute-taker)	337-802-7508
Brandon Owens	NOAA EAT	985-351-0353
Jason Kroll	NOAA	2257575411
Barry Hebert	LDWF	225-765-0233
Jonathan Foret	SLWDC	985-232-2800
Cindy Cestrenew	Port of Morgan City	985 384 0850
Tori Henry	Port of Morgan City	985 384 0850
Chad Camillo	Miami Corporation	337.264.1695
~~Tori Henry~~	~~Port of Morgan City~~	~~985-38~~
J. P Hebert	SMSWCD	
Mark W. Hester	professor UL Lafayette	337-482-5246
PATRICK WILLIAMS	CEO EJES INC.	318-518-7535
Chris Fetters	Director - GIS Engineering	225-772-3439
Bill Bourgeois	St. Mary Levee Dist - Legal	985 384-2055
Vicki Summers	Terrebonne Coastal Restorations	985-873-6809
Ray Fremin JR	Iberia Parish Levee Dist	337-380-8439
Ron Bourtang	NRCS	337-291-3067
Terry Dugas	PCS	337-517-1292
Blaine Sanchez	Living Blanket	225 304 3985
Brayton Dunard	" "	" " "

LMV FORM 583-R
JAN 88

ATTENDANCE RECORD

DATE	SPONSORING ORGANIZATION	LOCATION
February 1, 2017 9:30 A.M.	COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT	Port of Morgan City - Office 7327 Highway 182 Morgan City, LA

PURPOSE

MEETING OF THE REGIONAL PLANNING TEAM REGION III

PARTICIPANT REGISTER

NAME	JOB TITLE AND ORGANIZATION	PHONE NUMBER
Chris Cannon	111 "	504-472-7004
MARY Black	Coastal Restoration Director, TPCG	985-873-6889
Tom Constè	Engineer, Jesco	337-824-9074
Whitney Broussard	Research Scientist, UL Lafayette	337-482-1396
Tyler Ortego	Coastal Resilience Group	225-372-5582
Cody Colvin	NRCS	225-278-2732
Cindy Stelly	NRCS	225-645-4253 xt
Patrick Wiegman	NOAA Fisheries	225-389-0508
Randy Moertle	Point Au Fer/Rainey Conservation Alliance	985-856-3630
Alton James Jr	USDA – NRCS	
Dawn Davis	NOAA NMFS	225 389 0508
Twyla Cheatwood	NOAA NMFS	225 389 0508
Lance Campbell	LDWF	337-373-0032
Todd Baker	LDWF	225 765 2814
Monique Verdin	United Houma Nation	504 330 0768
Blaise Pezold	LDAF CRVP	504-264-8125
Amanda Vaisin	Lafourche Parish Gov't	985-493-6616
Kevin Roy	USFWS	337-291-3120
Ronny Paille	"	337-291-3117
Susan Testroet-Bergeron	BTNEP	985-447-0868
Charles Sasser	LSU	225-578-6375
Mac Parker	USDA-NRCS	337-369-3234 ext. 3

LMV FORM 583-R
JAN 88

ATTENDANCE RECORD

DATE	SPONSORING ORGANIZATION	LOCATION
February 1, 2017 9:30 A.M.	COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT	Port of Morgan City - Office 7327 Highway 182 Morgan City, LA

PURPOSE

MEETING OF THE REGIONAL PLANNING TEAM REGION III

PARTICIPANT REGISTER

NAME	JOB TITLE AND ORGANIZATION	PHONE NUMBER
Robert Dubois	USFWS	337-291-3127
Angela Love	S&WE	337-408-3103
Desiree Juneau	Ducks Unlimited	985-209-3270
Karl H. Rhodes	RECON	337-533-3844
John Boatman	NRCS	985-331-9084
Kent Bollfrass	CPRA	225-342-4733
Wes LeBlanc	CPRA	225 342-4127
RALPH LIBERSAT	Vermilion Parish	337-652-6557
HENRY BOL LACOMBE	ST. MARY PARISH GOVT	337-828-4100
Brandon Howard	NOAA-NMFS	225-389-0508

LMV FORM 583-R
JAN 88

REGION 3 – Teche-Vermilion

Project Number	Project Proposals
R3-TV-01	South Humble Canal Marsh Creation
R3-TV-02	Belle Isle Bayou Marsh Creation and Terracing
R3-TV-03	Freshwater Bayou East Marsh Creation and Hydrologic Restoration
R3-TV-04	West Vermilion Marsh Creation and Shoreline Protection
R3-TV-05	Lake Sand Marsh Creation and Shoreline Protection

R3-TV-01

South Humble Canal Marsh Creation

TV-1

PPL27 PROJECT NOMINEE FACT SHEET
January 2017

Project Name
South Humble Canal Marsh Creation

Louisiana's 2012 Coastal Master Plan
Marsh Creation – 004.MC.07

Project Location
Region 3, Teche-Vermilion Basin, Vermilion Parish

Problem
In addition to marsh erosion along Freshwater Bayou Channel, significant interior marsh loss has resulted from saltwater intrusion and hydrologic changes associated increasing tidal influence, storm surge impacts, and herbivory. The ensuing erosion creates water turbidity within the interior ponds. This coupled with increased pond depth, decreases the coverage of submerged aquatic vegetation. Recent hurricane scour sites are not likely to recover unaided. Erosion of the eastern bank line of Freshwater Bayou has resulted in formation of three breaches, allowing vessel induced water displacement surges to adversely affect the interior project area ponds, lakes, and marshes. These wakes and water surges from passing vessels are also causing the export of organic material from the project area.

Goals
The project goal is create a band of solid marsh inland of the Freshwater Bayou Channel to mitigate its hydrologic impact on interior marshes. Additionally, terraces will be installed to create a baffle system to reduce exchange and trap suspended sediments in marshes immediately adjacent to the channel.

Proposed Solution
Create 285 acres of marsh and nourish 105 acres within interior ponds and lakes (from Gulf of Mexico borrow). Additionally, a series of earthen terraces totaling 7710 feet in length would be constructed in smaller ponds adjacent to the channel to create baffles designed to reduce hydraulic energy and trap suspended sediment.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   Approximately 394 acres of marsh would be benefitted directly (390 from marsh creation and 4 acres from terracing). Indirect benefits may occur due to sediment trapping and to interior marshes and ponds protected from excessive channel-induced tidal exchange.

2) *How many acres of wetlands will be protected/created over the project life?*
   The total net acres protected/created over the project life is approximately 273 acres (3 ac from terracing).

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (e.g., 50% reduction in the background loss rate)?*
   The anticipated loss rate reduction throughout the area of direct benefit is estimated to be 50%.

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?*
None.

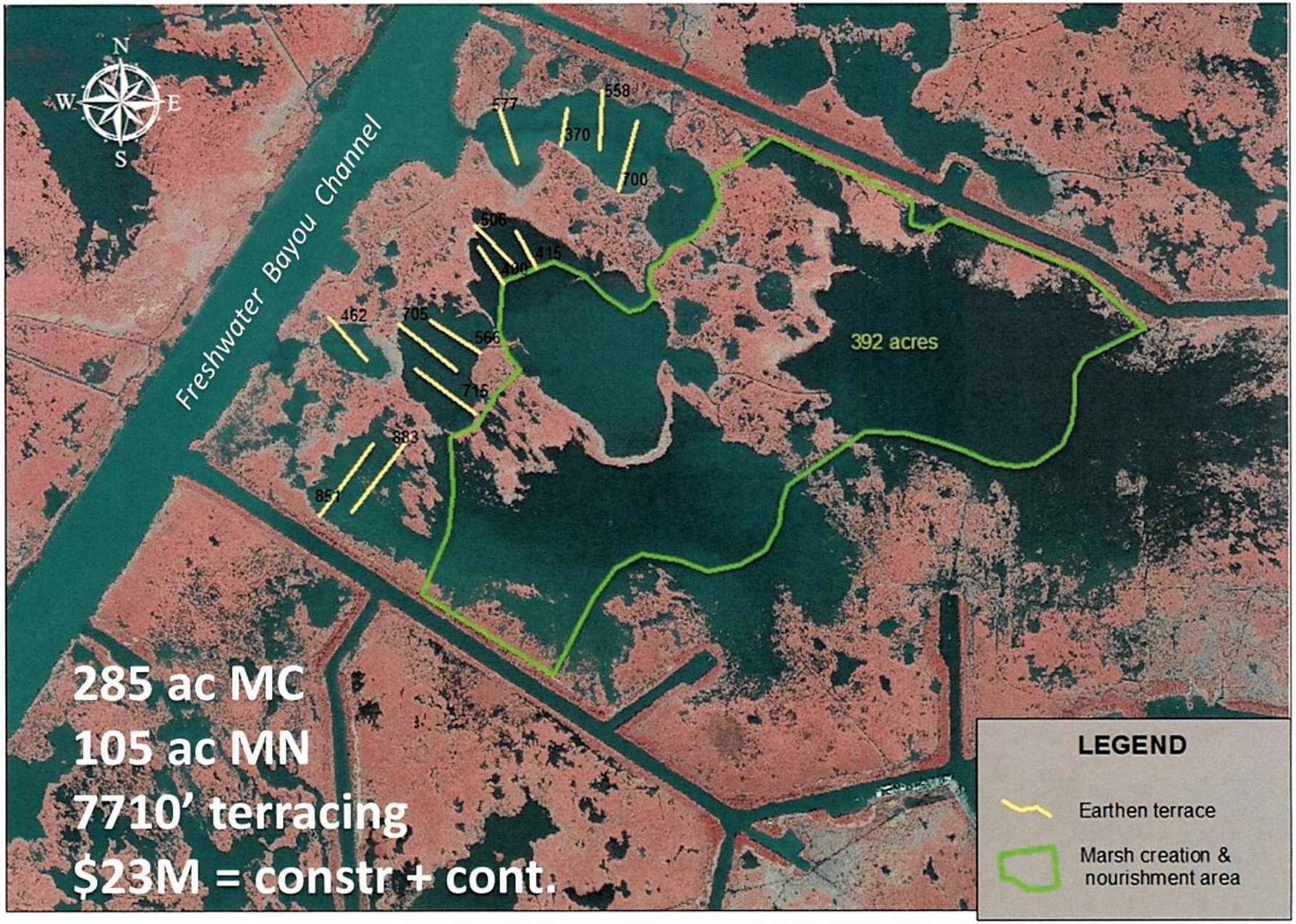
6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
None.

Other Considerations
Contaminant survey of borrow material required by landowner.

Preliminary Construction Costs:
The estimated construction cost including 25% contingency is $23M.

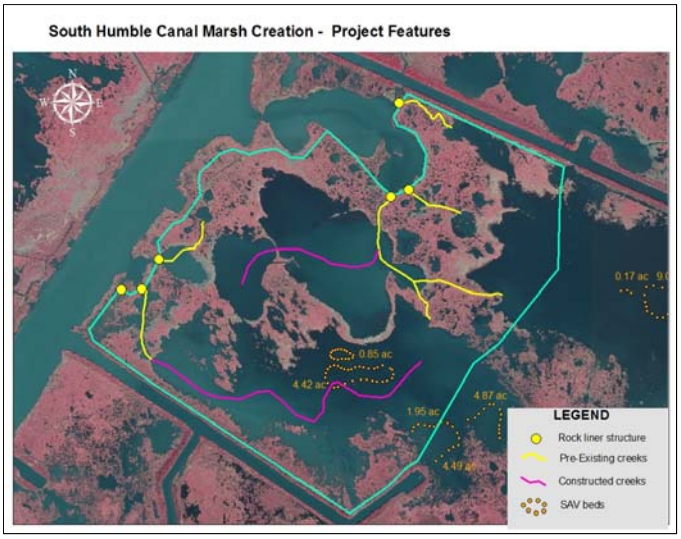
Preparer(s) of Fact Sheet:
Ronny Paille: U.S. Fish and Wildlife Service; 337-291-3117; Ronald_Paille@fws.gov

PPL 27 Nominee: South Humble Canal Marsh Creation Project



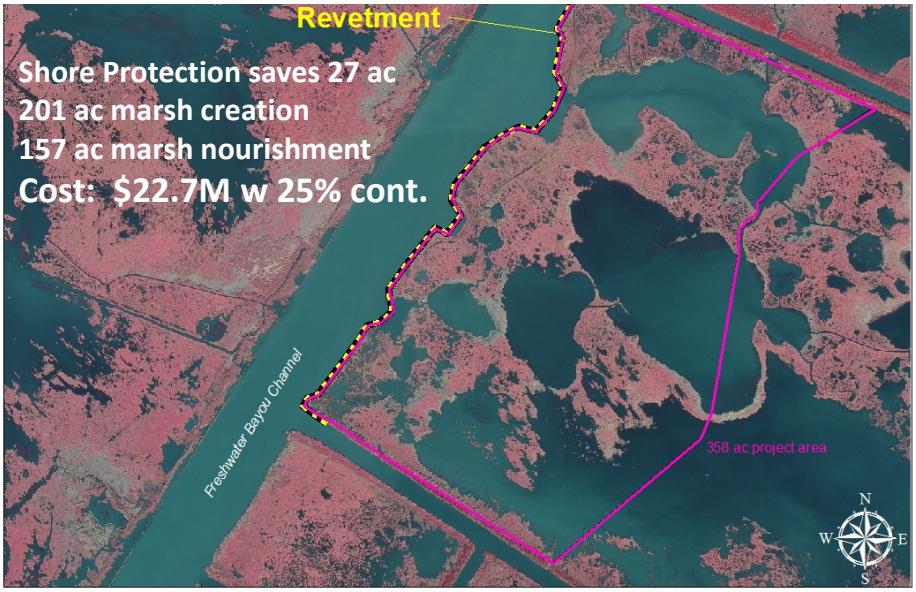
Vicinity Map
South Humble Canal Project

PPL 24 South Humble Canal Candidate

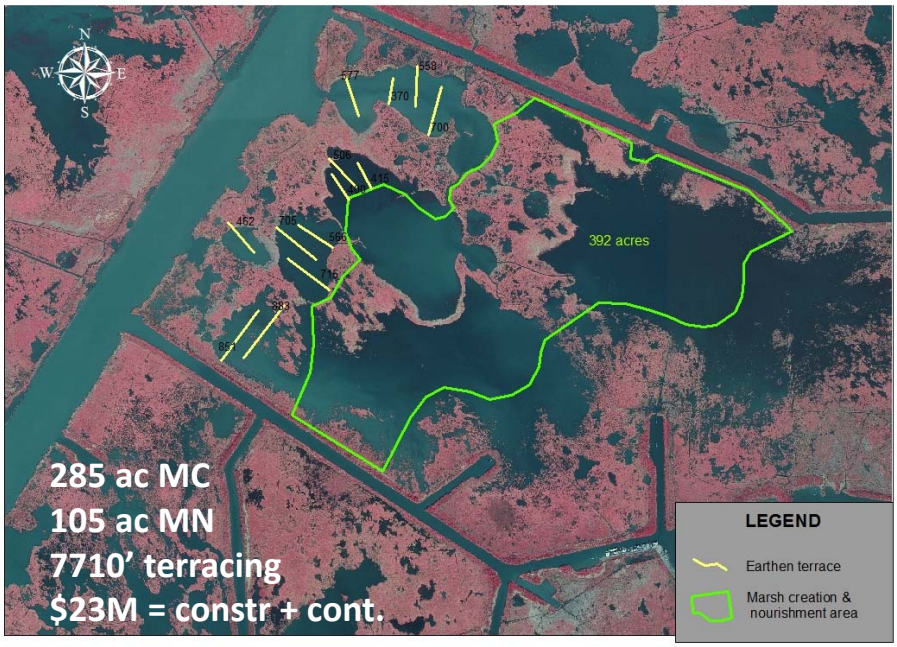


301 marsh acres created, 215 marsh acres nourished
$34.5M fully funded

PPL26 Nominee
South Humble Canal Shore Protection and Marsh Creation



PPL 27 Nominee: South Humble Canal Marsh Creation Project



R3-TV-02

Belle Isle Bayou Marsh Creation and Terracing

TV-02

PPL27 PROJECT NOMINEE FACT SHEET
February 1, 2017

Project Name
Belle Isle Bayou Marsh Creation and Terracing

Project Location
Region 3, Teche-Vermilion, Vermilion Parish

Problem
Project area wetlands are undergoing losses at -0.33%/year based on 1985 to 2016 USGS data from the East Freshwater Bayou mapping unit. Marshes in this area are subject to losses from subsidence/sediment deficit, seasonal saltwater intrusion and altered hydrology from levees and increased connectivity with Freshwater Bayou Canal. Interior marshes are fragmenting with erosion and submergence and waterbodies are enlarging. The result is plant stress reducing marsh productivity, a critical component of vertical accretion. Disturbances to the landscape from hurricanes and herbivory have resulted in the breakup and export of interior marsh. The erosion leads to higher water turbidity within the interior ponds, increased pond width and depth, and decreases the coverage of submerged aquatic vegetation. Additionally, recent hurricanes have resulted in large and wide-spread losses. It is unlikely that many of these areas will recover unaided.

As evidenced from aerial photography the project area is part of a larger feature of weakened interior marsh on either side of Freshwater Bayou Canal. If left to deteriorate, the project vicinity could eventually open into Freshwater Bayou risking conversion of larger interior marsh areas to open water.

Goals
The project goal is to create and nourish approximately 375 acres of marsh (300 acres creation and 75 acres nourishment) and construct approximately 8,470 linear feet of terraces (approximately 5 emergent acres).

Proposed Solution
The proposed project would create approximately 300 acres and nourish 75 acres of existing marsh utilizing dedicated dredging and confined disposal. Sediment would be mined from Vermilion Bay. The borrow area would be designed to avoid adverse impacts to the existing bay shorelines. In addition to marsh creation, approximately 8,470 linear feet of terraces would be constructed. The terraces slopes and crown would be planted with appropriate marsh vegetation. Containment dikes would be gapped. Constructing tidal creeks will be considered during Phase 0. During Phase 0 and Phase 1, opportunities would be explored to increase the amount of marsh creation.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   This total project area is 496 ac (including terrace field).

2) *How many acres of wetlands will be protected/created over the project life?*
   Approximately 298 acres of marsh will be protected/created over the project life.

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (e.g., 50% reduction in the background loss rate)?*
The anticipated land loss rate reduction throughout the area of direct benefits will be 50% over the projects life.

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 have moderate net positive impact to both critical (i.e., Freshwater Bayou Canal) and non-critical (i.e., minor oil and gas facilities) infrastructure. If marshes are left to deteriorate, the project area would eventually coalesce with Freshwater Bayou Canal. Oil and gas companies have facilities and pipelines in this area, which 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 Cole's Bayou Marsh Restoration Project (TV-63), the Little Vermilion Bay Sediment Trapping Project (TV-12), Freshwater Bayou Bank Stabilization Project (TV-11), and Freshwater Bayou Canal (ME-31).

Considerations
The proposed project has potential utility/pipeline considerations.

Preliminary Construction Costs
The fully funded cost range is $35M-$40M.

Preparer(s) of Fact Sheet:
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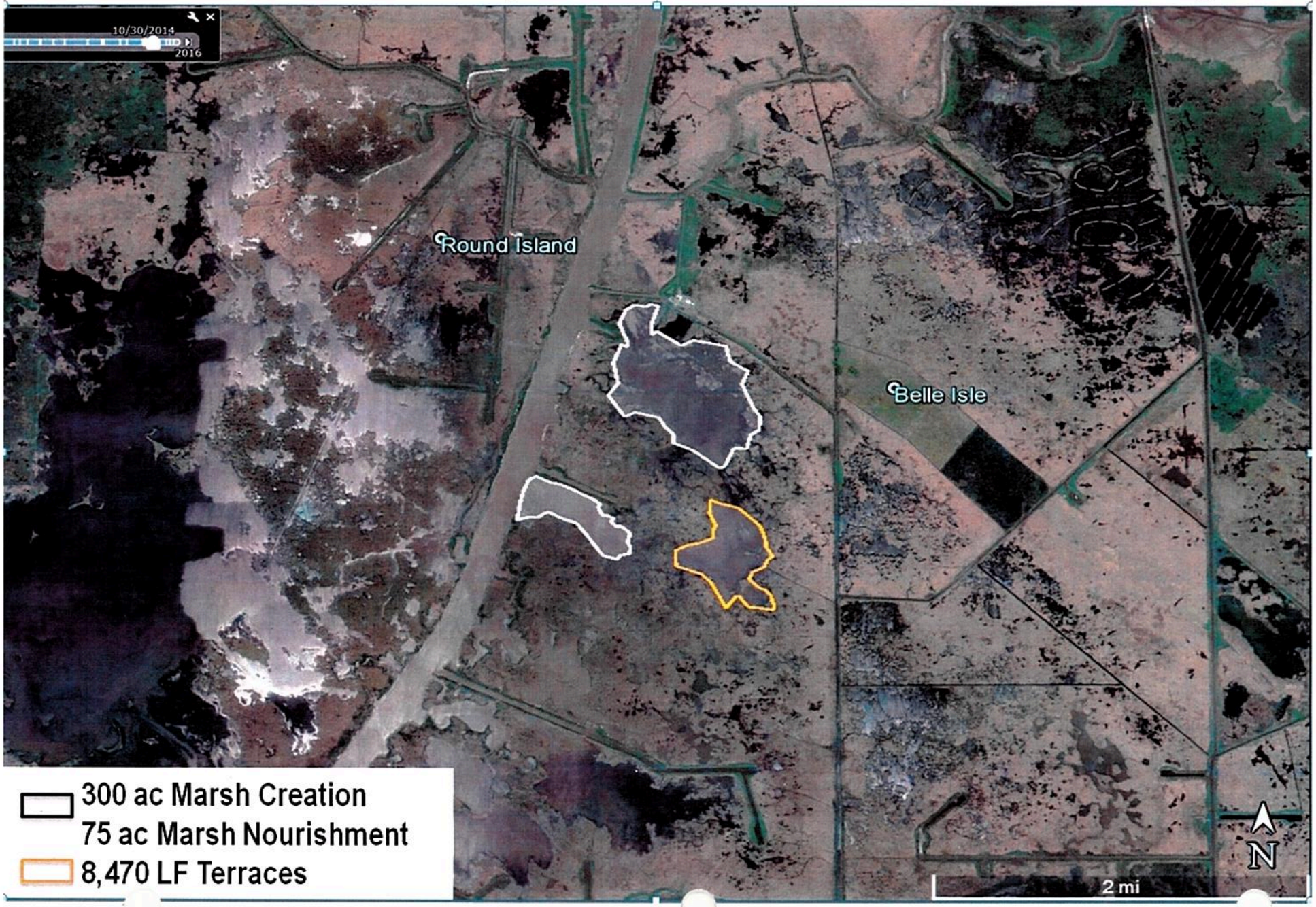
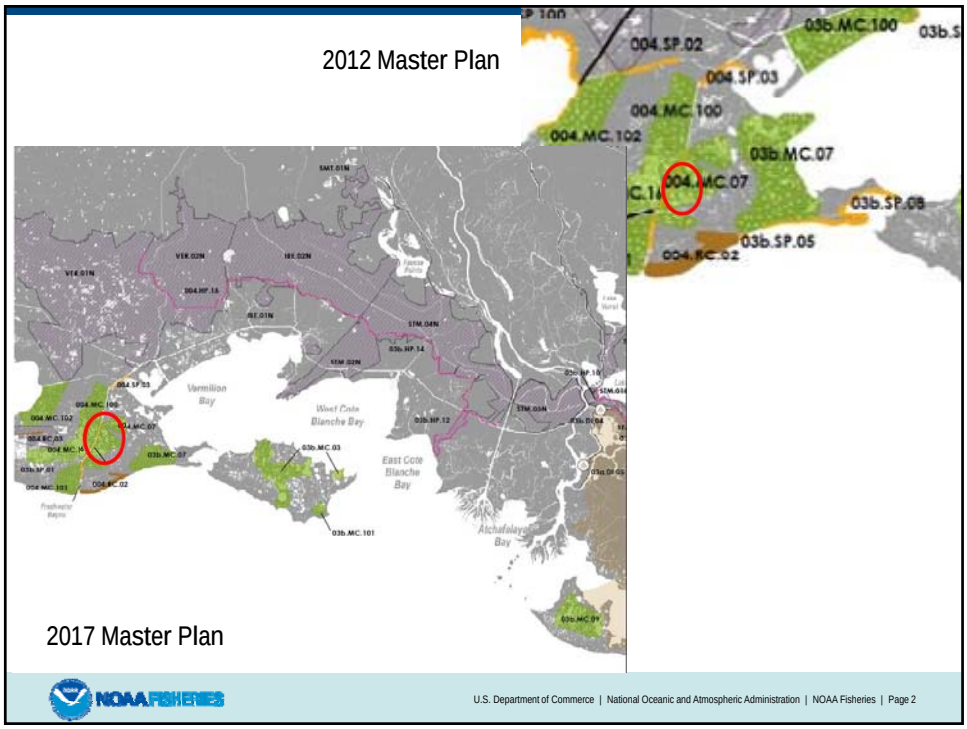
Joy Merino, NOAA Fisheries, 337-291-2109, joy.merino@noaa.gov

PPL27 Belle Isle Bayou Marsh Creation and Terracing



PPL27 Belle Isle Bayou Marsh Creation and Terracing

February 1, 2017

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2016
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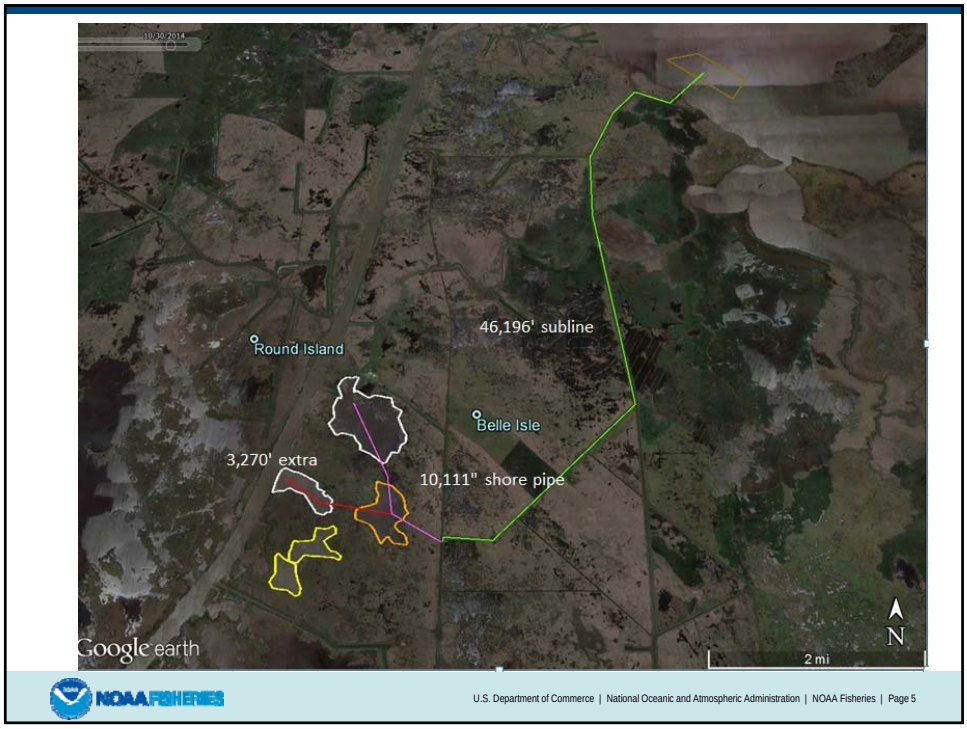
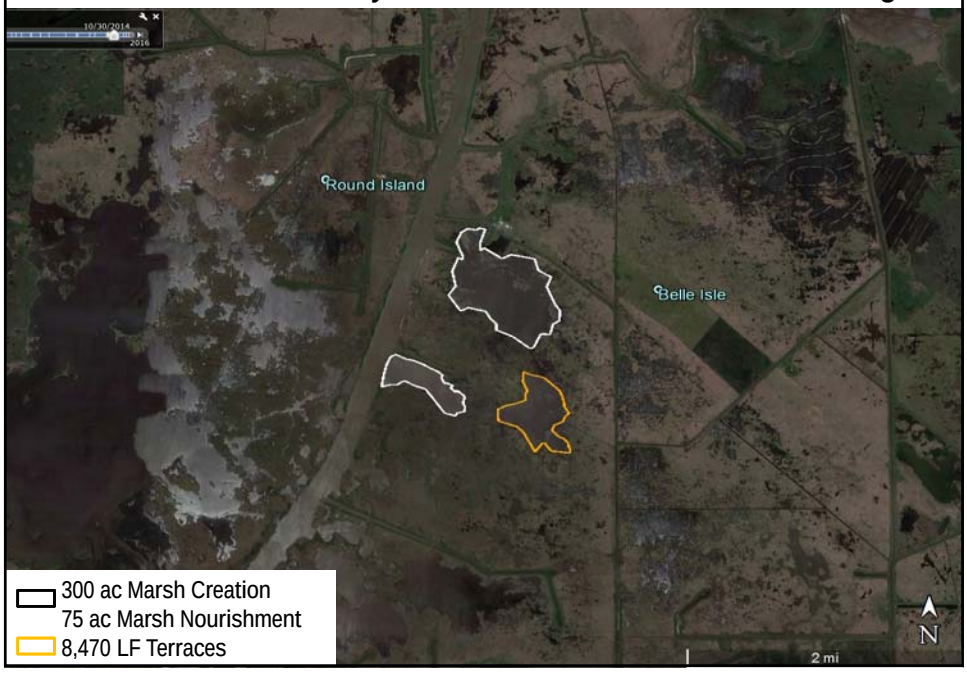


PPL27 Belle Isle Bayou Marsh Creation and Terracing



Summary

- Total acres = 375 ac
- Marsh Creation = 300 ac
- Marsh Nourishment = 75 ac
- Terracing = 8,470 LF/5 ac
- Net acres = 298 ac
- Utilizes material from Vermilion Bay
- Fully Funded Cost Range: $35M – $40M

R3-TV-03

Freshwater Bayou East Marsh Creation and Hydrologic Restoration

Freshwater Bayou East Marsh Creation and Hydrologic Restoration

PPL-27 Region 3 RPT Meeting
February 1, 2017

#3 **State Master Plan Strategy**
004.MC.07 West Rainey Marsh Creation

Project Location:
Region 3, Teche/Vermilion Basin, Vermilion Parish, southeast side of Freshwater Bayou canal.

Problem:
The construction of Freshwater Bayou canal has led to much decline in the adjacent marshes. Not only has the channel significantly expanded its width, but has also breached deep into the marsh and allowed for the net export of organic soils and deterioration of the interior marsh. As large ponds develop, erosion accelerates through an increase in tidal prism as well as the increase in wind fetch on fragile marsh banks.

Goals:
The goal of the project is to use a combination of shoreline protection, marsh creation and terraces to stabilize large fragmented areas within a marsh complex east of freshwater bayou were there has been rapid decline. In addition, culverts will be placed to strategically optimize the tidal movement of water through the system in a one-way direction to allow for increased residence time and trapping of materials with in the system.

Proposed Solutions:
Approximately 12,600 linear ft of shoreline protection will be constructed along this severely deteriorated bank of Freshwater Bayou. Sediments will be hydraulically dredged from Freshwater Bayou and pumped via pipeline to create approximately 51 acres of marsh habitat. Terraces will be built around the marsh creation cells constructed in open water to reduce wave energy and complement the marsh creation cells. Culverts will be installed on the north and south ends of the project to move water from north to south through the project area to capture sediment and nutrients to enhance marsh growth.

Project Benefits:
The project would result in approximately 196 net acres over the 20 year project life.

Project Costs:
Estimated construction cost with 25% contingency is approximately $17.1 million.

Preparer(s) of Fact Sheet:
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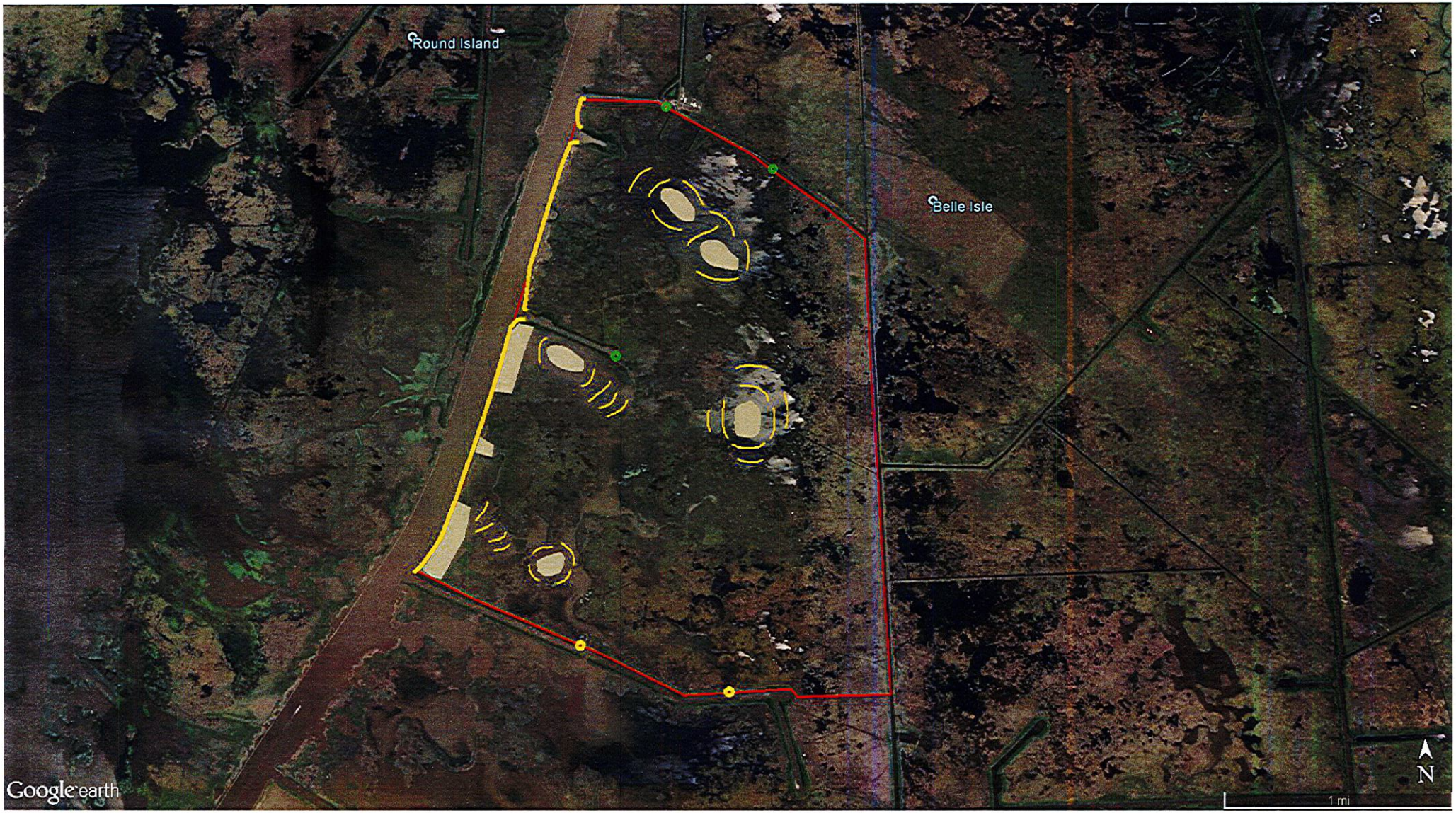
Cody Colvin, NRCS, planning engineer, cody.colvin@la.usda.gov


Round Island
Belle Isle
Google earth
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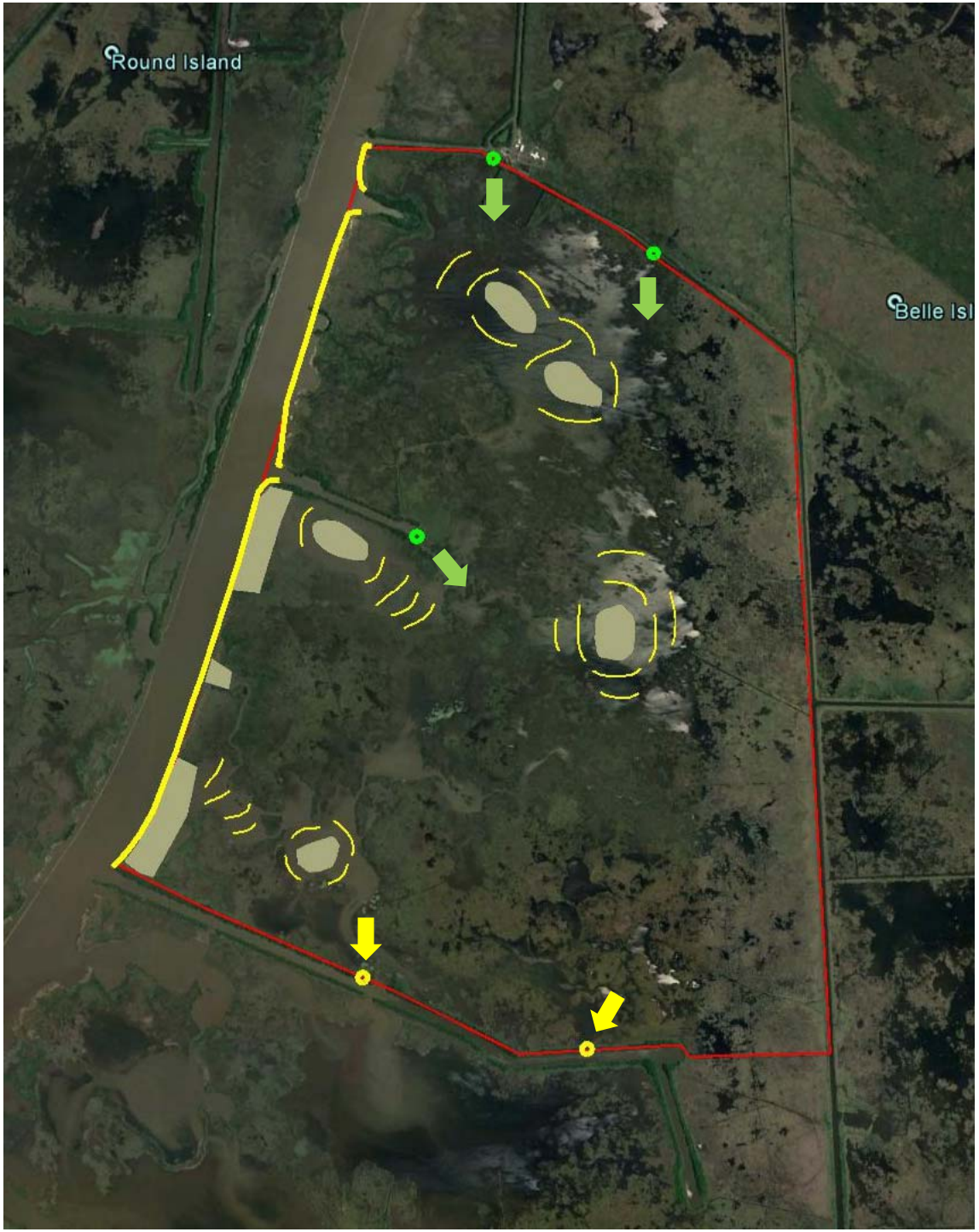

PPL27-Freshwater Bayou East Marsh Creation and Hydrologic Restoration

Project Objectives:

1) Create marsh
2) Shoreline protection
3) Reduce expansion/erosion
4) Improve habitat/edge
5) Optimize cost/benefit in terms total area of impact
6) Enhance tidal flow through the project area to optimize material capture.

Features/Benefits:

79 acres of marsh creation*
20,900 linear ft of terraces
12,644 ln ft shoreline protection
6 sets of 2-36” culverts

Cost:

Construction + 25% = $17.1M

- *Includes borrow from FW Bayou & floatation channel material*

R3-TV-04

West Vermilion Marsh Creation and Shoreline Protection n

TV-04

PPL27 PROJECT FACT SHEET
February 1, 2017

Project Name
West Vermilion Marsh Creation and Shoreline Protection

Master Plan Strategy
East Rainey Marsh Creation (2012 Master Plan: 03b.MC.07). Creation of approximately 3,080 acres of marsh in the eastern portion of Rainey Marsh to create new wetland habitat, restore degraded marsh, and reduce wave erosion. Vermilion Bay and West Cote Blanche Bay Shoreline Protection (2012 Master Plan: 03b.SP.06a). Shoreline protection through rock breakwaters of approximately 83,000 feet of shoreline along Vermilion Bay and West Cote Blanche Bay to preserve shoreline integrity and reduce wetland degradation from wave erosion.

Project Location
Region 3, Teche-Vermilion Basin, Vermilion Parish

Problem
Over the past decades, the project area has experienced altered geomorphologic and hydrologic conditions, shoreline erosion and wetland loss due to damage from storms; dredging of navigation and petroleum access canals, construction of spoil banks and levees, and natural wave energy. Wave energy in the Bay has gradually increased over the centuries because the bay is naturally getting deeper due to a slight yet constant subsidence and global sea-level rise. Recent loss rates (2003-2013) were calculated from aerial photography at 6.0 ft/yr.

Goals
The goals of this project are to: 1) Create and/or nourish 677 acres of marsh, by pumping sediment from Vermilion Bay; 2) Protect/armor approximately 18,351 ft (92 acres) the western shoreline of Vermilion Bay between Bayou Prien and Hog Bayou and the Vermilion Bay shoreline adjacent to the proposed marsh creation cell near North Lake. Assuming some natural vegetative recruitment, vegetative plantings are planned at a 50% density at project year one. Containment dikes will be degraded or gapped by year three to allow access for estuarine organisms.

Proposed Solution
The project proposes to create/nourish 651 acres of marsh in an area east of Hog Lake between Bayou Prien and Hog Bayou. The project would restore marsh along the remnant shoreline between North Lake and Vermilion Bay (26 acres) and stabilize the shoreline in three areas: between North Lake and Vermilion Bay, between the small lake near Redfish Point and Vermilion Bay, and along the western shoreline of Vermilion Bay between Bayou Prien and Hog Bayou (92 acres, 18,351 ft).

Project Benefits
The project would result in approximately 317 net acres over the 20-year project life and armoring approximately 18,351 ft of shoreline from increased erosion due to wave action.

Project Costs
The total fully-funded cost is $24,975,860.

Preparers of Fact Sheet
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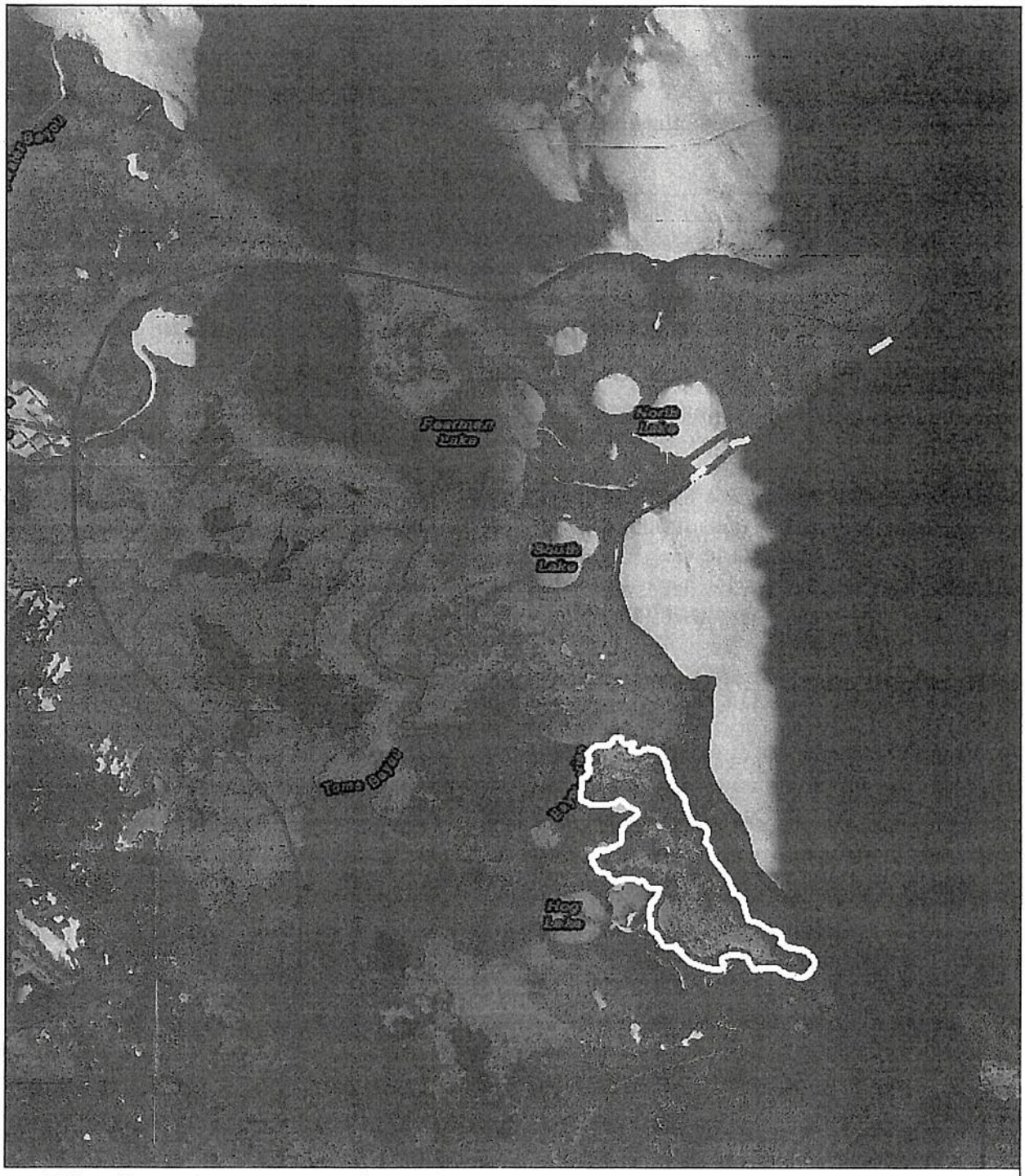


West Vermilion Bay Marsh Creation and Shoreline Protection

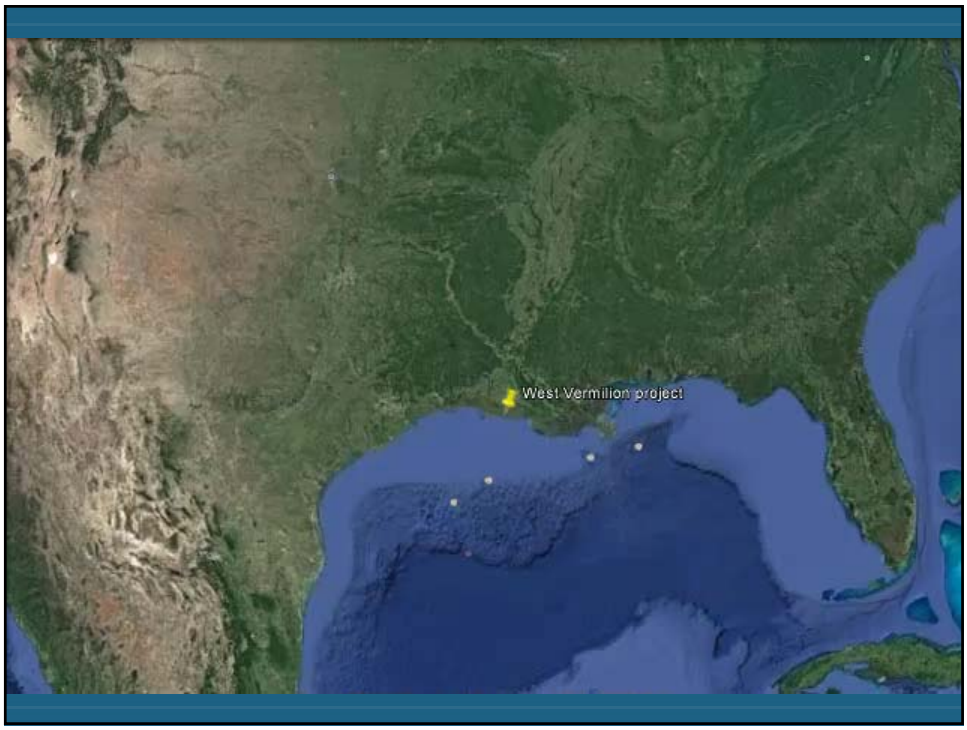
South Marsh Creation
North Lake/Redfish Pt Lake Shoreline Protection
North Lake Marsh Creation
South Shoreline Protection
2012 Master Plan

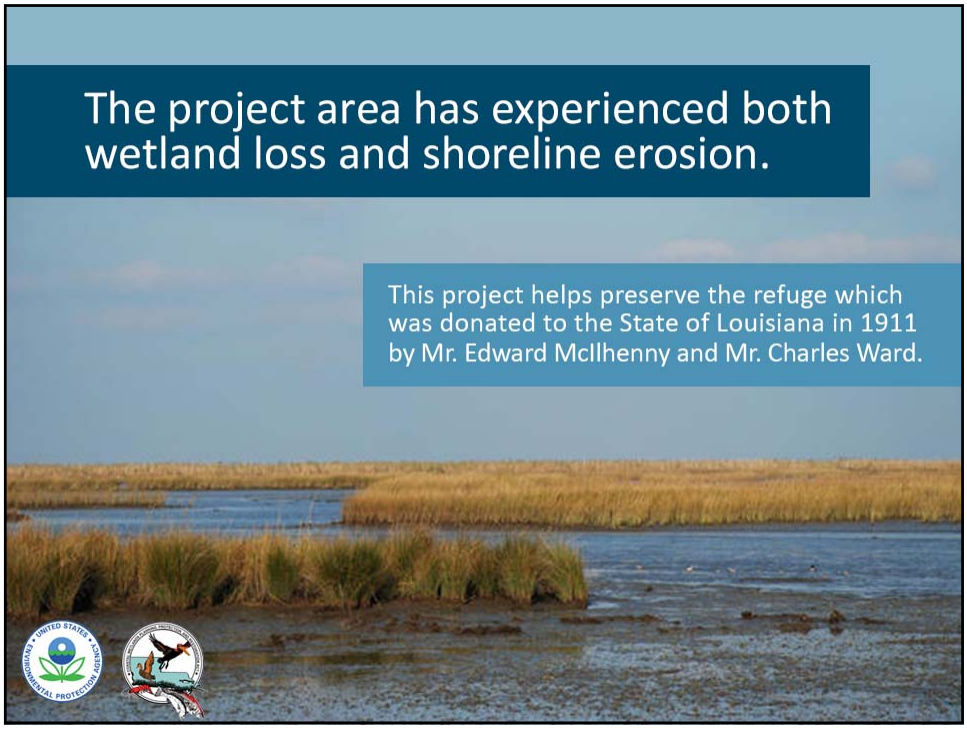
N

Basemap: 2015 NAIP DOQQ - Vermilion Parish
Produced by: EPA Region 6, Dallas, TX

0 0.475 0.95 1.9 2.85 Miles


West Vermilion Bay
Marsh Creation &
Shoreline Protection
The Coastal Wetlands Planning, Protection and Restoration Act


West Vermilion project


The project area has experienced both wetland loss and shoreline erosion.
This project helps preserve the refuge which was donated to the State of Louisiana in 1911 by Mr. Edward McIlhenny and Mr. Charles Ward.


Marsh loss is caused by subsidence, storm losses, sea level rise, and human intervention. Numerous oil & gas canals in project area have altered hydrology.
Opportunities for recreational activities such as fishing, shrimping and bird-watching abound. Approximately 13,000 visitors per year take advantage of these opportunities.

Shoreline erosion along Vermilion Bay is due to increased wave energy.

Shorebirds, wading birds, colonial seabirds and neotropical migrants use the refuge. Alligators as well as many marine species such as shrimp, redfish, spotted seatrout and blue crabs are common. Mammals such as raccoons, muskrats, nutria, mink, and white-tailed deer are also present in good numbers.

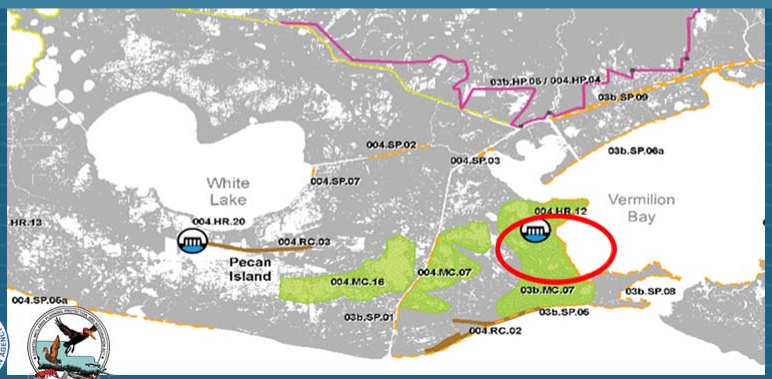
2012 Master Plan Solution

"Creation of approximately 3,080 acres of marsh in the eastern portion of Rainey Marsh to create new wetland habitat, restore degraded marsh, and reduce wave erosion."

03b.MC.07: East Rainey Marsh Creation

"Shoreline protection through rock breakwaters of approximately 83,000 feet of shoreline along Vermilion Bay and West Cote Blanche Bay to preserve shoreline integrity and reduce wetland degradation from wave erosion."

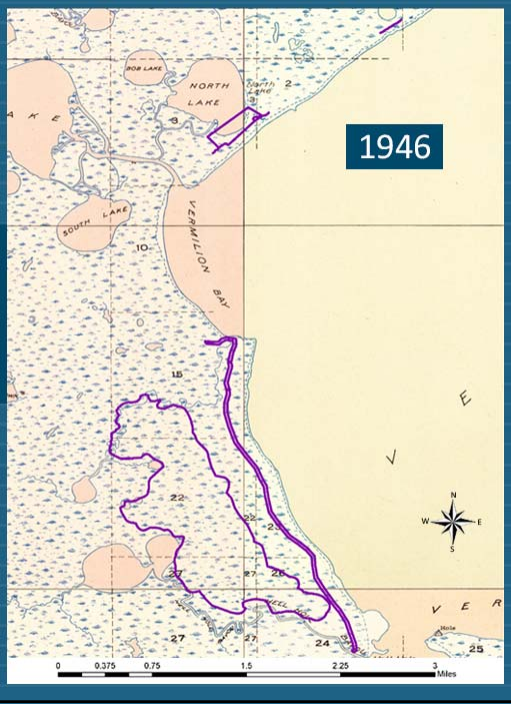
03b.SP.06a: Vermilion Bay and West Cote Blanche Bay Shoreline Protection

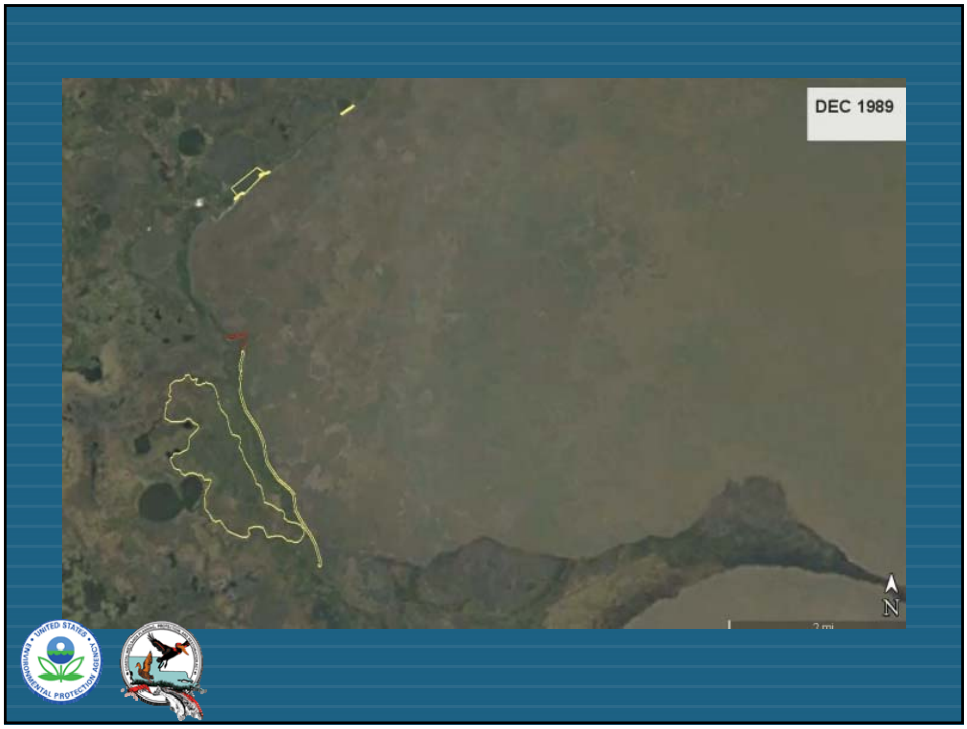


Master Plan Consistency

- 03b.MC.07: East Rainey Marsh Creation
- 03b.SP.06a: Vermilion Bay and West Cote Blanche Bay Shoreline Protection
- Joint sponsored project between NRCS and EPA

Historical Reference




DEC 1989
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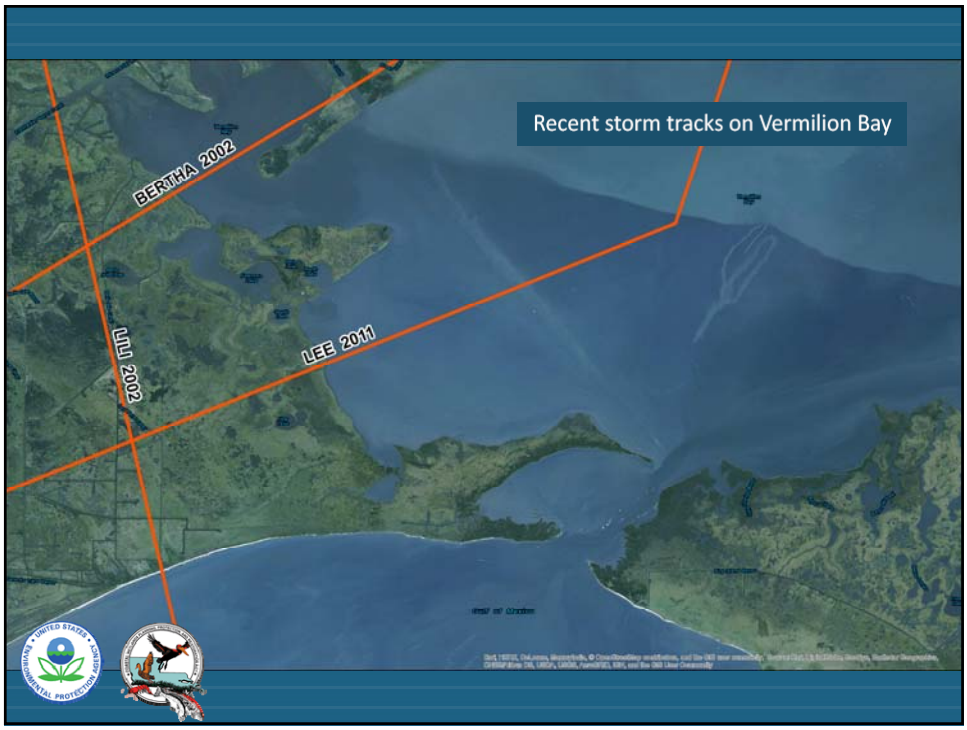
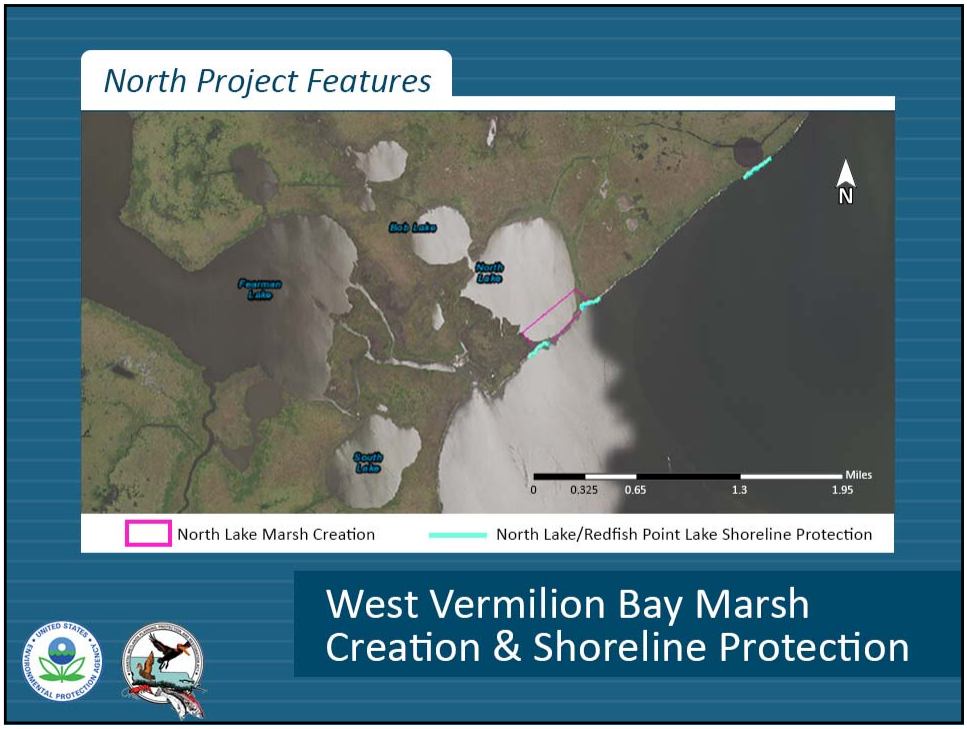
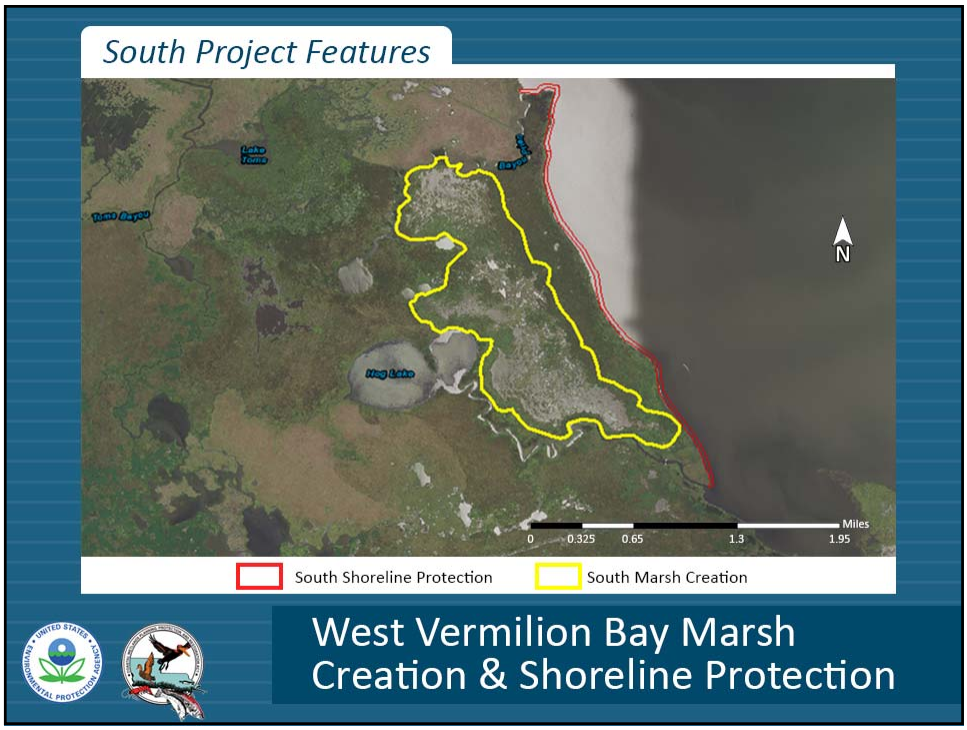

Recent storm tracks on Vermilion Bay
BERTHA 2002
LEE 2011


North Project Features
Bob Lake
North Lake
Pearman Lake
South Lake
N
0 0.325 0.65 1.3 1.95 Miles
North Lake Marsh Creation
North Lake/Redfish Point Lake Shoreline Protection
West Vermilion Bay Marsh Creation & Shoreline Protection


South Project Features
Lake Tome
Tome Bayou
Hog Lake
N
0 0.325 0.65 1.3 1.95 Miles
South Shoreline Protection
South Marsh Creation
West Vermilion Bay Marsh Creation & Shoreline Protection

Project Goals

Preserve the Refuge for future generations

- Create/nourish 374 acres of marsh with sediment from Vermilion Bay
- Nourish an estimated 303 additional acres in a 300' buffer zone surrounding the southern cell
- Armor approximately 18,378 linear feet of shoreline along Vermilion Bay in 2 areas:
  - Between Bayou Prien and Hog Bayou
  - Along the shoreline between North Lake and Vermilion Bay
- Estimated cost + 25% contingency = $17.3M
- Fully funded range = $20M-$25M

Preservation	Offsets future land loss and erosion.
Sustainability	Features remain in place beyond project life.
Low Cost	Shallow location reduces material needed.
Priority	Included in the 2012 Master Plan.

Questions?

R3-TV-05

Lake Sand Marsh Creation and Shoreline Protection

TV-05

PPL27 PROJECT FACT SHEET
February 1, 2017

Project Name
Lake Sand Marsh Creation and Shoreline Protection Project

Master Plan Strategy
Master Plan 2012: Project No. 03b.SP.06a – Vermilion Bay and West Cote Blanche Bay Shoreline Protection (Critical Areas): Shoreline protection through rock breakwaters of approximately 83,000 feet of shoreline along Vermilion Bay & West Cote Blanche Bay to preserve shoreline integrity and reduce wetland degradation from wave erosion.
Master Plan 2017 (in Draft): Project No. 03b.MC.03 – Creation of approximately 11,500 acres of marsh on Marsh Island to create new wetland habitat and restore degraded marsh.

Project Location
Region 3, Teche-Vermilion Basin, Iberia Parish.

Problem: The Marsh Island Refuge serves as a crucial geomorphic structure that helps maintain the estuarine character of the Vermilion-Cote Blanche Bays system while providing vital support to important fish and wildlife species. Located at the conjunction of wave & tidal energy impacts generated in the Gulf of Mexico and across East & West Cote Blanche Bays, Marsh Island's eastern point is being severely impacted. Wave energy and persistent overwash buffeting the north and east shoreline reaches of the Refuge are driving shoreline retreat, and causing narrowing and breaching of the perimeter marshes that shield large interior lakes from bay encroachment. Multiple storm impacts in the last decade have also accelerated fragmentation and loss of the interior marsh that maintains separation between Lake Sand and other lakes. Capture of this interconnected shallow lake-marsh system by West Cote Blanche Bay will significantly disrupt interior hydrology, increase wave and tidal exchange impacts, and accelerate degradation and loss of fragile wetland habitat.

Goal: The goals of this project are to 1) protect critical shoreline areas on the southern West Cote Blanche Bay shoreline and prevent breaching into interior lakes, and 2) restore the marshes and counter interior loss on the eastern point of Marsh Island by creating and nourishing marsh with dredged sediments.

Proposed Solutions: The project area of over 1,400 acres on the eastern tip of Marsh Island Refuge comprises three lakes that are surrounded and separated by fragmenting marsh areas. The project measures consist of 1) a total of **19,431** LF of rock breakwater along the bay shoreline of marshes that maintain separation of West Cote Blanche Bay from the interior lakes; and 2) **90** acres of marsh creation and **210** acres of marsh nourishment, with an additional **17,144** LF of interior lake rim restoration.

Preliminary Project Benefits: Maintaining shoreline integrity and restoring emergent marshes, and stabilizing selected areas of the Teche-Vermilion Bays system will prevent future loss of shoreline reaches critical to protecting important interior wetland areas utilized by numerous species of fish, waterfowl and other wildlife. Over the 20-year project life, features would prevent the bay from capturing substantial acreage of existing shallow-water lakes and surrounding marsh. In addition, the proposed project will have significant synergistic effects with existing restoration and protection projects on the refuge such as TV-14, TV-21, and other restoration actions.

Identification of Potential Issues: There are no potential issues anticipated with this proposed project. La Department of Wildlife and Fisheries owns and manages the refuge.

Preliminary Construction Costs: The estimated construction cost with 25% contingency is approximately $23.6 million.

Preparer(s) of Fact Sheet:
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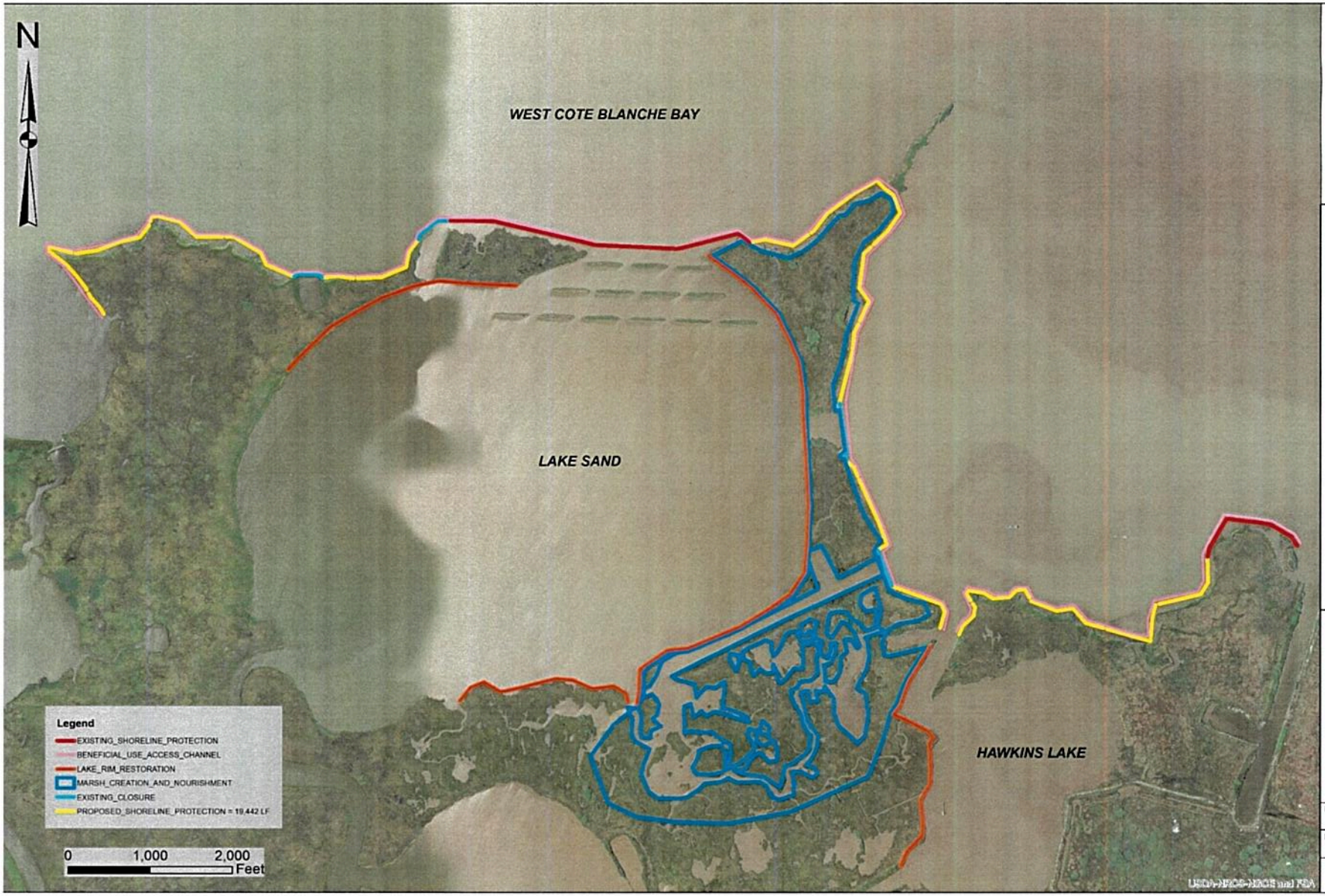
Todd Baker, tbaker@wlf.la.gov and Lance Campbell, ljcampbell@wlf.la.gov (337) 373-0032



1/30/2017

NAIP 2015 IMAGERY

LAKE SAND
MARSH CREATION AND
SHORELINE PROTECTION PROJECT

USDA United States Department of Agriculture
Natural Resources Conservation Service

File No.

Drawing No.
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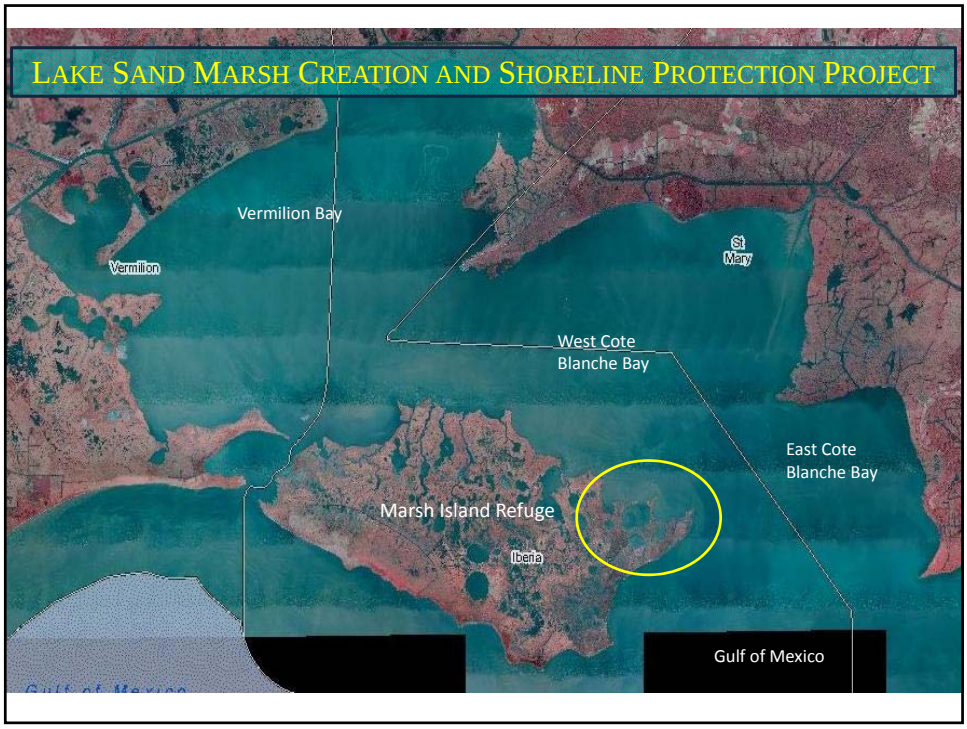
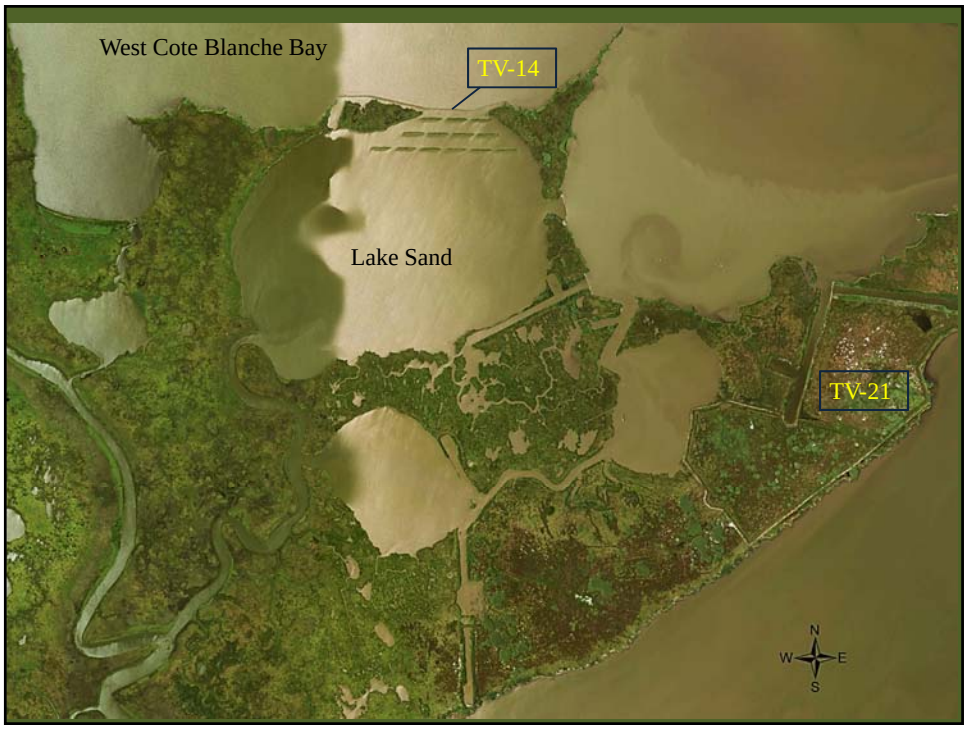
Sheet X of X

REGION 3 – ATCHAFALAYA BASIN

No Projects Were Nominated In This Basin.


LAKE SAND MARSH CREATION AND SHORELINE PROTECTION PROJECT
Vermilion Bay
Vermilion
St Mary
West Cote Blanche Bay
East Cote Blanche Bay
Marsh Island Refuge
Iberia
Gulf of Mexico


West Cote Blanche Bay
TV-14
Lake Sand
TV-21
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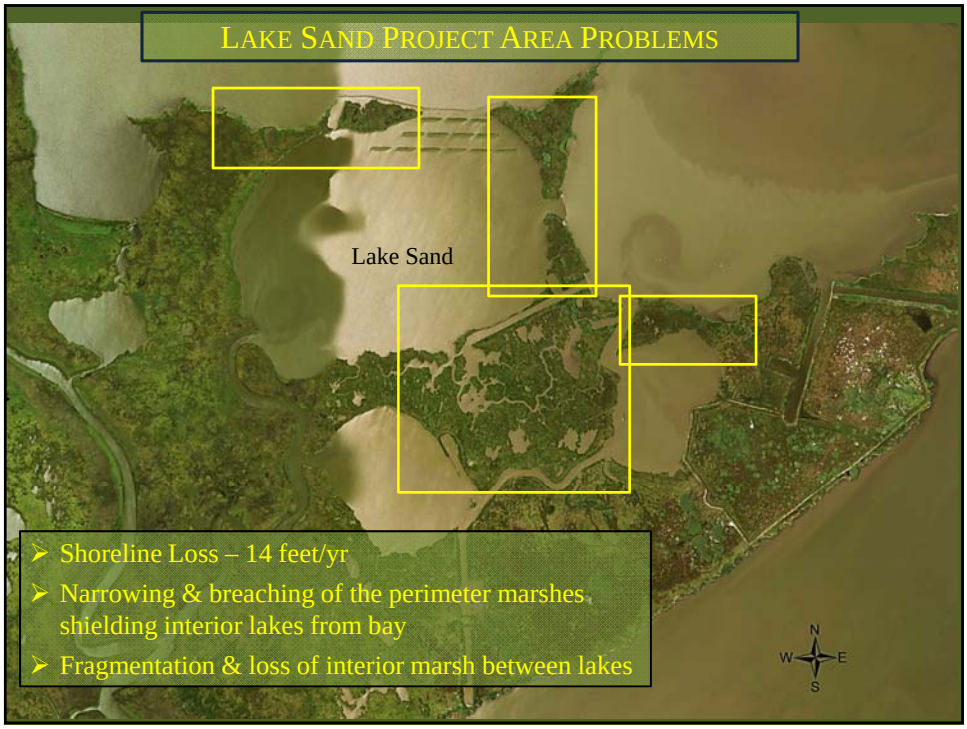
LAKE SAND PROJECT AREA PROBLEMS
Lake Sand
Shoreline Loss – 14 feet/yr
Narrowing & breaching of the perimeter marshes shielding interior lakes from bay
Fragmentation & loss of interior marsh between lakes
N
W
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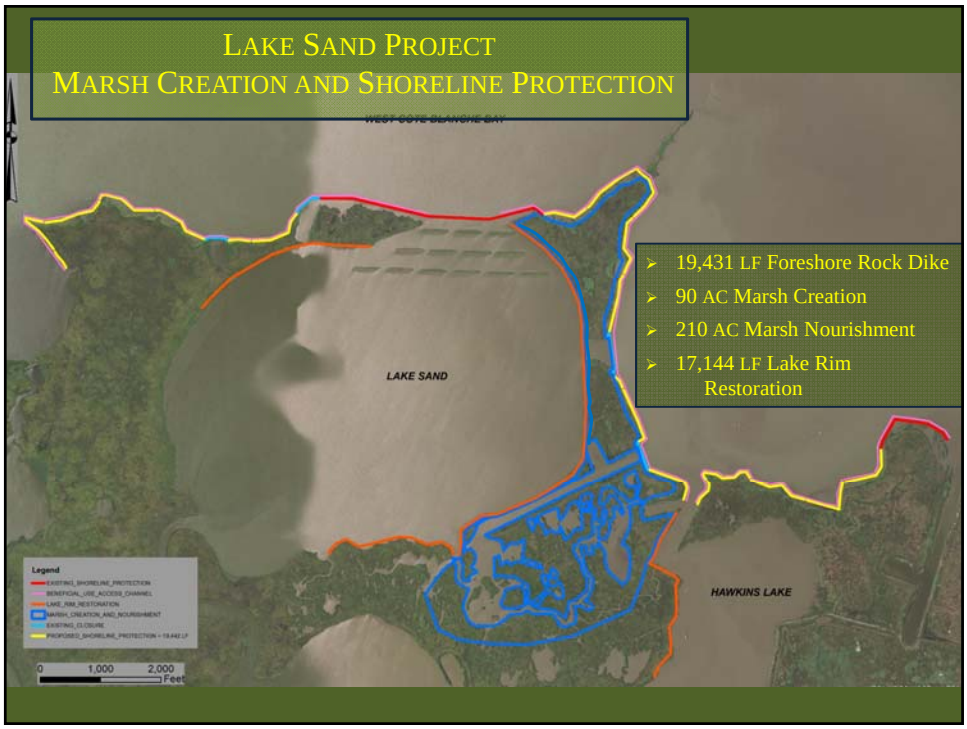
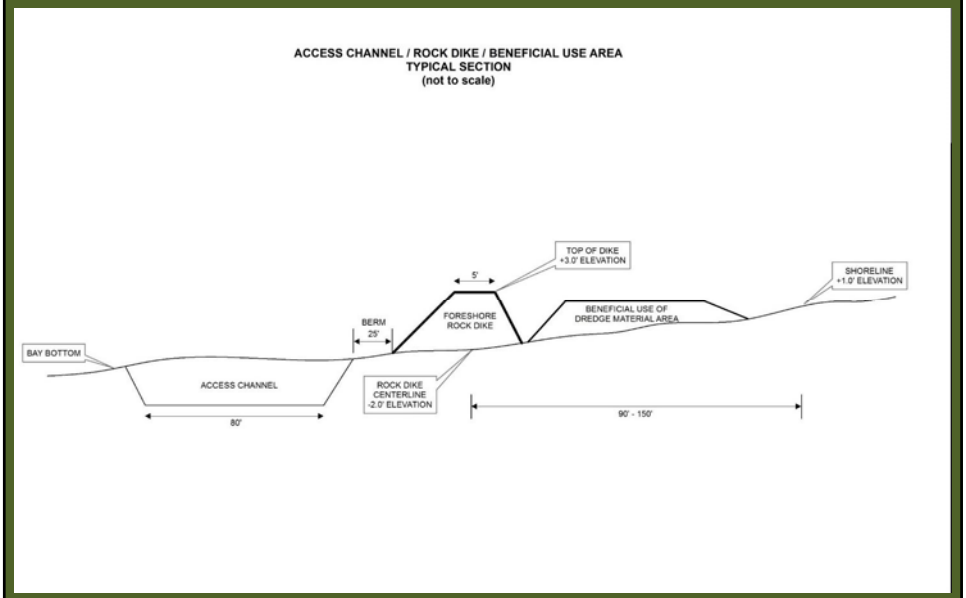
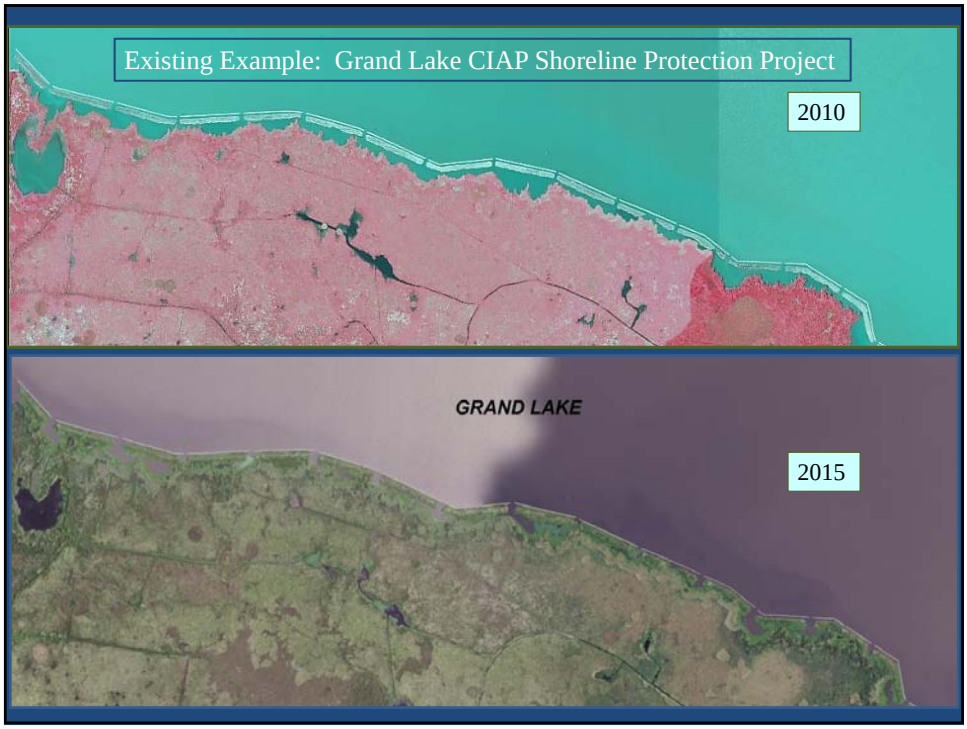

LAKE SAND PROJECT
MARSH CREATION AND SHORELINE PROTECTION
19,431 LF Foreshore Rock Dike
90 AC Marsh Creation
210 AC Marsh Nourishment
17,144 LF Lake Rim Restoration
LAKE SAND
HAWKINS LAKE
Legend
0
1,000
2,000
Feet

QUESTIONS ?

USDA NRCS

Cindy S. Steyer, NRCS Water Resources




Existing Example: Grand Lake CIAP Shoreline Protection Project
2010
GRAND LAKE
2015

REGION 3 – Terrebonne Basin

Project Number	Project Proposals
R3-TE-01	North Terrebonne Marsh Creation
R3-TE-02	Grand Caillou Marsh Creation and Terracing
R3-TE-03	Bayou Terrebonne Freshwater Diversion
R3-TE-04	Lake Chapeau 2 Marsh Creation
R3-TE-05	West LA Hwy 1 Marsh Creation
R3-TE-06	East Catfish Lake Marsh Creation and Terracing
R3-TE-07	Small Bayou LaPointe Marsh and Ridge Restoration
R3-TE-08	West Raccourci Bay Marsh Creation and Terracing
R3-TE-09	North Lake Boudreaux Shoreline Protection and Marsh Creation
R3-TE-10	Point au Fer Marsh Creation
R3-TE-11	Pointe au Chien Ridge Restoration and Marsh Creation
R3-TE-12	North Bayou Decade Ridge and Marsh Creation
R3-TE-13	South Catfish Lake Marsh Creation

R3-TE-01

North Terrebonne Marsh Creation

TE-01

PPL27 PROJECT FACT SHEET
February 1, 2017

Project Name
North Terrebonne Marsh Creation

Master Plan Strategy
North Terrebonne Bay Marsh Creation-Component B 03a.MC.09b. Creation of approximately 4,940 acres of marsh south of Montegut between Bayou St. Jean Charles and Bayou Point au Chien to create new wetland habitat, restore degraded marsh, and reduce wave erosion.

Project Location
Region 3, Terrebonne Basin, Terrebonne Parish

Problem
The Terrebonne Basin has experienced rapid interior wetland loss over the years. Between 1956 and 2004, Terrebonne Basin lost 321 square miles of land and an additional 17 square miles of coastal land was lost in 2005 due to the effects of Hurricanes Katrina and Rita. Wetland loss has also been attributed to sediment deficit, high subsidence, sea level rise, saltwater intrusion, historic oil and gas activity, and natural deterioration of barrier islands, which contributes to the inland invasion of marine tidal processes (including erosion, scour, and saltwater intrusion). Since 1978 Terrebonne Parish has suffered over 10 percent of its area converting to open water. Projections indicate it is likely to lose another 11 percent by 2050.

Goals
The project goals are to create/nourish approximately 730 acres of new marsh in areas of open water and restore coastal marsh habitat.

Proposed Solution
This project will create and/or nourish 730 acres of marsh utilizing dredged material from a borrow site located in Lake Felicity. Material would be pumped to a healthy marsh elevation as deemed by healthy marsh survey. Once material is in place and adequately dewatered, containment dikes will be adequately gapped to allow tidal exchange of nutrients and aquatic organisms with the marsh. Additionally the project site would be planted in order to reestablish the plant productivity within the marsh.

Project Benefits
Create and/or nourish approximately 730 acres of emergent brackish marsh through dredging material from a borrow site located in Lake Felicity.

Preliminary Construction Costs
The estimated cost + 25% is $25 million. The fully funded range is $25M - $30M.

Preparer of Fact Sheet
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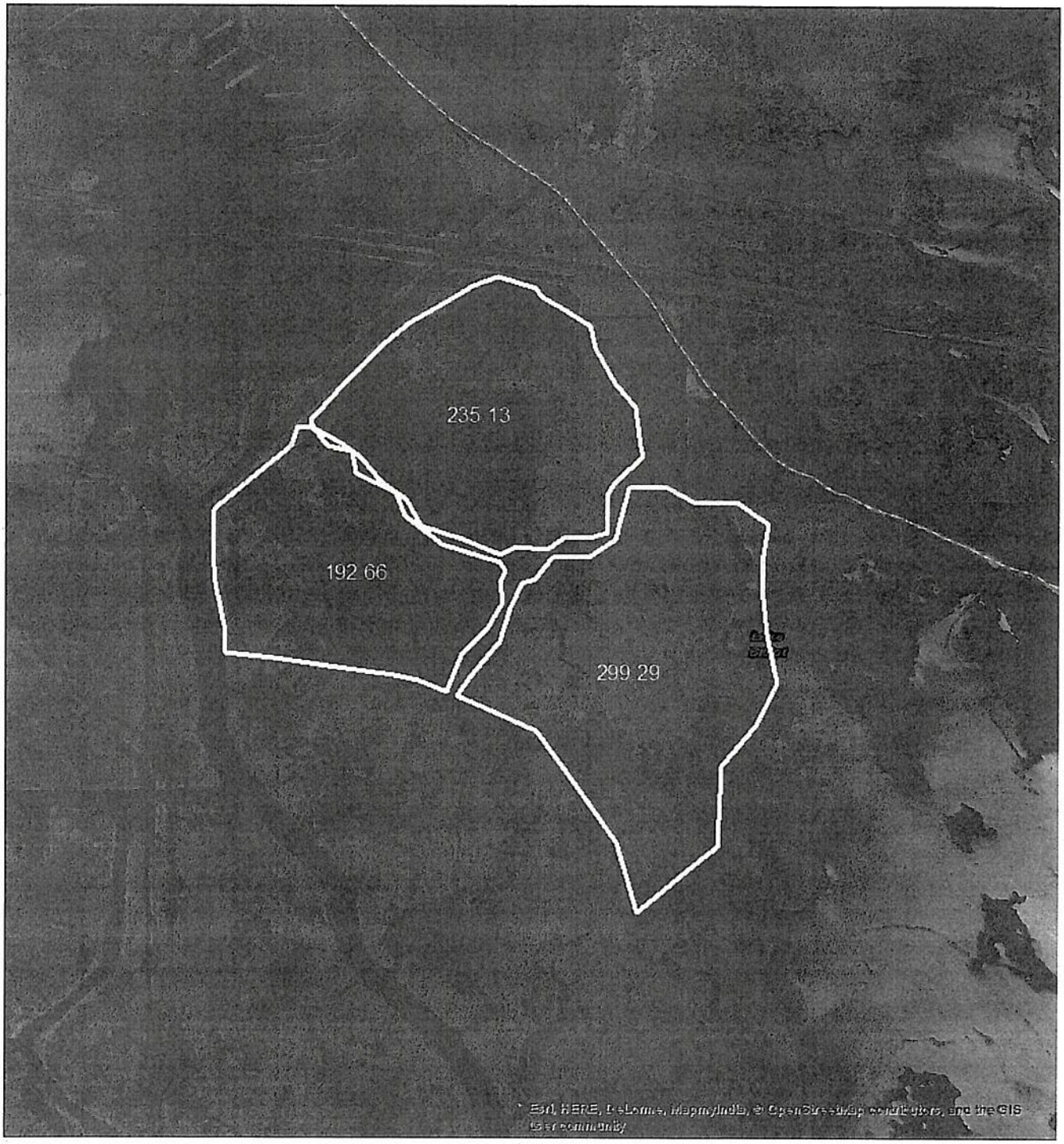
Sharon Osowski, Ph.D., EPA; (214) 665-7506, osowski.sharon@epa.gov



North Terrebonne Marsh Creation (PPL26)

Proposed Marsh Creation

N

Basemap: 2015 NAIP DOQQ
Produced by: EPA Region 6, Dallas, TX

0 0.1 0.2 0.4 0.6 0.8 Miles

North Terrebonne Marsh Creation

A Project of the Environmental Protection Agency
Presented by students of the Wetlands Discovery Center

North Terrebonne Marsh Creation

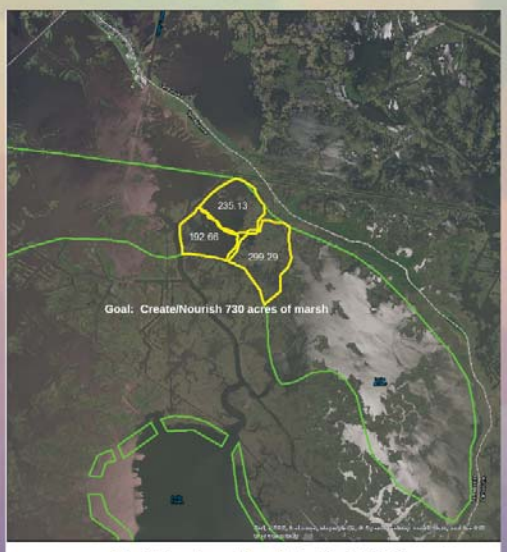
A Project of the Environmental Protection Agency
Presented by students of the Wetlands Discovery Center

First step to a perfect presentation...

Problems in Terrebonne Basin

- Eastern Terrebonne marshes are the most rapidly degrading marshes in Louisiana
- 1956-2004 321 square miles lost
- 17 square miles lost in 2005 due to hurricanes
- Sediment Deficit
- High Subsidence Rates/Sea Level Rise
- Saltwater Intrusion
- Historic Gas and Oil Activity
- Natural Deterioration of Barrier Islands
- Erosion/Scouring

Project Location - Region 3
Terrebonne Basin



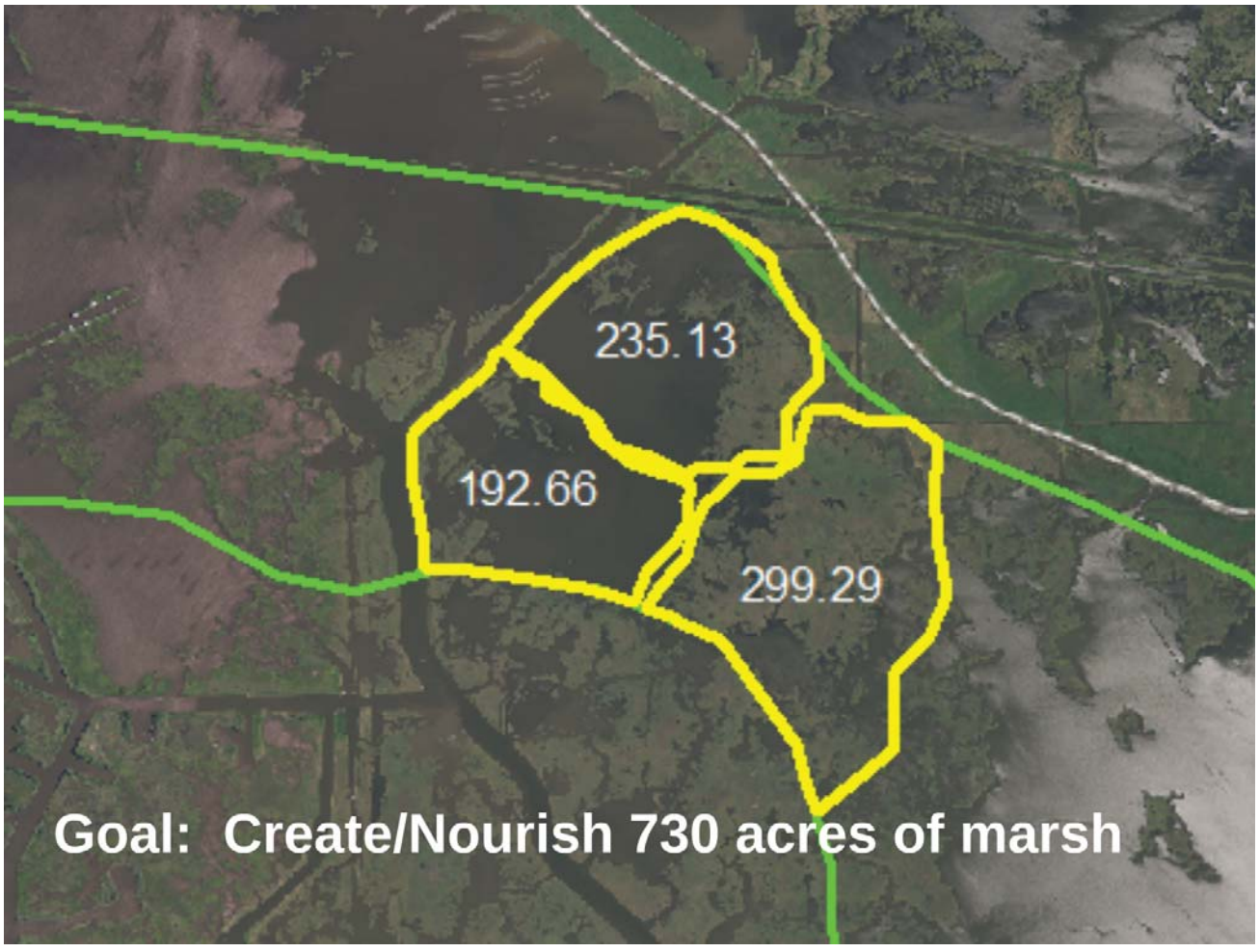
North Terrebonne Marsh Creation (PPL26)

Proposed Marsh Creation
2012 Master Plan Marsh Creation

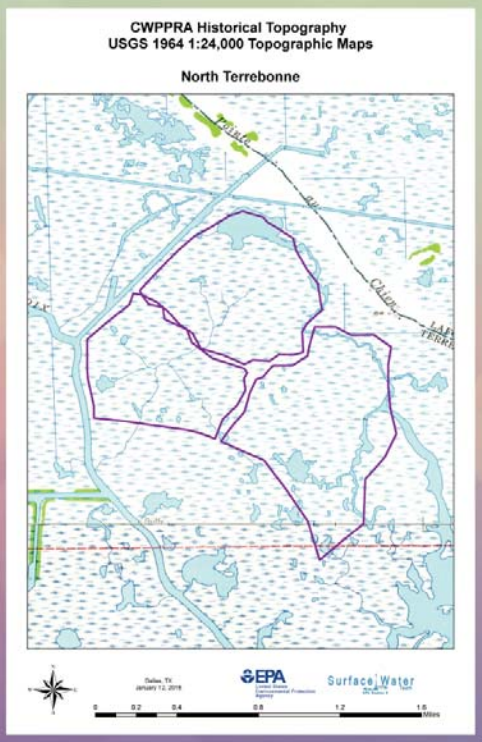
N

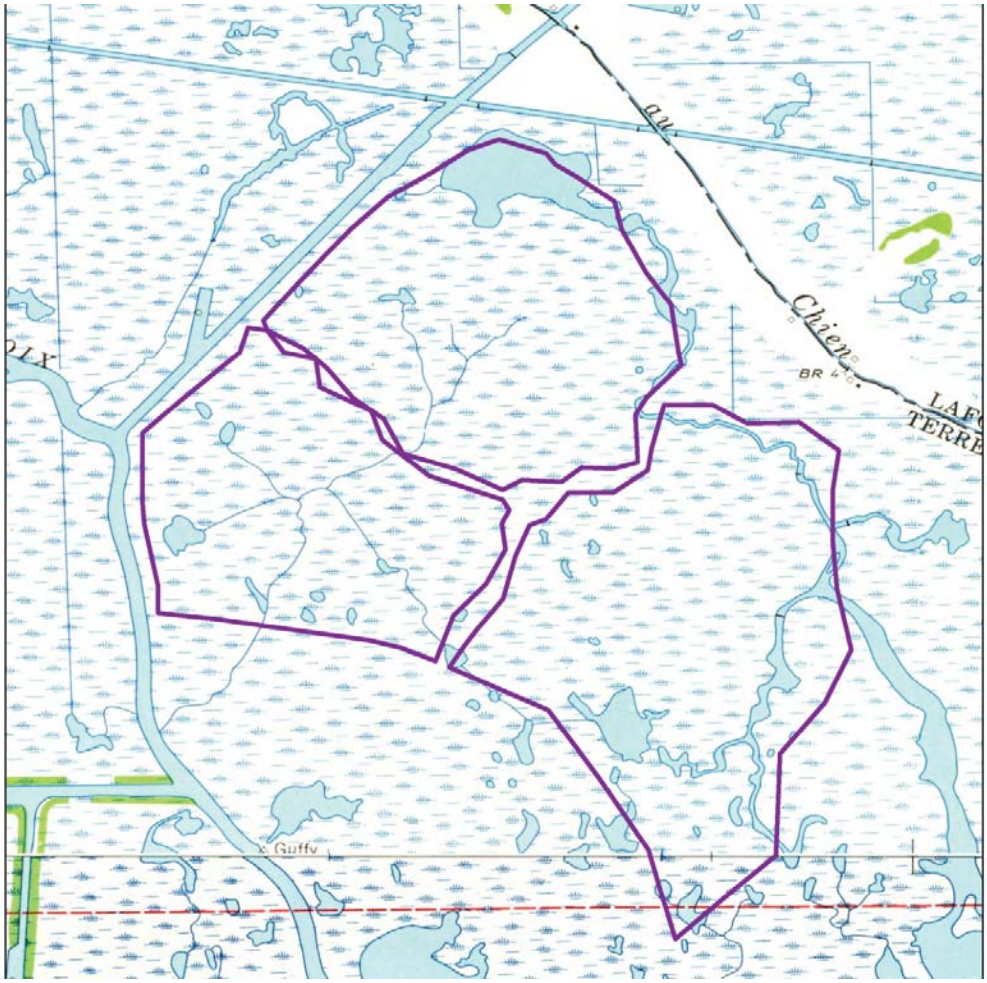
Basemap: 2013 NAIP DOQQ
Produced by: EPA Region 6, Dallas, TX

0 0.25 0.5 1 1.5 2
Miles



Historical Context of Project Location





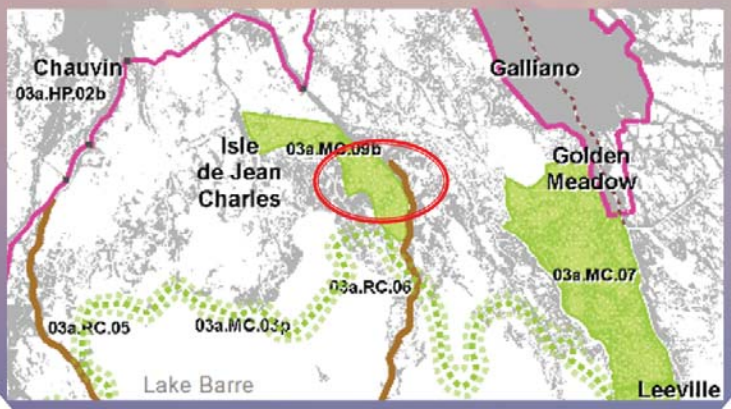

235.13
192.66
299.29
North Terrebonne Marsh Creation (PPL26)
Proposed Marsh Creation
N
Basemap: 2015 NAIP DOQQ
Produced by: EPA Region 6, Dallas, TX
0 0.1 0.2 0.4 0.6 0.8
Miles


235.13
192.66
299.29

Solution

- Create/Nourish 730 acres of marsh
- Use dredged material from Lake Felicity
- Use containment dikes that allow for tidal exchange
- Project site will be planted for sustainability

Master Plan Strategy Marsh Creation 03a.MC.09b



Estimated Costs

- Total Cost + 25% is $25 Million
- Fully Funded Range of $30-$35 Million

Benefits

- Protects Levees, Communities and Infrastructure in our most vulnerable areas
- Marsh Creation in Eastern Terrebonne is desperately needed
- This project may define the future of our coastline

Questions?

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North Terrebonne Marsh Creation

A Project of the Environmental Protection Agency
Presented by students of the Wetlands Discovery Center

R3-TE-02

Grand Caillou Marsh Creation and Terracing

TE-02

PPL27 PROJECT NOMINEE FACT SHEET
January 2017

Project Name
Grand Caillou Marsh Creation and Terracing

Louisiana's 2017 Coastal Master Plan
03a.MC.100

Project Location
Region 3, Terrebonne Parish, south of Falgout Canal

Problem
Marshes south of Falgout Canal, and between Bayous DuLarge and Grand Caillou are continuing to experience degradation and loss. A checkerboard array of small ditches dredged across the interior marshes allow tidal water exchange to traverse the marsh, connecting Bayou Sauveur to west, Sister Lake to the south, Bayou Grand Caillou to the east, and the Fohs Canal oil field to the north. As the interior marshes continue to degrade water flows through these ditches have increased such that now, some of these ditches have scoured to depths of 7 feet deep or more. Wind action and accelerated tidal exchange are contributing to the conversion of area marshes to open water.

Goals
The project goal is to re-create marshes in a location that will reduce the cross-flow of currents through the marsh and to create terraces that reduce wind fetch and slow north-south water exchange.

Proposed Solution
Using borrow material from Sister Lake, create 429 acres of marsh, and nourish 211 acres of existing marsh. Additionally, 23,400 linear feet of terraces would be constructed to reduce north-south water exchange and reduce wind fetch in large open water areas.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   Approximately 666 acres would be benefitted directly (640 ac MC/MN + 26 ac terracing). Indirect benefits would accrue to marshes protected by the terracing and reduced tidal exchange.

2) *How many acres of wetlands will be protected/created over the project life?*
   Through MC/MN and terracing, 472 acres would be protected over the project life.

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (e.g., 50% reduction in the background loss rate)?*
   The anticipated loss rate reduction throughout the area of direct benefit is estimated to 50%.

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?*

5) *What is the net impact of the project on critical and non-critical infrastructure?*
Project features would provide some indirect protection for the Morganza to the Gulf levee system.

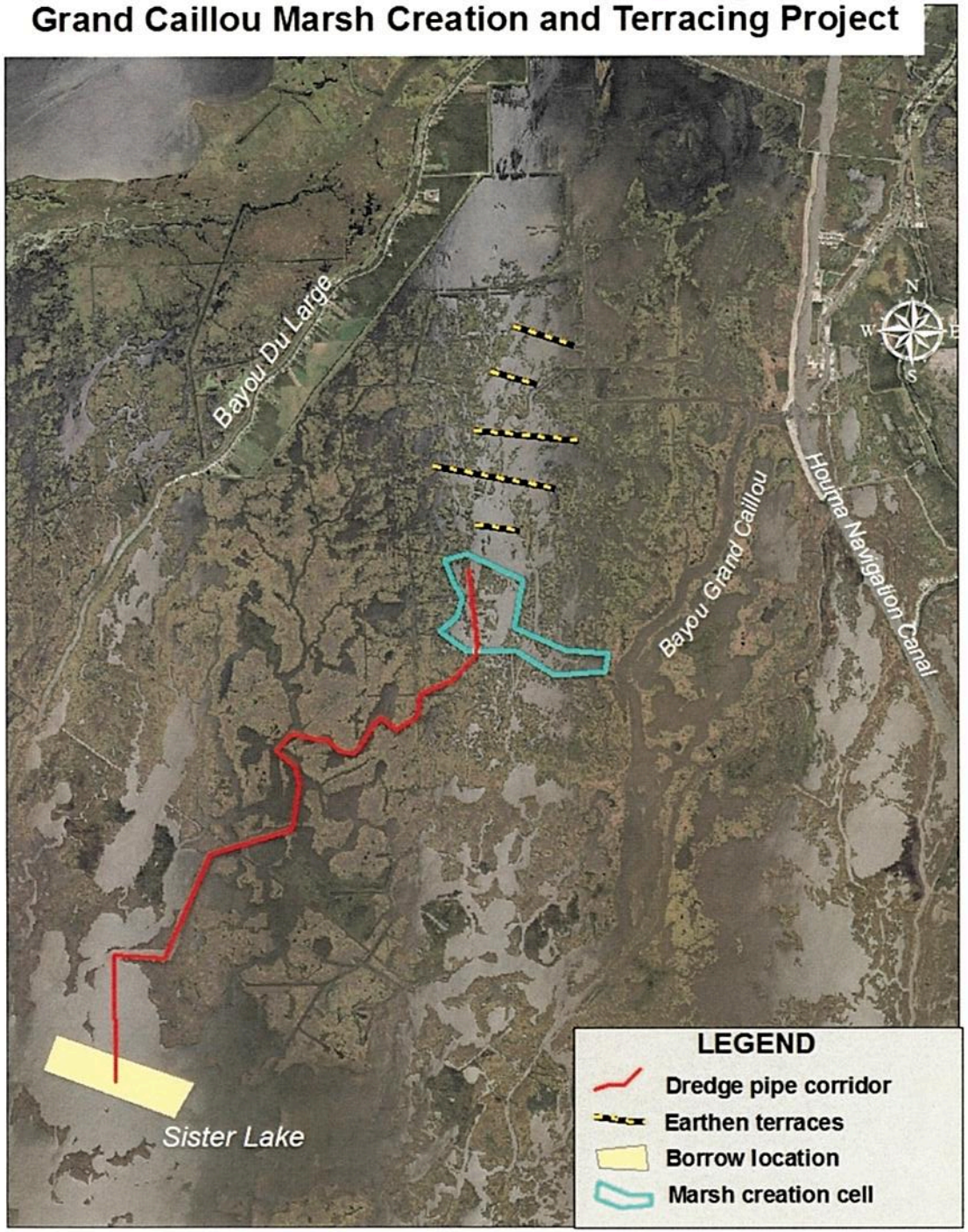
6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The proposed features would be synergistic with the installation and operation of the two freshwater introduction structures being installed in the Falgout Canal reach of the Morganza to the Gulf levee.

Other Considerations
Pipelines?

Preliminary Construction Costs:
The estimated construction cost including 25% contingency is $30M.

Preparer(s) of Fact Sheet:
Ronny Paille: U.S. Fish and Wildlife Service; 337-291-3117; Ronald_Paille@fws.gov

Grand Caillou Marsh Creation and Terracing Project



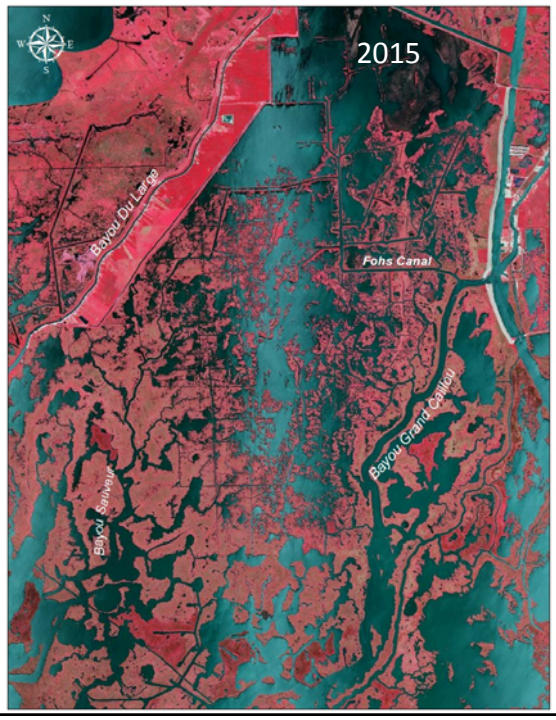
429 ac marsh creation
211 ac marsh nourishment
640 ac Total

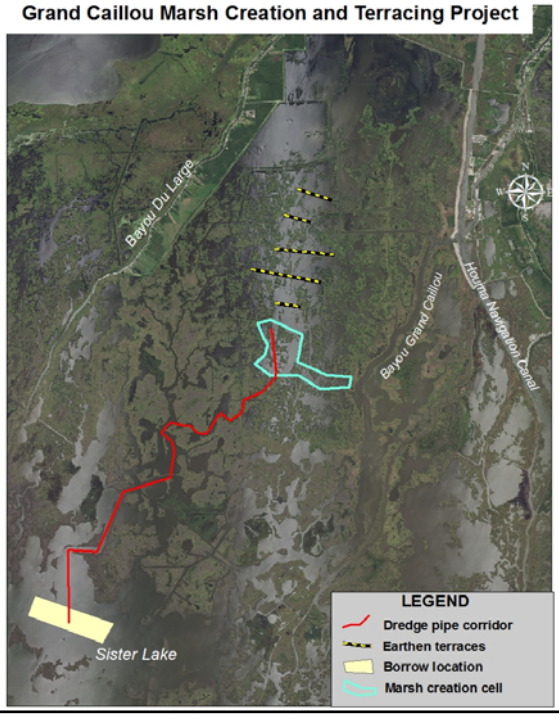
23,400 ft terraces

48,250 ft pump distance

$30M = constr + 25%


Feb. 1998
Falgout Canal
Bayou Du Large
Bayou Grand Caillou
Houma Navigation Canal
Lake Mechant
Sister Lake
Image U.S. Geological Survey
Google


2015
Bayou Du Large
Fohs Canal
Bayou Grand Caillou
Bayou Sauvage



429 ac marsh creation
<u>211 ac</u> marsh nourishment
640 ac Total

23,400 ft terraces

48,250 ft pump distance

$30M = constr + 25%

R3-TE-03

Bayou Terrebonne Freshwater Diversion

TE-03

PPL27 Bayou Terrebonne Freshwater Diversion

Project Location:
Region 3, Terrebonne Basin, Terrebonne Parish along Bayou Terrebonne between the towns of Montegut and Pointe aux Chenes in Terrebonne Parish. The primary project area is located within the Louisiana Department of Wildlife and Fisheries Pointe aux Chenes WMA.

Problem:
The Central and Eastern Terrebonne marshes are greatly deprived of freshwater, nutrients and sediments from riverine sources. Consequently, subsidence and saltwater intrusion have resulted in high rates of land loss. More recently, efforts have been underway to try to optimize freshwater flows to some of these areas where possible; however, the sources of freshwater are greatly limited. The Gulf Intracoastal Waterway (GIWW) has been recognized as a lateral source of freshwater from the Atchafalaya River extending from west to east across the entire Terrebonne Basin. This resource provides the potential to reroute freshwater through the bayous to the Central and East Terrebonne marshes.

Goals:

1. To convey freshwater, nutrients and sediments from the Atchafalaya River east via the GIWW and Bayou Terrebonne into the Central and Eastern Terrebonne marshes.
2. Create marsh habitat through construction of marsh terracing.

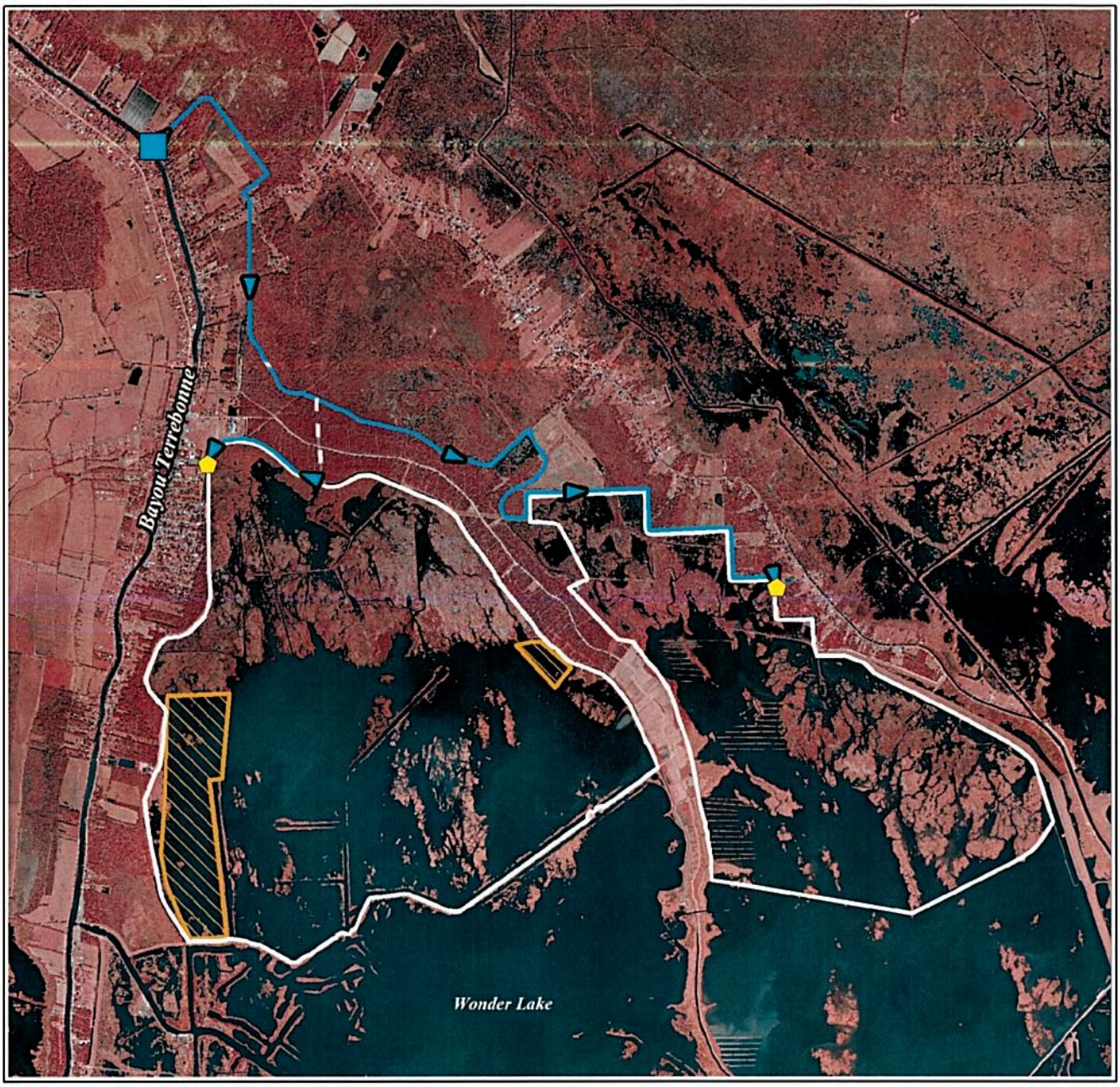
Proposed Solution:

1. Freshwater Diversion: The project will construct a freshwater diversion to move freshwater, nutrients and sediments originating largely from the Atchafalaya River via the GIWW and Bayou Terrebonne into the Montegut Unit and Pointe aux Chenes marshes in Central and Eastern Terrebonne Parish. The project will include rerouting water from Bayou Terrebonne through an existing canal system where a series of forced drainage pumps will be used to move freshwater into two adjacent marsh complexes. Two additional project-specific pumps will be installed at existing pump facilities to divert freshwater when forced drainage systems are not in service.
2. Terraces: Approximately 26,000 linear feet of terraces will be constructed in the Montegut Unit to create approximately 16 acres of marsh.

Project Benefits:
The project would result in approximately 173 net acres of marsh over the 20-year project life.

Project Costs:
The total fully-funded cost is $22,636,335.

Preparer(s) of Fact Sheet: Ron Boustany, NRCS, (337) 291-3067, ron.boustany@la.usda.gov
Todd Baker, LA Dept. of Wildlife and Fisheries, (225) 765-2814, tbaker@wlf.la.gov



Bayou Terrebonne Freshwater Diversion (PPL26 Candidate)

USGS
science for a changing world

Freshwater Diversion
Pump
Freshwater Flow *
Channel Cleanout *
Terrace Field *
Freshwater Influence/ Project Boundary

* denotes proposed features

1 0 1 Kilometers
1 0 1 Miles

Scale 1:60,000

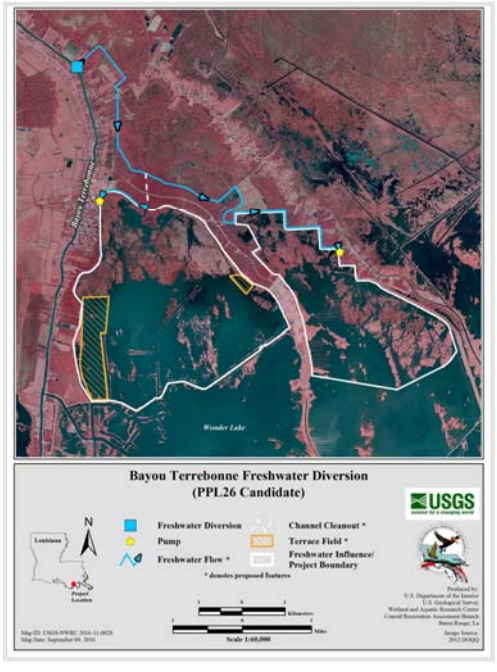
Map ID: USGS-NWRC 2016-11-0028
Map Date: September 09, 2016

Produced by:
U.S. Department of the Interior
U.S. Geological Survey
Wetland and Aquatic Research Center
Coastal Restoration Assessment Branch
Baton Rouge, La

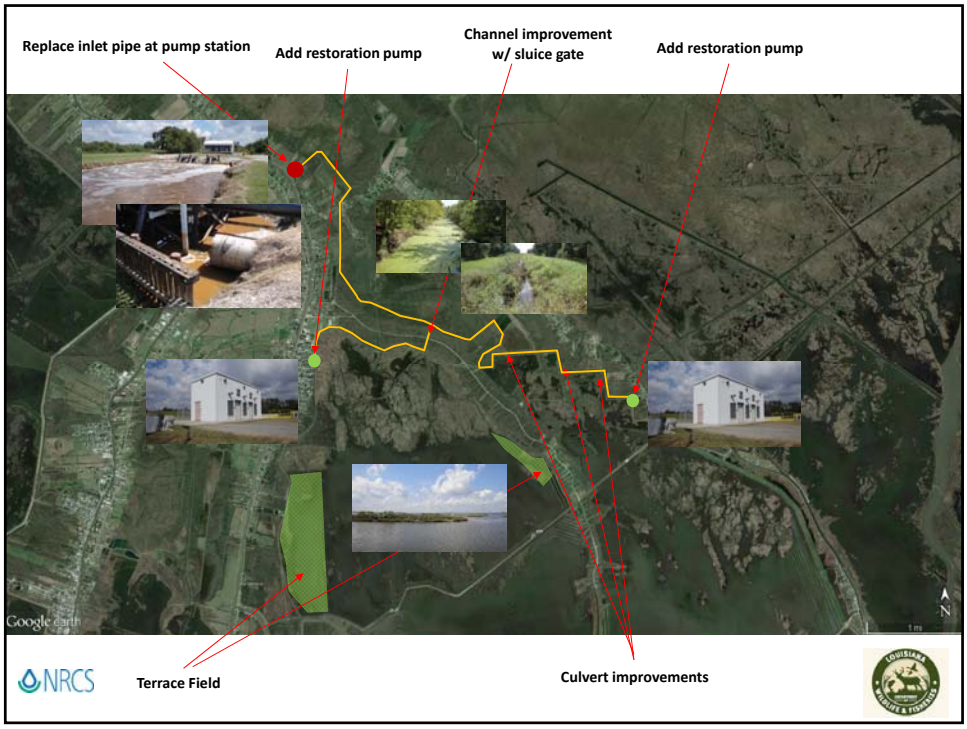
Image Source:
2012 DOQQ

Bayou Terrebonne Freshwater Diversion Project

Todd Baker / CWPPRA Region 3 Planning Team Meeting / February 1, 2017



NRCS


Replace inlet pipe at pump station
Add restoration pump
Channel improvement w/ sluice gate
Add restoration pump
Terrace Field
Culvert improvements
NRCS


February 2006
January 2015

February 2006

February 2015

February 2007

January 2016

Project Summary

Bayou Terrebonne Freshwater Diversion Project

Objectives: Introduce freshwater, sediments and nutrients originating from the Atchafalaya River via Bayou Terrebonne and into one of the most freshwater-deprived areas of the state using a series of existing forced-drainage canals and pump systems and create marsh to both restore and protect coastal resources.

Benefits:

Freshwater Introduction:	156 acres
Terraces:	16 acres
Total:	173 acres

Cost:

$9.6 million (construction + 25% contingency)

NRCS

R3-TE-04

Lake Chapeau 2 Marsh Creation

TE-04

PPL27 PROJECT NOMINEE FACT SHEET
February 1, 2017

Project Name
Lake Chapeau 2 Marsh Creation

Project Location
Region 3, Terrebonne Basin, Terrebonne Parish

Problem
The loss rate for Point au Fer Island is -0.06%/yr based on 1985 to 2016 USGS data from the Point au Fer mapping unit. Since 1973, Point au Fer has experienced freshening as a result of sediments and freshwater from the Atchafalaya River. Although there is a low marsh loss rate, this freshwater flow and sediment source has not been effective in restoring marsh. Lake Chapeau has increased in size as the shorelines fragmented and interior marsh loss occurred. A reach of Locust Bayou has coalesced with Lake Chapeau. As lake and bayou banks disappeared, tidal flows have increased and circumvented natural flow patterns.

Goals
The project goal is creating marsh in the project area to replace marsh lost, restore the west and southern shorelines of Lake Chapeau, and restore a reach of Locust Bayou. Specifically, the goal is to create and nourish approximately 514 acres of marsh (360 acres creation and 154 acres nourishment).

Proposed Solution
The proposed project would further restore the structural framework of Lake Chapeau and Locust Bayou by creating approximately 360 acres of marsh and nourish 154 acres of existing marsh utilizing dedicated dredging and confined disposal. Sediment would be mined from Atchafalaya Bay. The borrow area would be designed to avoid adverse impacts to the existing shorelines of Point au Fer Island. The created marsh would be planted with smooth cordgrass. During Phase 0 and Phase 1, opportunities would be explored to increase the amount of marsh creation to further complete restoration of Lake Chapeau.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   This total project area is 514 ac.

2) *How many acres of wetlands will be protected/created over the project life?*
   Approximately 364 acres of marsh will be protected/created over the project life.

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (e.g., 50% reduction in the background loss rate)?*
   The anticipated land loss rate reduction throughout the area of direct benefits will be 50% over the projects life.

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?*

The project would further restore the structural framework of Lake Chapeau.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
The project would have minor net positive impact to non-critical oil and gas infrastructure.

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 Lake Chapeau Sediment Input and Hydrologic Restoration Project (TE-26), Point au Fer Canal Plugs (TE-22), and the State Small Dredge Project.

Considerations
The proposed project has potential utility/pipeline considerations.

Preliminary Construction Costs
The fully funded cost range is $30M-$35M.

Preparer(s) of Fact Sheet:
Patrick Williams, NOAA Fisheries, 225-389-0508, ext 208, patrick.williams@noaa.gov
Dawn Davis, NOAA Fisheries, 225-389-0508, ext 204, dawn.davis@noaa.gov

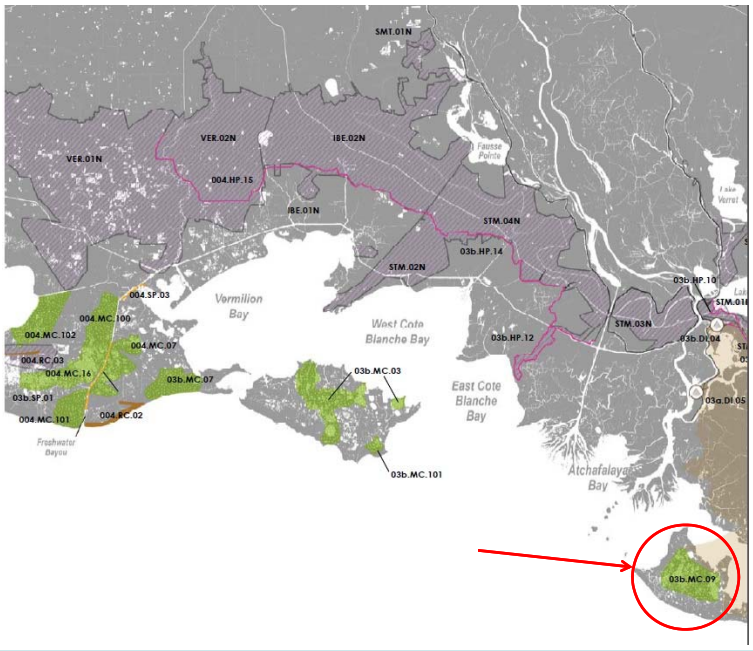
PPL27 Lake Chapeau 2 Marsh Creation

PPL27 Lake Chapeau 2 Marsh Creation

NOAA FISHERIES

Habitat Conservation Division

February 1, 2017




Lake Chapeau
Point Au Fer I
Google earth
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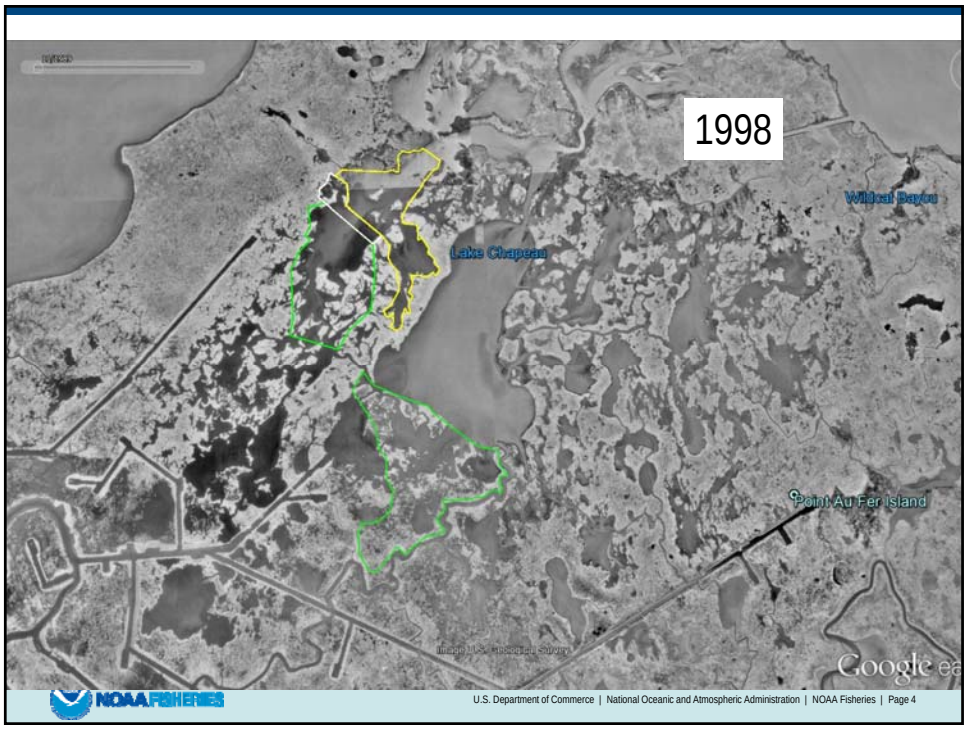
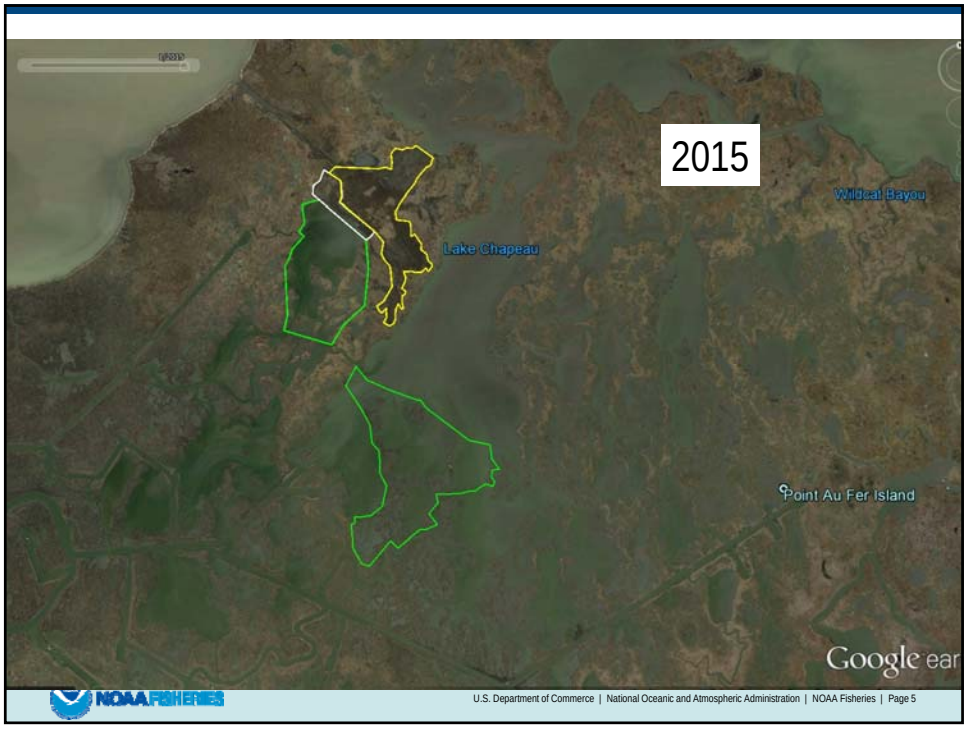
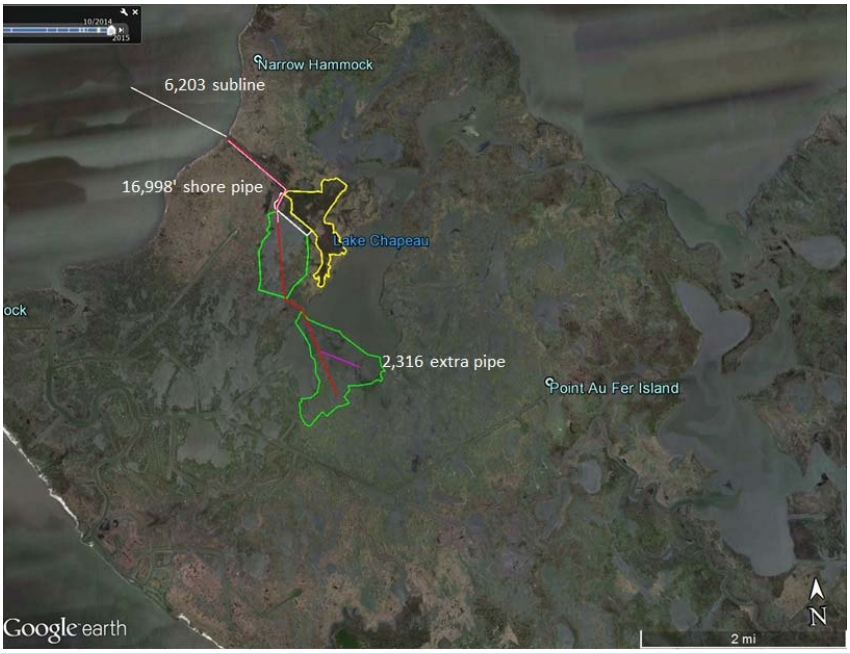
1 mi


1998
Lake Chapeau
Point Au Fer Island
NOAA FISHERIES
U.S. Department of Commerce | National Oceanic and Atmospheric Administration | NOAA Fisheries | Page 4


2015
Wildcat Bayou
Lake Chapeau
Point Au Fer Island
Google ear


Narrow Hammock
6,203 subline
16,998' shore pipe
Lake Chapeau
2,316 extra pipe
Point Au Fer Island
Google earth
2 mi
N

PPL27 Lake Chapeau 2 Marsh Creation

Summary:

- Total: 514 ac
- Marsh Creation: 360 ac
- Marsh Nourishment: 154 ac
- Net Acres: 364 ac
- Atchafalaya Bay Borrow
- Fully Funded Cost Range: $30M - $35M

R3-TE-05

West Louisiana Highway 1

Marsh Creation

TE-05

PPL27 PROJECT NOMINEE FACT SHEET
February 1, 2016

Project Name
West Louisiana Highway 1 Marsh Creation

Project Location
Region 3, Terrebonne Basin, Lafourche Parish

Problem
The Terrebonne Basin is an abandoned delta complex, characterized by a thick section of unconsolidated sediments that are undergoing dewatering and compaction, contributing to high subsidence, and a network of old distributary ridges extending southward from Houma. Historically, subsidence and numerous oil and gas canals and pipelines in the area have contributed significantly to wetland losses. Since 1932, the Terrebonne Basin has lost approximately 20% of its wetlands. Current loss rates range from approximately 4,500 to 6,500 acres/year. This loss amounts to up to 130,000 acres during the next 20 years. One-third of the Terrebonne Basin's remaining wetlands would be lost to open water by the year 2040. The wetland loss rate for the project area is -1.05%/year based on USGS hyper temporal data from 1984 to 2016.

Goals
The project goals are to create and/or nourish up to 346 acres of emergent brackish marsh

Proposed Solution
The proposed project's primary feature is to create and/or nourish approximately 346 acres of emergent brackish marsh (292 marsh creation and 54 marsh nourishment). In order to achieve this, sediment will be hydraulically pumped from a borrow source in Catfish Lake. Containment dikes will be constructed around the marsh creation area to retain sediment during pumping The containment dikes will be degraded and/or gapped no later than three years post construction. The project will include planting smooth cordgrass plugs installed in strategic locations based on 10% of the acreage. A robust engineering and design cost is included to investigate additive or alternate marsh creation features to the west and possibly north of the proposed project.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   This total project area is approximately 346 acres (292 acres of marsh creation and 54 acres of marsh nourishment).

2) *How many acres of wetlands will be protected/created over the project life?*
   The net acre benefit range is 250-300 acres after 20 years.

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (e.g., 50% reduction in the background loss rate)?*
   A 50% loss rate reduction is assumed for the marsh creation and nourishment.

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.?*

The project will help restore the backside of the natural Bayou Lafourche bank.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
The project will provide additional protection to LA 1 south of Golden Meadow. The project would also provide positive impacts to non-critical (i.e., minor oil and gas facilities) infrastructure. Minor oil and gas facilities and pipelines in the area 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 is an area of need due to the lack of previous restoration efforts.

Considerations
The proposed project has potential utility/pipeline issues along with oyster leases along the dredge pipeline path.

Preliminary Construction Costs
The fully-funded cost range is $30M - $35M.

Preparer(s) of Fact Sheet:
Dawn Davis, NOAA Fisheries, 225-389-0508 ext 206, dawn.davis@noaa.gov
Patrick Williams, NOAA Fisheries, 225-389-0508, ext 208, patrick.williams@noaa.gov

West Louisiana Highway 1 Marsh Creation

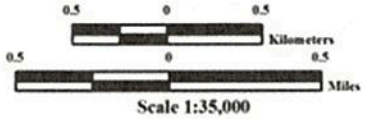
PPL 27 Candidate

USGS
science for a changing world

Marsh Creation *

Project Boundary

* denotes proposed features



Scale 1:35,000

Produced by:
U.S. Department of the Interior
U.S. Geological Survey
Wetland and Aquatic Research Center
Coastal Restoration Assessment Branch
Baton Rouge, La

Image Source:
2012 DOQQ

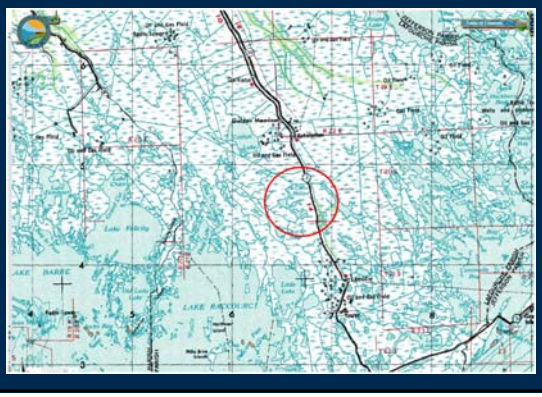
Map ID: USGS-NWRC 2016-11-0032
Map Date: July 01, 2016

Science, Service, Stewardship

West Louisiana Highway 1 Marsh Creation

Region 3 – Terrebonne Basin

PPL27 RPT



NOAA FISHERIES SERVICE

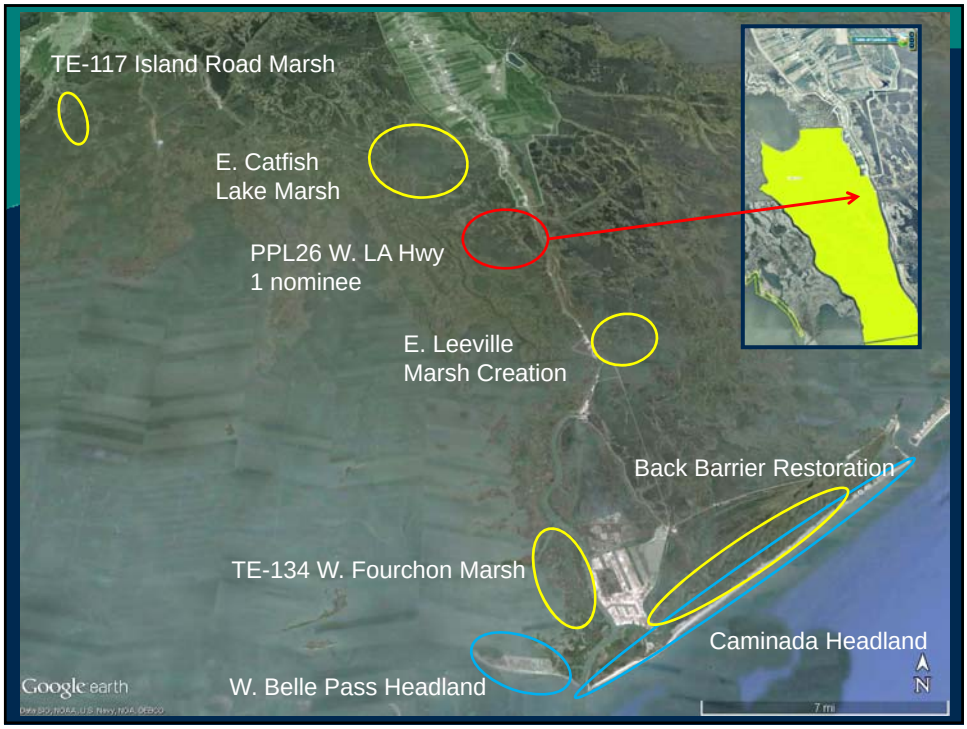
February 1, 2017

NOAA FISHERIES SERVICE

Problems Along Western side of Bayou Lafourche

- High land loss rates in Terrebonne Basin, 20% since 1932 and currently 4,500-6,500 acres lost per year
- High subsidence in the area, 0.5 ft/20 yr, 2017 Coastal Master Plan (mod 8.8 mm/yr rate)
- Limited protection to either side of LA Hwy 1
- Wetland loss rate for the project area is -1.05%/year based on USGS hyper temporal data from 1984 to 2016

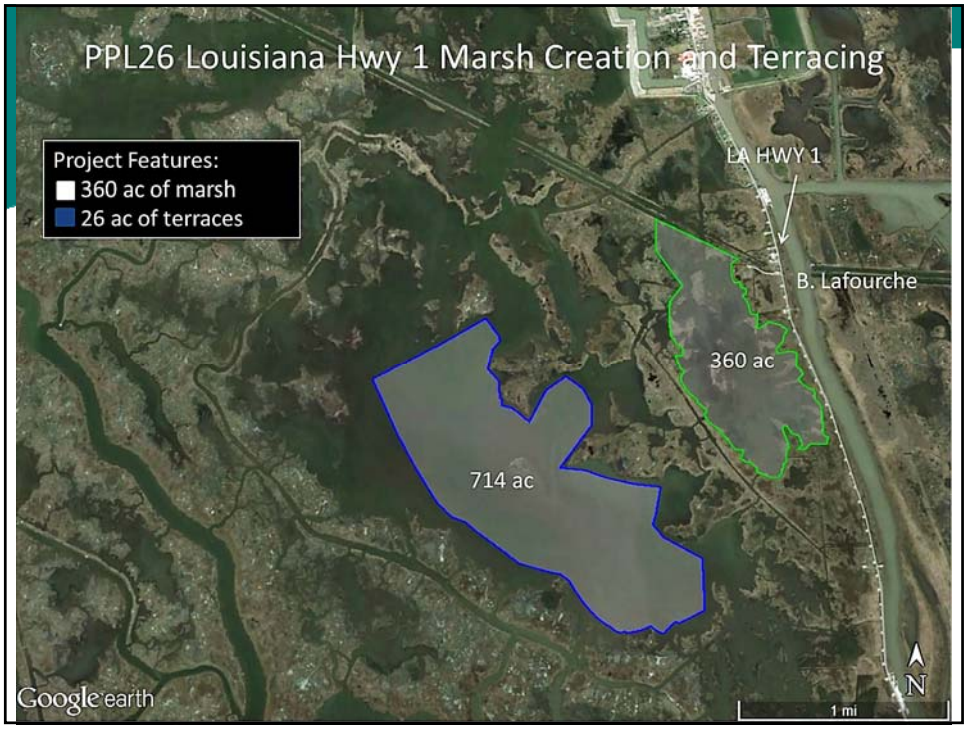
2


TE-117 Island Road Marsh
E. Catfish
Lake Marsh
PPL26 W. LA Hwy
1 nominee
E. Leeville
Marsh Creation
Back Barrier Restoration
TE-134 W. Fourchon Marsh
Caminada Headland
W. Belle Pass Headland
Google earth
N


200 feet
Google earth
N


TWIN PIPELINE
Google earth
2000 ft
N


Additional Considerations
Elevated LA1 Phase 2
270 ac
120 ac
Laurier Bayou
Laurier Bay
Borrow from Little Lake to south
Google earth
4000 ft
N



NOAA FISHERIES SERVICE

8

NOAA FISHERIES SERVICE

Project Features and Benefits

- Project area: 346 acres (292 acres of marsh creation and 54 acres of marsh nourishment)
- Borrow from outside immediate project area in Catfish Lake
- Consistent with 2017 Coastal Master Plan, Marsh Creation Subunit – 03a.MC.07, Belle Pass-Golden Meadow Marsh Creation
- Supports “T9” Concept (Twin Pipelines) for Lafourche Parish, 5th Annual Coastal Restoration Workshop
- Promotes protection to HWY LA 1
- Fully funded cost is $30-35 M

9

R3-TE-06

East Catfish Lake Marsh Creation and Terracing

TE-06

PPL27 PROJECT NOMINEE FACT SHEET
February 1, 2017

Project Name
East Catfish Lake Marsh Creation and Terracing

Project Location
Region 3, Terrebonne Basin, Lafourche Parish, east of Catfish Lake

Problem
Examination of historical aerial photography clearly indicates significant marsh loss around Catfish Lake. Subsidence, canal dredging, a lack of freshwater input, saltwater intrusion, and altered hydrology are all important factors contributing to this loss. Of particular note, is the area between Catfish Lake and Golden Meadow. Canal dredging, associated with oil and gas activities, has resulted in the rapid deterioration of this area. USGS calculated a 1985-2010 loss rate of -0.79% per year for the PPL22 North Catfish Lake Marsh Creation Project. Shoreline erosion rates along the southeastern Catfish Lake shoreline averaged 29 ft/yr from 1990-2015.

Goals
Goals are to restore the eastern and southeastern shorelines of Catfish Lake via marsh creation and to create habitat via terracing in areas of deteriorated marsh.

Service goals include restoration/protection of habitat for threatened and endangered species and other at-risk species. This project would restore habitat potentially utilized by the black rail and Louisiana eyed silkmoth, which are both petitioned for listing as threatened/endangered species. The project could also benefit other at-risk species including the peregrine falcon, osprey, diamondback terrapin, and seaside sparrow.

Proposed Solution
1. Sediments will be hydraulically dredged in Catfish Lake and pumped via pipeline to create/nourish approximately 483 acres of marsh.
2. Containment dikes will be constructed as necessary and gapped upon project completion.
3. Terraces (37,730 linear ft-26 ac) will be constructed in deteriorated marsh areas to reduce fetch, promote SAV production, and provide marsh edge habitat.
4. Articulated concrete mats (6,900 ft) will be placed along the eastern shoreline of Catfish Lake (on the western side of the three marsh creation cells.

Preliminary Project Benefits
1) *What is the total acreage benefited both directly and indirectly*? Approximately 1,115 acres would be benefited directly and indirectly. Direct benefits include 483 acres of marsh creation and 26 acres of terraces. Indirect benefits would occur to surrounding marshes and within the 632-acre terrace field.

2) *How many acres of wetlands will be protected/created over the project life*? The total net acres protected/created over the project life is approximately 400-450 acres.

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (<25%, 25-49%, 50-74% and >75%).* The anticipated loss rate reduction throughout the area of direct benefit is estimated to be 50%.

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.* Yes. The project would restore marsh along the eastern Catfish Lake shoreline.

5) *What is the net impact of the project on critical and non-critical infrastructure*? The project would afford protection to the Golden Meadow Hurricane Protection Levee.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects*? The project would complement other restoration projects in the area including the PPL22 North Catfish Lake Marsh Creation Project and CIAP/Parish marsh creation projects in the Catfish Lake area.

Identification of Potential Issues
Potentials issues include oil and gas infrastructure, oyster leases, and the Louisiana Highway 1 Improvement Project alignment.

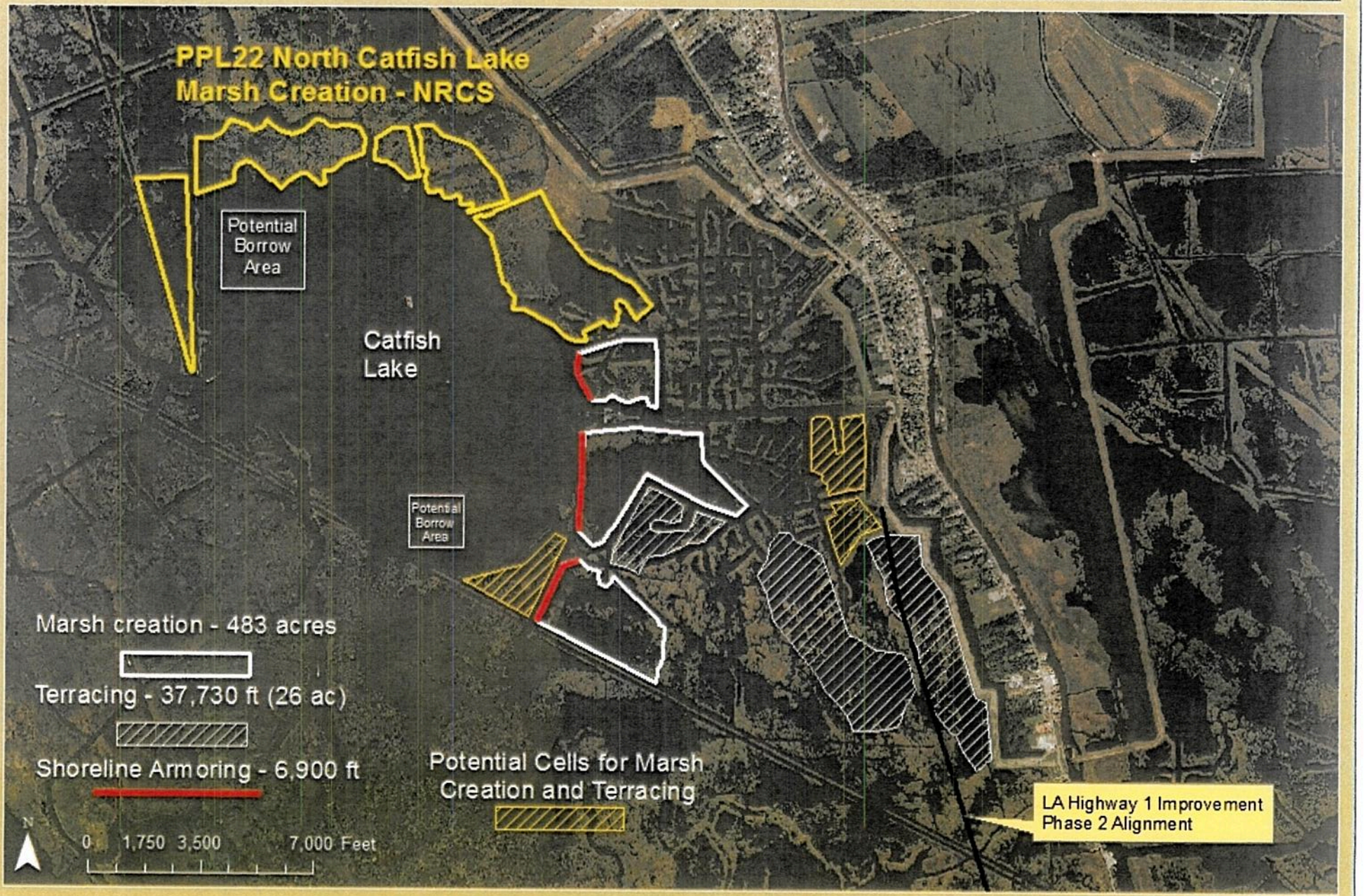
Preliminary Construction Costs
The estimated construction cost including 25% contingency is $25M - $30M.

Preparer of Fact Sheet
Kevin Roy, USFWS, (337) 291-3120, kevin_roy@fws.gov

U.S. Fish & Wildlife Service

Louisiana Ecological Services Field Office

East Catfish Lake Marsh Creation and Terracing



REGION III

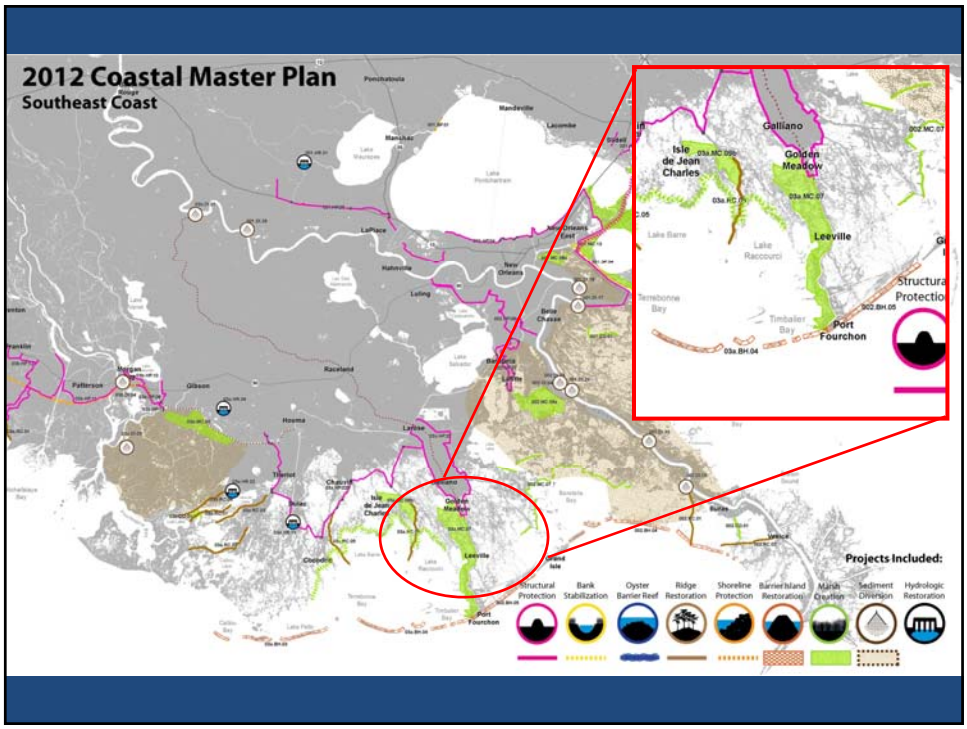
REGIONAL PLANNING TEAM MEETING

TERREBONNE BASIN

Morgan City, LA

February 1, 2017

Kevin Roy
U.S. Fish and Wildlife Service
Lafayette, LA

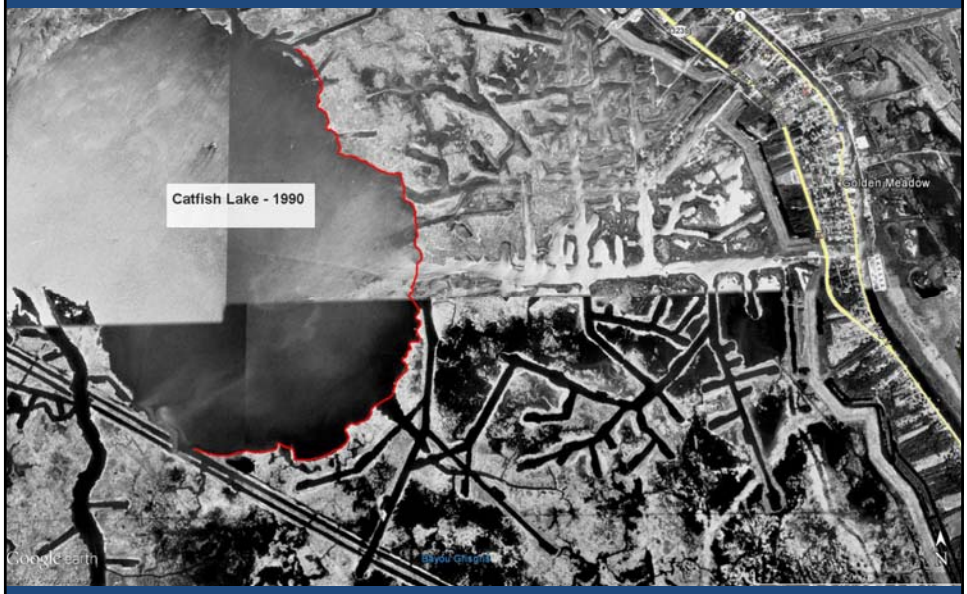


2017 Draft Coastal Master Plan

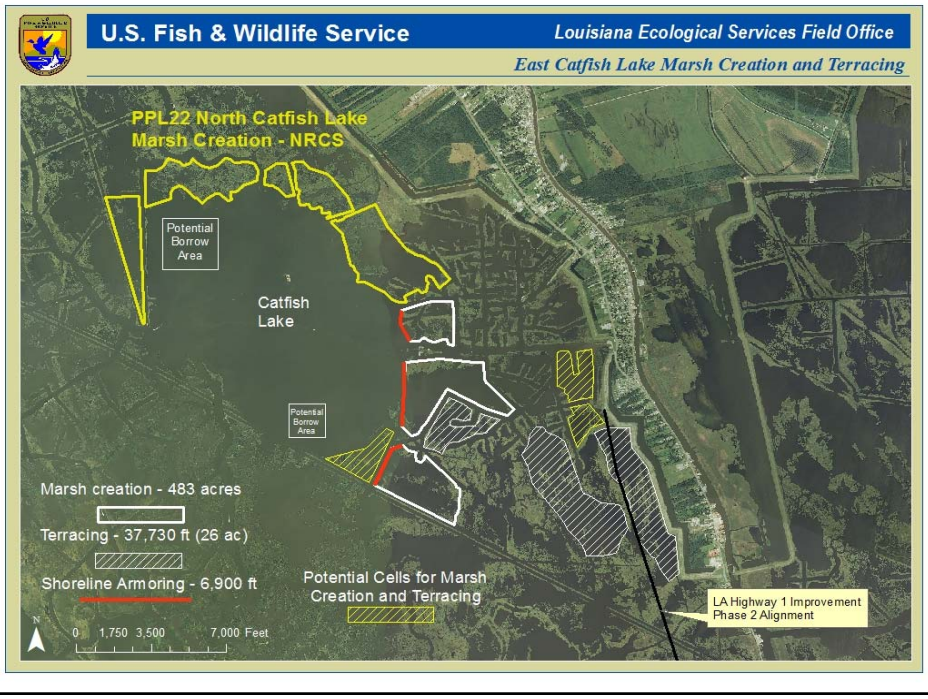
Not included in draft 2017 Coastal Master Plan

Could be our last opportunity to nominate a project around Catfish Lake

Catfish Lake – Eastern Shoreline Erosion



Catfish Lake – Eastern Shoreline Erosion



East Catfish Lake Marsh Creation and Terracing

- Catfish Lake borrow site
- Maximum pump distance of 18,000 feet
- 483 acres of marsh creation/nourishment
- 37,730 linear feet of terraces – 26 acres
- 6,900 linear feet of shoreline armoring
- Net acres = 400-450
- Construction plus contingency = $25M - $30M

R3-TE-07

Small Bayou LaPointe Marsh and Ridge Restoration

TE-07

PPL27 PROJECT NOMINEE FACT SHEET
February 1, 2017

Project Name
Small Bayou LaPointe Marsh and Ridge Restoration

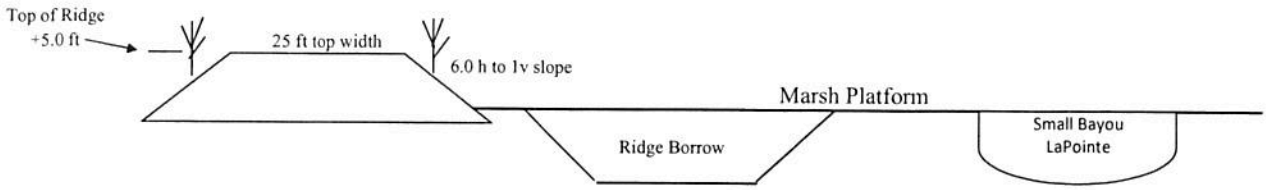
Project Location
Region 3, Terrebonne Basin, Terrebonne Parish, east of Raccourci Bay, adjacent to Small Bayou LaPointe

Problem
Examination of historical aerial photography clearly indicates significant marsh loss in the vicinity of the project area, particularly in the area between Small Bayou LaPointe and Bayou DeCade. Subsidence, canal dredging, saltwater intrusion, and altered hydrology are all important factors contributing to marsh loss in the area. USGS calculated a 1985-2016 loss rate of -0.53% per year for the Lake Mechant LCA polygon. In addition, forested ridge no longer exists along Small Bayou LaPointe. The ridge has subsided over several centuries and is now marsh.

Goals
The goals are to: 1) Restore 393 acres of intermediate/brackish marsh habitat along the northern side of Small Bayou LaPointe and 2) Restore ridge habitat along Small Bayou LaPointe.

Service goals include restoration/protection of habitat for threatened and endangered species and other at-risk species. This project would restore habitat potentially utilized by the black rail which is petitioned for listing as a threatened/endangered species. Restoration of forested coastal ridge habitat would benefit neotropical migratory songbirds. The project could also benefit other at-risk species including the diamondback terrapin and seaside sparrow. The mottled duck, a priority species for the Gulf Coast Joint Venture, would also be benefited by the restoration of intermediate/brackish marsh habitat.

Proposed Project Features
1. Sediments will be hydraulically dredged in Lake Mechant and pumped via pipeline to create/nourish approximately 393 acres of marsh.
2. Containment dikes will be constructed as necessary and gapped upon project completion.
3. The maximum pump distance for the Lake Mechant borrow site is approximately 29,000 feet.
4. Approximately 18,500 ft (23 acres) of ridge will be constructed along the southern bank of Small Bayou LaPointe. Ridge material will be obtained north of the ridge alignment and the borrow area filled during construction of the marsh platform. Proposed ridge dimensions include a settled elevation of +5 ft, a 25 ft top width, 1V:6H side slopes, and a base width of 55 ft. Chinese tallow tree control and hardwood plantings are included.



Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly*? Approximately 393 acres of marsh would be benefited directly from marsh creation. Ridge restoration would result in 23 acres of ridge habitat.

2) *How many acres of wetlands will be protected/created over the project life*? The total net acres protected/created over the project life is approximately 250-300 acres.

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (<25%, 25-49%, 50-74% and >75%).* The anticipated loss rate reduction throughout the area of direct benefit is estimated to be 50%.

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.* Yes. The project would restore a forested ridge along Small Bayou LaPointe.

5) *What is the net impact of the project on critical and non-critical infrastructure*? None.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects*? The project would provide a synergistic effect with the North Lake Mechant Landbridge Restoration Project (TE-44) located to the west. Both projects would work together to maintain a ridge/marsh landbridge along the intermediate zone between Lake Mechant and Bayou Decade.

Identification of Potential Issues

Oyster leases in Lake Mechant.

Preliminary Construction Costs

The estimated construction cost including 25% contingency is $25M - $30M.

Preparer of Fact Sheet

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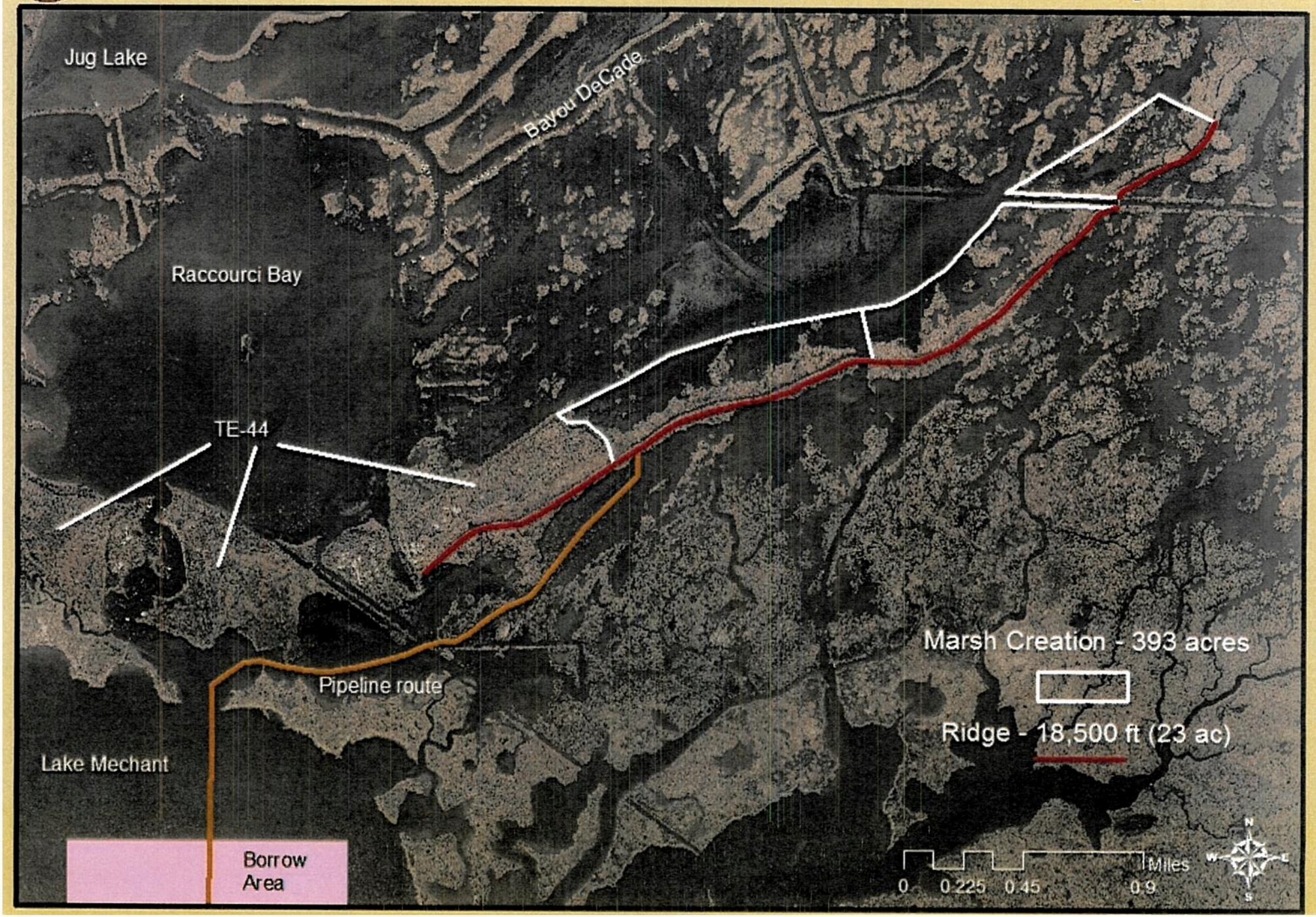
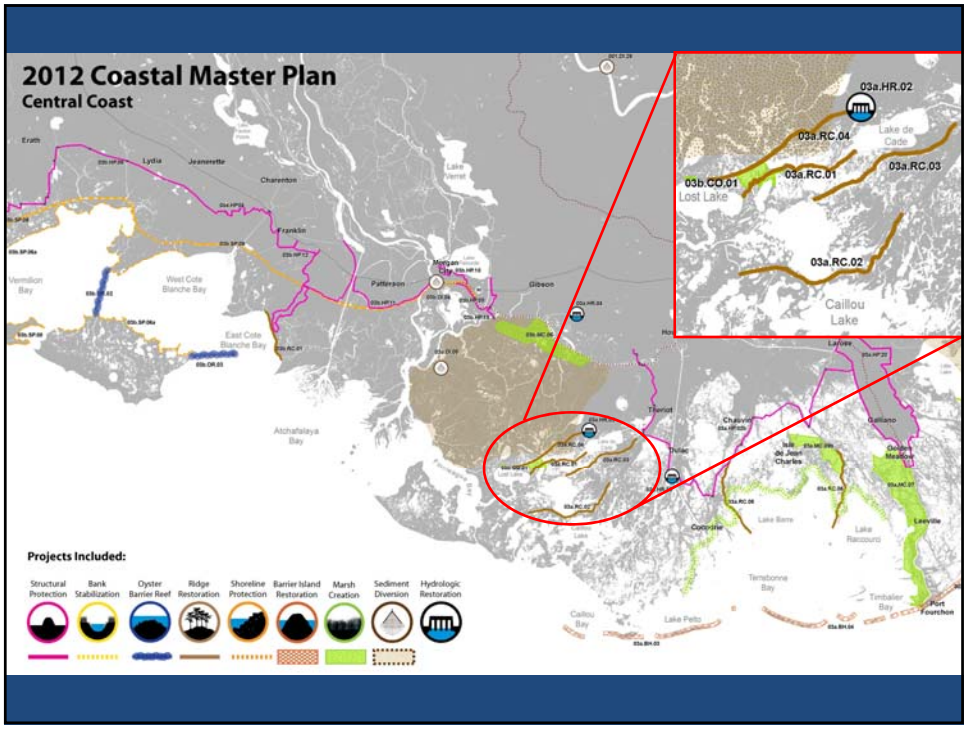
U.S. Fish & Wildlife Service

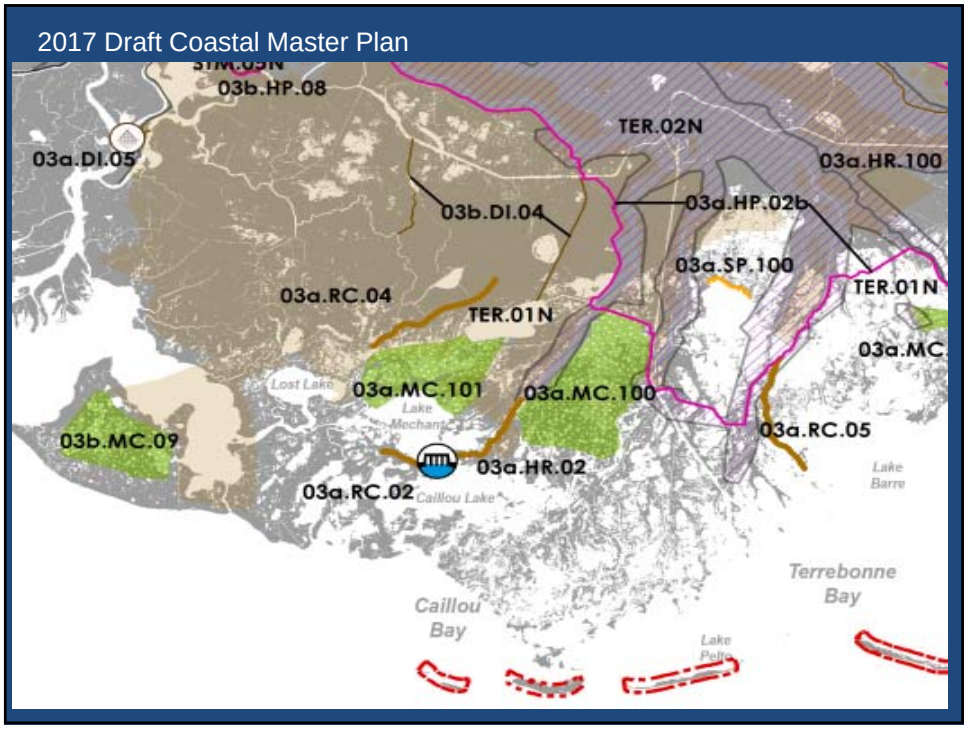
Louisiana Ecological Services Field Office

Small Bayou LaPointe Marsh and Ridge Restoration




2012 Coastal Master Plan
Central Coast
03a.HR.02
03a.RC.04
03a.RC.01
03a.RC.03
03b.CO.01
Lost Lake
03a.RC.02
Caillou Lake
Projects Included:
Structural Protection
Bank Stabilization
Oyster Barrier Reef
Ridge Restoration
Shoreline Protection
Barrier Island Restoration
Marsh Creation
Sediment Diversion
Hydrologic Restoration


2012 State Master Plan
Ridge Alignments
Mauvais Bois
Decade
LaPointe
Dularge
Google earth
N
3 mi


2017 Draft Coastal Master Plan
03b.HP.08
03a.DI.05
TER.02N
03a.HR.100
03b.DI.04
03a.HP.02b
03a.SP.100
TER.01N
03a.RC.04
TER.01N
03a.MC
Lost Lake
03a.MC.101
Lake Mechant
03a.MC.100
03b.MC.09
03a.RC.05
03a.HR.02
03a.RC.02
Caillou Lake
Lake Barre
Terrebonne Bay
Caillou Bay
Lake Pelto


U.S. Fish & Wildlife Service
Louisiana Ecological Services Field Office
Small Bayou LaPointe Marsh and Ridge Restoration
Jug Lake
Bayou DeCade
Raccourci Bay
TE-44
Pipeline route
Lake Mechant
Borrow Area
Marsh Creation - 393 acres
Ridge - 18,500 ft (23 ac)
0 0.225 0.45 0.9
Miles

Small Bayou LaPointe Marsh and Ridge Restoration

- Lake Mechant borrow site
- 393 acres of marsh creation/nourishment
- 18,500 ft of ridge restoration (23 ac)
- Net acres = 250-300
- Construction plus contingency = $25M - $30M
- Project synergy – North Lake Mechant Landbridge Restoration (TE-44)

R3-TE-08

West Raccourci Bay Marsh Creation and Terracing

TE-08

PPL27 PROJECT NOMINEE FACT SHEET
February 1, 2017

Project Name
West Raccourci Bay Marsh Creation and Terracing

Project Location
Region 3, Terrebonne Basin, Terrebonne Parish, west of Raccourci Bay, north of Lake Mechant

Problem
Examination of historical aerial photography indicates significant marsh loss in the vicinity of the project area, particularly in the area between Raccourci Bay and Lake Pagie. Subsidence, canal dredging, storm damage, and altered hydrology are all important factors contributing to marsh loss in the area. USGS calculated a 1984-2011 loss rate of -0.995% per year for the TE-72 Lost Lake Marsh Creation and Hydrologic Restoration Project.

Goals
The primary goals of this project are; 1) restore marsh habitat in the open water areas via marsh creation and terracing and 2) reduce fetch and wave energy in open water areas via the construction of terraces. Specific goals of the project are: 1) Create approximately 628 acres of marsh with dredged material from Lost Lake and 2) create 30,520 linear feet (18 acres) of terraces.

Service goals include restoration/protection of habitat for threatened and endangered species and other at-risk species. This project would restore habitat potentially utilized by the black rail, which is petitioned for listing as a threatened/endangered species. The project could also benefit other at-risk species such as the seaside sparrow. The mottled duck, a priority species for the Gulf Coast Joint Venture, would also be benefited by the restoration of intermediate/brackish marsh habitat.

Proposed Project Features
1. Sediments will be hydraulically dredged in Lost Lake and pumped via pipeline to create/nourish approximately 628 acres of marsh.
2. Containment dikes will be constructed as necessary and gapped upon project completion.
3. Approximately 30,520 ft (18 acres) of terraces will be constructed and planted with appropriate vegetation.

Preliminary Project Benefits
1) *What is the total acreage benefited both directly and indirectly*? Approximately 1,113 acres of marsh and open water habitat would be benefited by the project. Approximately 628 acres would benefit directly from marsh creation/nourishment. The terrace field encompasses 485 acres and would result in the creation of 18 acres of marsh.

2) *How many acres of wetlands will be protected/created over the project life*? The total net acres protected/created over the project life is approximately 450-500 acres.

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (<25%, 25-49%, 50-74% and >75%).* The anticipated loss rate reduction throughout the area of direct benefit is estimated to be 50%.

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.

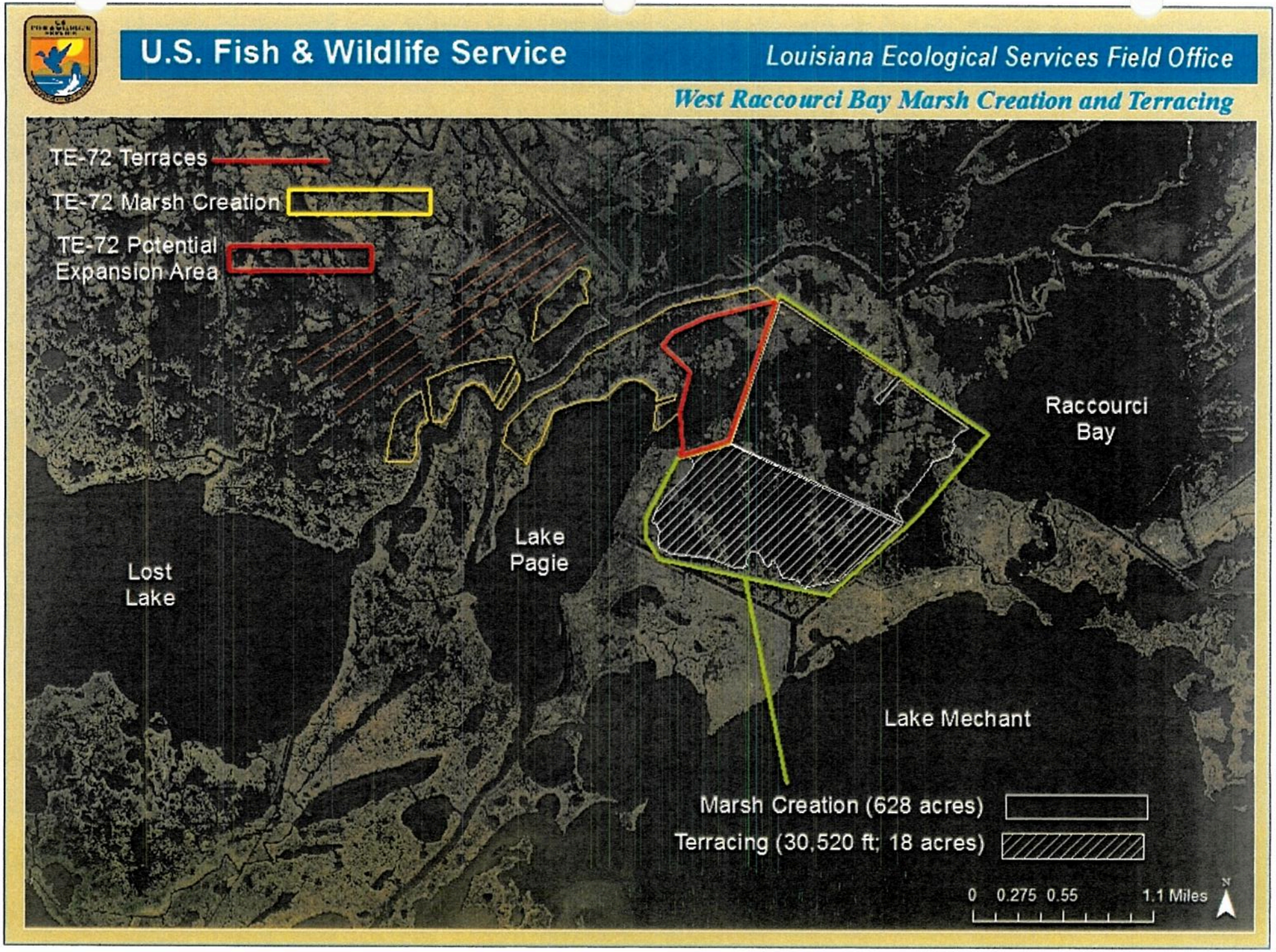
5) *What is the net impact of the project on critical and non-critical infrastructure*? None.

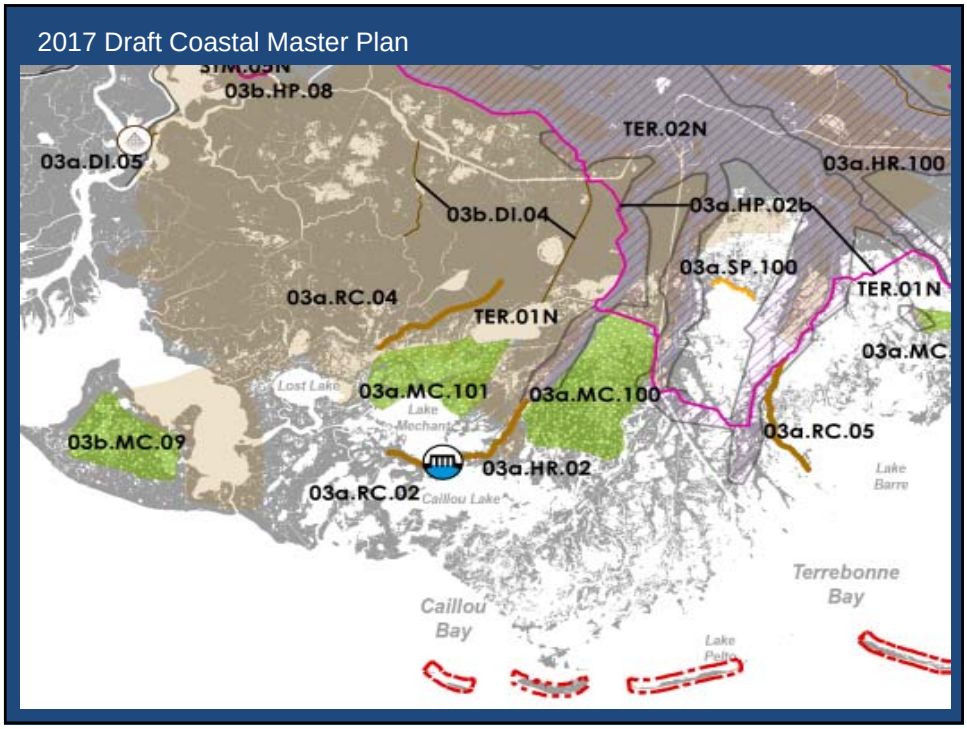
6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects*? The project would provide a synergistic effect with the North Lake Mechant Landbridge Restoration Project (TE-44) located to the south and east and the Lost Lake Marsh Creation and Hydrologic Restoration Project (TE-72) located to the west. All of these projects would work together to maintain a marsh land bridge along the intermediate zone between Lost Lake and Lake Decade.

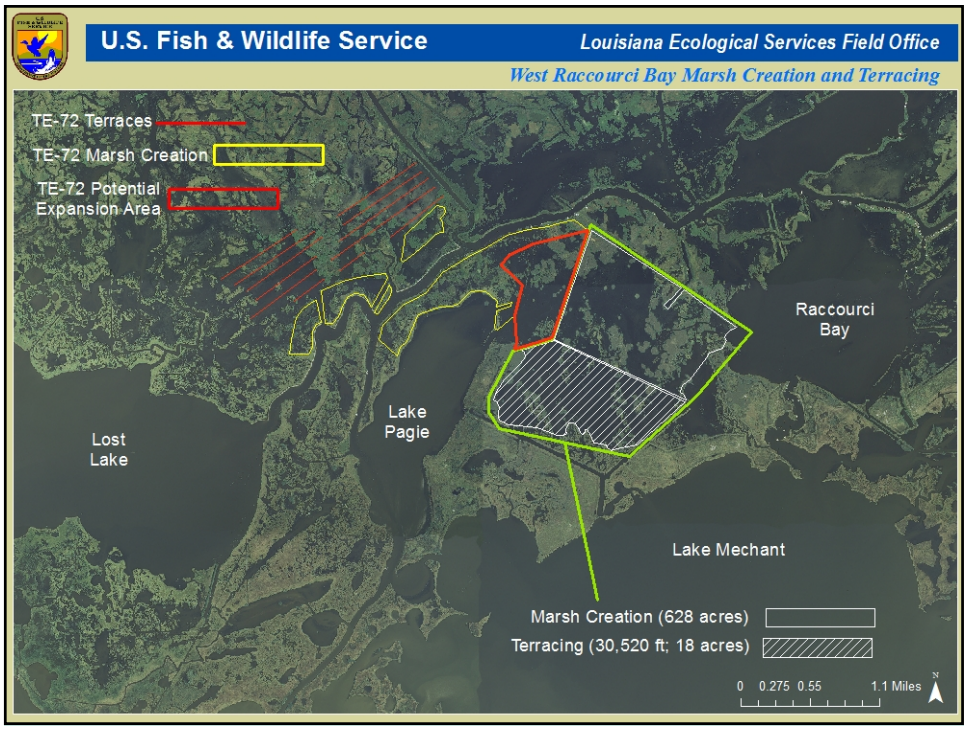
Identification of Potential Issues
None identified at this time.

Preliminary Construction Costs
The estimated construction cost including 25% contingency is $25M - $30M.

Preparer of Fact Sheet
Kevin Roy, USFWS, (337) 291-3120, kevin_roy@fws.gov


U.S. Fish & Wildlife Service
Louisiana Ecological Services Field Office
West Raccourci Bay Marsh Creation and Terracing
TE-72 Terraces
TE-72 Marsh Creation
TE-72 Potential Expansion Area
Raccourci Bay
Lake Pagie
Lost Lake
Lake Mechant
Marsh Creation (628 acres)
Terracing (30,520 ft; 18 acres)
0 0.275 0.55 1.1 Miles
N


2017 Draft Coastal Master Plan
03b.HP.08
03a.DI.05
TER.02N
03a.HR.100
03b.DI.04
03a.HP.02b
03a.SP.100
TER.01N
03a.RC.04
TER.01N
03a.MC
Lost Lake
03a.MC.101
Lake Mechant
03a.MC.100
03b.MC.09
03a.RC.05
03a.HR.02
Lake Barre
03a.RC.02
Caillou Lake
Terrebonne Bay
Caillou Bay
Lake Pelto


U.S. Fish & Wildlife Service
Louisiana Ecological Services Field Office
West Raccourci Bay Marsh Creation and Terracing
TE-72 Terraces
TE-72 Marsh Creation
TE-72 Potential Expansion Area
Raccourci Bay
Lake Pagie
Lost Lake
Lake Mechant
Marsh Creation (628 acres)
Terracing (30,520 ft; 18 acres)
0 0.275 0.55 1.1 Miles
N

West Raccourci Bay Marsh Creation and Terracing

- Lost Lake borrow site
- 628 acres of marsh creation/nourishment
- 30,520 ft of terraces (18 ac)
- Net acres = 450 - 500
- Construction plus contingency = $25M - $30M
- Project synergy – Lost Lake Marsh Creation and Hydrologic Restoration (TE-72); North Lake Mechant Landbridge Restoration (TE-44)

R3-TE-09

North Lake Boudreaux Shoreline Protection and Marsh Creation

TE-09

PPL27 PROJECT NOMINEE FACT SHEET
February 1, 2017

Project Name: North Lake Boudreaux Shoreline Protection and Marsh Creation

Project Location:
Region 3, Terrebonne Basin, Terrebonne Parish, South of Houma, Northern Shoreline of Lake Boudreaux

Problem:
Historic aerial photography indicates significant marsh loss in the project area north of Lake Boudreaux. Subsidence, canal dredging, saltwater intrusion, and altered hydrology (levees) are all important factors contributing to the loss of marsh habitat within and surrounding the project area. High saline waters enter Lake Boudreaux via Robinson and Boudreaux Canals impacting low salinity marshes north of Lake Boudreaux. USGS calculated a 1985-2016 area loss rate of -1.52% per year. Shoreline erosion rates in the areas without rock or a maintained earthen shoreline ranged from 60 ft./yr. to 9 ft./yr. Much of the lake shoreline has shoreline protection through the Corps and Parish Mitigation projects and CWPPRA West Lake Boudreaux TE-46 project. There are approximately 11,000 feet of shoreline between and adjacent to these existing projects that are in need of protection.

Goals:
The goals of the project are to 1) protect approximately 11,000 feet of critical shoreline, 2) protect approximately 75 acres of marsh habitat, 3) create approximately 300 acres of marsh and nourish an additional 200 acres of marsh with material dredged from Lake Boudreaux, and 4) create 56,000 LF of terraces (30 acres of marsh).

Service goals include the creation of habitat or improvement of habitat for rare species, species of concern, and threatened and endangered species. The creation of brackish intertidal marsh habitat would benefit several species that are currently on the lists of rare species and species of concern. These include, but are not limited to Least Bittern, Black Rail, Mottled Duck, Brown Pelican, King Rail, Louisiana Eyed Silkmoth and Saltwater topminnow.

Proposed Solutions:
The current proposed project would include 11,000 ft. of rock foreshore dike built to a settled height of +3.0 NAVD 88 along Lake Boudreaux shoreline at the -2 ft. contour. The proposed project would also create 300 acres of marsh and nourish an additional 200 acres of marsh using sediment hydraulically dredged from Lake Boudreaux. Existing canal spoil banks, emergent marsh, and segments of containment dikes will be used to contain the dredge material. Containment dikes will be degraded and/or gapped as necessary to reestablish hydrologic connectivity with adjacent wetlands. The current proposal would also create 56,000 LF of terraces (30 acres of marsh) in the open water area north and east of the lake which would protect the Ward 7 levee.

Preliminary Project Benefits:
1) What is the total acreage benefited both directly and indirectly? Approximately 1,400 acres would be benefited.

2) How many acres of wetlands will be protected/created over the project life? The total net acres protected/created over the project life are approximately 362 acres.

3) What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (<25%, 25-49%, 50-74% and >75%). Loss rate reduction should be 50>74%.

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. This project would contribute to protection of the Lake Boudreaux shoreline and the Ward 7 Levee.

5) What is the net impact of the project on critical and non-critical infrastructure? There oil and gas facilities that would be protected along with the newly constructed Terrebonne Non-Federal Levee, and Ward 7 Levee. The project would also help protect the city of Houma, Chauvin, and Boudreaux.

6) To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects? This project would work synergistically with TE-46 and the Terrebonne Parish Ward 7 mitigation.

Identification of Potential Issues:
There are two nearby existing borrow site that are cleared for dredging.

Preliminary Construction Costs:
The estimated construction cost including 25% contingency is $27 M.

Preparer(s) of Fact Sheet:
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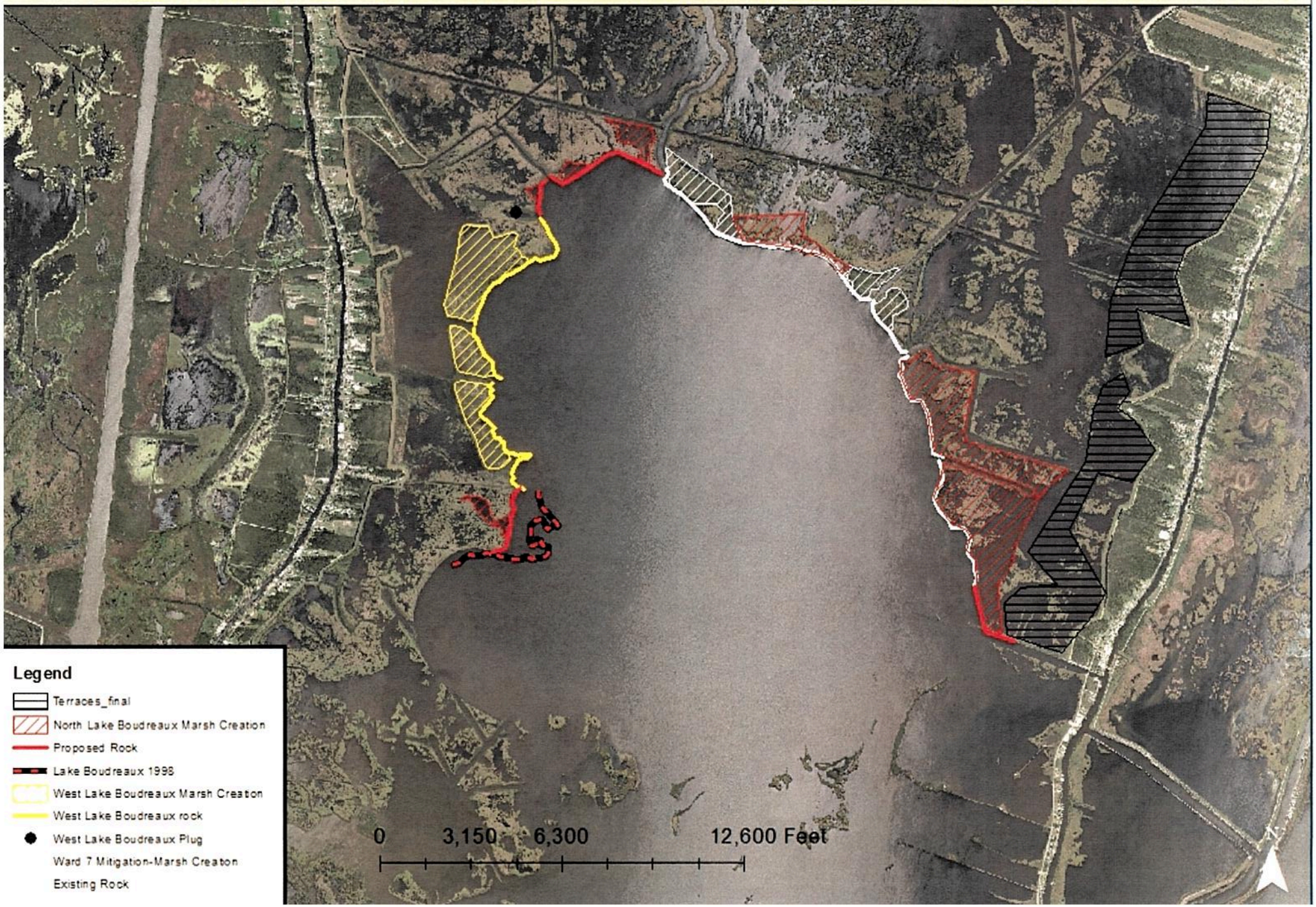
U.S Fish and Wildlife Service - Louisiana Ecological Sevices Field Office

PPL27 - North Lake Boudreaux Marsh Creation and Shoreline Protection

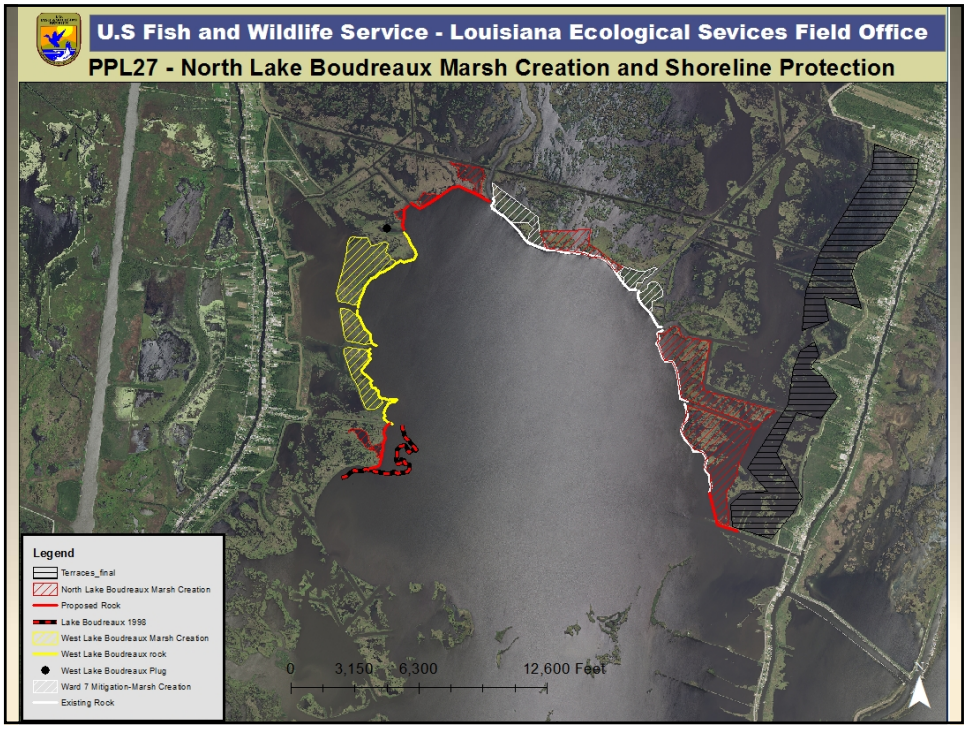


NORTH LAKE BOUDREAUX MARSH CREATION AND SHORELINE PROTECTION

NORTH LAKE BOUDREAUX MARSH CREATION AND SHORELINE PROTECTION

Problem:

- **Subsidence, canal dredging, saltwater intrusion, and altered hydrology**
- **Shoreline Erosion**
- **Erosion rates between 9-60 ft./yr.**


U.S Fish and Wildlife Service - Louisiana Ecological Sevices Field Office
PPL27 - North Lake Boudreaux Marsh Creation and Shoreline Protection
Legend
Terraces_final
North Lake Boudreaux Marsh Creation
Proposed Rock
Lake Boudreaux 1998
West Lake Boudreaux Marsh Creation
West Lake Boudreaux rock
West Lake Boudreaux Plug
Ward 7 Mitigation-Marsh Creation
Existing Rock
0 3,150 6,300 12,600 Feet


U.S Fish and Wildlife Service - Louisiana Ecological Sevices Field Office
PPL27 - Lake Boudreaux Marsh Creation and Shoreline Protection
Legend
Terraces_final
North Lake Boudreaux Marsh Creation
Proposed Rock
Lake Boudreaux 1998
West Lake Boudreaux Marsh Creation
West Lake Boudreaux rock
West Lake Boudreaux Plug
Ward 7 Mitigation-Marsh Creation
Existing Rock
0 2,500 5,000 10,000 Feet

NORTH LAKE BOUDREAUX MARSH CREATION AND SHORELINE PROTECTION

Solution:

- **Build 11,000 ft. of foreshore rock dike along the -2 ft. contour and built to a height of +3.0 ft.**
- **Hydraulically dredge material from Lake Boudreaux water bottom to create 300 acres and nourish 200 acres of marsh.**
- **Construct 56,000 lf of Terraces (30 acres of Marsh).**

NORTH LAKE BOUDREAUX MARSH CREATION AND SHORELINE PROTECTION

Goals:

- Protect +11,000 feet of critical shoreline and 75-100 acres of marsh.
- Create 300 acres of marsh.
- Nourish 200 acres of marsh.
- Create 56,000 lf of terraces (30 acres of marsh).

Net Acres:

- Total net acres = 362 acres marsh

Potential Issues:

- There are two existing borrow site that could be utilized if needed.

Preliminary Construction Costs

- The estimated construction cost plus 25% contingency $26M.

Species of Concern and Rare Species

- Least Bittern
- Black Rail
- Mottled Duck
- Brown Pelican
- Louisiana Eyed Silkmoth
- King Rail

R3-TE-10

Point au Fer Marsh Creation

TE-10

PPL27 PROJECT NOMINEE FACT SHEET
February 1, 2017

Project Name: Point au Fer Marsh Creation

Project Location:
Region 3, Terrebonne Basin, Terrebonne Parish, Point au Fer Island, South of Locust Bayou

Problem:
Historic project area land loss includes subsidence, altered hydrology (from numerous canals), and wind and wave erosion. This area receives fresh to low salinity water from the Atchafalaya River via Four League Bay and higher saline water from the Gulf of Mexico via Locust Bayou. USGS calculated a 1985-2016 area loss rate of -1.80% per year.

Goals:
The goals of the project are to 1) create approximately 405 acres of marsh and nourish an additional 65 acres of marsh with dredged material from Atchafalaya Bay, 2) create 56,000 lf of Terraces (40 acres of marsh) and 3) close 4 openings into the interior marsh.

Service goals include the creation of habitat or improvement of habitat for rare species, species of concern, and threatened and endangered species. The creation of low salinity brackish and intermediate intertidal marsh habitat would benefit several species that are currently on the lists of rare species and species of concern. These include, but are not limited to Least Bittern, Black Rail, Mottled Duck, Brown Pelican, and King Rail.

Proposed Solutions:
The current proposed project would include the creation of 405 acres of brackish marsh and nourish 65 additional acres of marsh. The marsh would be created with material dredged from Atchafalaya Bay and contained with earthen dikes and existing spoil banks. Containment dikes would be degraded and/or gapped as necessary to reestablish hydrologic connectivity with adjacent wetlands. The current proposal would also create 56,000 LF of terraces (40 acres of marsh) in the open water area north of the created marsh with long reach excavators. These terraces would capture sediment and reduce wind induced erosion.

Preliminary Project Benefits:
1) What is the total acreage benefited both directly and indirectly? Approximately 1,270 acres would be benefited.

2) How many acres of wetlands will be protected/created over the project life? The total net acres protected/created over the project life are approximately 381 acres.

3) What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (<25%, 25-49%, 50-74% and >75%). Loss rate reduction should be 50>74%.

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? There several oil and gas facilities that would be protected.

6) To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects? This project would work synergistically with TE-26 Lake Chapau sediment Input and Hydrologic Restoration project and TE-22 Point au Fer Canal Plugs project.

Identification of Potential Issues:
There are oil and gas facilities and pipeline in the area.

Preliminary Construction Costs:
The estimated construction cost including 25% contingency is $24.5 M.

Preparer(s) of Fact Sheet:
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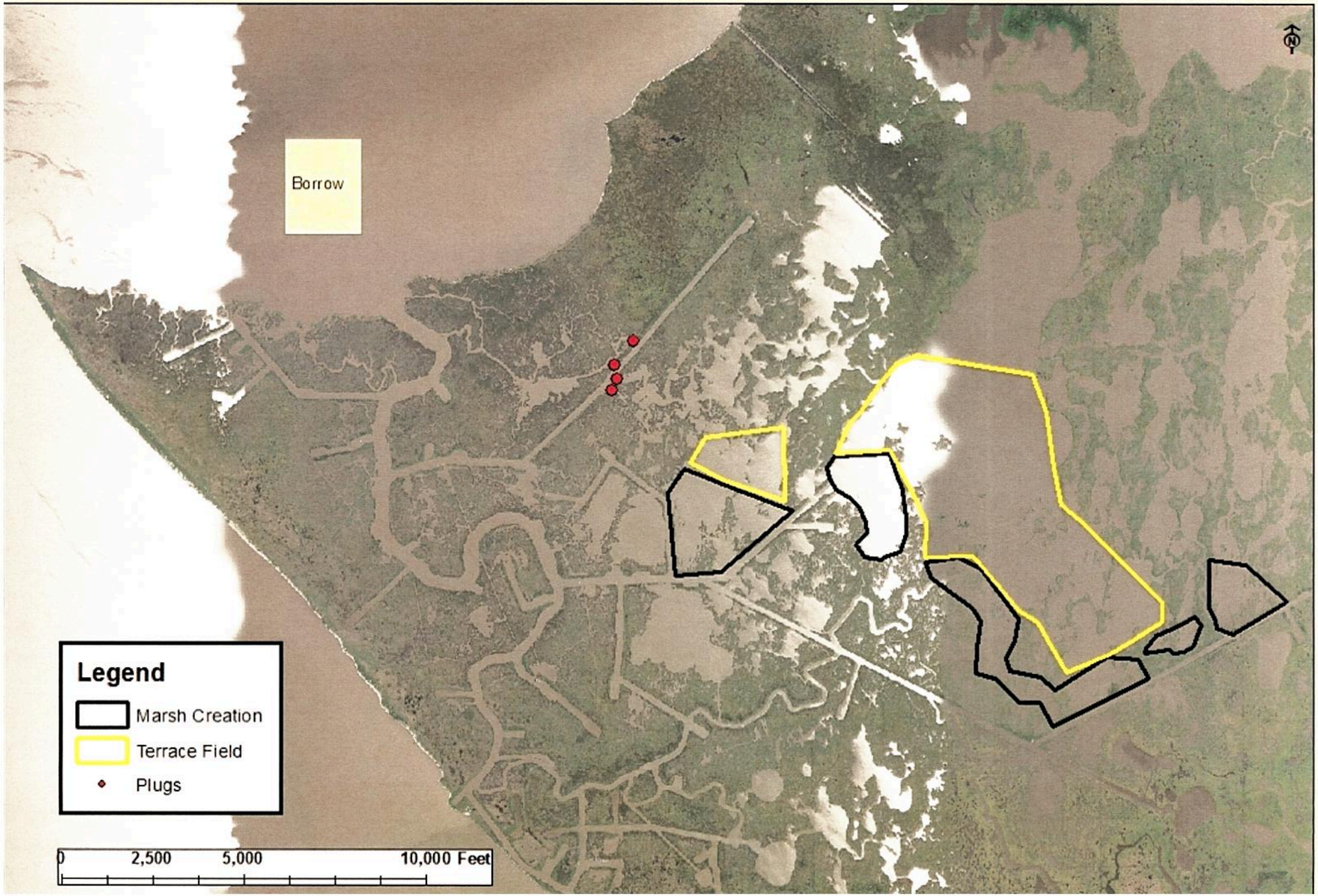
U.S. Fish & Wildlife Service

Louisiana Ecological Services

PPL 27 Point au Fer Marsh Creation

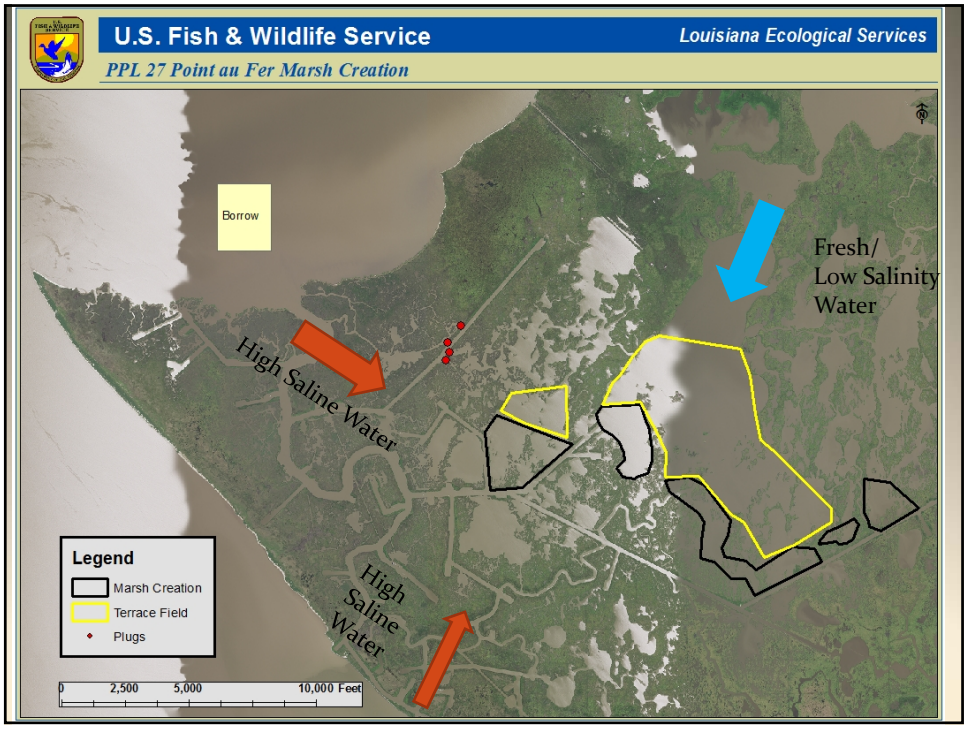


POINT AU FER MARSH CREATION

POINT AU FER MARSH CREATION

Problem:

- **Subsidence, canal dredging, saltwater intrusion, wind and wave induced shoreline erosion and altered hydrology**



POINT AU FER MARSH CREATION

Solution:

- **Create 400 acres of marsh and nourish an additional 65 acres of marsh with material hydraulically dredge from Atchafalaya Bay.**
- **Create 56,000 lf of Terraces (40 acres)**
- **Close 4 openings into the interior marsh**

POINT AU FER MARSH CREATION

Goals:

- Create 400 acres of marsh.
- Nourish 65 acres of marsh.
- Create 56,000 LF of terraces (40 acres of marsh).

Net Acres:

- Total net acres = 81 acres

Potential Issues:

- There are two existing borrow site that could be utilized if needed.

Preliminary Construction Costs

- The estimated construction cost plus 25% contingency $24.5 M.

Species of Concern and Rare Species

- Least Bittern
- Black Rail
- Mottled Duck
- Brown Pelican
- King Rail

R3-TE-11

Pointe au Chien Ridge Restoration and Marsh Creation

TE-11

PPL27 PROJECT NOMINEE FACT SHEET
February 1, 2017

Project Name
Pointe au Chien Ridge Restoration and Marsh Creation

Master Plan Strategy
Bayou Pointe au Chien Ridge Restoration. Restoration of approximately 57,000 ft (130 acres) (2012/2017 Draft Master Plan 03a.RC.06) of historic ridge to an elevation of 5 ft NAVD88 along the southern portions of Bayou Terrebonne to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation. Terrebonne Bay Rim Marsh Creation Study (2012 Master Plan 03a.MC.03p). Planning, engineering and design to develop marsh creation along the northern rim of Terrebonne Bay (approximately 3,370 ac).

Project Location
Region 3, Terrebonne Basin, Lafourche Parish and Terrebonne Parish

Problem
Ridges only build up when they are being formed along the banks of active distributaries or as active gulf beaches. Surface elevations of all relict natural levee ridges, chenier ridges, artificial ridges, embankments, levees, and uplands become lower through time in response to subsidence. As a result, both the Deltaic and Chenier Plain systems are badly degraded (Coast 2050: Toward a Sustainable Coastal Louisiana). The land loss rate for the area is -1.05% per year.

Goals
Create 13,985 linear feet of ridge along southern portions of Bayou Terrebonne to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation. Create/nourish 400 acres emergent marsh with sediment from the Deep Lake and Lake Raccourci.

Proposed Solution
The proposed project would create and fortify 13,985 linear feet of ridge. The proposed project will create/nourish 402 acres of marsh by dredging sediment from designated borrow sources in Deep Lake and Lake Raccourci. Containment features would be degraded or gapped as needed to promote tidal exchange after consolidation of the fill material. 50% of the newly created area will include vegetative plantings.

Project Benefits
- Create 13,985 linear feet of ridge along southern portions of Bayou Terrebonne.
- Create/nourish 402 acres emergent marsh with sediment from Deep Lake and Lake Raccourci.

Preliminary Cost
The preliminary project cost estimate with 25% contingency is approximately $26 million. The fully funded range is $30M - $35M.

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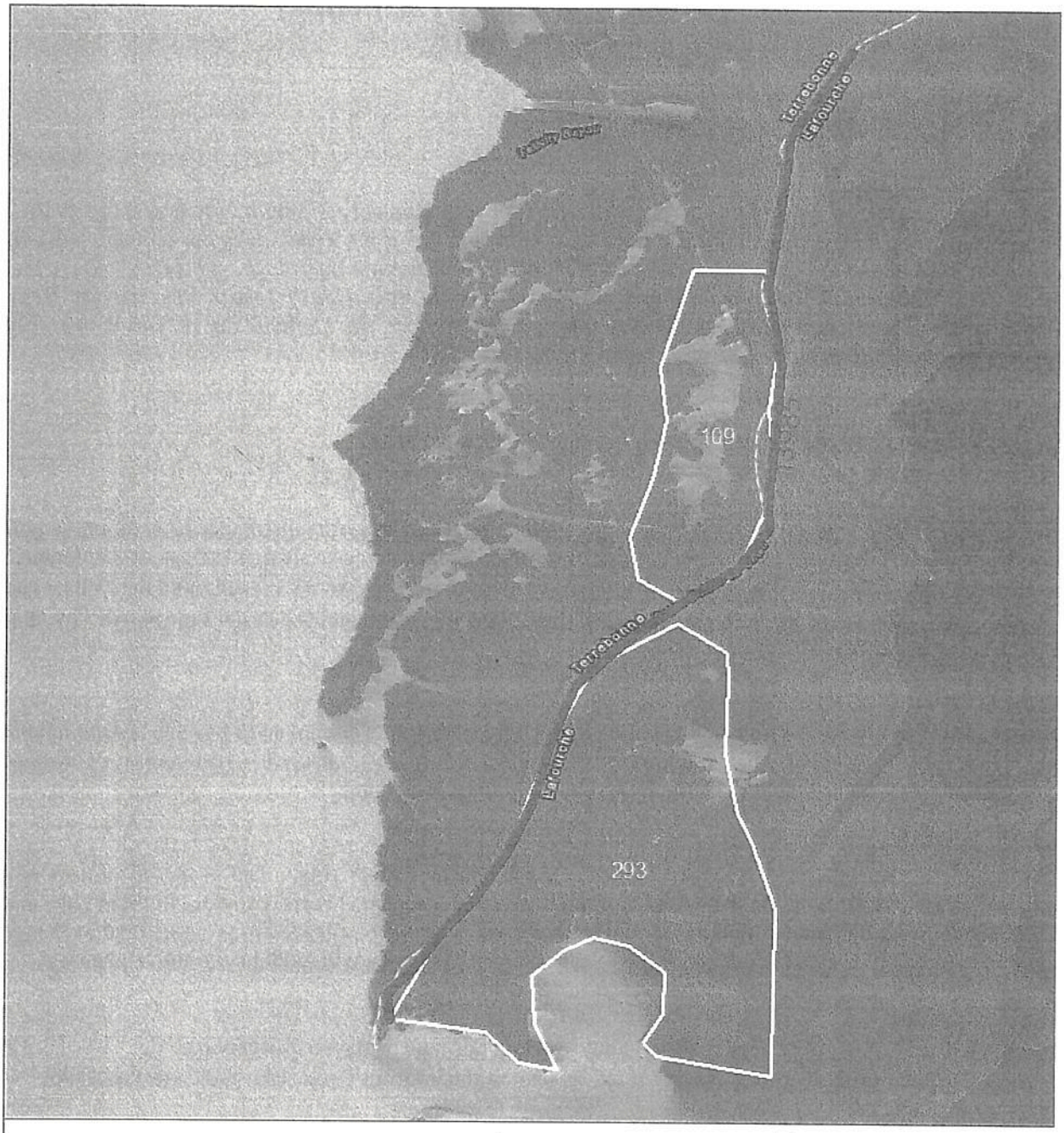


Bayou Pointe au Chien Ridge Restoration and Marsh Creation

Proposed Marsh Creation
Proposed Ridge Restoration

N

Basemap: 2015 NAIP DOQQ - LaFourche Parish
Produced by: EPA Region 6, Dallas, TX

0 0.15 0.3 0.6 0.9 Miles

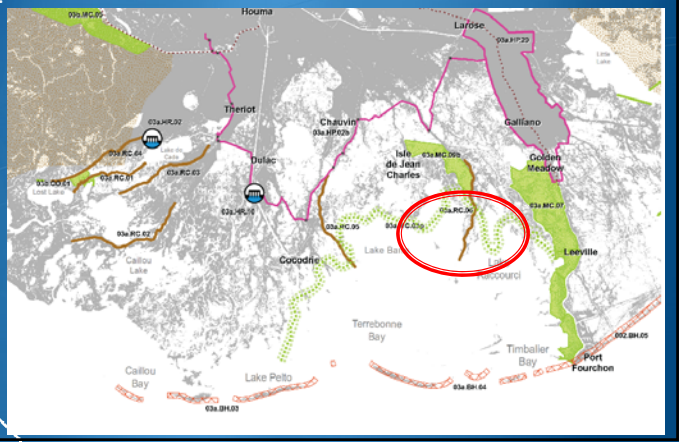
Pointe au Chien Ridge Restoration and Marsh Creation

Coastal Wetlands Planning, Protection and Restoration Act

2012/2017 Master Plan Solution

03a.RC.06 Bayou Pointe au Chien Ridge Restoration: Restoration of approximately 57,000 ft (130 acres) of historic ridge along the southern portions of Bayou Terrebonne to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation

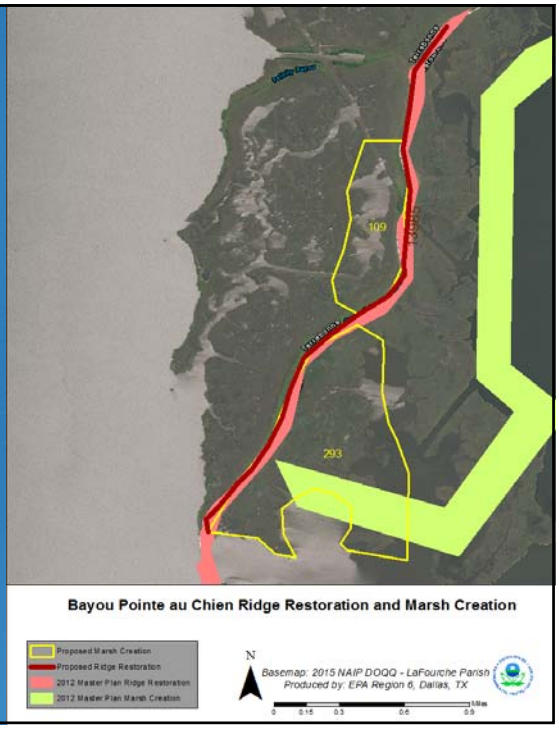
03a.MC.03p Terrebonne Bay Rim Marsh Creation Study: Planning, engineering and design to develop marsh creation along the northern rim of Terrebonne Bay (approximately 3,370 ac).



2012/2017 Master Plan Consistency

03a.RC.06: Bayou Pointe au Chien Ridge Restoration

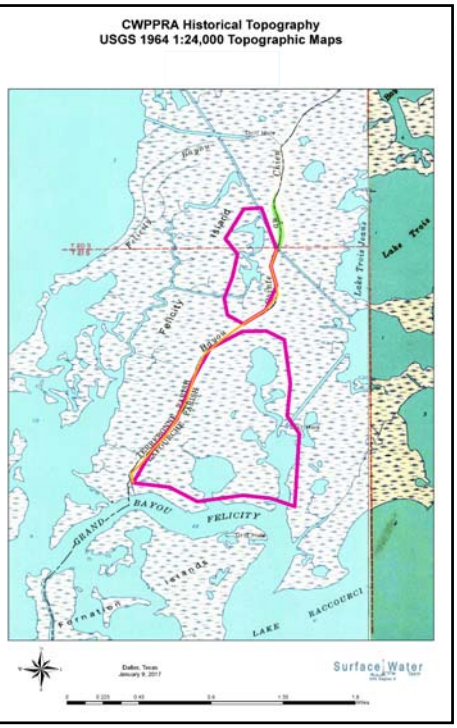
03a.MC.03p: Terrebonne Bay Rim Marsh Creation Study (2012 MP only)



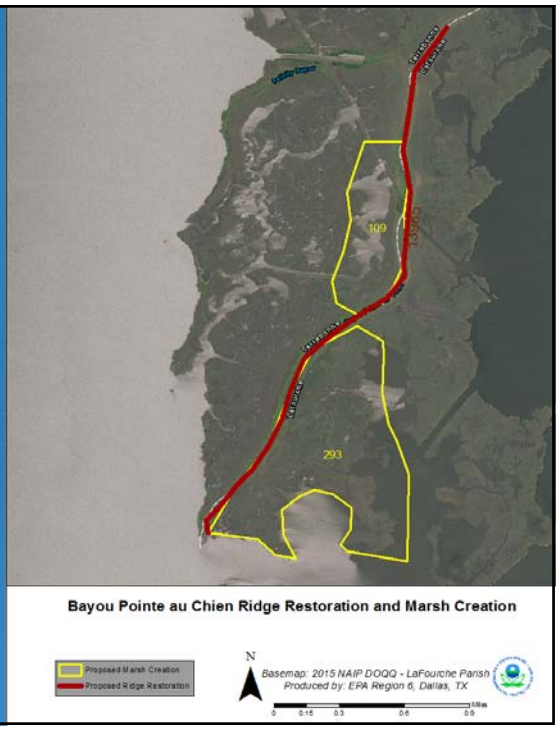
Problems

- High subsidence of soils & sediment deficit
- Saltwater intrusion
- Construction of access/pipeline canals; historic oil and gas activity
- Historic ridges have been damaged or eliminated due to storm surge and erosion
- Natural hydrologic patterns have been affected by the lack of historic ridge features
- Terrebonne Parish could experience the second highest land loss of any Parish (2017 MP)
- LaFourche Parish could be at risk for increased storm surge and flooding in the next 50 years (2017 MP)

Historical Reference



Project Features



Project Goals

- Create/nourish 402 acres emergent marsh with sediment from Deep Lake and Lake Raccourci
- Restore the natural ridge by creating 13,985 linear feet of ridge
- Estimated preliminary cost w/25% contingency is $26 million
- Fully funded cost range $30-35M

R3-TE-12

North Bayou Decade Ridge and Marsh Creation

TE -12

North Bayou Decade Ridge and Marsh Creation

PPL-27 Region 3 RPT Meeting
February 1, 2017

State Master Plan Strategy
03a.Rc.01 Bayou DeCade Ridge Restoration

Project Location:
Region 3, Terrebonne Basin, Terrebonne Parish, North Bayou Decade

Problem:
The marshes along Bayou Decade have deteriorated dramatically over the past few decades. Coastal restoration actions have focused on improving hydrologic conditions in the area to reduce salinities and improved freshwater flows from the Atchafalaya River. Significant improvements have been made yet there are some areas of large open water that are slow to improve. Marsh creation would rapidly recover marshes along with protection afforded by elevation of ridge features on the north bank of the bayou.

Goals:
The goal of the project is to create a ridge feature on the north bank of Bayou Decade and create marsh in a vast expanse of open water where marsh used to exist.

Proposed Solutions:
Sediments will be hydraulically dredged from Lake Mechant and pumped via pipeline to create approximately 310 acres of marsh habitat and in situ material will be excavated to create a ridge feature.

Project Benefits:
The project would result in approximately 310 acres marsh created and 18,736 linear feet of ridge habitat.

Project Costs:
Estimated construction cost is approximately $23.8 million.

Preparer(s) of Fact Sheet:
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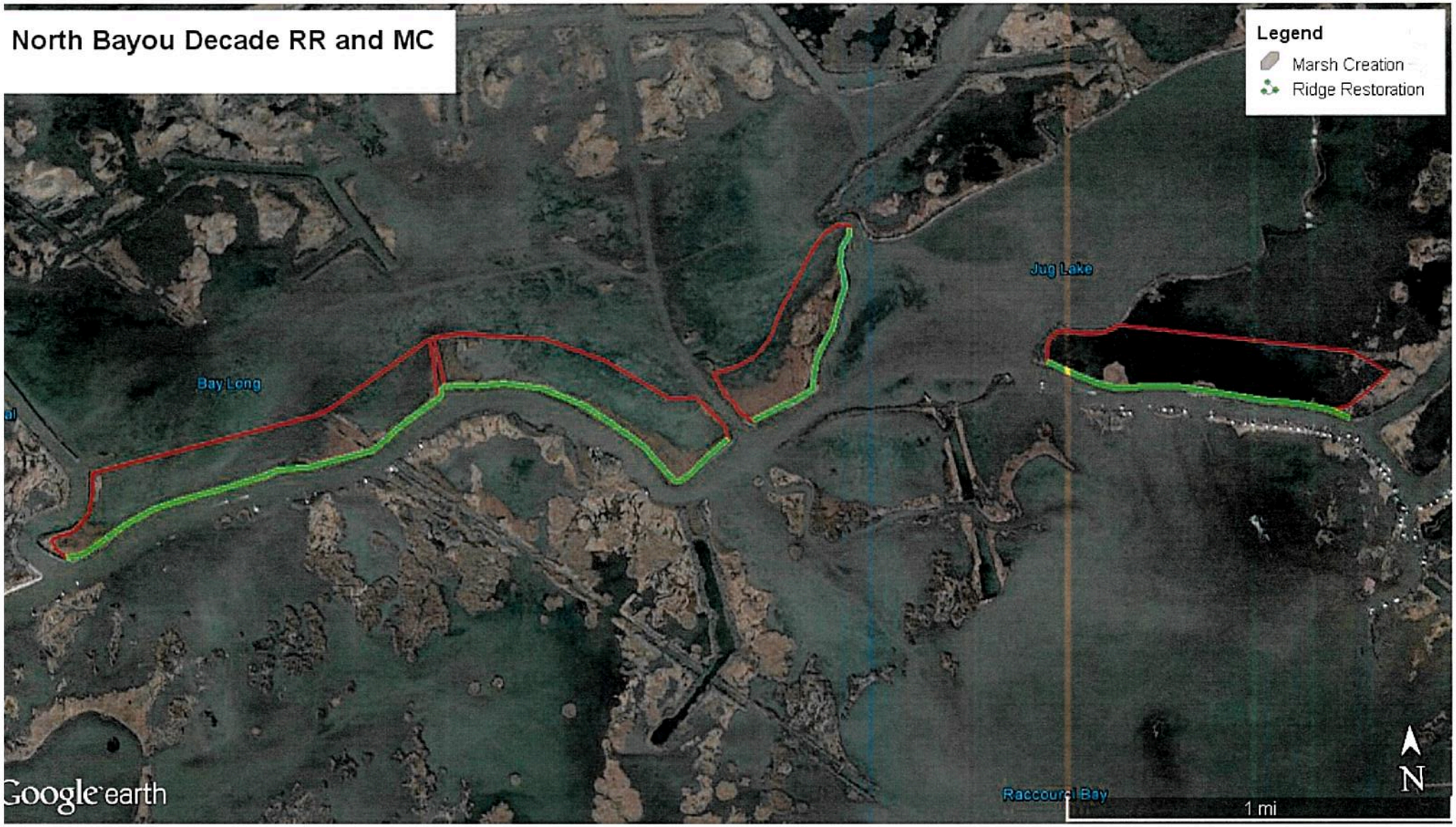
North Bayou Decade RR and MC
Legend
Marsh Creation
Ridge Restoration
Jug Lake
Bay Long
Raccourci Bay
Google earth
N
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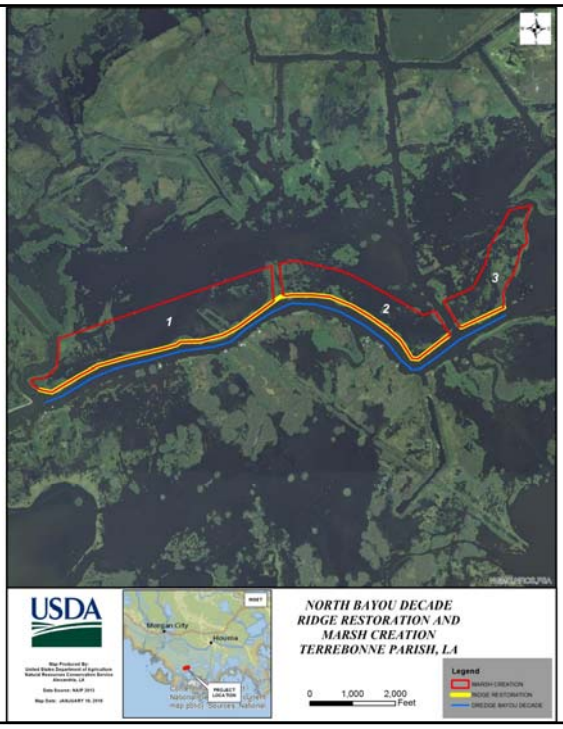
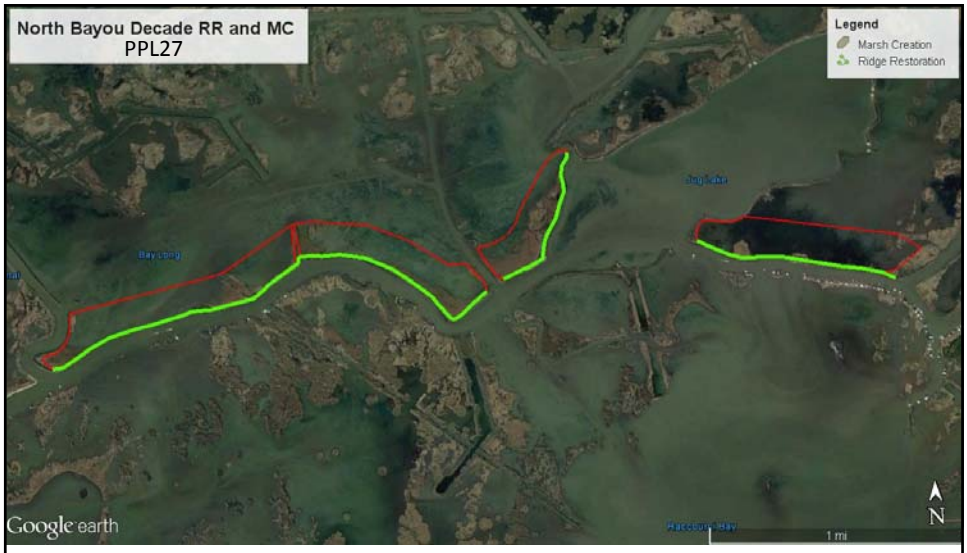


North Bayou Decade
Ridge and Marsh Creation
PPL26

Project Objectives:
1) Create ridge feature along north bank of Bayou Decade
2) Create marsh in large open water area where deteriorated

Benefits:
247 acres of marsh creation
12,000 linear ft of ridge

Cost:
Construction Costs + 25% = $19 million



Project Objectives:
1) Create ridge feature along north bank of Bayou Decade
2) Create marsh in large open water area where deteriorated

Benefits:
310 acres of marsh creation
18,700 linear ft of ridge

Cost: Construction + 25% = $23.8 million

R3-TE-13

South Catfish Lake Marsh Creation

TE-13

South Catfish Lake Marsh Creation

PPL-27 Region 3 RPT Meeting
February 1, 2017

State Master Plan Strategy
03a.MC.09b Belle Pass-Golden Meadow Marsh Creation

Project Location:
Region 3, Terrebonne Basin, Lafourche Parish, South of Catfish Lake and south side of Twin Pipelines.

Problem:
Eastern Terrebonne Basin is significantly isolated from the riverine influences of the Mississippi and Atchafalaya Rivers. Consequently, both subsidence and erosion of shorelines have occurred at some of the highest rates in Louisiana. The southern half of the Catfish Lake shoreline has experienced significant erosion and the interior marsh has also succumbed to several large ponds that tend to expand and accelerate erosion. The State has identified this region as a priority in the master plan.

Goals:
The goal of the project is to strategically create marsh on the southern side of Catfish Lake to prevent further expansion into the adjacent marshes.

Proposed Solutions:
Sediments will be hydraulically dredged from Catfish Lake and pumped via pipeline to create/nourish approximately 280 acres of marsh habitat.

Project Benefits:
The project would result in approximately 220 net acres over the 20 year project life.

Project Costs:
Estimated construction cost with 25% contingency is approximately $16 million.

Preparer(s) of Fact Sheet:
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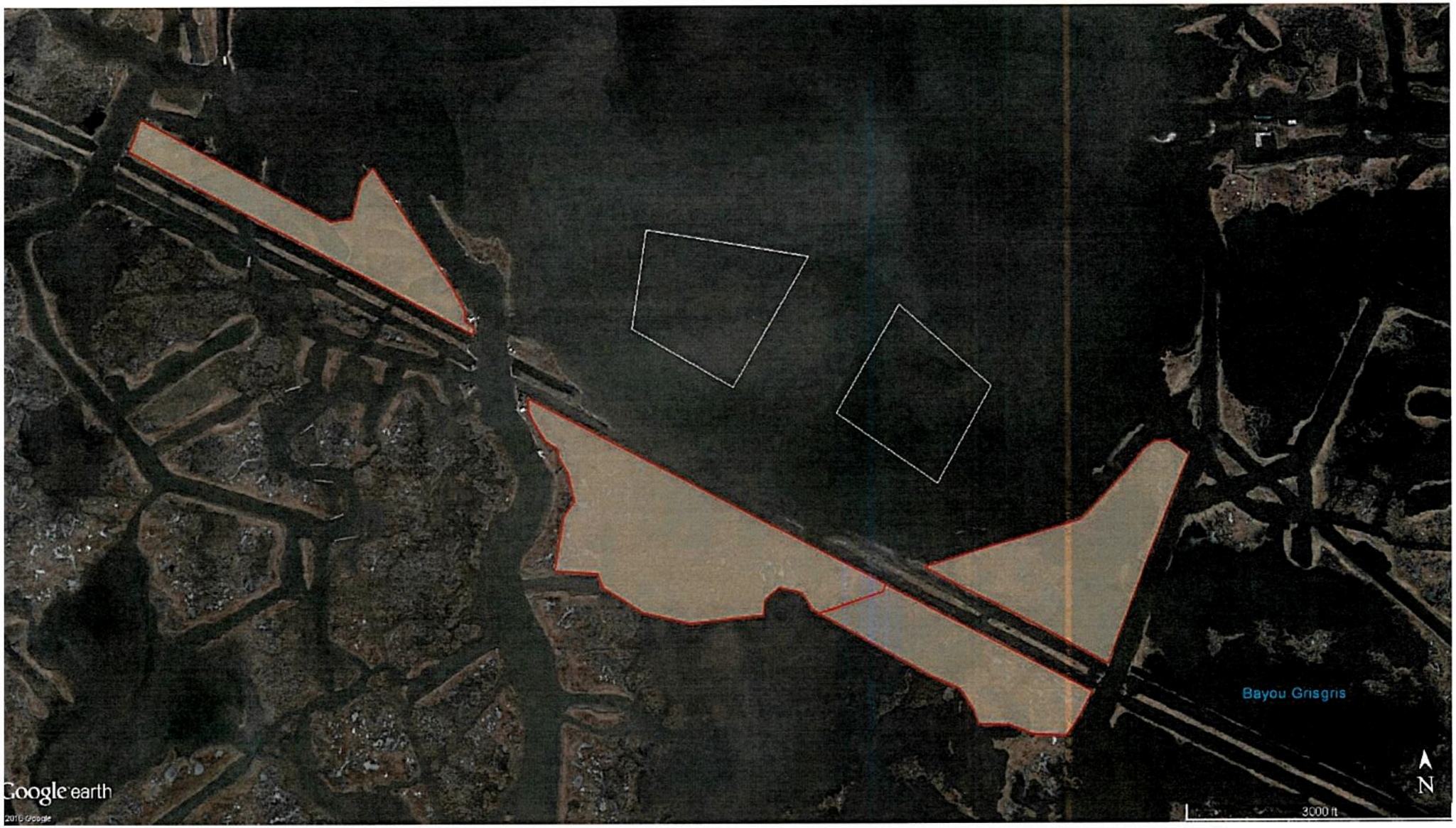
Bayou Grisgris
N
3000 ft
Google earth
2016 Google

Project Objectives:
1) Create marsh along the southern periphery of Catfish Lake
2) Maintain the integrity of the lake rim and adjacent marshes

Benefits:
280 acres of marsh creation/nourishment

Cost:
Construction Costs + 25% = $16 million

NRCS