Coastal Wetlands Planning Protection & Restoration Act

31st Priority Project List

Region 3

Regional Planning Team Meeting

Lead:
Ron Boustany, NRCS

February 3, 2021

CWPPRA

Announcements

- PPL 31 RPT meetings to accept project nominees:
  - Region IV, Feb. 2, 2021, 10:00 am
  - Region III, Feb. 3, 2021, 9:30 am
  - Region II, Feb.4, 2021, 10:00 am
  - Region I, immediately following Region II

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**

RPT Meetings

- Project proposals should be consistent with the 2017 State Master Plan.
- A project can only be nominated in one basin except for coastwide projects
- Proposals that cross multiple basins 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 Lead will call for a break
  - RPT representatives will then participate in a “breakout session” via WebEx to determine the path forward

CWPPRA

RPT Meetings

- All proposals submitted in advance will go in the order indicated on the agenda.
- A request for all other proposals will occur after advance submissions.
- Limit project proposals to 5 minutes.
- Public comments on project proposals will be accepted verbally during the RPT meetings and in writing by February 18, 2021.
- Limit comments/questions during meeting to PPL 31 subject proposals and processes.

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Coastwide Projects

- Proposes a proven technique applicable across the coast (e.g. vegetative planting)
- Nominated at any RPT meeting
- Engineering/Environmental Workgroups will validate that coastwide projects fit CWPPRA Standard Operating Procedures criteria
- All coastal parishes & agencies will vote on selection of one coastwide nominee

Demonstration Projects

- Demonstrates a coastal wetlands restoration technique or material that can be transferred to other areas of the coastal zone
- Engineering/Environmental Workgroups will validate that demos fit CWPPRA Standard Operating Procedures criteria
- All coastal parishes & agencies will vote on selection of up to 6 demos.
- Previous demo candidates must be ***re-nominated*** for PPL 31.

Coastwide Electronic Vote (Feb. 23rd) 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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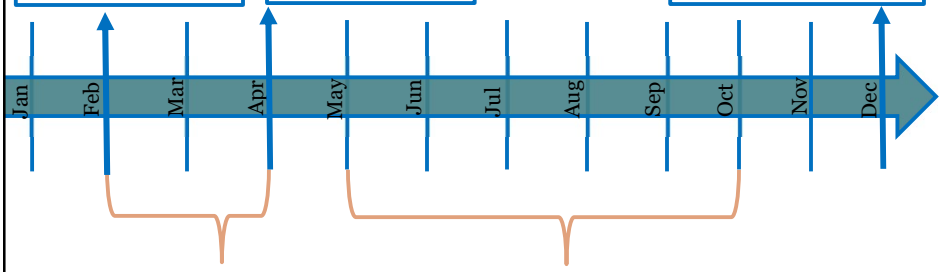
PPL 31 Timeline

Coastwide Electronic Vote (23 Feb)
- 21 Basin
- 1 coastwide
- Up to 6 demos

April Technical Committee Mtg
- 10 candidates
- Up to 3 demos

December Technical Committee Mtg
- Recommend up to 4 projects for Phase 1 funding



March – April 2021
- Agencies assigned to projects
- Fact sheets developed
- Workgroup review
- Workgroups may recommend that no demos move forward

May – October 2021
- Site visits
- Workgroup evaluations

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Written Comments

- Send written comments on projects & demos proposed today to the CWPPRA program manager
- **Deadline: February 18, 2021**

Sarah Bradley
U.S. Army Corps of Engineers
CEMVN-PM-R, RM 331
7400 Leake Avenue
New Orleans, LA 70118

Email: Sarah.C.Bradley@usace.army.mil

(this information has been provided via CWPPRA Newsflash and posted on the USACE CWPPRA webpage)

For more info, please visit lacoast.gov or contact Alice Kerl at Alice.P.Kerl@usace.army.mil

Region 3

Atchafalaya – No Proposals

Teche-Vermilion

R3, TV-01	SE Marsh Island MC and Nourishment	EPA
R3, TV-02	West Branch MC on Marsh Island	NMFS
R3, TV-03	Freshwater Bayou East Restoration	NRCS
R3, TV-04	Lake Sand MC	NRCS
R3, TV-05	Shark Island	NRCS

Terrebonne

R3, TE-01	Lake Chien Shoreline MC	USACE
R3, TE-02	Pointe aux Chene MC	USACE
R3, TE-03	Port Fourchon MC	EPA
R3, TE-04	South Bayou Decade MC	EPA
R3, TE-05	Trinity Island Beach and MC	EPA
R3, TE-06	Timbalier Island Beach and MC	EPA
R3, TE-07	Jug Lake MC&T	NMFS
R3, TE-08	West LA Hwy 1	NMFS
R3, TE-09	West Raccourci MC & T	NRCS
R3, TE-10	Bayou Jean Lacroix	NRCS
R3, TE-11	Mound Bayou MC	NRCS
R3, TE-12	Bayou Barre MC & T	FWS
R3, TE-13	North Lake Boudreaux MC & SP	FWS
R3, TE-14	Southwest Golden Meadow	FWS

PPL31 PROJECT FACT SHEET
February 3, 2021

Project Name
Southeast Marsh Island Marsh Creation and Nourishment

Master Plan Strategy
Southeast Marsh Island (2017 Master Plan 03b.MC.101): Creation of approximately 1,200 acres of marsh on the eastern tip of Marsh Island to create new wetland habitat and restore degraded marsh.

Project Location
Region 3, Teche-Vermilion Basin, Iberia Parish, Southeast end of Marsh Island Wildlife Refuge.

Problem
Areas of emergent marsh in Marsh Island interior have been converted to open water, primarily due to hurricane activity and subsidence. Marsh Island provides protection to tens of thousands of wetland acres and over 75 miles of shorelines on the mainland to the north, west and east of the island (Iberia, Vermilion and St. Mary parishes). It provides crucial protection to over 10,000 acres of susceptible/fragile marsh to the west and northwest of the project. Marsh Island has been projected to lose 12.9% of its marsh habitat through 2050. Areas targeted by this project are those with the greatest historic land loss and are proximal to East Cote Blanche Bay.

Proposed Solution
The project would utilize hydraulic dredging from a borrow site (located in the bay and potentially the same one used for TV-21 or the Gulf of Mexico) to create/nourish approximately 668 acres of emergent marsh by completely filling in open water and deteriorated areas. Unconfined or limited confinement techniques will be used allowing finer material to flow through the interior marsh areas and provide nourishment. Efforts will be made to limit water quality impacts and minimize impacts to potential oyster bed areas. This project would complement the constructed Marsh Island Hydrologic Restoration (TV-14) and the East Marsh Island Marsh Creation (TV-21) projects on the east-end of Marsh Island.

Project Benefits
Create/nourish approximately 668 acres of emergent marsh using dredged sediment.

Project Costs
The estimated construction cost including 25% contingency is $20M - $25M.

Preparer(s) of Fact Sheet:
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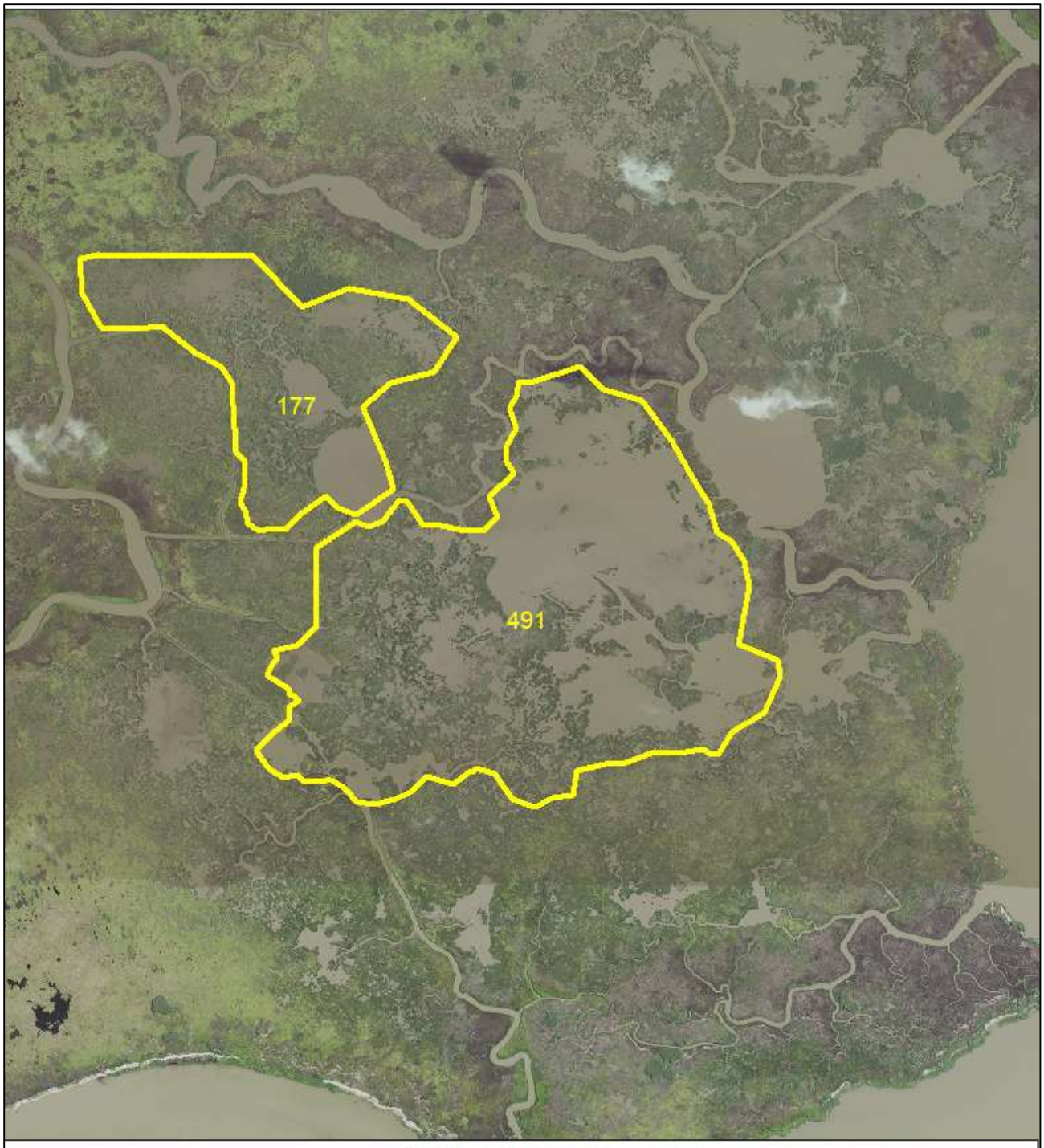


SE Marsh Island
Marsh Creation

SEMarsh Island MC

N

Basemap: 2019 USGS Iberia Parish
Produced by: EPA Region 6, Dallas, TX

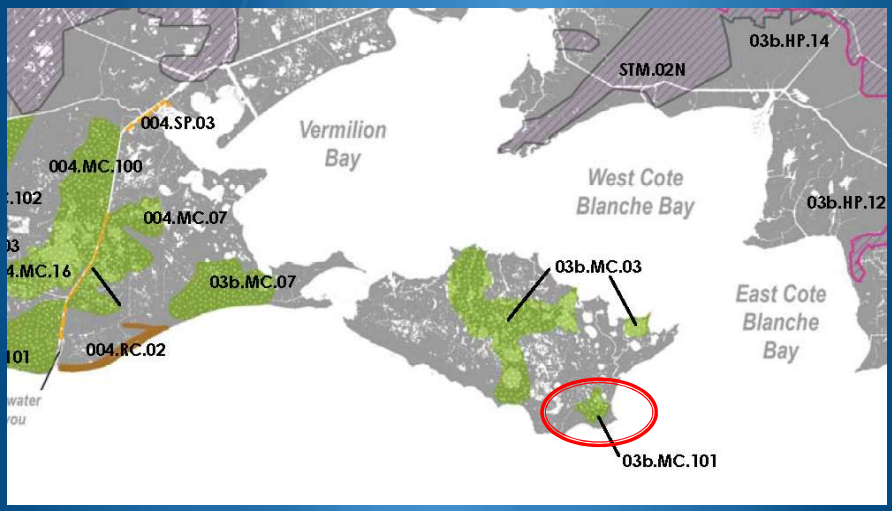
0 0.15 0.3 0.6 0.9 Miles

SE Marsh Island Marsh Creation

Coastal Wetlands Planning, Protection and Restoration Act

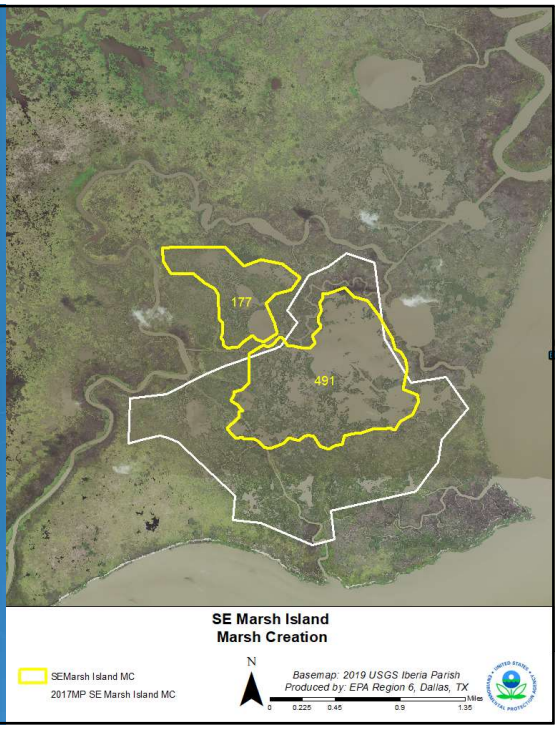
2017 Master Plan Solution

03b.MC.101 Southeast Marsh Island Marsh Creation : Creation of approximately 1,200 acres of marsh on the eastern tip of Marsh Island to create new wetland habitat and restore degraded marsh.



2017 Master Plan Consistency & Project Synergy

- 03b.MC.101 Southeast Marsh Island Marsh Creation
- Synergistic with TV-21 & TV-14
- TV 21 borrow source may be used for this proposal



Problems/Concerns

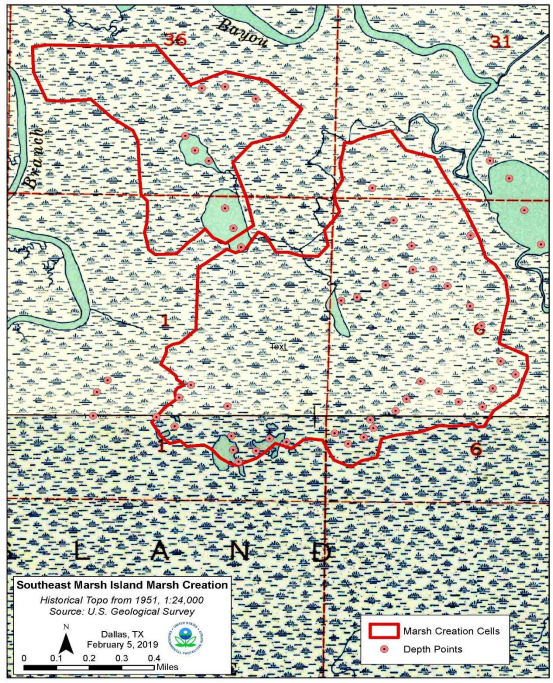
- Subsidence, storm and hurricane activity have increased wetland loss
- Iberia Parish could lose an additional 12.9% of its land area over the next 50 years and face severe storm surge flood risk (2017 MP).
- 90% or more of Marsh Island would experience 15ft + storm surge and would be lost in 50 years under the medium scenario (2017MP)

Project Significance

- Marsh Island provides protection to tens of thousands of wetland acres and over 75 miles of shorelines on the mainland to the north, west and east of the island (Iberia, Vermilion and St. Mary parishes).
- Provide crucial protection to over 10,000 acres of susceptible/fragile marsh to the west and northwest of the project.

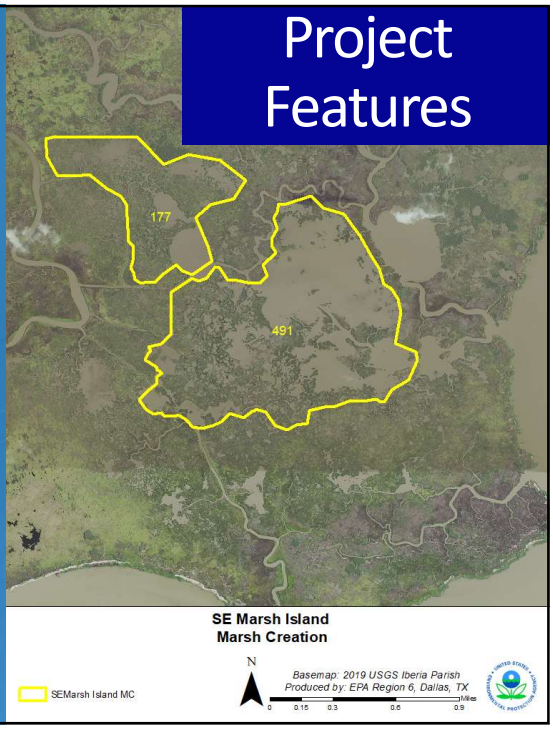
Historical Reference

- 1951 Topo
- Mostly solid marsh



Project Features

- Create/nourish 668 acres emergent marsh with sediment from bay or offshore
- Restore degraded wetland habitat
- Provide increased protection from storm surge and flooding
- Marsh Island serves to protect more inland areas in Iberia Parish
- Construction plus 25% contingency = $20-25M



PPL31 PROJECT NOMINEE FACT SHEET
February 3, 2021

Project Name
West Branch Marsh Creation on Marsh Island, LA

Louisiana's 2017 Coastal Master Plan
Marsh Creation – 03b.MC.03

Project Location
Region 3, Teche-Vermilion Basin, Marsh Island in Iberia Parish, LA

Problem
Earliest reports of deteriorating marsh at the project area describe the geology and human alterations of Marsh Island. Orton (1959) describes how the construction of Dynamite Ditch (linked to the east branch of Oyster bayou) prior to 1932 may have led to the increased salinity along the western branch of Oyster bayou. The construction of Dynamite Ditch appears to have initiated 90 years of multiple recorded stresses on the marsh, including marsh fires, and muskrat, nutria and waterfowl eat-outs.

Ted O'Neil conducted a survey of muskrat in the area during 1941 and 1942, when populations were so numerous as to completely denude hundreds of acres of marsh. He described the proposed project area as healthy saltmarsh where lower salinity marshes had previously been. The marsh was solid and well drained into the 1960s, and classified as intermediate (low salinity) marsh in 1979. While the marsh is primarily brackish marsh, the variations record the areas propensity for (or susceptibility to) change.

The geology differs from the sandy foundation of areas immediately to the south and west, and peaty soils farther north which may contribute to this area being more susceptible to the combined saltwater and water level fluctuations. Attempts at managing water level on the island – while successful at minimizing water fluctuations and increasing SAV – did little to slow the marsh loss (Nyman 1990 and Merino et al. 2005). Land loss primarily occurred after 2002. The conversion to open water is visible in March 2004 (google earth), and rapidly declines concurrent with the significant hurricanes of 2005, 2008 and 2020.

None of these stresses, however, are comparable to the marsh losses of the 2000's. The vast majority of land loss in this area primarily occurred after 2002. The conversion to open water is visible in March 2004 (google earth), and rapidly declines concurrent with the significant hurricanes of 2005 and 2008. Many tropical systems in the 2000's have caused storm induced scouring, folding, or sub-sediment wash out. There are no opportunities for the necessary quantities of sediment to reach this portion of the island naturally, but the foundation should be ideal for recreating marsh with dredged soils.

Goals
The project goals include: re-creating the continuous band of marsh that once existed in the West Branch Oyster Bayou area on Marsh Island, restoring intertidal marsh habitat between Oyster Lake and East Branch Oyster Bayou. The project should be designed and constructed to maximize wetland benefits throughout the twenty year project life.

Proposed Solution
The proposed solution is create and/or nourish approximately 567 acres (383 acres created and 184 acres nourished). The project is conceptualized to be constructed in two separate fill cells. The western most cell (285 acres total) is proposed in its entirety as a fill cell. The eastern most cell is an area in which approximately half of total investigated area (half of 566 acres = 283 acres) will be selected for marsh creation. Opportunities for project expansion will be investigated as the project moves forward through the implementation process. Sediment would be hydraulically dredged from a Gulf of Mexico borrow areas into these shallow marsh creation areas. Containment dikes would be constructed around the marsh creation area to retain material on-site during pumping. Tidal creeks and ponds may be incorporated into the design process, where applicable. Containment dikes would be degraded to the current platform elevation and gapped to improve hydrologic connectivity. Creation areas may be planted with native vegetation if necessary.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
The project area comprised of marsh creation and nourishment is 567 acres (383 acres created and 184 acres nourished).

2) *How many acres of wetlands will be protected/created over the project life?*
The net acres benefit range is 350-400 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 area over the project 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?*
Yes. Marsh Island is a critical barrier coastal feature for this portion of Louisiana.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
The project would provide positive impacts to critical infrastructure. The loss of wetlands in this area increases the vulnerability of infrastructure to wave energy. Protecting/creating wetlands in this area may also assist in reducing storm damages to infrastructure.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The project provides a synergistic effect with other CWPPRA project investments in the area. TV-14 and TV-21.

Considerations
Pipelines and other infrastructure, as well as oyster resources in the vicinity are considerations in the project design.

Preliminary Construction Costs
The estimated construction cost plus 25% contingency range is $20M - $25M.

Preparer(s) of Fact Sheet:
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PPL31 West Branch Marsh Creation Project

on Marsh Island, LA

383 Acres Marsh Creation
184 Acres Marsh Nourishment

Federal Sponsor: NOAA Fisheries
2018 Aerial Imagery
Map Date 01-21-2020

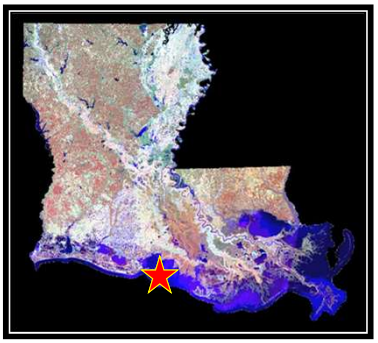
Legend

Marsh Creation

Borrow Area

West Branch Marsh Creation Project

on Marsh Island, Louisiana

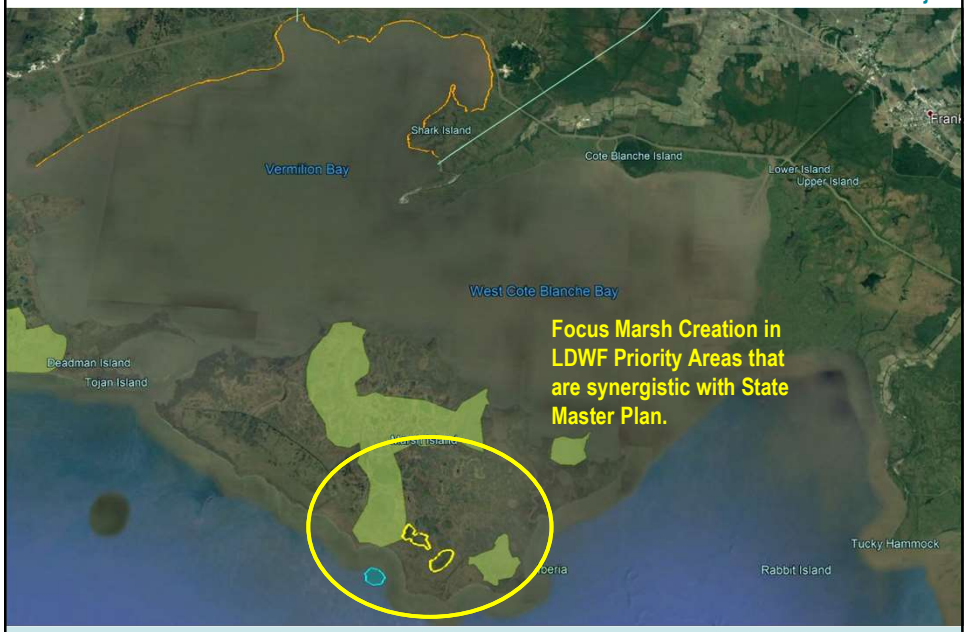


REGION 3– Teche Vermilion Basin

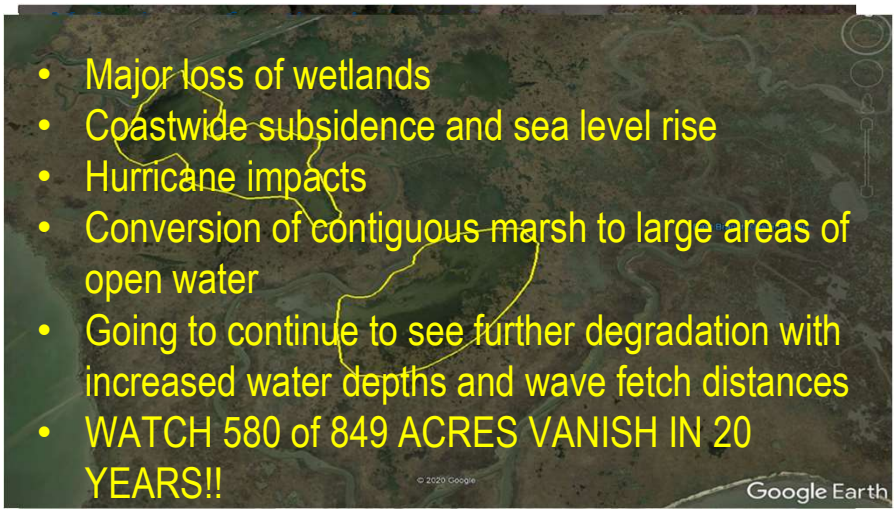
Presenter: Jennifer Smith, NOAA

Special Thanks
Lance, Vaughn, Tyson at LDWF
CPRA
Jason Kroll and NOAA Team

PPL31 CWPPRA Regional Planning Team Meeting
Virtual Meeting
February 3, 2021



Project Area Problem



- Major loss of wetlands
- Coastwide subsidence and sea level rise
- Hurricane impacts
- Conversion of contiguous marsh to large areas of open water
- Going to continue to see further degradation with increased water depths and wave fetch distances
- WATCH 580 of 849 ACRES VANISH IN 20 YEARS!!

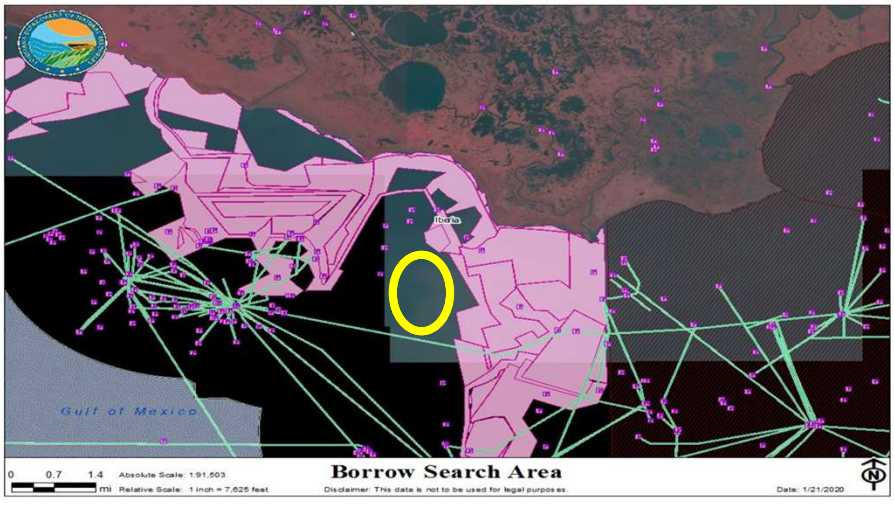
Project Goals

- Marsh Creation and Nourishment
  - Re-create the continuous band of marsh that once existed in this targeted area.
  - Restore intertidal marsh habitat Between Oyster Lake and East Branch Oyster Bayou.
  - Design and construct resilient wetlands to maximize wetland benefits throughout the 20 year project life.

Restoration Solution

- 567 Acres of Marsh Creation/Nourishment
  - All of the eastern cell and about half of the western cell as shown on the maps.
  - 383 Acres of marsh creation & 184 Acres of marsh nourishment
  - Hydraulically dredge material from Gulf of Mexico.
  - Contained fill areas with dike gapping after construction

Restoration Solution



Project Map

- Synergistic with 03b .MC.03 and 30b.MC.101 of the 2017 State Master Plan
- Gulf of Mexico Borrow Area
- 567 Acres TOTAL of Marsh Creation/Nourishment
- Approximately 383 acres Creation and 184 acres Nourishment

Summary of Features, Cost, and Benefits

- 567 Acres Total
  - 383 acres Marsh Creation
  - 184 acres Nourishment
- Construction Cost + 25% Contingency $25M - $30M
- Net Benefits: 350-400 acres

Contact information:
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PPL31 PROJECT FACT SHEET
February 3, 2021

Project Name
Freshwater Bayou East Marsh Restoration

Project Location
Region 3, Teche/Vermilion Basin, Vermilion Parish, East bank of Freshwater Bayou about 4-6 miles north of the Freshwater Bayou lock system

Problem
The marshes adjacent to Freshwater Bayou have degraded significantly by a combination of natural and man-induced conditions. Hurricanes has scoured out large areas very quickly, but numerous anthropogenic activities and alterations have allowed the area to be much more vulnerable. Various restoration measures have been employed in this area with high degree of success including protection of the bankline of the navigation channel and adjacent marsh creation and terracing. The proposed location for this project is one that has not been addressed and continues losses. USGS estimates that the area has a loss rate of about -0.33 %/y and the state estimates subsidence at about 3.8 mm/y. Additionally, that location being adjacent to the navigation channel experiences significant bankline erosion (12-15 ft/y).

Goals
The primary goals of this project are to 1) create/restore approximately 105 acres of marsh habitat in the open water areas via marsh creation/nourishment, 2) reduce fetch and wave energy in open water areas via the construction of terraces and 3) preserve approximately 150 acres of marsh along the bank of the channel through shoreline protection.

Proposed Solution
1. Sediments will be hydraulically dredged and pumped via pipeline from a borrow site located in the Freshwater Bayou Canal to create/nourish approximately 105 acres of marsh.
2. Approximately 31,115 linear feet of terraces will be constructed.
3. 18,000 linear feet of shoreline projection along the Freshwater Bayou Canal.

Preliminary Project Benefits
Preliminary benefits will be to create/nourish/protect approximately 242 acres of marsh.

Preliminary Cost
The estimated cost for construction plus contingency (25%) is $25-30 million.

Preparer of Fact Sheet
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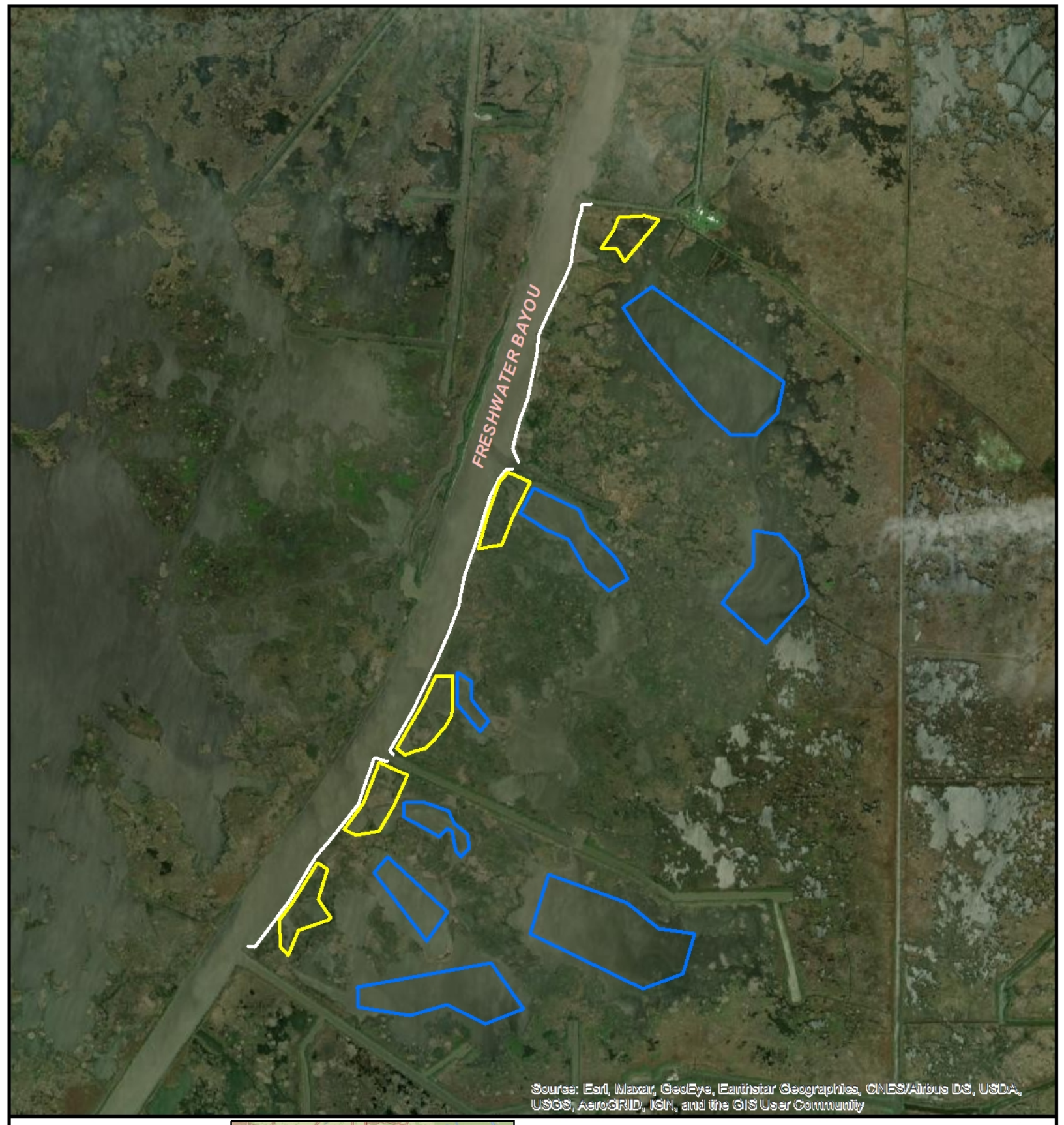


USDA

Map Produced By:
United States Department of Agriculture
Natural Resources Conservation Service
Alexandria, LA

Data Source: ESRI FEBRUARY 2019

Map Date: JANUARY 19, 2021

PPL 31
FRESHWATER BAYOU EAST MARSH RESTORATION
VERMILION PARISH, LA

N
W E
S

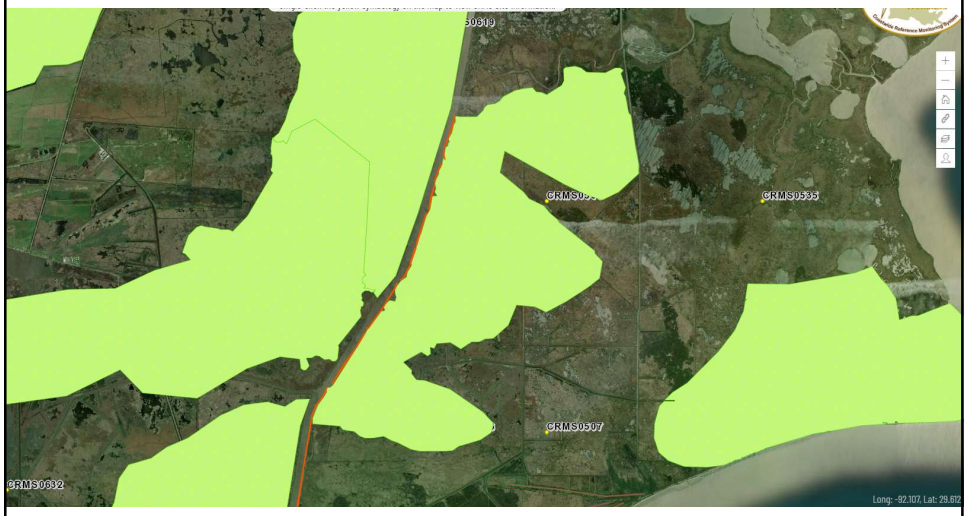
0 2,000 4,000
Feet

Legend

- MARSH_CREATION
- TERRACE_FIELDS
- SHORELINE_PROTECTION

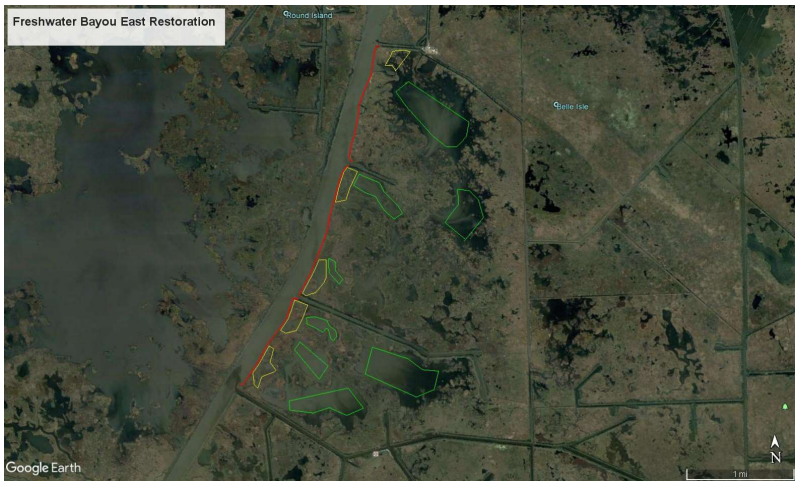
NRCS

PPL 31 Freshwater Bayou East Marsh Restoration



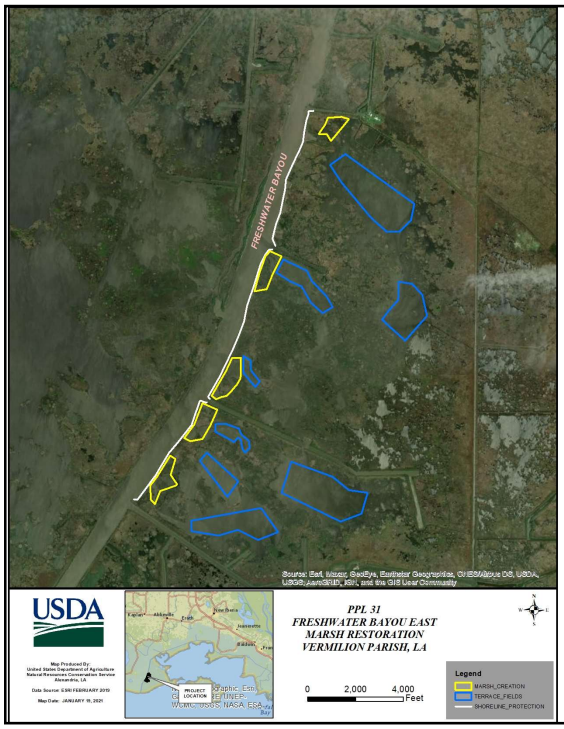
2017 State Master Plan

NRCS



Project would be an alternative to the PPL30 North Marsh project. The main difference is to build 18,000 linear ft of shoreline protection (red line), borrow from the FWB Canal for marsh creation/nourishment (105 acres) and supplement with terraces on the interior. Preliminary cost range is $25M, which would be a cheaper alternative to offshore borrow. (Note: access material for rock placement would be used for marsh creation/nourishment).

NRCS



PPL 31

Freshwater Bayou East Restoration

Problem: The project area has suffered marsh loss from wave erosion along the FW Bayou Canal as well as subsidence and erosion of interior marshes.

Project Goals: The project will stabilize the shoreline of FWB Canal to reduce erosion and protect the interior marsh by creating marsh along the bankline and reduce fetch in open water areas in the interior with terraces.

Project Benefits:
18,000 ft linear ft of shoreline projection (126 acres)
Create/Nourish 105 acres of marsh
Create 31,115 linear feet of terraces (11 acres)

Estimated Cost: $25M (Const+25%)

PPL31 PROJECT FACT SHEET
February 3, 2021

Project Name
Lake Sand Marsh Creation and Shoreline Protection

Project Location
Region 3, Teche-Vermilion Basin, Iberia Parish, northeast Marsh Island

Problem
Marsh Island Refuge serves as the crucial geomorphic structure in maintaining the estuarine character of the Vermilion-Cote Blanche Bays system and provides vital support to important fish and wildlife species. Marsh Island's eastern area is being severely impacted by wave & tidal energy impacts generated across the Gulf of Mexico and East & West Cote Blanche Bays. Wave energy and storm overwash cause shoreline erosion and elevational loss, resulting in narrowing and breaching of perimeter marshes that protect large interior lakes from bay encroachment. The 1998-2019 erosion rate along the project area's bay shoreline averaged 14 ft/yr, and Lake Sand interior shoreline erosion averaged 4 ft/yr. The 1985-2016 USGS rate of land change for the entire E. Marsh Island mapping unit is -0.04% per year and regional subsidence is 3.8 mm/y.

Goals
The project goals are to prevent West Cote Blanche Bay from capturing the shallow lake-marsh system by 1) to creating/nourishing the thin band of interior brackish marsh to counter fragmentation and breach into Lake Sand and 2) by protecting the exposed sections of shoreline to avert breaching of narrow bands of marsh between Lake Sand and the Bay.

Proposed Solutions
The project will complete the shoreline protection across the entire area tying in additional foreshore rock dike (8,832 linear ft) and create/nourish 243 acres of marsh to increase the land area along the bay front.

Preliminary Project Benefits
The project is expected to create 153 acres of marsh and nourish another 90 acres of existing marsh. The shoreline protection will protect about 57 acres of marsh (20 years) and prevent the bay from coalescing with the interior lake system.

Preliminary Cost
The fully funded cost range is $19.7M (construction +25%).

Preparer(s) of Fact Sheet
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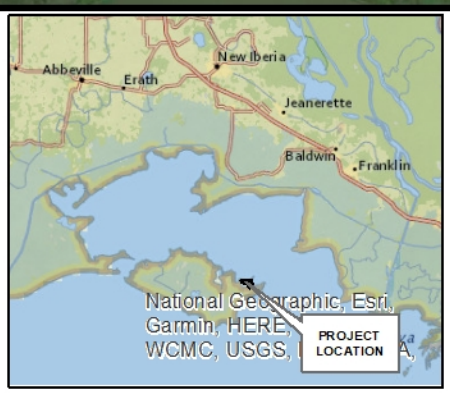
USDA

Map Produced By:
United States Department of Agriculture
Natural Resources Conservation Service
Alexandria, LA

Data Source: ESRI MAY 2018

Map Date: JANUARY 19, 2021



PPL 31
LAKE SAND
MARSH CREATION AND
SHORELINE PROTECTION
IBERIA PARISH, LA

N
W E
S

0 1,000 2,000 Feet

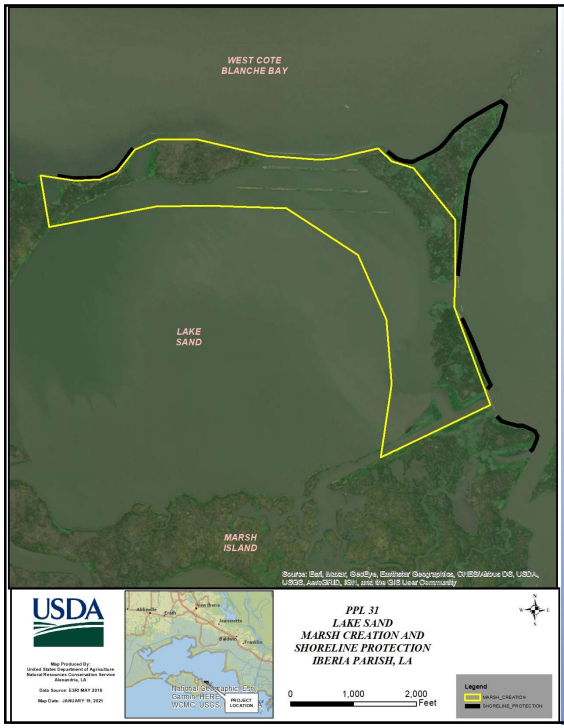
Legend
- MARSH_CREATION
- SHORELINE_PROTECTION


PPL 31
Lake Sand Marsh Creation and Shoreline Protection
Franklin
Centerville
Patterson
West Cote Blanche Bay
Lake Sand Marsh Creation and Shoreline Protection
Marsh Island
Iberia
St Mary
Natural Resources Conservation Service
Google Earth
10 mi
N
NRCS


1998 to 2019 Shoreline Loss
(57 acres loss in 20yrs)
Lake Sand
Hawkins Bayou
Google Earth
3000 ft
N
NRCS

Existing Shoreline Project Segments

NRCS



PPL-31

Lake Sand Marsh Creation and Shoreline Protection

Problem: Lake Sand is at risk of coalescing with West Cote Blanche bay.

Goal: To stop shoreline erosion and breach into the lake system and create marsh to create land between bay and lake system.

Project Benefits: Project will create/nourish 243 acres of marsh and protect another 57 acres of marsh from bank erosion.

Estimated Cost: $19.7M (construction + 25%)

NRCS

PPL31 PROJECT NOMINEE FACT SHEET
FEBRUARY 3, 2021

Project Name
Shark Island Shoreline Protection Project

Project Location
Region 3, Teche-Vermilion Basin, along Shark Island between Vermilion and Weeks Bays in Iberia Parish, LA

Problem
Final Closeout Report for LA-16 (McGinnis, II T.E., 2018):

> Both historically and recently, the northeast Vermilion Bay shoreline along Shark Island has retreated at a high rate. The Barrier Island Comprehensive Monitoring Program (BICM) reported that the Cypermort Point – West shoreline, which includes Shark Island, eroded 22.1 ft/yr (6.7 m/yr) from 1930s to 2005 which were among the highest rates west of the Atchafalaya River including along the Gulf of Mexico (Martinez et al. 2009; Fig. 2). More recently, the shoreline erosion rate along Shark Island ranged from 20 to 40+ ft/yr from 2004 to 2012 (Byrnes et al. 2016).

An erosion rate of 37 ft/yr has been determined for this project based on an analysis of aerial photography from 2004 to 2020.

Goals
The goal is to construct 11,578 LF, 2.2 miles, of foreshore breakwater to maintain shoreline integrity along Shark Island and stabilize the eastern shoreline of Vermilion Bay. A total of 180-ac would be protected by the project. A reduction in benefits by 7% during the first nine years is assumed based on results from the Bio-Engineered Oyster Reef Demonstration project (LA-08). A 25% reduction in the following 11 years is applied due to settlement of the breakwater, sea level rise, and no maintenance of the structure (similar to ME-18).

Proposed Solution
A breakwater with light weight aggregate core, or non-rock alternative design, would be constructed along the -2.0 ft to -2.5 ft (NAVD88) contour, approximately 100 feet from the shoreline, and generally follow the shape of the shoreline. The breakwater will extend from the western point of Shark Island to the east for approximately 11,578 linear feet and will include gaps approximately every 1,000-ft. The project feature may trap sediments and allow for accretion behind the breakwater as has occurred at ME-18.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   Approximately 180 acres of marsh would be benefited directly through reduction in shoreline erosion rate. Indirect benefits could occur due to accretion behind the proposed structure.

2) *How many acres of wetlands will be protected/created over the project life?*
   Approximately 100-150 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 75-100%.

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 maintain shoreline integrity and stabilize critical areas of Vermilion and Weeks Bays by reducing shoreline erosion and facilitating accretion behind the shoreline protection.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
The project will provide indirect benefits to the GIWW, a federally maintained navigation waterway, and the Weeks Island salt dome, where a U.S. Department of Energy Strategic Petroleum reserve facility is located.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?* Rock breakwaters have been constructed in the area under the State of Louisiana Wetland Conservation and Restoration Program (TV-72) Quintana Canal/Cypremort Point project built in 1998 and the Cypremort Point State Park Beach Breakwater project funded by FEMA (2018).

Considerations
The project has landowner support. The breakwaters are proposed within designated state water bottoms and designated oyster seed ground (Tier 3).

Preliminary Construction Costs
The estimated construction cost +25% contingency is $10 -15M.

Preparer(s) of Fact Sheet:
Angela Trahan, Project Manager, Angela.Trahan@USDA.gov, 337/291-3142
Jackie Jones, Planning Engineer, Jacqueline.Jones@USDA.gov, 337/291-3055

USDA

Map Produced By:
United States Department of Agriculture
Natural Resources Conservation Service
Alexandria, LA

Data Source: ESRI FEBRUARY 2020

Map Date: JANUARY 20, 2021

PPL 31
SHARK IALAND
SHORELINE PROTECTION
IBERIA PARISH, LA

N
W E
S

0 1,000 2,000 Feet

Legend
SHORELINE_PROTECTION_SEGMENT_1 = 8503 LF
SHORELINE_PROTECTION_SEGMENT_2_ALTERNATIVE = 3075 LF

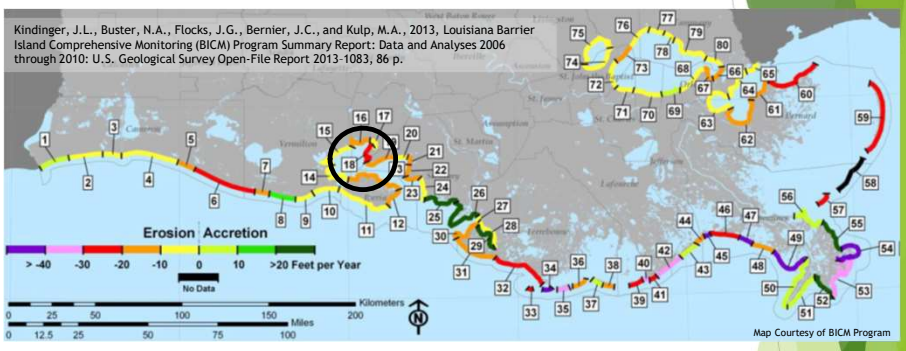
PPL31

Shark Island Shoreline Protection

Region 3, Teche-Vermilion Basin

Contacts:
Angela Trahan, Project Manager, Angela.Trahan@USDA.gov, 337/291-3142
Jackie Jones, Planning Engineer, Jacqueline.Jones@USDA.gov, 337/291-3055

PPL31 - Shark Island Shoreline Protection



Both historically and recently, the northeast Vermilion Bay shoreline along Shark Island has retreated at a high rate.

Among the highest rates west of the Atchafalaya River including along the Gulf of Mexico (Martinez et al. 2009)

Cypermort Point – West shoreline (Segment 18) eroded 22.1 ft/yr from 1930s to 2005 (BICM Program)

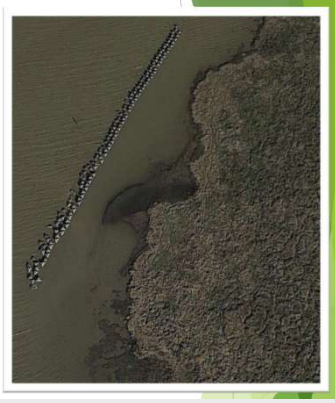
Documented Erosion Rates

Time Period	Erosion Rate (ft/y)	Source
1930s - 2005	22.1	BICM, Martinez et al. 2009
2004 - 2012	20 - 40+	BICM, Byrnes et al. 2016
2014 - 2017	51	LA-16 Demo, McGinnis 2018

LA-16 Non-Rock Alternatives to Shoreline Protection Demonstration Project:

Wave Attenuation Devices (WAD®s) - Living Shoreline Solutions, Inc.

- pyramid shaped structures
- 9.5 ft tall, 6.75 tons each
- double row alignment
- 60-130 feet from the shoreline



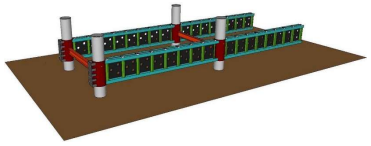
Shoreline Change = - 2.6 ft/y
~ 95% slower than the Reference Area

Positive Soil Elevation Change behind the WADs

Information Provided by Final Closeout Report for LA-16 & 2018 SOC Lessons Learned Presentation (McGinnis, II T.E., 2018)

LA-16 Non-Rock Alternatives to Shoreline Protection Demonstration Project:

Wave Screen System(WSS) - Integrated Shoreline Solutions, LLC
(Designed by Royal Engineers & Consultations)



- Double Wall of HDPE sheets supported by steel pilings and framing, with 6-inch holes
- 125-150 ft from shoreline (-4 ft of water)
- Screens hung down about 4 feet, about 1-1.5 ft above the bay bottom

Shoreline Change = - 1.8 ft/y
~ 98% slower than the Reference Area

Positive Soil Elevation Change behind the WSS
Accretion of 0.63ft underneath

Information Provided by Final Closeout Report for LA-16 & 2018 SOC Lessons Learned Presentation (McGinnis, II T.E., 2018)

Rockefeller Refuge Shoreline Stabilization (ME18):

Photos courtesy of SW LA Regional Update
(2020 Carroll, J. CPRA)

PPL31 – Shark Island Shoreline Protection

Goal:
Maintain shoreline integrity and stabilize critical areas of Vermilion and Weeks Bays by reducing shoreline erosion

Solution:

- Construct 11,578 LF (2.2 miles) of shoreline protection
- Gaps Every 1,000 feet
- -2 to -2.5 ft contour, ~100 feet from shoreline

Direct Benefits: 180 Acres (100-150 Net Acres)

Est. Construction Cost + Contingency: $10-15M

Terrebonne Basin

PPL 31 PROJECT FACT SHEET
February 2021

Project Name
Lake Chien Shoreline Marsh Creation

2017 Master Plan Strategy
03a.MC.03p: Terrebonne Bay Rim Marsh Creation Study: Planning, engineering, and design of marsh creation features to provide benefits to communities in Terrebonne Parish and the Morganza to the Gulf protection system.

Project Location
This project is located in Terrebonne Parish, Terrebonne Basin, Louisiana (Region 3). Lake Chien is situated on the north central section of the Terrebonne Bay Rim, just north of Lake Felicity.

Problem
The Terrebonne Basin is a delta complex that receives high subsidence and consists of a network of old distributary ridges. Historically, subsidence and numerous oil and gas canals and pipelines in the area have contributed significantly to wetland losses. This area currently serves as a shoreline to the lakes that lead to the Gulf of Mexico. Restoring the shoreline will serve as a stop gap for further land loss to open water.

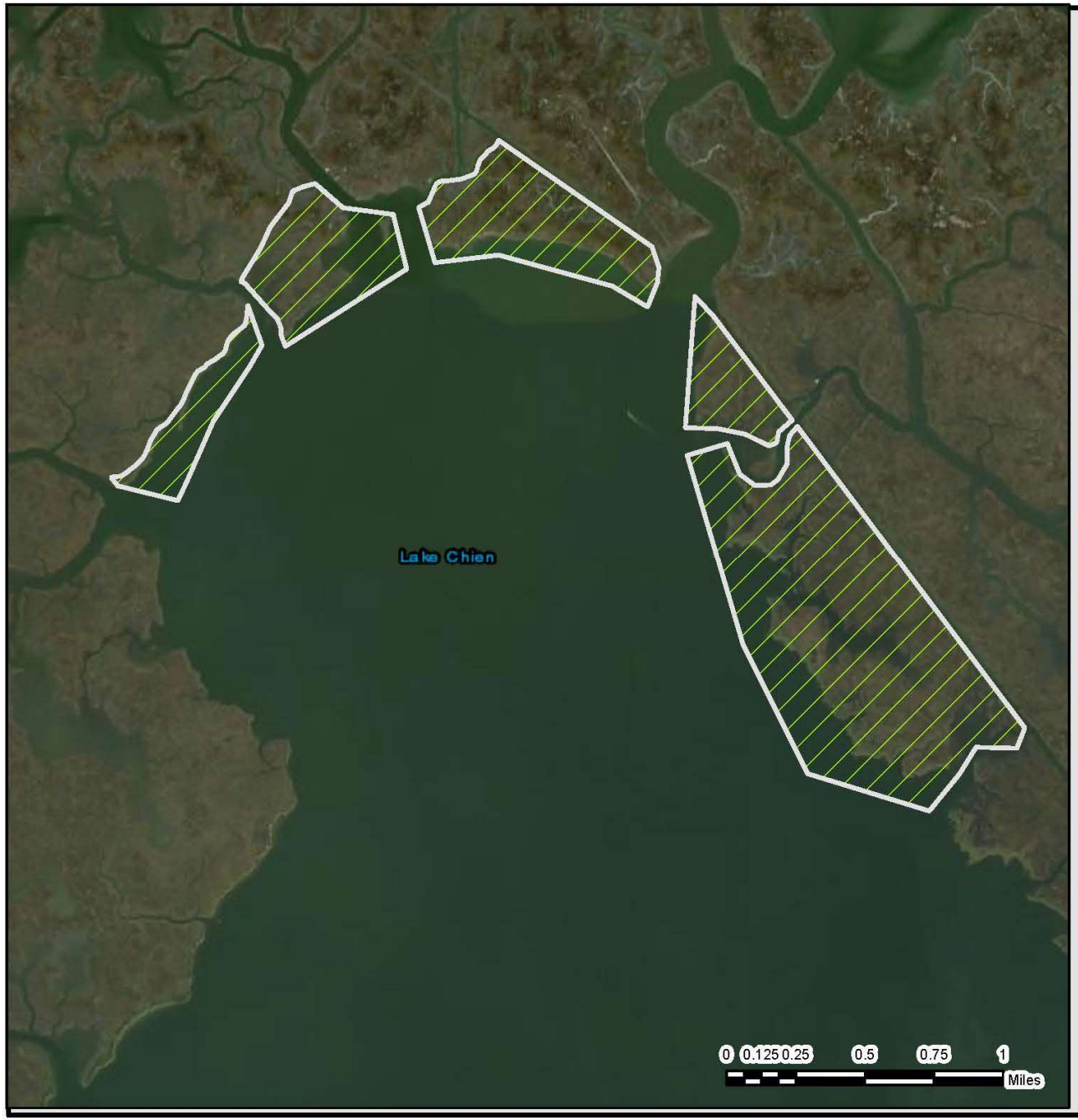
Considerations in the project will include private oyster leases around Lake Chien, oil and gas pipelines, and other wildlife of conservation concern.

Proposed Project Features
Approximately 1.8 million CY of material would be mined from two borrow sites in Lake Chien. It would be used to restore a total of 321 acres of saline marsh. Containment dikes will be gapped and/or degraded after construction to support estuarine fisheries access and to achieve a functional marsh.

Project Benefits
The project will restore 137 acres of saline marsh with sediment dredged from Lake Chien and nourish 183 acres of degraded saline marsh. This project will create saline marsh in current open water areas that were historically marsh to reduce the effects of coastal storm surge and restore the natural shoreline of Lake Chien. It will also reestablish the natural habitat for a wide range of recreationally and commercially significant species.

Preliminary Construction Costs
The estimated construction cost including 25% contingency is $35M – $40M

Preparers of Fact Sheet
Danielle Keller, USACE, 504-862-1744 danielle.a.keller@usace.army.mil



US Army Corps of Engineers
New Orleans District

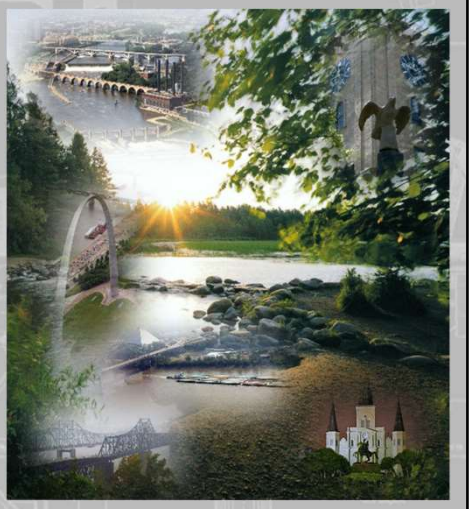
Lake Chien Shoreline Marsh Creation

Marsh Creation / Nourishment

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Map Date: December 30, 2020

LAKE CHIEN SHORELINE MARSH CREATION



February 3, 2021
Region 3
Terrebonne Basin

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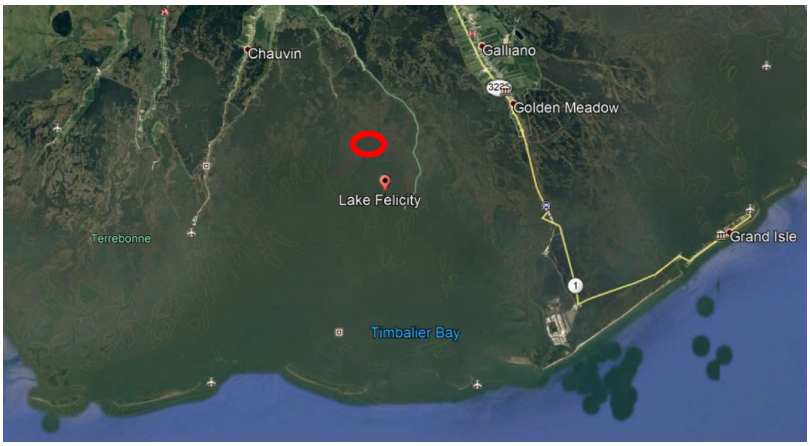
PROJECT LOCATION



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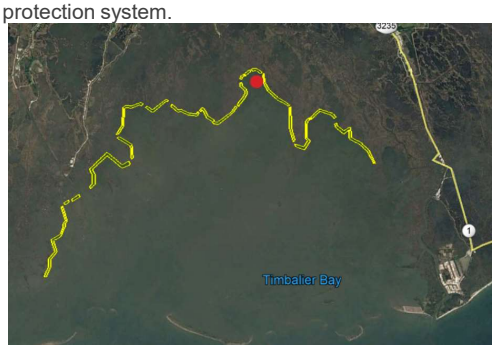
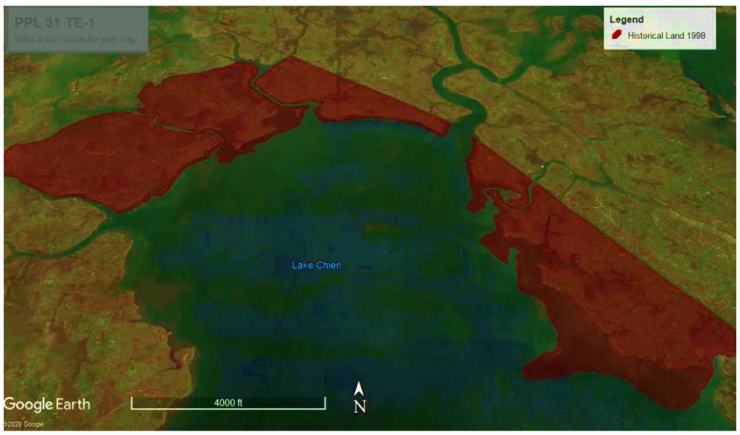
STATE MASTER PLAN CONSISTENCY

03a.MC.03p: Terrebonne Bay Rim Marsh Creation Study: Planning, engineering, and design of marsh creation features to provide benefits to communities in Terrebonne Parish and the Morganza to the Gulf protection system.



HISTORIC LAND LOSS

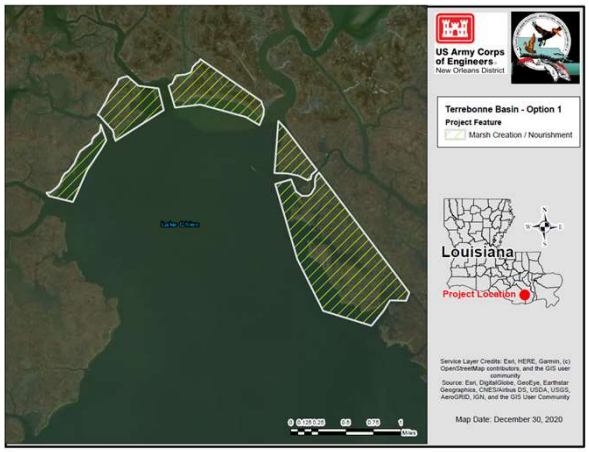


PROJECT PROPOSAL

Total Acres: 321
- 137 acres creation
- 183 acres nourishment

Estimated Cost: $35M – $40M
- 25% contingency

Borrow Source:
Lake Chien



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CURRENT SIGNIFICANCE AND NEED

- Terrebonne Basin has experienced the greatest decrease in wetland area
- Restoring the shoreline will serve as a stop gap for further land loss.
- Restore the nursery and foraging habitat for a wide range of species

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PPL 31 PROJECT FACT SHEET
February 2021

Project Name
Pointe aux Chenes Marsh Creation

2017 Master Plan Strategy
03a.MC.09b: North Terrebonne Bay Marsh Creation- Comp B Creation of approximately 5,400 acres of marsh south of Montegut between Bayou St. Jean Charles and Bayou Pointe Aux Chenes to create new wetland habitat and restore degraded marsh.

Project Location
This project is located in Terrebonne Parish, Terrebonne Basin, Louisiana (Region 3). It is on the northeastern border of Lake Billiot, just southwest of Bayou Pointe aux Chien on the Terrebonne side of the Terrebonne and Lafourche Parish line.

Problem
Historically, wetland loss has been caused by subsidence and numerous oil and gas canals and pipelines. Since 1932, the Terrebonne Basin has lost approximately 20% of its wetlands. One-third of the Terrebonne Basin's remaining wetlands are estimated to be lost to open water by the year 2040.

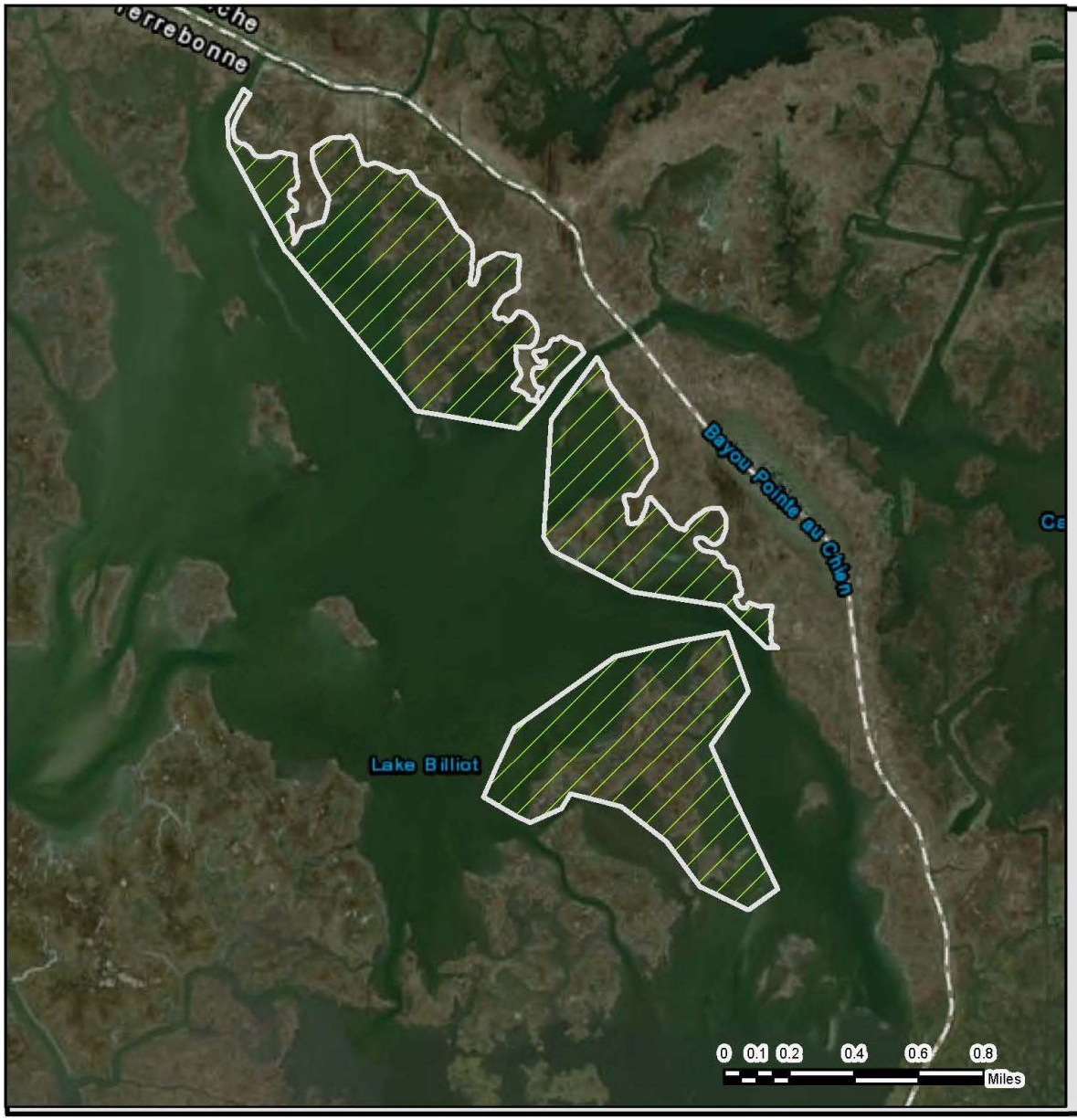
Considerations in the project will include private oyster leases around Lake Chien, oil and gas pipelines, and other wildlife of conservation concern.

Proposed Project Features
Approximately 2.3 million CY of material would be mined from a borrow site in Lake Chien. It would be used to restore a total of 412 acres of marsh. Containment dikes will be gapped and/or degraded after construction to support estuarine fisheries access and to achieve a functional marsh.

Project Benefits
The project will restore 202 acres of saline marsh with sediment dredged from Lake Chien and nourish 210 acres of degraded saline marsh. This project will create saline marsh in current open water areas that were historically marsh to reduce the effects of coastal storm surge and restore the natural shoreline of Lake Billiot. It will also reestablish the natural habitat for a wide range of recreationally and commercially significant species, which in turn will improve the seafood industry and economy for Terrebonne Parish.

Preliminary Construction Costs
The estimated construction cost including 25% contingency is $20M – $25M

Preparers of Fact Sheet
Danielle Keller, USACE, 504-862-1744 danielle.a.keller@usace.army.mil



US Army Corps of Engineers
New Orleans District

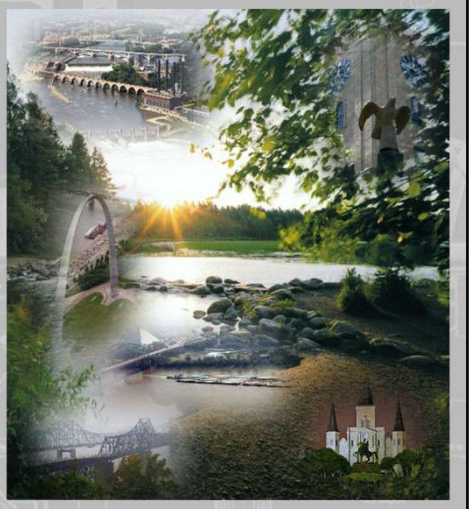
Point aux Chene Marsh Creation

Marsh creation / nourishment

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Map Date: December 30, 2020

POINTE AUX CHENES MARSH CREATION



February 3, 2021
Region 3
Terrebonne Basin

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PROJECT LOCATION

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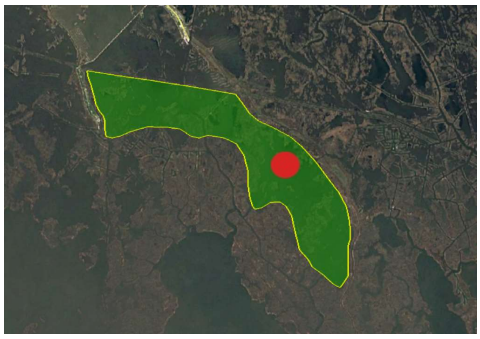
STATE MASTER PLAN CONSISTENCY

03a.MC.09b: Terrebonne Bay Rim Marsh Creation Study: Planning, engineering, and design of marsh creation features to provide benefits to communities in Terrebonne Parish and the Morganza to the Gulf protection system.



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HISTORIC LAND LOSS

198
4

201
9

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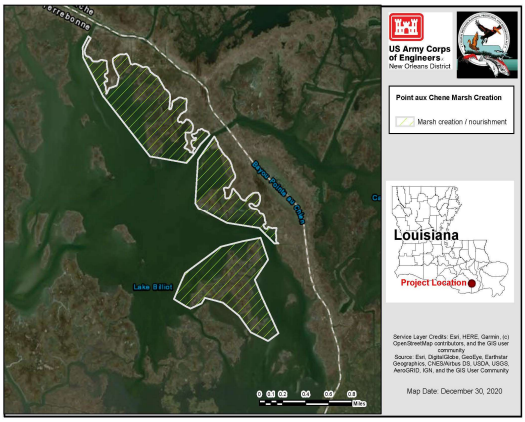
PROJECT PROPOSAL

Total Acres: 412
- 202 acres creation
- 210 acres nourishment

Estimated Cost: $20M – $25M
- 25% contingency

Borrow Source:
Lake Chien



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CURRENT SIGNIFICANCE AND NEED

- Will reduce the effects of coastal storm surge and restore the natural shoreline of Lake Billiot
- Provide additional buffer between Lake Billiot and Bayou Pointe au Chien to maintain recreational activities
- Reduce further land loss
- Restore the nursery and foraging habitat for a wide range of species

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PPL31 PROJECT NOMINEE FACT SHEET
February 3, 2021

Project Name
Port Fourchon Marsh Creation Project

Project Location
Region 3, Terrebonne Basin, Lafourche Parish

Problem
Historic wetland loss in the project area stems from subsidence, sediment deprivation, and construction of pipeline canals. According to USGS data, nearly 324,000 ac of land were lost between 1932 and 2010 within the basin, which had the highest land loss rate in the state from 1985 to 2004. Wetlands have been replaced by open water where canals are dug, while spoil banks convert them to upland habitat. Bounded by Bayou Lafourche to the east and Timbalier Bay to the west the project area is also subject to shoreline erosion. Land loss rate is estimated at -1.05%

Goals
The primary goals of this project are to restore degraded wetland habitat and provide increased protection from storm surge and flooding. Specific goals of the project are to create approximately 301 acres and nourish approximately 227 acres of marsh with dredged material from Belle Pass. The project would also evaluate the use of Belle Pass sediment for coastal Restoration

Proposed Solution
Create/nourish 528 acres of wetlands by converting open water into marsh and nourishing existing marsh remnants with sediment hydraulically dredged from a borrow source in Belle Pass. Temporary containment dikes will be constructed and gapped within three years of construction to allow greater tidal exchange and estuarine organism access

Preliminary Project Benefits
1) *What is the total acreage benefited both directly and indirectly*? Total marsh creation and marsh nourishment is 528 acres.

2) *How many acres of wetlands wie protected/created over the project life*? Approximately 250-300 ac 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 (<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 help maintain the Bayou Lafourche ridge.

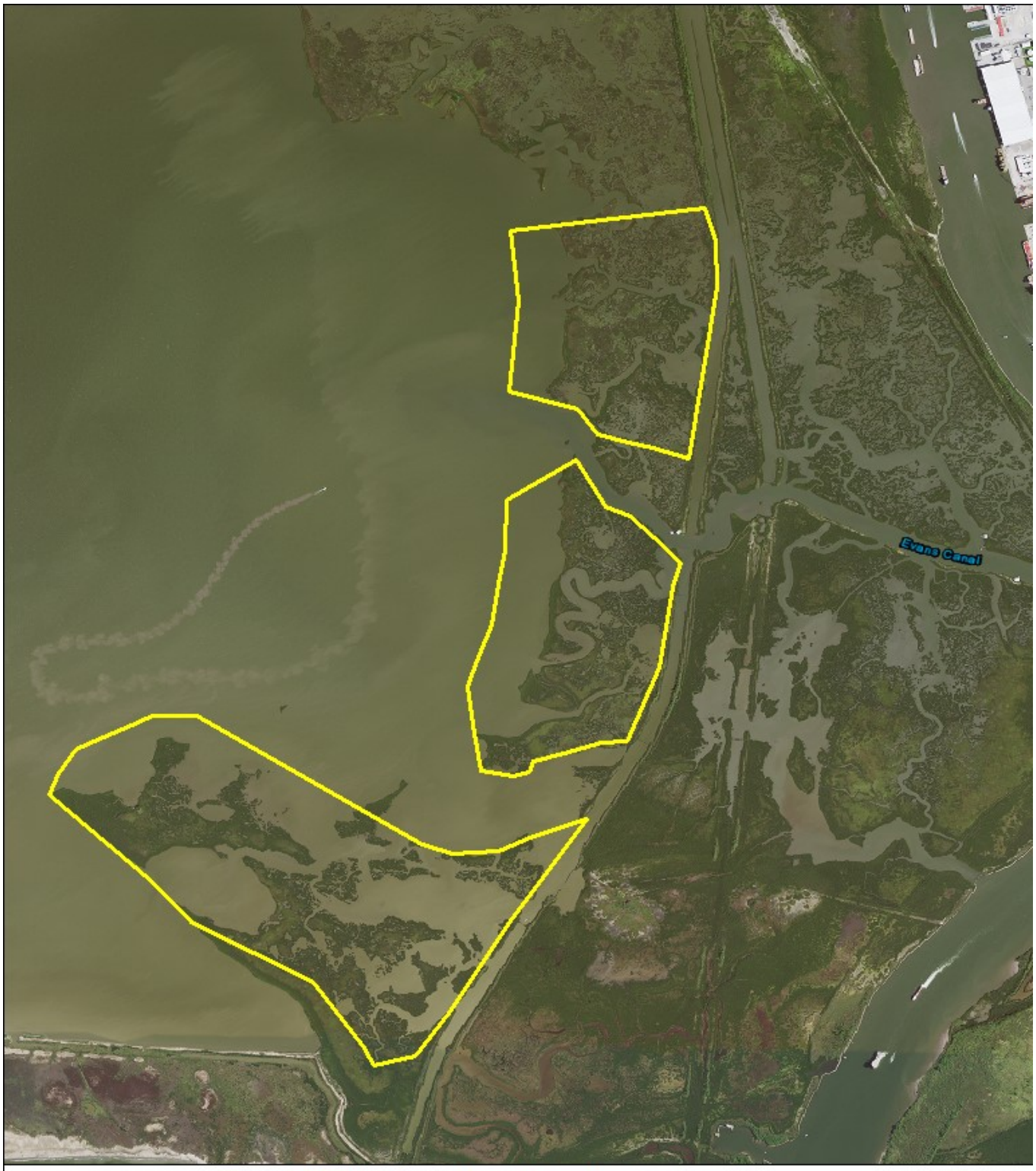
5) *What is the net impact of the project on critical and non-critical infrastructure*? The project would protect LA Highway 1, Port Fourchon, and the communities and infrastructure adjacent to Bayou Lafourche. The project would also complement the expansion efforts for Port Fourchon which would benefit to the local economy.

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 West Fourchon Marsh Creation & Nourishment (TE-134), West Belle Pass Headland Restoration (TE-23), and the Caminada Headland Dune, Beach and Back Barrier restoration projects (BA-171, BA-45, BA-149).

Considerations
Considerations include the Port Fourchon expansion and oil and gas infrastructure, including pipelines. According to the support letter from the Director of Port Fourchon, there may be cost sharing opportunities with the port.

Preliminary Cost
Construction + 25% contingency = $20M - $25M.

Preparer of Fact Sheet
Brad Crawford, EPA; (214) 665-7255, Crawford.brad@epa.gov



North Fourchon Marsh Creation

N

Basemap: 2019 NAIP DOQQ LaFourche Parish
Produced by: EPA Region 6, Dallas, TX

Miles
0 0.15 0.3 0.6 0.9

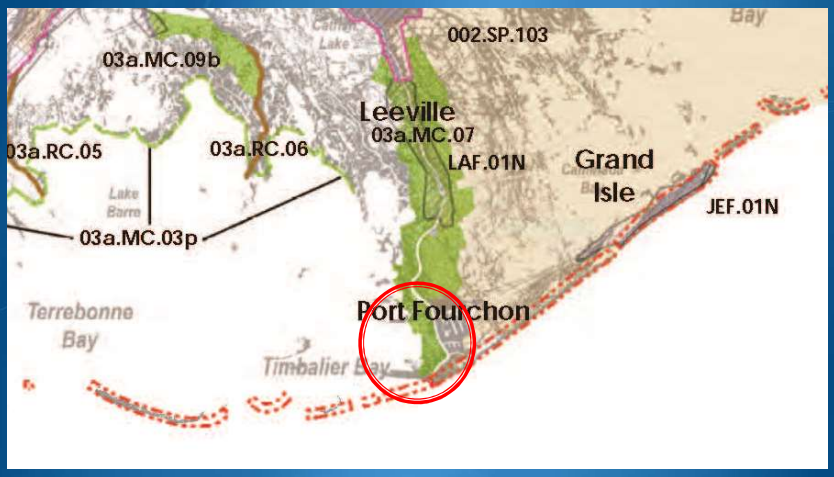
Marsh Creation Cells

Port Fourchon Marsh Creation

Coastal Wetlands Planning, Protection and Restoration Act

2017 Master Plan Solution

03a.MC.07 Belle Pass-Golden Meadow Marsh Creation: Creation of approximately 24,800 acres of marsh from Belle Pass to Golden Meadow to create new wetland habitat and restore degraded marsh.



2017 Master Plan Consistency & Project Synergy

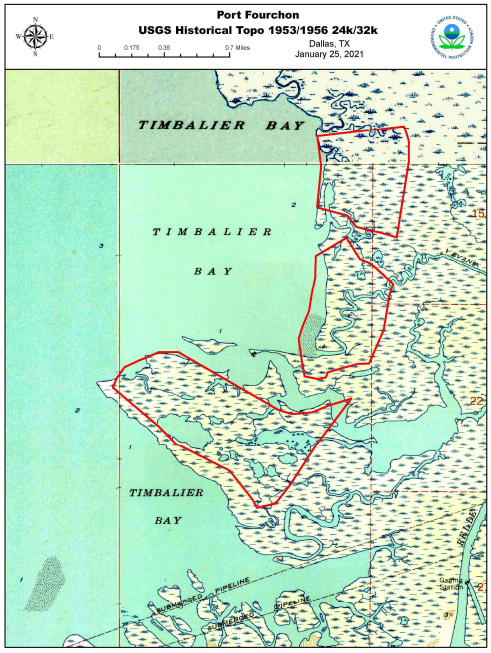
- 03a.MC.07 Belle Pass-Golden Meadow Marsh Creation
- Synergistic with TE-134 & BA-194
- Borrow from Bayou Lafourche

Problems

- This area has experienced wetland loss due to:
  - Subsidence
  - Sediment deprivation
  - Erosion
  - Construction of pipeline canals
- Since 1932, Terrebonne lost ~20% of its wetlands
- Current Loss rate = ~4,500-6,500 acres/year
- LaFourche Parish could be at risk for increased storm surge and flooding in the next 50 years (2017 MP).

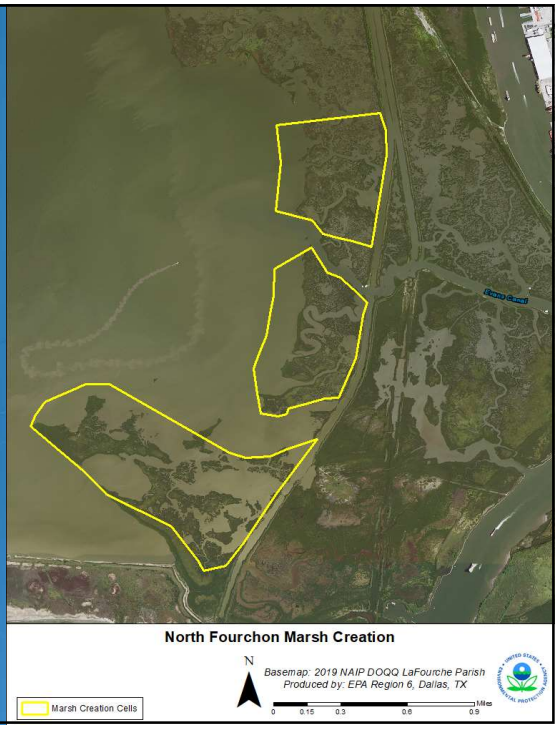
Historical Reference

- Historical topo from 1953
- Mostly solid marsh



Project Features

- 528 Acres (301 acres MC + 227 acres MN)
- Beneficial Use of Belle Pass borrow



Project Goals

- Create/nourish 528 acres emergent marsh with sediment from Belle Pass
- Provide protection for the community and infrastructure of the Port Fourchon area
- Prove viability of using Port sediment for Coastal Restoration
- Construction + 25% contingency = $20M-$25M

PPL31 PROJECT FACT SHEET
February 3, 2021

Project Name
South Bayou Decade Marsh Creation

Master Plan Strategy
North Lake Mechant Marsh Creation (2017 Master Plan 03a.MC.101): Creation of approximately 12,100 acres of marsh between Lake Decade and Lake Mechant to create new wetland habitat and restore degraded marsh.

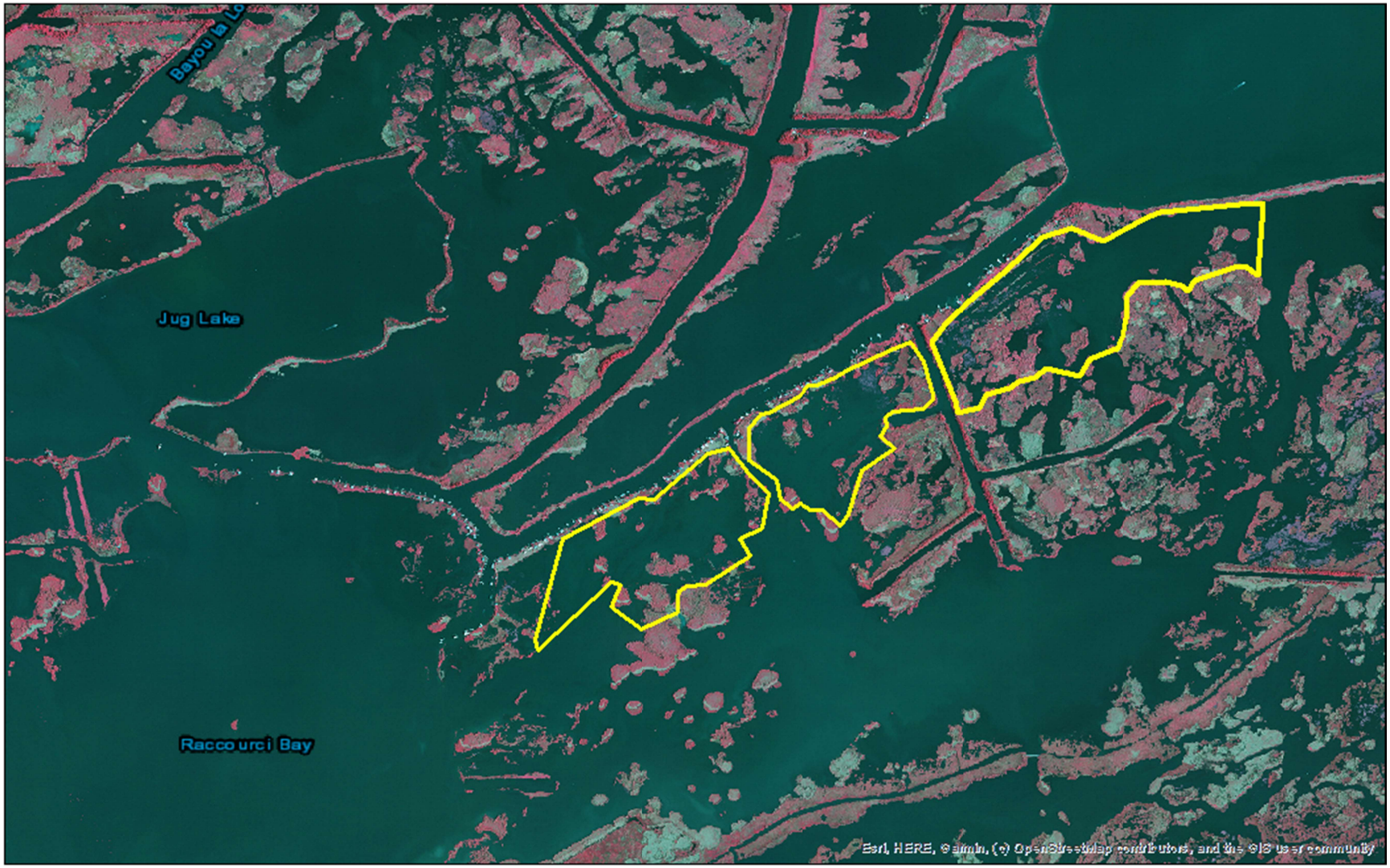
Project Location
Region 3, Terrebonne Basin, Terrebonne Parish, South of Bayou Decade

Problem
The marsh along Bayou Decade have seen a significant amount of deterioration over the past few decades. Wetland loss in the area has been primarily attributed to subsidence, saltwater intrusion and the numerous gas and oil pipelines and canals. 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. Wetland loss in the area is estimated to -0.79%/yr.

Proposed Solution
The proposed project would create/nourish approximately 434 acres (339 acres marsh creation and 95 acres marsh nourishment) of marsh using sediment dredged from Lake Mechant. Temporary containment dikes will be constructed and gapped within three years of construction to allow greater tidal exchange and estuarine organism access. Vegetative plantings are proposed to help stabilize the project area.

Project Costs
The cost + 25% contingency range is $25M - $30M.

Preparer(s) of Fact Sheet:
Brad Crawford, P.E.; (214) 665-7255; Crawford.brad@epa.gov



South Bayou Decade Marsh Creation

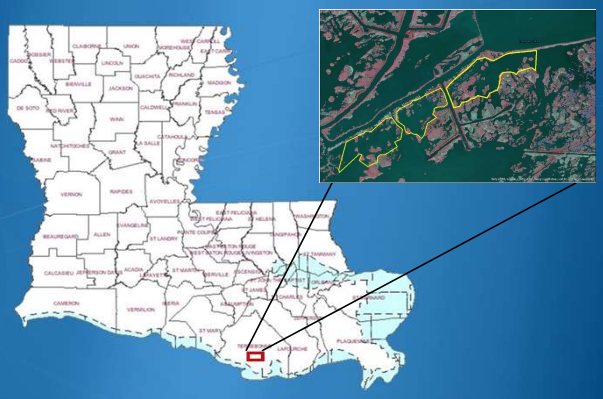
South Bayou Decade Marsh Creation 434ac

N

Basemap: 2019 NAIP DOQQ Terrebonne Parish
Produced by: EPA Region 6, Dallas, TX

0 0.125 0.25 0.5 0.75 1
Miles

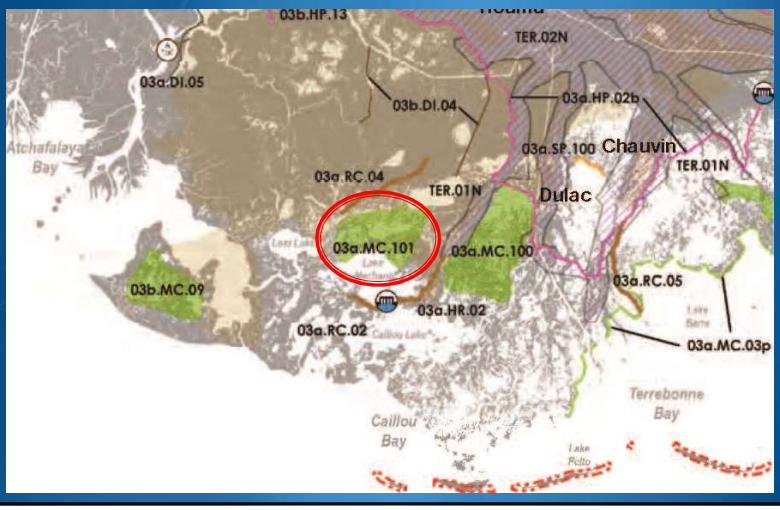
South Bayou Decade Marsh Creation



Coastal Wetlands Planning, Protection and Restoration Act

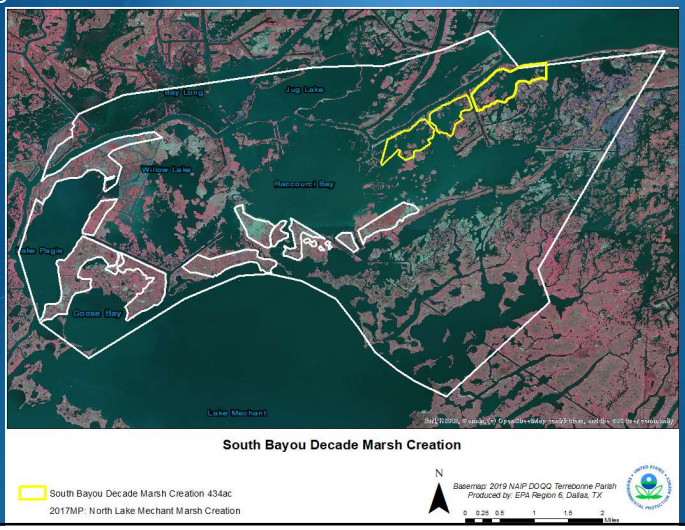
2017 Master Plan Solution

03a.MC.101 North Lake Mechant Marsh Creation : Creation of approximately 12,100 acres of marsh between Lake Decade and Lake Mechant to create new wetland habitat and restore degraded marsh.



2017 Master Plan Consistency

03a.MC.101: Creation of approximately 12,100 acres of marsh between Lake Decade and Lake Mechant to create new wetland habitat and restore degraded marsh.

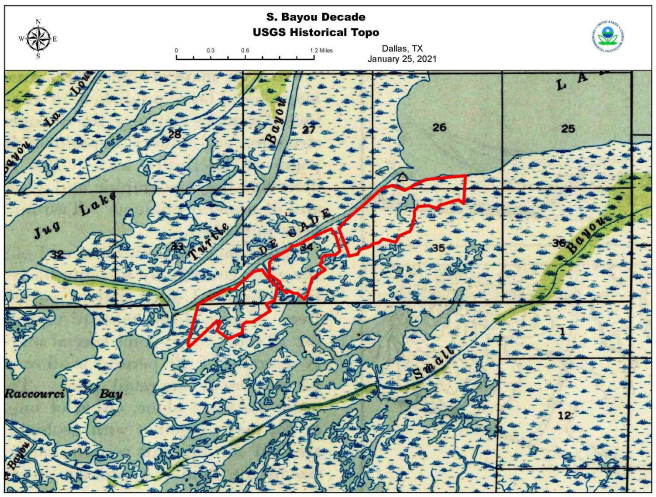


Problems

- This area has experienced wetland loss due to:
  - Subsidence
  - Saltwater intrusion
  - Sediment deprivation
  - Erosion
  - Construction of pipeline canals
- Since 1932, Terrebonne Basin has lost approximately 20% of its wetlands.
- Terrebonne Parish could experience the second highest land loss of any parish (2017 MP)

Historical Reference

- Historical topo from 1940



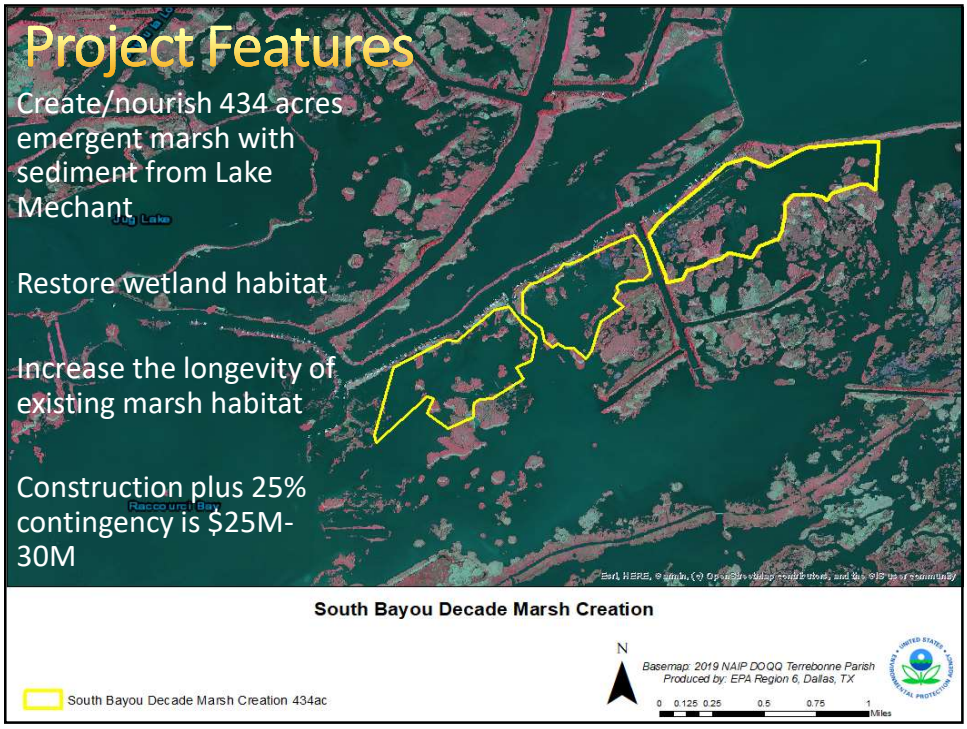
Project Features

Create/nourish 434 acres emergent marsh with sediment from Lake Mechant

Restore wetland habitat

Increase the longevity of existing marsh habitat

Construction plus 25% contingency is $25M-30M



PPL31 PROJECT FACT SHEET
February 3, 2021

Project Name: Trinity Island Beach and Marsh Creation

Master Plan Strategy: Barrier Island Restoration

Project Location
Region 3, Terrebonne Basin, Terrebonne Parish

Problem
Barrier islands are the first line of defense against storm surge and protect the interior wetlands and infrastructure from open ocean wave effects. They ensure the estuaries behind them are low energy environments capable of supporting wetlands and emerging deltas. Trinity Island is part of the Isles Dernieres barrier island chain, one of the most rapidly deteriorating barrier shorelines in the U.S. BICM data from 2008 to 2016 indicates land loss is nearly 128 acres, with only a 44-acre land gain. Previous restorations did not provide for extensive beach and back barrier marsh platforms inhibiting a sustainable landward migration. The easternmost project area encounters considerable wave action and material movement not only on the Gulf shore, but also on the bayside of the island.

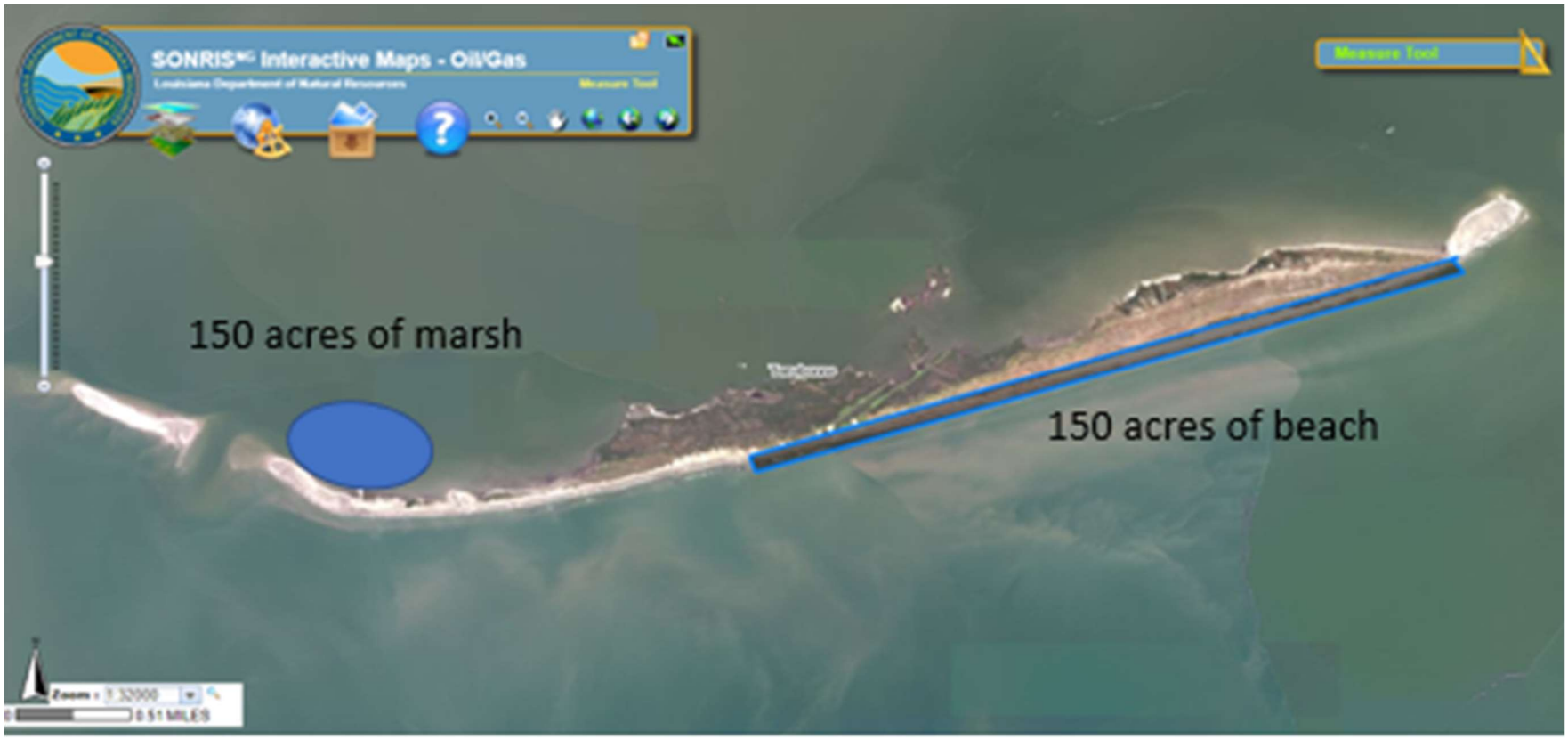
Goals:
1) create the westernmost back marsh platform to enable sustainable and successful island migration
2) extend the life of this barrier island by increasing its width
3) create approximately 150 acres of beach and 150 acres of marsh habitat
4) protect Terrebonne estuary and wetlands against direct exposure to the Gulf of Mexico
5) add sand to this sand-starved barrier island system

Proposed Solution
Dredged material will be placed on the westernmost bayside of the island creating additional backbarrier marsh and a beach will be created along the Gulf shoreline. The bayside marsh will provide a stable backbarrier platform onto which the island sand can continue to migrate landward, while the beach will provide additional sand for redistribution by currents and waves along the entire island's Gulf shore.

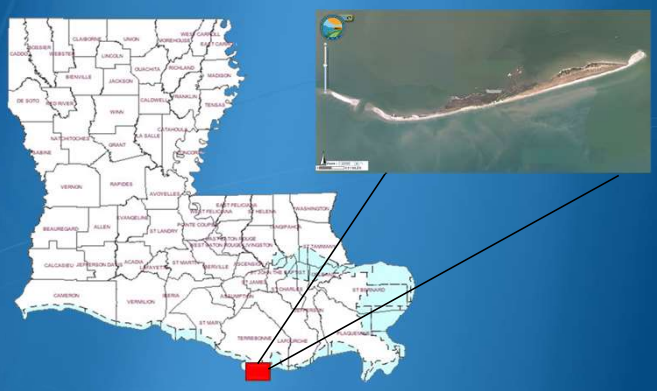
Project Benefits
This project benefits approximately 300 acres of barrier island habitat and maintains strategic components of the coastal ecosystem (barrier islands). The project provides a synergistic effect on previously constructed CWPPRA projects (TE-20, TE-24, and TE-37) and other restoration projects on the Isles Dernieres including the TE-143 project currently under construction.

Projects Costs
The estimated construction cost including 25% contingency is $30M - $35M.

Preparers of Fact Sheet:
Patty Taylor, EPA Region 6, (214) 665-6403, taylor.patricia-a@epa.gov


SONRIS^NG Interactive Maps - Oil/Gas
Measure Tool
150 acres of marsh
150 acres of beach

Trinity Island Beach and Marsh Creation



Coastal Wetlands Planning, Protection and Restoration Act

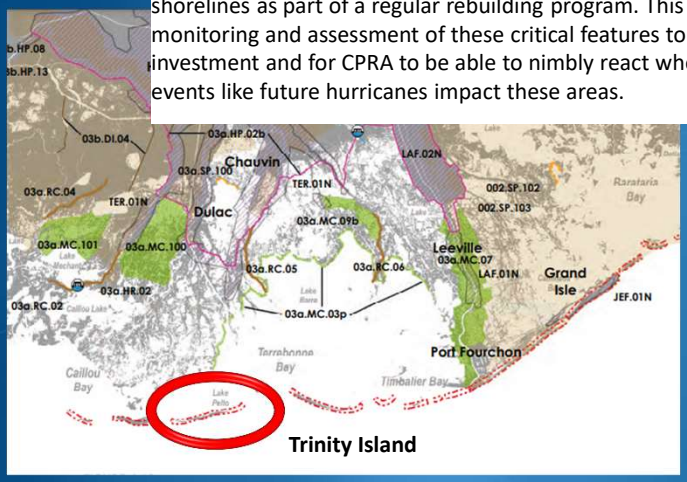
First Line of Defense

"Sustaining our barrier islands is a vital component of coastal protection. They protect interior wetland systems. They stand in front of our protection systems. And they are positioned in front of our communities. Each of these layers must work together to provide holistic storm protection"

Gov. Edwards, September 13, 2019

2017 Master Plan Solution

Rather than recommending specific barrier island and shoreline projects and assigning them to a certain implementation period, CPRA intends to restore the Terrebonne, Timbalier, and Barataria barrier islands and shorelines as part of a regular rebuilding program. This will allow monitoring and assessment of these critical features to drive project investment and for CPRA to be able to nimbly react when catastrophic events like future hurricanes impact these areas.



Why Invest in Barrier Islands?

- Buffer full force and effects of wave action
- Provide marsh to capture sediments washing over the islands
- Reduce saltwater intrusion, storm surge and tidal currents on adjacent estuaries and wetlands
- Provide habitat for endangered and threatened species
- CWPPRA has approximately 20 BI projects

Problems

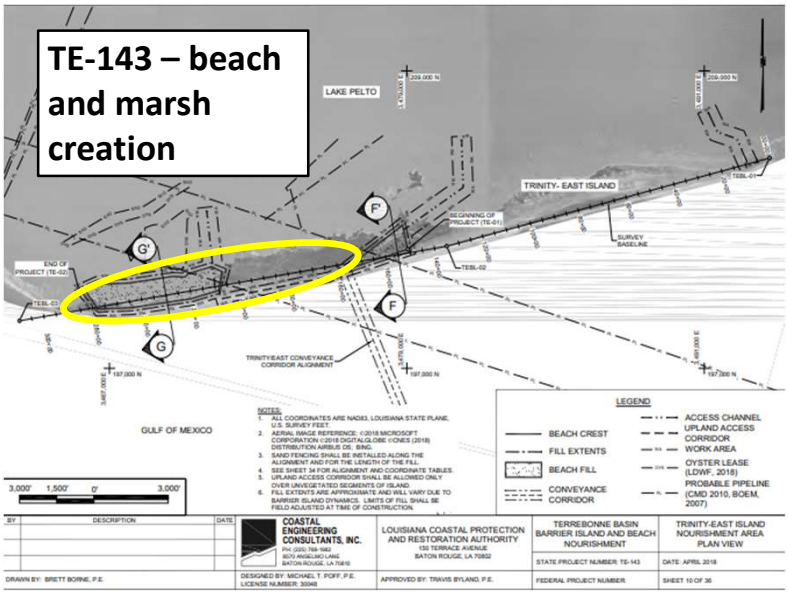
- Sediment starved environment
- Lack of beach and back barrier marsh
- Natural landward migration inhibited
- Barrier islands are not “one and done”
- Numerous storms – islands are the first line of defense against storm surge
- Isles Dernieres barrier island chain is one of the most rapidly deteriorating barrier shorelines in the U.S.

BICM Habitat Report Tool – Trinity Island

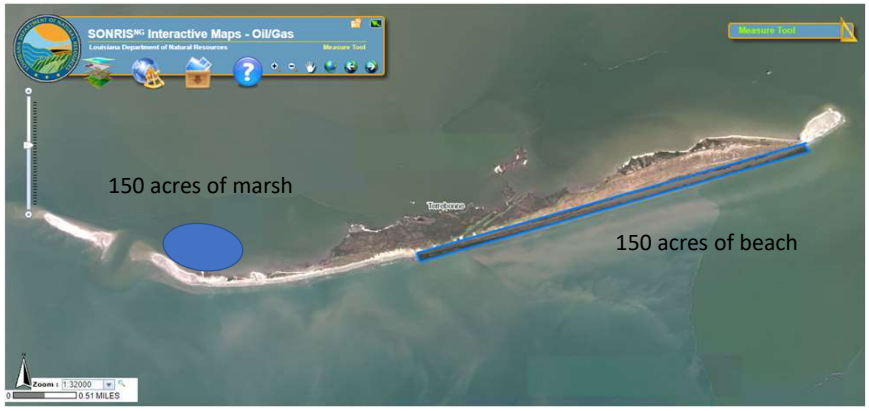
plenty of dune, but little to no beach remaining

Trinity Island Beach and Marsh Creation Concept

Previous CWPPRA restoration: TE-20 (1999), TE-24 (1999) and TE-37 (2007)



Trinity Island Beach and Marsh Creation Concept



150 acres of bayside marsh adjacent to TE-147 marsh creation

150 acres of beach – to work with east to west sediment transport mechanisms

Project Goals

- create the westernmost bayside marsh to enable sustainable island migration
- extend island life by increasing width
- create approximately 150 acres of beach and 150 acres of marsh habitat
- protect Terrebonne estuary and vegetated wetlands against direct exposure to the Gulf of Mexico
- add sand to sand-starved barrier island system
- Construction cost + 25% contingency is $30 M - $35 M

PPL31 PROJECT FACT SHEET
February 3, 2021

Project Name: Timbalier Island Beach and Marsh Creation

Master Plan Strategy: Barrier Island Restoration

Project Location: Region 3, Terrebonne Basin, Terrebonne Parish

Problem
Barrier islands are the first line of defense against storm surge, protecting interior wetlands and infrastructure from the effects of wave action from the open ocean. They ensure the estuaries they protect are low energy environments capable of supporting wetlands and emerging deltas. Timbalier Island is located south of Terrebonne Bay and west of East Timbalier Island in Terrebonne Parish, Louisiana, approximately 13 miles offshore. CWPPRA implemented a dune and marsh creation project in 2005 restoring 2.2 miles on the eastern end of the island. Several significant storms have since occurred and BICM data from 2008 to 2016 indicates a net land loss of over 51 acres. The easternmost project area encounters considerable wave action and sediment movement on both the bay and the Gulf sides of the island. Overall, the island is shortening and narrowing. This loss can be attributed to an inadequate sediment supply, relative sea-level rise, and the impacts from several storms. In October 2020, Category 2 Hurricane Zeta made landfall in Cocodrie, Louisiana with wave heights measuring 50 feet at the Louisiana Offshore Oil Platform. Hurricane Zeta passed over or very close to Timbalier Island. It has been estimated that without mitigating efforts Timbalier Island will disappear by the year 2050.

Goals:
1) create and extend the back marsh platform to enable sustainable and successful island migration
2) increase the width of the island, thus extending its presence and protection to interior wetlands and communities
3) create approximately 75 acres of beach and 300 acres of marsh habitat
4) protect Terrebonne Bay wetlands from direct exposure to the wave action of the Gulf of Mexico
5) add sand to this sand-starved barrier island system

Proposed Solution
Dredged material will be placed on the bayside of the island creating additional backbarrier marsh and along the Gulfside shoreline to create a beach. The bayside marsh will provide a stable backbarrier platform onto which the island sand can continue to migrate landward, while the beach will provide additional sand for redistribution by currents and waves along the entire island's Gulf shore.

Project Benefits
This project benefits approximately 375 acres of barrier island habitat and maintains strategic components of the coastal ecosystem (barrier island). The project provides a synergistic effect with previous CWPPRA projects (TE-18 and TE-40) and other restoration projects on the island including the TE-143 project currently under construction.

Projects Costs
The estimated construction cost including 25% contingency is $30M - $35M.

Preparers of Fact Sheet:
Patty Taylor, EPA Region 6, (214) 665-6403, taylor.patricia-a@epa.gov

Timbalier Island Beach and Marsh Creation Concept

300 acres of bayside marsh adjacent to TE-147 marsh creation

75 acres of beach – to work with east to west sediment transport mechanisms

Timbalier Island Beach and Marsh Creation

Coastal Wetlands Planning, Protection and Restoration Act

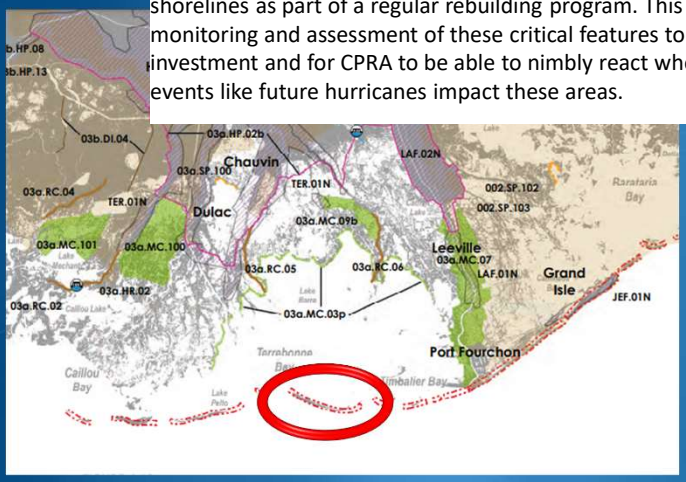
First Line of Defense

"Sustaining our barrier islands is a vital component of coastal protection. They protect interior wetland systems. They stand in front of our protection systems. And they are positioned in front of our communities. Each of these layers must work together to provide holistic storm protection,"

Gov. Edwards, September 13, 2019

2017 Master Plan Solution

Rather than recommending specific barrier island and shoreline projects and assigning them to a certain implementation period, CPRA intends to restore the Terrebonne, Timbalier, and Barataria barrier islands and shorelines as part of a regular rebuilding program. This will allow monitoring and assessment of these critical features to drive project investment and for CPRA to be able to nimbly react when catastrophic events like future hurricanes impact these areas.

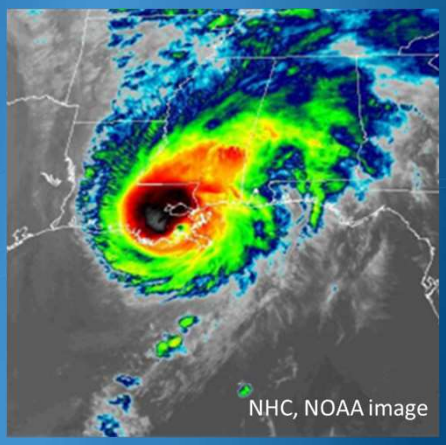


Why Invest in Barrier Islands?

- Buffer full force and effects of wave action
- Provide marsh to capture sediments washing over the islands
- Reduce saltwater intrusion, storm surge and tidal currents on adjacent estuaries and wetlands
- Provide habitat for endangered and threatened species
- CWPPRA has approximately 20 BI projects – about 10% of the program projects

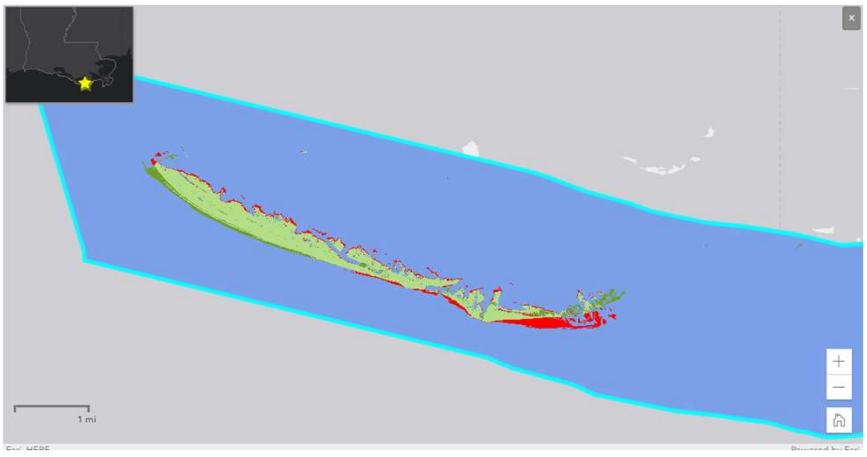
Problems

- Sediment starved environment
- Lack of beach and backbarrier marsh
- Natural landward migration inhibited
- Barrier islands are not “one and done”
- Numerous storms – islands are the first line of defense against storm surge



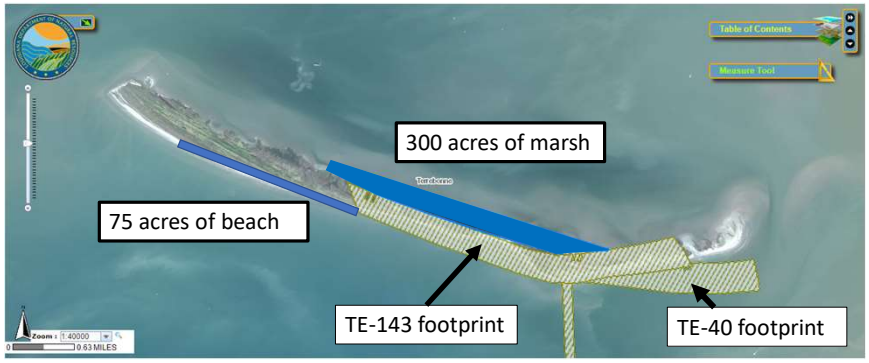
Category 2 Hurricane Zeta made landfall in Cocodrie, LA

BICM Habitat Report Tool – Timbalier Island



From 2008 to 2016 – net loss of over 51 acres

Timbalier Island Beach and Marsh Creation Concept



300 acres of bayside marsh adjacent to TE-147 marsh creation

75 acres of beach – to work with east to west sediment transport mechanisms

Project Goals

- create back marsh platform to increase width and enable sustainable island migration
- create approximately 75 acres of beach and 300 acres of marsh habitat
- protect Terrebonne Bay wetlands from direct exposure to the Gulf of Mexico
- add sand to sand-starved barrier island system
- Construction cost + 25% contingency is $30 M - $35 M

PPL31 PROJECT NOMINEE FACT SHEET
February 3rd, 2021

Project Name
Jug Lake Marsh Creation and Terracing Project

Project Location
Region 3, Terrebonne Basin, Terrebonne Parish, west of Lake De Cade

Problem
The Terrebonne Basin is an abandoned delta complex, characterized by a thick section of unconsolidated sediments that are undergoing dewatering compaction, contributing to high subsidence. Historically, subsidence, saltwater intrusion, hurricanes, and numerous oil and gas 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 approximately 130,000 acres over 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 in the area is -0.82%/year based on CRMS0398 data from 2006 to 2020.

Goals
The project goals are to create and/or nourish 395 acres of intermediate marsh and ~ 322 acres of terrace fields.

Proposed Solution
Sediments from Jug Lake/Bay Raccourci will be hydraulically dredged and pumped via pipeline to create/nourish 395 acres of marsh. Dewatering and compaction of dredged sediments should produce elevations conducive to the establishment of emergent marsh and within the intertidal range. Containment dikes will be constructed around each marsh creation cell. Where practicable, material will be borrowed from perimeter lakes and bayous. Containment dikes will be gapped at the end of construction or by TY3. The terrace fields will be constructed by using sediments from adjacent water bottoms.

Preliminary Project Benefits
1) *What is the total acreage benefited both directly and indirectly*? Approximately 395 acres would be benefited directly and indirectly. Direct benefits include 305 acres of marsh creation and 90 acres of marsh nourishment. Indirect benefits could occur to surrounding marsh and open water areas.

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 300-350 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 interior 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.* The project would help to maintain portions of the Turtle Bayou and Jug Lake shoreline.

5) *What is the net impact of the project on critical and non-critical infrastructure*? The project would help protect numerous camps along Bayou De Cade as well as some oil and gas infrastructure in the area.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects*? The project would work synergistically with the North Lake Mechant Landbridge Restoration Project (TE-44), the Lost Lake Project Marsh Creation Hydrologic Restoration (TE-72), and the Bayou De Cade Marsh Creation Project (TE-138).

Considerations

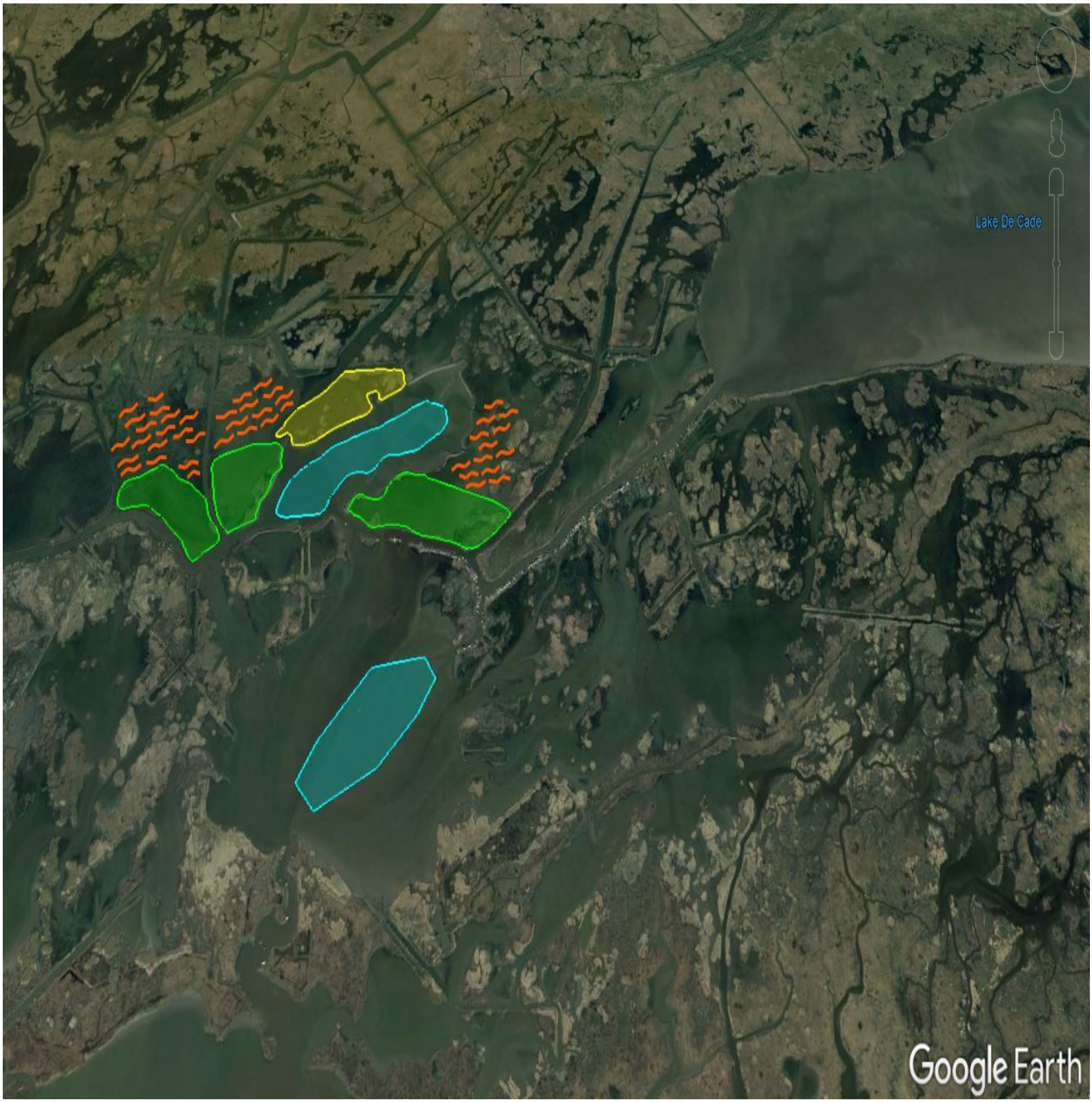
Considerations for this project include pipelines/utilities. Only one landowner.

Preliminary Cost

The fully-funded cost range is $20M - $25M.

Preparer of Fact Sheet

Jennifer Smith, NOAA, (225) 954-6654, jennifer.smith@noaa.gov
Jason Kroll, NOAA, (225) 335-9659, jason.kroll@noaa.gov



PPL31 Jug Lake Marsh Creation and Terracing

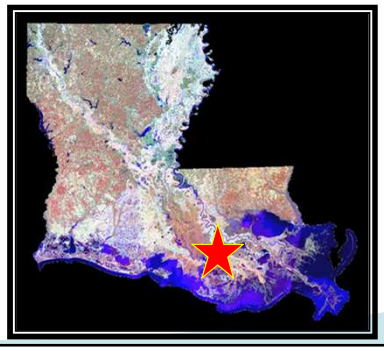
305 Acres Marsh Creation
90 Acres Marsh Nourishment

Federal Sponsor: NOAA Fisheries
2019 Aerial Imagery
Map Date 01-24-2021

Legend

- Terrace Field
- Marsh Creation
- Alternative Fill
- Borrow Area

Jug Lake Marsh Creation and Terracing Project



REGION 3 – Terrebonne Basin

Presenter: Jennifer Smith, Project Manager, NOAA

Special Thanks:
Ron Boustany, NRCS
Eric Whitney, NRCS
Apache Louisiana Minerals, LLC
Terrebonne Parish

PPL31 CWPPRA Regional Planning Team Meeting
Virtual Meeting
February 3, 2021

Project Location

Project Location

Project Area Problem

- Wetland degradation
  - Sea Level Rise
  - Subsidence
  - Hurricane impacts
  - Conversion of marsh to open water
  - Nutria foraging

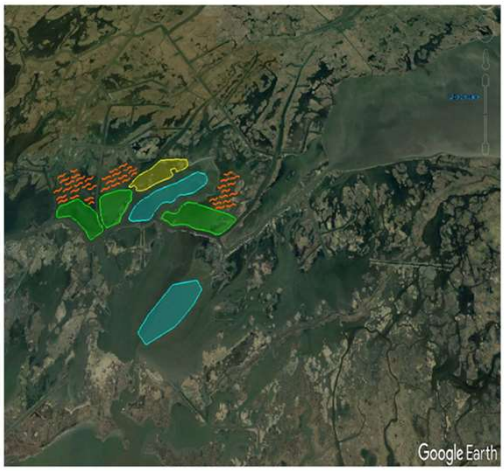
Project Goals

- Marsh Creation/Nourishment and Terracing
  - Restore intertidal marsh habitat
  - Design and construct resilient wetlands to maximize wetland benefits throughout the 20 year project life.

Restoration Solution

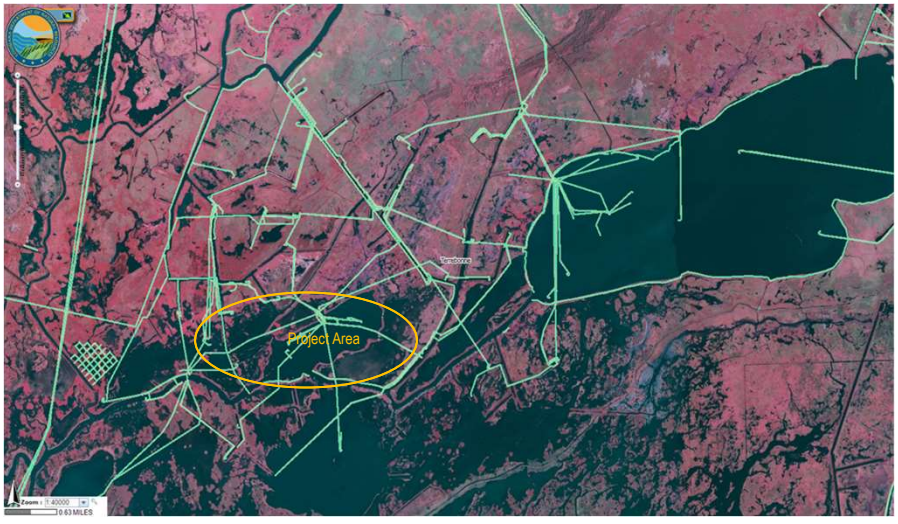
- 395 Acres of Marsh Creation/Nourishment
  - 305 Acres of Marsh Creation & 90 Acres of Marsh Nourishment
  - Hydraulically dredge material from Jug Lake/Raccourci Bay
  - Contained Fill areas with dike gapping after construction
  - Short pumping distance, less than 1.5 miles
  - ~ 322 acres of Terrace Fields

Project Map



- 2017 State Master Plan Polygon 03a.MC.101
- Jug Lake/Raccourci Bay Borrow
- 395 Acres TOTAL of Marsh Creation/Nourishment
- Approximately 305 acres Creation and 90 acres Nourishment
- Create ~ 322 acres of Terrace Fields

Pipelines



Summary of Features, Cost, and Benefits

- **395 Acres Marsh Creation/Nourishment**
  - 305 acres Marsh Creation
  - 90 acres Nourishment
- **~ 322 acres of Terrace fields**

- **Construction Cost + 25% Contingency $20M - $25M**
- **Net Benefits: 300-350 acres**

Contact information:
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jennifer.smith@noaa.gov
Jason Kroll, 225-335-9659
jason.kroll@noaa.gov

PPL31 PROJECT NOMINEE FACT SHEET
February 3, 2021

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 -0.86% per year based on USGS hyper temporal data from 1984 to 2019.

Goals
The project goals are to create and/or nourish up to 313 acres of emergent brackish marsh

Proposed Solution
The proposed project's primary feature is to create and/or nourish approximately 313 acres of emergent brackish marsh (261 acres of marsh creation and 52 acres of marsh nourishment). In order to achieve this, sediment will be hydraulically pumped from a borrow source in Bay Laurier. 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.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   This total project area is approximately 313 acres (261 acres of marsh creation and 52 acres of marsh nourishment).

2) *How many acres of wetlands will be protected/created over the project life?*
   The net acre benefit range is 200-250 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 estimated construction cost is $15M - $20M plus 25% contingency.

Preparer(s) of Fact Sheet:
Dawn Davis, NOAA Fisheries, 225-380-0041, dawn.davis@noaa.gov

West Louisiana Highway 1 Marsh Creation

(PPL31 Nominee)

Marsh Creation *

Project Boundary

* denotes proposed features

0.5 0 0.5
Kilometers
0.5 0 0.5
Miles

Scale 1:35,000

Map ID: USGS-NWRC 2019-11-0019
Map Date: July 30, 2019

USGS science for a changing world

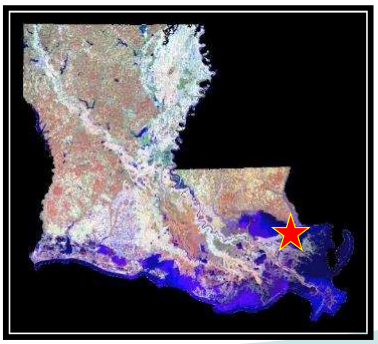
Produced by:
U.S. Department of the Interior
U.S. Geological Survey
Wetland and Aquatic Research Center
Coastal and Ocean Restoreation Branch
Baton Rouge, La

Image Source:
2017 NAIP Photography

PPL31 West Louisiana Highway 1 Marsh Creation

NOAA FISHERIES

Habitat Conservation Division



REGION 3 – Terrebonne Basin

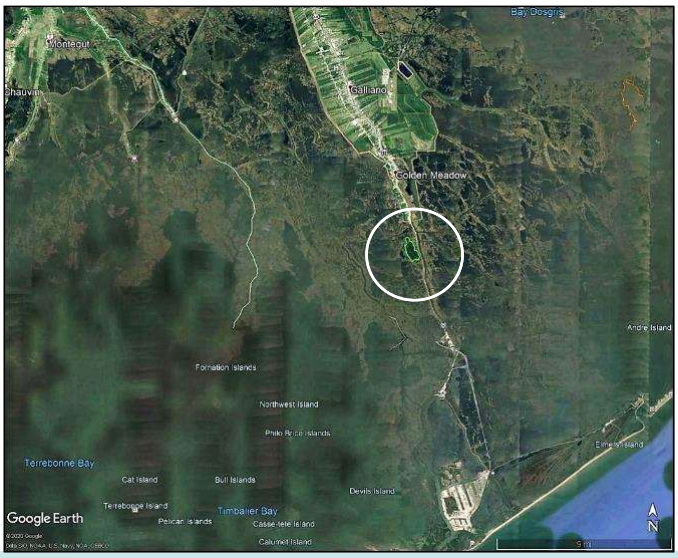
Presenter: Dawn Davis, Fishery Biologist

PPL31 CWPPRA Regional Planning Team Meeting

Virtual

February 3, 2021

Project Location



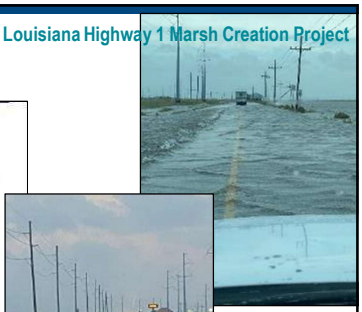
Project Area Problem

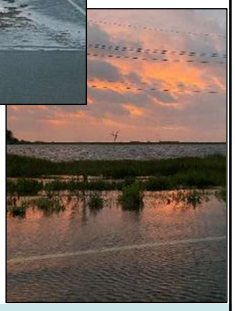
- High land loss rates in Terrebonne Basin, 20% since 1932 and currently 4,500-6,500 acres lost per year
- High subsidence in the area, 0.5 ft/20 yr, 2017 Coastal Master Plan (mod 8.8 mm/yr rate)
- Limited protection to either side of LA Hwy 1
- Wetland loss rate for the project area is -0.9% per year based on USGS hyper temporal data

News from the LA 1 Coalition

The 2020 active storm season forced closures of low-lying LA 1 for five of the six storms that impacted our region, including Tropical Storm Cristobal and Hurricanes Laura, Beta, Delta and Zeta.

We have learned from the cost-benefit analysis for Phase 2 of the LA 1 Project compiled for the INFRA Grant Program that each day that LA 1 is closed, inhibiting access to an open Port Fouchon, costs the U.S. $46 million in oil & gas production and $528 million in total GDP. These significant costs justify the needed local/state/federal investment of $445 million in the elevated highway from Golden Meadow to Leeville in order to avoid the economic impacts of highway closures to our local, state and national economies.





West Louisiana Highway 1 Marsh Creation Project

LA 1 Project Moves Toward Construction in 2021

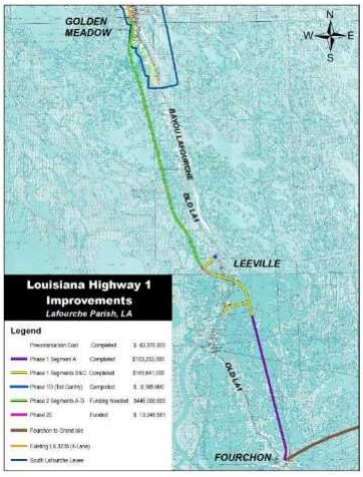
LA DOTD Set to Take Bids for Phase 2 in October 2021

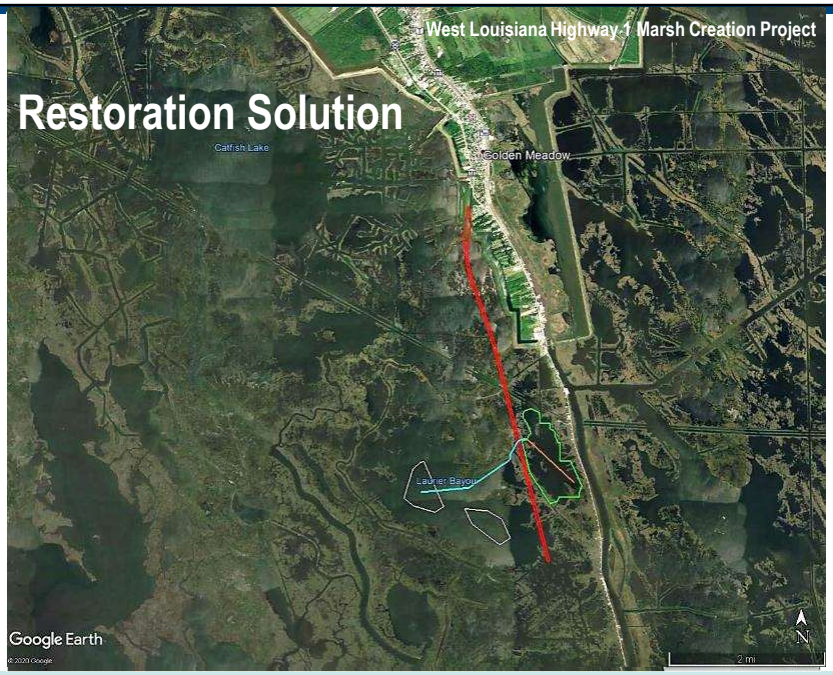
With an aggressive design and pre-construction task schedule, the Louisiana Department of Transportation and Development (LA DOTD) has set an October 2021 date to receive construction bids for the elevated highway from Golden Meadow to Leeville.

This past June the LA 1 Phase 2 Project won a $135 million grant from the United States Department of Transportation's INFRA Grant Program, providing the state 30% of the $445 million estimated cost. *Pictured above are Governor John Bel Edwards, Congressman Steve Scalise, local legislators, and GLPC and Coalition officials at the grant announcement in Golden Meadow.*

Another $150 million of construction funding will come from BP Economic Damage monies which was committed in Act 443 of state's 2019 Regular Legislative Session. Additional funds are pledged through the state Capital Outlay Program, from the Greater Lafourche Port Commission, from Lafourche Parish Government, from local land owners and several oil & gas companies. The LA 1 Coalition also pledged funds representing buy-in from the nonprofit sector. **Pledge letters from such a wide range of community stakeholders helped our state and the LA 1 Project win the largest INFRA grant the federal government is awarding throughout the country in 2020.**

Thank you to all who contributed to the winning grant application!

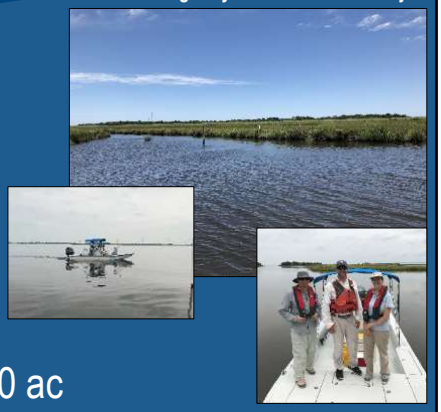




Project Features and Benefits

- 261 acres of marsh creation and 52 acres of marsh nourishment
- Borrow from Laurier Bayou
- 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 LA HWY 1

Summary of Features, Cost, and Benefits



- Total: 313 ac
  - Marsh Creation: 261 ac
  - Marsh Nourishment: 52 ac
- Estimated net acres: 200-250 ac
- Estimated construction cost: $15M - $20M plus contingency

Contact information:
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PPL31 NOMINEE FACT SHEET
February 3, 2021

Project Name
West Raccourci Marsh Creation and Terracing

Project Location
Region 3, Mechant/de Cade Basin, Terrebonne Parish; located north of Lake Mechant and south of Bayou Decade between Bay Raccourci and Lake Pagie.

Problem
Subsidence, canal dredging and storm damage have contributed significantly to the loss of marsh in the area. The zone of intermediate marsh is located just north of Lake Mechant. High salinity water has infiltrated through oil and gas canals and Bayou Raccourci and entered lower salinity marshes surrounding Bay Raccourci and eventually entering Bayou Decade. Increased freshwater input from Atchafalaya River water to the lower Penchant marshes influences the area. Much of that influence is filling in open bays and lakes. A loss rate was calculated for the area by USGS to be -0.21% /yr between years 1984 to 2019 (Bay Raccourci Inc II Marsh Creation).

Goals
The goal of this project is to restore low salinity brackish/intermediate marsh north of the "Y" canal to slow the movement of saline water north. The construction of terraces will help to buffer salinities, restore habitat and continue to allow for the beneficial influence of freshwater flows south through the marsh. Restoration of this marsh will compliment adjacent marsh restoration projects and may help alleviate the need for the long-term maintenance of some of the structural components of TE-44.

Proposed Solution
Sediment will be dredged from a borrow site in Lake Pagie and pumped via pipeline to create/nourish approximately 652 acres (429 MC +223 MN) of marsh. Earthen containment dikes will be constructed around the perimeter of marsh creation cells. Containment dikes will be gapped at the end of construction or by target year 3. Approximately 11,830 LF of terraces will be constructed in a 167-acre area influenced by freshwater flow from Raccourci Bay. Terraces are proposed with a 15 ft top width, 1:5 side slopes, and 250 ft spacing.

Considerations
Oil and gas infrastructure

Preliminary Cost
Construction cost plus 25% contingency is estimated to be $25-30M.

Preparer(s) of Fact Sheet:
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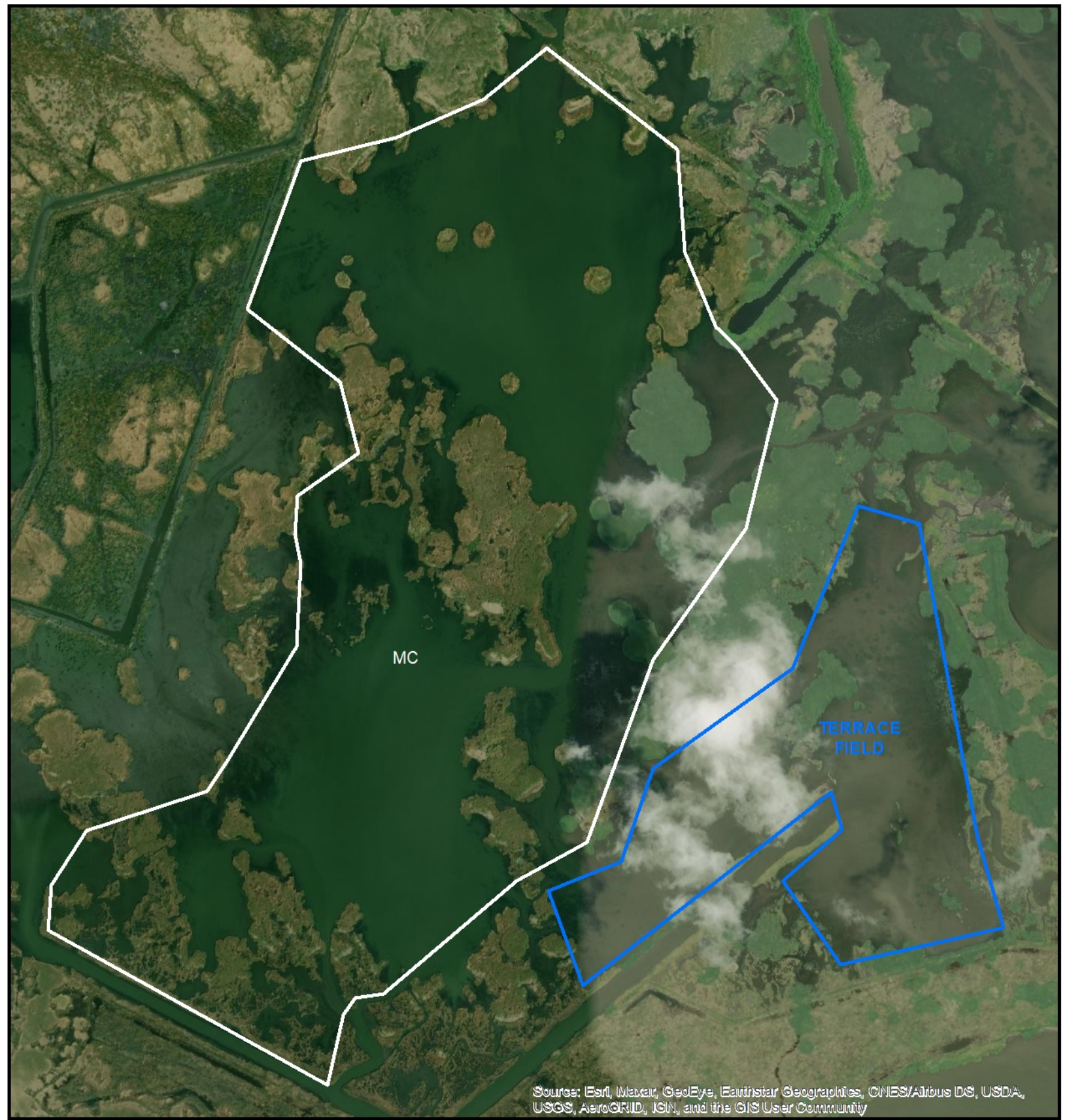
Jackie Jones, Planning Engineer, Jacqueline.Jones@USDA.gov, 337/291-3055

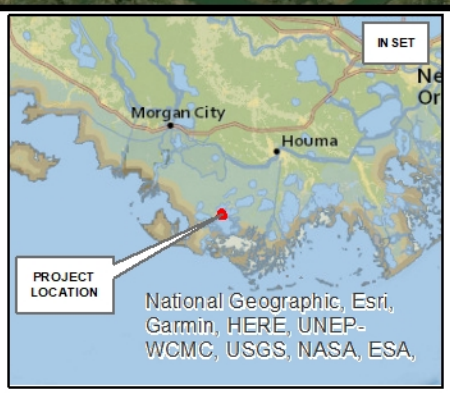


USDA

Map Produced By:
United States Department of Agriculture
Natural Resources Conservation Service
Alexandria, LA

Data Source: ESRI 2019

Map Date: JANUARY 4, 2021



PPL 31 WEST RACCOURCI
MARSH CREATION AND TERRACING
TERREBONNE PARISH, LA

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0 600 1,200
Feet

Legend

- MARSH_CREATION
- TERRACE_FIELD

PPL31

West Raccourci Marsh Creation and Terracing

Region 3, Terrebonne Basin

Contacts:
Angela Trahan, Project Manager, Angela.Trahan@USDA.gov, 337/291-3142
Jackie Jones, Planning Engineer, Jacqueline.Jones@USDA.gov, 337/291-3055

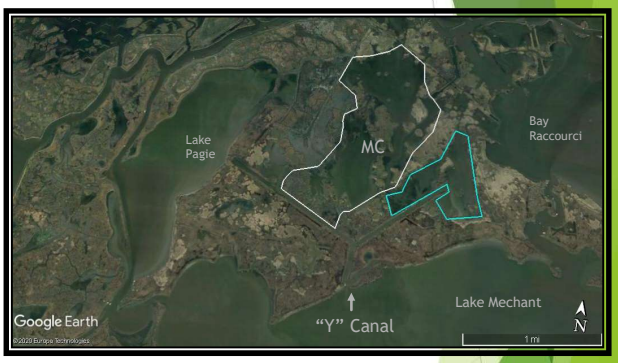
Problem:

- high salinity water has infiltrated through oil and gas canals & through Lake Pagie and Bayou Raccourci and entered lower salinity marshes surrounding these open water areas.
- Increased freshwater input from Atchafalaya River through the lower Penchant marshes influences the area. Much of that influence is filling in open bays and lakes.

PPL31 – West Raccourci Marsh Creation & Terracing

Goal:

1) restore low salinity brackish/intermediate marsh north of the "Y" canal (BA = Lake Pagie)
2) Construct terraces to reduce fetch and buffer salinities & continue to allow for the beneficial influence of freshwater flows south through the marsh



- Compliments adjacent marsh restoration projects
- May help alleviate the need for the long-term maintenance of some of the structural components of TE-44

PPL31 – West Raccourci Marsh Creation & Terracing

Solution:

Lake Pagie Borrow

429 acres Marsh Creation

223 acres Marsh Nourishment

652 acres Total

167-acre Terrace Field

11,830 LF Terraces

Total Area of Benefits = **819 acres**

Construction Costs + 25% Continency = **$25-30M**

PPL31 PROJECT NOMINEE FACT SHEET
February 3, 2021

Project Name
Bayou Jean Lacroix Marsh Creation

Project Location
Region 3, Terrebonne Basin, Terrebonne Parish, Bayou Jean Lacroix just south of the twin pipelines.

Problem
The marshes of Eastern Terrebonne Parish have suffered extensive damage from subsidence, erosion, salinity intrusion and sea level rise. These areas are particularly vulnerable because the area set in a position where waters from the Mississippi and Atchafalaya Rivers have the least amount of influence. Terrebonne Parish has consistently expressed most concern for these marshes because so many of their cultural heritage communities are increasingly threatened. The regional loss in the area is -1.71% per year with a subsidence rate of 8.8 mm/y (moderate scenario). Therefore, projects in the Eastern Terrebonne Basin are a high priority. Much like the other basins of the Deltaic Plain, building synergy in the form of a landbridge may be feasible in the Eastern Terrebonne Basin.

Goals
The primary goals of this project are to 1) create/nourish marsh habitat in the degraded marsh and open water via marsh creation, marsh nourishment and terracing, 2) reduce fetch and wave energy in open water areas with the construction of terraces and 3) bank restoration to reconstitute the flow channel.

Proposed Solution
Sediments will be hydraulically dredged and pumped via pipeline from a borrow site located in near Lake Felicity to create/nourish approximately 374 acres of marsh. 8,400 linear feet of terraces will be constructed adjacent to the marsh creation area along the bayou. 9,959 linear feet of bank restoration will be constructed adjacent to the project area along Bayou Jean Lacroix.

Project Benefits
The project is expected to initially create/nourish approximately 374 acres of marsh and an additional 8 acres of marsh with terraces.

Preliminary Cost
The construction cost range is $30M - $35M (construction + 25%).

Preparer of Fact Sheet
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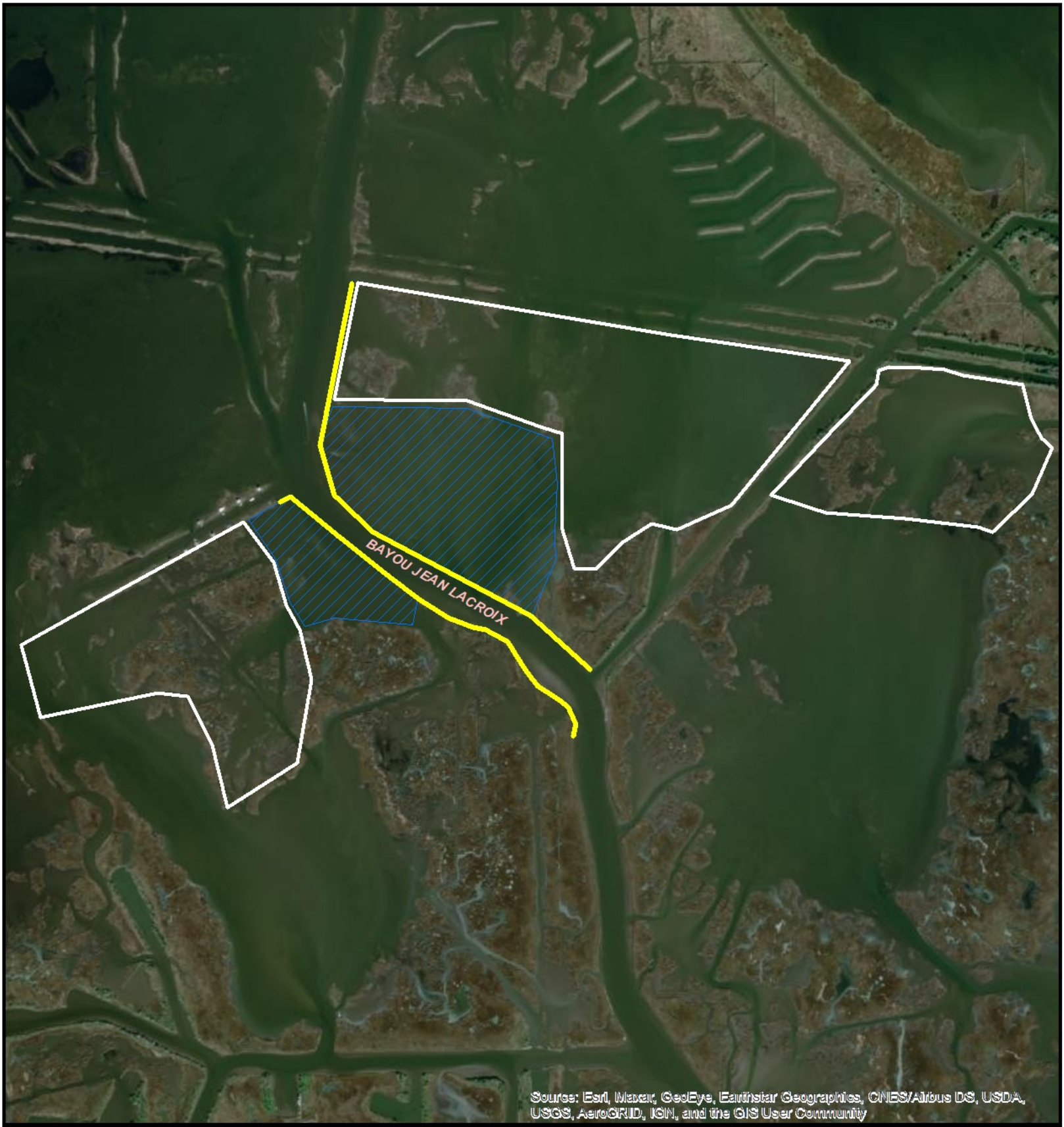

USDA

Map Produced By:
United States Department of Agriculture
Natural Resources Conservation Service
Alexandria, LA

Data Source: ESRI JANUARY 2020

Map Date: JANUARY 20, 2021

PPL 31
BAYOU JEAN LACROIX
MARSH CREATION
TERREBONNE PARISH, LA

N
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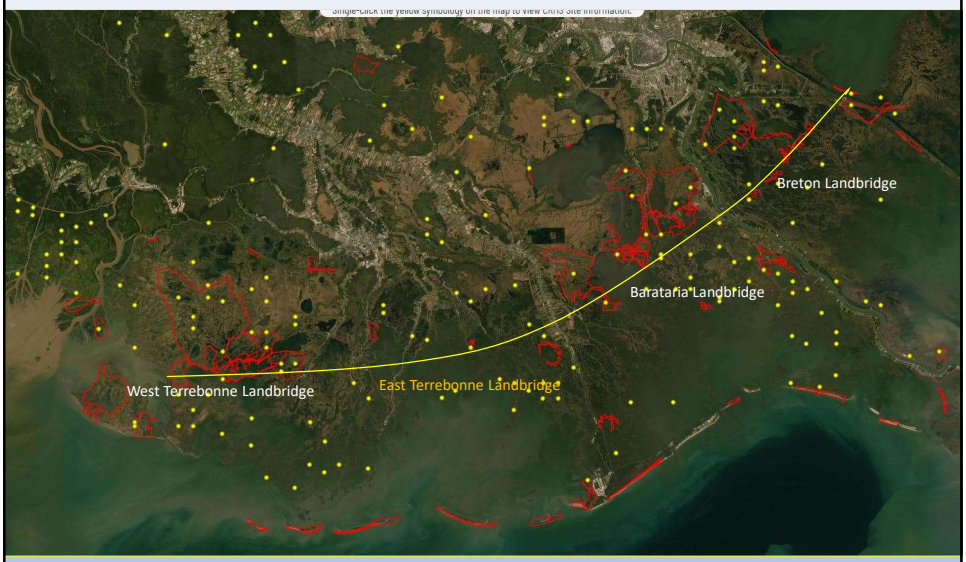
0 1,000 2,000 Feet

Legend

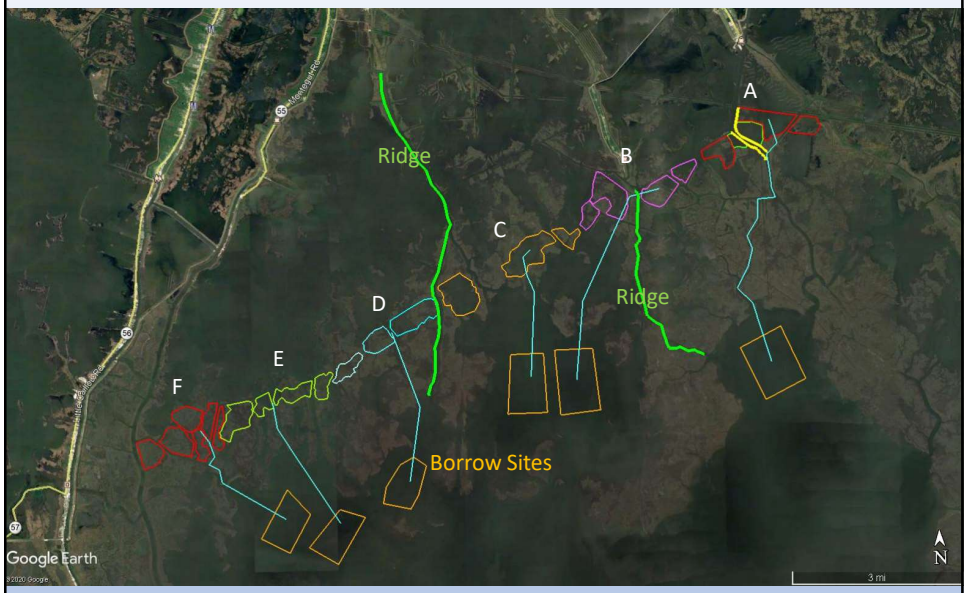
- MARSH_CREATION
- EARTHEN_BANK_RESTORATION
- TERRACE_FIELD

East Terrebonne Landbridge Concept

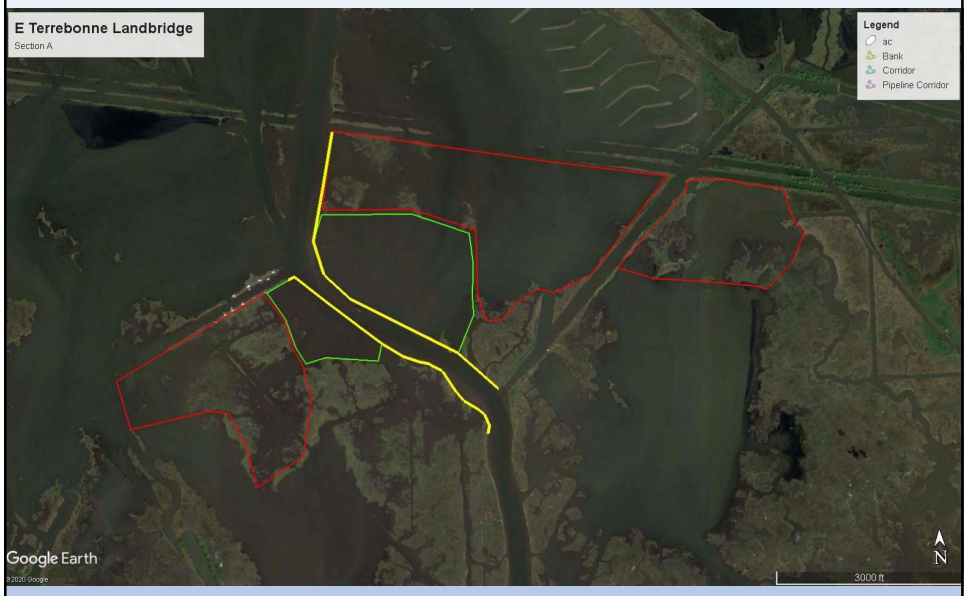


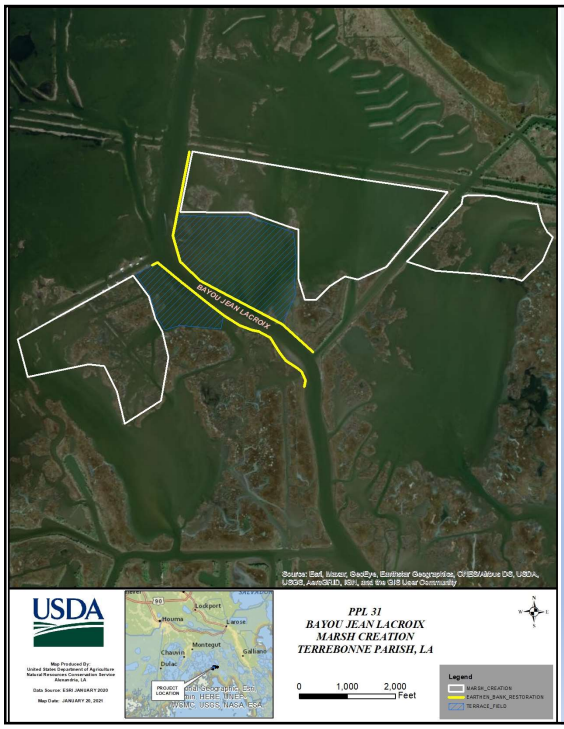
East Terrebonne Landbridge Concept

East Terrebonne Landbridge Concept



East Terrebonne Landbridge Concept (Section A)- <u>Bayou Jean Lacroix Marsh Creation</u>





PPL31
Bayou Jean Lacroix Marsh Creation

Problem: The eastern Terrebonne basin has suffered much loss due to subsidence, erosion, salinity intrusion and sea level rise.

Project Goals: To create marsh and terraces and stabilize the banks of Bayou Jean Lacroix. Build synergy with a potential land bridge across Eastern Terrebonne Basin.

Project Benefits: The project will create/nourish 374 acres of marsh, 8,400 lf of terraces and 9,959 lf of bankline restoration.

Preliminary Cost: $30-35M (const+25%)

PPL31 PROJECT NOMINEE FACT SHEET
February 3, 2021

Project Name
Mound Bayou Marsh Creation

Project Location
Region 3, Terrebonne Basin, Terrebonne Parish, East of Theriot and south of Falgout Canal

Problem
The marshes south of Falgout Canal have been severely degraded for quite some time now. Most of the area has completely converted to open water with exception to a few oil and gas canals. The area continues to lose marsh at a rate of -0.61 %/y and the state estimates the area is subsiding at 8.8 mm/y. Recently, Terrebonne Parish has completed a segment of the Morganza to the Gulf levee protection system and in this area they have installed two freshwater diversion structures to move water from Falgout Canal to the south. This action presents an excellent opportunity for creating sustainable marsh by taking advantage of the newly introduced freshwater, nutrients, and sediments into the area.

Goals
The primary goals of this project are to 1) create/nourish marsh habitat in the degraded marsh and open water via marsh creation, marsh nourishment and terracing, 2) reduce fetch and wave energy in open water areas with the construction of terraces and 3) utilize terracing to enhance the capture of sediments and nutrients introduced through the diversion structures.

Proposed Solution
1. Sediments will be hydraulically dredged and pumped via pipeline from a borrow site located in the Houma Navigation Canal (HNC) to create/nourish approximately 412 acres of marsh
2. Approximately 18,200 linear feet (10.8 acres) of terraces will be constructed. The terraces will be strategically placed to both create marsh where needed, reduce fetch in the open water areas and capture nutrients and sediment moving through the diversion structures.
3. Containment dikes will be gapped, and the terraces will be planted.

Project Benefits
The project is expected to initially create/nourish approximately 412 acres of marsh and an additional 10.8 acres of marsh with terraces.

Preliminary Cost
The construction cost range is $20M - $25M.

Preparer of Fact Sheet
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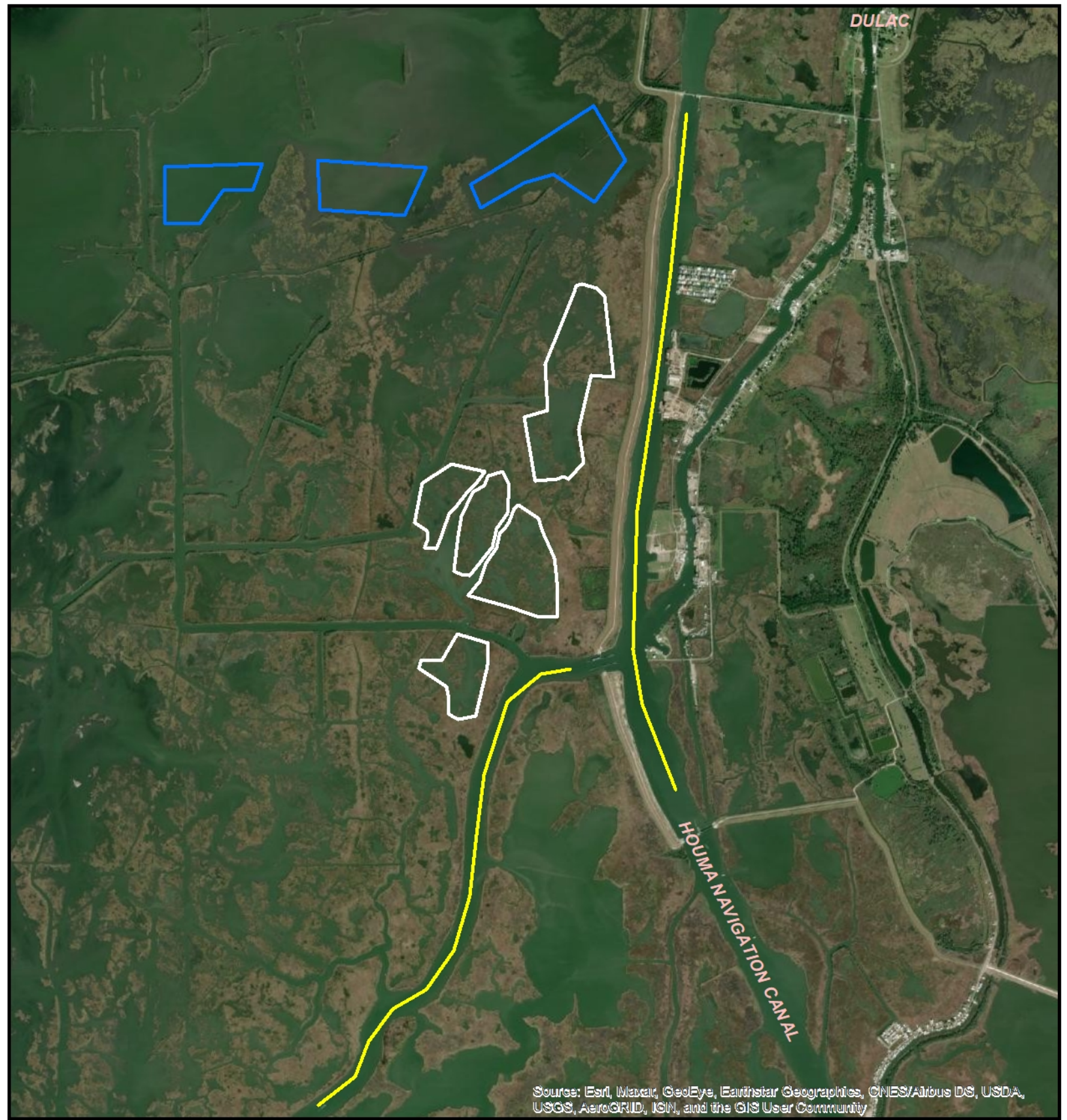
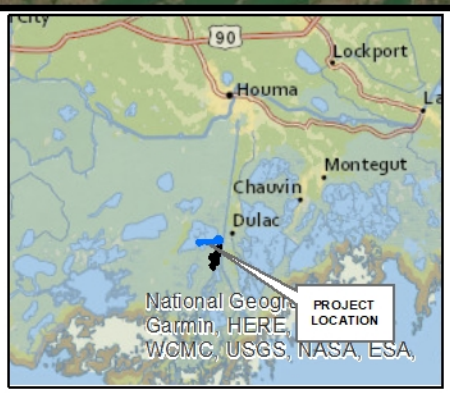


USDA

Map Produced By:
United States Department of Agriculture
Natural Resources Conservation Service
Alexandria, LA

Data Source: ESRI NOVEMBER 2017

Map Date: JANUARY 25, 2021



PPL 31
MOUND BAYOU
MARSH CREATION
TERREBONNE PARISH, LA

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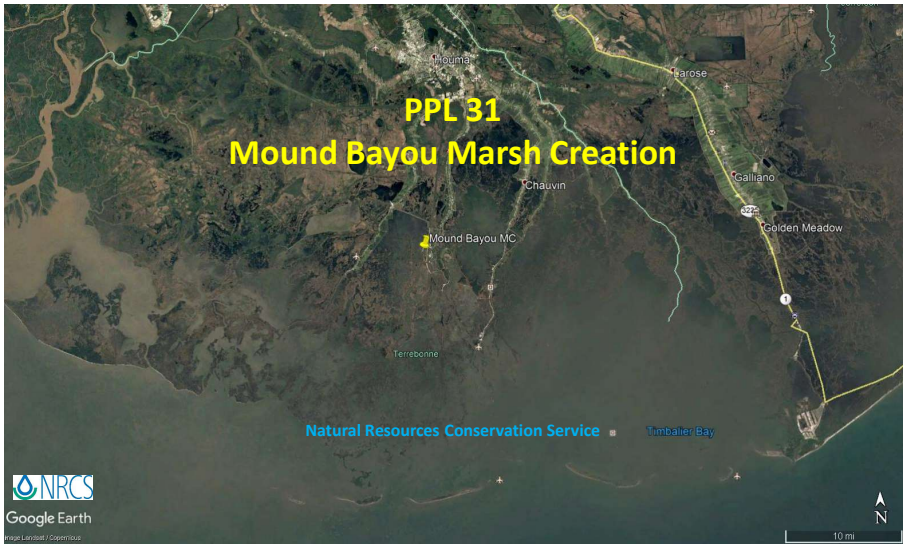
Legend

- MARSH_CREATION
- TERRACE_FIELD
- BORROW_AREA


PPL 31
Mound Bayou Marsh Creation
Houma
Larose
Chauvin
Galliano
Golden Meadow
Mound Bayou MC
Terrebonne
Natural Resources Conservation Service
Timbalier Bay
NRCS
Google Earth
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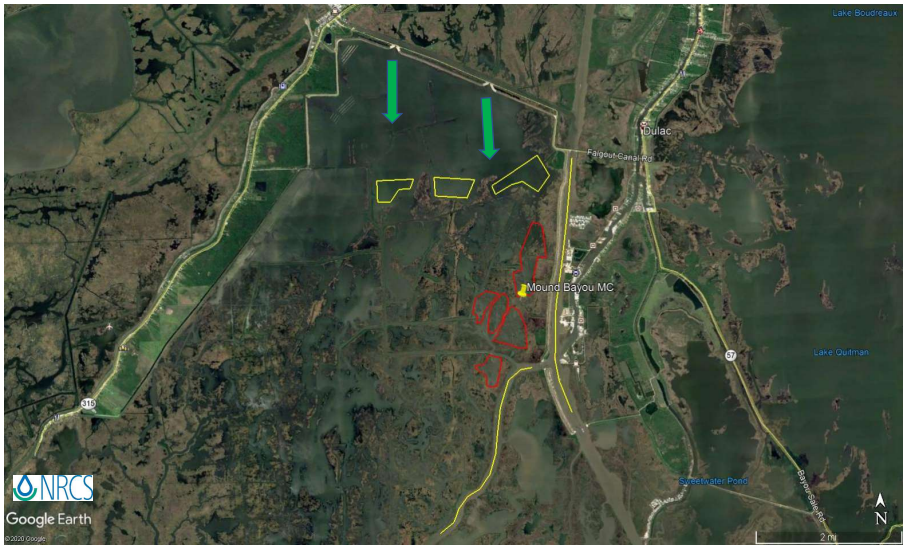
Lake Boudreaux
Dulac
Mound Bayou MC
Lake Quitman
Freshwater Pond
NRCS
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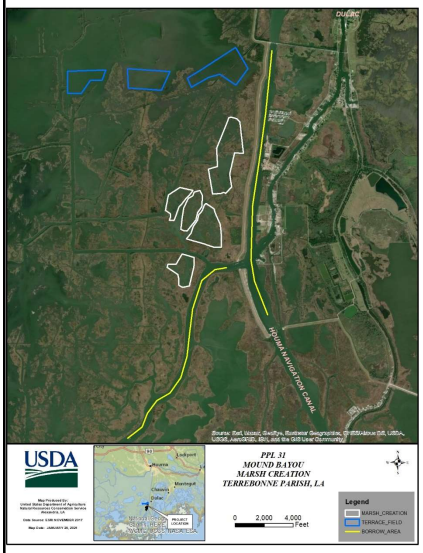

PPL-31

Mound Bayou Marsh Creation

Problem: Marshes south of Falgout Canal have suffered huge losses related to subsidence/erosion, and salinity intrusion. Recent addition of freshwater flow through the area offers an opportunity to build sustainable marsh in the area.

Project Objectives:

- Create marsh habitat via marsh creation nourishment and terracing
- Reduce interior erosion via the construction of terraces
- Use terraces to enhance the capture of sediments and nutrients from diversion structures

Project Features and Benefits:

- Create/nourish 412 acres of marsh
- Create 18,200 lf of terraces (10.8 acres of marsh)

Project Cost:

- $24.5 million (Const+25%)

PPL 31 PROJECT NOMINEE FACT SHEET
February 3, 2021

Project Name:
Bayou Barre Marsh Creation and Terracing

Project Location:
Region 3, Terrebonne Basin, Terrebonne Parish. Southeast Montegut between Wonder Lake and Madison Bay.

Problem:
The marshes near the Madison Bay area have experienced tremendous wetland loss due to a variety of factors, including subsidence, saltwater intrusion, a lack of sediment supply, and oil and gas activities. The loss of the marshes have exposed significant infrastructure to open water conditions and has made the area less suitable for various wildlife and fisheries. The 1985 to 2016 loss rate for the Wonder Lake area is 1.67%/yr. With high wetland loss in the vicinity, the Morganza Hurricane Protection Levee to the north of the project area has become extremely susceptible to high wave energies with the increase in fetch.

Goals :
This project would strategically start the process of tying together three ridges (Bayou Terrebonne Ridge, Bayou St. Jean Charles Ridge, and Point au Chene Ridge) and the Island Road Marsh Creation project.

Specific goals: 1) Create 400 acres of brackish intertidal marsh, 2) nourish 20 acres of brackish intertidal marsh, and 3) construct 21,000 LF of terraces (5 acres).

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 be beneficial to 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, and Saltwater topminnow. Keeping these species off the threatened and endangered list is a goal of FWS because at that point ALL Federal agencies must then address those species.

Proposed Solution:
This project would propose to create/nourish approximately 420 acres of emergent marsh by utilizing a small hydraulic dredge to pump material from Maddison Bay borrow area. The distance required to pump that material could be kept under 15,000 feet. That material would be placed in shallow open water areas between Wonder Lake and Maddison Bay. Utilizing a small dredge would reduce the height of the containment dikes needed to create marsh in open water areas. At this time there are remnant dikes that are still in tack surrounding most of the marsh creation cells. Dredge material would be placed to a height conducive for the creation of healthy intertidal marsh. All constructed containment dikes would be sufficiently gapped or degraded no later than 3 years post construction to allow for fisheries access.

Preliminary Project Benefits:
1) What is the total acreage benefited both directly and indirectly?
This total project area is 710 acres.

2) How many acres of wetlands will be protected/created over the project life?
Approximately 345 ac of brackish marsh will be protected/created over the 20 year project life.

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 land loss rate reduction throughout the area of direct benefits would be 50-74% over the 20 year project 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 help restore portions of the Wonder Lake shoreline and portions of the Bayou Barre bankline.

5) What is the net impact of the project on critical and non-critical infrastructure?
This project would help protect the Morganza Hurricane Protection Levee, Point Barre road, several camps, and some 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 work synergistically with two other projects (Maddison Bay Marsh Creation and Terracing project and Island Road Marsh Creation project) which would tie together three ridges (Bayou Terrebonne Ridge, Bayou St. Jean Charles Ridge, and Pointe aux Chene Ridge).

Identification of Potential Issues:
There would most likely be some pipeline issues, numerous oyster leases, and poor soils within the project area.

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

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

Louisiana Ecological Services Field Office

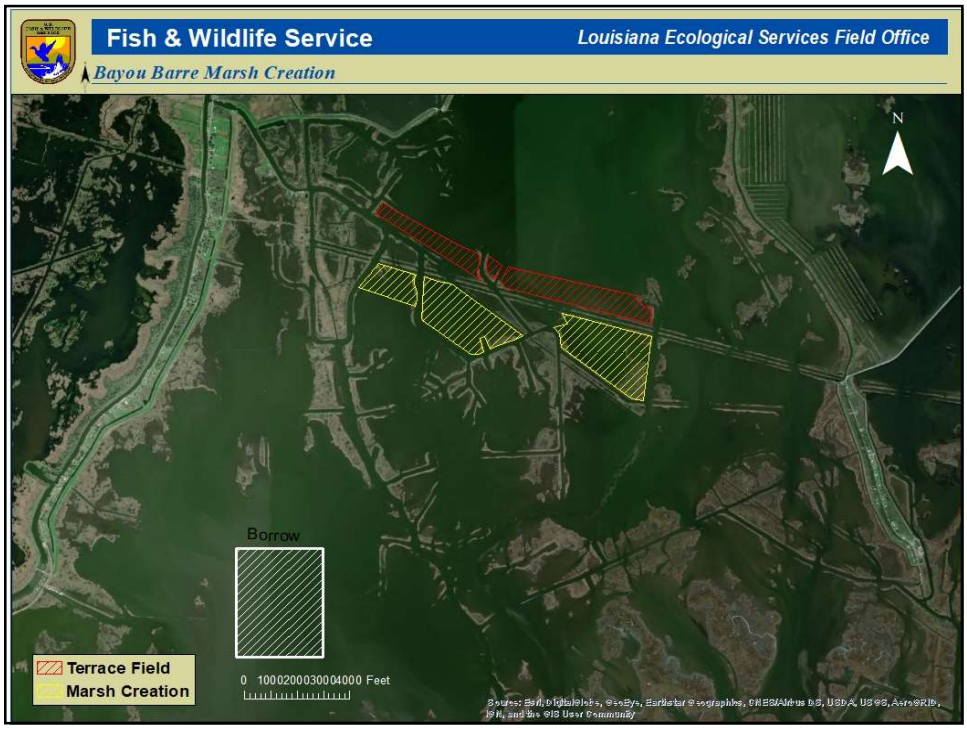
Bayou Barre Marsh Creation

BAYOU BARRE MARSH CREATION AND TERRACING

BAYOU BARRE MARSH CREATION AND TERRACING

Problem:

- Project area wetlands loss is due to subsidence, saltwater intrusion, a lack of sediment supply, and oil and gas activities.
- The 1985 to 2016 loss rate 1.67%/yr. (Wonder Lake)
- Losses have exposed infrastructure to open water conditions and has made habitats in the area less suitable for various fish and wildlife species.



BAYOU BARRE MARSH CREATION AND TERRACING

Concerns:

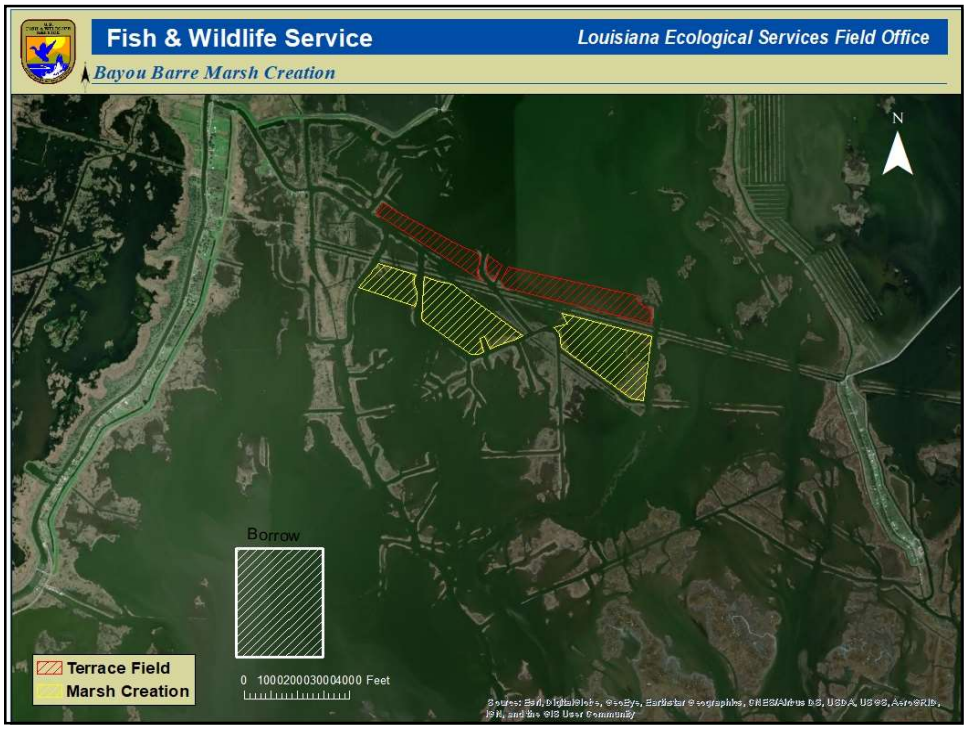
1) Maddison Bay project was placed on the Inactive list and issues with the Island Road project.

2) Pipeline will be an Issues.

- We have more experience dealing with pipeline with very little cover
- Private pipeline companies have said this would not be a problem in this area with the depth of water above the pipeline to float the disposal pipeline

3) Issues with poor soils and constructing containment dikes

- With the small dredge (16-18 inch dredge) overbuilt containment dikes are not needed. Low velocity pumping allows water/material being pumped to remain at lower levels.
- The area we are looking at building marsh are almost completely surrounded by some type of levee or containment dike. We have a base for the containment dikes.


Fish & Wildlife Service
Louisiana Ecological Services Field Office
Bayou Barre Marsh Creation
N
Borrow
Terrace Field
Marsh Creation
0 1000200030004000 Feet

BAYOU BARRE MARSH CREATION AND TERRACING

- This area is an incredible area of need. With the exception of TE-46, no CWPPRA project has been constructed in the entire Eastern Terrebonne area (HNC to Lafourche Parish)!
- This project would show that we could tie together three ridges (Bayou Terrebonne Ridge, Bayou St. Jean Charles Ridge, and Point au Chene Ridge) which would be very strategic in this area.

BAYOU BARRE MARSH CREATION AND TERRACING

Goals:

- Create 400 acres of marsh.
- Nourish 20 acres of marsh.
- Construct 21,000 LF of terraces

Net Acres:

- Total net acres = 345 acres marsh including 8 acres from terraces

Potential Issues:

- Multiple pipelines, poor soils, and mindset of "we can not build anything in that area because….."

Preliminary Construction Costs

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

Species of Concern and Rare Species

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

PPL31 PROJECT NOMINEE FACT SHEET
February 3, 2021

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 8,800 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 8,800 feet of critical shoreline, 2) protect approximately 55 acres of marsh habitat, 3) create approximately 220 acres of marsh and nourish an additional 80 acres of marsh with material dredged from Lake Boudreaux, and 4) create 35,000 LF of terraces (19 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, and Saltwater topminnow.

Proposed Solutions:
The current proposed project would include 8,800 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 200 acres of marsh and nourish an additional 50 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 35,000 LF of terraces (20 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 480 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 195 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? Oil and gas facilities 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 could be pipelines in the marsh creation and terracing areas.

Preliminary Construction Costs:
The estimated construction cost range is $20-25 M.

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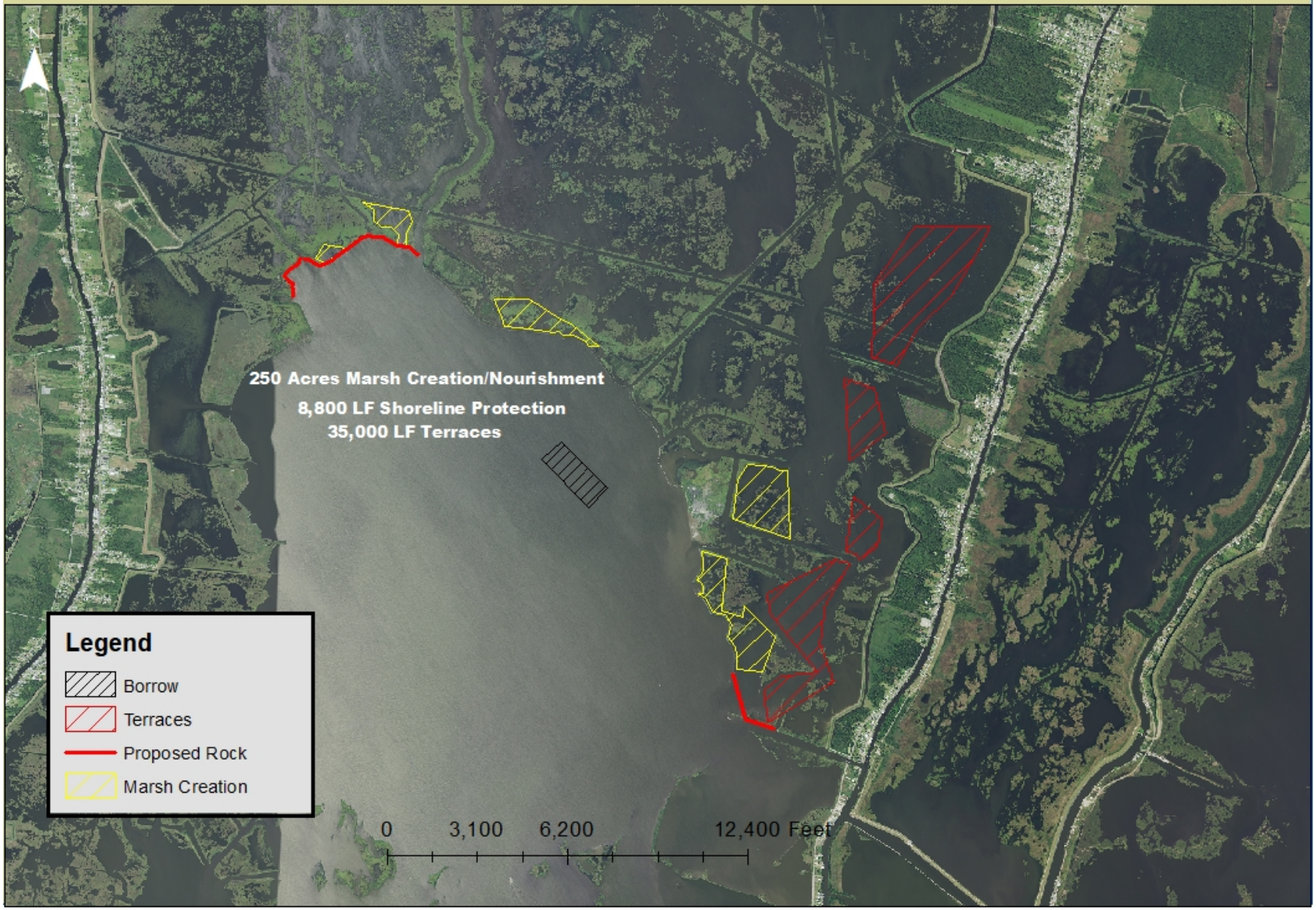
U.S Fish and Wildlife Service - Louisiana Ecological Sevices Field Office

North Lake Boudreaux Marsh Creation and Shoreline Protection



PPL31 NORTH LAKE BOUDREAUX MARSH CREATION AND SHORELINE PROTECTION

NORTH LAKE BOUDREAUX MARSH CREATION AND SHORELINE PROTECTION

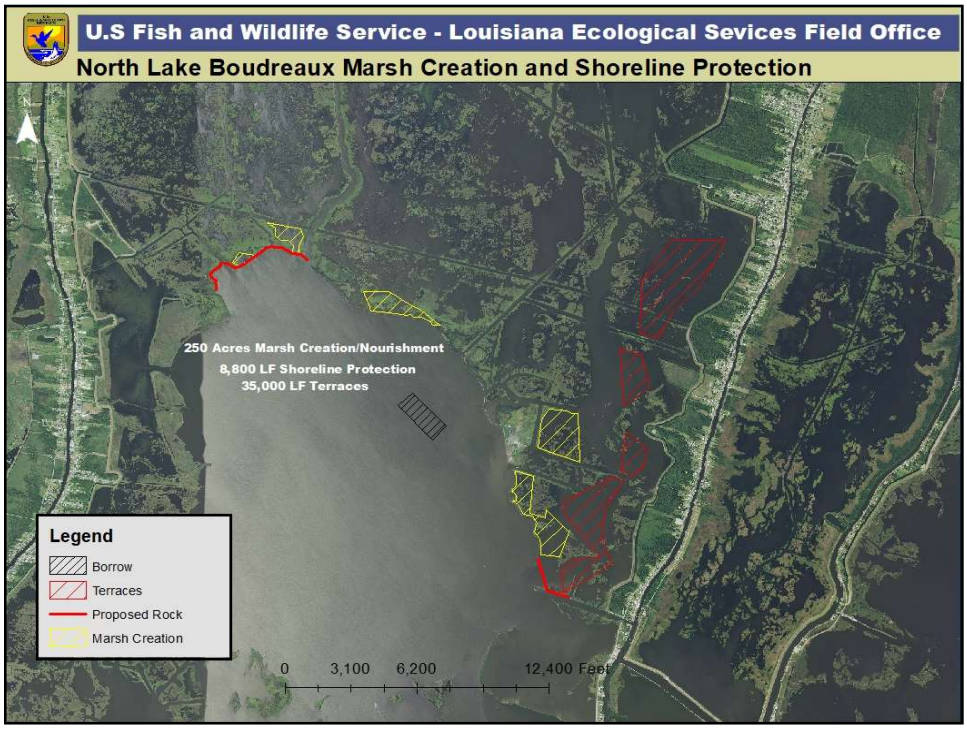
Problem:

- **Subsidence, canal dredging, saltwater intrusion, and altered hydrology**
- **Shoreline Erosion**
- **Erosion rates have been reported as high as 9-60 ft./yr.**

NORTH LAKE BOUDREAUX MARSH CREATION AND SHORELINE PROTECTION

Solution:

- **Build 8,300 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 200 acres and nourish 55 acres of marsh.**
- **Construct 35,000 lf of Terraces (20 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 200 acres of marsh.
- Nourish 50 acres of marsh.
- Create 35,000 lf of terraces (20 acres of marsh).

Net Acres:

- Total net acres = 199 acres marsh (not including shoreline protection)

Potential Issues:

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

Preliminary Construction Costs

- The estimated construction cost range plus 25% contingency $20-25M.

Species of Concern and Rare Species

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

PPL31 PROJECT NOMINEE FACT SHEET
February 3, 2021

Project Name: Southwest Golden Meadow Marsh Creation

Project Location:
Region 3, Terrebonne Basin, Lafourche Parish, South and West of Golden Meadow

Problem:
Historic aerial photography indicates significant marsh loss in the project area west of Golden Meadow near Catfish Lake. 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. 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 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 areas near the project area is -1.05%/year based on USGS hyper temporal data from 1984 to 2016.

Goals:
The goals of the project are to: 1) protect approximately 10,000 feet of hurricane protection levee, 2) create approximately 280 acres of marsh and nourish an additional 50 acres of marsh with material dredged from large open water south and west of project.

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, and Saltwater topminnow.

Proposed Solutions:
The current proposed project would create 280 acres of marsh and nourish an additional 50 acres of marsh using sediment hydraulically dredged from an unnamed lake south and west of the project area. 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.

Preliminary Project Benefits:
1) What is the total acreage benefited both directly and indirectly? Approximately 350 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 256 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 the protection of the Larose to Golden Meadow Hurricane Protection Levee. Directly protect several homes and business.

5) What is the net impact of the project on critical and non-critical infrastructure? Would protect the Larose to Golden Meadow Hurricane Protection Levee and several homes and business outside of the levee system.

6) To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects? Would work with the Catfish Lake MC and Shoreline Protection project (Phase I funding) and North Catfish Lake Marsh Creation project (Phase I).

Identification of Potential Issues:
Could be oyster leases located in the borrow site.

Preliminary Construction Costs:
The estimated construction cost range plus 25% contingency is $15-$20M.

Preparer(s) of Fact Sheet:
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U.S. Fish & Wildlife Service
Louisiana Ecological Services Field Office
Southwest Golden Meadow Marsh Creation
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PPL31
SOUTHWEST GOLDEN MEADOW MARSH CREATION

SOUTHWEST GOLDEN MEADOW MARSH CREATION

Problem:

- **Subsidence, canal dredging, saltwater intrusion, and altered hydrology**
- **Shoreline Erosion**


U.S. Fish & Wildlife Service
Louisiana Ecological Services Field Office
Southwest Golden Meadow Marsh Creation
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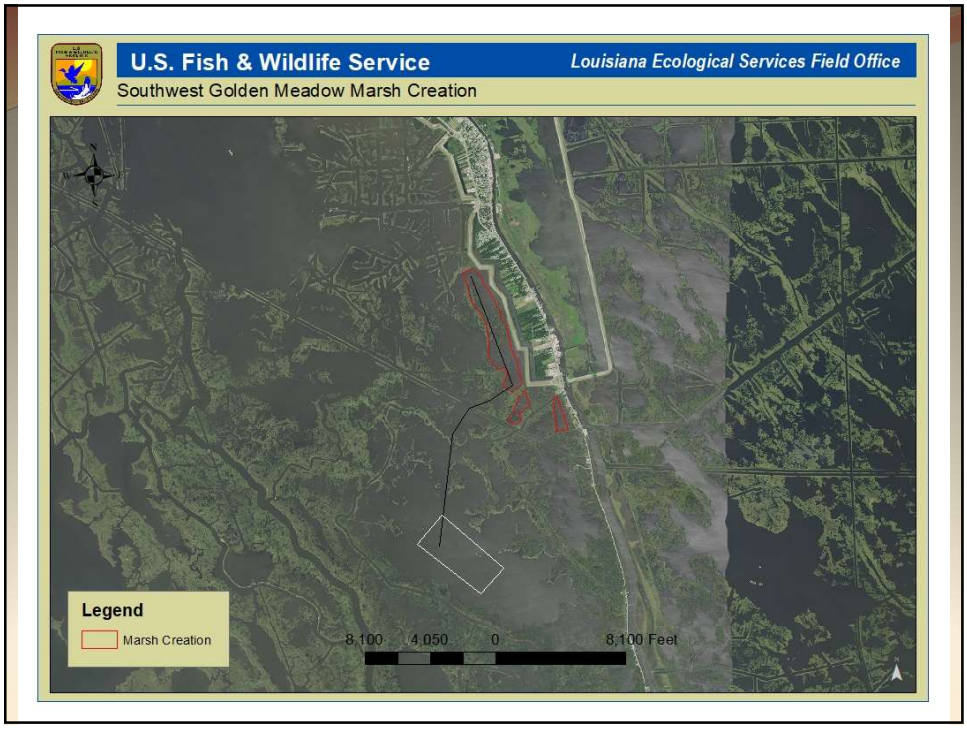
U.S. Fish & Wildlife Service
Louisiana Ecological Services Field Office
Southwest Golden Meadow Marsh Creation
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SOUTHWEST GOLDEN MEADOW MARSH CREATION

Solution:

- **Hydraulically dredge material from open water area south and west of project site.**

SOUTHWEST GOLDEN MEADOW MARSH CREATION

Goals:

- **Protect +10,000 feet of critical Hurricane Protection Levee.**
- **Create 280 acres of marsh.**
- **Nourish 50 acres of marsh.**

Net Acres:

- **Total net acres = 256 acres marsh**

Potential Issues:

- **Potential oyster leases in borrow area.**

Preliminary Construction Costs

- **The estimated construction cost range plus 25% contingency $20-25M.**

Species of Concern and Rare Species

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