CWPPRA

PPL 33 Regional Planning Team (RPT) Meetings

Preliminary Agenda

As of 2 February 2023

Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA)
Priority Project List 33
Regional Planning Team Meetings

Region 4 – Lake Charles – February 7, 2023, 9:30 am
Region 3 – Morgan City – February 8, 2023, 9:30 am
Region 1 & 2 – Mandeville – February 9, 2023, 9:30 am

AGENDA

Meeting Purpose: The Regional Planning Teams (RPTs) will accept project and demonstration project nominations for developing the 33rd Priority Project List (PPL33). Public comments are welcomed. RPTs will select PPL 33 nominees via electronic voting on February 23, 2023.

1. **Welcome and Introductions**
   RPT Team Leader, Louisiana Coastal Protection and Restoration Authority (CPRA), U.S. Army Corps of Engineers (USACE), CWPPRA Representatives, Parish Representatives,State Representatives, RPT members

2. **PPL 33 Selection Process Brief Overview and Ground Rules for Today's PPL 33 Nomination Meeting (RPT Leader)**

3. **Explanation of Coastwide Voting Process (RPT Leader)***

4. **PPL 33 Project Nominations (Entire RPT)**
   Nominees must be consistent with and support the state's 2017 and/or draft 2023 Coastal Master Plan.

5. **Announcements of upcoming PPL 33, Task Force, Technical Committee and Other Program Meetings**

6. **Adjourn**

**Parishes within each basin will be asked to identify who will vote during the coastwide electronic vote by February 1st.*

No additional projects will be nominated after the RPT meetings, nor will any significant changes to projects proposed at these meetings be allowed. Public comments will be heard during the meeting and additional written comments may be forwarded to the CWPPRA Program Manager, Kaitlyn Richard, by February 16, 2023 for dissemination to the CWPPRA agencies.

Region 4

Calcasieu-Sabine Basin

Project ID	Agency	Project Name
R4, CS-01	EPA	West Cove South Marsh Creation
R4, CS-02	EPA	Mud Lake South Marsh Creation
R4, CS-03	NMFS	Sweet Lake Canal Marsh Creation
R4, CS-04	USACE	Sabine Lake Hydrologic Restoration and Marsh Creation

Mermentau Basin

Project ID	Agency	Project Name
R4, ME-01	FWS	South Pecan Island Restoration
R4, ME-02	FWS	Gulf Shoreline Protection West
R4, ME-03	NMFS	North Hog Bayou Marsh Creation and Terracing

PPL33 PROJECT FACT SHEET
February 7, 2023

Project Name
West Cove South Marsh Creation

Master Plan Strategy
Mud Lake Marsh Creation (2017 Master Plan 004.MC.04): Creation of approximately 5,200 acres of marsh at Mud Lake south of West Cove, Calcasieu Lake to create new wetland habitat and restore degraded marsh. Mud Lake Marsh Creation (2023 Draft Master Plan): Creation of marsh within a footprint of approximately 8,100 acres at Mud Lake south of West Cove Calcasieu Lake to create new wetland habitat, restore degraded marsh, and reduce wave erosion.

Project Location
Region 4, Calcasieu/Sabine Basin, Cameron Parish

Problem
The project proposed is a fragmented wetland area water located immediately southeast of West Cove, approximately 1 mile north of Mud Lake. The project area is located near the PPL29/PPL31 Candidate Mud Lake South Marsh Creation project (WVA) which shows a land loss rate of -1.05%/yr.

Proposed Solution
The proposed project would create/nourish approximately 724 acres of marsh using sediment dredged from the Calcasieu Ship Channel. The dredged material may be fully contained or partially contained depending upon the borrow sediment characteristics and site conditions. Containment dikes would be degraded as necessary to reestablish hydrologic connectivity with adjacent wetlands.

Project Benefits
Create/nourish approximately 724 acres (create 434 acres and nourish 290 acres) of marsh using sediment dredged from the Calcasieu Ship Channel.

Project Costs
The estimated construction cost plus 25% contingency is $20M-25M with USACE credit.
The estimated construction cost plus 25% contingency is $35M-40M w/o USACE credit.

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West Cove South MC
340
384
0 0.075 0.15 0.3 0.45 0.6
Miles
N
Marsh Creation Cells
EPA
Basemap: 2021 NAIP DOQQ Cameron Parish
Produced by EPA Region 6, Dallas, TX
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

PPL33 PROJECT FACT SHEET
February 7, 2023

Project Name
Mud Lake South Marsh Creation

Master Plan Strategy
Mud Lake Marsh Creation (2017 Master Plan 004.MC.04): Creation of approximately 5,200 acres of marsh at Mud Lake south of West Cove, Calcasieu Lake to create new wetland habitat and restore degraded marsh. Mud Lake Marsh Creation (2023 Draft Master Plan): Creation of marsh within a footprint of approximately 8,100 acres at Mud Lake south of West Cove Calcasieu Lake to create new wetland habitat, restore degraded marsh, and reduce wave erosion.

Project Location
Region 4, Calcasieu/Sabine Basin, Cameron Parish

Problem
The project proposed is a fragmented wetland area water located immediately west of Mud Lake, just north of LA Hwy 27. The project area has experienced substantial wetland loss due to subsidence, oil and gas activity, saltwater intrusion, construction of the Calcasieu Ship Channel, LA Highway 27 and storm damage. In August of 2020, Hurricane Laura made landfall in Cameron Parish as a Category 4 hurricane and decimated the town of Holly Beach, LA. The land loss rate for the area as determined for the PPL31 WVA is -1.05%/yr.

Proposed Solution
The proposed project would create/nourish approximately 321 acres of marsh using sediment dredged from the Gulf of Mexico. The dredged material may be fully contained or partially contained depending upon the borrow sediment characteristics and site conditions and containment dikes would be degraded as necessary to reestablish hydrologic connectivity with adjacent wetlands. The proposed project would be synergistic with Oyster Bayou Marsh Creation and Terracing (CS-59), Oyster Lake Marsh Creation and Nourishment (CS-79), East Mud Lake Marsh Management (CS-20) to the northwest, and Holly Beach Sand Management (CS-31).

Project Benefits
This project would create 267 acres of marsh and nourish at least 54 acres of existing fragmented emergent marsh near Mud Lake in areas that were historically marshland but are now largely open water. The proposed project features will help maintain the marshes adjacent to and separating Mud Lake and Mud Pass and will provide support as a barrier marsh to the Gulf of Mexico shoreline. Nearby infrastructure would benefit from this project.

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

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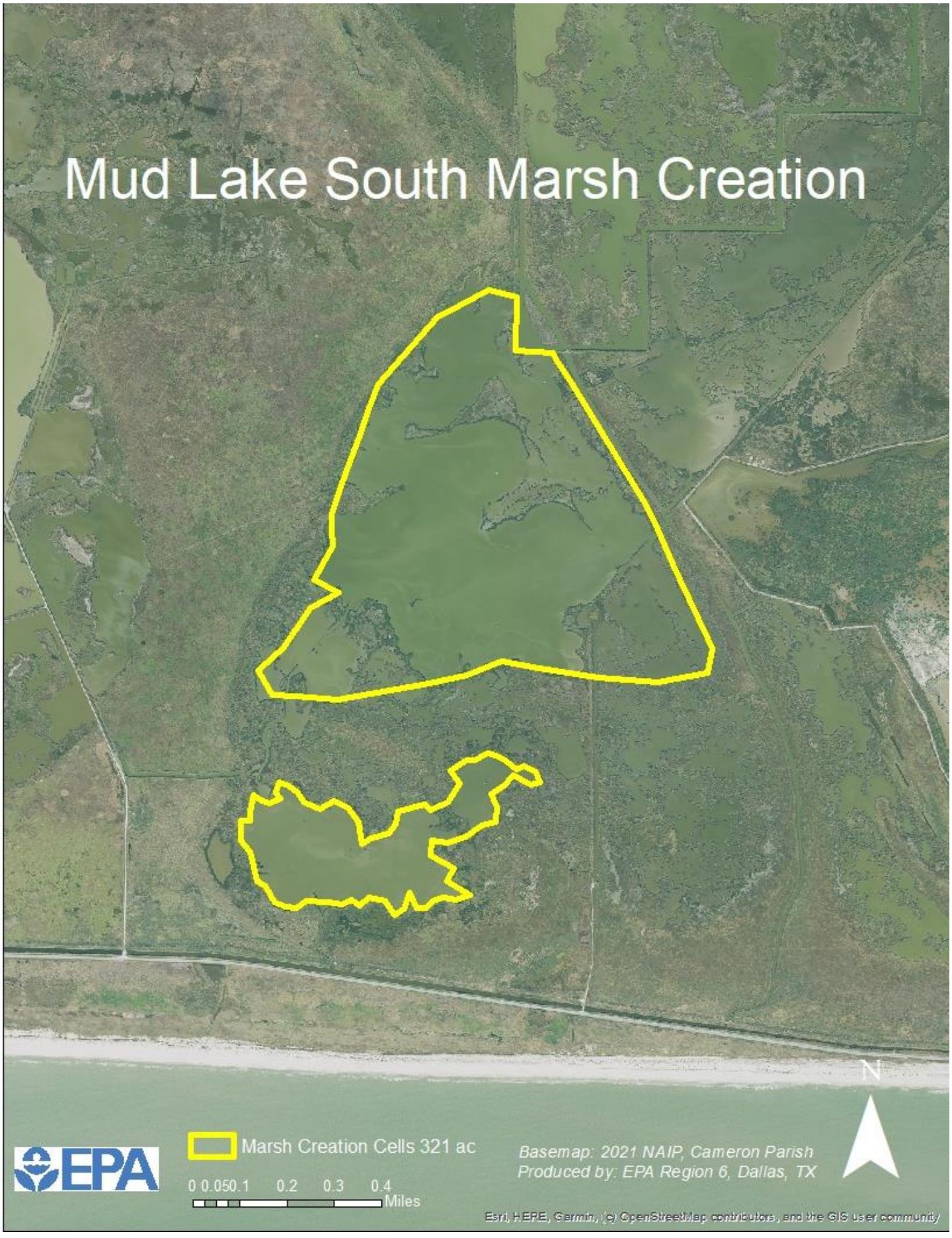
Mud Lake South Marsh Creation
Marsh Creation Cells 321 ac
0 0.050.1 0.2 0.3 0.4
Miles
Basemap: 2021 NAIP, Cameron Parish
Produced by: EPA Region 6, Dallas, TX
N
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

PPL33 PROJECT RPT NOMINEE FACT SHEET
February 7, 2023

Project Name
Sweet Lake Canal Marsh Creation

Project Location
Region 4, Calcasieu-Sabine Basin, Cameron Parish

Problem
Wetland loss in the Calcasieu-Sabine Basin is due to altered hydrology, drought and inundation stress, subsidence, and hurricane-induced damage. The USGS land change trend from 1985 to 2020 for the Sweet Lake Canal subunit (046) is 0.14% gain per year. However, the current condition of the project area is predominately open water, with eroding and relic terraces from a previously constructed restoration project.

Goals
The project goal is to restore approximately 410 acres of tidal marsh in the Cameron Creole Watershed east of Calcasieu Lake.

Proposed Solution
The proposed solution would be to create approximately 410 acres of tidal marsh, restore hydrologic patterns and historic flow paths, and includes two tidal creeks along a salinity gradient to restore a northern portion of the Cameron Creole Watershed. Sediment will be hydraulically pumped from Calcasieu Lake into a fully contained marsh creation cell. Temporary earthen containment dikes will be constructed using a combination of internal and external borrow, and will be gapped within three years of construction. Additionally, tidal creeks will be included elements to allow greater tidal exchange and estuarine organism access.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   The total project area is approximately 410 acres.

2) *How many acres of wetlands will be protected/created over the project life?*
   The net acre 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 cells.

4) *Do any project features maintain or restore structural components of the coastal ecosystem such as barrier islands, natural or artificial levee ridges, beach and lake rims, cheniers, etc?*
   No.

5) *What is the net impact of the project on critical and non-critical infrastructure?*

The project may have minor net positive impact to non-critical infrastructure comprised of pipelines.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The project will have synergistic effects with: 1) CS-04a Cameron-Creole Maintenance, 2) CS-49 Cameron-Creole Freshwater Introduction, 3) CS-54 Cameron-Creole Watershed Grand Bayou Marsh Creation, 4) Ducks Unlimited terraces, and 5) CS-87 Calcasieu-Sabine Large Scale Marsh and Hydrologic Restoration.

Considerations
Calcasieu Lake public oyster seed grounds and pipelines.

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

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PPL33 Sweet Lake Canal Marsh Creation

410 Total Project Acres

410 Acres Marsh Creation
Hydrologic Restoration
Tidal Creeks

2022 Google Earth Aerial Imagery
Map Date 02-01-2023

Federal Sponsor: NOAA Fisheries

Legend

- Earthen Containment Dikes
- Marsh Creation Areas
- Tidal Creeks

PPL33 PROJECT NOMINEE FACT SHEET
February 7, 2023

Project Name
Sabine Lake Hydrologic Restoration and Marsh Creation

Project Location
Region 4, Calcasieu-Sabine Basin, Cameron Parish

Problem
The area has experienced wetland loss to hurricanes (e.g., Rita 2005, Ike 2008, Laura 2020, and Delta 2020), relative sea level rise, wind erosion, and saltwater intrusion. A major issue in the area is lack of conveyance/drainage and tidal connectivity (McGinnis et.al., 2019). Water entering the area (e.g., from rainfall and/or releases at Toledo Bend) cannot rapidly exit the system, resulting in deterioration of marshes being inundated for long periods of time, sometimes weeks to months (McGinnis et.al., 2019). The USGS estimates land loss rates in the project area at -0.21%/year from 1985 to 2020, and losses are projected to continue (CPRA, 2017 and 2023).

Goals
The project goal is to create and nourish approximately 597 acres of emergent marsh, primarily on the Sabine National Wildlife Refuge, while improving drainage in the area through cleanout of natural conveyance channels in order to sustain marsh creation benefits and nourish surrounding marsh by reducing inundation.

Proposed Solution
The project would create and nourish approximately 597 acres of marsh (281 acres of marsh creation and 316 acres of marsh nourishment). Cost estimates for this proposal assume sediment for marsh creation would be dredged from Sabine Lake and placed via pipeline, but dredging Sabine River north of the project is preferred and opportunities to partner with SWG and the Port of Orange for beneficial use of material dredged from the river would be explored during E&D and could result in significant cost savings. Initial acreage estimates were calculated based on use of traditional marsh creation approaches, but opportunities would also be explored during E&D to decrease cost (and/or increase the total footprint for marsh creation) through shifting to an unconfined approach for marsh creation as well as data collection and modeling to inform prioritization of hydrologic restoration needs.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   This total project area is 665 acres. This includes the marsh creation footprint (597 acres) as well as the area directly impacted by channel cleanout (68 acres) but does not include additional benefits expected to surrounding marsh from reduced inundation.

2) *How many acres of wetlands will be protected/created over the project life?*
   Approximately 250-300 net acres of marsh will be benefited from marsh creation and nourishment over the project life, not including additional acres of surrounding marsh expected to experience benefits from reduced inundation.

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% land loss rate reduction is assumed for marsh creation and nourishment with a loss rate of -0.21%/year based on USGS data from 1985 to 2020 (East Pass).

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 protect the rim of Sabine Lake.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
By protecting the rim of Sabine Lake, the project would help protect the Port of Orange and related infrastructure to the north. The project could also help protect water control structures and weirs in the nearby Black Bayou Hydrologic Restoration Project (CS-27) and the East Sabine Lake Hydrologic Restoration Project (CS-32).

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The project will have a synergistic effect with CS-27 to the north and CS-32 as well as with the Hickory Cove Marsh Creation and Living Shoreline project (USACE SWG, Port of Orange) planned to the west and USACE SWG mitigation projects planned to the north and south.

Considerations
Considerations in the area potentially include oil and gas pipelines, navigation in the Sabine River, and oyster seed grounds in Sabine Lake.

Preliminary Construction Costs
The estimated construction cost plus 25% contingency is $30 – 35 M. Note that this cost estimate was developed conservatively, and opportunities for cost savings (and/or expanding the footprint for marsh creation and nourishment) would be explored during E&D.

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**Prepared in coordination with team from NMFS and CPRA*

Sabine Lake Marsh Creation and Hydrologic Restoration

Sheet Legend

Proposed Marsh Creation/Nourishment Platform

Proposed Channel Rehabilitation

Existing Channel

Satellite Imagery: 2017 LA NAIP

US Army Corps
of Engineers
NEW ORLEANS DISTRICT

0 3000' 6000'

PPL33 PROJECT NOMINEE FACT SHEET
February 1, 2023

Project Name
South Pecan Island Restoration

Project Location
Region 4, Mermentau Basin, Vermilion Parish, South of Pecan Island

Problem
Wetland loss in the vicinity of the project area has been caused by impoundments, saltwater intrusion, and hurricane/storm events. Twenty-five percent of the 46,370 acres of marsh south of Pecan Island, from Freshwater Bayou Canal to Rollover Bayou, converted to open water from 1932 to 1990 (Coast 2050). Hurricanes Rita (2005) and Ike (2008) are responsible for much of the recent loss in the project area. A land change analysis conducted by USGS for 254 coastal subunits indicates a 1985-2020 land change rate of -0.21 %/yr for the Rockefeller-Pecan Island Subunit. A project-specific land change analysis conducted for the adjacent Southeast Pecan Island Marsh Creation and Terracing Project (PPL31 Candidate) yielded a 1984-2021 loss rate of -0.83 %/yr.

Goals
Create and nourish approximately 250 acres of intermediate to brackish marsh south of Pecan Island. Specific goals include: 1) Create 225 acres and nourish 25 acres of intermediate to low salinity brackish marsh and 2) Create 24,000 LF (13 acres) of terraces.

Service goals include restoration/protection of habitat for at-risk species. This project would restore habitat potentially utilized by the threatened black rail and other at-risk species such as the seaside sparrow and saltmarsh topminnow.

Proposed Solution
Sediments will be hydraulically dredged in the Gulf of Mexico and pumped via pipeline to create 225 acres and nourish 25 acres of intermediate to brackish marsh south of Pecan Island. Approximately 24,000 LF (13 acres) of earthen terraces will be constructed in open water areas totaling 263 acres. Containment dikes will be gapped or degraded and tidal creeks and ponds will be constructed post-construction in the marsh creation cells to restore area hydrology, allow fisheries access, and improve wetland productivity.

Project Benefits
The project would result in approximately 200-250 net acres over the 20-year project life.

Project Costs
The estimated construction cost plus 25% contingency is $30M - $35M.

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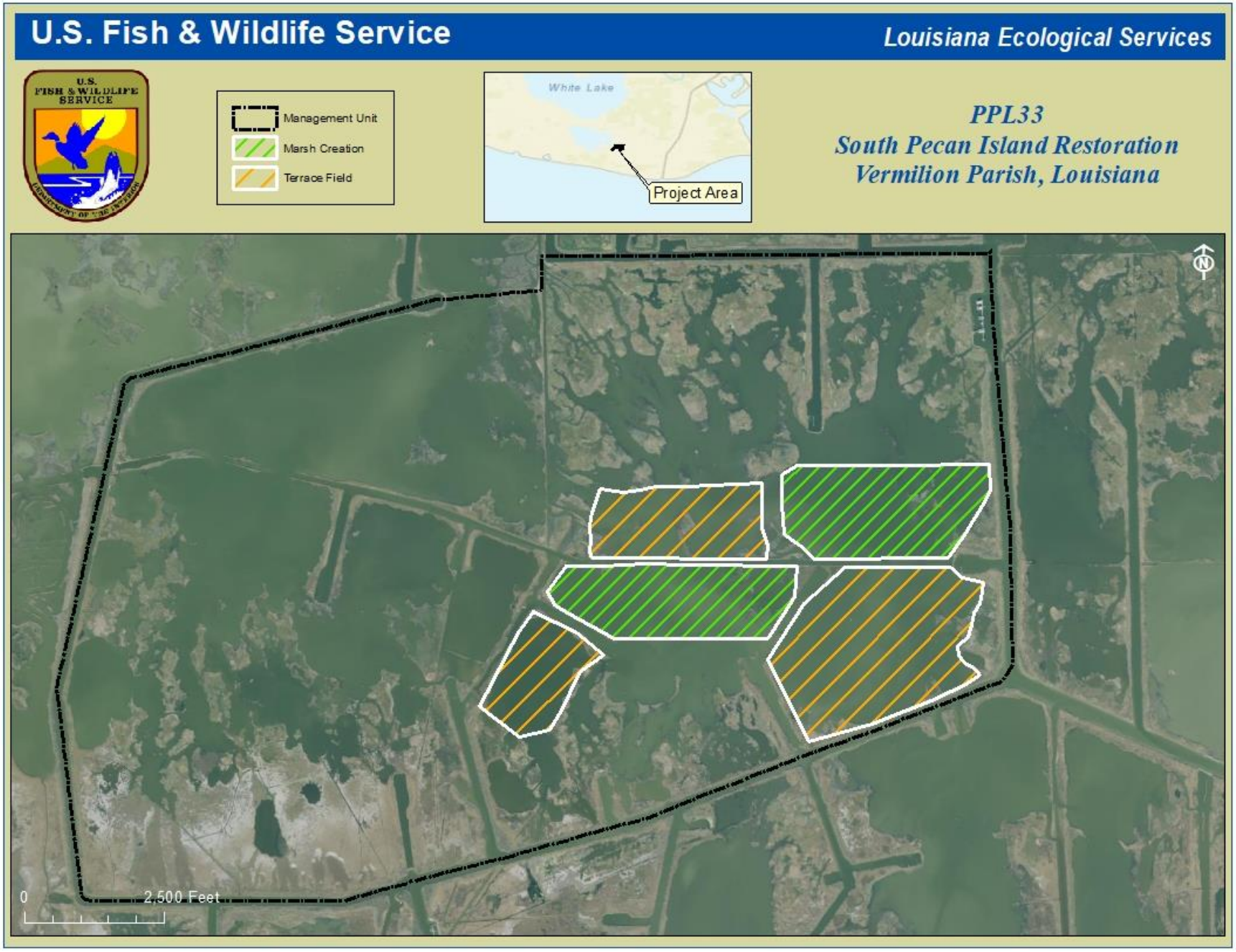
U.S. Fish & Wildlife Service
Louisiana Ecological Services
U.S. FISH & WILDLIFE SERVICE
Management Unit
Marsh Creation
Terrace Field
White Lake
Project Area
PPL33
South Pecan Island Restoration
Vermilion Parish, Louisiana
N
0
2,500 Feet

PPL32 PROJECT NOMINEE FACT SHEET
February 7, 2023

Project Name
Gulf Shoreline Protection West

Project Location
Region 4, Mermentau Basin, Cameron Parish, south of Rockefeller State Wildlife Refuge

Problem
The area along Rockefeller Refuge between Josephs Harbor and Price Lake Road, the Gulf of Mexico shoreline erosion rate has been estimated to be 46 feet per year (1998 to 2010). After recent hurricanes in 2020 the erosion rate is probably even higher. This is the equivalent to approximately 11 acres of shoreline lost per year in the project area. Without protection, the Refuge shoreline will continue to retreat landward, leaving less marsh complex, which could have substantial impacts on the Refuge (including resident endangered species) as well as the surrounding area. Without stabilizing the Gulf shoreline at Rockefeller Refuge, the shoreline may retreat over 900-ft within a 20-year timespan.

Goals
The project goal is to halt erosion of the Gulf shoreline erosion by along a critical 2-mile-long reach where continued erosion will threaten the integrity of Price Lake Road and the watershed within Rockefeller Refuge. A total of 279-ac would be protected by the project.

Service goals include the protection of shoreline beaches designated as critical habitat for the threatened piping plover and beaches used by the threatened red knot. The project would also prevent the loss of back beach marshes which is known occupied habitat for the recently listed black rail.

Proposed Solution
The proposed project is similar to the Rockefeller Refuge Gulf Shoreline Stabilization Project (ME-18). The project would construct a 2-mile-long foreshore breakwater with light weight aggregate core along the -3.5-ft (NAVD88) contour (approximately 150-ft offshore) generally follow the shape of the shoreline. It would extend from the spot where the ME-35 project ends and parallel the shoreline for 2 miles with gaps every 1,500- ft. The project feature may trap sediments from the gulf, which could result in accretion behind the breakwater as has occurred at ME-18.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   The total project area is approximately 223 acres would be benefited directly. Indirect benefits could occur due to land creation between the breakwater and shoreline.

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)? >75%*
A 93% loss rate reduction is assumed for the Target Years 1-10 and 75% for Target Years 11-20. (Workgroup assumptions for Flat Lake)

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 protect marsh and beach shoreline along the Gulf of Mexico and the Refuge.

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

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The project will have synergistic effects with ME-18, ME-35, ME-37, and the ME-20 projects.

Considerations
Considerations for this project include pipeline/utilities.

Preliminary Costs
The construction cost plus 25% contingency is estimated to be between $35 and $40M. There would be no maintenance cost associated with this project.

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PPL33 PROJECT NOMINEE FACT SHEET
February 7, 2023

Project Name
North Hog Bayou Marsh Creation and Terracing

Project Location
Region 4, Mermentau Basin, Cameron Parish, Louisiana

Problem
The project is located east of Forest Road between Grand Chenier and Louisiana Highway 82 to the north of Hog Bayou to the south. The project is adjacent and contiguous with ME-20 and ME-32 is between previously constructed earthen terraces. The project is located within the Hog Bayou watershed west of Rockefeller Refuge with hydrologic connectivity to the Gulf through Beach Prong and the Mermentau River. Areas closer to the highway are classified as intermediate marsh (2021) and progress to brackish marsh near Hog Bayou with both brackish and saltmarsh classifications at the adjacent CRMS (0614) station. Non-restored portions of the project vicinity north of Hog Bayou are predominantly shallow open water and remnant fragments of marsh. Impoundment, drainage, saltwater intrusion, subsidence, sea level rise, storms, ring levee and pipeline and construction all have contributed to widespread historic and continued land loss within the project vicinity. The USGS 1985 to 2020 loss rate is -0.27%/yr. for the Hog Bayou/Oak Grove/Lower Mud Lake mapping unit. There is increasing exposure risk to Highway 82 and Grand Chenier from increased wave fetch and tidal and storm surge flooding as interior marsh has converted to open water.

Goals
The project goal is to restore elevations by creating and nourishing approximately 260 acres of marsh and create approximately 355 acres of terrace field consisting of approximately 24,850 linear feet of earthen terraces. The project focus is to restore wetland habitat generally parallel with Hog Bayou, the Gulf Shoreline, Highway 82, and Grand Chenier. The project goal is to create marsh by extending restored areas parallel with and north of Hog Bayou thereby promoting synergy with adjacent areas while maintaining drainage.

Proposed Solution
The proposed solution is to create 260 acres of intermediate to brackish marsh through hydraulic dredging and 355 acres of terrace field from mechanical dredging. Sediment would be mined from the Gulf of Mexico, pumped approximately 4.5 miles, and placed to create and nourish marsh in areas temporarily confined with earthen dikes. Gulf borrow would be sited to avoid adverse impacts to the Gulf shoreline. Containment dikes would be gapped to the constructed marsh fill elevation at the end of construction for dewatering and gapped or degraded no later than year three after construction to establish tidal function. Mechanical dredging would be utilized to construct approximately 24,850 linear feet of earthen terraces. Terraces would be planted with the appropriate vegetation.

Preliminary Project Benefits
1) *What is the total acreage benefited both directly and indirectly*? The total acres benefited is 615 acres (260 ac marsh creation + 355 ac terrace field).

2) *How many acres of wetlands will be protected/created over the project life*? The total net acres of marsh protected/created over the project life is approximately 250 - 300 acres (269 net marsh creation and terrace acres after 20 years).

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 benefits is 50-74%.

4) *Do any project features maintain or restore structural components of the coastal ecosystem such as barrier islands, natural or artificial levee ridges, beach and lake rims, cheniers, etc. No*. Although the project features do not directly restore structural framework, they provide indirect synergy with the restored portions of Hog Bayou and Second Lake banklines and selection of latitudinal project features will aid in protecting areas to the north.

5) *What is the net impact of the project on critical and non-critical infrastructure*? The project would have positive net benefits to non-critical infrastructure (pipelines and wells). As a whole with completed restoration, the project may have net benefit to critical infrastructure consisting of Highway 82 and Grand Chenier. However, the project location individually isn't immediately adjacent or contiguous to critical infrastructure.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects*? The project has synergy with ME-20, ME-32, and existing terrace fields near Hog Bayou, Second Lake, and Highway 82.

Considerations

Considerations for this project include pipelines/utilities and Eastern Black Rail.

Preliminary Cost

The estimated constructed cost + 25% contingency range is $30M - $35M.

Preparer of Fact Sheet

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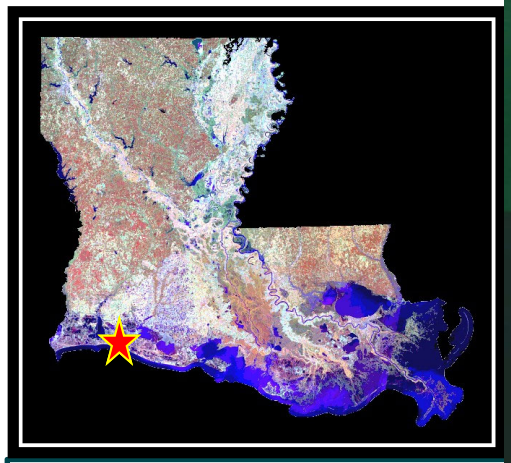

North Hog Bayou Marsh Creation and Terracing

260 ac Marsh Creation
355 ac Terrace Field; 24,850 LF Terraces

2021 Aerial Imagery
Map Date 01-31-2023

Legend

- Marsh Creation
- Terrace Field
- Borrow Area

Region 3

Teche-Vermilion Basin

Project ID	Agency	Project Name
R3, TV-01	NRCS	South Avery Island Marsh Creation and Shoreline Enhancement
R3, TV-02	NRCS	Freshwater Bayou East Marsh Restoration
R3, TV-03	EPA	West Vermilion Marsh Creation and Shoreline Protection
R3, TV-04	EPA	Southeast Marsh Island Marsh Creation and Nourishment

Terrebonne Basin

Project ID	Agency	Project Name
R3, TE-01	NRCS	Bayou Jean Lacroix Marsh Creation
R3, TE-02	NRCS	Carencro Bayou Diversion
R3, TE-03	NOAA	West Lake De Cade Marsh Creation
R3, TE-04	NOAA	Sevin West Landbridge Creation
R3, TE-05	NOAA	West Bayou Jean Lacroix Landridge Creation
R3, TE-06	EPA	Lake Billiot and Eastern Terrebonne Landbridge Restoration
R3, TE-07	NRCS	Lake Pagie Small Scale Marsh Restoration
R3, TE-08	FWS	Bayou Barre MC (Eastern Terrebonne Landbridge Increment 1)
R3, TE-09	FWS	Eastern Terrebonne Landbrige Marsh Creation Increment 1

PPL 33 PROJECT NOMINEE FACT SHEET
February 8, 2023

Project Name
South Avery Island Marsh Creation and Shoreline Enhancement

Project Location
Region 3, Teche-Vermilion Basin, located on the south side of the Intracoastal Canal between the Avery Canal and Weeks Bay, immediately south of Avery Island.

Problem
The project would restore Vermilion Bay shoreline and adjacent marsh to offset levels of historic and ongoing wetland loss. USGS estimates land loss in this region to be -0.01%/y but recent aerial photography analysis of 2016-2020 indicates a substantial loss of land in the project area from recent hurricanes. Hydrologic isolation (inundation) coupled with 2020 hurricane induced losses have resulted in substantial interior marsh breakup and removal. Shoreline retreat since 1998 has generally been relatively mild and steady from both the GIWW side from the interior and the bay side, but, more recently, threatens to coalesce Vermilion Bay into the interior lakes and the GIWW. Recent hurricanes have exposed a vulnerability in this area that could result in accelerated shoreline loss and interior marsh loss.

Goals
Restore approximately 376 acres of coastal marsh habitat and enhance approximately 7,400 linear feet of bay rim habitat.

Proposed Solution
Approximately 255 acres of marsh will be created, and 197 acres of marsh will be nourished (452 acres total) using sediment dredged from Vermilion Bay. The marsh creation cells will be mostly unconfined; all outflow channels will be temporarily plugged to minimize outflow of dredge material. Portions of the shoreline where the marsh creation cells run parallel to the bay, the bankline will be enhanced mainly by construction of 15 ft top-width earthen berm sections. Upon completion, the earthen plugs will be degraded as necessary to re-establish hydrologic connectivity with adjacent wetlands, but the bay-side shoreline enhancement sections will be left intact to strengthen the bay rim. The earthen enhancement areas will be planted.

Project Benefits
Approximately 452 acres would be benefited include 255 acres of marsh creation and 197 acres of marsh nourishment.

Preliminary Construction Costs: The construction cost range is $15-20M.

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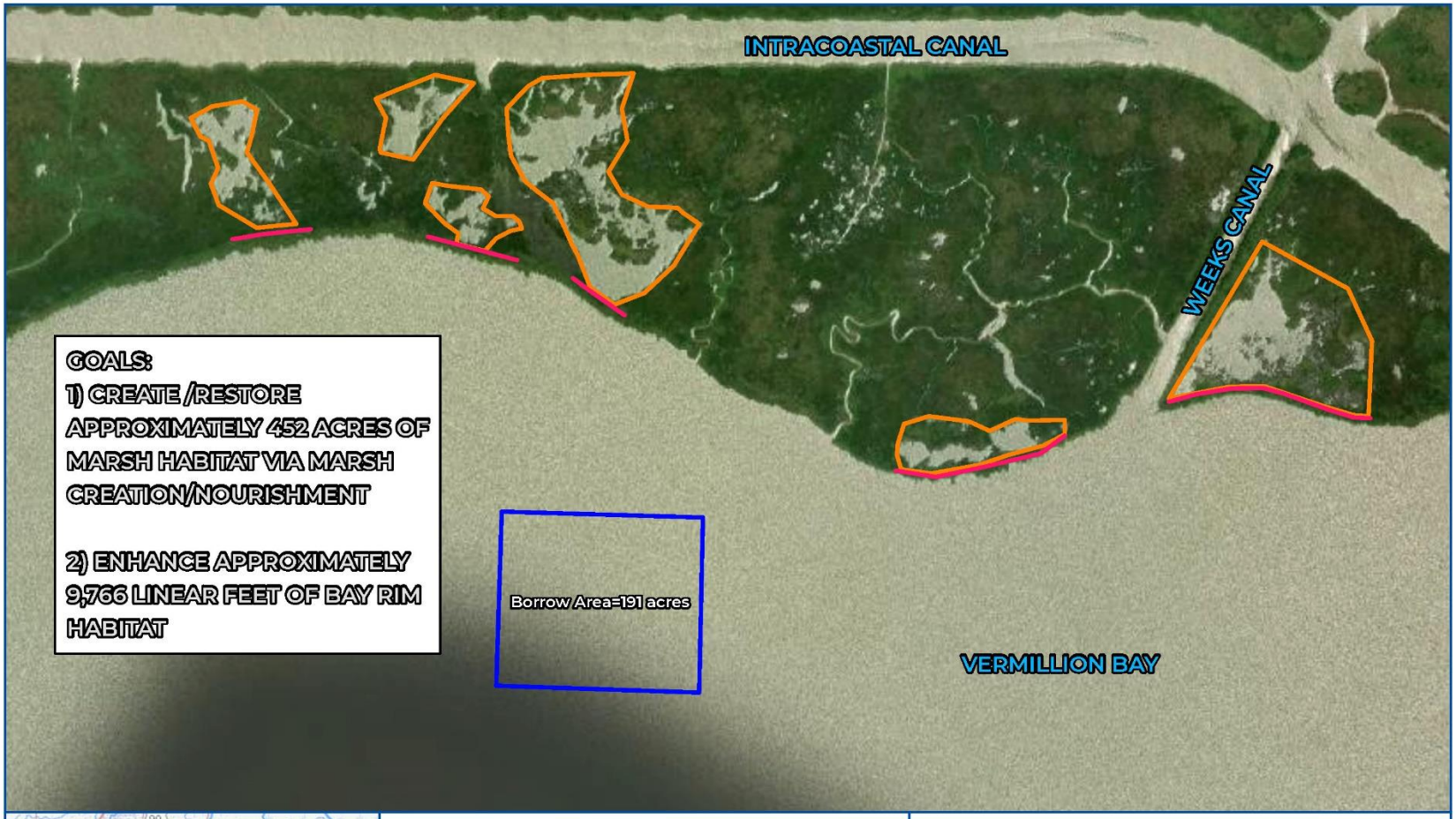

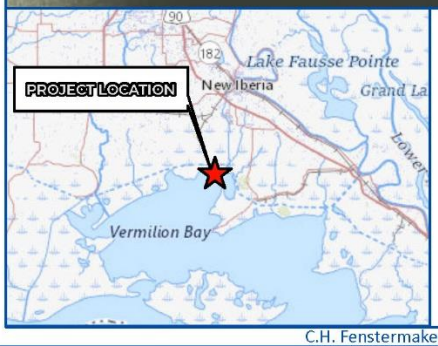

0 0.5 1 Miles

Borrow Area

Marsh Creation Area

Shoreline Enhancement

N W E S

SOUTH AVERY ISLAND MARSH CREATION & SHORLINE ENHANCEMENT

IBERIA PARISH, LOUISIANA

REVISED BY: ETB
DATE: 1/19/2022
PROJ. MGR: JDF

Path: R:\Proposals__Proposals - OneCompany\Rainey Conservation Alliance\Avery Island Marsh Creation\Avery Island Marsh Creation_Elliot_2_0.aprx

C.H. Fenstermaker & Associates, L.L.C. 135 Regency Sq. Lafayette, LA 70508, Ph. 337-237-2200 Fax. 337-232-3299 www.fenstermaker.com

PPL33 PROJECT NOMINEE FACT SHEET
February 8, 2023

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 -0.62 %/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 166 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 106 acres of marsh along the bank of the channel through shoreline protection and help stabilize interior marsh.

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 166 acres of marsh.
2. Approximately 19,810 linear feet of terraces will be constructed.
3. 18,314 linear feet of shoreline projection along the Freshwater Bayou Canal.

Project Benefits
The project is expected to restore approximately 284 acres of marsh.

Preliminary Cost
The construction cost range is $25-30 million.

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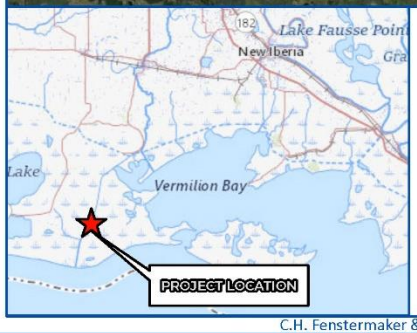

0 0.5 1 Miles

Marsh Creation Area

Terraces

Shoreline Protection

N W E S

FRESHWATER BAYOU EAST MARSH RESTORATION

IBERIA PARISH, LOUISIANA

REVISED BY: ETB
DATE: 1/31/2023
PROJ. MGR: JDF

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PPL33 PROJECT FACT SHEET
February 9, 2023

Project Name
West Vermilion Marsh Creation and Shoreline Protection

Master Plan Strategy
#157c East Rainey Marsh Creation (2023 Master Plan, year 7): Creation of marsh in the northern portion of Rainey Marsh to create new wetland habitat, restore degraded marsh, and reduce wave erosion

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

Problem
Over the past decades, the project area has experienced altered geomorphologic and hydrologic conditions, shoreline erosion and wetland loss due to damage from storms; dredging of navigation and petroleum access canals, construction of spoil banks and levees, and natural wave energy. Wave energy in the Bay has gradually increased over the centuries because the bay is naturally getting deeper due to a slight yet constant subsidence and global sea-level rise. The land loss rate for the Rainey Marsh Subunit it -0.05%. Shoreline erosion rate was calculated at 5.5 ft/yr.

Proposed Solution
The project proposes to create/nourish 707 acres of marsh in an area east of Hog Lake between Bayou Prien and Hog Bayou. The project would restore marsh along the remnant shoreline between North Lake and Vermilion Bay (29 acres) and stabilize the shoreline in three areas: between North Lake and Vermilion Bay, between the small lake near Redfish Point and Vermilion Bay, and along the western shoreline of Vermilion Bay between Bayou Prien and Hog Bayou (92 acres, 18,352 ft).

Project Benefits
The goals of this project are to: 1) Create and/or nourish 707 acres of marsh, by pumping sediment from Vermilion Bay; 2) Protect/armor approximately 18,352 ft (92 acres) of the western shoreline of Vermilion Bay between Bayou Prien and Hog Bayou and the Vermilion Bay shoreline adjacent to the proposed marsh creation cell (29 acres) near North Lake. Assuming some natural vegetative recruitment, vegetative plantings are planned at a 50% density at project year one. Containment dikes will be degraded or gapped by year three to allow access for estuarine organisms.

Project Costs
The estimated construction cost including 25% contingency is $15M - $20M.

Preparers of Fact Sheet
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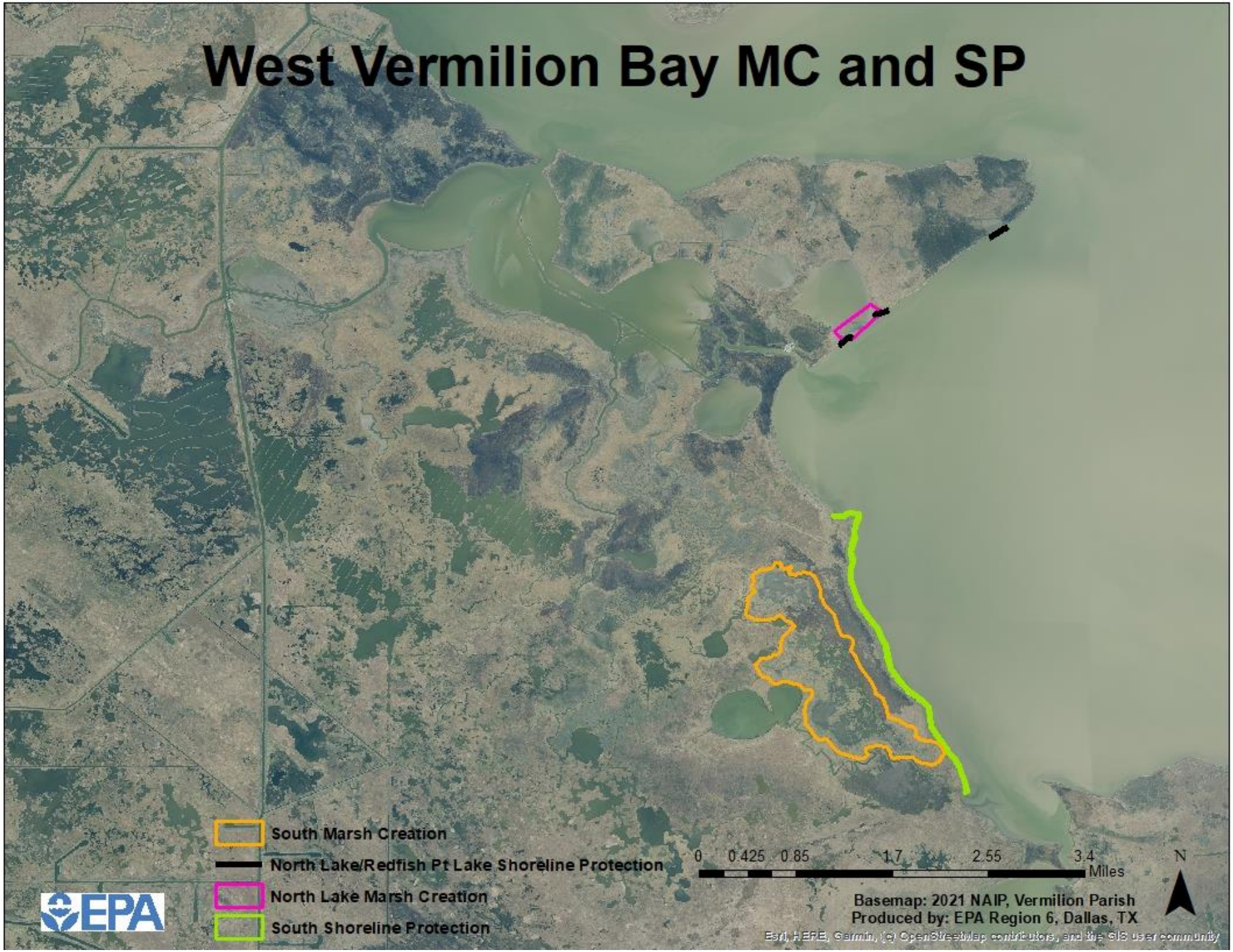
West Vermilion Bay MC and SP
South Marsh Creation
North Lake/Redfish Pt Lake Shoreline Protection
North Lake Marsh Creation
South Shoreline Protection
0 0.425 0.85 1.7 2.55 3.4
Miles
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EPA
Basemap: 2021 NAIP, Vermilion Parish
Produced by: EPA Region 6, Dallas, TX
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

PPL33 PROJECT FACT SHEET
February 8, 2023

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. Also present in Draft 2023 State Master Plan. Marsh Island Barrier Marsh Creation (2023 Master Plan #346): Creation of marsh within a footprint of approximately 16,000 acres on Marsh Island to create new wetland habitat, restore degraded marsh, and reduce wave erosion.

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

Problem
Areas of emergent marsh in the interior of Marsh Island 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. The marsh creation cell is located near the West Branch MC Candidate (WVA) which shows a land loss rate of -0.58%/yr.

Proposed Solution
The project would use hydraulic dredging from Cote Blanche Bay to create/nourish approximately 485 acres of emergent marsh by filling in open water and deteriorated areas. Beneficial use of dredged material from the port of Morgan City is also being investigated as a potential sediment source. 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 485 acres of emergent marsh (437 acres created, 48 acres nourished) using dredged sediment.

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

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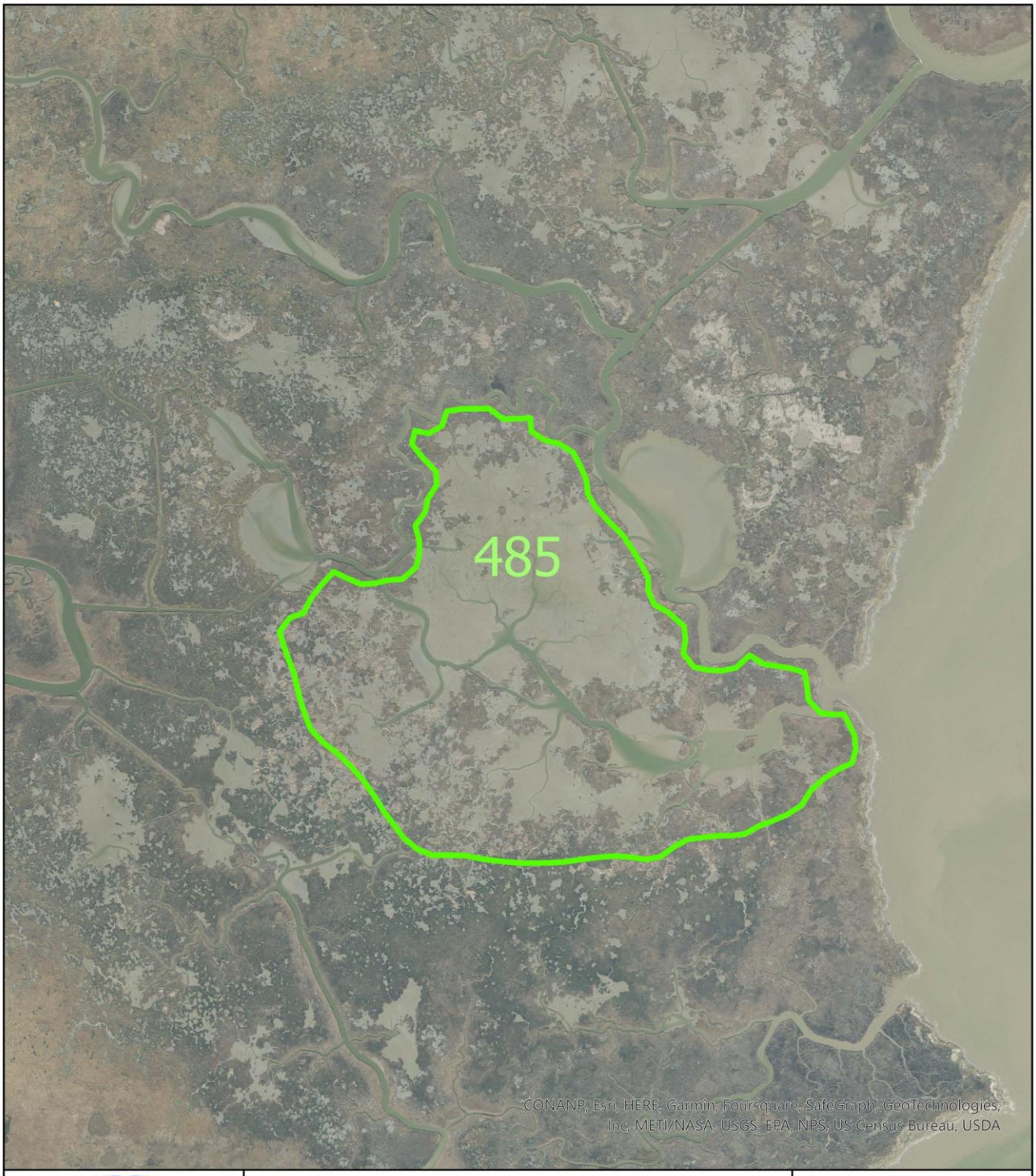

SE Marsh Island MC

Basemap: NAIP 2021

2023

Produced by: EPA, Region 6, Dallas TX

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0 0.3 0.6 Km

PPL33 PROJECT NOMINEE FACT SHEET
February 8, 2023

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 and nourishment, 2) reduce fetch and wave energy in open water areas with the construction of terraces and 3) bank restoration to reconstitute the flow channel. The project will also be synergistic with the TE-117 Island Road MC project providing additional protection to the communities of Isle de Jean Charles and Pointe aux Chenes. The two projects are located in the alignment of the conceptual plans for a future Eastern Terrebonne landbridge.

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 $25M - $30M (+25% Contingency).

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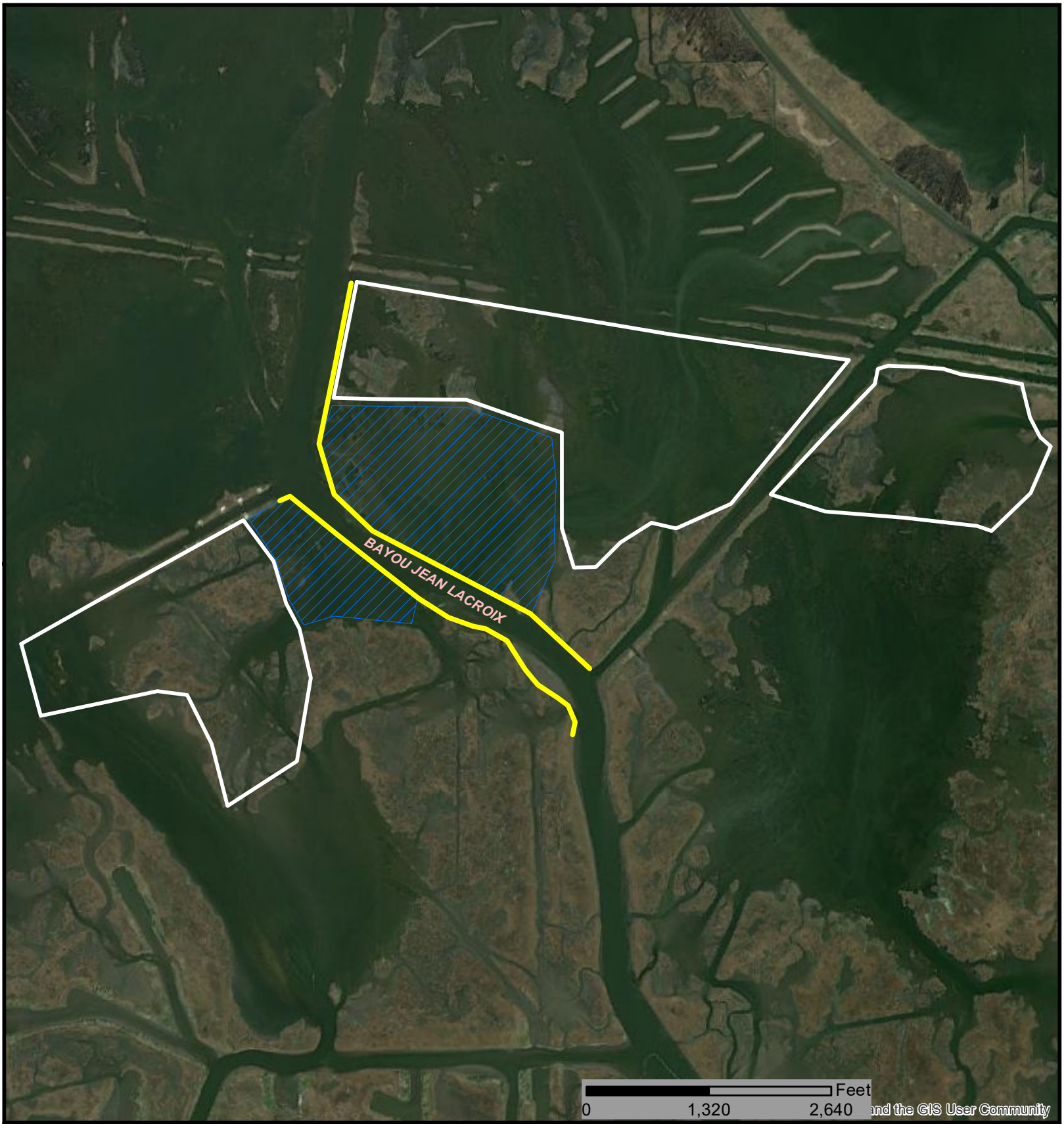

USDA

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

Data Source: ESRI - 2022 IMAGERY

Map Date: JANUARY 31, 2023

PPL 33
BAYOU JEAN LACROIX
MARSH CREATION
TERREBONNE PARISH, LA

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W E
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Legend

- MARSH_CREATION
- EARTHEN_BANK_RESTORATION
- TERRACE_FIELD

PPL33 PROJECT NOMINEE FACT SHEET
February 8, 2023

Project Name
Carencro Bayou Diversion

Project Location
Region 3, Terrebonne Basin, Terrebonne Parish, Carencro Bayou

Problem
Bayou Penchant is the largest bayou flowing across upper Terrebonne, however, where it connects to Carencro Bayou most of the water flow is diverted southwest to the Superior Canal and flows down Palmetto Bayou and back to Atchafalaya Bay. This short-circuits water movement to the east where marshes are deprived of the freshwater, nutrients and sediments of the Atchafalaya River. The State Master Plan calls for diverting Atchafalaya River water to the east through the Gulf Intercoastal Waterway and various other distributaries throughout the Central Terrebonne marsh complex. The reactivation of Carencro Bayou would bring water directly to areas where there have been heavy losses of wetlands caused by saltwater intrusion and sediment deprivation.

Goals
The objective of this project is to introduce freshwater, nutrients and sediments from Bayou Penchant into southern Terrebonne marshes to a general area east of Lost Lake to reduce saltwater intrusion and marsh loss in this area.

Proposed Solution
The project would: (1) Reduce flow in the Superior Canal near the junction with Carencro Bayou by necking down this canal from 200 feet wide and 20 feet deep to 80 feet wide and 10 feet deep. This would be accomplished by the construction of a rock weir (barge bay); (2) opening historic Carencro Bayou, by dredging, from the point where it is narrower than 100 feet wide and 8 feet deep following the old bayou channel for approx. 21,400 feet southeast to where it intersects a north/south location; and (3) enlarging the north/south location canal and existing DU/ConocoPhillips water control structure to accommodate this increased flow.

Project Benefits
These components would re-direct much of the water flowing down Bayou Penchant to the re-opened Carencro Bayou instead of to Superior Canal and Palmetto Bayou then lost back to Atchafalaya Bay. This re-directed water would flow south into southern Terrebonne connecting with Bayou Decade east of Lost Lake.

Preliminary Cost
The construction cost range is $5M - $10M (+25% Contingency).

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Bayou Carencro Diversion

Avoca Island Cutoff

Avoca Island Cutoff

Legend

- Carencro Bayou Cleanout
- Outfall Replacement Structure
- Superior Canal Structure

Apache LA Minerals, LLC - LaTer

Google Earth

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PPL33 PROJECT NOMINEE FACT SHEET
February 8th, 2023

Project Name
West Lake De Cade Marsh Creation 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 -0.32%/year estimated by USGS with a subsidence of at least 3.6mm/y.

Goals
The project goals are to create and/or nourish 405 acres of intermediate marsh and armor 8,116 LF of shoreline.

Proposed Solution
Sediments from Lake De Cade will be hydraulically dredged and pumped via pipeline to create/nourish 405 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.

Preliminary Project Benefits
1) *What is the total acreage benefited both directly and indirectly*? Approximately 405 acres would be benefited directly and indirectly. Direct benefits include 288 acres of marsh creation and 117 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 250-300 acres.

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

5) *What is the net impact of the project on critical and non-critical infrastructure*? The project would help protect 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 estimated construction cost plus 25% contingency range is $25M - $30M.

Preparer of Fact Sheet

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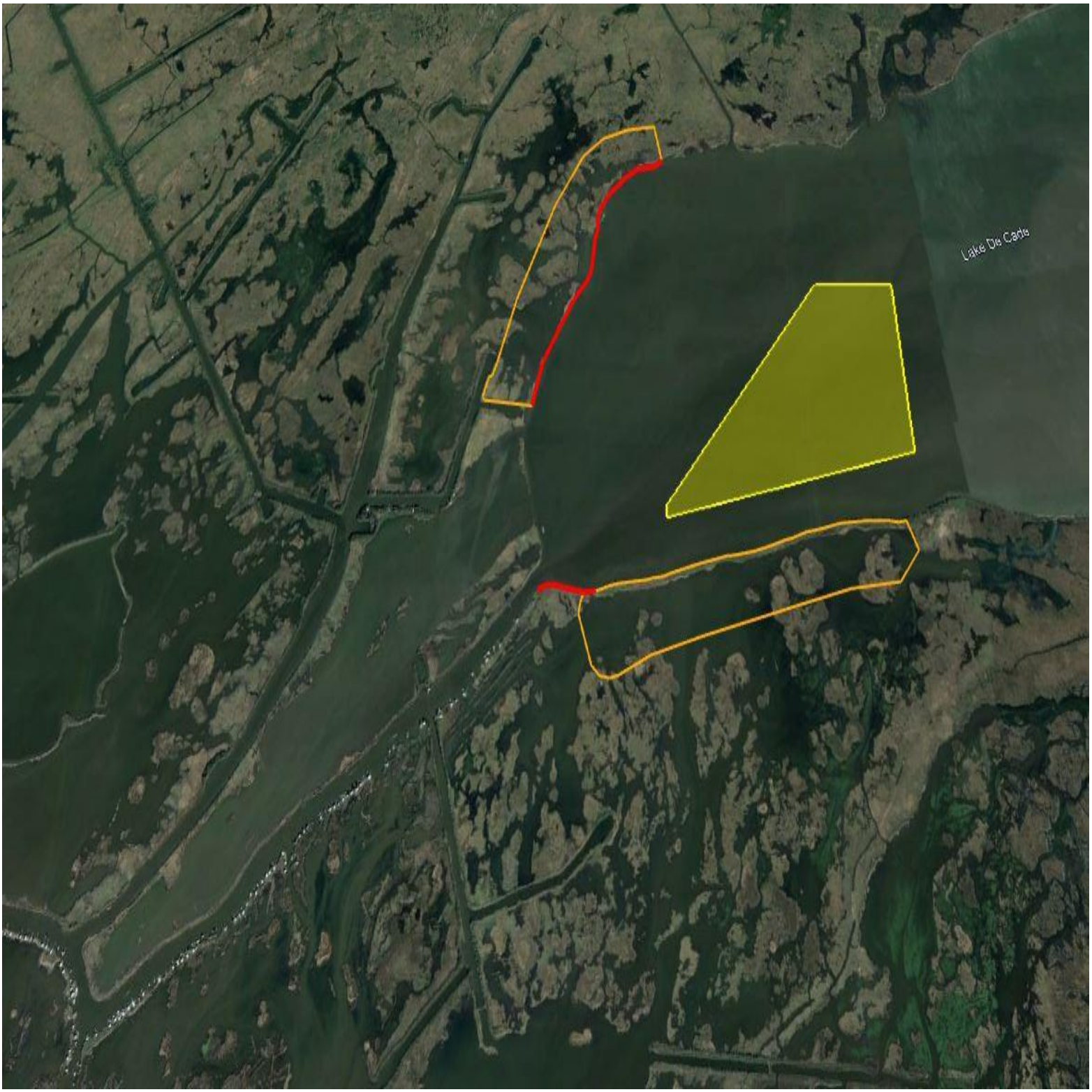

PPL33 West Lake De Cade Marsh Creation Project

2022 Aerial Imagery Federal Sponsor: NOAA Fisheries

288 Acres Marsh Creation

117 Acres Marsh Nourishment

Map Date 01-18-2023

Legend

- Marsh Creation
- Borrow
- Shoreline Armor

PPL33 PROJECT NOMINEE FACT SHEET
February 8, 2023

Project Name
Sevin West Landbridge Creation Project

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

Problem
The project is located southwest of Golden Meadow, LA, south of Catfish Lake, and east of Grand Bayou Blue. The project vicinity contains a combination of low elevation marsh and open water with organic substrates which are highly vulnerable to excessive inundation and erosion. Subsidence, sea level rise, storms, and canal and pipeline construction all have contributed to widespread historic and continued rapid land loss within the project vicinity. The USGS 1985 to 2020 loss rate is -1.33%/yr for the Terrebonne Bay mapping unit. As interior marsh has converted to open water, there is more exposure risk from increased inundation, wave fetch, and tidal and storm surge flooding.

Goals
The project goal is to create and nourish approximately 437 acres of marsh (219 marsh creation and 218 marsh nourishment) along the banks of Grand Bayou Blue and Bayou Sevin. The goal of the bayou bank enhancement is to contribute to the overall performance of the landbridge project by providing long term resilience of the adjacent restoration features as well as restoring hydrology to the natural bayous.

Proposed Solution
The proposed solution is to create and nourish 437 acres of salt marsh through hydraulic and mechanical dredging. Sediment would be mined from Bayou Laurier for the marsh creation and nourishment and adjacent in situ soils for the bayou bank enhancement. Hydraulically dredged sediment would be pumped approximately 2.5 miles and placed into a confined marsh creation area. Approximately 14,255 linear feet of bayou bank enhancement would be constructed along the seaward side of the landbridge alignment. Typical containment dikes would be gapped to the constructed marsh fill elevation at the end of construction for dewatering and gapped or degraded no later than year three after construction to establish tidal function.

Preliminary Project Benefits
1) *What is the total acreage benefited both directly and indirectly*? The total acres benefited is 437 acres (219 marsh creation, 218 acres marsh nourishment).

2) *How many acres of wetlands will be protected/created over the project life*? The total net acres of marsh protected/created over the project life is approximately 200 - 250 acres.

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (<25%, 25-49%, 50-74% and >75%).* The anticipated loss rate reduction throughout the area of direct benefits is 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 strategic location of the marsh creation and bank enhancement along the bayous will aid in re-establishing the structural framework of marshes across the Eastern Terrebonne basin and more locally along the tributaries of Grand Bayou Blue and Bayou Sevin.

5) *What is the net impact of the project on critical and non-critical infrastructure*? The project will contribute to a larger scale effort of building a landbridge across the eastern Terrebonne basin. As a whole that landbridge will have a positive impact on infrastructure. However, this project location individually isn't immediately adjacent to critical and non-critical infrastructure.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects*? When considering the scale of the overall restoration feature (landbridge), this project would work synergistically with TE-117 (Island Road Marsh Creation and Nourishment).

Considerations

Considerations for this project include pipelines/utilities, oysters, West Indian Manatee, and Eastern Black Rail.

Preliminary Cost

The estimated constructed cost + 25% contingency range is $20M - $25M.

Preparer of Fact Sheet

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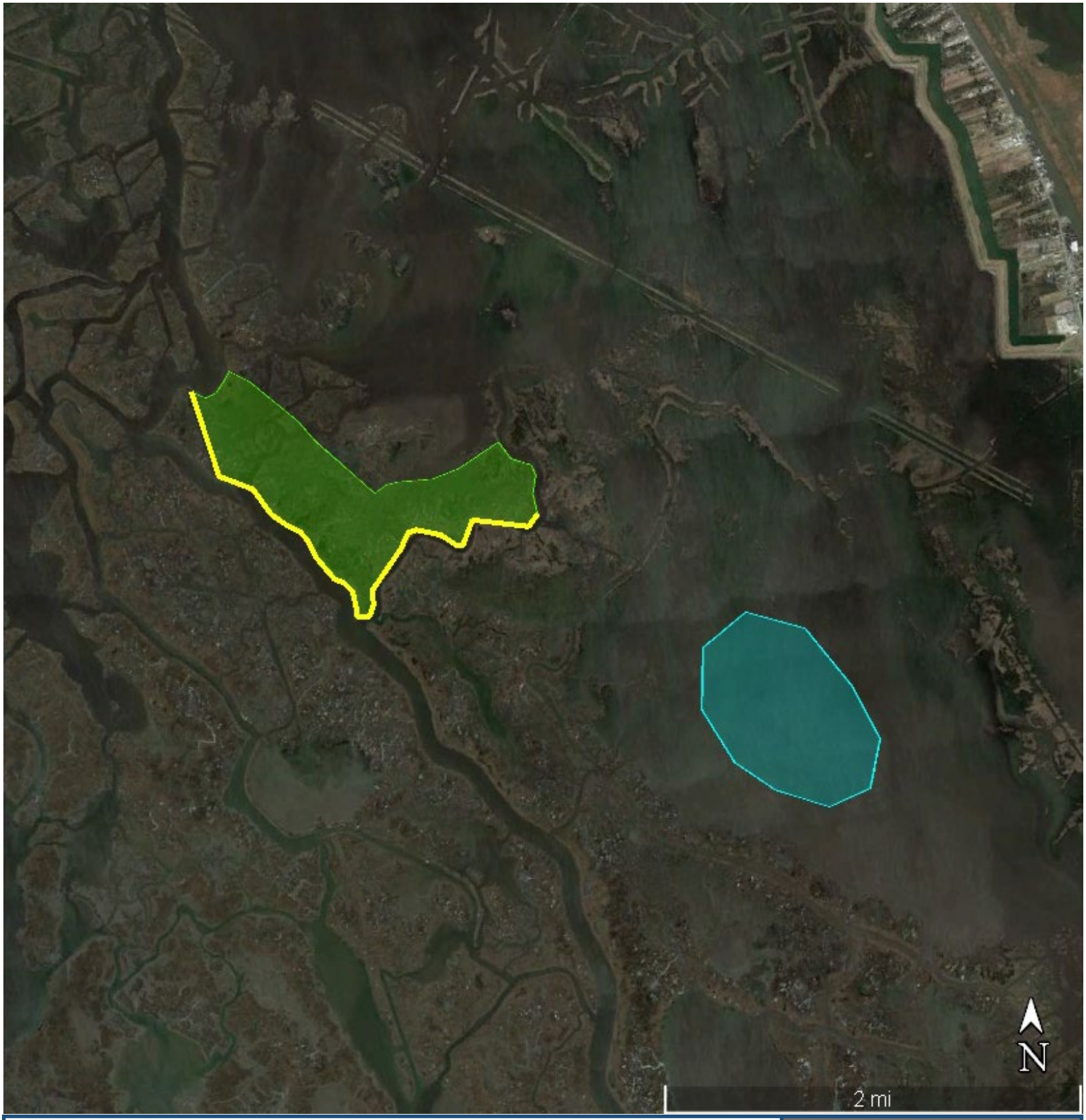

PPL33 Sevin West Landbridge Project

219 Acres Marsh Creation
218 Acres Marsh Nourishment
14,255 LF Bayou Bank Enhancement
Acreages and lengths are approximate

Federal Sponsor: NOAA Fisheries
2022 Aerial Imagery
Map Date 01-27-2023

Legend

- Marsh Creation
- Borrow Area
- Bayou Bank Enhancement

PPL33 PROJECT NOMINEE FACT SHEET
February 8, 2023

Project Name
West Bayou Jean Lacroix Landbridge Creation Project

Project Location
Region 3, Terrebonne Basin, Terrebonne Parish, Louisiana

Problem
The project is located southeast of Isle de Jean Charles, north of Lake Chien, and west of Bayou Jean Lacroix. The project vicinity contains a combination of low elevation marsh and open water with organic substrates which are highly vulnerable to excessive inundation and erosion. Subsidence, sea level rise, storms, and canal and pipeline construction all have contributed to widespread historic and continued rapid land loss within the project vicinity. The USGS 1985 to 2020 loss rate is -1.33%/yr for the Terrebonne Bay mapping unit. As interior marsh has converted to open water, there is more exposure risk from increased inundation, wave fetch, and tidal and storm surge flooding.

Goals
The project goal is to create and nourish approximately 497 acres of marsh (199 marsh creation and 298 marsh nourishment) along the banks of Bayou Jean Lacroix. Because of the low and vulnerable elevation of the marsh in this area of the basin, nourishment of marsh with sediment is an important goal of the project which leads to the long term sustainability of the overall landbridge. The goal of the enhanced containment features is to contribute to the overall performance of the landbridge project by providing long term resilience of the adjacent restoration features as well as restoring hydrology to the natural bayous.

Proposed Solution
The proposed solution is to create and nourish 497 acres of salt marsh through hydraulic and mechanical dredging. Sediment would be mined from Lake Chien for the marsh creation and nourishment and adjacent in situ soils for the enhanced dike features. Hydraulically dredged sediment would be pumped approximately 2.5 miles and placed into a confined marsh creation area. Approximately 10,970 linear feet of enhanced containment dikes would be constructed along the seaward side of the landbridge alignment. Typical containment dikes would be gapped to the constructed marsh fill elevation at the end of construction for dewatering and gapped or degraded no later than year three after construction to establish tidal function.

Preliminary Project Benefits
1) *What is the total acreage benefited both directly and indirectly*? The total acres benefited is 497 acres (199 marsh creation, 298 acres marsh nourishment).

2) *How many acres of wetlands will be protected/created over the project life*? The total net acres of marsh protected/created over the project life is approximately 200 - 250 acres.

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (<25%, 25-49%, 50-74% and >75%).* The anticipated loss rate reduction throughout the area of direct benefits is 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 strategic location of the marsh creation and bank enhancement along the bayous will aid in re-establishing the structural framework of marshes across the Eastern Terrebonne basin and more locally along Bayou Jean Lacroix.

5) *What is the net impact of the project on critical and non-critical infrastructure*? The project will contribute to a larger scale effort of building a landbridge across the eastern Terrebonne basin. As a whole that landbridge will have a positive impact on infrastructure. The project location is located only two to three miles from Isle de Jean Charles and Point Aux Chenes Marina.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects*? When considering the scale of the overall restoration feature (landbridge), this project would work synergistically with TE-117 (Island Road Marsh Creation and Nourishment).

Considerations

Considerations for this project include pipelines/utilities, oysters, West Indian Manatee, and Eastern Black Rail.

Preliminary Cost

The estimated constructed cost + 25% contingency range is $20M - $25M.

Preparer of Fact Sheet

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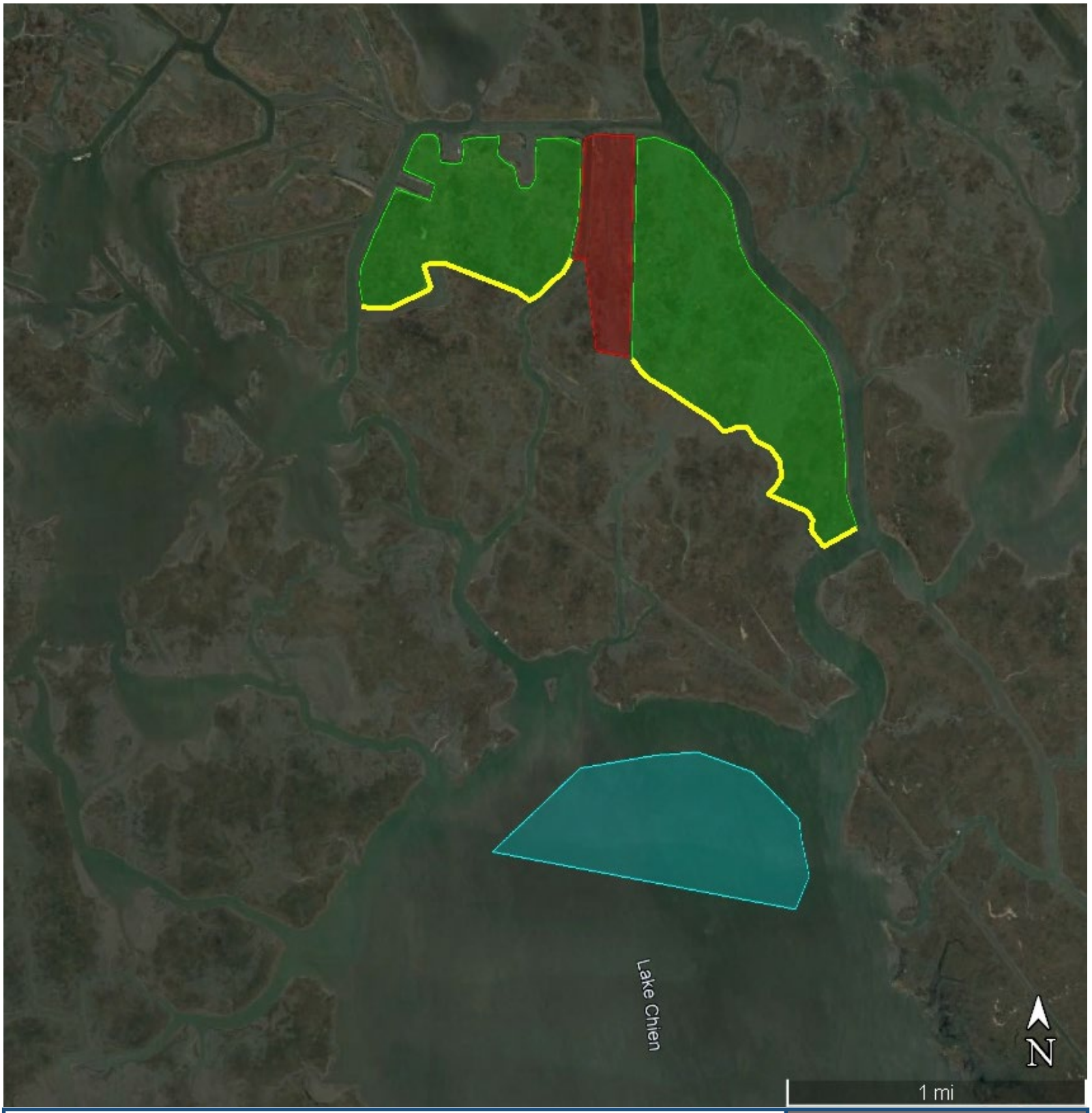

PPL33 West Bayou Jean Lacroix Landbridge Project

199 Acres Marsh Creation
298 Acres Marsh Nourishment
10,970 LF Enhanced Dikes
Acreages and lengths are approximate

Federal Sponsor: NOAA Fisheries
2022 Aerial Imagery
Map Date 01-31-2023

Legend

- Marsh Creation & Nourishment
- Additional Phase 1 Investigation Area
- Borrow Area
- Bayou Bank Enhancement

PPL33 PROJECT FACT SHEET
February 8, 2023

Project Name
Lake Billiot and Eastern Terrebonne Landbridge Restoration

Master Plan Strategy
- **2017 MP-03a.MC.09b North Terrebonne Bay Marsh Creation - Component 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.**03a.RC.06 Bayou Pointe Aux Chenes Ridge Restoration:** Restoration of approximately 43,600 feet of historic ridge to an elevation of 5 feet NAVD88 to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation along the southern portions of Bayou Pointe Aux Chenes.
- **2023 Draft MP-North Terrebonne Bay Marsh Creation:** Creation of marsh within a footprint of approximately 6,200 acres south of Montegut between Bayou St. Jean Charles and Bayou Pointe-aux-Chênes to create new wetland habitat, restore degraded marsh, and reduce wave erosion. **Eastern Terrebonne Landbridge – East:** Creation of marsh including filling areas deeper than 2.5 feet, from Bayou Pointe-aux-Chênes to the south Lafourche Levee near Catfish Lake. 30,000 feet of shoreline revetment to limit erosion in exposed areas and channel armoring to maintain channels at current dimensions at Bayou Pointe-aux-Chênes and Bayou Blue to reduce the tidal prism and to create new wetland habitat, restore degraded marsh, and reduce wave erosion. Restoration of approximately 44,000 feet of Bayou Pointe-aux-Chênes Ridge.

Project Location
Region 3, Terrebonne Basin, Terrebonne Parish

Problem
The Terrebonne Basin has experienced rapid interior wetland loss over the years. Between 1956 and 2004, Terrebonne Basin lost 321 square miles of land and an additional 17 square miles of coastal land was lost in 2005 due to the effects of Hurricanes Katrina and Rita. Wetland loss has also been attributed to sediment deficit, high subsidence, sea level rise, saltwater intrusion, historic oil and gas activity, and natural deterioration of barrier islands, which contributes to the inland invasion of marine tidal processes (including erosion, scour, and saltwater intrusion). The land loss rate for SW Golden Meadow PPL32 CWPPRA candidate is -1.37%/yr.

Proposed Solution
The proposed solution aims to have a triple impact: address the 2017 Master Plan MP-03a.MC.09b/2023 Draft Master Plan N Terrebonne Bay MC area, create a ridge/bank stabilization feature as support and to add habitat diversity, and to address the E Terrebonne Landbridge-East 2023 Draft Master Plan concept with marsh creation/nourishment. Locations within the larger marsh creation/nourishment area would naturally develop tidal creeks/ponds.

Project Benefits
Create 168 ac of terrace areas to address part of the N Terrebonne Bay MC 2023 MP feature (Lake Billiot). Create/nourish 467 acres of marsh to establish part of the Eastern Terrebonne Landbridge (East) 2023 Draft Master Plan feature. Create a bank stabilization or ridge as support for both the landbridge MC and Lake Billiot terrace features.

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

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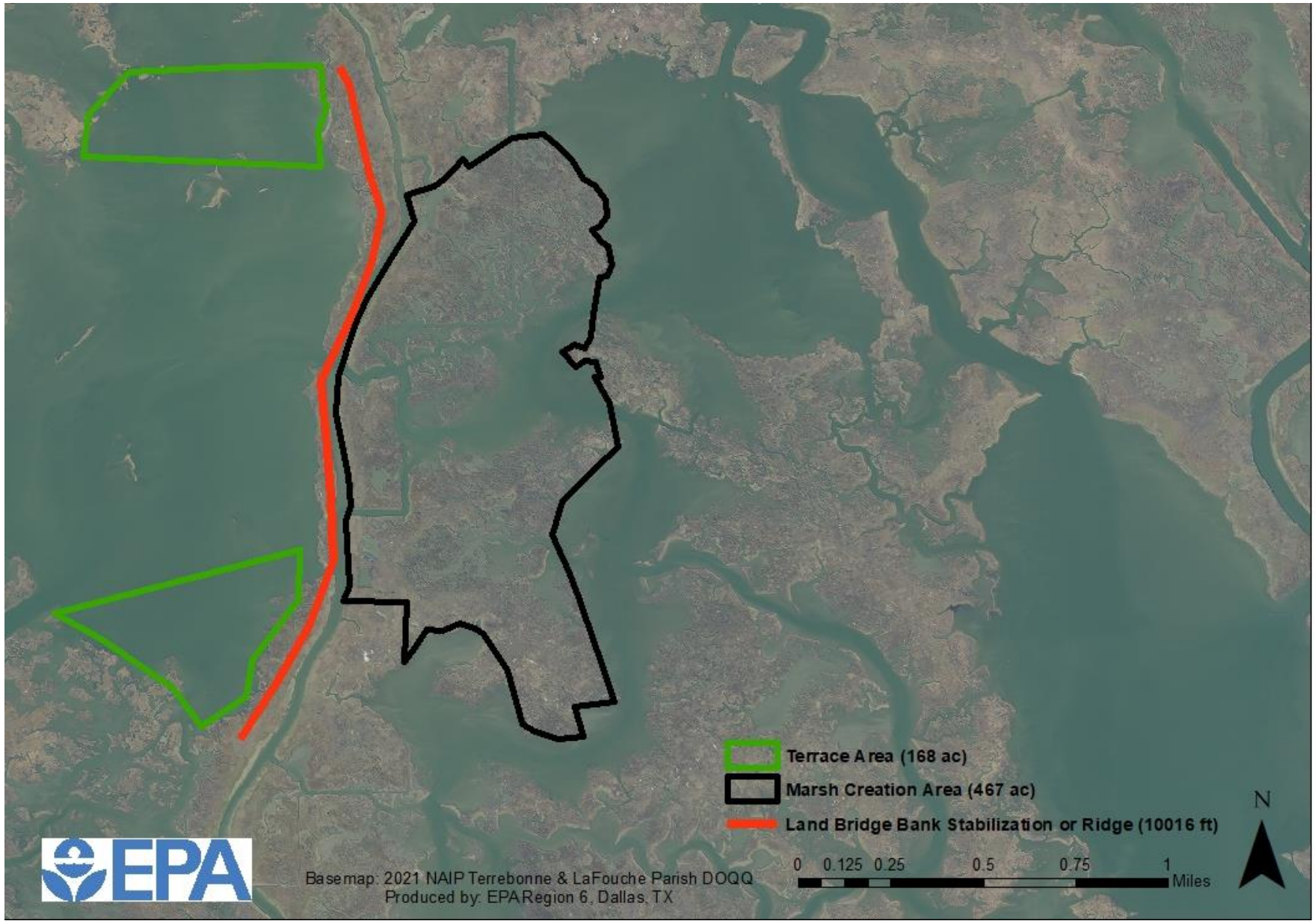

Terrace Area (168 ac)
Marsh Creation Area (467 ac)
Land Bridge Bank Stabilization or Ridge (10016 ft)
N
0 0.125 0.25 0.5 0.75 1
Miles
EPA
Basemap: 2021 NAIP Terrebonne & LaFouche Parish DOQQ
Produced by: EPA Region 6, Dallas, TX

PPL32 NOMINEE FACT SHEET
February 8, 2023

Project Name
Lake Pagie Small Scale Marsh Restoration

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 of Bay Raccourci and 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 and moderate exchange. The project will work synergistically with terraces proposed through NAWCA 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.

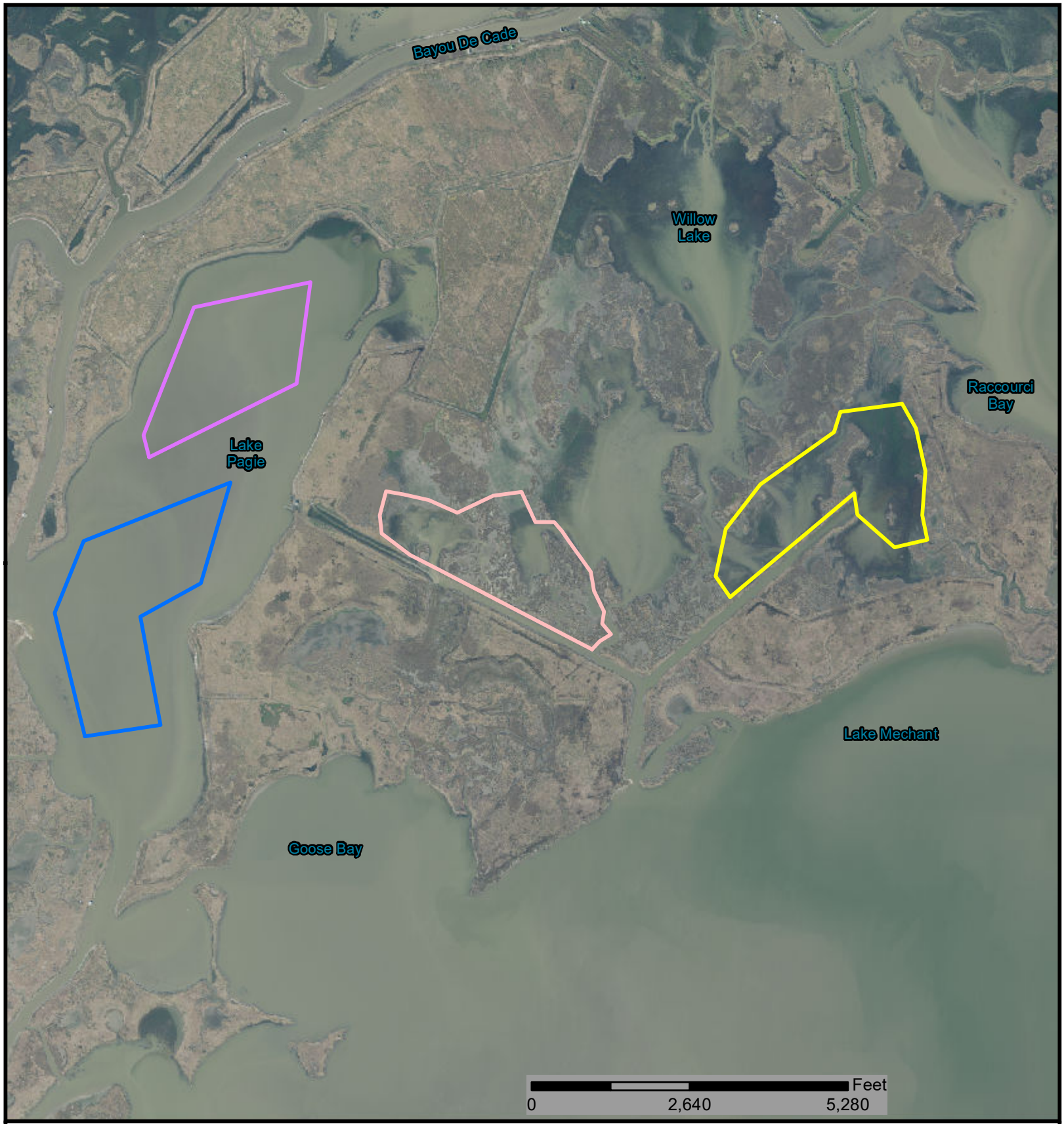
The project is being planned as a small-scale marsh creation project to strategically target areas of marsh creation that will provide greater benefits through hydrologic restoration and will work with other projects as a lower cost alternative solution.

Proposed Solution
Sediment will be dredged from a borrow site in Lake Pagie and pumped via pipeline to create/nourish approximately 241 acres (182 MC +59 MN) of marsh in two marsh creation areas immediately north of the "Y" canal. 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.

Considerations
Oil and gas infrastructure

Preliminary Cost
Construction cost plus 25% contingency is estimated to be $15-20M.

Preparer(s) of Fact Sheet:
Angela Trahan, Project Manager, Angela.Trahan@USDA.gov, 337/291-3142

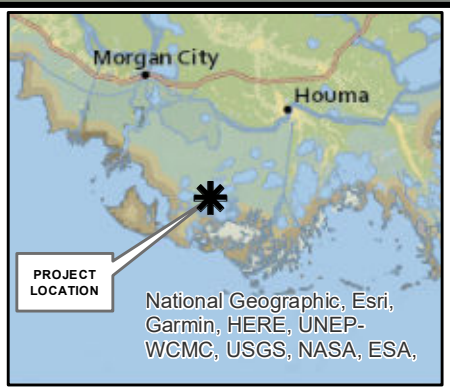


USDA

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

Data Source: NAIP 2021

Map Date: JANUARY 24, 2023



PPL 33
LAKE PAGIE SMALL SCALE MARSH RESTORATION
TERREBONNE PARISH, LA

N
W E
S

Legend

- SMALL_SCALE_MC_WEST = 117 ACRES & 10,594 LF DIKE LENGTH
- SMALL_SCALE_MC_EAST = 124 ACRES & 11,893 LF DIKE LENGTH
- PRIMARY_BORROW_AREA = 143 ACRES
- ALTERNATE_BORROW_AREA = 103 ACRES

PPL 33 PROJECT NOMINEE FACT SHEET
February 8, 2023

Project Name:
Bayou Barre Marsh Creation
(Eastern Terrebonne Landbridge Increment 1)

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 2020 loss rate for the Wonder Lake area is 1.08%/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 be the first of several marsh creation projects as part of the Eastern Terrebonne Landbridge and the first of two project that would tie Isle de Jean Charles and Bayou Terrebonne Ridges together.

Specific goals: 1) Create 406 acres and nourish 39 acres of brackish intertidal 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 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, King Rail, Louisiana Eyed Silkmoth and Saltwater topminnow.

Proposed Solution:
This project would propose to create/nourish approximately 445 acres of emergent marsh by utilizing a small hydraulic dredge to pump material from Maddison Bay borrow area. 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 445 acres.

2) How many acres of wetlands will be protected/created over the project life?
Approximately 367 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?
This project would be the first installment of the Eastern Terrebonne Landbridge concept.

5) What is the net impact of the project on critical and non-critical infrastructure?
Protects pipelines.

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 Island Road Marsh Creation project and would be the first installment of marsh creation within the Eastern Terrebonne Landbridge 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 $35 to 40M.

Preparer(s) of Fact Sheet:
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PPL33 PROJECT NOMINEE FACT SHEET
February 8, 2023

Project Name
Eastern Terrebonne Landbridge Marsh Creation Increment 1

Project Location
Region 3, Terrebonne Basin, Lafourche Parish

Problem
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. 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. The most recent significant land loss in the area has been the recent hurricanes that have passed directly over or near the project area, including Hurricane Ida. The wetland loss rate for areas near the project area is -1.37%/year based on USGS hyper temporal data from 1984 to 2021.

Goals
The goals of the project are to: 1) create/nourish approximately 583 acres of marsh with material dredged from large open water south of project (Laurier Bayou) and 2) create approximately 14,000 LF (200 acres) of terraces (10 acres of marsh).

Proposed Solution
The proposed solution would be to create approximately 201 acres and nourish 382 acres to restore a portion of the Eastern Terrebonne Landbridge. Sediment will be hydraulically pumped from Lake Saint Catherine. Temporary containment dikes will be constructed and gapped within three years of construction to allow greater tidal exchange and estuarine organism access. In addition, 14,000 LF of terraces (10 acres of marsh) would be created south of the created marsh to help protect that marsh.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   The total project area is approximately 593 acres.

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 marsh 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 protect portions of the Huricane Protection Levee near Golden Meadow and is the first increment of the Eastern Terrebonne Landbridge.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
The project will help protect a portion of the Hurricane Protection Levee near Golden Meadow.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
None. It is the first increment of the Eastern Terrebonne Landbridge.

Considerations
None

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

Preparer(s) of Fact Sheet:
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Region 2

Barataria Basin

Project ID	Agency	Project Name
R2, BA-01	EPA	Three Bayou Bay Marsh Creation
R2, BA-02	EPA	Bayou L'Ours Marsh Creation and Terracing
R2, BA-03	EPA	Bayou Chevreuil Hydrologic Restoratoin and Vegetative Planting
R2, BA-04	FWS	Northwest Little Lake Marsh Creation Extension
R2, BA-05	FWS	Bayou Perot West Marsh Creation
R2, BA-06	FWS	Southeast Golden Meadow Marsh Creation
R2, BA-07	NMFS	Southeast Lafitte Marsh Creation
R2, BA-08	NMFS	Little Lake Dedicated Dredging near Bayou L'Ours
R2, BA-09	NRCS	West Dupre Cut Marsh Creation
R2, BA-10	USACE	Red Pass Ridge and Marsh Restoration

Breton Sound Basin

Project ID	Agency	Project Name
R2, BS-01	NOAA	South Delacroix Marsh Creation and Terracing
R2, BS-02	EPA	Verret Marsh Creation and Terracing
R2, BS-03	EPA	Davant Marsh Creation (Increment 1)
R2, BS-04	NMFS	North Lake Lery Marsh Creation and Rim Restoration
R2, BS-05	NRCS	Bayou Terre aux Boeufs Ridge Restoration and Marsh Creation
R2, BS-06	NRCS	Horsepower Canal Marsh Creation
R2, BS-07	NRCS	Bayou La Chape Small Scale Marsh Creation
R2, BS-08	FWS	East Lake Lery Marsh Creation
R2, BS-09	FWS	East Breton Marsh Creation
R2, BS-10	FWS	Spanish Lake S o e i e Resto atio o e i e e m a s C eatio

PPL33 PROJECT FACT SHEET
February 9, 2023

Project Name
Three Bayou Bay Marsh Creation

Master Plan Strategy
Lower Barataria Marsh Creation-Component A (2017 Master Plan 002.MC.04a): Creation of approximately 7,400 acres of marsh in Jefferson Parish on the east shore of Little Lake and Turtle Bay to create new wetland habitat and restore degraded marsh. Large Scale Barataria Marsh Creation (2023 Master Plan #090c): Creation of marsh within a footprint of approximately 15,000 acre in western portion of Large-Scale Barataria marsh Creation project to create new wetland habitat, restore degraded marsh, and reduce wave erosion.

Project Location
Region 2, Barataria Basin, Jefferson Parish

Problem
The project area is a semi-open water body near Three Bayou Bay. Wetland loss has occurred in the project area and are not able to maintain viable elevations due to ongoing subsidence. In addition, oil and gas canals disrupted hydrology and facilitated saltwater intrusion further degrading the marsh. The marsh creation cell is located near the NE Turtle Bay Extension MC project which shows a land loss rate of -0.64%/yr.

Proposed Solution
The proposed project would create/nourish approximately 574 acres (402 acres created, and 172 acres nourished) of marsh using sediment dredged from the Little Lake. The dredged material would be fully contained. Containment dikes would be degraded as necessary to reestablish hydrologic connectivity with adjacent wetlands.

Project Benefits
Create/nourish approximately 574 acres of marsh using sediment dredged from the Little Lake.

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

Preparer(s) of Fact Sheet:
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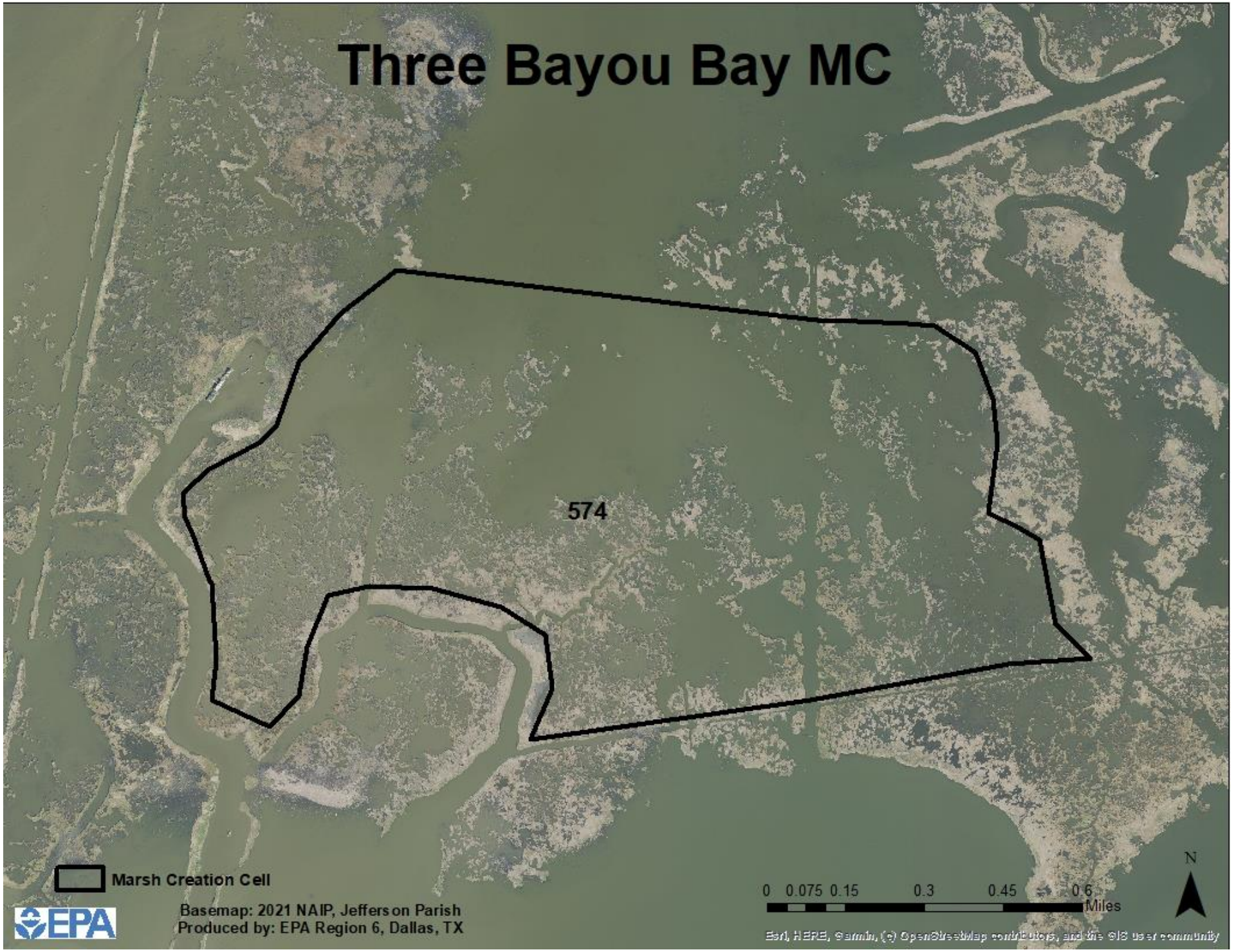
Three Bayou Bay MC
574
Marsh Creation Cell
Basemap: 2021 NAIP, Jefferson Parish
Produced by: EPA Region 6, Dallas, TX
EPA
0 0.075 0.15 0.3 0.45 0.6
Miles
N
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

PPL33 PROJECT FACT SHEET
February 9, 2023

Project Name
Bay L'Ours Marsh Creation and Terracing

Master Plan Strategy
Mid-Barataria Landbridge – West (2023 Draft Master Plan) - Creation of marsh within a footprint of approximately 3,800 acres including filling areas deeper than 2.5 feet, from Galliano to Bayou Perot. 63,000 feet of shoreline revetment to limit erosion in exposed areas and channel armoring to maintain channels at two canals in the Clovelly Oil Field to reduce the tidal prism and to create new wetland habitat, restore degraded marsh, and reduce wave erosion.

Project Location
Region 2, Barataria Basin, Lafourche Parish

Problem
The project area has been relatively stable until August 2021 when this portion of the Barataria Basin experienced enormous land loss due to Hurricane Ida, in particular, Northwest Little Lake, Bay L'Ours and Brusle Lake. The land loss rate for the nearby NW Little Lake MC project is -0.84%/yr.

Proposed Solution
The proposed project would create/nourish approximately 396 acres of marsh using sediment dredged from Little Lake. An additional 132-acre cell has been identified for terraces, with the terracing not to exceed 10% of the project.

Project Benefits
Create/nourish approximately 396 acres (create 367 acres and nourish 29 acres) of emergent marsh using sediment dredged from Little Lake.

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

Preparer(s) of Fact Sheet:
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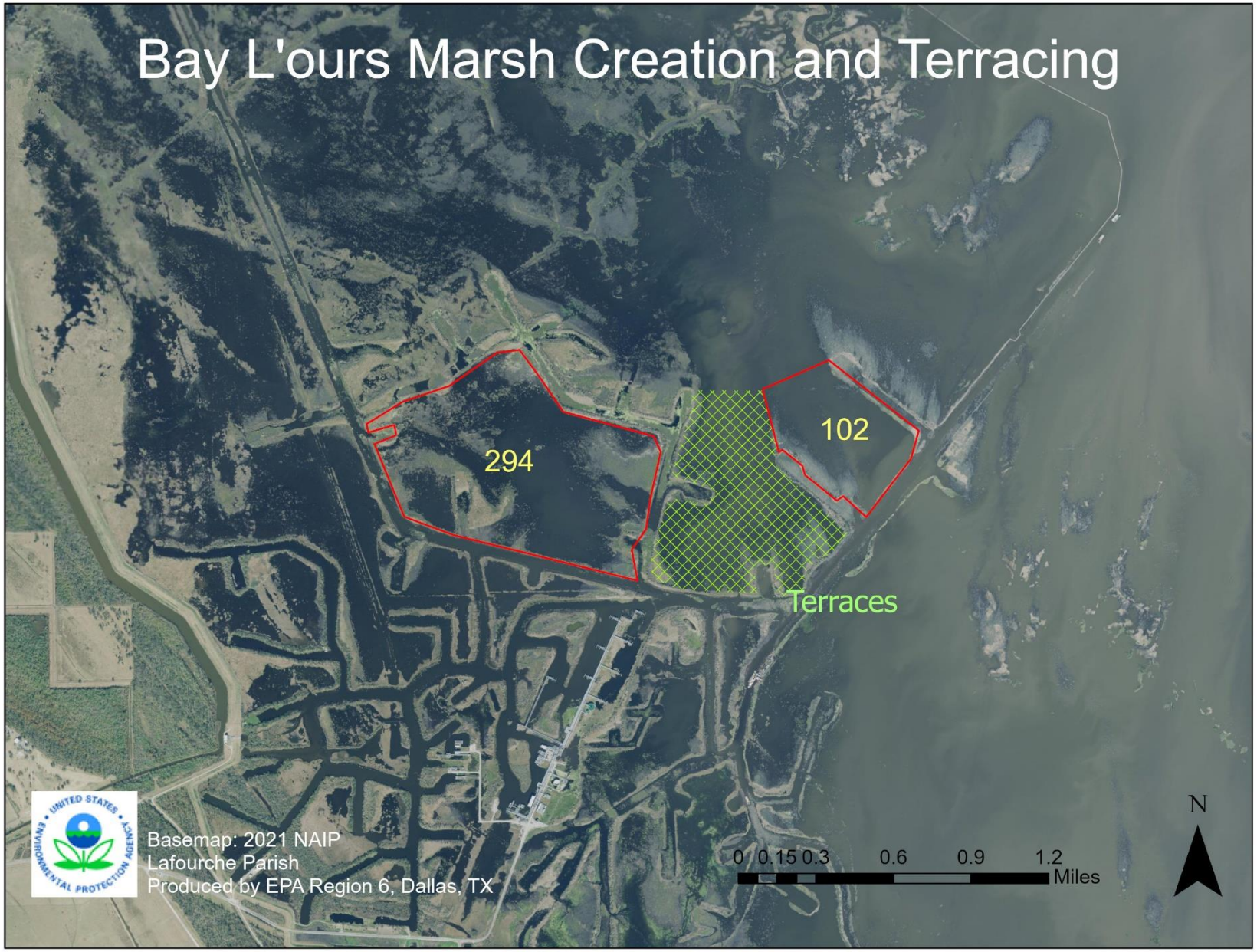
Bay L'ours Marsh Creation and Terracing
294
102
Terraces
Basemap: 2021 NAIP
Lafourche Parish
Produced by EPA Region 6, Dallas, TX
0 0.15 0.3 0.6 0.9 1.2
Miles
N

PPL33 PROJECT FACT SHEET
February 9, 2023

Project Name:
Bayou Chevreuil Hydrologic Restoration and Vegetative Planting

Project Location:
Region 2, Barataria Basin, St. John the Baptist and St. James Parishes, Bayou Chevreuil, Lac Des Allemands Swamp

Problem:
The Lac Des Allemands River Basin has experienced drainage impairments, water quality impairments, impoundment, subsidence, and inadequate accretion of sediment and organic matter. These problems were largely caused by human activities that severed the area from the natural flow of water. The poor hydrology in the area is due to multiple manmade and natural levees. The Vacherie Canal to the north eliminated connectivity with bottomland hardwood swamps and uplands to the north. Bayou Chevreuil to the south was dredged in 1959 which impounded the area with spoil banks.

Goals:
The goals of this project are similar to those of BA-34-2 and include 1) restoring natural hydrology on Bayou Chevreuil 2) reducing impoundment 3) increasing swamp longevity and productivity, and 4) protecting neighboring developed areas from flooding hazards through hydrologic restoration.

Proposed Solution:
The proposed project includes: 1) construction of gaps on the northern bank of Bayou Chevreuil and elsewhere; 2) creation of conveyance channels that originate from the gaps and extend inward into the swamp; 3) improve/clean out historical drainage pathways to the gap locations; and, 4) vegetative plantings of cypress and tupelo saplings.

Project Benefits:
The proposed project will benefit approximately 2,864 acres with hydrologic improvements that would reverse the impoundment effects. Planting seedlings will help reestablish the swamp forest. Project benefits include storm buffering, increased swamp productivity and increased wildlife and fishery habitat.

Project Estimated Costs: $5 - $10M

Preparer of Fact Sheet:
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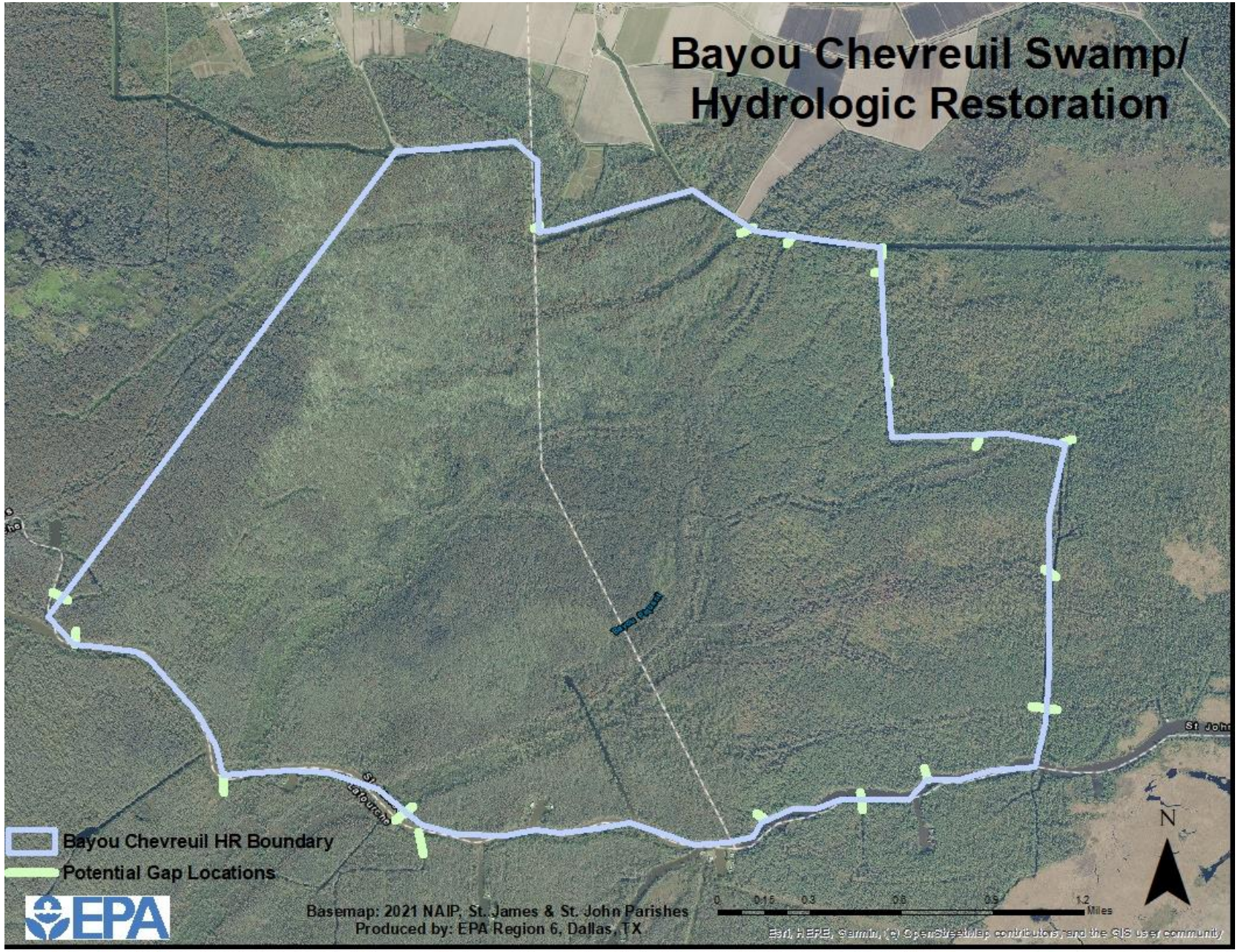
Jenny Byrd, EPA, (214) 665-7377, Byrd.Jennifer@epa.gov


Bayou Chevreuil Swamp/
Hydrologic Restoration
Bayou Chevreuil HR Boundary
Potential Gap Locations
EPA
Basemap: 2021 NAIP, St. James & St. John Parishes
Produced by: EPA Region 6, Dallas, TX
0 0.15 0.3 0.6 0.9 1.2
Miles
N
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

PPL33 PROJECT NOMINEE FACT SHEET
January 26, 2023

Project Name
Northwest Little Lake Marsh Creation Extension

Project Location
Region 2, Barataria Basin, Lafourche Parish

Problem
Until 2021, the project area was relatively stable and experienced very little interior marsh loss. Shell deposits along the Little Lake shoreline provided for a stable shoreline feature with low erosion rates. A land change analysis conducted by USGS for 254 coastal subunits indicates a 1985-2020 land change rate of +0.09% per year for the Delta Farms Subunit, which encompasses the project site. However, in August 2021, the central and western Barataria Basin experienced thousands of acres of land loss with the passage of Hurricane Ida. One of the areas hardest hit by the storm was the northwestern shoreline of Little Lake. The extensive flotant marsh that previously carpeted the area was removed by the storm, converting the area to vast expanses of open water. Based on an analysis conducted by the USGS for the Northwest Little Lake Marsh Creation (BA-268), which includes Hurricane Ida marsh loss and shoreline erosion, loss rates in the area are estimated to be -0.84% per year (1984 to 2021).

Goals
The primary goals of the project are: 1) restore marsh habitat in an area significantly impacted by Hurricane Ida and 2) restore approximately 1.9 miles of the northwestern Little Lake shoreline. The specific project goals are: 1) create 329 acres of marsh, 2) nourish 113 acres of marsh, and 3) restore approximately 9,900 linear feet (LF) of Little Lake shoreline.

Service goals include restoration/protection of habitat for at-risk species. This project would restore habitat potentially utilized by the threatened black rail and other at-risk species such as the seaside sparrow and saltmarsh topminnow.

Proposed Solution
Sediments from Little Lake will be hydraulically dredged and pumped via pipeline to create/nourish approximately 442 acres of marsh. A full containment system will be utilized with containment dikes gapped at the end of construction or no later than three years post-construction. Vegetation will be planted on the exterior slopes of the northern and western containment dikes to reduce erosion from wave energy. Dewatering and compaction of dredged sediments should produce elevations conducive to the establishment of emergent marsh and within the intertidal range. Marine mattresses will be placed along 8,360 LF of the lakeshore containment dike.

Preliminary Project Benefits
1) *What is the total acreage benefited both directly and indirectly?*
   The total project area is approximately 442 acres.

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

The project would result in approximately 300-350 net acres 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)?*
A 50% loss rate reduction is assumed for the marsh creation and marsh 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 a portion of the Little Lake rim.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
This project will not protect any critical- or non-critical infrastructure.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The project will have synergistic effects with: 1) BA-268 Northwest Little Lake Marsh Creation, 2) BA-260 Northwest Little Lake Increment II, and 3) BA-02 GIWW (Gulf Intracoastal Waterway) to Clovelly Hydrologic Restoration.

Considerations
This project could have potential oyster, land rights, and utility considerations.

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

Preparer(s) of Fact Sheet:
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Eric Whitney, NRCS, (337) 291-3069, Eric.Whitney@usda.gov

U.S. Fish & Wildlife Service

Louisiana Ecological Services

Legend

- Shoreline Stabilization
- Marsh Creation

PPL33
Northwest Little Lake
Marsh Creation Extension
Lafourche Parish, Louisiana

PPL33 PROJECT NOMINEE FACT SHEET
January 30, 2023

Project Name
Bayou Perot West Marsh Creation

Project Location
Region 2, Barataria Basin, Lafourche Parish

Problem
The western Bayou Perot shoreline suffered extreme marsh loss in 2021 by Hurricane Ida. Prior to Hurricane Ida, the project area was relatively stable and experienced very little interior marsh loss. A land change analysis conducted by USGS for 254 coastal subunits indicates a 1985-2020 land change rate of -0.03%/yr for the Bayou Perot/ Bayou Rigolettes Subunit, which includes the project site. However, in August 2021, the central and western Barataria Basin experienced thousands of acres of land loss with the passage of Hurricane Ida. One of the areas hardest hit by the storm was the western shoreline of Bayou Perot. Prior to Hurricane Ida, the 451-acre project area was an extensive and robust flotant marsh. Post-Ida, the marsh was removed and the area has largely converted to open water. Based on an analysis conducted by the USGS for the Northwest Little Lake Marsh Creation (BA-268), which includes Hurricane Ida marsh loss and shoreline erosion, loss rates in the area are estimated to be -0.84% per year (1984 to 2021).

Goals
The primary goal of the project is to restore 3.1 miles Bayou Perot shoreline and adjacent marshes. The specific project goals are: 1) create 316 acres of marsh, 2) nourish 135 acres of marsh, and 3) restore approximately 16,400 LF of western Bayou Perot shoreline.

Service goals include restoration/protection of habitat for at-risk species. This project would restore habitat potentially utilized by the threatened black rail and other at-risk species such as the seaside sparrow and saltmarsh topminnow.

Proposed Solution
Sediments from Bayou Perot will be hydraulically dredged and pumped via pipeline to create/nourish approximately 451 acres of marsh. A full containment system will be utilized with containment dikes gapped at the end of construction or no later than three years post-construction. Dewatering and compaction of dredged sediments should produce elevations conducive to the establishment of emergent marsh and within the intertidal range. Bank restoration is also proposed. A large earthen berm will be constructed along 16,400 LF of the bayou-facing containment dike.

Preliminary Project Benefits
1) *What is the total acreage benefited both directly and indirectly?*
The total project area is approximately 451 acres.

2) *How many acres of wetlands will be protected/created over the project life?*
The project would result in approximately 300-350 net acres 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)?*
A 50% loss rate reduction is assumed for the marsh creation and marsh 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 restore a portion of the Bayou Perot shoreline a d a ata ia a d id e

5) *What is the net impact of the project on critical and non-critical infrastructure?*
This project will not protect any critical- or non-critical infrastructure.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The project will have synergistic effects with: 1) BA-27 Barataria Basin Landbridge Shoreline Protection, Phases 1 and 2, 2) BA-27c Barataria Basin Landbridge Shoreline Protection, Phase 3, and 3) BA-260 Northwest Little Lake Increment II.

Considerations
This project could have potential land rights and utility considerations.

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

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

Louisiana Ecological Services

Legend

- Shoreline Stabilization
- Marsh Creation

PPL33
Bayou Perot West Marsh Creation
Lafourche Parish, Louisiana

PPL33 PROJECT NOMINEE FACT SHEET
February 1, 2023

Project Name
Southeast Golden Meadow Marsh Creation

Project Location
Region 2, Barataria Basin, Lafourche Parish, Southeast of Golden Meadow

Problem
The project area has experienced extensive loss of emergent wetlands from subsidence, storms, canal dredging, and altered hydrology. Wetland loss has increased the vulnerability of the South Lafourche Hurricane Protection Levee to damage from tropical storms and hurricanes. Hurricane Ida, in August 2021, was particularly devastating to the area. At present, very little marsh remains for several miles east of the protection levee. The remaining emergent land consists of canal spoil banks and isolated stands of fragmented marsh. Based on the land-water analysis conducted by USGS for the PPL32 candidate project evaluation, the land loss rate in the project area was -1.05% per year for the period 1984 to 2021.

Goals
The primary goal of this project is to restore marsh southeast of Golden Meadow along the alignment of the South Lafourche Hurricane Protection Levee. The specific goal of the project is to create approximately 333 acres (293 acres of marsh creation and 40 acres of marsh nourishment) of marsh with dredged material from Bayou Lafourche.

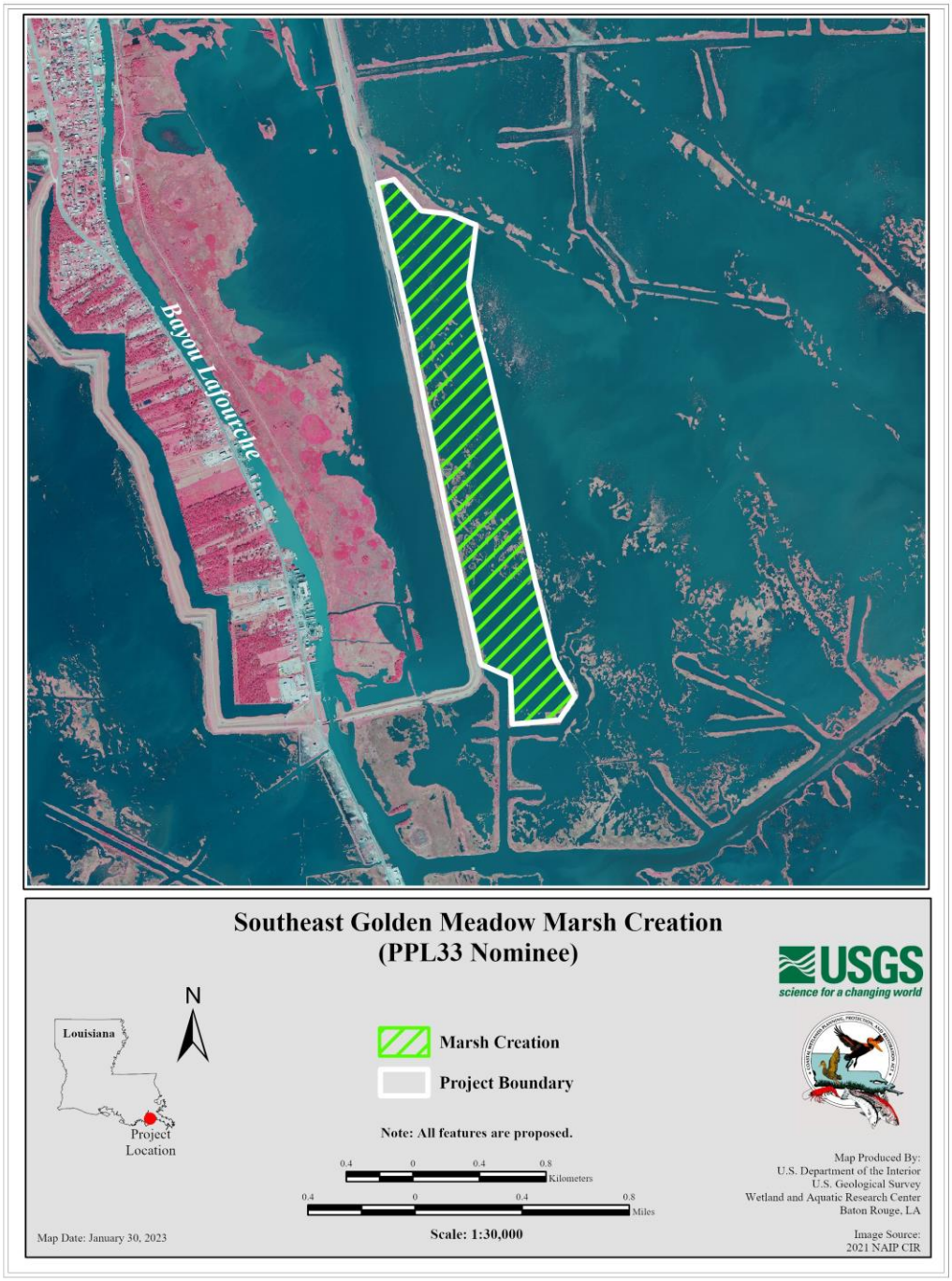
Service goals include restoration/protection of habitat for at-risk species. This project would restore habitat potentially utilized by the threatened black rail and other at-risk species such as the seaside sparrow and saltmarsh topminnow.

Proposed Solution
Sediments will be hydraulically dredged from a series of borrow sites in Bayou Lafourche and pumped via pipeline to create/nourish approximately 333 acres of marsh. Full containment would be utilized. Containment dikes will be gapped at the end of construction or no later than three years post construction. Vegetative plantings are proposed along the eastern containment dike which is exposed to wave energy. Dewatering and compaction of dredged sediments should produce elevations conducive to the establishment of emergent marsh and within the intertidal range.

Project Benefits
The project would result in 250-300 net acres over the 20-year project life.

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

Preparer of Fact Sheet
John Savell, USFWS, john_savell@fws.gov


Bayou Lafourche
Southeast Golden Meadow Marsh Creation
(PPL33 Nominee)
USGS
science for a changing world
N
Louisiana
Project
Location
Marsh Creation
Project Boundary
Note: All features are proposed.
0.4 0 0.4 0.8
Kilometers
0.4 0 0.4 0.8
Miles
Scale: 1:30,000
Map Date: January 30, 2023
Map Produced By:
U.S. Department of the Interior
U.S. Geological Survey
Wetland and Aquatic Research Center
Baton Rouge, LA
Image Source:
2021 NAIP CIR

PPL33 PROJECT NOMINEE FACT SHEET
February 9, 2023

Project Name
Southeast Lafitte Marsh Creation

Project Location
Region 2, Barataria Basin, Jefferson Parish

Problem
The Barataria Land Bridge consists of 3000 acres of degraded marsh and open water in the Upper Barataria Basin. Historically, sea level rise, saltwater intrusion, and construction of oil and gas canals and pipelines, along with sediment deprivation from the construction of levees along the Mississippi River have contributed significantly to wetland losses. The Barataria Basin has the second highest land loss rate of the ten coastal basins in the state, having lost approximately 29% of its wetlands (Couvillion et al 2017). An additional impact to the wetlands occurred when Hurricane Ida struck Louisiana in 2021. It caused an estimated 160 km^2 of land loss in Barataria Basin (Couvillion 2021, CPRA Board Meeting, 11/17/21). The marshes along the southern shore of the Pen need to be restored as they serve as one of the lines of defense to help protect the town of Lafitte from future storm impacts. The Southeast Lafitte Marsh Creation Project would work synergistically with the other Large-Scale Barataria Marsh Creation – Component E (Coastal Master Plan 2016) projects.

Goals
The project goals are to create and/or nourish up to 375 acres of intertidal marsh and to design the project to build resilient wetlands that maximize wetland benefits for the twenty year project life.

Proposed Solution
The proposed project's primary feature is to create and/or nourish approximately 375 acres of emergent intermediate marsh (207 acres of marsh creation and 168 acres of marsh nourishment). Sediment will be hydraulically pumped from a borrow source in the Pen. 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.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   This total project area is approximately 375 acres (approximately 207 acres of marsh creation and 168 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 southern rim of the Pen.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
The project will provide additional protection to the town of Lafitte.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
This project works synergistically with Large Scale Barataria Marsh Creation: Upper Barataria Component (BA-207), South Shore of the Pen (BA-41), Bayou Dupont Marsh and Ridge Creation (BA-48) and Bayou Dupont Sediment Delivery - Marsh Creation #3 and Terracing (BA-164 in rebuilding the Barataria Land Bridge.

Considerations
The proposed project has potential pipeline issues.

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

Preparer(s) of Fact Sheet:
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PPL33 Southeast Lafitte Marsh Creation

375 acres of Marsh Creation and Nourishment

Federal Sponsor: NOAA Fisheries
2021 Aerial Imagery
Map Date 02-10-2022

Legend

- Marsh Creation
- Borrow

PPL33 PROJECT NOMINEE FACT SHEET
February 9, 2023

Project Name
Little Lake Dedicated Dredging near Bay L'Ours

Project Location
Region 2, Barataria Basin, Lafourche Parish

Problem

The Little Lake mapping unit has high wetland loss caused by shoreline erosion, subsidence, and channel construction. The project is located in an area protecting approximately 3,000 acres of fragile interior marshes between the Little Lake shoreline and Bayou L'Ours Ridge. Project area wetlands are subject to high shoreline erosion rates (20 to 40 feet per year) and subsidence deteriorating interior marshes. An additional impact to the wetlands occurred when Hurricane Ida struck Louisiana in 2021. It caused an estimated 160 km^2 of land loss in Barataria Basin, particularly on its western side (Couvillion 2021, CPRA Board Meeting, 11/17/21).

Goals
The project goals are to create and/or nourish up to 417 acres of intertidal marsh and to design the project to build resilient wetlands that maximize wetland benefits for the twenty year project life. This project will restore approximately 2.0 miles of lake shoreline.

Proposed Solution
The proposed project's primary feature is to create and/or nourish approximately 417 acres of emergent marsh (359 acres of marsh creation and 58 acres of marsh nourishment). The marsh creation area will be protected by an existing shoreline protection feature along the western rim of Bay L'Ours. Sediment will be hydraulically pumped from a borrow source in Bay L'Ours. 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 to allow greater tidal exchange and fisheries access.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   This total project area is approximately 417 acres.

2) *How many acres of wetlands will be protected/created over the project life?*
   The net acre benefit range is 300-350 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 southwestern rim of Little Lake near Bay L'Ours.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
The project will provide some protection to the levee system near Galliano, LA.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
This project works synergistically with Little Lake Shoreline Protection/Dedicated Dredging Near Round Lake (BA-37), Northwest Little Lake March Creation (PPL32), and future Northwest Little Lake March Creation-Increment 2.

Considerations
The proposed project has potential pipeline and oyster issues.

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

Preparer(s) of Fact Sheet:
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PPL33 Little Lake Dedicated Dredging near Bay L'Ours

417 Acres Marsh Creation and Marsh Nourishment

Federal Sponsor: NOAA Fisheries
2022 Aerial Imagery
Map Date 01-26-2023

Legend

- Marsh Creation
- Borrow

PPL33 RPT Meeting Project Fact Sheet

February 9, 2023

Project Name

West Dupre Cut Marsh Creation

Project Location

Region 2, Barataria Basin, Jefferson Parish, north of Three Bayou Bay and east of Bayou Rigolettes

Problem

Problems facing the basin include sea level rise, subsidence, and effects of channelization and construction of levees. Historical freshwater and sediment sources drastically decreased after building levees on the Mississippi River as well as closing Bayou Lafourche in Donaldsonville. Thus, rain is the most significant source of freshwater. Erosion of barrier islands at the south end of the basin increases and exacerbates tidal effects, high salinity levels, and leads to more rapid rates of land loss. Canals and pipelines altered the area's hydrology and contribute to habitat degradation. The limited freshwater and sediment from natural channels are the most critical problems coupled with the historical and more recent impacts associated with hurricanes. USGS estimated a loss rate of -0.64% per year (1984-2020) for the nearby Northeast Turtle Bay Marsh Creation Extension project.

Goals

The goal is to create and nourish 605 acres of brackish marsh in two cells.

Proposed Solution

The area was heavily impacted by Hurricane Ida, creating more open water area. Marsh will be created to reestablish habitat and continue the Barataria Landbridge. The cells will be fully contained and the containment dikes will be degraded as necessary to establish hydrologic connectivity with adjacent wetlands. If the area does not re-vegetate on its own, the plan is to plant 15% of the created marsh in Year 3.

Considerations

The project is adjacent to the Lafitte Oil and Gas Field and there are associated pipelines and well heads in the area. The project layout has been configured to avoid these features.

Preliminary Construction Cost + 25%

$30M - $35M

Preparer of Fact Sheet

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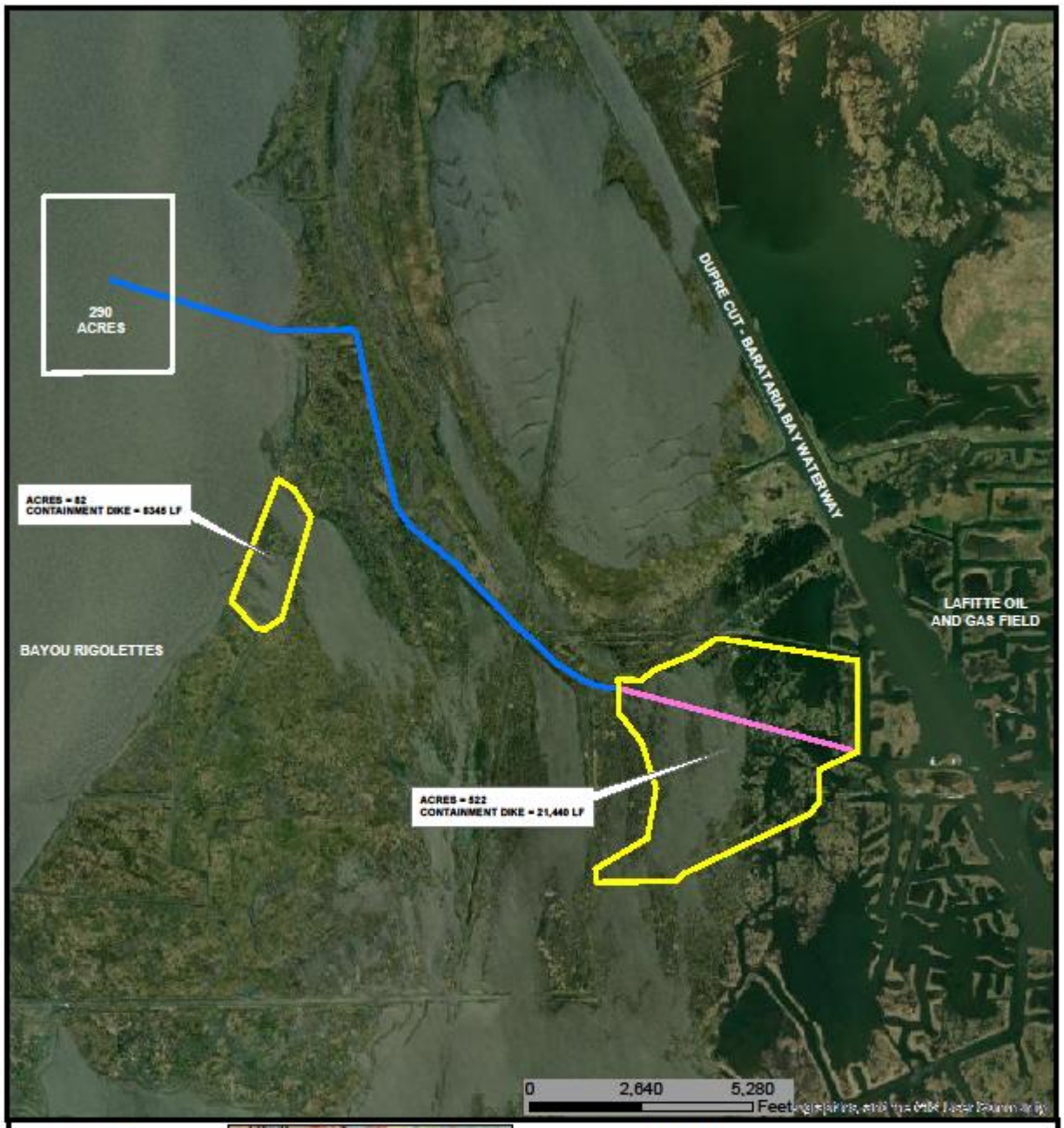
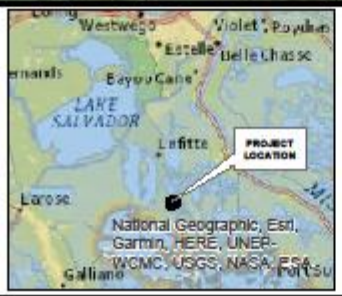


USDA

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

Data Source: ESRI 2022 IMAGERY

Map Date: JANUARY 31, 2023



PPL 33
WEST DUPRE CUT
MARSH CREATION
JEFFERSON PARISH, LA

Legend
MARSH_CREATION_1_30_23
BORROW_AREA_1_30_23
SUBMERGED_DREDGE_PIPE_1_30_23 = 17,892 LF
SHORE_DREDGE_PIPE_1_30_23 = 5556 LF

PPL33 PROJECT NOMINEE FACT SHEET
9 February 2023

Project Name
Red Pass Ridge and Marsh Restoration

Project Location
Region 2, Barataria Basin, Plaquemines Parish, southwest of Venice.

Problem
Red Pass ridge is an important structural framework component that serves as a continuation of the barrier island chain creating the first line of defense from storm surge damage to coastal wetlands and communities to the north. The coastal upland habitat of the ridge itself and the surrounding marshes have degraded over time due to factors such as historically high subsidence, lower sediment introduction, increasing frequency of tropical storms, and oil and gas activity in the area. Recently, the area saw storm surge impacts from Hurricane's Ida (2021) and Zeta (2020), including disruptions to vessel traffic located at the nearby port in Venice, LA.

Goals
Approximately 20,101 linear feet of historic ridge will be restored. In addition, approximately 425 acres of marsh will be created and nourished, which will help support the integrity of the ridge throughout the project life.

Proposed Solution
Utilizing Gulf of Mexico borrow, the Red Pass Ridge will be developed to a +4.5 feet NAVD88 crown height with a 25 feet width. According to the state's 2017 Coastal Master Plan, restoration of this ridge will "…provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation". This proposal includes restoration of approximately 20,101 linear feet of the western portion of the ridge and 425 acres of marsh behind the ridge.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   The total project area is 425 acres. This includes 111 acres of marsh creation and 314 acres of marsh nourishment.

2) *How many acres of wetlands will be protected/created over the project life?*
   Approximately 100 - 150 net acres of marsh will be benefited from marsh creation and nourishment over the project life. This estimate does not include benefits from the ridge feature.

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 marsh creation and marsh nourishment with a loss rate of -0.45%/year based on USGS data from 1985 to 2020 (Grand Liard).

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 restore 20,101 linear feet of Red Pass Ridge. This ridge notably aligns with the natural barrier island chain that protects Terrebonne and Barataria basins as their first line of defense against storm damage.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
The project may have a net positive impact to non-critical infrastructure comprised of pipelines and oil and gas wells and camps and has potential to provide protection to coastal communities to the north.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The proposed project may help reduce storm surge for the nearby Spanish Pass Ridge and Marsh Restoration (BA-191), Barataria Basin Ridge and Marsh Creation – Spanish Pass Increment (BA-203); OPA Mosquito Bay (TE-109), and/or Grand Liard Marsh and Ridge Restoration (BA-68).

Considerations
Considerations in the area include private oyster leases and oil and gas pipelines. Endangered species documented in the area include the Hawksbill Sea Turtle, the Leatherback Sea Turtle, and the Kemp Ridley's Sea Turtle. Threatened species in the area include the West Indian Manatee and migratory birds like the Eastern Black Rail, Piping Plover and the Red Knot.

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

Preparer(s) of Fact Sheet:
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Red Pass Ridge and Marsh Restoration

Sheet Legend

- Proposed Marsh Creation/Nourishment Platform
- Proposed Ridge Restoration & Protection

Satellite Imagery: 2017 LA NAIP

US Army Corps of Engineers
NEW ORLEANS DISTRICT

PPL33 PROJECT NOMINEE FACT SHEET
February 9, 2023

Project Name
South Delacroix Marsh Creation and Terracing

Project Location
Region 2, Breton Basin, Plaquemines Parish

Problem
Hurricanes Katrina, Rita, and Ida caused the majority of wetland loss in the project area. Wind erosion and saltwater intrusion have resulted in loss of marsh vegetation and wetland soils. Marsh loss has increased exposure of Delacroix to flooding from the south. The USGS expanded project boundary loss rate from the adjacent (immediately across Bayou Gentilly) PPL27 Mid Breton Land Bridge Marsh Creation and Terracing (BS-32) project is -1.91%/year from 1984 to 2019 for the extended project boundary area.

Goals
The project goal is to create and nourish approximately 402 acres (ac) of tidal emergent marsh and 18,000 linear feet of terraces.

Proposed Solution
The project solution is to create and nourish approximately 402 ac of marsh (382 ac creation 20 ac nourishment) utilizing a layout to help protect the community of Delacroix and provide synergy with BS-37 East Delacroix Marsh Creation and Terracing, BS-41 North Delacroix Marsh Creation and Terracing, and BS-32 Mid Breton Land Bridge Marsh Creation and Terracing projects. BS-37 and BS-31 have received construction authorization and the remainder is in Phase I Engineering and Design. This project would be one of the final pieces in the overall Breton Land Bridge concept. Sediment would be mined from nearby Petit Lake and placed via pipeline. The borrow area would be designed to avoid adverse impacts to the existing shorelines. Containment dikes would be gapped post construction to allow fisheries access.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   This total project area is 576 ac. This includes 402 ac of marsh creation and nourishment, and a 174 ac terrace field.

2) *How many acres of wetlands will be protected/created over the project life?*
   Approximately 300 – 350 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 (e.g., 50% reduction in the background loss rate)?*
   The anticipated land loss rate reduction throughout the area of direct benefits will be 50% over the projects life.

4) *Do any project features maintain or restore structural components of the coastal ecosystem such as barrier islands, natural or artificial levee ridges, beach and lake rims, cheniers, etc?*

The project will complete the Breton Land Bridge near the vicinity of the community of Delacroix and be a crucial piece of the overall concept. The project would add protection to the adjacent Bayou Terre Aux Boeufs Ridge.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
The project would have net positive impact to critical infrastructure which consists of Delacroix Highway, a hurricane evacuation route, and residences of Delacroix. Net positive impact would result from providing reduced impact from wind driven waves and help protect the highway.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The project will have a synergistic effect with other projects either being constructed or being engineered and designed (E&D) within the greater Breton Land Bridge. Nearby projects include BS-37 (construction funded), BS-41 (E&D), and BS-32 (construction funded).

Considerations
The proposed project has potential utility/pipeline considerations.

Preliminary Construction Costs
The estimated construction cost plus 25% contingency is $30M - $35M.

Preparer(s) of Fact Sheet:
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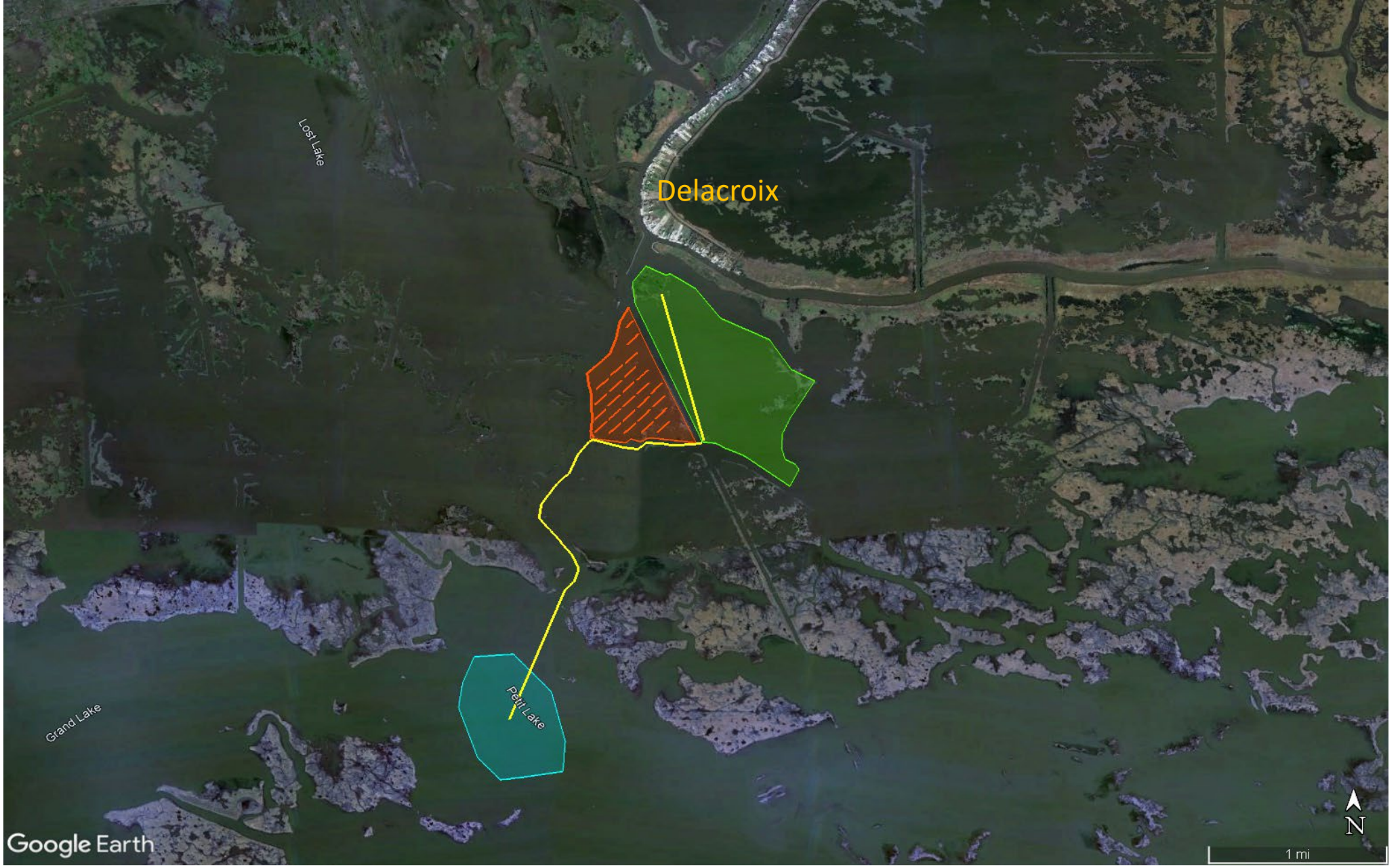
Jason Kroll, NOAA Restoration Center, 225-757-5411, jason.kroll@noaa.gov



PPL33 South Delacroix Marsh Creation and Terracing

382 Acres Marsh Creation
20 Acres Marsh Nourishment
18,000 Linear Feet of Terraces

Federal Sponsor: NOAA Fisheries
2021 Aerial Imagery
Map Date 1-28-2023

Legend

- Marsh Creation
- Terrace Field
- Borrow Area

PPL33 PROJECT FACT SHEET
February 9, 2023

Project Name
Verret Marsh Creation and Terracing

Master Plan Strategy
2017 MP Breton Marsh Creation-Component A (2017 Master Plan 001.MC.06a): Creation of approximately 12,000 acres of marsh in the Breton Marsh east of Delacroix Island to create new wetland habitat and restore degraded marsh. 2023 Draft MP North & East Lake Lery Marsh Creation: Creation of marsh within a footprint of approximately 14,000 acres in North and East Lake Lery to create new wetland habitat, restore degraded marsh, and reduce wave erosion.

Project Location
Region 2, Breton Sound Basin, St. Bernard Parish

Problem
This project area has experienced wetland loss due to a variety of factors including subsidence, saltwater intrusion, and storm damage. Hurricane Katrina devastated the area resulting in substantial marsh loss which has exposed infrastructure to open water conditions. Most recently, the area experienced impacts due to Hurricane Zeta in 2020 and Ida in 2021.

Proposed Solution
Create/nourish 376 acres of wetlands with sediment hydraulically dredged from a borrow source in Lake Borgne. This project would provide a buffer to 88 acres of mature Live Oak/Hackberry ridge ecosystems that are critical habitat for Trans-Gulf Migratory birds. It would also buffer the New Orleans HSDRRS levee system that protects the underserved community of Verret La. Another component of this project are terraces proposed at the intersection of the Reggio canal and the Eastern flank of Bayou Terre aux Boeufs ridge. Terraces would not exceed 10% of the project footprint. Restoration in this shallow water environment could reduce fetch lengths and edge erosion. Additionally, it would provide synergy between North Delacroix Marsh Creation and Terracing (BS-41) and Reggio Marsh Creation and Hydrologic Restoration (BS-43).

Project Benefits
Create/nourish 376 acres (create 323 acres and 53 nourish acres) of emergent marsh with sediment dredged from Lake Borgne and construct 146 acres of terraces to the E of the Bayou. An additional 68 acres could either be marsh creation or terraces, depending on site conditions.

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

Preparer(s) of Fact Sheet:
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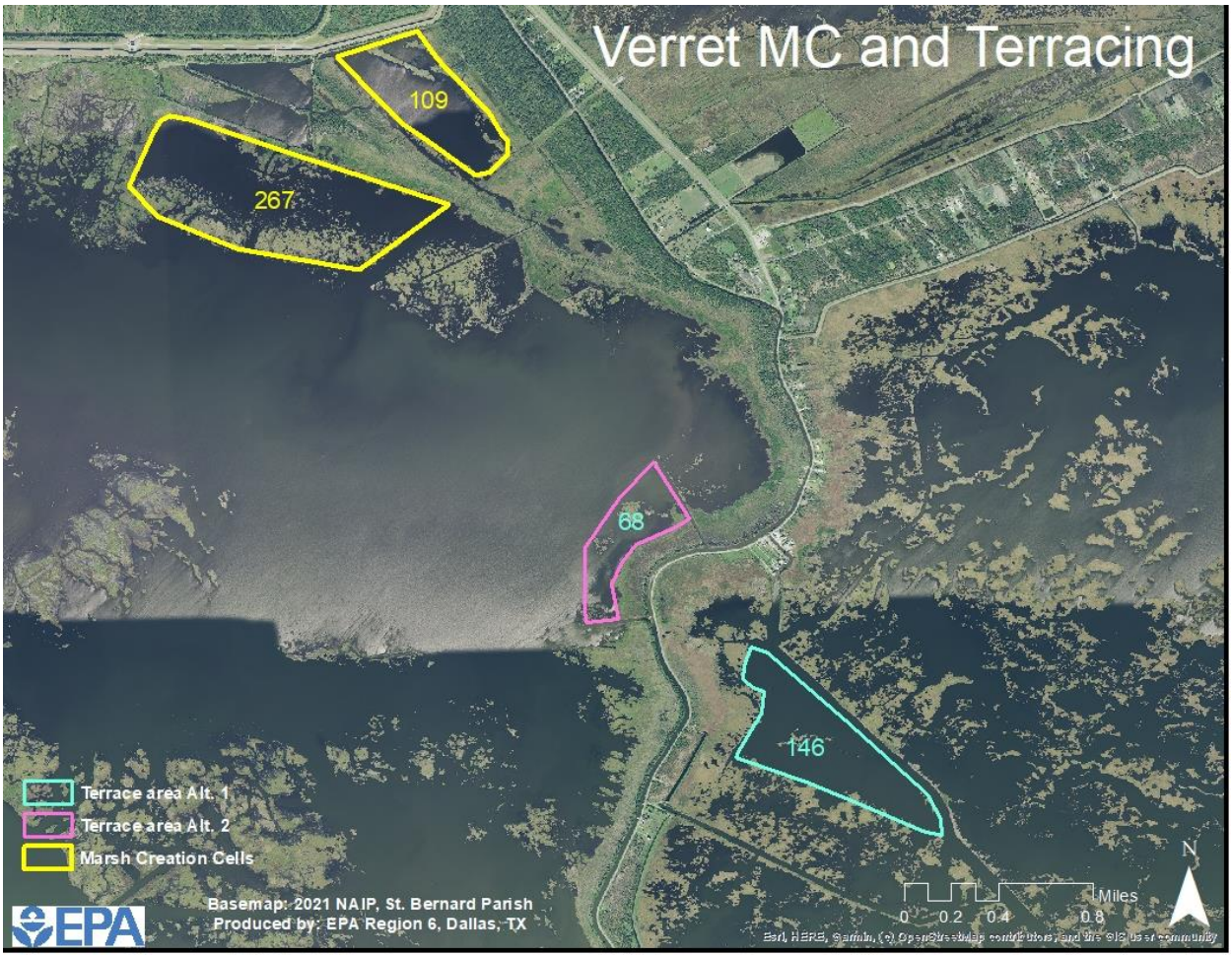
Jenny Byrd, EPA, (214) 665-7377, Byrd.Jennifer@epa.gov


Verret MC and Terracing
109
267
68
146
Terrace area Alt. 1
Terrace area Alt. 2
Marsh Creation Cells
Basemap: 2021 NAIP, St. Bernard Parish
Produced by: EPA Region 6, Dallas, TX
EPA
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Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS User Community

PPL33 PROJECT FACT SHEET
February 9, 2023

Project Name
Davant Marsh Creation (Increment 1)

Master Plan Strategy
Pointe a la Hache Marsh Creation (2017 Master Plan 001.MC.102): Creation of approximately 19,100 acres of marsh on the east bank of Plaquemines Parish near Pointe a la Hache to create new wetland habitat and restore degraded marsh. Pointe a la Hache and Carlisle Marsh Creation (2023 Master Plan #248c): Creation of marsh along the east side of the Mississippi River from White Ditch to Bohemia to create wetland habitat, restore degraded marsh, and reduce wave erosion.

Project Location
Region 2, Breton Sound Basin, Plaquemines Parish

Problem
The project area is an open water body immediately adjacent to the east bank of the Mississippi River levee. As a result of leveeing the Mississippi River for navigation and flood control, the Pointe a la Hache wetlands were cut off from the historic overbank flooding of the river. Without continued sediment input, marshes could not maintain viable elevations due to ongoing subsidence. In addition, oil and gas canals disrupted hydrology and facilitated saltwater intrusion further degrading the marsh. The land loss rate for the nearby BS-42 and BS-44 Phoenix CWPPRA projects is -1.17%/yr.

Proposed Solution
The proposed project would create/nourish approximately 419 acres of marsh using sediment dredged from the Mississippi River.

Project Benefits
Create/nourish approximately 419 acres (create 361 acres and nourish 58 acres) of emergent marsh using sediment dredged from the Mississippi River.

Project Costs
The estimated construction cost including 25% contingency is $35M - $40M.

Preparer(s) of Fact Sheet:
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Sharon L. Osowski, Ph.D.; EPA; (214) 665-7506; osowski.sharon@epa.gov
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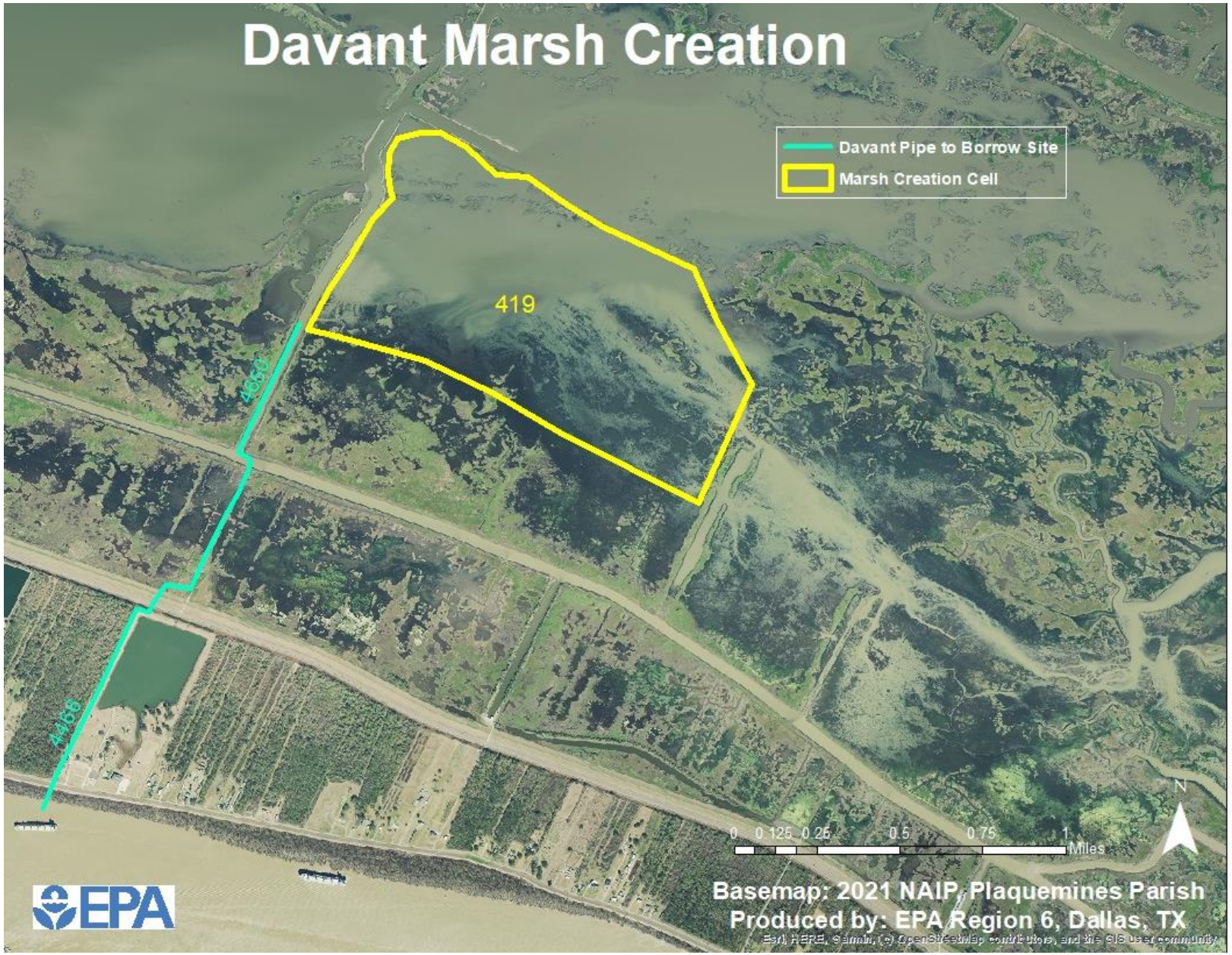
Davant Marsh Creation
Davant Pipe to Borrow Site
Marsh Creation Cell
419
4650
4168
0 0.125 0.25 0.5 0.75 1
Miles
N
EPA
Basemap: 2021 NAIP, Plaquemines Parish
Produced by: EPA Region 6, Dallas, TX
Esri, HERE, ©1min, (c) OpenStreetMap contributors, and the GIS User Community

PPL33 PROJECT NOMINEE FACT SHEET
February 9, 2023

Project Name
North Lake Lery Marsh Creation and Rim Restoration Project

Project Location
Region 2, Breton Basin, St. Bernard Parish

Problem
The marshes forming the shoreline of Lake Lery were severely damaged by Hurricane Katrina. Wind-induced waves within Lake Lery could further damage the shoreline and cause accelerated interior marsh loss. Without directly rebuilding these marshes, the lake will continue to grow and potentially coalesce with newly open waters north of the lake. The northwestern portion of the lake has the greatest rate of shoreline loss leading St. Bernard Parish Government (SBPG) to choose this as a high priority area for restoration (SBPG Coastal Strategy Document 2018). The estimated loss rate for the area is -0.95% per year (Terracing and Marsh Creation South of Big Mar project**,** BS-24, 1984 to 2021).

Goals
The primary goals of the project are to create/nourish 437 acres of intertidal marsh through dedicated dredging and to protect 2.4 miles (12,665 linear feet) of the Lake Lery shoreline with shoreline stabilization. The project will be designed to build resilient wetlands that maximize wetland benefits for the twenty year project life. The goal of the shoreline stabilization is to ensure constructability of the project and provide resilience to the newly created marsh shortly after construction to allow marsh to vegetate.

Proposed Solution
The project would create 217 acres and nourish 219 acres of marsh along the northern shore of Lake Lery using material dredged from Lake Lery. The shoreline stabilization will be placed along the southern shoreline of the marsh creation area. Temporary containment dikes will be constructed and gapped within three years of construction to allow greater tidal exchange and fishery access.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   This total project area is 437 acres.

2) *How many acres of wetlands will be protected/created over the project life?*
   Approximately 200-250 net acres of marsh will be protected/created over the twenty year project life.

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

5) *What is the net impact of the project on critical and non-critical infrastructure?*
The project would have moderate net positive impact to non-critical infrastructure comprised of pipelines.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The project will have synergistic effects with: 1) BS-16 South Lake Lery Shoreline and Marsh Restoration, 2) BS-24 Terracing and Marsh Creation South of Big Mar, and 3) CIAP project constructed west of Delacroix.

Considerations
The proposed project has utility/pipeline considerations.

Preliminary Construction Costs
The construction cost plus 25% contingency is $30M-$35M.

Preparer(s) of Fact Sheet:
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PPL33 North Lake Lery Marsh Creation and Rim Restoration

437 Acres Marsh Creation and Marsh Nourishment
12,665 LF Shoreline Stabilization

Federal Sponsor: NOAA Fisheries
2021 Aerial Imagery
Map Date 01-26-2023

Legend

- Marsh Creation
- Shoreline Stabilization
- Borrow

PPL33 PROJECT FACT SHEET
February 9, 2023

Project Name
Bayou Terre aux Boeufs Ridge Restoration and Marsh Creation

Master Plan Strategy
Bayou Terre aux Boeufs Ridge Restoration (2017 Master Plan 001.RC.100): Restoration of approximately 91,200 feet of historic ridge to an elevation of 5 feet NAVD88 to provide coastal upland habitat, restore natural hydrology, and provide wave and storm surge attenuation along Bayou Terre aux Boeufs.

Project Location
Region 2, Breton Sound Basin, Plaquemines Parish

Problem
As a result of storm events, subsidence, and sea level rise, among other factors, the ridge has degraded in this area. As the ridge continues to degrade the water bodies on each side merge creating a much larger open water area, bringing increased wave fetch, storm surge, and conversion of the remaining fragmented wetlands into open water areas. The area remains vulnerable to future hurricane damage and subsidence. The marsh creation cell is located within the Caernarvon Outfall Subunit which shows a land loss rate of -0.96%/yr.

Proposed Solution
Create 26,948 linear feet of ridge along Bayou Terre aux Boeufs to provide coastal upland habitat, restore natural hydrology, provide storm surge attenuation, and improve local community resilience. Create/nourish 384 acres emergent marsh with sediment pumped from the Petit Lake.

Project Benefits
Create 26,948 linear feet of ridge along Bayou Terre aux Boeufs and create/nourish 384 acres (create 230 acres and nourish 154 acres) emergent marsh.

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

Preparer(s) of Fact Sheet:
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Bayou Terre aux Boeufs Ridge Restoration & Marsh Creation (PPL32 Candidate)

Ridge

Marsh Creation

Project Boundary

Note: All features are proposed.

0.5 0 0.5 1 Kilometers

0.5 0 0.5 1 Miles

Scale: 1:50,000

USGS science for a changing world

Map Produced By:
U.S. Department of the Interior
U.S. Geological Survey
Wetland and Aquatic Research Center
Baton Rouge, LA

Image Source:
2021 NAIP CIR

Map ID: 2022-11-0019
Map Date: July 12, 2022

PPL33 PROJECT FACT SHEET
February 9, 2023

Project Name
Horsepower Canal Marsh Creation

Project Location
Region 2, Breton Sound Basin, Plaquemines Parish, East of Phoenix, LA

Problem
Within the project vicinity, marsh loss has occurred as the result of oil/gas canals, subsidence, and a lack of sediment deposition. For the Phoenix Marsh Creation-West Increment Project, USGS calculated a land change rate of -1.17% per year for the period 1984 to 2021.

Goals
The primary goal of this project is to restore degraded marsh along the east bank of Plaquemines Parish near Pointe a la Hache and to continue the East Bank Land Bridge west of River aux Chenes. The specific goal of this project is to create 355 acres of marsh and nourish 150 acres of marsh with dredged material from the Mississippi River.

Proposed Solution
Sediment will be hydraulically dredged from the Mississippi River-Myrtle Grove Anchorage to create 355 of marsh and nourish an additional 150 acres. The dredged riverine sediments will be pumped via pipeline into two fully contained marsh creation cells. Containment dikes will be gapped no later than three years post construction.

Considerations
The proposed project has potential utility/pipeline and levee considerations.

Preliminary Costs
The construction cost plus 25% contingency is $35-40 million.

Preparer of Fact Sheet
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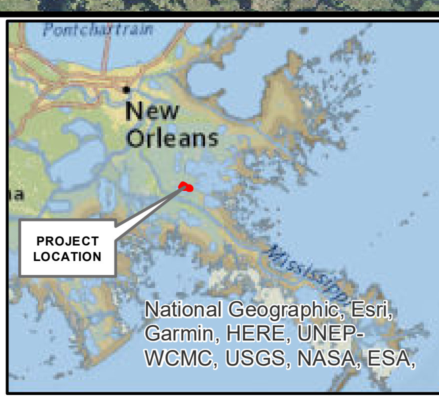

Map Produced By:
United States Department of Agriculture
Natural Resources Conservation Service
Alexandria, LA

Data Source: NAIP 2021

Map Date: JANUARY 23, 2023

PPL 33
HORSEPOWER CANAL
MARSH CREATION
PLAQUEMINES PARISH, LA

N W E S

0 1,000 2,000 Feet

Legend

MARSH_CREATION

PPL33 PROJECT NOMINEE FACT SHEET
February 9, 2023

Project Name
Bayou La Chape Small Scale Marsh Creation

Project Location
Region 2, Breton Sound Basin, St. Bernard Parish

Problem
Pipeline canals and channelization have increased the tidal prism and allowed higher salinities waters to infiltrate fresher marshes further inland. As fresher marshes die off organic soils are lost during tidal exchange and their ability to withstand storm surges is weakened. Hurricane Betsy, and more recently Hurricane Katrina, caused much of the wetland loss in the project area. Due to this altered hydrology and saltwater intrusion, marsh loss has increased exposure of the communities of Delacroix and Reggio to flooding. The 1984 to 2021 USGS loss rate calculated for extended boundary of the Yscloskey MC project is - 0.86%/year.

Goals
The project goal is to restore approximately 211 acres of brackish marsh strategically located west of pipeline canal and restore the natural hydrology by reducing the number of outlets into the pipeline canal.

Proposed Solution
The proposed solution is to create and nourish approximately 211 acres (ac) of marsh (25% marsh nourishment and 75% marsh creation). The intent is to restore degraded marsh west of the TGP Twin Pipeline canal to reduce tidal movement further inland and restore the salinity gradient. Sediment is proposed to be dredged from Lake Amedee. The project will work synergistically with the marsh creation projects along Terre aux Boeufs Ridge.

The project is being planned as a small-scale marsh creation project to strategically target areas of marsh creation that will provide greater benefits through hydrologic restoration and will work with other projects as a lower cost alternative solution.

Considerations
The proposed project has potential utility/pipeline considerations.

Preliminary Cost
Construction cost plus 25% contingency is estimated to be $15-20M.

Preparer(s) of Fact Sheet:
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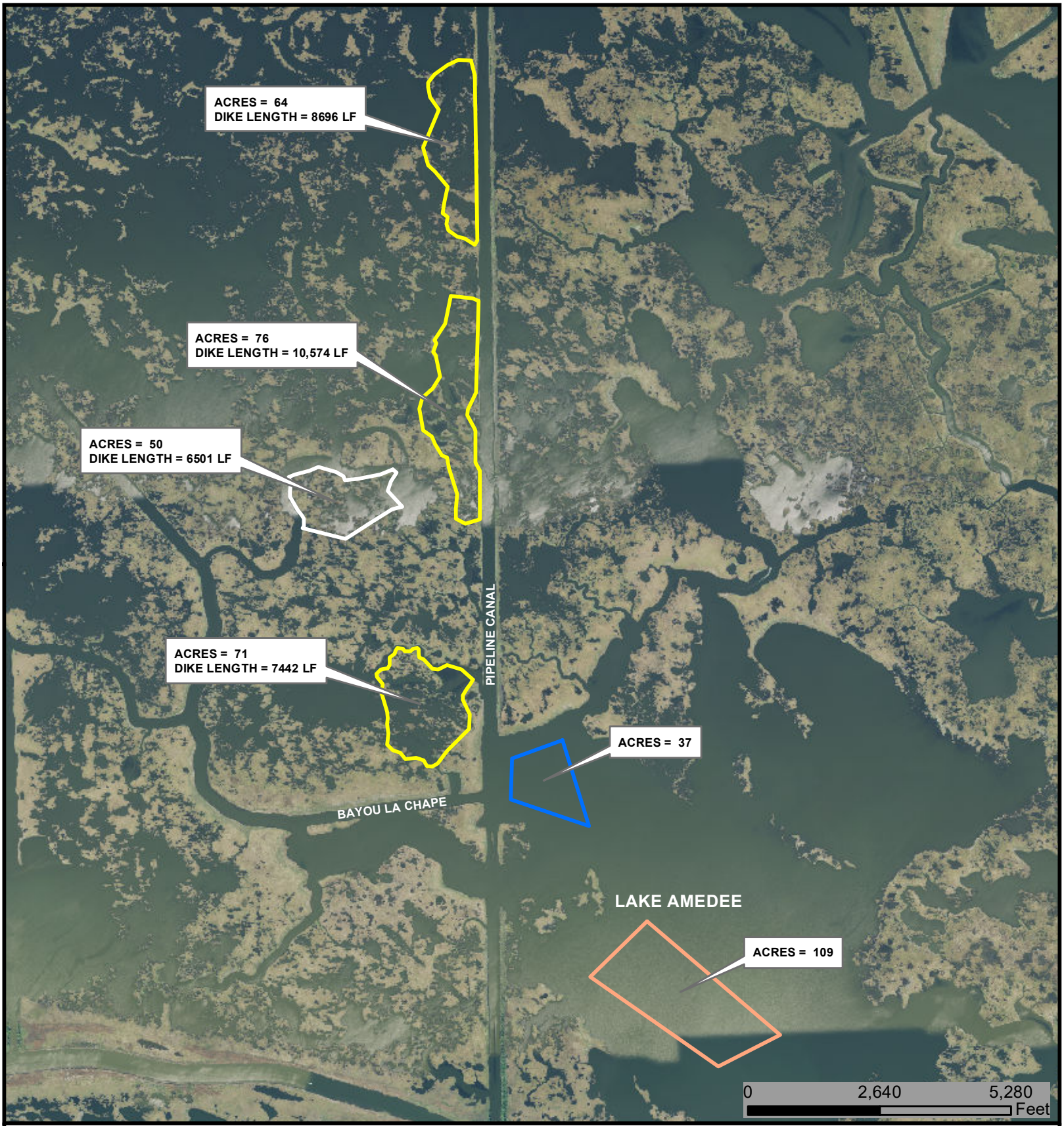
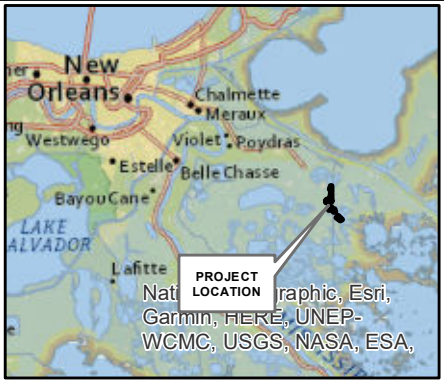


USDA

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

Data Source: NAIP 2021

Map Date: JANUARY 23, 2023



PPL 33
BAYOU LA CHAPE
MARSH CREATION
ST BERNARD PARISH, LA

N
W E
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Legend

- MARSH_CREATION_AREA
- MCA_ADDITIVE_ALTERNATE
- NW_BORROW_AREA
- SE_BORROW_AREA

PPL33 PROJECT NOMINEE FACT SHEET
January 30, 2023

Project Name
East Lake Lery Marsh Creation

Project Location
Region 2, Breton Sound Basin, St. Bernard Parish

Problem
The eastern Lake Lery shoreline and surrounding wetlands were severely damaged in 2005 by Hurricane Katrina. In the years following this storm, wind induced waves within the lake have begun to cause further damage to the lake's shoreline and interior marshes. Currently the shorelines have become so damaged that the interior emergent marshes that are still intact are being exposed to the damaging waves. This has caused an increased loss of emergent marsh habitat. A land change analysis conducted by USGS for 254 coastal subunits indicates a 1985-2020 land change rate of -0.81% per yearr for the North Lake Lery Subunit, which encompasses the project site.

Goals
The primary goals of the project are to restore approximately 3,800 linear feet (LF) of Lake Lery shoreline. The specific project goals are: 1) create 346 acres of marsh, 2) nourish 75 acres of marsh, and 3) restore approximately 3,800 LF of eastern Lake Lery shoreline.

Service goals include restoration/protection of habitat for at-risk species. This project would restore habitat potentially utilized by the threatened black rail and other at-risk species such as the seaside sparrow and saltmarsh topminnow.

Proposed Solution
Sediments from Lake Lery will be hydraulically dredged and pumped via pipeline to create/nourish approximately 421 acres of marsh. A full containment system will be utilized with containment dikes gapped at the end of construction or no later than three years post-construction. Dewatering and compaction of dredged sediments should produce elevations conducive to the establishment of emergent marsh and within the intertidal range. Bank restoration is also proposed. A large earthen berm will be constructed along 3,800 LF of the lakeshore containment dike.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   The total project area is approximately 421 acres.

2) *How many acres of wetlands will be protected/created over the project life?*
   The project would result in approximately 300-350 net acres 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)?*
   A 50% loss rate reduction is assumed for the marsh creation and marsh 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 a portion of the Lake Lery rim.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
This project will not protect any critical- or non-critical infrastructure.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The project will have synergistic effects with: 1) BS-32 Mid Breton Land Bridge Marsh Creation and Terracing, 2) BS-41 North Delacroix Marsh Creation and Terracing, Marsh Creation, and 3) BS-16 South Lake Lery Shoreline and Marsh Restoration.

Considerations
This project could have potential land rights and utility considerations.

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

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

Louisiana Ecological Services

Legend

- Shoreline Stabilization
- Marsh Creation

PPL33
East Lake Lery Marsh Creation
St. Bernard Parish, Louisiana

PPL33 PROJECT NOMINEE FACT SHEET
January 30, 2023

Project Name
East Breton Marsh Creation

Project Location
Region 2, Breton Sound Basin, Plaquemines Parish

Problem
The major cause of wetland loss has been from storm activity, causing storm-induced scouring and erosion. In 2005 Hurricane Katrina devastated the area resulting in substantial marsh loss. Altered hydrology and oil/gas development have exacerbated this loss. Natural lakes and bays increase in size due to coalescence with marsh lost to water and increased wave fetch. A land change analysis conducted by USGS for 254 coastal subunits indicates a 1985-2020 land change rate of -0.96%/yr for the Caernarvon Outfall Subunit, which includes the project site.

Goals
The primary goal of the project is to restore intertidal marshes south of Delacroix and along the western bank of the historic Bayou Gentilly. The specific project goals are: 1) create 418 acres of marsh, and 2) nourish 12 acres of marsh.

Service goals include restoration/protection of habitat for at-risk species. This project would restore habitat potentially utilized by the threatened black rail and other at-risk species such as the seaside sparrow and saltmarsh topminnow.

Proposed Solution
Sediments from Petit Lake will be hydraulically dredged and pumped via pipeline to create/nourish approximately 430 acres of marsh. A full containment system will be utilized with containment dikes gapped at the end of construction or no later than three years post-construction. Dewatering and compaction of dredged sediments should produce elevations conducive to the establishment of emergent marsh and within the intertidal range.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   The total project area is approximately 430 acres.

2) *How many acres of wetlands will be protected/created over the project life?*
   The project would result in approximately 350-400 net acres 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)?*
   A 50% loss rate reduction is assumed for the marsh creation and marsh 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 restore an extension of the Breton Landbridge.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
This project will not protect any critical- or non-critical infrastructure.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The project will have synergistic effects with: 1) BS-32 Mid Breton Land Bridge Marsh Creation and Terracing, 2) BS-37 East Delacroix Marsh Creation and Terracing, and 3) BS-38 Breton Landbridge Marsh Creation (West) River aux Chenes to Grand Lake.

Considerations
This project could have potential land rights and utility considerations.

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

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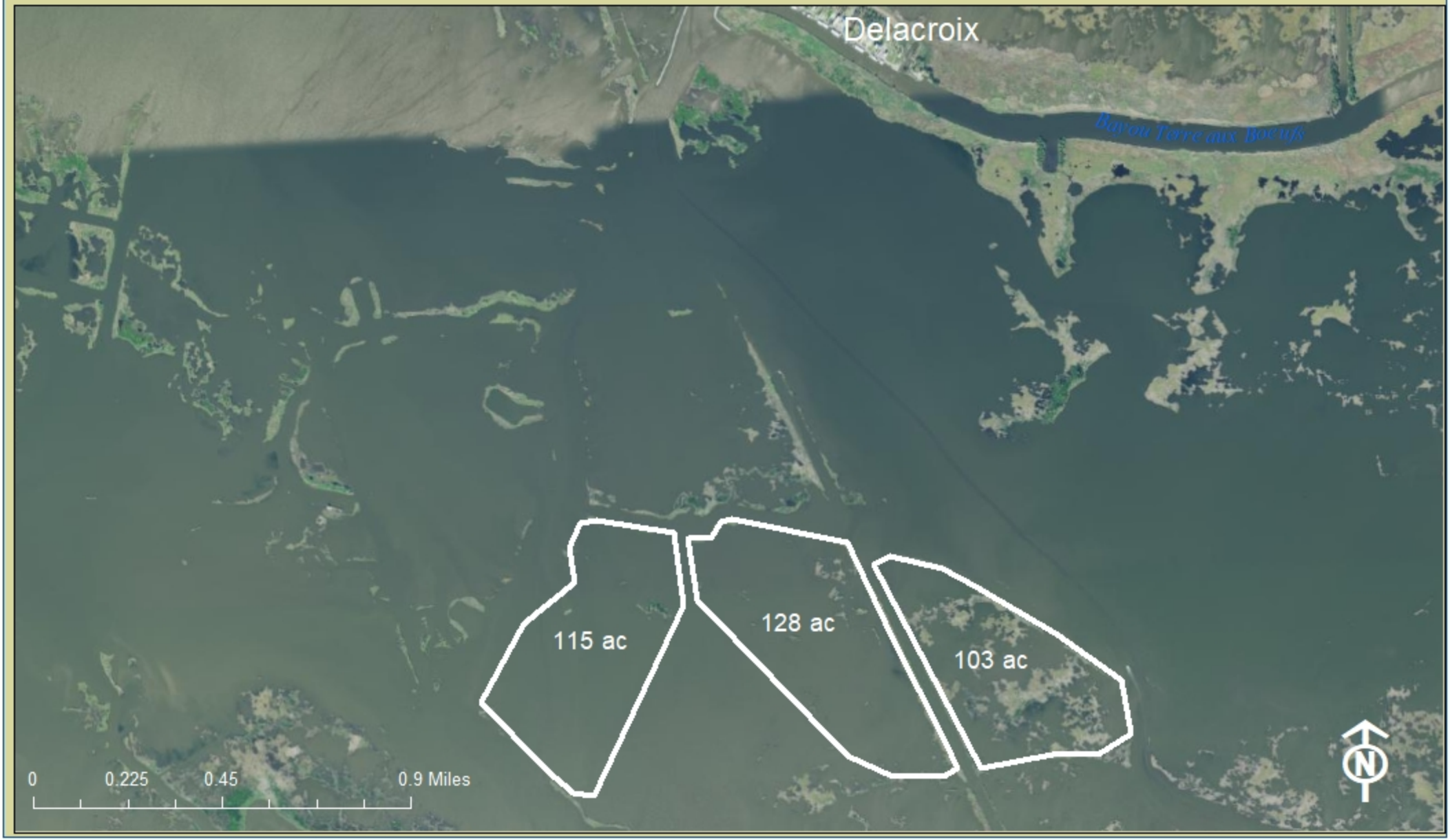
U.S. Fish & Wildlife Service

Louisiana Ecological Services

Legend

Marsh Creation

PPL33
East Breton Marsh Creation
Plaquemines Parish, Louisiana



PPL33 PROJECT NOMINEE FACT SHEET
February 9, 2023

Project Name
Spanish Lake Shoreline Restoration (Shoreline Berm/Marsh Creation)

Project Location
Region 2, Breton Basin, Plaquemines Parish, west of Grand Lake and east of Spanish Lake.

Problem
From 1932 to 1990, the Caernarvon Mapping Unit lost 14,240 acres of its marsh. Prior to Hurricane Katrina, the greatest lost documented occurred between 1956 and 1974 and coincided with Hurricane Betsy and extensive canal building. Hurricane Katrina in 2005 devastated the area resulting in substantial marsh loss. According to USGS Open File Report (2006-1274), approximately 39 square miles of marsh around the upper and central portions of Breton Sound were converted to open water by mechanical removal of the marsh or by marsh submergence. Based on the hyper-temporal analysis conducted by USGS for the extended project boundary, the loss rate in the project area is estimated to be –0.96 %/year for the period 1985 to 2020.

Goals
The goal of this project is to restore the eastern shoreline of Spanish Lake with a more robust marsh and create more typical intertidal marsh in the open water and fragmented marshes east of that restored shoreline.

Specific goals: 1) Create approximately 207 acres and nourish approximately 25 acres of intermediate to low salinity brackish marsh around the perimeter of Spanish Lake. 2) Restore approximately 18,000 linear feet of Spanish Lake's eastern shoreline.

Proposed Features
1. Hydraulically dredge material from the Mississippi River (Alliance or Alliance South Anchorage) to create/nourish 232 acres of marsh.
2. Approximately 18,000 linear feet of shoreline would be restored with material dredged from Mississippi River.
3. Material would be shaped from a higher elevation near the newly created Spanish Lake shoreline to a lower elevation east of that shoreline.
4. Because river material will be used, earthen containment would not be necessary.

Preliminary Project Benefits

1) What is the total acreage benefited both directly and indirectly?
This total project area is 232 ac.

2) How many acres of wetlands will be protected/created over the project life?
Approximately 190 net acres would result after 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 is approximately 50% to 74% 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?*
This project would restore the eastern shoreline of Spanish Lake.

5) *What is the net impact of the project on critical and non-critical 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 BS-16, BS-24, BS-32, BS-38, BS-42, and BS-44.

Preliminary Cost
The construction cost plus 25% contingency is estimated to be between $35 and $40M.

Preparer(s) of Fact Sheet:
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Region 1

Pontchartrain Basin

Project ID	Agency	Project Name
R1, PO-01	NRCS	Bayou Bienvenue Wetland Triangle Restoration
R1, PO-02	NRCS	Duncan Canal Marsh Creation
R1, PO-03	NRCS	Biloxi Marsh Shoreline Protection
R1, PO-04	NRCS	Bayou Ducros Marsh Creation
R1, PO-05	NOAA	Hopedale Marsh Creation
R1, PO-06	NOAA	Miller Bayou Marsh Creation
R1, PO-07	EPA	Rabbit and Hog Islands Marsh Creation
R1, PO-08	FWS	Bayou Sauvage Marsh Creation

PPL33 PROJECT FACT SHEET
February 9, 2023

Project Name
Bayou Bienvenue Wetland Triangle Restoration

Master Plan Strategy
2023 Draft State Master Plan has this project listed within the Central Wetlands Marsh Creation #040.

Project Location
Region 1, Pontchartrain Basin, Orleans Parish, at Bayou Bienvenue Triangle wetland area.

Problem
The Bayou Bienvenue Wetland Triangle was once a thriving baldcypress swamp. The swamp was destroyed by saltwater intrusion resulting from the construction of the Mississippi River Gulf Outlet (MRGO) in 1963, which increased regional salinities and coincided with the death of much of the forested wetlands. With the closure of the MRGO in 2009, salinities in the Bayou Bienvenue Wetland Triangle have decreased to levels that are conducive to baldcypress and water tupelo survival and growth. The 2023 Louisiana State Master Plan includes the Bayou Bienvenue wetland area for restoration. The regional loss rate for the Central Wetlands is estimated at 0.09%/yr but the PPL24 WVA calculation for loss in the specific area of this project was -2.04%/yr and the project area currently consists of almost all open water.

Goals
We propose to create several small islands within the 400-acre complex using clean sediment from either a land source, such as the Bonnet Carré Spillway, or from dredged sediments from the Mississippi River.

Proposed Solution
Approximately 103 acres of wetlands will be created in the 400-acre Wetland Triangle. The average depth of the Wetland Triangle is 3 ft. Thus, the total amount of fill needed will be approximately 500,000 cubic yards: 103 acres = 4,486,680 ft^2 x 3 ft depth = 13,460,040 ft^3 = 498,520 $yards^3$. Islands will be planted with baldcypress (*Taxodium distichum*) and water tupelo (*Nyssa aquatica*) seedlings and interspersed with giant bullwhip (*Schoenoplectus californicus*). Various methods of construction will be investigated to determine the most feasible approach including trucking in material as well as by small dredge.

Preliminary Project Benefits
This project will restore approximately 103 acres of forested wetland swamp and marsh that offer important wildlife, fish, and shellfish habitat and recreational opportunities as well as provide as a structural line of defense for communities in St. Bernard and the greater New Orleans area from highly destructive storm surge events.

Preliminary Construction Costs
The estimated construction cost with 25% contingency is approximately $10-15 million.

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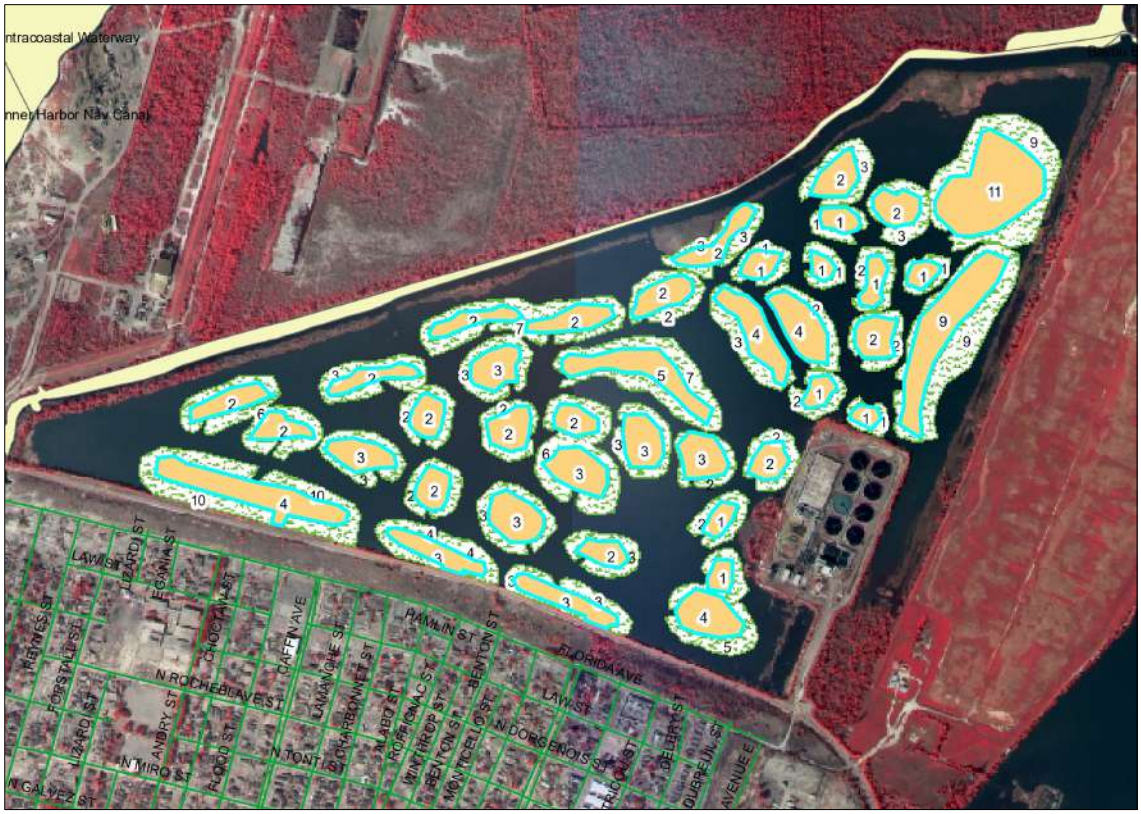

Conceptual design of the proposed wetland islands in the Bayou Bienvenue Wetland Triangle.

PPL33 PROJECT NOMINEE FACT SHEET
February 9, 2023

Project Name
Duncan Canal Marsh Creation

Project Location
Region 1, Pontchartrain Basin, St. Charles Parish, south shoreline of Lake Pontchartrain

Problem
The Labranche Wetlands serve as not only a crucial coastal marsh wetland in St. Charles Parish, but also as a protective barrier from Lake Pontchartrain to crucial infrastructure in the Parish including U.S. Interstate 10, La. Highway 61, and multiple levee systems. The State is investing in shoreline protection along the eastern portion of the shoreline near the St. Charles Parish line. This is the last reach of the Labranche Wetlands shoreline protection. Restoration of the interior marsh behind the shoreline will support those efforts and provide synergistic benefits. Despite positive land change rates estimated for the Labranche Wetlands Unit (+0.17 %/year, 1985-2020 USGS Land Change Trends Unit 234), the organic marshes were severely impacted by Hurricane Ida in 2021, resulting in increased loss.

Goals
The goal of this project is to restore interior marsh lost as a result of Hurricane Ida through dedicated dredging of sediments from Lake Pontchartrain.

Proposed Solution
The project will create approximately 372 acres of marsh and nourish approximately 21 acres of marsh using hydraulically dredged material from Lake Pontchartrain.

Preliminary Project Benefits
The net acre benefit range is 350-400 acres after 20 years.

The project will have synergistic effects with the following CWPPRA projects: 1) PO-17 Bayou Labranche Wetland Creation, 2) PO-75 Labranche East Marsh Creation, and 3) PO-133 Labranche Central Marsh Creation, as well as the Labranche Shoreline Protection Project (PO-0003b) and the State's East Labranche Shoreline Protection Project (PO-194).

Considerations
Although not within designated critical habitat, there may be potential Atlantic sturgeon considerations, as well as pipeline and transmission line considerations.

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

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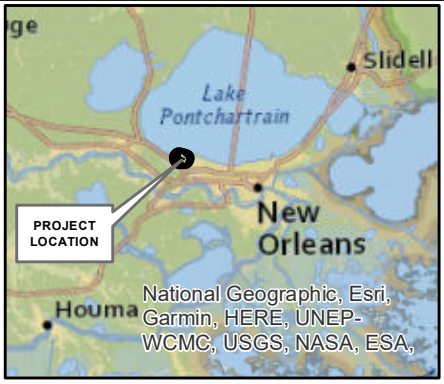
Angela Trahan, NRCS, (337) 291-3142, Angela.Trahan@usda.gov

USDA

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

Data Source: ESRI 2022 IMAGERY

Map Date: JANUARY 30, 2023



PPL 33
DUNCAN CANAL MARSH CREATION
ST CHARLES PARISH, LA

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Legend
MARSH_CREATION

PPL33 PROJECT NOMINEE FACT SHEET
FEBRUARY 9, 2023

Project Name: Biloxi Marsh Shoreline Protection

Project Location:
Region 1, Pontchartrain Basin, St. Bernard Parish, Lake Borgne and Biloxi Marshes

Problem:
Historic wetland loss in the area was caused mainly by shoreline erosion. Based on the hyper-temporal analysis conducted by USGS to detect land change trends from 1985 to 2020, the interior loss rate for the Biloxi Marsh area was calculated to be 0.36%/yr. Using maps from 1998 and 2013, Lake Borgne shoreline erosion rates were calculated along the Biloxi Marshes Wildlife Management Area (specifically in the vicinity of Point aux Marchettes). Shoreline erosion rates in that area ranged from 10 ft./yr. to 90 ft/yr. A 12,900 LF section of shoreline was estimated to have an average erosion rate of 19 ft./yr. It is estimated that without the project there would be over 112 acres lost due to shoreline erosion.

Goals:
The project goals are to 1) protect approximately 12,900 feet of critical shoreline and 2) protect approximately 112 acres of highly productive saline marsh habitat.

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, Louisiana Eyed Silk moth, and Saltwater topminnow.

Proposed Solutions:
The proposed project would: 1) Construct approximately 12,900 LF of rock revetment along the Lake Borgne shoreline. Rock would be placed on geocloth and stacked to a settled height of +2.5.

Preliminary Project Benefits:
1) What is the total acreage benefited both directly and indirectly? Approximately 112 acres would be benefited directly.

2) How many acres of wetlands will be protected/created over the project life? The total net acres protected/created over the project life would be approximately 100 to 150 acres of marsh from shoreline protection.

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 >75%.

4) Do any project features maintain or restore structural components of the coastal ecosystem such as barrier islands, natural or artificial levee ridges, beach and lake rims, cheniers, etc.
Installing shoreline protection would protect much of the Lake Borgne shoreline abutting the Biloxi Marshes Wildlife Management Area. The shoreline protection would also protect the natural ridges along a portion of Lake Shore Bayou, Bayou Grande as well as other smaller bayou ridges in the area.

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

6) To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects? This project would work synergistically with the existing CIAP project, PO-30, PO-72, PO-178, and PO-180 projects.

Identification of Potential Issues:
The proposed project has the following potential issues: there may be pipelines in the project area and Lake Borgne is considered Atlantic Sturgeon Critical Habitat.

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

Preparer(s) of Fact Sheet:
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PPL 33 PROJECT FACT SHEET
February 9, 2023

Project Name
Bayou Ducros Marsh Creation

Master Plan Strategy
Master Plan 2017: Marsh creation .06a concepts

Project Location
Region 1, Pontchartrain Basin, St. Bernard Parish

Problem: Marsh loss near Bayou Ducros is due to manipulation of the tidal prism from multiple canals and lack of sediment input from the Mississippi River. The Mississippi River Gulf Outlet (MRGO) was completed in 1968. Construction of this ship channel combined with oil exploration and conveyance canals have increased the tidal prism of local waterways. The increase in the tidal prism lead to salinity spikes as high as 35 ppt that destroyed the freshwater and brackish marsh environments along Bayou Ducros. The MRGO was officially closed in 2008 and salinities have stabilized to around 3-4 ppt, but the area still suffers from lack of sediment input from the Mississippi River. The land area change rate determined by Couvillion et al (2017) between 1932-2016 is -0.53%/year. The subsidence in the area is estimated to be 4.4 mm/yr. in a moderate scenario.

Goal: Restore 371 acres of estuarine marsh within the Golden Triangle marsh. Approximately 175 acres (45%) will be created, and 196 acres (51%) will be nourished.

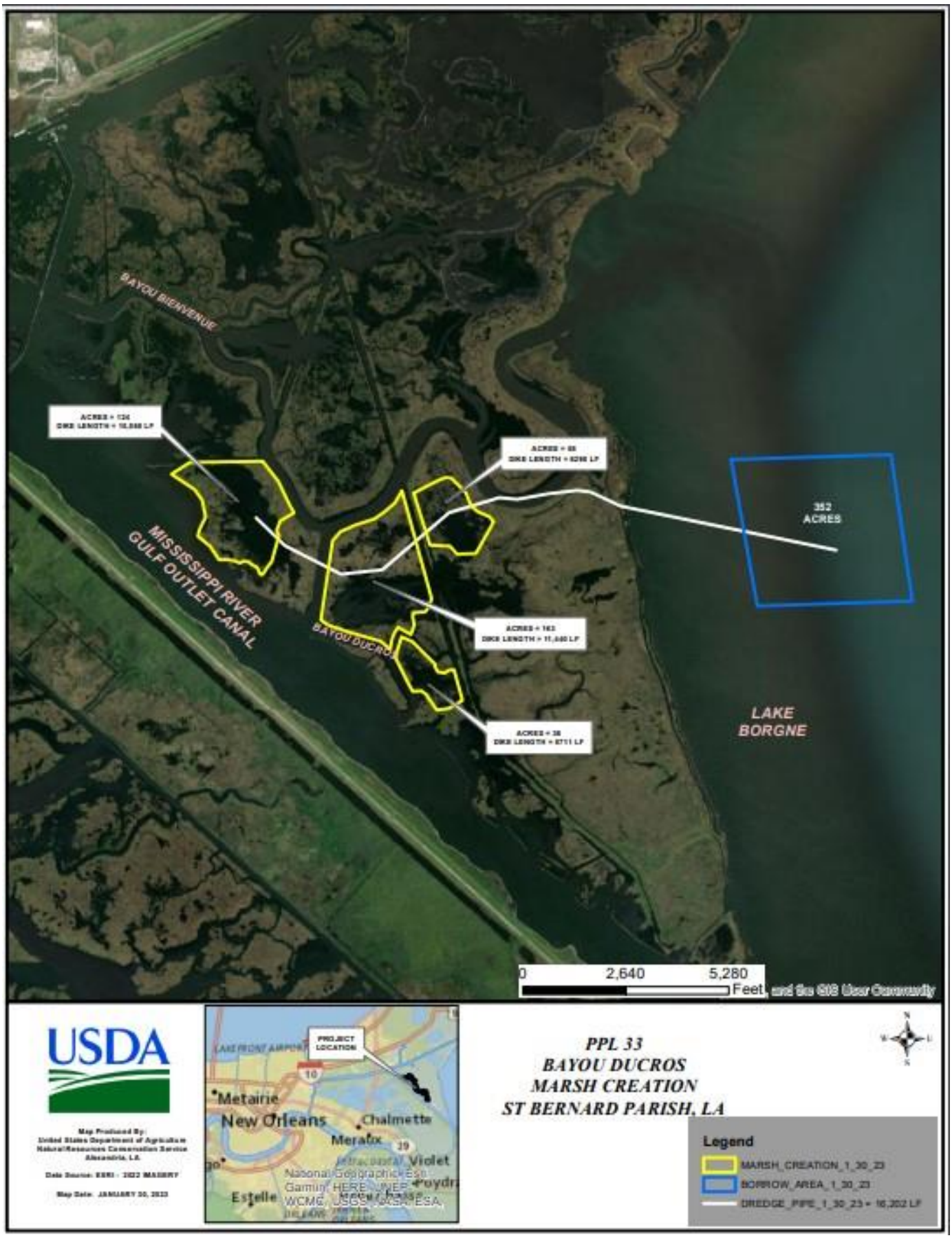
Proposed Solutions: Approximately 175 acres of marsh will be created and approximately 196 acres of marsh will be nourished (371 acres total) using sediment dredged from Lake Borgne. Portions of the MRGO shoreline along the project area include riprap. However, earthen containment is proposed for the entire area. Upon completion earthen containment will be degraded as necessary to re-establish hydrologic connectivity with adjacent wetlands.

Preliminary Project Benefits: This project will restore approximately 371 acres of brackish marsh that serves as a natural buffer within the Golden Triangle area, an area identified by several restoration plans as a priority for restoration. These marshes offer important wildlife, fish, and shellfish habitat and recreational opportunities. The proposed project will have significant synergistic effects with the Golden Triangle Marsh Creation, NRDA Lake Borgne Phase 3 and institutes components of the MRGO Ecosystem Restoration Plan. The Bayou Ducros Marsh Creation project also serves as a structural line of defense for the Hurricane Storm Damage Risk Reduction System that protects communities in the greater New Orleans area from highly destructive storm surge events.

Identification of Potential Issues: The proposed project has the following potential issues: pipelines bisect the project site and oyster leases exist adjacent to the potential borrow site.

Preliminary Construction Costs: The estimated construction cost with 25% contingency is approximately $15-$20 million.

Preparer of Fact Sheet:
Blaise Pezold, Meraux Foundation, 504-264-8125, Blaise@merauxfoundation.org


BAYOU BIENVENUE
MISSISSIPPI RIVER GULF OUTLET CANAL
BAYOU DUCROS
LAKE BORGNE
352 ACRES
0
2,640
5,280
Feet
USDA
PROJECT LOCATION
Metairie
New Orleans
Chalmette
Violet
Estelle
PPL 33
BAYOU DUCROS
MARSH CREATION
ST BERNARD PARISH, LA
Legend
MARSH_CREATION_1_30_23
BORROW_AREA_1_30_23
DREDGE_PIPE_1_30_23 = 16,302 LF

PPL33 PROJECT NOMINEE FACT SHEET
February 9, 2023

Project Name
Hopedale Marsh Creation

Project Location
Region 1, Pontchartrain Basin, St. Bernard Parish

Problem
Wetlands in the project area have been adversely impacted by increases in flood durations due to the near complete impoundment caused by the construction of LA Highway 624 and the Mississippi River Gulf Outlet (MRGO). During construction of LA Highway 624, four sets of non-gated culverts were installed under the highway. These culverts allowed tidal exchange between Bayou La Loutre and previously impounded wetlands north of the highway. The Hopedale Hydrologic Restoration Project (PO-24) improved hydroperiods within the wetlands. Hurricanes and subsidence have continued to impact the area and the marshes have not recovered. The USGS land loss rate from 1985-2020 is -0.49%/year.

Goals
The project goal is to create and nourish approximately 414 acres (ac) of tidal emergent marsh.

Proposed Solution
The solution is to create and nourish approximately 414 ac of marsh (209 ac creation 205 ac nourishment). Sediment would be mined from the nearby MRGO as the first option, with Lake Borgne as a second option. The material would be placed via pipeline. The borrow area would be designed to avoid adverse impacts to the existing shorelines. Containment dikes would be gapped post construction to allow fisheries access.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   This total project area is 414 ac.

2) *How many acres of wetlands will be protected/created over the project life?*
   Approximately 200 – 250 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 (e.g., 50% reduction in the background loss rate)?*
   The anticipated land loss rate reduction throughout the area of direct benefits will be 50% over the projects life.

4) *Do any project features maintain or restore structural components of the coastal ecosystem such as barrier islands, natural or artificial levee ridges, beach and lake rims, cheniers, etc?*
   The project would add protection to the adjacent Bayou La Loutre Ridge.

5) *What is the net impact of the project on critical and non-critical infrastructure?*

The project would have a net positive impact to critical infrastructure which consists of LA Highway 624, a hurricane evacuation route, and help protect residences and fishing infrastructure in Hopedale, Shell Beach, and Yscloskey.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The project will have a synergistic effect with PO-24, the Lake Borgne Marsh Creation Project, and the Yscloskey Marsh Creation Project.

Considerations
The proposed project has potential utility/pipeline considerations.

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

Preparer(s) of Fact Sheet:
Brandon Howard, NOAA Fisheries, 225-380-0056, brandon.howard@noaa.gov
Jason Kroll, NOAA Restoration Center, 225-757-5411, jason.kroll@noaa.gov

PPL33 Hopedale Marsh Creation

209 Acres Marsh Creation
205 Acres Marsh Nourishment

Federal Sponsor: NOAA Fisheries
2021 Aerial Imagery
Map Date 1-28-2023

Legend

- Marsh Creation
- Borrow Area

PPL33 PROJECT RPT FACT SHEET
February 9, 2023

Project Name
Miller Bayou Marsh Creation

Project Location
Region 1, Pontchartrain Basin, Orleans Parish

Problem
Wetland loss in Pontchartrain Basin from erosion of wetlands, saltwater intrusion, subsidence, and river levee and oil/gas construction has caused large impacts to this region in recent decades. Lakes Pontchartrain and Borgne continue to increase in size due to Borgne Land Bridge marshes disappearing because of severe shoreline retreat and increased tidal fluctuations. High subsidence rates range from 3.4 to 5.5 mm/year. The 1985 to 2020 USGS land loss rate for this area is -0.39%/year from the East Orleans Landbridge subunit. The East Orleans landbridge is a critically important landscape feature to restore and maintain as it provides important habitat and storm buffer to critical infrastructure and highly populated communities nearby.

Goals
The project goal is to create and nourish approximately 493 acres of marsh along the southeastern bank of Lake Saint Catherine. The goal of the shoreline stabilization is to ensure constructability of the project and provide resilience to the newly created marsh shortly after construction to allow soils to gain strength and marsh to vegetate.

Proposed Solution
The proposed solution would be to create approximately 299 acres and nourish 194 acres to restore a portion of the Lake Saint Catherine shoreline. It is planned to provide approximately 8,500 linear feet of shoreline stabilization to the newly created marsh. Sediment will be hydraulically pumped from Lake Saint Catherine. Temporary containment dikes will be constructed and gapped within three years of construction to allow greater tidal exchange and estuarine organism access. The newly created marsh will be designed and constructed to remain within the preferred inundation range for as long as possible throughout the 20 year project life.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   The total project area is approximately 493 acres.

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

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (e.g., 50% reduction in the background loss rate)?*
   A 50% loss rate reduction is assumed for the marsh creation and marsh 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 portions of Lake Saint Catherine shoreline which is part of the Borgne Landbridge.

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

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The project will have synergistic effects with: 1) PO-191 East Orleans Landbridge (Design) 2) PO-179 St. Catherine Island Marsh Creation and Shoreline Protection (Design), 3) PO-169 N.O. Land Bridge Shoreline Stabilization and March Creation (Construction), 4) PO-22 Bayou Chevee Shoreline Protection (Constructed), and 4) PO-06 Fritchie Marsh Restoration (Constructed).

Considerations
This project could have potential sturgeon and oil/gas pipeline considerations.

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

Preparer(s) of Fact Sheet:
Dawn Davis, NOAA Fisheries, 225-380-0041, dawn.davis@noaa.gov
Jason Kroll, NOAA Fisheries, 225-757-5411, jason.kroll@noaa.gov

PPL33 Miller Bayou Marsh Creation

299 Acres Marsh Creation
194 Acres Marsh Nourishment
8,500 LF Shoreline Stabilization
Acreages and lengths are approximate

Federal Sponsor: NOAA Fisheries
2022 Aerial Imagery
Map Date 01-26-2023

Legend

- Marsh Creation
- Borrow Area
- Shoreline Stabilization

PPL33 PROJECT FACT SHEET
February 9, 2023

Project Name
Rabbit and Hog Islands Marsh Creation

Project Location
Region 1, Pontchartrain Basin, Orleans & St. Tammany Parish

Master Plan Strategy
New Orleans Landbridge Restoration (2017 Master Plan 001.MC.05): Creation of approximately 33,400 acres of marsh in the New Orleans East Landbridge to create new wetland habitat and restore degraded marsh. New Orleans East Marsh Creation (2023 Draft Master Plan): Creation of marsh within a footprint of approximately 29,000 acres in a portion of the New Orleans East Landbridge Marsh Creation project to create new wetland habitat, restore degraded marsh, and reduce wave erosion.

Problem
The project area includes fragmented marsh on the New Orleans landbridge in Orleans Parish, and an area in St. Tammany Parish adjacent to The Rigolets. The area has experienced impacts from storm surge and hurricanes as well as subsidence. Without continued sediment input, marshes cannot maintain viable elevations due to ongoing subsidence. Restoring the marsh in this area would protect and maintain resources vital to nearby communities. Based on the PO-169 New Orleans Landbridge project, loss rates in the area are estimated to be -0.35% per year.

Proposed Solution
The proposed project would create/nourish approximately 362 acres (create 219 acres and nourish 143 acres) of marsh using sediment dredged from nearby Lake Borgne or Little Lake.

Project Benefits
The proposed project will maintain the marshes on the New Orleans landbridge, separating Lake Pontchartrain and Lake Borgne and will maintain marsh on the St. Tammany Parish side of the Rigolets. The landbridge, along with the Biloxi Marsh area and the Chandeleur Islands, provides protection and improves local community resiliency for the New Orleans area. Infrastructure, such as a rail line and US Hwy 90, will indirectly benefit from this project. The proposed project is designed to work synergistically with the New Orleans Landbridge Shoreline Stabilization and Marsh Creation (PO-169) and compliments PO-06 and PO-173 in St Tammany Parish.

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

Preparer(s) of Fact Sheet:
Sharon L. Osowski, Ph.D.; EPA; (214) 665-7506; osowski.sharon@epa.gov
Patty Taylor, P.E., Ph.D.; EPA, (214) 665-6403, taylor.patricia-a@epa.gov
Jenny Byrd, EPA, (214) 665-7377, byrd.jennifer@epa.gov


Rabbit & Hog Islands MC
182
180
Marsh Creation Cells 362 ac
Basemap: 2021 NAIP, Orleans Parish
Produced by: EPA Region 6, Dallas, TX
EPA
0 0.1 0.2 0.4 0.6 0.8
Miles
N
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

PPL32 PROJECT NOMINEE FACT SHEET
February 9, 2023

Project Name
Bayou Sauvage Marsh Creation

Project Location:
Region 1, Pontchartrain Basin, Orleans Parish

Problem:
Bayou Sauvage is located along the eastern shoreline of Lake Pontchartrain and is considered one of the few urban refuges as it is located only a short distance from the city of New Orleans. This area has experienced extensive loss of interior emergent wetlands and severe damage to the lake shorelines from Hurricanes Katrina and Ida passing directly over the area in 2005 and 2021 respectively. Continued loss of the weakened project area shorelines has increased the vulnerability of the New Orleans East Hurricane Protection Levee and several roads and other infrastructure. Based on LA Land Change Trends 1985-2020 analysis conducted by USGS, loss rates near the project area are estimated to be -0.39% per year.

Goals:
The primary goals of this project are to create interior low salinity marsh with placement of material hydraulically dredged from Lake Pontchartrain and restore and protect a portion of the Lake Pontchartrain shoreline.

Specific Goals: 1) Create approximately 182 acres of marsh and nourish an additional 10 acres of marsh with material dredged from Lake Pontchartrain, 2) restore 2,000 LF of Lake Pontchartrain shoreline, and 3) protect 13,500 LF of Lake Pontchartrain shoreline with articulated concrete mats.

Proposed Features
Hydraulically dredge material from Lake Pontchartrain and pumped via pipeline to create/nourish approximately 192 acres of marsh. The proposed design is to place the dredged material to a height suitable for intertidal marsh after adjusting for dewatering and compaction of dredged sediments. Containment dikes will be constructed to fully contain material. Containment dikes will be gapped/degraded after 3 years. This project would also place articulated concreate mats along 13,500 LF of the Lake Pontchartrain shoreline.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   This total project area is 192 ac (192 mc + 50 sp).

2) *How many acres of wetlands will be protected/created over the project life?*
   Approximately 225 (175 mc + 50 sp) net acres would result after 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 is 50% to 74% 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?*
This project would restore a portion of the eastern shoreline of Lake Pontchartrain as-well--as a portion of the Irish Bayou bankline.

5) *What is the net impact of the project on critical and non-critical infrastructure?*
This project would help protect a portion of the New Orleans East Hurricane Protection Levee, Highway 11, railroad, Interstate 10, several businesses along Irish Bayou, and several camps and houses.

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 the constructed PO-22 (Bayou Chevee), PO-169 (obtained Phase II construction funding), PO-179 (completed Phase I E& D), and a nearby Corps mitigation site.

Preliminary Cost
The construction cost plus 25% contingency is estimated to be between $25 and $30M.

Preparer(s) of Fact Sheet:
Robert Dubois, U.S. Fish and Wildlife Service, 337-291-3127, Robert_Dubois@fws.gov

Demonstration Projects

Project ID	Agency	Project Name
Demo - 01	Independent	Louisiana Coastal Restoration 2023 Reefbud Project
Demo - 02	Independent	AquaRockBags

Coastwide Projects

Project ID	Agency	Project Name
Coastwide - 01	EPA	Marsh Creation Containment

reefbuds

the only good thing to drop into the ocean

LOUISIANA COASTAL RESTORATION

2023 REEFBUD PROJECT

PRESENTED BY MATHEW BERNIER AND CHRIS TALBOT |

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Dear Team,

Per the RFP, we have condensed our creative Executive Summary to be as concise and informative as possible, reserving the details for our standup presentation. We look forward to illustrating how we will get this project done, the various components we will integrate, and how they will deliver a real solution for Louisiana in a most cost-effective way. Most importantly, **we want to protect our shorelines and for marine life to thrive**— we're building a solution that solves for both.

Once again, thank you for your consideration. We look forward to presenting to you in person. Warm regards,

Mathew Bernier

Founder,
REEFBUD, LLC
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985-507-9191

Secondary proposal contact:

Chris Talbot
Partner, Marketing & New Business Development REEFBUD, LLC
504-319-1452 (cell)
Nola.talbot@gmail.com

GENERAL APPROACH

With over a decade of research under our belt, we intimately understand the Gulf States Coastlines, the marine life, and need for innovative thinking around coastal restoration—what works and what doesn't, what can be improved to enhance and maximize the stability of our shorelines and waterways, and help marine life thrive.

That said, our main goals are environmental benefits and cost-effectiveness. We accomplish this with a two-pronged strategy. First and foremost is our team—highly passionate and experienced in this industry—and extensively trained in executing environmental studies, supporting the delivery of maximum project knowledge and learnings.

Second is our proprietary **Reefbuds material solution** used to construct and fortify barrier islands, wave-breaks and other attenuation, and surge protection systems.

THE SOLUTION

Reefbuds. The reason this project is a winner.

What are Reefbuds? Reefbuds are made of environmentally friendly all natural organic and inorganic materials, such as shredded coconut husk, rice stalks, volcanic rock, activated carbon, sand and cement all combined to form a rough hollow pyramid structure. The key features and benefits include:

- POROSITY - Reefbuds structures are like solid sponges that absorb sea water. (up to 30% of its weight)
- PH – The entire Reefbud takes on the PH of the surrounding water as it penetrates the structure through capillary action. The absorbed marine life germinates quickly within the fertile environment inside the Reefbuds.
- CALCIFICATION - The blend of materials in the Reefbuds reacts with seawater and triggers a calcification process very much like the natural process that takes place continuously in the sea. e.g., calcification in coral structures, crab shells, crustaceans, turtle shells, etc. This makes the Reefbuds a rock solid natural habitat for all forms of marine life.
- STABILITY - Because they are heavy massive structures and become even heavier as they absorb sea water and marine life, Reefbuds cannot be moved by strong currents during storms. Moreover, they are built with an aquadynamic shape that allows currents to simply glide around the structures instead of pushing on them. Stability allows the Reefbuds to become permanent homes and spawning grounds for marine life.
- COMPATIBILITY - Reefbuds were formulated to use beach sand and sea water as basic raw materials. REEFBUD mix (25% of volume) are mixed and formed with beach sand and the cheapest cement (20% of volume). This ensures Reefbuds compatibility with the waters where they will be deployed. Use of materials in close proximity to the seas are major sustainability and logistical benefits of employing our Reefbuds technology.

SPEED of GROWTH - This is perhaps the best feature of Reefbuds. Marine life such as algae, seaweeds, oysters, etc. can be found plentiful on Reefbuds in as little as 4 weeks after being dropped in a marine dead area (with only sand and/or mud). Reefbuds have been found to be one of the most effective and fastest ways to rekindle a marine ecosystem which has disappeared or severely damaged. https://youtu.be/4GTMkJ1_Sqk

PROJECT DESCRIPTION

The project goals include bringing an internationally proven technology to Louisiana. Scientific studies on massive Reefbuds projects like Boracay island show revival of a dead marine environment of coral rubble covering hundreds of hectares. The environmental benefits include shoreline protection (wave attenuation) as well as habitat creation. (Reference the 2006 World Bank Country Development Marketplace, "Development with Equity" contest) https://youtu.be/7HSiiqO_JCI

We seek to reproduce the results of the studies that show given coral spawning seasons, natural coral recruits taking life on Reefbuds surfaces are at least 6 times more than if the spawn fell on the natural environment of sand, rocks, coral rubble and other debris. The studies also show that coral branches grafted onto Reefbuds surfaces exhibit healthy growth and are able to withstand the battering of powerful typhoons like Yolanda in 2013. For that matter the Reefbuds structures in the different projects (some of which go back over a decade), have remained intact as they continue to grow and play host to various forms of marine life.

We seek to demonstrate that Reefbuds can play a vital role in fish enhancement even in areas not suitable to coral growth as they did in the highly polluted seas in and around Manila Bay. In Rosario Cavite, a Reefbuds project supported by the Cavite Export Processing Zone Authority since 2009, some 1400 Reefbuds structures have played host to various forms of edible marine life such as fish, crabs, clams, and shrimps. Until now, we have only been able to imagine what it could do for coastal restoration and revitalization in Louisiana.

- **Demo Project Location and Plan:** We are open to deploy wherever our solution is needed. We believe deploying in - **the Chandeleur Islands and the Rockefeller Refuge** would be a great place to prove Reefbuds is the right solution for our coastline.
    - Ref: ChandeleurIslands.pdf (usgs.gov)
    - Ref for Rockefeller: ptrosclair@wlf.la.gov
- We aim to design, create, deploy and monitor a reefbud wall similar to the picture below. However, our application would be positioned at different depths and distances from the coastline and will help with managing coastal erosion, storm surge and wave attenuation. It will also build a habitat that will boost the ecosystem in the area.
- Phillip Trosclair with LWF has agreed to sponsor a location for us to deploy in the Rockefeller Refuge (see photo attached of area highlighted in yellow).

- 
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SOLUTIONS AND ADVANTAGES

Reefbuds' proprietary mix is engineered to rapidly restore marine life in dead or depleted areas while being more cost efficient and environmentally friendly than other materials like concrete, rock, and scrap materials.

Solutions

- Living shorelines and sustainable Reefbuds planters providing anchoring for planting projects along the Gulf Coast in partnership with RES.gov Resource Environmental Solutions, LLC
- Surge and shoreline Protection: Southern and Coastal parishes including St. Tammany
- Wave attenuation: Reefbud speed bumps, sandbars, and natural wave breaks
- Land bridges/bulkheads: Kremnitz Wall
- Marine Life/habitat/safe haven for oyster, crab, shrimp, and fish

Key Advantages

Reefbuds are a more sustainable cost-effective method of rebuilding a marine ecosystem and protecting shorelines. The popular method of deploying rock or rubble results in excessive settlement in weak, coastal Louisiana soils. The material erodes over time, supports minimal marine life growth, and is expensive to deploy.

Additional advantages include:

- Adaptable along all coasts, different regions
- Cost effective
- Environmentally friendly
- Multiple designs and molds
- Rapid growth
- Easy to construct
- Sustainable, Resilient, Synergy, environmental beneficial
- Anchor system for planting projects
- Proven technology , successfully deployed, monitored, and data
- Shelter/safe haven for smaller species allow successful spawning and growth

Problems Solved by Reefbuds

Reefbuds represent a new and effective way of reviving near shore marine ecosystems that have been severely damaged by unregulated human activity. In addition to environmental benefits and cost-effectiveness, our demonstration seeks to evaluate different deployment methods in order to find the one that bears the best results (geometries, anchor systems, Gulf coast, bays and lakes, channel shoreline stabilization,bulkheads, etc.). As we can create different molds for particular areas to assist with diverse issues such as surge protection, wave breaks, natural sandbars and speed bumps to help with wave attenuation.

For Example: The Kremnitz Wall:

The Kremnitz Wall is conceived to be an immovable stable structure that is free from the dependence of binders by virtue of its hexagonal locking mechanism. This concept was inspired by one of nature's most stable structures, the beehive honeycomb. Each tube acts as a brace for its counterpart and increases the overall stability of the wall. The Kremnitz Wall is specifically engineered to act as a wave-mitigating sieve, effectively serving as an anti-erosion alternative to the traditional Reefbuds design. Moreover, because the wall is made of Reefbud mix, it becomes an increasingly hardened yet porous shell-like construction with marine life making the structure their home.

- Anti-Erosion Above and Below Sea Level
- Hexagonal Locking Mechanism
- Long Term Stability
- Customizable Wall Dimensions

GETTING IT DONE - STRATEGY

Having successfully studied the growth of this solution globally for almost ten years gives us inside knowledge of how to execute efficiently within budget. Your 2023 program comes with a budget that we take very seriously. Our approach to delivering a successful project within these parameters includes a prototype testing phase and a schedule for gathering metrics and data throughout the project timeline.

1. **Prototype Testing**
   Working with our sponsor at the Rockefeller refuge, we will design, build, and deploy the correct size structures using Reefbud materials.

2. **Monitoring Plan**

   We are prepared to collect data, monitor the reefs, and surrounding areas for as long and as often needed to document this study.

3. **Summary of Project Budget**

   We are asking for a grant to protect the shoreline of the Rockefeller refuge. Our cost to construct, deploy, and monitor will be determined by the size of the project, and funds available.

FINAL WORDS.

We're thrilled at the option of partnering with you on this project and know we can make it a success. We're looking forward to presenting to your team in person and further illustrating our ideas and strategy.

Thank you !

Links to more information on Reefbuds:

https://reefbuds.net/about-us/

https://youtu.be/7HSiiqO_JCI

https://youtu.be/_jXzNGwyuHc

https://youtu.be/L6JgFD30jgo

https://youtu.be/efTaBx7jrw4

https://youtu.be/4GTMkJ1_Sqk

https://www.facebook.com/RBGCorals/

https://www.dropbox.com/s/6wyuzssrxj131wh/Monitoring-of-Reefbuds-efficacy-December-2015.pdf?dl=0

Geostar Technologies LLC
3351 Millbranch Road, Memphis, TN 38116
(901) 881–2517 | Geostartechnolgies.com

AquaRockBag

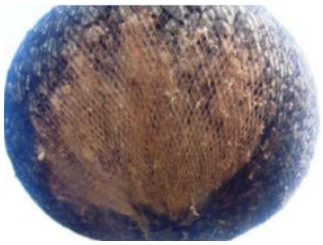
2-Ton Data Sheet

Raw Material: HDPE

Parameter	*Values**	*Test-Method*
Tensile Strength MD	1713 lbs/ft	EN ISO 10319
Tensile Strength CMD	582 lbs/ft	EN ISO 10319
Elongation at Maximum Load MD	15%	EN ISO 10319
Elongation at Maximum Load CMD	75%	EN ISO 10319
Mass / Unit	5.75 oz/yd^2	ISO 9864
Thickness @ 2 kPa	2 mm	ISO 9863-1
Resistance to Hydrolysis	Retained Strength: 85%	EN 12447
Microbiological Resistance	Retained Strength: 80%	EM ISO 12225
Resistance to Chemical Degradation Method A	Retained Strength: 90%	ISO TR 12960
Resistance to Chemical Degradation Method B	Retained Strength: 90%	ISO TR 12960
Resistance to Weathering	Retained Strength: 85%	EN 12224
Durability		
	>25 years in soils with PH-value 4-9 and soil-temperature <25°C	EN 13251: 2016, Annex B
Environmental Impact		
	Not harmful to the environment	M Geok E, Edition 2016
Properties	*Units*	
Filled Dimensions	Diameter: 6.46 ft Height: 0.65 ft Volume: 44 ft^3	
Number of nets per pallet	60 nets / pallet	
Weight of nets incl. ring (before filling)	14.33 lbs	
Dimensions of the filling jig	120cm x 120cm x 90cm	
Mesh sizes	25mm	
Stone sizes to be used	>50mm	
Drag-Test: The product with complete 2-Ton load has been dragged for 10 meters on natural terrain		
Observation 1: No Holes | Observation 2: No Tears		

Observation 1

Observation 2



Notes:

* All values are average-values

-Dimensions can vary based on type of fill material

Geostar Technologies LLC
3351 Millbranch Road, Memphis, TN 38116
(901) 881–2517 | Geostartechnolgies.com

AquaRockBag

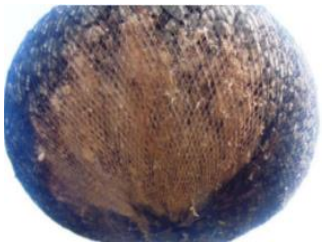
4-Ton Data Sheet

Raw Material: HDPE

Parameter	*Values**	*Test-Method*
Tensile Strength MD	2398 lbs/ft	EN ISO 10319
Tensile Strength CMD	1027 lbs/ft	EN ISO 10319
Elongation at Maximum Load MD	15%	EN ISO 10319
Elongation at Maximum Load CMD	75%	EN ISO 10319
Mass / Unit	8.848 oz/yd^2	ISO 9864
Thickness @ 2 kPa	2.4 mm	ISO 9863-1
Resistance to Hydrolysis	Retained Strength: 85%	EN 12447
Microbiological Resistance	Retained Strength: 80%	EM ISO 12225
Resistance to Chemical Degradation Method A	Retained Strength: 90%	ISO TR 12960
Resistance to Chemical Degradation Method B	Retained Strength: 90%	ISO TR 12960
Resistance to Weathering	Retained Strength: 85%	EN 12224
Durability		
	>25 years in soils with PH-value 4-9 and soil-temperature <25°C	EN 13251: 2016, Annex B
Environmental Impact		
	Not harmful to the environment	M Geok E, Edition 2016
Properties	*Units*	
Filled Dimensions	Diameter: 7.21 ft Height: 2.78 ft Volume: 88.28 ft^3	
Number of nets per pallet	48 nets / pallet	
Weight of nets incl. ring (before filling)	30.86 lbs	
Dimensions of the filling jig	150cm x 150cm x 120cm	
Mesh sizes	25mm	
Stone sizes to be used	>50mm	
Drag-Test: The product with complete 2-Ton load has been dragged for 10 meters on natural terrain		
Observation 1: No Holes | Observation 2: No Tears		

Observation 1

Observation 2



Notes:

* All values are average-values

-Dimensions can vary based on type of fill material

PPL33 PROJECT FACT SHEET
February 9, 2023

Project Name
Coastwide: Marsh Creation Containment

Master Plan Strategy
This project constructs containment for CWPPRA projects to expedite construction, reduce costs and beneficially use sediments.

Project Location
Coastwide

Problem
The costs of restoration projects are rising, and funding sources are limited. Sediments generated from dredging events are often "disposed of" offshore or in upland borrow areas. Multiple projects designate the same borrow locations with use on a first come, first served basis. A borrow source may not be available when the project design is completed. Designed projects wait for the annual allocation of construction funds resulting in a backlog of these projects.

Proposed Solution
This coastwide concept provides for constructing containment/earthen berms for marsh creation projects and using sediments dredged by others. Constructing the containment portion of a project saves project restoration dollars as dredging is the most expensive feature of a marsh creation project. The Marsh Creation Containment coastwide would enhance CWPPRA's ability to build more marsh creation projects faster and at a lower cost. Both large and small dredging projects can build marsh and eliminate project issues or scope changes that often present a major barrier to project construction.

Project Benefits
The cost of dredging is often the most expensive project feature in coastal restoration projects. This approach facilitates and encourages use of all dredged sediment resources to build acres of marsh, while reducing CWPPRA project costs and time for project construction. Sediments currently disposed of offshore could be used in coastal restoration projects. In addition to expediting marsh creation benefits, the containment dikes/berms create habitat and variety in the landscape supporting eco diversity and provide a measure of storm resilience. Containment or low ridges reduce wave erosion and the tidal prism, and provide "hard" support for marsh projects so that they don't subside faster. The coastwide concept is estimated to build containment for four projects over the 20 year life for less cost than one marsh creation project. Supports USACE 70/30 goal for beneficial use.

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

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