Restoration Projects
Substantially Designed Not Yet Funded

1. Northwest Turtle Bay Marsh Creation

2. Cameron Meadows Marsh Creation and Terracing

3. Cole’s Bayou Marsh Creation
Northwest Turtle Bay Marsh Creation

Thomas McLain, E.I.
Engineering Division
April 14, 2015
NW Turtle Bay Marsh Creation Project Summary

- Jefferson Parish
- 423 Acres of Marsh Creation
- 337 Acres of Marsh Nourished
- Borrow Source: Turtle Bay
- Federal Sponsor: US Fish & Wildlife Service, Kevin Roy
- PM: Keith Boeneke (CB&I)
- NRCS Turned Over Design of the Project to CPRA Summer 2014
- Continuing with Minimal Containment Concept
NW Turtle Bay Marsh Creation Project Status

- Currently at 30% Design
- Pipeline Canal Concerns
- Project is Undergoing Redesign
- Approximately 3.2M CY
NW Turtle Bay Marsh Creation

Path Forward

- 95% Design Review Fall 2016
- CWPPRA Phase II Funding
- Vote Winter 2016
QUESTIONS
Restoration Projects
Substantially Designed Not Yet Funded

1. Northwest Turtle Bay Marsh Creation

2. Cameron Meadows Marsh Creation and Terracing

3. Cole’s Bayou Marsh Creation
Cameron Meadows Marsh Creation and Terracing (CS-66)

Julia Wall, E.I.
Engineering Division
April 14, 2015
PROJECT FEATURES

- 350 Acres Marsh Creation (2M CY of Sediment)
- 20,000 LF Earthen Containment Dikes
- 35,000 LF Terrace
- Hydrologic Restoration
- Design Constraint: Pipelines
BORROW AREA

- Existing Elevation: -20 to -25 ft. NAVD88
- Cut Elevation: -34.5 to -37 ft. NAVD88
- Available Material: ~4.9M CY
- Avg. Pumping Distance: 6 miles
- Design Constraint: Crossing LA82
PROJECT STATUS

• Engineering and Design: 2014-2015
  • Hydrodynamic modeling
  • Topographic, bathymetric, and magnetometer survey
  • Geotechnical investigation
  • Offshore borrow site investigation

• Compete for CWPRRA Phase II Funding: Winter 2015
  • Landright agreements
  • Permit
QUESTIONS
Restoration Projects
Substantially Designed Not Yet Funded

1. Northwest Turtle Bay Marsh Creation

2. Cameron Meadows Marsh Creation and Terracing

3. Cole’s Bayou Marsh Creation
Cole’s Bayou Marsh Restoration (TV-63)

Amanda Taylor, E.I.
Engineering Division
April 14, 2015
Proposed Project Features
Proposed Project Features

Earthen Containment Dike Typical for Marsh Creation Cells 1 & 2

Earthen Containment Dike Typical for Marsh Creation Cell 3

Water Control Structure Typical Section
Design Considerations

- Pipelines
Design Considerations

• Dredge Pipeline Alignment

• Equipment Access Corridor
  • ~11,000 LF of dredging
  • ~10 ft. total draft
Estimated Schedule

• Engineering and Design- Fall 2015

• Compete for Phase II Funding- Winter 2015
  • Apply for permit
  • Complete Landrights
QUESTIONS
Restoration Projects
Design Complete/ Construction Funds Available

1. NRDA Caillou Lake Headlands
2. Lost Lake Marsh Creation and Hydrologic Restoration
3. Cheniere Ronquille Barrier Island Restoration
4. Oyster Bayou Marsh Restoration
5. Cameron Creole Watershed Grand Bayou Marsh Creation
6. Bayou Bonfouca Marsh Creation
7. Living Shoreline Demonstration Project
NRDA Caillou Lake Headlands (TE-100)

Jacques Boudreaux, E.I.
CPRA – Engineering Division
April 14, 2015
BACKGROUND

• Located in Terrebonne Hydrologic Basin, Isles Dernieres Barrier Island Chain

• Proximity to Whiskey Island Back Barrier Marsh Creation Project (TE-50),Constructed by WMI 2008-2009 Through CWPPRA PPL 13

• Feasibility Study Funded Through LCA Via TBBSR Program

• Construction Funding Source: NRDA Phase III ER
**FEATURE** | **DESIGN DIMENSION**
---|---
MARSH EL. | +2.4’ NAVD88
BEACH EL. | +4.2’ NAVD88
BEACH SLOPE | 1V:25H
DUNE EL. | +6.4’ NAVD88
DUNE SLOPE | 1V:30H
### FEATURES

- **CONSTRUCTED BEACH/DUNE HABITAT** = 754 ACRES
- **CONSTRUCTED MARSH HABITAT** = 179 ACRES
- **SHIP SHOAL BLOCK 88 CONVEYANCE** = 10.2 MILES
- **OPTIONAL WHISKEY 3A CONVEYANCE** = 5.2 MILES
- **DURATION OF CONSTRUCTION CONTRACT** = 650 DAYS

### PROJECT FEATURES OF INTEREST

<table>
<thead>
<tr>
<th>PROJECT FEATURES OF INTEREST</th>
<th>UNIT</th>
<th>ESTIMATED BID QUANTITY</th>
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<td>BEACH AND DUNE FILL</td>
<td>CY</td>
<td>8,358,200</td>
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<td>MARSH FILL</td>
<td>CY</td>
<td>885,900</td>
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<td>*BEACH SEPARATION DIKE</td>
<td>LF</td>
<td>19,600</td>
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<td>*MARSH CONTAINMENT DIKE</td>
<td>LF</td>
<td>9,530</td>
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*OPTIONAL, PENDING SELECTION OF MARSH BORROW AREA
PROJECT SCHEDULE

• OCM Permitting Finalized Winter 2014

• Sand Lease Between BOEM and CPRA Currently Underway

• Plans and Specs Under Review

• CPRA Bid Advertisement Anticipated Summer 2015
QUESTIONS
Restoration Projects
Design Complete/Construction Funds Available

1. NRDA Caillou Lake Headlands

2. **Lost Lake Marsh Creation and Hydrologic Restoration**

3. Cheniere Ronquille Barrier Island Restoration

4. Oyster Bayou Marsh Restoration

5. Cameron Creole Watershed Grand Bayou Marsh Creation

6. Bayou Bonfouca Marsh Creation

7. Living Shoreline Demonstration Project
Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)

Greg Mattson II, E.I.
Engineering Division
April 14, 2015
Project Features

- 467 Acres Marsh Creation (3.2 MCY)
- 56,860 LF Earthen Containment Dikes
- 30,000 LF Earthen Terraces
- Hydrologic Restoration
Project Features

Earthen Terrace Design

Marsh Creation Area 1 Cross Section

Marsh Creation Area 3 Cross Section

Typical Borrow Area Cross Section
Estimated Schedule

• Construction is Funded
• Land Rights Completed
• Permit Mod Being Processed
• Pre-bid-- Mid 2015
• Construction Start-- Late 2015
QUESTIONS
Restoration Projects
Design Complete/ Construction Funds Available

1. NRDA Caillou Lake Headlands
2. Lost Lake Marsh Creation and Hydrologic Restoration
3. Cheniere Ronquille Barrier Island Restoration
4. Oyster Bayou Marsh Restoration
5. Cameron Creole Watershed Grand Bayou Marsh Creation
6. Bayou Bonfouca Marsh Creation
7. Living Shoreline Demonstration Project
Chenier Ronquille Barrier Island Restoration Project (BA-76)

Julia Wall, E.I.
Engineering Division
April 14, 2015
Fill Area: Plan View

- Beach and Dune
- Back Marsh
- Access Channel
- Primary Containment
- Temporary Disposal Area
- Discharge Area
- Sand Fence
- Monument

Coastal Protection and Restoration Authority of Louisiana
Fill Area: Cross-Sections

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<tr>
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<th>Construction Elevation (ft. NAVD88)</th>
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<tr>
<td>Access Channel</td>
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<td>Dune and Beach Fill</td>
<td>1,644,500</td>
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<td>LF</td>
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<tr>
<td>Sand Fencing</td>
<td>8,700</td>
<td>LF</td>
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</table>
Borrow Area

Plan View
• 4 Permitted Areas
  • 3 Sand Sources
  • 2 Marsh Sources
• Average Pumping Distance: ~2 miles

Cross-Sections
S1 & S2: -8 < Sand Cut < -16 ft.
D1: -10 < Marsh Cut < -18 ft.
D1: -18 < Sand Cut < -26 ft.
Quatre Bayou: -10 < Marsh Cut < -18
Project Status

- Funded through NRDA
- Designed by Coastal Planning and Engineering (CB&I)
- NOAA/NMFS to bid for construction

- DNR/OCM Consistency and USACE Permit approved
- Land agreements to be completed
- Oyster lease acquisition ongoing

- Scheduled to bid Fall 2015
- Estimated construction duration: 310 days
QUESTIONS
Restoration Projects
Design Complete/ Construction Funds Available

1. NRDA Caillou Lake Headlands
2. Lost Lake Marsh Creation and Hydrologic Restoration
3. Cheniere Ronquille Barrier Island Restoration
4. Oyster Bayou Marsh Restoration
5. Cameron Creole Watershed Grand Bayou Marsh Creation
6. Bayou Bonfouca Marsh Creation
7. Living Shoreline Demonstration Project
Oyster Bayou Marsh Restoration (CS-59)

Kodi Guillory, P.E.
Engineering Division

committed to our coast
Coastal Protection and Restoration Authority of Louisiana

Vicinity Map

Mud Lake
Oyster Bayou
Terrace Field
Marsh Creation/Nourishment Areas

Gulf of Mexico

Sabine/Calsasie Basin

Coastal Protection and Restoration Authority of Louisiana
Project Information

- CWPPRA  PPL 21
- Federal Sponsor: NOAA’s National Marine Fisheries Service (NMFS) is the
- Creates/Nourishes 605 acres of marsh
- Phase 2 Funding Request: Approved in January 2015

- Dredge Volume (cut):  3,307,660 CY
- Earthen Containment Dikes:  45,000 LF
- Earthen Terraces:  17,550 LF
- Maximum Pump Distance:  5.5 miles
Dredge Pipeline Corridor
Dredge Pipeline Corridor

HWY 27/82

CS-33 Beach Fill

Coastal Protection and Restoration Authority of Louisiana
Dredge Pipeline Corridor
Typical Section – Marsh Creation

Coastal Protection and Restoration Authority of Louisiana
Typical Section – Offshore Borrow

Coastal Protection and Restoration Authority of Louisiana
Typical Section – Earthen Terraces
Schedule

• Phase 2 Funding Request: Approved in January 2015

• Design: Substantially Complete (dredge pipeline crossing at highway)

• Permitting: Underway

• Landrights/Servitude Agreements: Underway

• Advertisement: Late 2015/Early 2016
QUESTIONS
Restoration Projects

Design Complete/Construction Funds Available

1. NRDA Caillou Lake Headlands
2. Lost Lake Marsh Creation and Hydrologic Restoration
3. Cheniere Ronquille Barrier Island Restoration
4. Oyster Bayou Marsh Restoration
5. **Cameron Creole Watershed Grand Bayou Marsh Creation**
6. Bayou Bonfouca Marsh Creation
7. Living Shoreline Demonstration Project
Cameron-Creole Watershed Grand Bayou Marsh Creation

Thomas McLain, E.I.
Engineering Division
April 14, 2015
Cameron-Creole Watershed Grand Bayou Marsh Creation

Summary

- Cameron Parish
- 617 Acres of Marsh Creation
  - Northern Cell: 219 Acres
  - Southern Cell: 398 Acres
- Borrow Source: Calcasieu Lake
- Federal Sponsor: US Fish & Wildlife Service

Federal PM:
Angela Trahan, USFWS

CPRA PM:
Garvin Pittman, CB&I
Cameron-Creole Watershed Grand Bayou Marsh Creation
Cameron-Creole Watershed Grand Bayou Marsh Creation

Quantities

- Cut Volume
  - 2,565,250 CY
- 10 ft Cut Depth
- Containment Length
  - North Cell: 16,800 ft
  - South Cell: 21,900 ft
Cameron-Creole Watershed Grand Bayou Marsh Creation

Recent Milestones
- Received CWPPRA Tech Committee Vote for Phase II Funding Q4 2014
- Coastal Use Permit Application Submitted Q2 2015

Path Forward
- Developing Plans & Specifications
- Plan to go for Bidding Q4 2015

Issues/ Concerns
- LDWF has Expressed Turbidity Concerns in Calcasieu Lake
QUESTIONS
Restoration Projects
Design Complete/ Construction Funds Available

1. NRDA Caillou Lake Headlands
2. Lost Lake Marsh Creation and Hydrologic Restoration
3. Cheniere Ronquille Barrier Island Restoration
4. Oyster Bayou Marsh Restoration
5. Cameron Creole Watershed Grand Bayou Marsh Creation
6. **Bayou Bonfouca Marsh Creation**
7. Living Shoreline Demonstration Project
Bonfouca Marsh Creation (PO-104)

Shannon Haynes, P.E.
Engineering Division
April 14, 2015
Proposed Project Features
Design Issues/Constraints
Estimated Schedule

- Engineering and Permitting - October 2015
- Construction is funded
- No Dredging Window for Sturgeon
- Construction Start – January 2016
QUESTIONS
Restoration Projects
Design Complete/ Construction Funds Available

1. NRDA Caillou Lake Headlands
2. Lost Lake Marsh Creation and Hydrologic Restoration
3. Cheniere Ronquille Barrier Island Restoration
4. Oyster Bayou Marsh Restoration
5. Cameron Creole Watershed Grand Bayou Marsh Creation
6. Bayou Bonfouca Marsh Creation

7. Living Shoreline Demonstration Project
Living Shoreline Demonstration Project (PO-148)

Tye Fitzgerald, P.E.
Engineering Division
April 14, 2015
Project Background

• Located in St. Bernard Parish

• Proposing Living Breakwater Structures (approximately 4 different products)

• Approximately 11,200 LF of Shoreline Protection

• CIAP Funded
Project Features

- Existing Ground Surface
- Baseline
- Reef Ball Units (Detachable Fabric and Stone)
- Temporary Access Channel (Excavate and Backfill)
- Field Determined
- Angle of Repose, Both Sides
- 0% Grade
- T.O. Temp. Spoil Placement Area
- Temp. Warning Sign, See Note 2

Perspective View
Reef Ball Units

Perspective View
Top Oyster Break Armor Unit Layer
Each Row Staggered One Half Unit Width From Adjacent Rows

Distance FT
STA. 37+64.28
STA. 38+66.22
Project Schedule

• Permits  Summer 2015
• Plans & Specifications  Summer 2015
• Bid Advertisement  Fall 2015
QUESTIONS
Flood Protection Projects

1. Morganza to the Gulf Reach L

2. Delcambre-Avery Canal – Control Structure

3. Bayou Tigre – Control Structure

4. Bayou Tigre – Pump Station
Flood Protection Projects

TE-78 MTOG Reach L
TV-57 Delcambre-Avery Canal – Control Structure
TV-67 Bayou Tigre – Control Structure
TV-75 Bayou Tigre – Pump Station

Binh Dao, E.I.
Engineering Division
April 14, 2015
Project Overview
Project Background
Cut Off/Pointe-Aux-Chene Levee Rehabilitation

- CDBG Project
- Project Location: Lafourche Parish
- Construction completed in 1990s for existing levee reach
- Part of Morganza to the Gulf Flood Protection System
- Reach L is approximately 2.2 miles long.
Project Background

- Apache Minerals
- Existing levee elevation
Levee Design

PROTECTED SIDE

FLOOD SIDE

STA. 468+00 TO STA. 512+50 AND STA. 517+00 TO STA. 578+00
TYPICAL SECTION - LEVEE AND BORROW CANAL

<table>
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<th>ALTERNATIVE NO. 1</th>
<th>ALTERNATIVE NO. 2</th>
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<tr>
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<td>A1</td>
<td>LEVEE CROWN - FLOOD SIDE</td>
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<td>B1</td>
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<td>C1</td>
<td>LEVEE TOE - PROTECTED SIDE</td>
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<td>BORROW AREA - TOP OF SLOPE (RIGHT)</td>
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<td>E1</td>
<td>BORROW AREA - BOTTOM OF SLOPE (RIGHT)</td>
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<td>F</td>
<td>BORROW AREA - BOTTOM OF SLOPE (LEFT)</td>
<td>-213.50</td>
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Project Plan View of Pump Station
Coastal Protection and Restoration Authority of Louisiana

Pump Station
## Quantities

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<th>Estimated Quantities</th>
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<td>Separator Geotextile</td>
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<td>Embankment, Compacted Fill</td>
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<td>Seeding &amp; Mulching</td>
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<td>24” Culvert</td>
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<td>Filter Stone</td>
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<td>55-LB Class Riprap</td>
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### TE-78 Reach L

**Estimated Schedule**

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<td>September 2014</td>
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<td>Permitting &amp; Land Rights</td>
<td>Summer 2015</td>
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<tr>
<td>Estimated Construction</td>
<td>Fall 2015</td>
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</table>
Project Background
TV-57 Delcambre-Avery Canal

- Project Location: Iberia Parish
Proposed Project Features

Project Information
- Potentially reduces inland flooding to portions of Iberia and Vermilion Parishes due to small storms and rainfall events
- Site selection, design criteria and associated cost estimates will be a part of the Basis of Design (Phase 1) document
- Level of protection is restricted by the surrounding topography

Project Features
- Flood gate structure across Delcambre-Avery Canal
- The maximum width for a control structure across Delcambre-Avery canal is approximately 125 feet
TV-57 Delcambre-Avery

- Estimated Schedule

<table>
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<tr>
<th>Task</th>
<th>Completion Date</th>
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<tbody>
<tr>
<td>Intergovernmental Agreement</td>
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<tr>
<td>Basis of Design Document</td>
<td>Fall 2015</td>
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</table>
Project Background
TV-67 Bayou Tigre- Flood Gate
TV-75 Bayou Tigre – Pump Station

- Project Location: Vermilion Parish
TV-67 Bayou Tigre – Flood Gate

Project Information
• Proposed elevation is +17.0 ft. 50 year event (2% AEP)
• 50-year design life
• Potentially reduces inland flooding to portions of Vermilion Parish during small storm & rainfall event
• Level of protection is restricted by the surrounding topography

Project Features
• Approximately 40-foot-wide steel barge gate with structural tie-ins
• Canal depth are approximately 12-14 ft deep
Proposed Project Features
Proposed Swing Gate Features

- **BARGE GATE (OPEN POSITION)**
- **BARGE GATE (CLOSED POSITION)**
- **FABRICATED CAP**
- **CONCRETE APRON**
- **RIP RAP**
- **FUTURE LEVEE**
- **T/PILE EL. 25.00**
- **T/STRUCTURE EL. 17.00**
- **LEVEE BEYOND**
- **STEEL SHEET PILE FLOOD WALL**
- **BARGE LANDING SLAB**
- **CUT OFF WALL**

**SECTION B-B**

**SCALE: N.T.S.**
Proposed Swing Gate Features

• Maximum Swing Gate Closing Time (4 hours maximum)
• Occupancy (3 personnel maximum)
• Minimized Maintenance (Corrosion Protection/Sacrificial)
• Redundancy
• Power (120V/240V/Diesel)
• Pumps
Channel Profile

Outline of Barge in Closed Position

Sheet Pile Flood Wall

T/ Struct.
EL. 17.00
Ex. Grade
EL. 4.00 (Varies)
Mudline
EL. (-)11.00

MSL
EL. 2.00
(Assumed)

CHANNEL PROFILE
Scale: N.T.S.

Existing Water Channel (Assumed)

1253 SF

Proposed Water Channel

612 SF

Application By:
Atkins

Coastal Protection and Restoration
Authority

450 Laurel Street
Baton Rouge, Louisiana 70801

State Project Number:

Federal Project Number:

Date: June 25, 2014

Sheet 7 of 7
Proposed Project Features
TV-75 Bayou Tigre – Pump Station

Project Information
• Site selection, design criteria & the associated cost for this project will be determined during Basis of Design (Phase 1)
• Will aide in pumping water to the flood side once Bayou Tigre flood gate is in the closed position

Project Features
• According to the Four Closures Structure study completed by Fenstermaker & Associates in 2013, an estimated capacity of 530 cfs is required to relieve upstream ponding due to the closure of the structures
## Bayou Tigre – Flood Gate
### Estimated Schedule

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<td>Phase 3 (Final Design)</td>
<td>Spring 2016</td>
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<td>Develop Bid Documents</td>
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<td>Flood Gate Construction</td>
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## Bayou Tigre – Pump Station
### Estimated Schedule

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<td>Pump Station Design Completion</td>
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