Caminada Headland Beach and Dune Restoration, the First Use of Ship Shoal Sand for Barrier Island Restoration

Brad Miller
Coastal Protection and Restoration Authority
Outline

• Project Overview
• Project Phases and Involvement
• History of Ship Shoal
• Project Design
• Construction Overview and Challenges
• Lessons Learned
In 1990’s,

The beginning of coastal/ecosystem restoration/dredging in Louisiana these were considered big:

- 5 miles of 30 inch dredge pipe, no booster pumps;
- 100 acres of marsh and dune creation;
- 1-2 miles barrier island;
- $20-30 M projects with one funding source;
Now…:

- 22 miles of 30 inch dredge pipe, 4 booster pumps;
- 1st hopper dredge project in 2013;
- 1st use of Ship Shoal in 2013 (30+ miles transport);
- 500 + acres Marsh and Dune Creation;
- 5-10 miles barrier island;
- 1st $100 Million + contract for restoration;
- 1st single contract of over 10 MCY for restoration;
- Multiple funding sources; Combining projects for efficiency;
- 1st dredging from Mississippi River 2010, now 5;
- 1st dredging from Mississippi River to -70 NAVD, now to -90 NAVD;
- 1st use of electric booster pump;
Caminada Headland

- Former site of the mouth of the Mississippi River
- Approx. 14 miles long
- Consists of narrow, low lying sand dune and beach berm, barrier marshes and chenier ridges
- Shoreline erosion rate of 45 feet per year
- No other Louisiana headland remains attached to the distributary that formed it.
Outline

• Project Overview
• **Project Phases and Involvement**
• History of Ship Shoal
• Project Design
• Construction Overview and Challenges
• Lessons Learned
**Project Phases**

- **Feasibility Phase**
  - Conducted as part of the Louisiana Coastal Area (LCA) Barataria Basin Barrier Shoreline Restoration (BBBS).

- **Design/Construction Phase**
  - BA-45 – Caminada Increment I designed, permitted, and constructed as part of the Coastal Impact Assistance Program (CIAP) and LA State Surplus.
  - BA-143 – Caminada Increment II designed and is under construction as part of the settlement funds administered by the National Fish and Wildlife Foundation (NFWF)
## Project Timelines

### LCA COMPONENT
- Feasibility Report
- USACE Final Report
- USACE Chief’s Report

### BA-45 CAMINADA INCREMENT-I
- Preliminary Design
- Permitting
- Final Design
- Bid Document Preparations
- Bid Opening
- Construction

### BA-143 CAMINADA INCREMENT-II
- Preliminary Design
- Permitting (including amendment)
- Final Design
- Bid Document Preparations
- Bid Opening
- Construction
## BA-45 / BA-143 Comparison

<table>
<thead>
<tr>
<th></th>
<th>Increment I</th>
<th>Increment II</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beach Elev.</td>
<td>+4.5</td>
<td>+4.5</td>
<td>Ft. NAVD88</td>
</tr>
<tr>
<td>Beach Width</td>
<td>65</td>
<td>65</td>
<td>Average Ft.</td>
</tr>
<tr>
<td>Dune Elev.</td>
<td>+7.0</td>
<td>+7.0</td>
<td>Ft. NAVD88</td>
</tr>
<tr>
<td>Dune Crest Width</td>
<td>290</td>
<td>290</td>
<td>Average Ft.</td>
</tr>
<tr>
<td>Surface Area</td>
<td>303</td>
<td>489</td>
<td>Acres</td>
</tr>
<tr>
<td>Total Fill Volume</td>
<td>3,310,000</td>
<td>5,098,000</td>
<td>Cubic Yards</td>
</tr>
<tr>
<td>Total Length of Project</td>
<td>31,000</td>
<td>39,000</td>
<td>Linear Feet</td>
</tr>
</tbody>
</table>

Coastal Protection and Restoration Authority
Project Involvement

Caminada Headland Restoration

LCA (Feasibility) USACE / CPRA
- Federal Agencies: USACE
- State Agencies: CPRA
- Consultants: SJB, CEC

BA-45 Increment-I CPRA / CIAP
- Federal Agencies: USACE, USFWS, NMFS, BOEM
- State Agencies: CPRA, LDWF, LDNR, SHPO
- Consultants: CEC, OSI, EMC, Picciola, GEO, GEC, CTC, Goodwin
- Stakeholders: Wisner, LDWF, Cailouet, Loop, GLPC
- Contractor: Weeks Marine

BA-143 Increment-II CPRA / NRDA / NFWF
- Federal Agencies: USACE, USFWS, NMFS, BOEM
- State Agencies: CPRA, LDWF, SHPO, LDNR
- Consultants: CEC, OSI, EMC, GEO, GEC, CTC, Goodwin
- Stakeholders: Wisner, LDWF, Gild, Loop
- Contractor: Weeks Marine

Coastal Protection and Restoration Authority
Outline

- Project Overview
- Project Phases and Involvement
- History of Ship Shoal
- Project Design
- Construction Overview and Challenges
- Lessons Learned
Ship Shoal

- Ship Shoal is associated with barrier islands that were reworked remnants of the Maringouin delta complex of the Mississippi River.
- Approximately 8,000 years old.
- BA-45 is the 1st project ever to use offshore shoal sands in the gulf for barrier island restoration.
- Ship Shoal is estimated to contain approximately 1 billion cubic yards of sand (Penland et al., 1990, Byrnes and Patniak, 1991).
Negotiated Non-Competitive Agreement

General EA Schedule for Noncompetitive Negotiated Agreement for OCS Sand, Gravel, and Shell Resources

- Initial request to MMS for OCS mineral resource
- Application guidance sent to applicant
- Preliminary scoping and EA/EIS determination (if EIS, follow EIS schedule)
- Cooperating agency agreement, if necessary
- Kick-off meeting b/w MMS, applicant, and possible third party
- Develop requirements schedule for MMS approval
- Draft assessment submitted to and approved by MMS in advance
- Air quality analysis and conformity determination (120 days)
- Essential fish habitat consultation (90 days)
- ESA Section 7 consultation (NMFS/FWS) (135 days)
- CZMA Consistency Subpart D (180 days) or Subpart C review (60-75 days)
- Date for analysis submitted to MMS
- Data for analysis submitted to MMS
- Draft assessment submitted to and approved by MMS in advance
- Physical impacts assessment (45 days)
- Survey completed in advance
- Archeological and shallow hazards surveys (30 days)
- Modeling completed in advance
- Coordinating: Leasing and Environment Division collaborate through Leasing/BEA assigned coordinators. Applicant works with MMS to develop draft NEPA document and complete mandatory consultations.

Note:
Other environmental requirements / permits may be necessary, including those that are the responsibility of the applicant.

Applicant submits draft EA

- Applicant submits consistency material to affected State(s)
- FONSI or move to EIS (if EIS, follow EIS schedule)
- Final negotiated agreement and legal review
- Draft negotiated agreement and final review
- Appraiser approval and signature
- MMS administration approval and signature
- Final negotiated agreement

Coastal Protection and Restoration Authority
Outline

• Project Overview
• Project Phases and Involvement
• History of Ship Shoal
• Project Design
• Construction Overview and Challenges
• Lessons Learned
Cultural Resources Survey Results
Geotechnical Investigations

NOTES:
1. ALL COORDINATES ARE IN NAD 83, STATE PLANE - LOUISIANA SOUTH, U.S. SURVEY FEET.
2. ALL UNITS ARE U.S. SURVEY FEET.
Geologic Sections

K - K'

Existing Grade (2011)

L - L'

Existing Grade (2011)

Scale
H: 1" = 1200'
V: 1" = 20'

Notes:
1. Pipeline data from OSI, 2011.
2. Bathymetric survey conducted by OSI, 2011.
3. Elevations hereon are referenced to North American Vertical Datum 1988 (NAVD88).
5. Data derived through sampling are extrapolated by Coastal Engineering Consultants, Inc. Professional geologist to render an opinion about overall subsurface conditions. Actual conditions in areas not sampled may differ from those inferred to exist.
Headland Typical Cross Section

Legend:
- Beach / Dune Fill
- Existing Grade (2010)
- Design
- Construction Tolerance

A - A'

Target Dune EL +7.0'
Construction Tolerance
Target Beach EL +4.5'

Existing Grade (2010)

Distance from baseline (FT)

NOTES:
1. Sections are viewed as looking east.
2. All slopes 1V:20H unless otherwise designated.
3. A one foot tolerance is included to account for construction methods and consolidation/settlement of the fill.
4. Construction slope tolerance of 1V:40H provided from mean low water seaward.

Coastal Protection and Restoration Authority
Outline

• Project Overview
• Project Phases and Involvement
• History of Ship Shoal
• Project Design
• Construction Overview and Challenges
• Lessons Learned
Sediment Transport Methods

1. **Cutterhead Dredge Excavation and Filling Scow Barge via Spider Barge**
2. **Scow Barge Transport to Fill Area**
3. **Hydraulic Unloading of Scow Barge and Pump to Fill Area**
4. **Hopper Dredge Excavation and Transport to Fill Area**
5. **Hopper Dredge Pump to Fill Area**
6. **Discharge at Fill Area**
Migratory Bird Nesting
Bird Abatement – Wind Rows

Coastal Protection and Restoration Authority
Sea Turtle Protections

**Biological Opinion Requirements - Observers**

---

**Endangered Species Observer Program**

**Weekly Summary**

- **Project Name:** Caminada Headlands Increment 1
- **Usace District:** New Orleans
- **Dredge Name:** Weeks Coast Min.
- **Contract:** BA-45
- **Dates:** 5/26/2014 - 6/11/2014
- **Load:** 10

**Areas worked (Cut):** A B C D E

- **Locations:**
  - Lat/Log: N 28° 55.024 ′ W 90° 36.464 Δ
  - Lat/Log: N 28° 54.761 ′ W 90° 36.318 Δ

- **Were there incidents involving endangered or protected species?**
  - Yes [X]

**Weather conditions:**
- **Tidal stage:** High
- **Beaufort sea state:** 3
- **Air Temp:** 88 °F
- **Waves:** 2 ft
- **Waves direction:** SW
- **Water Temp:** 80 °F

**Screen type:**
- **Inflow screening:** None
- **Overflow screening:** None
- **Other screening:** None

**Screen contents:** Shells, rocks, rope

**Starboard screen contents:**

- **Estimated number entrained on this load:** 0

**Specie of turtle take:** Unknown

**Bridge watch summary**

- **Date/Time:**
  - 5/30/14 - Break for repairs - 1:00 PM
  - 6/14 - Pumped load #22 without offloading in order to go to fuel dock for repairs

- **Location/Comments:**

---

**Observer:**
- **Name:** Kerry Rollo
- **Observer firm:** Remsa

---

Coastal Protection and Restoration Authority
Sea Turtle Protections
Biological Opinion Requirements – Inflow / Outflow Screening
Sea Turtle Protections

Biological Opinion Requirements – Relocation Trawling
Sea Turtle Relocation Trawling

- Total Allowable Take for Turtles to be Relocated Bi-Annually was 76.
- Turtle Relocation Trawling began in May 2014.
- 76th Turtle Relocated on June 7, 2014…
- BOEM re-initiated consultation with NMFS to continue and in total there were 157 relocations for this project, including 79 ridleys, 76 loggerheads, and 2 greens. No turtles were harmed during relocation trawling activities.
- Some of the highest numbers of mature male turtles ever tagged and released!
CAM II Turtle GPS Tagging Program
Sea Turtles
Guardians of the Sea

Left: Happy Turtle, Middle: Mike Miner of BOEM, Right: Rachel Sweeney of NMFS

Coastal Protection and Restoration Authority
BA-45 Completed Project
BA-45 Completed Project
BA-143 Completed Project

Coastal Protection and Restoration Authority
BA-143 Completed Project
Lessons Learned

• Engage all agencies and stakeholders early and often during design and permitting.
• Design and permit as many construction access options as practical to allow the contractor flexibility.
• Plan for environmental contingencies in your design.
• Constant Communication with Regulatory Agencies is Essential.
• Expect the unexpected.
QUESTIONS