FOWL RIVER WATERSHED MANAGEMENT PLAN

Submitted by:

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ESANextSCEStantec
**EXECUTIVE SUMMARY**

**RECOMMENDED PROJECT/PROGRAM PRIORITIZATION:**

1. Restore and stabilize shorelines in the lower Watershed. Coastal zone projects were prioritized on the basis of threat to the natural resource, cost benefit analyses, and access. A combination of historical aerial imagery available from the University of Alabama, Google Earth's timelapse Historical Imagery Tool, and onshore inspection data were evaluated to identify threat, the ability to preserve/protect the habitat, ecological value, and cost (section 6). The top four priority coastal zone projects include the following:

<table>
<thead>
<tr>
<th>Priority (Zone)</th>
<th>Location Name</th>
<th>Length (feet)/Area (acres)</th>
<th>Est. Cost</th>
<th>Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (1)</td>
<td>Lightcap</td>
<td>1800 / 1.7</td>
<td>$2.1M</td>
<td>Proposed salt marsh enhancement and protection would include structural stabilization, fill, and appropriate vegetation.</td>
</tr>
<tr>
<td>2 (1)</td>
<td>Tapia</td>
<td>2800 / 4.2</td>
<td>$3.2M</td>
<td>Proposed salt marsh enhancement and protection would include structural stabilization, fill, and appropriate vegetation.</td>
</tr>
<tr>
<td>3 (1)</td>
<td>Strout</td>
<td>1300 / 0.8</td>
<td>$1.5M</td>
<td>Proposed spit and salt marsh enhancement and protection would include structural stabilization, fill, and appropriate vegetation.</td>
</tr>
<tr>
<td>4 (1)</td>
<td>Closing Hole</td>
<td>1700 / 3.2</td>
<td>$2.0M</td>
<td>Proposed spit and salt marsh enhancement and protection would include structural stabilization, fill, and appropriate vegetation.</td>
</tr>
</tbody>
</table>
Potential causes:

- Scarcity of sediment
- Water scouring: fast flows, boating
- Sea level rise
Three-tier approach:

1) Marsh health and recovery study
   1.1) Baseline of marsh health
   1.2) “Proof-of-concept” restoration experiments

- Address and resolve concerns
- Implement study as possible
1.1) Baseline of marsh health

Transects from water fringe to upland edge
1.1) Baseline of marsh health

Transects from water fringe to upland edge
1.1) Baseline of marsh health

Transects from water fringe to upland edge: 30 locations throughout the salinity gradient in the lower watershed

Measurements:

a) Plant identity, density and morphology
Measurements (cont’d):

b) Elevation profile: RTK GPS
Measurements (cont’d):

c) Sediment accrual/loss rates: feldspar horizon marker
Measurements (cont’d):

d) Porewater salinity, nutrients and pollutants: groundwater wells
These measurements are indicators of marsh health:

Healthy marsh

Unhealthy marsh
Three-tier approach:

1) Marsh health and recovery study
   1.1) Baseline of marsh health
   1.2) “Proof-of-concept” restoration experiments

2) Hydrological study (water and sediment)

3) Engineering Assessment and Design
1.2) “Proof-of-concept” restoration experiments

Protect the shoreline with some sort of “living shoreline design” breakwater/rip-rap/revetment to slow down wave action and thus:

- Reduce scouring
- Enhance sedimentation
1.2) “Proof-of-concept” restoration experiments

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- Reduce scouring
- Enhance sedimentation

Do we have to jump-start/help it with sediment filling and marsh planting???
1.2) “Proof-of-concept” restoration experiments

- Four treatments:

  Control (no amendment)
  Breakwater
  Breakwater and filling
  Breakwater and filling and planting
Control (no amendment)

Photo by S. St. John
Breakwater

Photo by E. Sparks
Breakwater and filling
Breakwater and filling
Breakwater and filling
Breakwater and filling
Breakwater and filling and planting
Breakwater and filling and planting
1.2) “Proof-of-concept” restoration experiments

• Four treatments:
  Control (no amendment)
  Breakwater
  Breakwater and filling
  Breakwater and filling and planting

• Done in two locations, one with highly eroding shorelines and a second one with moderately eroding shorelines

• Treatments replicated at each location (at least 3 replicates per treatment per location)

• Experiment run for one year

• Response metrics as in baseline: plant measurements, elevation profiles, sedimentation rates and porewaters
We have evidence that it may work...
Test transplant of Black Needle rush where Sawgr ass marsh was lost.
Three-tier approach:

1) Marsh health and recovery study
   1.1) Baseline of marsh health
   1.2) “Proof-of-concept” restoration experiments (cost-effectiveness angle)

2) Hydrological study (water and sediment)

3) Engineering Assessment and Design
Integration among the three tiers

- Correlation between scouring intensity (from hydrological study) and shoreline/marsh condition in baseline study → continuous predicted mapping of shoreline condition across the entire lower watershed.

- Using the results of the experiments and the scouring/sediment conditions from the hydrological study, the engineering assessment and design study can provide recommendations for cost-effective marsh/island restoration across the lower watershed.
Three-tier approach:

1) Marsh health and recovery study
   1.1) Baseline of marsh health
   1.2) “Proof-of-concept” restoration experiments

• Address and resolve concerns
• Implement study as possible