# FOWL RIVER WATERSHED MANAGEMENT PLAN

Submitted by:

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ALABAMA COOPERATIVE Extension SYSTEM

ESA

planning NEXT

SCE

Stantec

# 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 tim at coastal shorelines he threat, the ability to preserve/protect the habitat, ecological value, and cost (Section 8). The top four priority coastal zone projects include the following:

Restore and Stabilize Shorelines in the Lower Watershed

| Priority (Zone) | Location Name | Length (feet)/ Area (acres) | Est. Cost | Brief Description | Location Diagram |
|---|---|---|---|---|---|
| 1 (I) | Lightcap | 1800 / 1.7 | $2.1M | Proposed salt marsh enhancement and protection would include structural stabilization, fill, and appropriate vegetation. | |
| 2 (I) | Tapia | 2800 / 4.2 | $3.2M | Proposed salt marsh enhancement and protection would include structural stabilization, fill, and appropriate vegetation. | |
| 3 (I) | Strout | 1300 / 0.8 | $1.5M | Proposed spit and salt marsh enhancement and protection would include structural stabilization, fill, and appropriate vegetation. | |
| 4 (I) | Closing Hole | 1700 / 3.2 | $2.0M | Proposed spit and salt marsh enhancement and protection would include structural stabilization, fill, and appropriate vegetation. | |

Photo by S. St. John

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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

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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

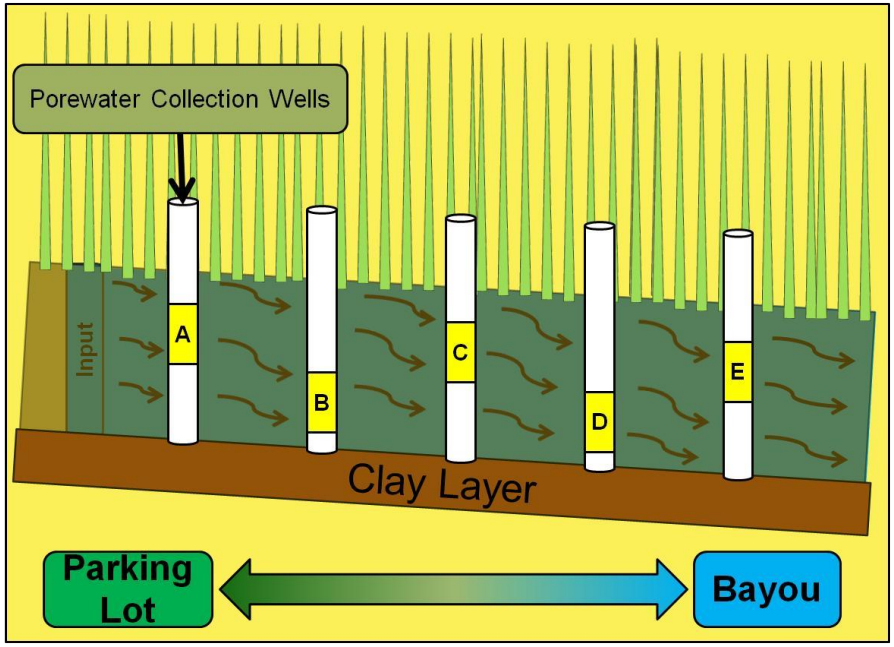
Measurements (cont'd):

c) Sediment accrual/loss rates: feldspar horizon marker

Photo by U.S. Geological Survey

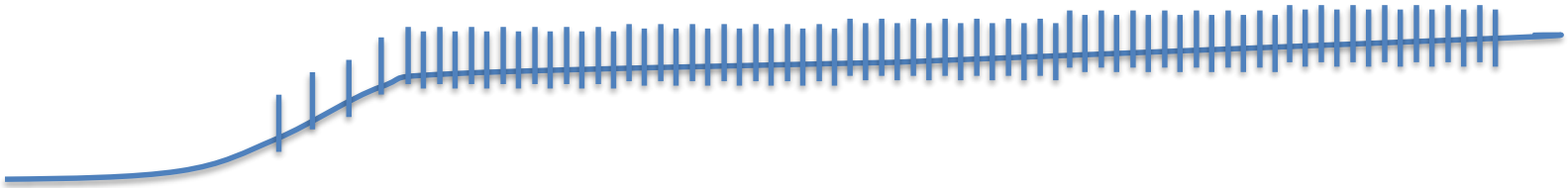
Measurements (cont'd):

d) Porewater salinity, nutrients and pollutants: groundwater wells

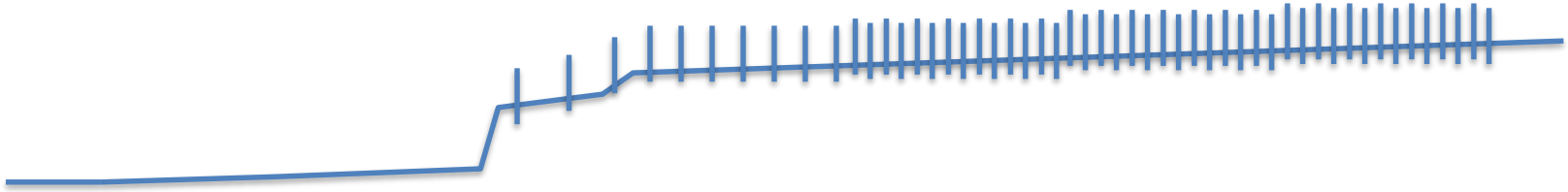


# These measurements are indicators of marsh health:

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

Photo by K. Duhring

Photo by Keep Pensacola Beautiful

Photo by B. Pounds

Photo by J. Parente

## 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

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)

# Breakwater

Photo by E. Sparks

# Breakwater and filling

# 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 Needlerush
where Sawgrass marsh was lost.
Photo by S. St. John

# 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