



North Carolina  
Coastal Federation

*Working Together for a Healthy Coast*

## **Best Practices for Working with Marsh Plants and Oyster Shell in Living Shoreline Projects**

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# Best Practices for Working with Marsh Grass and Oysters

## Marsh Grass

- Types of marsh grass commonly used
- Where to get them
- When and where to plant them
- How to plant them

## Oysters

- Using oyster shell in living shorelines
- Where to get recycled shell
- How to build oyster sills
- Alternative techniques



**Living Shorelines** are a creative approach to maintain, restore, or enhance the shoreline's natural habitats while providing stabilization.









# Common Marsh Grass Species Used for Living Shorelines



*Spartina alterniflora*  
(smooth cordgrass)  
*Sporobolus alterniflorus*



*Juncus roemerianus*  
(black needlerush)



*Spartina patens*  
(salt meadow hay)







# In Lower Salinity Areas



*Spartina cynoseroides*  
Giant cordgrass



*Cladium* sp.  
Sawgrass



# Ordering and Planting Times

- Order in fall
- Plant in spring/summer
- Plant in spring for 2-3 years
- Trays or boxes
- Trim - “Haircut”
- Grow them in a greenhouse





# Nurseries that Grow Salt Marsh Plugs

- Garner's Landscaping, Tree Farm & Plant Stand, Newport
- Wetland Plants Inc., Edenton
- Mellow Marsh Farm, Inc., Siler City
- Carolina Silvics, Edenton
- Garners Landscaping, Newport

Prices range from \$0.75-\$1.25 per plug



# When and Where to Plant

- Plant in spring/summer (May-August) for 2-3 years.
- If planting an unvegetated area:
  - Smooth cordgrass -below high tide line
  - Salt meadow hay and black needlerush- at/above high tide line
- If planting area with marsh grass present:
  - Plant where that species is already present
- Close together and close to existing grass





# How to Plant Marsh Grass

- Dibble bar
- Six inches deep
- Six inches – 1 ft. apart
- One plug per hole
- Fertilizer is optional









# How Many to Plant

Determine:

---Area to be Planted

---Plant Spacing (6", 12", 18", 24")

Example: Shoreline is 100' long, and 10' wide  
Area to be planted is 1,000 square feet

- 1) At one foot spacings= area to be planted  
1,000 plants needed
- 2) At 6" spacings= multiply by 4  
4,000 plants needed
- 3) At 18" spacings= roughly divide by 2  
500 plants needed
- 4) At 24" spacings= divide by 4  
250 plants needed











*Before Planting*



*After 3 years*



*After 6 years*



# Using Recycled Oyster Shells for Living Shorelines

- The shells of oysters that were harvested and consumed.
- Help to reduce shoreline erosion and create habitat.





# Using Recycled Oyster Shells for Living Shorelines

## Loose Oyster Shells



## Oyster shell bags

### *Marsh Toe Revetment*



### *Patch Oyster Reefs*



### *Sill*





# Using Recycled Oyster Shells for Living Shorelines

Patch Oyster Reefs

Oyster Shell Bag Sills

Marsh Grass Plantings

Walk Lightly  
Oyster & Marsh Restoration  
IN PROGRESS



# Obtaining the Recycled Oyster Shells

- Purchase from shucking houses
  - Quality Seafood, Elizabeth City
  - Mattamuskeet Seafood, Englehard
- Purchased from trucking companies
  - Roy Rogers
- Donated from oyster roasts
- Restaurants





# Curing Shell





# Patch Oyster Reef Construction

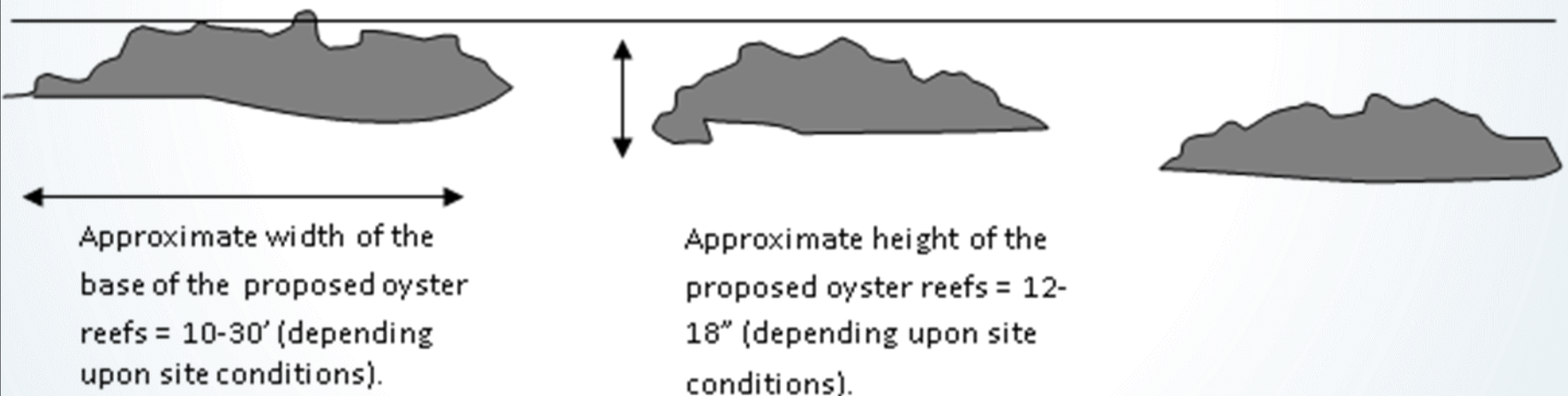




# Patch Oyster Reef Design



NWL





# Using Recycled Oyster Shells for Living Shorelines



*Marsh Toe Revetment*



*Sill*



# Making the Oyster Shell Bags





# Marl





# Transporting the Bags



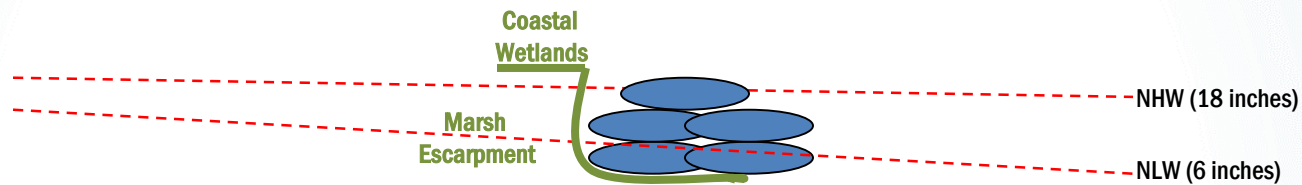


# Stockpile Sites





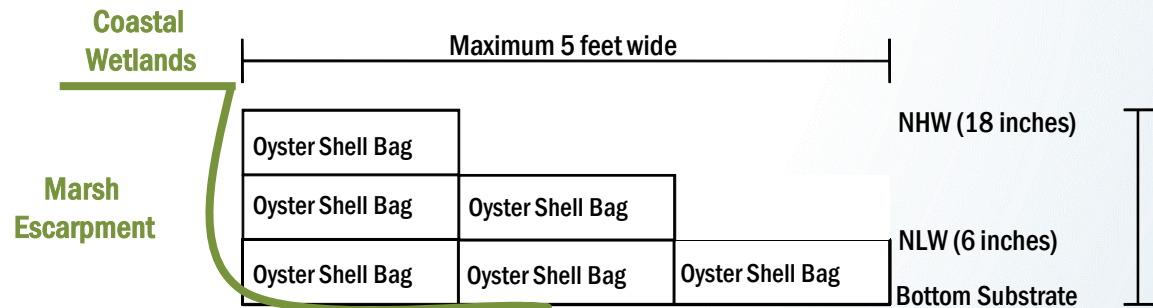
# Typical Marsh Toe Revetment Schematic



Oyster Shell Bag Marsh Toe Revetment.



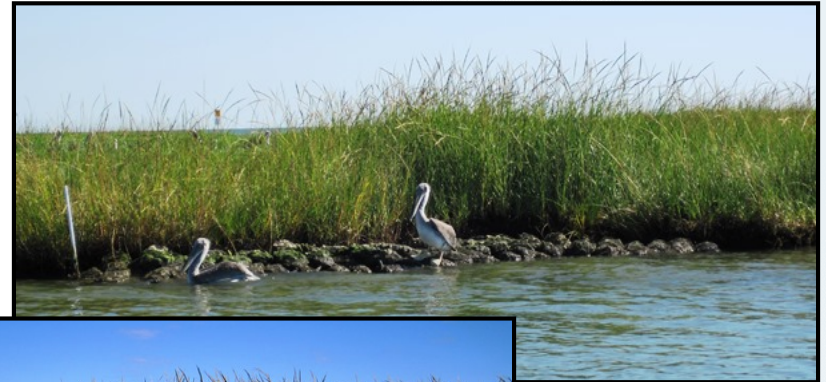
Example of Oyster Shell Bag Marsh Toe Revetment.



Cross-Section/Profile of Oyster Shell Bag Marsh Toe Revetment.



# Oyster Shell Bag Marsh Toe Revetments





# Oyster Shell Bag Sill Design



6 ft. wide

Shoreline

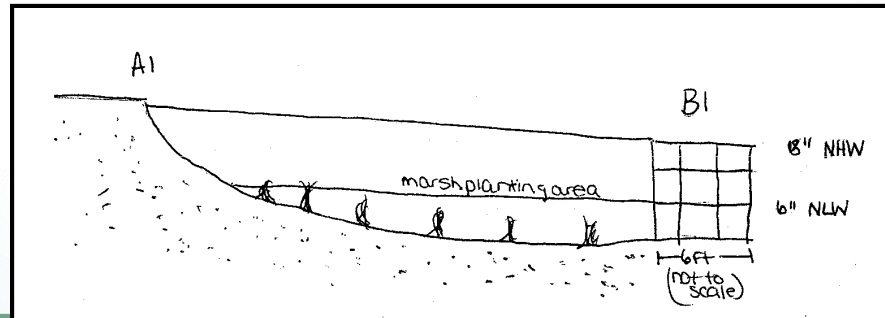
NHW (18 in.)

NLW (6 in.)

Bottom Substrate

	Oyster bag	
Oyster bag	Oyster bag	Oyster bag
Marl bag	Marl bag	Marl bag

~ 1.5 ft. high



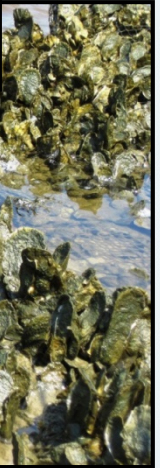


# Oyster Shell Bag Sill





# Oyster Shell Bag Sill





# Contracted Out





# Oyster Domes (ie. ReefBalls)





# Oyster Castles





Coated Crab Pots



Oyster Rastas

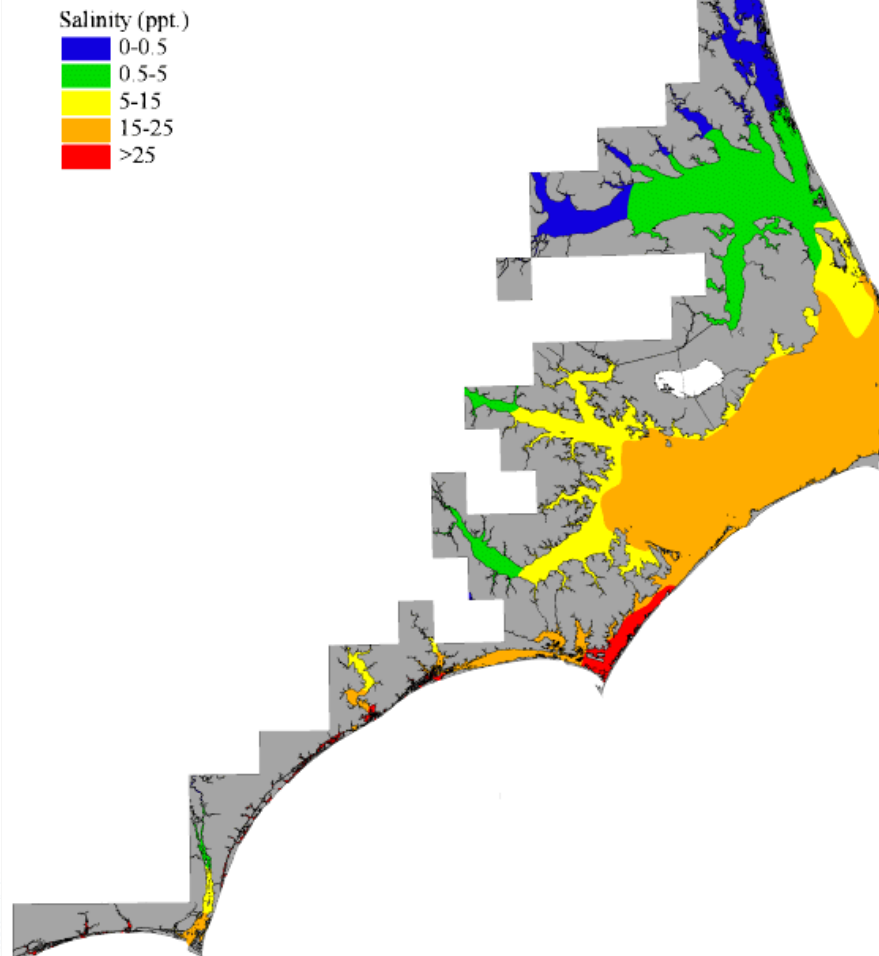


Reef Makers



# Location, Location, Location

## *North Carolina Estuaries: Biologically-Based Salinity Zones*







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