Living Shorelines from A to D in the Florida Panhandle

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Restore America’s Estuaries
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• Reduce wave energy
• Reduce stormwater velocity
• Buffer storms
• Reduce erosion and property loss
• Trap sediment
• Maintain natural sediment movement
• Improve water quality
• Stabilize land

• Filter pollutants (kidneys)
• Allow tidal exchange
• Preserve coastal resiliency
• Mitigate sea level rise
• Provide high productivity
• Connect diverse animal habitats
• Sequester carbon
• Aesthetic value
• Recreation
Do nothing
“Living shorelines – A shoreline management practice that provides erosion control benefits; protects, restores, or enhances natural shoreline habitat; and maintains coastal processes through the strategic placement of plants, stone, sand fill, and other structural organic materials (e.g. biologs, oyster reefs, etc).”

“NOAA is working to implement a more natural bank stabilization technique called “living shorelines.” This approach uses plants, sand, and **limited use of rock** to provide shoreline protection and maintain valuable habitat. Living shoreline projects utilize a variety of structural and organic materials, such as wetland plants, submerged aquatic vegetation, oyster reefs, coir fiber logs, sand fill, and stone.”
Coastal Shoreline Continuum & Typical “Living Shorelines” Treatments

http://www.habitat.noaa.gov/restoration/techniques/lsimplementation.html
Beware of Green-Washing
Goal

To establish ‘Living Shorelines’ as the primary means for protecting eroding shorelines in the coastal areas of Northwest Florida where needed and appropriate and where do-nothing is not an option, thereby steering coastal protection towards softer, more natural alternatives, and away from hardening.
Northwest Florida Living Shoreline Sites
2008 to Present
Do nothing
Retreat

A) Native plants only
B) Native plants + coir fiber
C) Plants + oyster breakwater
D) Oyster breakwater only

Non-oyster breakwater
Groin, jetty, riprap, bulkhead, seawall
<table>
<thead>
<tr>
<th>Variables</th>
<th>Variables</th>
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<tbody>
<tr>
<td>Fetch</td>
<td>Wildlife habitat</td>
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<td>Wind direction</td>
<td>Scarping</td>
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<td>Coastal contour</td>
<td>Adjacent property</td>
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<td>Sediment</td>
<td>Shoreline access</td>
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<td>Salinity</td>
<td>Exotic/invasive species</td>
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<tr>
<td>Vegetation</td>
<td>Slope of intertidal/upland</td>
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<td>Presence of oysters</td>
<td>Light availability</td>
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<td>Tidal regime</td>
<td>Stormwater outfalls</td>
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<td>Shoreline length</td>
<td>Hidden structures</td>
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<td>Presence of seagrass</td>
<td>Upland erosion influences</td>
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<tr>
<td>Shoreline history</td>
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</tbody>
</table>
Planting Techniques

- Low tide
- Planting depth
- Healthy plants
- Zonation
- Spacing
- Grade
- Invasive/exotics
- Monitoring
- Maintenance
Plant Supply

**Wetland**
- Spartina alterniflora
- Scirpus robustus
- Juncus roemerianus
- Symphotrichum tenufolium
- Sesuvium portulacastrum
- Spartina patens
- Sporabolus virginicus
- Paspalum vaginatum
- Distichilus spicata
- Baccharis halimifolia
- Iva frutescens
- Spartina bakeri
- Muhlenbergia capillaris
- Panicum amarum
- Gaillardia pulchella
- Conradina canescens

**Upland**
- <$20/foot

Florida Department of Environmental Protection
A) Vegetation Only

fetch <1 mile

2001

2008

Spartina alterniflora

Juncus roemerianus

<$20/foot
B) Vegetation + Coir Fiber

1< fetch >3 miles

Sep 2013

Jan 2014

July 2014

S. patens
S. bakeri
Baccharis halimifolia
Juncus roemerianus
S. alterniflora

<$20/ft plants
~$20/ft coir log

Florida Department of Environmental Protection
Top view of typical oyster reef layout

- 10 Feet
- 16 Feet
- 4 Feet
- 7.5ft

16x4x2.5ft
~250 bags

Wave Energy: Waterside
Offer Your Shell To Enhance Restoration

1 reef = 200 bags of shell (4,000 lb)

~$143/ft reef

64% of cost = volunteer labor (@ $22.25/hr)
C) Vegetation + Oyster Reef #1

Fetch = 3 miles

Florida Department of Environmental Protection
December 2013

Baccharis halimifolia
Spartina patens
Juncus roemerianus
Spartina alterniflora
C) Vegetation + Oyster Reef #2

fetch = 1 mile

Dec 2012

Dec 2012

Dec 2012

Dec 2012

May 2013
C) Vegetation + Oyster Reef #3

April 2010

Fetch > 5 miles

Oct-Dec 2010

June 2011

Dec 2011
Baccharis halimifolia
Spartina patens
Juncus roemerianus
Spartina alterniflora

September 2013
D) Oyster Reef #1

Fetch < 1 mile

October 2013

October 2013
D) Oyster Reef #2

Jan 2013

Jan 2013

May 2013
Volunteers and Partnerships

Alvernia University
Apalachicola National Estuarine Research Reserve
Apalachicola Riverkeeper
Arthur Morgan School
Bayou Texar Foundation
Boy Scouts of America
Butler University
Catholic High School
Central High School
Choctawhatchee Basin Alliance
City of Pensacola
Clemson University
Cleveland State University
Community Collaborations International
Creative Learning Academy
Cub Scouts of America
East Brent Baptist Youth Group
Ecosystem Restoration Support Organization
UWF Environmental Studies Department
Escambia County
Escambia County United Way
Escambia High School
Friends of St. Andrews Bay
Global Learning Academy
UWF Grad Student Program
Grand Marlin Restaurant
Gulf Breeze Middle School
Gulf Coast Citizen Diplomacy Council
Harbor View Marina
Ithaca College
UWF Kappa Sigma Fraternity
Keep Pensacola Beautiful
Leadership Pensacola
Loyola
Marina Oyster Barn
UWF Marine Ecology Research Society
Mississippi Alabama Sea Grant
Mobile Bay National Estuarine Research Reserve
Montessori School
Naval Support Activity Center
Northern Illinois University
Northwestern University
Peg Leg Pete’s Restaurant
Pensacola High School
Pensacola Naval Air Station
Pensacola State College
Posner Marine
Publix
Ransom Middle School
Saginaw University
Shaggy’s Restaurant
Southern Company/Gulf Power
Tate High School
Tourism Cares
UF/IFAS Extension Office
UMASS
University of Alaska
University of Connecticut
University of Iowa
University of Mississippi
University of Missouri
University of South Florida
University of Virginia
UWF Scuba Club
UWF Women’s Soccer Program
Virginia Tech YMCA
Visit Pensacola
Wartburg
Washington High School Marine Science
Academy
West Florida High School
Westside High School
Winthrop University
Workman Middle School

75+
1000+
10,000’s
Avoid

- Water discharge areas
- Critical Habitat
- Relatively undisturbed bay areas
- Bayside of barrier island
Rules and Regulations

- Sovereign submerged land
- Florida Department of Environmental Protection
- Environmental Resource Permitting
- US Army Corps of Engineers/NMFS
- Joint Works Application
  1) DEP Exempt
  2) General Permit (restoration/enhancement)
  3) Federal Dredge-Fill (Wetland Impact Permit)
- Statewide Programmatic General Permit
Florida Administrative Code 62-330.051 Exempt Activities
(12)(e) Restoration of an eroding shoreline with native wetland vegetative enhancement plantings, provided:
1. Shoreline length < 500 linear feet
2. Use native wetland plants
3. No planting > 10 feet waterward of mean high water line (MHWL)
4. All invasive and exotic vegetation is removed
5. Turbidity curtain for temporary wave attenuation
6. No fill except to support planting, or “breakwater,” provided:
   a. Shoreward toe < 10 feet waterward of MHWL, top height < MHWL
   b. Predominantly of natural oyster shell (bagged) or other stable, non-degradable materials such as oyster reef, reef balls, unconsolidated boulders, clean concrete rubble, rip rap, rock sills, or triangular concrete forms
   c. No SAV within 3 feet
   d. Breaks > 3 feet for tidal flow every 20 feet
Questions