A Living Shoreline Initiative for the Florida Panhandle: Taking a Softer Approach

By Melody Ray-Culp

Property owners often harden their shorelines to combat coastal erosion. Ironically, this tends to increase erosion. It also prevents the shoreline from functioning naturally and destroys established habitat for many species. The Florida Panhandle Coastal Program and its partners have established a Living Shoreline Initiative to provide landowners and contractors a "softer" alternative to shoreline armoring.

Shorelines are dynamic environments, an always changing interface between land and water where erosion and accretion naturally occur. The tide goes in and out every day, and the sea level has risen and fallen over the millennia. What wind, waves, currents, tides, and storms take from one place they deposit some place else. Rising sea levels compound erosion problems by altering the location of the coastline and exposing new areas to erosion.

Erosion by natural processes is compounded by human activities such as dredge-and-fill operations, dam construction, groins and seawalls, channelization, wetland drainage, and boating. As coastal property owners watch their increasingly valuable coastal property wash away when their shoreline functions naturally during storm events, they often respond by constructing fixed structures such as bulkheads, seawalls, and revetments. Unfortunately, these hardened shorelines do not offer the benefits that living shorelines provide. Hardening can interrupt natural shoreline processes, eliminate nursery habitat for marine species and foraging habitat for wading birds, and degrade water quality—in effect, leading to dead shorelines.

Hard coastal armoring presents as much a threat to the ecological integrity of our bays and estuaries as it does to our high energy beaches, which have been the focus of most erosion studies. A recent report by the National Research Council (NRC), *Mitigating Shore Erosion Along Sheltered Coasts*, draws attention to our lower energy shores. It concludes that until we have a regional regulatory framework for shoreline management, erosion control for individual sites along sheltered shores as well as beaches will be driven by hardening, creating a domino effect of coastal armoring.

The Florida Panhandle Coastal Program

The mission of the U.S. Fish and Wildlife Service (FWS) is to work with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. The FWS' Coastal Program was established to support that mission in high priority coastal areas through a watershed-based, pro-active, non-regulatory, voluntary, and community approach to fish and wildlife conservation. The program seeks to achieve on-the-ground restoration results and provides funding to help do so. Partnerships with other agencies and private groups are essential for program success. After the first Chesapeake Bay/Estuary Program was established in 1985, the Coastal Program evolved into a nationwide network of 22 entities, including the Florida Panhandle Coastal Program (FPCP), which was established in 2001.

The FPCP's objective is to protect, conserve, restore, and enhance coastal areas and resources, including coastal wetlands and uplands, estuaries, and riparian corridors within northwest Florida. We serve 16 counties, which include 250 miles of shoreline along the Gulf of Mexico. This fringe of bays and estuaries supports hundreds of species of wildlife, including the federally protected Gulf sturgeon, Florida manatee, piping plover, beach mice, and sea turtles. Also, our coastal upland areas feature an ecologically rare and fragile system of coastal dune lakes.

The NRC report concludes that, although some states are pro-active in their shoreline management, no federal agency has been tasked to provide coastal planning at a national level. To help turn the tide on coastal armoring, the FPCP and its partners* have created a Living Shoreline Initiative to establish living shorelines as the primary means of erosion prevention in the coastal areas of northwest Florida. Our goal is to steer coastal protection toward soft alternatives and away from hardening. In a state where nearly 80% of the residents live near the coast, there are still some natural, undeveloped shorelines left in the Panhandle that we can help preserve. Notably, our Living Shoreline Initiative broadens program emphasis beyond our geographic area of service.

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**Partners in the Living Shoreline Initiative include Apalachicola Riverkeeper, Choctawhatchee Basin Alliance, Florida Department of Environmental Protection (Ecosystem Restoration Section, and Office of Coastal and Aquatic Managed Areas), Florida Fish and Wildlife Conservation Commission, National Oceanic and Atmospheric Administration, PBS&J, Pensacola Gulf Coast Keepers, Sea Grant Extension, University of Florida, University of West Florida, U.S. Fish and Wildlife Service, and West Florida Regional Planning Council.*

The Living Shoreline Initiative

So what is a living shoreline? It is a treatment to the coastline that offers a soft alternative to armoring by using natural habitat elements for erosion control. Living shorelines provide habitat for estuarine, coastal, and riverine plants and animals through careful consideration of the site and strategic placement of components along the upland-to-wetland profile. There are two basic types.

The first, suitable for low-moderate wave energy areas, is a totally soft option with no hard structure. It includes natural vegetation (salt marsh, submerged aquatic vegetation (SAV), dune grasses, upland shrubs and trees), biodegradable materials to provide stabilization until the plants become established (fiber logs, organic matting), and sand fill to provide soil for the plants.

Salt marshes thrive in natural bays and estuaries, performing vital ecological jobs that no seawall can. As stormwater flows downhill into a marsh, upland vegetation provides the first line of defense for erosion. But for the shoreline itself, salt marshes protect and stabilize, attenuate waves and absorb wave energy, buffer uplands from storms, reduce velocity of stormwater runoff, moderate effects of floods and storms, and maintain shoreline dynamics and sediment transport.

For the plants and animals that live in them, salt marshes:

- trap sediment, increasing soil available for vegetation;
- maintain tidal water exchange;
- improve water quality;
- serve as kidneys, removing nutrients and pollutants;
- create a natural buffer between water and land;
- maintain biodiversity at the transition zone where water and land species overlap;
- facilitate movement of estuarine species into freshwater wetlands; and
- provide shade, thereby lowering water temperatures and increasing oxygen retention.

When marshes trap sediment, they also help decrease turbidity and improve water clarity. Clear water allows light to pentetrate to the bottom, which is essential for seagrasses and other types of SAV. Marshes also provide vital spawning, nursery, juvenile, and adult habitat for many fish and invertebrate species. The Florida Fish and Wildlife Conservation Commission estimates that 70% of Florida's marine recreational fish require seagrass habitat at some stage in their life cycles. For humans, salt marshes provide aesthetic value, enhanced views, peace and privacy, and recreation.

The second type of living shoreline, suitable for shorelines with higher wave energy, is a hybrid. It uses the same materials as the first but adds a breakwater built from a minimum amount of rock, rubble, oyster/shell, or wood structures to hold the soft materials in place as vegetation fills in. Oyster reefs can provide the wave attenuation needed to allow planted salt marsh to become established. The Florida Department of Agriculture and Consumer Services, the state agency responsible for restoring oyster reefs for the benefit of improved harvest, is now expanding its efforts beyond its traditional role in harvestable waters to non-harvestable areas, where those areas can benefit from the ecological services oysters provide. These services, provided by hundreds of thousands of bivalve engineers, include filtering nutrients and suspended material; improving water quality and clarity; providing habitat for a host of fish, birds, and other invertebrates; and protecting the shoreline.

Project GreenShores is a large-scale and award-winning example of a hybrid living shoreline project constructed along the shores of Pensacola Bay. Site 1, completed in 2003, restored 8 acres of salt marsh and SAV and 7 acres of oyster reef. Site 2, currently under construction and almost complete, is restoring 22 acres of marsh, 2 acres of SAV, and nearly 5 acres of oyster reef. Project GreenShores was funded by multiple partners including the FPCP.

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There is also a third, do-nothing approach for property owners who recognize the dynamic nature of shorelines and that structures put on them may be lost as a result of those dynamics over time. If the do-nothing approach is not an option, the two soft alternatives provide a more environmentally friendly method of shoreline management than seawalls.

Implementing the Initiative

The NRC report points out that contractors may be more likely to recommend shoreline hardening because they have extensive experience constructing bulkheads, seawalls, and riprap breakwaters and because it is convenient to choose the familiar "hold the line" approach. Property owners may simply choose such structures by default, assuming hardening is their only option for protecting property built on an eroding shoreline. And the regulatory process in some areas may even promote shoreline hardening because it can be easier and quicker to get a permit to install a seawall than a permit to construct a living shoreline.

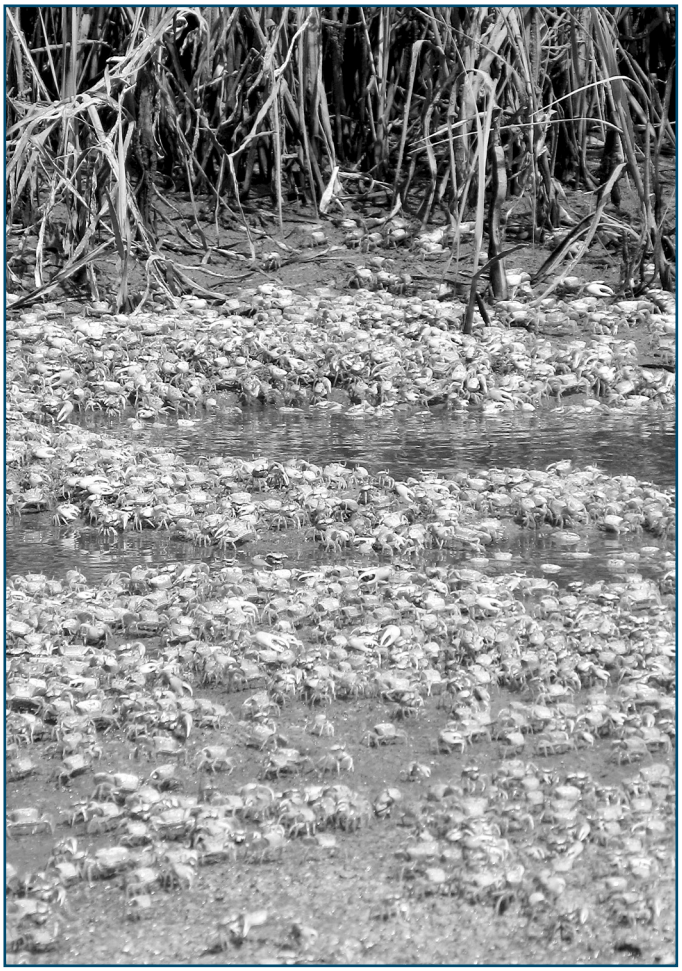
With this in mind, Initiative partners have identified several tasks to achieve our goal of establishing living shorelines as the primary means for protecting eroding shorelines. We must give contractors a more environmentally friendly tool in their tool box, encourage them to use that tool through "green tape" regulatory processes, change the hearts of minds of property owners who favor "neat and tidy" bulkheaded edges for their lawns to an appreciation

for the aesthetics of natural shorelines, and adopt regulations that encourage the use of living shorelines for protection whenever possible. In short, we must develop a product—the thing that we want property owners and land managers to choose instead of coastal armoring; market that product; and carry it over any hurdles, regulatory or otherwise, so the product gets implemented.

Our first task is to put living shorelines into a cookbook format that can easily reach our target audiences. These include contractors, property owners, public and private land managers, city and county commissioners and other policymakers, county planning staff, plant nurseries, schools and teachers, 4-H clubs, Master Gardeners, realtors, developers, and restoration volunteers. We need instruction manuals, workshops, and a one-stop-shop website for living shoreline resources specific to the Panhandle. We must make living shorelines as easy as possible so that people will choose to put soft alternatives into action when a choice has to be made.

The first step in writing our cookbook is establishing best management practices. A good deal of work has already been done on the subject. The Maryland Department of Natural Resources has led the way in developing and embracing living shorelines, with other states observing the results and creating their own programs. Maryland and Virginia hosted the first ever Living Shoreline Summit in December 2006 after many years of working on Chesapeake Bay issues. More than 160 people attended to learn and share their research. To benefit from these efforts and avoid duplication, we must compile, analyze, and synthesize what is already available; consider existing pilot projects; incorporate the latest science to develop new demonstration projects; make updates where needed; and adapt techniques for different shoreline types and to the specific needs of the Panhandle. We must scientifically establish that living shorelines can be an effective, ecologically sound, and economical way to protect eroding shorelines.

Our second task in promoting soft alternatives over the seawall status quo is to cultivate living shoreline-friendly contractors so that living shorelines are the first tool they reach for in their toolboxes. Contractors are the folks who will be implementing the living shoreline cookbook, hopefully taking advantage of another way to make money. If we want property owners to be banging down the door to get their very own living shoreline, there must be contractors who can supply them. We envision living shoreline construction as a niche market that eventually becomes mainstream. Initiative partners are busy developing workshops for contractors, with the first one to be held in November 2007, targeting contractors in Alabama, Florida, and Mississippi. Sea Grant is taking the lead role on this and will be an important disseminator of living shoreline information. We also plan to establish a living shoreline certification process for contractors to establish quality control.



An army of fiddler crabs doing their job as keystone species in the employ of the St. Joseph Bay Aquatic Preserve salt marsh in the Florida Panhandle. Photo by Melody Ray-Culp, U.S. FWS.

An essential ingredient for making living shorelines as easy as possible is to make the permit process as easy as possible. While it's understandable that restoration requires a permit, it should not be easier to get a permit to construct a seawall than to construct a living shoreline. Our third task, therefore, is to promote a "green tape" regulatory process for living shoreline construction instead of burdensome red tape. Initiative partners can help clarify current permitting requirements for living shoreline applicants, guide them through the process, and steer them toward potential funding sources. We plan to work with state officials to identify regulations that could be modified to better facilitate living shorelines and to help ensure consistent enforcement. We also want to work with local officials to incorporate living shorelines into their comprehensive plans and to encourage them to lead by example so that soft alternatives are selected for erosion protection on public property. County administrators are key in our living shoreline efforts.

With multiple restoration projects requiring plants during optimal planting months, our fourth task is to ensure a reliable plant supply. Appropriate plants must not be a limiting commodity, and no restoration project should suffer from lack of necessary material. The Florida Department of Environmental Protection's Ecosystem Restoration Section in Pensacola has large greenhouses for growing estuarine shoreline grasses and dune plants. State funding is also

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Conclusion

Although large tracts of uplands and wetlands have been permanently protected through public and private ownership in South Carolina, the coastal landscape remains vulnerable to alteration from a rapidly increasing human population. The Coastal Program in South Carolina will continue to work cooperatively through public-private partnerships to adapt innovative landscape-scale solutions to a dynamic coastal environment. The challenge is to protect and restore South Carolina's coastal ecosystems while accommodating the inevitable growth of our coastal communities. ■

Protecting Maine's Wetlands, *continued from page 8*

- expertise in GIS and habitat mapping and analysis;
- knowledge of conservation biology and coastal Maine ecology;
- strategic understanding of federal and other grant program requirements;
- practical experience working "on-the-ground" with landowners on land protection options;
- grant-writing skills;
- capacity to raise required non-federal matching funds and provide bridge loans;
- capability to effectively manage and steward protected lands; and
- outreach skills needed to promote land protection success stories.

By integrating their members' collective strengths, and by retaining a flexible, non-regulatory, and voluntary approach, the Coalition has demonstrated its effectiveness in working with people who want to work together to permanently protect thousands and thousands of acres of important habitat. In the broadest sense, Coalition members view all of the wetland and upland buffer protection projects—whether large or small, inland or coastal—as part of an integrated and comprehensive effort to ensure that Maine's high value wetland habitat remains intact, providing safe haven for endangered species, searun fish, and waterbirds as well as open space with natural resource values for all of us—for now and forever. ■

Maine Wetland Protection Coalition Partners

Maine Dept. of Inland Fisheries and Wildlife
U.S. FWS, Gulf of Maine Coastal Program
Maine Coast Heritage Trust
The Nature Conservancy (Maine Chapter)
Trust for Public Lands
Ducks Unlimited, Inc.

A Living Shoreline Initiative, *continued from page 11*

available to build more greenhouses at high schools to provide more plants and offer local career opportunities. Plant production in school yards through the Grasses in Classes program is another terrific solution that will provide plants and planting labor, with the added benefit of educating people of all ages in the community about the role they can play in restoration. The FPCP has provided funding to the West Florida Regional Planning Council to establish Grasses in Classes in at least one school in each coastal county. Community involvement plays an important role in these projects. We also envision a certification process for nursery owners to supply appropriate native species.

Initiative partners also plan to coordinate regularly on the inventory of all eroding shorelines in the Panhandle. This includes developing survey methods, determining which restoration profile would work best for each area, and deciding upon the highest priority areas in need of living shoreline protection so that technical assistance and funding can be directed appropriately. The state of Virginia is doing this now, with the ultimate goal of having a web portal through which data on potential erosion conditions and pre-determined methods for best protection for any shoreline segment are just a click away—a very useful tool for property owners and contractors.

We also plan to host regular living shoreline summits for scientists, regulatory agencies, contractors, engineers, policymakers, educators, and other professionals to encourage communication and information exchange.

Conclusion

Hardening the shoreline with fixed structures to "hold the line" is the most common technique used to combat coastal erosion. Ironically, this often increases erosion. It also prevents the shoreline from functioning naturally and destroys established habitat for many species. Hardening can create a bathtub effect where the gradual sloping transition from water to land is transformed into right angles.

Conversely, living shorelines create nursery and foraging habitat, enhance natural processes, and improve water quality. With our 2,300 miles of irreplaceable tidal coastline, Floridians can help turn the tide. The Living Shoreline Initiative can help restore our bays and streams by producing and implementing a living shoreline cookbook, providing property owners with an effective and ecologically sound alternative to coastal armoring. We want to make it as easy as possible for people to make that choice and put living shorelines into action. ■

Living Shoreline Resources

National Resource Council. 2007. Mitigating shore erosion along sheltered coasts. National Academies Press, Washington, D.C., *available at* http://www.nap.edu/catalog.php?record_id=11764.

NOAA Restoration Portal, *at* http://habitat.noaa.gov/restorationtechniques/public/shoreline_tab1.cfm.

Maryland Shorelines Online, *at* http://shorelines.dnr.state.md.us/living.asp.

Douglass, S.L. and B.H. Pickel, The Tide Doesn't Go Out Anymore—The Effect of Bulkheads on Urban Bay Shorelines, *at* http://www.southalabama.edu/cesrp/Tide.htm.