

'Living shoreline' aims to stop harmful bathtub effect of Mobile Bay bulkheads

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Mobile Bay is slowly being turned into a bathtub.

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The bay's natural

More and more, the gentle hiss of waves rolling ashore is being replaced by the slap and pop of water rocking against vertical walls known as bulkheads.

The bay's natural shoreline a mix of sandy beaches, muddy flats and marshy fringes is being lost behind an ever-growing number of these bulkheads, which are designed to stop waves from eating away at private waterfront property.

The problem is that bulkheads are barren, at least in terms of providing habitat for marine creatures. As natural shorelines give way to a growing wall of bulkheads, the bay begins to lose the shrimp, crabs, fish and other creatures that are part of its incredible fecundity, according to biologists.

Alarmed that more than a third of Mobile Bay's shoreline is now armored with bulkheads, several local groups have come together to create a property-protecting alternative they call "the living shoreline."

Built last week just offshore of Helen Wood Park near Dog River, the shoreline stabilization experiment was created through a partnership with the Dauphin Island Sea Lab, the Alabama State Lands Division and The Nature Conservancy.

In essence, a living shoreline consists of something hard stacked a little way offshore that breaks waves, robbing them of their full force. Ultimately, the hard surface which can be hunks of concrete, stacked oyster shells or just about anything will be colonized by shellfish, crabs and fish. Behind the breakwater, in the calmer water between the structure and shore, scientists believe underwater seagrasses will grow, along with common marsh grasses at the water's edge.

'Killing our bay'

"The more we bulkhead our bay, the quicker we are killing our bay," said Mary Austill Lott, who spearheaded the living shore project with The Nature Conservancy. "The No. 1 thing homeowners want to do is protect their property. We understand that. So, the goal is to come up with a way to protect those shorelines without bulkheads."

While they do a good job of protecting a shoreline from erosion, bulkheads have a number of unintended consequences, all detrimental to the marine environment.

"Something has to give, or we are going to turn our bay into a vertical bathtub," said Scott Douglass, a University of South Alabama engineer specializing in coastal erosion issues. "If we keep building bulkheads, we are going to continue to lose the intertidal zone all around the bay."

Douglass wrote a scientific paper about Mobile Bay's bulkheads titled "The Tide Doesn't Go Out Anymore." He said the intertidal zone the area of the seashore exposed during low tide is one of the most critical parts of any marine ecosystem, used by many creatures at some point during their life cycle.

Biological desert

In the marine world, a bulkheaded shoreline is essentially a biological desert. Flat panels of steel or vinyl provide no nooks or crannies for small creatures to hide in, and no place for shellfish to stick to. Studies have shown that fish tend to avoid areas with bulkheads.

In addition, scientists have shown that over time the water in front of a bulkhead gets deeper and deeper due to the way waves bounce off the straight walls. Gone are the varying water depths and varying habitat types associated with natural, gradually sloping beaches, seagrass meadows and stands of marsh grass. Gone, too, are the creatures that call those places home.

"If we bulkhead and armor the shorelines, the bay is going to get deeper, and the deeper water will mean our grass beds will disappear. Fishermen ought to care," said retired Dauphin Island Sea Lab director George Crozier, who calls the increasing number of bulkheads a major threat to the health of the bay. "The living shoreline idea provides another way to deal with erosion."

Crozier said a number of factors have conspired to increase the wave energy in Mobile Bay. He cited changes made to the Mobile Ship Channel to allow larger ships and the fact that there are more small fishing boats on the water than ever before, each boat's wake crashing ashore as miles and miles' worth of waves.

Successful elsewhere

Crozier also said that engineered living shorelines are functioning and working well in various places around the nation, including in Chesapeake Bay and in Pensacola. There are also two large-scale experiments under way in this area, one at Point Aux Pins and another at Alabama Port.

"At Point Aux Pins, we are definitely seeing some buffering along the shoreline. There is less shoreline loss, and a lot more fish," said Steven Scyphers, a graduate student at the University of South Alabama. He designed the much smaller experimental reefs set up at Helen Wood Park.

Scyphers said his goal was to create something on a scale that would be useful to a bayside homeowner trying to protect a waterfront lot. He said he hoped to find a cheaper, more environmentally friendly way of protecting the shore than constructing a bulkhead, which can cost tens of thousands of dollars.

For the project, he chose to compare two reef/breakwater designs, one formed from stacks of bagged oyster shells, the other consisting of large, hollow balls of concrete known as reef balls. Both designs were set up parallel to the shoreline in about 3 feet of water, with the top of the created reefs reaching within about 6 inches of the water's surface.

Reef balls work well

He said the concrete balls were easier to install and handle, and required far less labor to set up than the stacked oyster bags. A total of 120 reef balls cost \$10,000.

"With four or five people in a pontoon boat, we put out 150 of these things in a day. The labor was not too terrible. The balls weigh 123 pounds, but they are round, so you can roll them into place," Scyphers said. "Bagging the oysters was very labor intensive, probably a lot more work than the average homeowner would have time for."

He said studies in Florida have shown that the balls can become completely covered in oysters in fairly short order.

"One of the things we're going to look at is the habitat value of these reef balls compared to the oysters. There were already blue crabs in the reef balls the day after we put them out," Scyphers said. "Ultimately, we're looking at a natural way to provide shoreline stabilization, fisheries habitat and oyster habitat."

He said the projects will be monitored monthly for several years. Scientists will use gill nets and seines to study the types and numbers of fish and crabs around the reefs, and conduct underwater inspections to check for colonization by live oysters.

"On Mobile Bay, the issue is that all these people have 80- to 100-foot shorelines. We are trying to find solutions for them," said Lott, with The Nature Conservancy. "We are trying to find ways to help them bring seagrasses and oysters back to the bay where they belong."

