



ALABAMA

Coastal Alabama Restoration Project

RESTORATION

Oyster reefs breakwaters built
Oysters grow on breakwaters and become "living"

MONITORING

Measure growth and success of
oyster reefs and seagrass beds
Monitor water quality
Monitor species' use of reefs

BENEFITS TO PEOPLE AND NATURE

PEOPLE

Increased water quality
Recreational fishing
Eco-tourism
Shoreline protection

NATURE

Sustainable commercial
fishing
Increased essential
habitat for fish
Increased biodiversity

Project Highlights

- **Goals:** Restore and enhance shoreline habitat with a long-term goal of boosting the economy of coastal Alabama communities hit hard by hurricanes, habitat degradation and a struggling economy.
- **Jobs:** This project employed 33 full-time workers and contributed to paychecks for at least 83 positions in the coastal Alabama community, with most of the jobs being in the construction and deployment phases of the breakwater process. Due to significant cost savings in the first eight months of the project, staff has been able to extend the size of the reef by 50 percent.
- **Habitat Restoration:** The project includes 1.54 miles of submerged breakwater, 3.05 acres of oyster reef, and 30.54 acres of seagrass beds. In total, the living shoreline breakwaters will protect approximately 10,000 feet of shoreline.
- **Progress:** As of February 2011, construction of the reefs has been completed and post-restoration monitoring is continuing through summer 2012. Significant oyster growth and sediment accumulation have already occurred on the installed reefs.
- **Outreach:** Project staff has reached out to the community and are planning a number of outreach and educational events to promote the project and inform area residents about the benefits of oyster reefs and coastal restoration. Photographers and videographers have been hired to document the restoration process in all phases which will be used to promote the project throughout the Gulf Coast.
- **Measurement:** A scientific monitoring plan has been developed by local experts to measure both the short and long term success of this project. Contractors will perform a socio-economic analysis of the communities surrounding the project area. Specifically, the analysis will focus on determining which aspects of habitat and shoreline restoration are most valued by coastal Alabama residents.
- **Partners:** Dauphin Island Sea Lab, University of South Alabama, Alabama Department of Conservation and Natural Resources State Lands – Coastal Division, Mobile County, Reef Innovations, Coastal Environments, Inc., J&W Marine Enterprises, Inc.



American Oystercatchers near restoration site in Mobile, AL. ©Jared McKee/DISL

A Vision for Project Success

Short-term goals: To restore and enhance the ecological integrity of Alabama's marine habitat. By creating more than 1.5 miles of submerged breakwater reefs, the project is not only protecting the shoreline from damaging storm surges and wave action, but it is also enhancing vital habitat for fish and invertebrates – species essential to a healthy and sustainable coastal environment.

Long-term goals: To boost the economy of coastal Alabama communities hit hard by hurricanes, habitat degradation and a struggling economy. Not only is the project helping to create local jobs, but it is promoting healthy fisheries that can sustain traditional livelihoods of fishers and those involved in the seafood processing industry.

Coastal Recovery for People and Nature

The years 2004 and 2005 were an unfortunate turning point for the coastal communities of the Gulf of Mexico, including Mobile and Baldwin counties in Alabama. Hurricanes Ivan and Katrina severely degraded estuarine and beach habitat and either destroyed or damaged most of the seafood processing plants and fishing boats – significant sources of income for coastal Alabamians. The historic fishing communities of Bayou La Batre and Coden were devastated, as the majority of residents are tied to the fishing and seafood industries.

Habitat degradation, destroyed equipment and loss of personal property resulting from the storms were soon followed by skyrocketing gas prices and economic strife, forcing life-long fishers to find other lines of work or collect unemployment. Between 2006 and 2008, federal assistance to these fishers through the Organized Seafood Association of Alabama was nearly \$3 million.

Past attempts to protect shorelines from the damaging force of storms and heightened wave activity usually involved the construction of hardened structures like rock jetties, bulkheads and seawalls. But over time, experts have learned that these armored structures reflect wave energy back into the bay instead of absorbing or dampening their impact. In fact, shorelines adjacent to these structures become subjected to even greater wave energy causing erosion along the barrier with subsequent loss of intertidal habitats.

Estimates show that more than 30 percent of Mobile Bay's available coastline is armored and suffering from at least 10 to 20 acres of intertidal habitat loss – a high percentage for this area. Oyster reefs, however, are a promising natural alternative to hardened structures for the long-term protection and sustainability of Mobile Bay's ecology and tradition as a fishing community.



Reef ball fabrication. ©Jeff DeQuattro



Installation site. ©Jeff DeQuattro

Solving a Restoration Challenge

The Nature Conservancy, in collaboration with the Alabama Department of Conservation and Natural Resources, Dauphin Island Sea Lab, Mobile County and the University of South Alabama, is creating a living shoreline along two stretches of eroding shoreline in Mobile Bay and Portersville Bay. Funded through the NOAA-ARRA grant, this project is a vital step to restoring both the ecological integrity and economic stability of Bayou La Batre and the other fishing communities of coastal Alabama.

Using three distinctive techniques, the project is creating 3.05 acres of vertical oyster reefs and 30.54 acres of seagrass beds while protecting about 10,000 feet of shoreline. Unlike traditional methods of vertical bulkheads and other hardened structures, the methods used in this project offer a natural approach to shoreline protection that enhances critical habitats for many species of fish and invertebrates.

As a natural component of the ecological architecture of the coast, the reefs will absorb the impact of wave energy from storms and boat activity, thereby protecting the shoreline from erosion while enhancing habitat for fish, birds and invertebrates. Submerged oysters also filter impurities from water, helping to improve water quality and enhancing the viability of seagrass meadows and salt marshes, essential habitats for juvenile fish and invertebrates.

The project is designed to provide a long-term sustainable solution to restoring coastal habitat that has defined the livelihoods and quality of life for generations of coastal Alabamians. Thirty-five to 40 new jobs will be created through this project, with the majority being in the construction and deployment of the breakwater reefs.

In addition to the restoration work, The Nature Conservancy has contracted with the University of North Florida to perform a socio-economic analysis of the communities surrounding the project area. The goal is to determine how coastal habitats and restoration projects impact coastal communities, with a specific focus on which aspects of habitat and shoreline restoration (i.e., cost, durability, fisheries habitat, aesthetics, etc.) are most valued by coastal Alabama residents.



Shrimping boats. ©Jeff DeQuattro

Shoreline Restoration: Benefits for People and Nature

People: Direct benefits from healthy habitats

Oyster reefs perform a number of ecosystem services including filtering impurities from the water, thus improving water quality; providing essential habitat, shelter and food for recreational and commercial fish and invertebrates; enhancing the viability of seagrass meadows and salt marshes; and protecting the shoreline from storm surges and wave action.

- Marine-related resources such as estuaries, salt marshes, oyster reefs and seagrass meadows support a variety of enterprises along the Alabama coast ranging from the seafood industry to recreational fishing to eco-tourism.
- Recreation and tourism in coastal Alabama have a major economic impact. Coastal tourism accounts for approximately one-third of the total tourism expenditures in Alabama, and the coast is also home to many retirees who are lured by the climate, low cost of living and numerous amenities such as golfing and fishing.

- Over 2,000 Alabama anglers made fishing trips in 2006 that contributed more than \$600,000 to coastal economies supporting over 6,000 jobs.
- Alabama's seafood capital of Bayou La Batre is ranked 19th in the nation in value of landings and is the 5th most important port in the Gulf of Mexico.
- Over 21,000 jobs are supported by commercial fishing including harvesters, processors, and distributors in 2006.
- The harvest of marine resources (including fish, crabs, shrimp and oysters) brought into Alabama ports in 2006 was worth more than \$49 million.
- Thirty-four nature-tourism businesses operate in Baldwin and Mobile counties, according to current data.

Impact of the Gulf oil spill

As coastlines in Alabama received oil, the project was temporarily interrupted. Two incidents involving oil were recorded during shoreline assessments on the Alabama Port coastline. In the wake of the spill, the Conservancy formed a coalition with the Alabama Coastal Foundation, Mobile Baykeeper and The Ocean Foundation to address the environmental impacts of the oil spill and reverse years of damage along the Alabama coast.

LIVING SHORELINES

- Previous efforts to protect shorelines in this region have involved the introduction of hardened structures, such as seawalls, rock jetties, or bulkheads to reflect wave energy. A major concern with using bulkheads and seawalls to protect coastal property is that they can cause erosion and subsequent loss of intertidal habitats at and adjacent to the hardened structures.
- Recently, shoreline protection efforts have shifted towards using "living reefs," including oyster reefs to protect shorelines as an alternative to bulkheads and other armoring.
- Living shorelines usually involve the planting or restoration of naturally occurring coastal plants or shellfish.
- Living shorelines, especially when oyster or other shells are used, appear to have numerous benefits in addition to providing a buffer for estuarine and coastal shores.

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