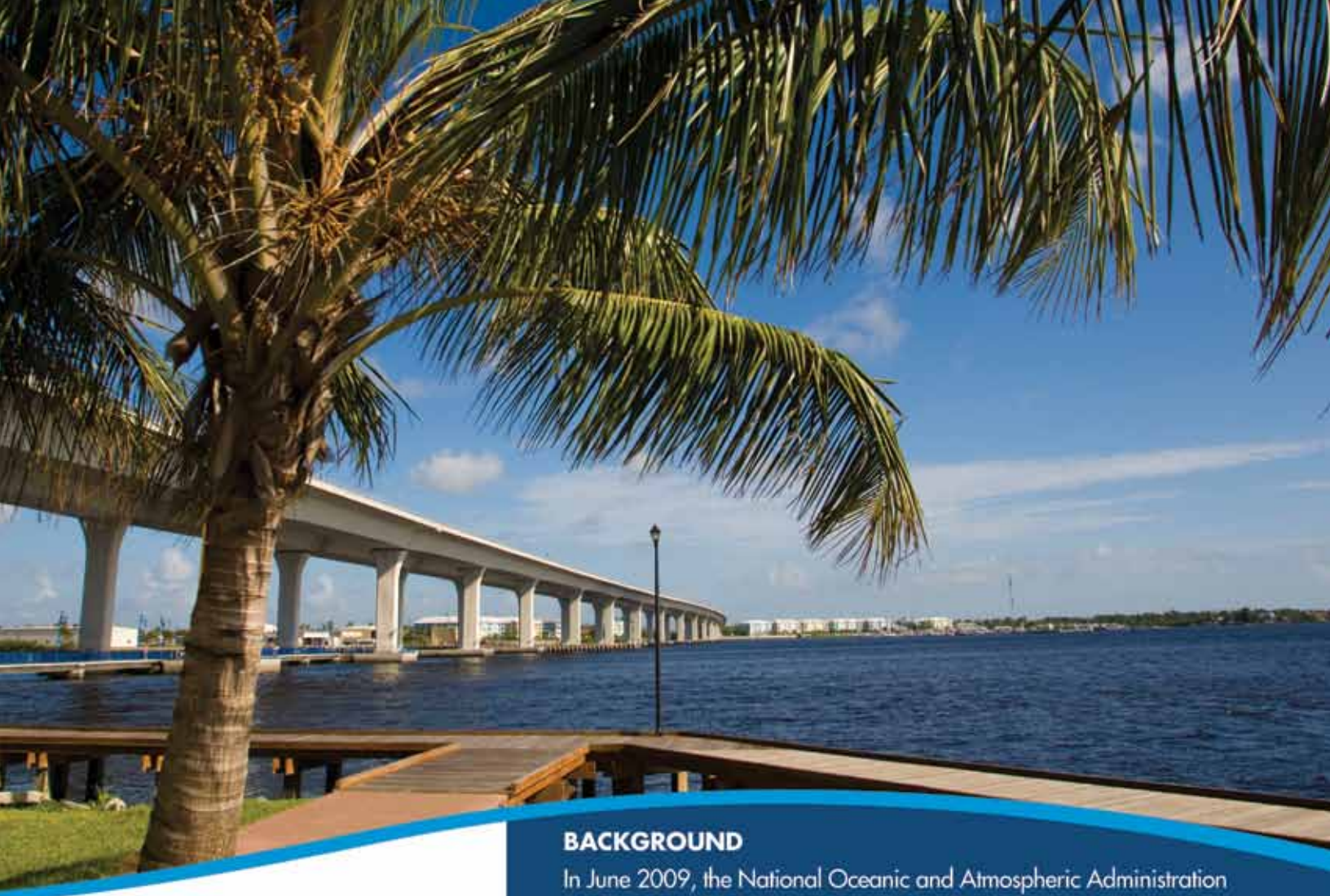


OYSTER REEF RESTORATION

BACKGROUND

In June 2009, the National Oceanic and Atmospheric Administration (NOAA) awarded Martin County more than $4 million in federal funding for the Oyster Reef Restoration Project as part of the American Recovery and Reinvestment Act of 2009. The project will restore important oyster habitat in the St. Lucie and Loxahatchee Estuaries, leading to long-term and significant ecological improvements to the health of the river as well as providing additional recreational and economic benefits to the community. The Oyster Reef Restoration project also takes a significant step toward the fulfillment of one of the goals of the Comprehensive Everglades Restoration Plan (CERP).

Why Do Oysters Matter?

Oyster habitat is vital to the health of an estuary, effectively filtering nutrients, fine sediments and toxins from the water and improving water quality. The filtration capacity of just one adult oyster is between 20 and 50 gallons per day! Oysters also support critical fisheries and when coupled with other coastal restoration efforts such as mangrove and spartina plantings, restored oyster reefs can also serve as effective shoreline buffers.

Oysters are an indicator species, meaning that their presence in the water can be used to gather information on the overall health of the estuary. Within the last 50 years, the oyster coverage that was historically present in the two estuaries has declined by as much as 75 percent. Restoration efforts that can increase the oyster population help to improve the overall ecological health of the river.

What is cultch?

Cultch is any hard material - most often fossilized shells, coral or other similar materials produced by living organisms - that are placed on water bottoms to enhance oyster habitat or create oyster reefs.

The Importance of the Estuaries

Estuaries are special places where freshwater meets and mixes with salty ocean water. Estuaries and the lands surrounding them are places of transition from land to sea, and from freshwater to saltwater. Although influenced by the tides, estuaries are protected from the full force of ocean waves, winds, and storms by the reefs, barrier islands, or fingers of land, mud, or sand that surround them.

Estuaries are among the most productive ecosystems in the world and can be thought of as the "cradle of the ocean." More than 70 percent of Florida's recreationally and commercially important fish, crustaceans, and shellfish spend part of their lives in estuaries, usually when they are young. The shallow water, salt marshes, seagrass, and mangrove roots provide excellent hiding places from larger, open-water predators. Some species grow in estuaries for a short time; others remain there for life. Many animal species rely on estuaries for food and as places to nest and breed. The importance of oyster reefs has long been underestimated. As a result, careless use of this resource has resulted in the loss of 85 percent of oyster reefs around the world.

Project Description

More than 30 million pounds of cultch will be used to construct a series of patch reefs (small, isolated reefs) within the St. Lucie and Loxahatchee Estuaries. The constructed reefs in the St. Lucie River will provide enough oyster habitat, when fully populated, to filter the total volume of the Estuary in a month. These reefs will also provide essential habitat structure for other species, including shrimp, clams, crabs, snails and a variety of fish, including many economically important species such as gag grouper, gray snapper, sheepshead, and red drum.

To determine the best locations for the reefs, a comprehensive survey has been conducted to measure muck layer depth, salinity levels, water quality, past existence of oyster beds and other characteristics. The final sites will have suitable conditions for the placement of cultch and for oyster spat recruitment.

New mangrove and other suitable shoreline plantings will be placed inshore of some of these restored reefs, reducing shoreline erosion and resulting in less sediment deposits in the estuaries. Oyster reefs and shoreline plantings will also provide much needed substrate (surface area to attach to) for oyster spat recruitment. Restoration efforts will improve water quality in both rivers enabling expanded growth of seagrass and supporting both estuarine and marine fish nurseries.

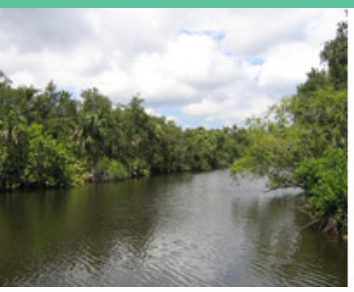
Benefits of Oyster Reef Restoration

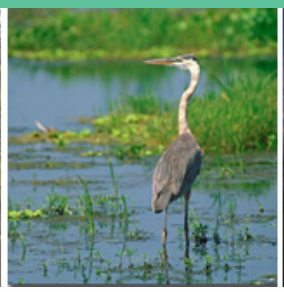
- The reefs will provide essential habitat for oysters and many other species including shrimp, clams, crabs, snails and a variety of fish.
- When fully populated with oysters, the reefs will be able to filter the total volume of the St. Lucie Estuary in about one month.
- Improved water quality will lead to expanded seagrass growth which creates important fish nursery habitat.
- Once the habitat "infrastructure" is in place, if oyster mortality occurs due to Lake Okeechobee releases or natural storm events, oysters will be able to repopulate more quickly. Past monitoring studies in the St. Lucie Estuary have shown this regeneration can occur in as little as one year.
- Oyster reefs along with mangrove and other plantings will serve as effective shoreline stabilizers.
- The marine industry is a significant economic engine in southeast Florida and the health of the marine environment is inextricably linked to the health of our economy. Improved water quality and increased habitat will benefit both commercial as well as recreational fishing and boating.
- Many local jobs ranging from marine construction to scientific research - will be safeguarded - and additional jobs created – through the duration of the project.

What is Oyster Spat?

Spat are oysters that have just settled to the bottom, hopefully finding some structure (prop roots, dock pilings, oyster shell, and natural rock) where they will attach and grow.

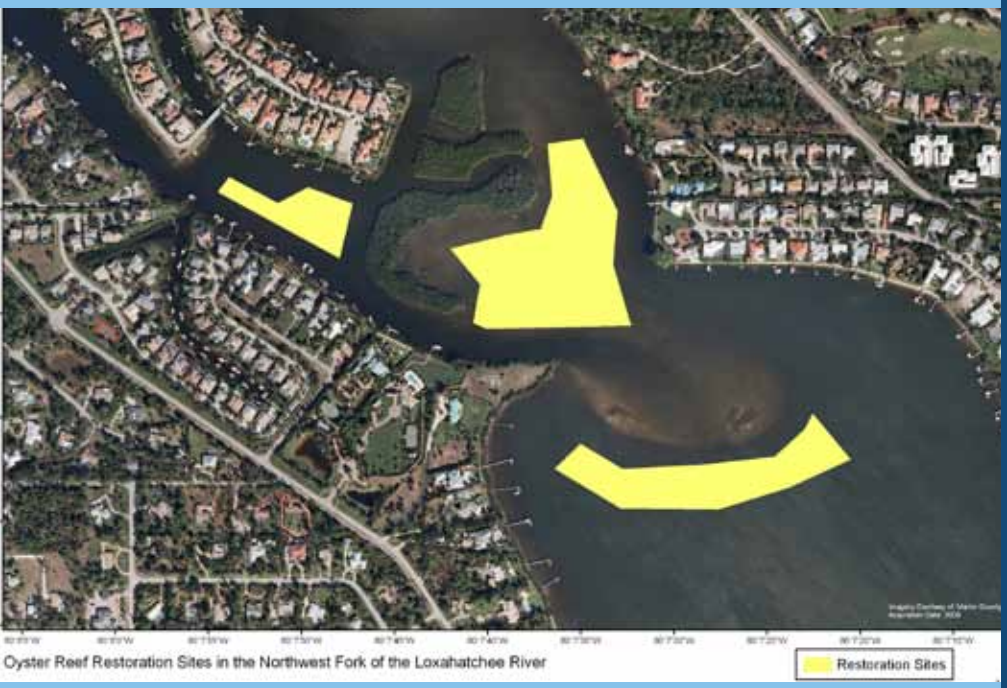
The life cycle of the oyster begins with a free-swimming larval stage that eventually attaches to a hard substrate becoming an oyster spat. The spat begins a growth period that is classified into sub-adult and adult phases.



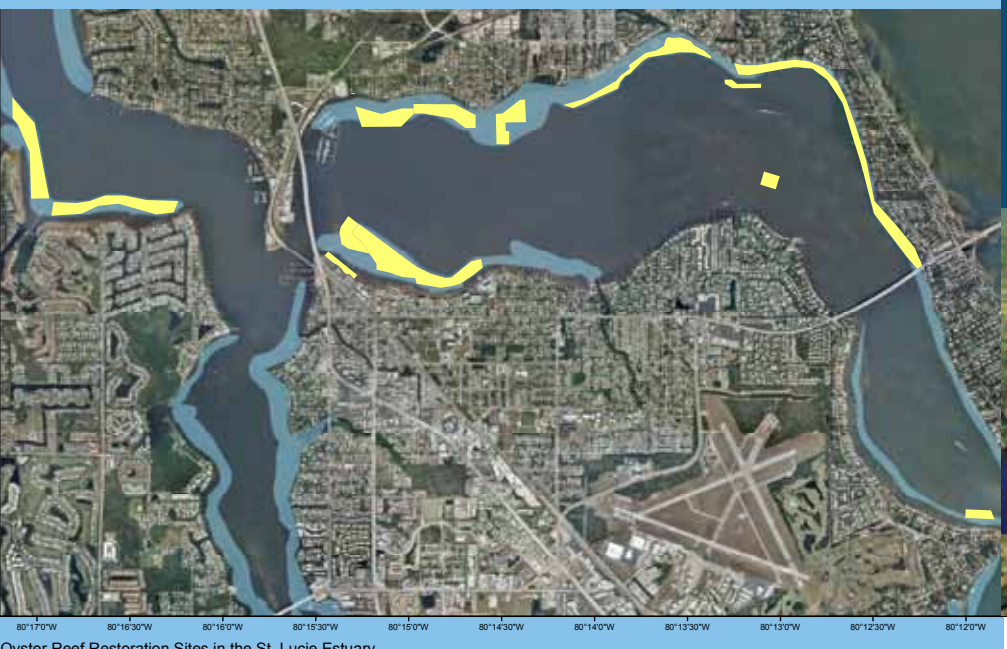


What happens to the Oysters when the water quality changes?

When public health and safety concerns require large releases from Lake Okeechobee, or other negative water quality impacts occur due to storms or other severe weather, oyster mortality levels will increase. These newly created reefs, however, will provide additional areas of refuge for the oyster population within the estuaries, increasing their rate of survival and allowing for a more rapid regeneration of oysters. Remnant shells will also serve to further increase habitat for new oyster populations.



Oyster Reef Restoration Sites in the Northwest Fork of the Loxahatchee River



Oyster Reef Restoration Sites in the St. Lucie Estuary

About the Rivers

The St. Lucie and Loxahatchee Estuaries both play an essential role in the environmental and economic health of the Treasure Coast and the Palm Beaches. These historic, scenic rivers attract an abundance of commercial and recreational activities such as fishing, boating, and ecotourism. They also serve as a source of inspiration for countless artists, writers and photographers and provide endless educational and scientific research opportunities.

From an environmental standpoint, the St. Lucie River has the distinction of being one of the largest brackish water systems on the east coast of Florida and provides vital habitat for many ecologically and economically important fish and invertebrate species. The Loxahatchee River has the distinction of being Florida's first nationally designated Wild and Scenic River. Unlike many other rivers that have been channelized by development, the Loxahatchee remains virtually unchanged.

Partnerships

The Oyster Reef Restoration project is being coordinated through Martin County's Coastal and Water Quality groups, both of which have been involved in water quality and oyster reef restoration efforts in the St. Lucie Estuary area for more than a decade. A coalition of supporters including government agencies, non-profit organizations, community and business leaders and volunteers are participating in various aspects of the restoration project. Key partners include the Loxahatchee River District, the South Florida Water Management District, Florida Fish & Wildlife Research Institute, CSA International, Florida Oceanographic Society, Harbor Branch Oceanographic Institute, Florida Atlantic University, Florida International University and many others.

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OYSTER REEF RESTORATION