

## The state of the bay

**Oysters may be the hardest-working creatures in the water, filters for an ocean's lifeblood. And their massive loss from Ike threatens the entire ecosystem.**

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HOUSTON CHRONICLE**

**Aug. 24, 2009, 12:49AM**



James Nielsen Chronicle

Runt Nelson, of Jeri's Seafood holds an oyster from a reef in Galveston's East Bay last week in Smith Point. The oyster is crucial to the bay system, acting as a filter by removing and disposing of impurities and releasing clean, clear saltwater.

### **GIVING THEM ROOM TO GROW**

East Galveston Bay's state-owned oyster reefs, hit hard by siltation carried by Hurricane Ike's storm surge, would be off-limits to harvest until November 2011 under a proposal to be considered this week.

The Texas Parks and Wildlife Commission will vote Thursday on a staff recommendation to close East Bay's public oyster reefs, some of the largest in the Galveston Bay system, to all harvest for the coming two oyster seasons.

The move is aimed at allowing the reefs to begin recovering and rebuilding after 80 percent of the oysters in the easternmost lobe of the bay system were smothered by silt and other debris swept into the bay this past September.

The Texas Parks and Wildlife Department's coastal fisheries division plans rehabilitation projects that include uncovering some of the oyster shell buried by Ike-carried silt and placing "cultch" — oyster shell, limestone and other hard material onto which juvenile oysters can attach and grow — in other areas of East Bay.

Harvesting oysters from public reefs, for personal or commercial use, is allowed each Nov. 1-April 30. Closing the East Bay reefs to harvest until Nov. 1, 2011 will give any "new" oysters two years to grow before potential harvest. Under average conditions, an oyster in Galveston Bay can grow from larvae to "legal" (shell length of at least 3 inches) in about two years.

Galveston Bay's oysters, crucial to the health of Texas' largest estuary ecosystem and the \$675 million-a-year recreational and commercial fishing industry it supports, have survived more than a century of human indignities, including avaricious gnawing by shell dredgers, burial under spoil from channel dredging and drastic changes in the bay's hydrology.

But many of the remaining patches of the bay's still-vibrant oyster reefs couldn't survive what nature dumped on them this past September.

As Hurricane Ike's wind-driven storm surge raked across Bolivar Peninsula and Galveston Island, it peeled away the skin of sand, soil and vegetation covering the fingers of land and swept it into the bay.

This mix of soil, sand, mud and vegetation settled onto the bay floor, carpeting much of it with a layer of muck.

Approximately 60 percent of oysters in Galveston Bay, including 80 percent of the oysters in East Galveston Bay, lie dead, smothered by that blanket of sediment.

The estimate was made by comparing pre-Ike images of the bay bottom, taken with side-scan radar that the Texas Parks and Wildlife Department is using to map the bay's topography, to post-Ike images and on-site surveys of submerged reefs.

"There were piles of vegetation and debris on the reefs, and these thick windrows of sediment everywhere," said Bill Balboa, Galveston Bay ecosystem leader for TPWD's coastal fisheries division. "It was pretty amazing. No one had ever seen anything like this."

### **Shrimpers fared better**

The loss threatens economic and ecological damage to the state's most commercially important oyster fishery and, more significantly, the bay's entire marine ecosystem. At risk are a recreational fishery annually generating an estimated \$650 million in economic impact and a commercial fishery directly pumping about \$25 million a year into the local economy.

Without the services healthy oyster reefs provide to the bay system — functions marine scientists equate with the work a liver does in the human body — water quality, biodiversity and bay productivity suffer.

"We need to look at oysters as the primary biological indicator of a healthy bay," said Dr. Sammy Ray, professor emeritus of marine biology at Texas A&M-Galveston.

Other Galveston Bay fisheries fared better than oysters both during and after the storm.

The bay's commercial shrimp and crab fisheries, already reeling from economic issues tied to fuel prices and a market dominated by imported seafood, suffered significant infrastructure damage.

But the shrimpers, and the shrimp, have struggled back over the past year. Charged by Ike's flushing effect and an abundance of forage courtesy of all that muck, the bay's shrimp population is thriving.

"Some shrimpers were fishing again within a couple of weeks of the storm," said Lance Robinson of the Texas Parks and Wildlife Department's coastal fisheries division. "Their biggest problem was all the debris in the bay — it was clogging their nets."

Many of the bay's 114 licensed commercial crabbers lost their traps and their boats, or both, to the storm. But most have since refitted, and catches since Ike have been similar to those seen in the past few years.

If only the oysters could be so fortunate.

## **\$320 million repair**

As oysters suffer, the effects ripple through the entire bay system, said Ray, who has spent more than six decades studying and working with oysters and is one of the nation's top experts on them.

To repair the damage — give Galveston Bay's oysters the chance to rebuild their numbers by uncovering some of the smothered reefs and placing hard material on which larval oysters can attach and grow on others — would cost some \$320 million .

Rehabilitation, while expensive, is crucial to maintaining the health and productivity of the nation's seventh-largest estuarine system.

“Oysters are hugely significant to the bay system, and not just for the value of their commercial fishery,” said Lance Robinson, Dickinson-based regional director of TPWD's coastal fisheries division. “Most people don't realize the services to the bay system oysters provide.”

Galveston Bay holds about 26,000 acres of oyster habitat. About 16,000 acres are what are most commonly called “reefs” — consolidated mounds of the thick-shelled mollusks covering as little as a room-size area and as much as 300 or more acres.

These reefs provide food and shelter for almost all species of bay life, from tiny isopods, marine worms and other base-of-the-food-chain species to top-end predators such as speckled trout, redfish, flounder, croaker — the fish on which the bay's thriving recreational fishery is built.

The reefs, solidly anchored on the bay bottom and sometimes rising several feet high, are natural breakwaters, serving to dissipate wave action that can erode the shoreline and muddy the water. Oysters even help reduce carbon dioxide in the environment, sequestering carbon by using calcium carbonate to build their shells.

But bays benefit greatest from oysters' ability to clean the water.

“Oysters' biggest role in maintaining a healthy bay is their filtering capability,” Robinson said. “You could certainly say they're the liver of the bay.”

An oyster population cycles the life-blood of the bay — its water — through its system, removing and disposing of impurities and releasing clean, clear saltwater.

Oysters feed on plankton and algae, and to get the tiny, free-floating morsels, each adult oyster sucks water over its miniscule gills and even finer cilia, which sift out any suspended particles.

If the oyster's “catch” is edible, it swallows and digests it. If it's not — if it's a grain of suspended sediment, even a virus or bacteria or clump of nitrogen molecules from fertilizer runoff — the oyster coats the rejected item with mucus and eventually ejects these packets. Those packets, weighed down by the mucus, settle into the sediment.

## **How to rebuild**

Each adult oyster filters prodigious amounts of water — as much as 50 gallons every day. Clearer water means fewer suspended pollutants and more aquatic vegetation, which leads to more habitat for marine life.

Texas coastal fisheries managers say providing habitat on which young oysters can permanently attach and grow is the key to rebuilding Galveston Bay's damaged oyster population.

They hope to provide that needed habitat by uncovering some of the oyster shell buried by Ike's sediment load and placing tons of suitable hard material in areas oysters are most likely to thrive.

Preliminary plans are to employ commercial oyster fishermen to use their oyster dredges — rake-like devices dragged behind oyster boats — to “plow” reefs covered with a relatively thin layer of sediment, exposing the shell. On reefs buried under deeper muck, tons of “cultch” — limestone, recycled oyster shell, crushed concrete and other suitable material — would be deployed atop the moribund reefs to provide substrate to which oyster larvae might attach .

Funding for the projects could come from federal grants akin to those awarded to Louisiana to counter severe loss of oyster habitat from hurricanes Katrina and Rita in 2005.

Gaining such funding is at best a multi-year process . In the meantime, state coastal fisheries managers are doing what they can with whatever funds they can scrounge.

“We've been doing preliminary investigations to prioritize which reefs we should concentrate on first,” Robinson said. “We hope to be able to get people out there, working on the reefs, by November.”

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