

The race to cure the region's ailing oysters

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By Kim Motylewski, Globe Correspondent | January 18, 2005

EDGARTOWN GREAT POND -- Paul Bagnall tossed a dragger over the side of his ramshackle vessel and pulled up a half-dozen mud-coated, wild oysters, and a clump of pond slime. There were no other oystermen in sight that drizzly day on Martha's Vineyard.

Bagnall, the town's shellfish warden, tried a few more times, with each throw bringing up as many gaping, empty shells as tightly sealed live ones.

For a decade, the oyster population in this pond has been afflicted by a parasitic disease called Dermo, which has been slowly moving northward since the 1940s. It is harmless to people who eat the bivalves, but can be deadly to oysters, and has decimated populations from the Gulf of Mexico to Chesapeake Bay.

The story of the parasite's progress in Edgartown contains a seed of hope for the oyster industry across New England.

At one point, 60 percent to 80 percent of Edgartown's oysters were dying each year from the parasite, which can take months or years to kill depending on water salinity and temperature. Right from the start, though, Bagnall could see that some oysters survived Dermo's onslaught.

Today the pond has some infected oysters believed to be 3 to 5 years old, and has supported an oyster season for the last two years. The recovery has been "kind of like watching a little bit of evolution," Bagnall said.

He and others are convinced the survivors must have some kind of resistance to the disease, which they are now trying to understand.

A few miles up the road, earlier the same day, Rick Karney hauled a wire cage out of the water and onto his dock in Lagoon Pond. The cage is like a small bureau with shellfish growing in each of its drawers. The top drawer holds about two handfuls of tiny shells that Karney, the hatchery's resident biologist and director, placed there in late July. The shells are only the size of dimes, but they've already assumed the lopsided shape and craggy ridges of oysters. These babies were spawned from Dermo survivors living in Edgartown Great Pond.

Another drawer holds similar-looking youngsters, but they are the offspring of animals from another of the Vineyard's ponds, which had not yet been exposed to Dermo. Karney hopes these animals will survive the winter to become subjects of experiments next spring: "We'll set out both groups in Edgartown Great Pond to see if the offspring from the Edgartown brood stock survives better than the unexposed controls."

If they do, Karney and his collaborators from the Marine Biological Laboratory in Woods Hole and Cape Cod Cooperative Extension Service will use traditional, selective breeding to shape the new recruits. Their goal is to identify genes or aspects of the immune system associated with Dermo-resistance and develop a brood stock that is disease-resistant, and adapted to local water conditions

Similar breeding efforts in New Jersey and Louisiana have worked, though those oysters don't grow well in Massachusetts.

In susceptible oysters, the parasite first attacks the stomach lining, then circulates in the animal's body fluid destroying tissue over a few months or years, depending on the severity of infection. Oysters can have mild cases, and live long enough to be harvested. If they die in the wild, they release their remains into the water, infecting other oysters.

The disease originally was thought to be a fungus, and was named *Dermocystidium marinum*, or Dermo for short. It's now known to be a protozoan parasite, *Perkinsus marinus*, but watermen still use the old nickname.

Dermo has been increasingly present in New England over the last decade. Even as Martha's Vineyard's wild oysters suffered, Cape Cod's oyster industry has so far escaped the kind of devastation seen in the Chesapeake, thanks to the climate and other environmental factors like salinity. But conditions are changing.

Roxanna Smolowitz, an aquatic veterinary pathologist at the Marine Biological Laboratory, estimated that Dermo is present in five out of six areas on the Cape. "But I think it's been getting worse," she said.

Water temperature is the biggest factor in determining progression of this disease, Smolowitz said. It prefers warmth, but it can survive the winter.

"So, if you have a short fall and a cold winter, there's a good chance your oysters will make it to harvest," she said. Harsh temperatures will reduce Dermo's prevalence and strength. "But if the fall is long and winter is warm, it's tougher."

In fact, it appears that water temperatures from Virginia to New Hampshire are rising, which could mean wider, stronger outbreaks of Dermo in this region.

Stephen Granger, an oceanographer at the University of Rhode Island, has documented significant warming from 1970 to 2002. He found that annual mean water temperatures averaged about 1.2 degrees Celsius warmer in the 1990s than they had between 1890 and 1970. Winter water temperatures were up by 1.7 degrees Celsius.

Cape Cod Cooperative Extension Agent and oyster grower Bill Walton said that it is difficult to predict whether the outbreak is worsening on the Cape because it isn't apparent which oysters are sick. Often the shellfish turn up dead just as they are reaching the legally marketable and most appetizing size -- between 3 and 3 inches in diameter.

Oyster aquaculture generates at least \$1.3 million per year -- and probably far more, according to state officials -- for the 120 or so growers on the Cape and Islands. Wellfleet is the single biggest producer in the Northeast, said J. Michael Hickey, shellfish program chief for the state.

For now, Walton said, "Dermo is not preventing the business from succeeding, but it is a major risk out there." Wild populations face a whole array of variation and hazards, he said, "but for farmers, Dermo is the biggest risk." ■