

Shelling out

By **DOUG FRASER**
STAFF WRITER

Nantucket is suffering through its second bad scallop season in a row.



■ Marc Allain, owner of Lobster Trap in South Yarmouth, scoops up scarce bay scallops at \$30.99 per pound.
(Staff photo by Paul Blackmore)

The islands, including Martha's Vineyard, are generally considered the lone bright spots in the state bay scallop fishery, whose landings have plummeted from 1.8 million pounds in 1969 to a bit more than 200,000 pounds by 2003 and 50,000 pounds in 2005.

Some point to increased numbers of predators such as green crabs and whelks, overfishing of juvenile scallops, or bad spawning seasons. But most agree that one critical component, what Nantucket town biologist Keith Conant calls the "binding factor" in the scallop equation, is in trouble.

It's just one part of a worldwide problem in which coastal sea grasses are under attack by a combination of the effects of development along the world's shorelines and global warming's impact on ocean temperatures.

Tiny scallop larvae attach to the ribbonlike blades of eelgrass that blanket portions of the Atlantic coastline in waving meadows. The grasses offer protection from predators, provide an anchor for the larval shellfish and

slow down the sea currents enough that scallops can feed on the plankton in the water.

"The harbor, according to most standards, is healthy but there are areas where (water quality) is declining and somewhat poor," Conant said. "Eelgrass in Nantucket Harbor has been declining steadily over the years."

Coastal scientists have grown accustomed to a gradual drop-off in eelgrass, but have seen an alarming trend over the past decade in which some eelgrass meadow beds close to shore have been dying off rapidly, sometimes in a couple of years.

Charles Costello, in charge of the state Department of Environmental Protection's wetlands mapping program, is surveying all of the state's eelgrass beds. He estimates a typical 2 percent to 3 percent drop-off in eelgrass each year. But in some areas, the deterioration has been much more rapid.

In Buttermilk Bay in Bourne, for example, Costello mapped relatively healthy amount of eelgrass beds in 1995.

"I was really shocked when I returned in 2001 and found nothing," he said.

The worst may be yet to come.

Higher ocean temperatures due to global warming, combined with elevated levels of algae, sediments from coastal development and boat traffic, may kill off eelgrass quickly as it has done in Chesapeake Bay.

"Under cooler temperatures, they could outlast eutrophication, but here, plants are dying of heat stress," said Linda Deegan, a senior scientist at the Marine Biological Laboratory in Woods Hole.

Eutrophication is a process where excessive amounts of nutrients enter water bodies fueling rapid plant growth. With an increasing number of septic systems, lawns and roads contributing nitrogen, lawn fertilizers and sediment to shoreside water, there are more algal blooms, which block sunlight from reaching plants. They also speed the growth of algae that grow on the plants themselves. It's like putting dark sunglasses on the plants' photosynthetic cells. Boat traffic, which stirs up bottom sediments, also clouds the water.

Eelgrasses are simple grasses that require a specific amount of sunlight to produce food. The water needs to be clear for that sunlight to reach the plants, especially in deeper waters.

Often eelgrass is forced to grow in shallower water where conditions are marginal. Eelgrass likes cooler water temperatures, but shallower waters heat up in summer. Relief from heat generally comes when cold offshore waters circulate into the inshore areas. With higher offshore water temperatures in recent years, the inshore waters haven't been cooling down as much. The combination of warmer waters and the stress from poor water quality may just be too much for the sea grasses, Deegan said.

University of New Hampshire sea grass researcher Frederick Short said temperatures in some of the small bays he monitors in his state reached 98 degrees last summer. While Short agreed the Chesapeake is feeling the effects of ocean temperature rise, he believes New England waters may still be cool enough for eelgrass to thrive if other conditions are improved.

But we may have only a few more years until ocean temperatures here warm up to the point where it is a factor, Short said.

Eelgrass is an important habitat for more than just scallops.

"I've done work that shows that the abundance of fish, in general, is 20 times higher in an eelgrass bed than in any adjacent areas," Deegan said. She believes these sea meadows may be the most important submerged habitat in New England waters.

The good news is that the grasses are resilient. Deegan believes that if nutrients and sediment in coastal waters, are reduced, the sea meadows will return.

It has happened before. Eelgrass suffered a massive die-off in the 1930s, when 90 percent of known beds were wiped out by an underwater slime mold. The meadows have mostly grown back in the intervening decades.

"If we can address the regional issue, the nutrient problem, we could have lush eelgrass beds. I'm sure of it," Deegan said.

Costello is not as optimistic. He said dying eelgrass beds tend to become mucky as the dead plants decompose on the bottom. Eelgrass seeds and seedlings like sandy bottoms, and it makes the rebuilding time much longer, if not impossible, he said.

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