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Cordgrass struggles to stay dry

By HAL BROWN

Hour Staff Writer

NORWALK -- Like any drowning victim, the cordgrass along the Five Mile River is struggling to keep the water from closing over it. With an accelerating increase in sea level during modern times, though, the marsh plants are losing their bid for survival. What was a healthy green estuary of nine or 10 acres in the mid-1930s makes up a single, sparse, patchy acre today.

The die-off of marsh plants on the Five Mile River between Rowayton and Darien may be New England's most obvious manifestation of the rise in sea level.

Dr. Johan Varekamp of Wesleyan University has studied the coastal geology of Connecticut for a number of years, concentrating mostly on the marshes in the eastern end of the state and of Long Island Sound. "In the eastern marshes, we find evidence over the last two or three decades for a drowning" of marsh plants, Varekamp said. "But it's a very subtle hint. At the Five Mile River, it's not a subtle hint. It's changed from a nice marsh meadow to a mudflat." Marsh plants seem to be dying in areas just inland from the coast. Ron Rozsa, chief of the technical section for the Connecticut Department of Environmental Protection Office of Long Island Sound Programs, said that pattern of die-offs is visible in nearly every one of the state's wetlands. It's more prevalent on the western end of the Sound, where the range of tides is higher -- seven to eight feet at Greenwich -- than in the eastern end, where the tides vary only a few feet. The Five Mile River marsh has lost 60 percent of its area in the last 20 years.

Rozsa said similar losses have been noted on the Sound's New York shore.

The extent of the wetlands lost in Connecticut due to the sea level increase hasn't been calculated, and few people are doing studies. A group of scientists from Connecticut College is researching long-term marsh elevation changes on Barn Island in southeastern Connecticut, and another group from Yale University and the University of New Haven is studying wetlands along the Quinnipiac River, where several hundred acres of marsh have been lost.

Western Connecticut, where the problem is the most severe, has received hardly any attention from researchers. A conference at Stony Brook on Long Island early this month was the first gathering of marsh experts to explore the losses on the western end of the Sound.

The plants in the estuary just inland from the coast are stressed because they can't adjust to the rising sea level. Bill Shadel, director of research and restoration for Save the Sound, said the increase, estimated at 4.4 millimeters a year (about .17 inch) may seem negligible, but is too much for the plants.

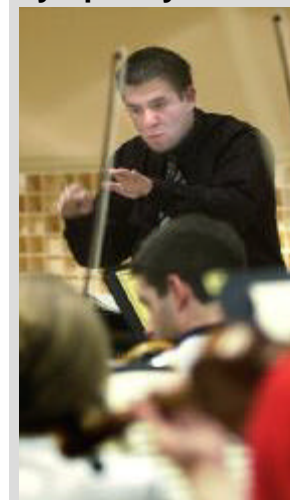
Saltwater cordgrass, the dominant marsh species, grows at a specific elevation in relation to the tide, he said. The brackish estuary is stressful for plants already, which is why there isn't a great variety of plants in the marsh, he said. The rise in sea level, he said, "may be enough to stress them and cause them to die off." The marsh plants would typically migrate landward, but along the Five Mile River, seawalls and cultivated areas provide a hard edge against that

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Eastern Festival Symphony



Zachary Nobile Kampler of Norwalk conducts the Eastern Festival Symphony Orchestra which he founded during a rehearsal for an upcoming concert at the Norwalk Concert Hall August 16th.
 Hour photo / Erik Trautmann

advance. "As the sea level goes up, the fringe goes up," he said. "The plants in what is now basically a mud flat don't have anywhere to go." Shadel said the increase in sea level may not be the only reason the marsh is dying. The marshes just inland from the coast are sediment-starved for a reason yet to be determined. He said, too, that the inland marsh area may not receive as vigorous a flushing from tides as other areas do. He compared the tidal action in the western end of the Sound to sloshing in an overlarge bathtub.

That relatively static condition may lead to the build-up of nitrogen and other pollutants that may affect plant growth, he said. Nitrogen, a fertilizer for most plants, may not be available to the marsh plants when it is suspended in the water column, he said. It may also accelerate the decomposition of the peat in the marsh, a necessary component for plants trying to achieve the proper elevation with the tides.

The key to restoring the area is retaining enough sediment in the marsh to raise the bottom high enough to let the plants root at the proper level. Shadel said Save the Sound hopes to lay out some test plots to trap sediment next spring. The plots call for coconut fiber "logs" to be laid in the marsh surrounding the plots. The "logs" are fiber-stuffed netting roughly a foot in diameter. "The advantage to these coconut fiber logs is they're kind of porous," Shadel said. "They tend to trap a lot of water, then as the water settles out they trap the sediment." The project envisions nine to 12 20-foot-by-20-foot plots, scattered over five or six acres of riverside marsh.

The grass spreads quickly once the proper elevation is achieved, he said. Shadel said plantings of cordgrass may be placed in planter-like tubes at varying elevations to determine the optimum level to let them flourish.

Save the Sound is conducting the research plantings with the help of a \$40,000 grant from the National Oceanic and Atmospheric Administration's Fisheries Restoration branch, and the private Restore America's Estuaries organization. Local fund-raising has also helped finance the project.

The project, which was scheduled to get under way this year, has been delayed awaiting DEP approval. Shadel said word on that approval should come in a few weeks, but the project likely won't start until spring next year because growing conditions are better with the earlier start.

The Five Mile River marsh was once particularly abundant. A 1972 study by ecologists William Niering and E. Zell Steever estimated it was producing 8.9 tons of cordgrass per acre. That compares to marshes in Delaware (2.5 tons), New Jersey (2.2 tons), and Maine (3.2 tons) as well as other parts of Connecticut, including Westport (6 tons), Greenwich (6.9 tons) and Barn Island (2.2 tons) that were used for comparison.

The Environmental Protection Agency estimates there are about 63 square kilometers of land five feet or less above sea level along the Connecticut coast and another 48.6 square kilometers between 5 and 11.5 feet that could be subject to sea level changes.

Salt marshes are an important part of the coastal ecology. Shadel said fisheries, especially, are dependent on estuary areas.

"Most fish that anyone eats spend part of their life in a salt marsh," he said. "Birds depend on (marshes); they come in, nest and feed." The shallow flats provide protection and food for a number of juvenile marine species.

Shadel said if the restoration technique works it may be used widely. A similar technique has been used in Holland to help raise the mainland relative to sea level, he said.