Cape ponds lack pollution cleanup

Freshwater ponds may be the poor relations in the Cape's wastewater debate.

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of phosphorous added via wastewater, lawn fertilizer or road runoff can produce 500 pounds of algae, which suck out oxygen needed by fish, water lilies and other pond life. Nitrogen promotes algae growth in marine waters.

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Freshwater ponds may be the poor relations in the Cape's wastewater debate.

Most of the concern — and money — has been focused on the bad effects of excess nitrogen in groundwater ends up. Officials estimate the effort to clean up high levels of nitrogen from the Cape's marine waters, including sewers and new wastewater treatment plants, will cost between $4 billion and $8 billion.

But information collected in the last decade shows that water quality in the Cape's 994 lakes and ponds has also declined significantly due to the buildup of phosphorous from septic systems, lawn fertilizers and road runoff. But freshwater bodies are not getting the same level of regulatory review that have driven cleanup efforts and protection of saltwater areas.

Ironically, ponds are most often mentioned within the context of an estuary cleanup plan as a cost-efficient way to absorb nitrogen from the groundwater, saving towns money that might go to treat wastewater flowing from septic systems into saltwater bays. There even have been studies on how to alter small shallow ponds to make them more efficient at removing nitrogen.

"A lot of people are concerned that (ponds and lakes) are getting overlooked and will get short shrift," said Judith Bruce, one of the founding members, and past president, of the Orleans Ponds Coalition.

The federal Clean Water Act requires communities to identify impaired freshwater ponds and lakes and set limits on the amount of phosphorous and other contaminants that flow into them, just as they do with contaminants in estuaries.

A landmark 2001 report, "The Cape Cod Pond and Lake Atlas," used volunteers from the Cape Cod Pond and Lake Stewardship Project to collect 421 water quality samples from 195 ponds. The survey found that between 74 percent and 93 percent of the Cape's ponds had been affected by surrounding development or land use.

Approximately 45 percent of all the sampled ponds and 89 percent of the deepest ones showed damage that under federal and state law would require the state to set Total Maximum Daily Loads, or TMDL, for contaminants like phosphorous. Similar surveys in the years since then have corroborated the 2001 report.

The good news is that most still were healthy enough for swimming, fishing and boating. Of the 67 impaired Cape water bodies requiring a TMDL on the most recent state list compiled in 2008, 11 were freshwater ponds.

In Brewster volunteers and others have collected water quality information on 29 of the town's 80 ponds and sent it to the Cape Cod Commission and the University of Massachusetts-Dartmouth, but the town has received technical reports from the Massachusetts Estuaries Project at UMass-Dartmouth on just two.

The state Department of Environmental Protection sets a TMDL after reviewing the information contained in the reports. Towns then use those numbers to write a management plan that will restore the water body to a healthy state.

"My impression is that the estuaries come first," said Brewster Town Planner Susan Leven.

DEP spokesman Ed Coletta said his agency is short-staffed with only four people handling 1,600 TMDL requests statewide. He said 430 have been done, with another 230 being worked on now.

Since 70 percent of state waters are affected by nutrient and bacterial contamination, they have been the priority. On the Cape, the DEP has decided to tackle the estuaries first given the large push to deal with that problem and the amount of money involved in the cleanup.

"(The ponds and lakes) are going to get done, but we need to move forward with the estuaries pieces first," Coletta said.

Since most of the Cape's freshwater ponds are primarily fed by groundwater, the analysis required to establish the TMDL takes more time and money than other types of ponds and lakes, he said.

"If it is on the impaired list, it eventually has to get a TMDL, and (remediation) work has to be done, but we obviously have staffing issues," Coletta said.

The wastewater issue has been centered on removing nitrogen, which acts like a fertilizer in the marine environment and spurs the rapid growth of plants, especially algae, which utilize nitrogen more efficiently than other plants and can overwhelm an ecosystem. Algae suck oxygen from the water both in their respiratory function and in decomposition after they die. Without oxygen, marine life dies.

But the problem in freshwater ponds is too much phosphorous, one of the essential building blocks of plant growth.

Almost all the phosphorus that is naturally available in a pond comes through plant decomposition and is quickly used by growing plants when available.

So when humans started adding phosphorous to ponds through wastewater, lawn fertilizer and road runoff, it was like throwing gasoline on a fire, because plants require only small amounts of phosphorus to grow.

In Brewster's Seymour Pond, University of Massachusetts scientists calculated that annually between 22 and 92 pounds of phosphorus enters from septic systems, road runoff, lawn fertilization and bird droppings. In some ponds, the phosphorus that has accumulated over time in sediment also can be cycled back up into the water column to be used by plants. Every pound of phosphorus that enters a pond can produce 500 pounds of algae.

Some towns, and now the Massachusetts Military Reservation, are treating ponds with aluminum sulfate, known as alum, to lower phosphate levels. But that decision has been controversial in places such as Long Pond in Brewster and Harwich, where opponents argue the alum can cause fish kills and damage other pond life.

Edward Eichner, a water scientist working with University of Massachusetts School of Marine Science and Technology in Dartmouth believes that all towns should be evaluating their drinking water, ponds and estuaries when developing comprehensive wastewater management plans.

"You're looking at a big ticket item for estuaries. I think it would be good to look at everything together," he said.

Cape Cod Commission Water Resources Program Manager Thomas Cambareri does not think the ponds are neglected or that they will be harmed in the marine cleanup.

"We have the data to make informed decisions," he said.

But he wondered if the effort to deal with an enormous and expensive marine cleanup was sapping away the will and the money to do the same for ponds.

"Given the level of effort that Cape Codders have undertaken now with the marine environment, are there any resources or energy left for people to deal with TMDLs on ponds in that manner?" he asked.