

# THE IPA NEWSLETTER

Mystic Lake, Middle Pond, and Hamblin Pond

Winter 2006

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## FINAL POND STUDY RESULTS

The final report of the IPA Pond Study, soon to be made available to the public, confirms what Ed Eichner of the Cape Cod Commission's Water Resources Office reported last July at the IPA Annual Meeting: that water quality in Mystic Lake is impaired due to excessive levels of phosphorus. Although water quality in Hamblin Pond and Middle Pond is of some concern, conditions in those two ponds are generally good.

This study of the three Indian Ponds, as previously reported in this newsletter, began in early 2004 as a collaborative effort by the IPA, the Cape Cod Commission, and the Town of Barnstable. Funding was provided by donations from IPA members, with the substantial cost of laboratory water analysis at the University of Massachusetts Dartmouth covered by the Town. Water samples, plus measurements of dissolved oxygen, temperature, and clarity, were collected by IPA volunteers bi-weekly from spring through fall in 2004 and again in 2005. Laboratory analysis of the water samples determined concentrations of total phosphorus, total nitrogen, alkalinity, pH, and chlorophyll *a*. Data provided by the IPA sampling were compared with benchmark data from other systematic pond sampling projects dating back over 50 years, serving as the basis for the Cape Cod Commission's report.

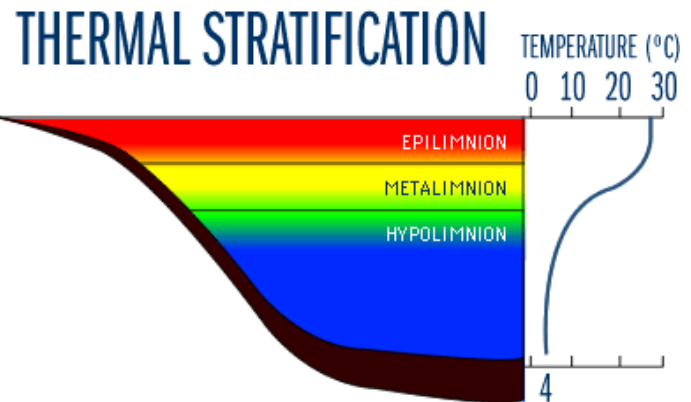


Diagram showing the different water layers in ponds deeper than about 30 ft that separate or stratify in the summer into different layers.

Temperature and dissolved oxygen measurements from surface to bottom show that water in Hamblin Pond and Mystic Lake, the deepest of the three Indian Ponds at about 62 and 42 ft, respectively, form a warm, well-mixed upper layer (epilimnion) overlying a cold, deep layer (hypolimnion) in a process called stratification (see above figure). Middle Pond, being shallower (about 31 ft deep), is well mixed from top to bottom due to wind action.

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A healthy pond on Cape Cod is defined as one in which the phosphorus concentration is 10 parts per billion (ppb) or less. In the IPA study, Hamblin Pond (treated with alum in 1995) was found to have an average surface concentration of 8.4 ppb, over 8 times lower than in 1993 (69 ppb) before the alum treatment. The overall average concentration in Middle Pond in 2004 was 10.6 ppb. For Mystic Lake, however, the average concentration in the upper two sampling depths in 2004 was 16 ppb, with anoxic conditions (no oxygen) during the summer extending from the bottom far up toward the surface. *continued on page 2*

### FORUM ON WATER QUALITY CONCERNS

A forum on water quality concerns in ponds and bays on Cape Cod will be held Sunday February 12 at the Barnstable Unitarian Church on Route 6A in Barnstable Village. A light lunch of soup and bread will be served at 12:30, with the program starting at 1:00. Speakers will be Emory Anderson, President of the IPA, and Nate Weeks, Engineer with Stearns and Wheler, LLC. A question-and-answer session will follow. The forum is open to all who are interested.

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### HERRING BAN FOR 3 YEARS

A 3-year ban on the possession of river herring was passed last fall by the MA Marine Fisheries Commission because of a drastic decline in abundance in the Northeast. Harvesting of river herring will be prohibited in all Commonwealth herring runs, including the popular run at Mill Pond at the junction of Routes 28 and 149 in Marstons Mills. This also applies to the Middle Pond run where harvesting in recent years has always been prohibited. Fisheries scientists speculate that the population decline is likely due to heavy predation at sea (e.g., striped bass, grey seals), commercial bycatch at sea, human harvesting during the spring migrations into freshwater, and/or drought conditions for several years in the early 2000s that prevented adult fish from reaching freshwater ponds to spawn and/or juveniles from getting back to the sea.

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*This Newsletter, with a circulation of 475, is a forum for the exchange of ideas on matters germane to the IPA mission and, as such, the views expressed by authors of articles do not necessarily represent official IPA policy.*

## FINAL POND STUDY RESULTS *(Cont'd from page 1)*

In the sediments at the bottom of all three ponds, organic matter decays, consuming oxygen in the process and producing anoxic conditions in the depths. This lack of oxygen permits phosphorus bound up in the sediments to be released into the overlying water. This phosphorus, in turn, fertilizes the growth of algae and rooted aquatic plants. When the algae die, they sink to the bottom and consume oxygen as they decay, creating conditions that foster the release of yet more phosphorus in an unhealthy cycle that eventually results in serious degradation of water quality.

As the amount of phosphorus in the water available to support the growth of algae and other plants increases, the clarity of the water decreases because of particles of live and dead algae suspended in the water. Depth of clarity, measured by Secchi disk, in Hamblin Pond has improved from less than 3 ft in 1948 to an average of 21 ft in 2004. Average depth of clarity in Middle Pond in 2004 was almost as good at 19 ft. In Mystic Lake, however, this measure averaged only 10 ft compared to 15 ft in 1948.

In addition to regenerating from sediments, phosphorus may also enter the ponds from groundwater, which flows from northwest to southeast through the three-pond area, containing septic system seepage, and also from waterfowl droppings. The elevated phosphorus levels now observed in Mystic Lake are thought to be primarily a result of regeneration from pond sediments and only secondarily from septic systems. This is because phosphorus travels extremely slowly through the ground (3 ft per year on Cape Cod). Septic systems around the ponds are generally new enough and far enough away from the ponds that their seepage has not yet reached the ponds, although they will certainly become a significant source of phosphorus loading in the future.

The staff of the Cape Cod Commission's Water Resources Office has recommended that the IPA and the Town consider **three parallel steps to remediate Mystic Lake**. The **first step** would be to address the phosphorus regeneration from the sediments. This could be done in a number of ways, such as alum treatment (see Summer 2005 issue) or aeration, any of which will likely require a permit and associated public hearings by the Town Conservation Commission, and will likely involve further sampling, study, and possible involvement by State agencies. An additional benefit of whatever remediation process is undertaken for Mystic Lake will be a reduction of the threat to Middle Pond, as Middle Pond is directly affected by conditions in its upstream neighbor.

The **second step** would be a number of activities to address the external sources of phosphorus loading, namely wastewater from septic systems and waterfowl droppings. Reducing the wastewater component could be done by sewers. Additional analysis,

warranted by the high cost of a sewer system, should include review of a) alternative treatments that utilize existing or upgraded septic systems; b) issues associated with design of a collection system, and c) cost evaluation of the various options.

The **third step** would be a review of existing regulatory programs (i.e., Town Board of Health, Conservation Commission, and Planning Board) and their regulations and bylaws to evaluate potential changes to better protect future water quality.

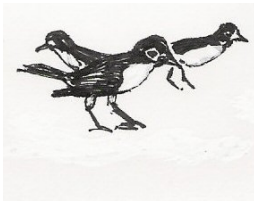
The report also recommends that the Town and/or the IPA continue to monitor all three Indian Ponds following a sampling protocol similar to that used in 2004 and 2005. The final report, when complete in several weeks, will be available on the IPA website: ([www.indianponds.org](http://www.indianponds.org)).

## IPA ON RADIO AGAIN

In case you missed it, IPA President Emory Anderson was on the air 7 am Saturday February 4 on radio station WXTK's (95.1 FM) *Spectrum* program and again at the same time and same program Sunday February 5 on sister station WCOD (106.1 FM). Interviewed by Mark Mumford for nearly a half hour on January 25, Anderson talked about the early years and accomplishments of the IPA and the organization's various activities of the past five years, including the major Pond Study, its conclusions, and recommendations.

This broadcast is the second to feature the IPA and its work. The first, reported in the Fall 2005 issue, was on WQRC's *Sunday Journal* program that was aired on October 23. Feedback from various listeners was positive. Hopefully, the most recent broadcast will also help heighten public awareness of the IPA and its mission.

## WINTER ROBINS



Too often, as we carefully pack away the holiday decorations and recover from the New Year's festivities, we are prone to feel that nothing will be really happening on the Cape for several months. Certainly, no tourists or visitors during the Cape winter – especially after last year!



Drawings by Robert Mesrop

We can be reassured, however, that one of nature's greatest annual performances is about to unfold in front of us; the arrival of *Turdus migratorius*, the winter robin, from Canada! Now, it is no coincidence that thousands of these visitors appear in Marstons Mills. The winter robins love our holly berries! There is no better spot to enjoy the feast with all of our varied specimens of holly, as well as other fruit-bearing trees, bushes, and vines which bask on the southern slope of the terminal moraine!

The winter robin is slightly larger than our spring/summer robin, that familiar worm hunter who long ago headed south for the beaches and warmer climes. Our northern guests have large, brick red chests with deep black heads merging into the gray feathers of the back. They used to simply stop over in our area before heading south to the regions of New Jersey, Pennsylvania, and Virginia. More and more, however, we are noticing that many are remaining here through the winter to relish the legendary warmth and offerings of our local hospitality.

What fun they are to watch as they swiftly swoop back and forth in flocks that can be as large as a hundred birds! A tree will be bare one moment and then, swoosh, it is inhabited with scores of winter robins who are having a feast! In the same

way, responding to a cry indicating a new discovery or a warning call, they will simultaneously fly away to another feeding ground!

While in the trees, they put on a show that would cause the Cirque de Soliel or the Boston Ballet personnel to blush with envy. Mind you, these robins are not light, delicate birds. They are hefty! Nevertheless, as they devour the berries, with claws firmly anchored on the wavering, bouncing branches, they are upside down, sideways, and in graceful perpetual motion. Even the sprigs of the bright red berries at the end of tiny branches are not immune. Shifting to their shorter "helicopter" wing cadence, they will hover in the air like a humming bird and snip off the berries, one at a time!

As you can well imagine, preliminary studies have already been completed to determine what happens after they leave. One study concluded that there was an overwhelming 85% fertilization rate of the fruit seeds that were left behind. Ahh, yes, perhaps with those invasive vines, but certainly not our hollies!

Enjoy the winter robins. They will be here for several months! Or, perhaps longer?

Betty Ann and Rick Wheeler

SMEDLEY

by Gordon Nelson





## A BOOK TO READ...."Living Downstream" by Sandra Steingraber

I was fortunate to hear Dr. Steingraber, along with other well known environmentalists, speak at a Woods Hole Research Institute symposium on environmental issues. At that event, I became aware of her book "Living Downstream", and the title caught my interest because of my affiliation with the Indian Ponds Association.

Dr. Steingraber, who holds a Ph.D. in biology from the University of Michigan, has followed in the footsteps of Rachel Carson, whom she quotes often, in raising alarms regarding the widespread use of synthetic chemicals in every facet of our lives. Like Rachel Carson, Steingraber contracted cancer as a young woman, attributed to environmental exposure, and while she continues to be cancer free, she speaks with an understandable passion about the need to limit our exposure, and especially that of our children, to toxic chemicals.

Much of her personal story is drawn from the environment in which she grew up, a farming community in Illinois, but like the well-trained scientist she is, she supports her conclusions using data from throughout the country. Among other areas

mentioned, the book includes a brief discussion of elevated cancer rates and pollution sources right here on Cape Cod.

There is a great deal of troubling data in the book, but all of it is backed up with more than 60 pages of source notes. Perhaps most troubling is the fact that specific chemicals in everyday use are classified by the US Environmental Protection Agency as probable human carcinogens.

The lessons are easy to draw for those of us living on Cape Cod, for with a sole source aquifer, we are all "living downstream". Do we know what chemicals we put into the ground through septic systems, lawn care, car and boat care? If we make the assumption that the products we use are safe because they are sold in the local hardware store or are applied by the local lawn care company, we may be in for a surprise. It behooves all of us to become educated consumers, guided by the principle of using the least toxic alternative. I highly recommend this important book, and it's at the Marstons Mills Library!

*Sheila Place*

### SCHWARM MEMORIAL SCHOLARSHIP

As reported in the Fall 2005 issue, the IPA Board of Directors has established the Schwarm Memorial Scholarship in memory of Edward Schwarm, former IPA Board members and officer who died in May 2005. All details have now been finalized and an application form prepared and submitted to the Barnstable High School Guidance Department. One \$500 scholarship will be awarded to a worthy, college-bound high school senior residing in Marstons Mills. The deadline for submission of applications is April 1.

Contributions to the scholarship fund are encouraged (see additional information in letter accompanying this newsletter).



Racing horses down Race Lane at Mystic Lake in ca 1910, a pastime that reportedly led to the name of the road.

*Photo courtesy of John Cullity*