

# THE IPA NEWSLETTER

Mystic Lake, Middle Pond, and Hamblin Pond in Marstons Mills, MA

Fall 2012

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## THE STORY OF PALS

The Cape Cod Pond and Lake Stewards (PALS) Program began as an idea that Cape Cod was blessed with hundreds of ponds, that these were used regularly for swimming, boating, and fishing, and they were one of the keys to the twin Cape economic engines of vacationing and retirement, but also with the acknowledgement that we knew very little about them. Aside from a handful of pond studies, little was known about their water quality or how to ensure that they would continue to provide economic and environmental benefits.

During the crafting of the 1989 Cape Cod Commission Act, "protection of groundwater, surface water and ocean water quality" was included as one of the CCC responsibilities. Much of the CCC initial focus was on the protection of drinking water, but as the 1990's progressed it became increasingly clear that surface water quality, both ponds and estuaries, needed at least equal attention. In my job as a CCC water scientist, we began to have discussions with Cape towns, state agencies, local advocacy and conservation organizations, and the University of Massachusetts Dartmouth about how to begin to develop reliable information that could provide reasonable management strategies for these surface waters. Using the concerted efforts of all these groups, the CCC was able to successfully pool some state grant funds, project contracts with towns, grant funds from the Community Foundation of Cape Cod and enthusiastic citizen support to begin the Cape Cod Pond and Lake Stewards (PALS) Program.

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## DREDGING THE HERRING RUN

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The herring run is open again! Soon the fry of "The Class of 2012" will head down the run to the sea as nature intended. In recent years removing one of the boards in the concrete structure at the top of the run filled the run with water. This year however as the pond level dropped just a little more the run went totally dry. A sand bank had built up in Middle Pond that effectively dammed the opening and stopped any flow.

But many people cooperated and the opening was dredged the morning of November 7. John Doane from Cape Cod Mosquito Control brought in the big machine (a low ground pressure excavator) that did the actual digging. Doug Kalweit from Town of Barnstable Natural Resources cooperated and provided Amy Raitto, and Martin Wunderly from his staff who worked hard to make certain the run was clear of leaves and obstructions. The route used by the excavator was provided by Jane Smith and her family who presently still own the land adjacent to the run that BLT hopes to acquire by spring. Tom McKeown, President of the Whistleberry Residents Association, was aware of the project and supported the dredging. Bob Nichols, IPA Vice President, wrote a letter explaining the science behind the

need to get the fry back to the sea before winter. Lindsey Counsell, Executive Director of Three Bays Preservation, remembered how the work had been done back in 2002 when this dredging was last done and provided guidance to the project.

You get the idea...this was a joint effort on the part of many people and organizations, and a wonderful example of what can be accomplished with strong teamwork. I will write and put on line pictures of the "dry" and "dredged" run as well as a document that can be referenced when this problem repeats itself. For now, thank you to everyone on behalf of the herring fry and the ponds!

--Alex Frazee, IPA President

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*This newsletter, with a circulation of over 650, is a forum for the exchange of ideas on matters concerning the IPA mission, and the views expressed by authors of articles do not necessarily represent official IPA policy.*

## IPA ELECTS THREE NEW DIRECTORS

At the IPA's Annual Meeting in July, the membership elected the following three new Directors to the IPA Board:

### CHRIS BIZINKAUSKAS - WHISTLEBERRY

"I have been a ponds resident in Whistleberry for the past 15 years, with my husband Paul and our three children. I have a science background and a strong interest in doing what I can to help preserve our ponds. I have admired the work of the IPA and I am honored to be included as a member of the IPA Board."



### GREG CRONIN - WHISTLEBERRY

"Lois and I moved to the Indian Ponds area in 1983 as newlyweds. For 27 years we lived on Old Mill Rd with our two sons, Tim and Ben. As members of Mystic Lake Hills Civic Association, we spent countless days enjoying Mystic Lake, often swimming across to "the cut." Our boys also took swimming lessons at the Hamblin Pond Town Beach. Two years ago we moved to Whistleberry Drive, close to Middle Pond. Over the years I've come to appreciate the valuable work the IPA has done in monitoring the health of all three ponds and look forward to contributing to those efforts."



### ROBERTA GOUGH - RACE LANE

"I have worked for federal, state, and local governments and recently retired from the Town of Chatham. My background is in the health and environmental sciences. Having been a resident of Centerville for over thirty years, I moved to Race Lane last year with my partner, Robert Lawrence, and three small goats. Water quality is of particular interest to me and I look forward to being a part of the IPA Board." Roberta served as an IPA Associate Director last year.



## DO NOT DISTURB!

There are over 30 benthic barriers (see picture) constructed from tarps and PVC pipe that have been placed over *Hydrilla* patches in Mystic Lake to kill the plants. The barriers are distributed all around Mystic Lake, typically in 2 to 5 ft of water, and are held in place by sand bags. **It is important that the barriers not be moved or disturbed.**



## HYDRILLA NOW NEARLY ENCIRCLES MYSTIC LAKE

*Hydrilla* can no longer be considered as existing only in the five separate areas around Mystic Lake described in the summer newsletter. The invasive plant has now shown up around most of the Mystic Lake shoreline this season, except for the northeast cove and the island (see map). The dramatic spread of *Hydrilla* around the lake shows that we are far from being on a path to eradication. We have merely been limiting the growth of patches/plants and hopefully have removed or killed (with barriers) much of this new growth before it could produce tubers, which can sprout next season.

IPA volunteers have spent about 350 hours this summer hand pulling small patches and individual plants and building and installing 35 benthic barriers on large patches all around the lake. It will likely be impossible for us to sustain this level of volunteer work next year without more volunteers.

Clearly the Town and the State cannot afford to allow the *Hydrilla* in Mystic Lake to get completely out of control, as that will ensure it eventually spreading to Middle Pond, the cranberry bogs west of the Indian Ponds, as well as the Marstons Mills River and Mill Pond. When *Hydrilla* gets out of control, it grows to the surface and fills the entire water column with dense growth. If *Hydrilla* becomes that widespread its eventual proliferation to other Cape waters will be inevitable.

The two shaded areas on the map in the northwestern cove are the areas where *Hydrilla* has become most abundantly established, with numerous patches and plants now intermixed with native plants. This is where the largest (30 ft by 40 ft) original patch of *Hydrilla* was discovered in 2010. This is also the area where the Town funded nine days of diver assisted suction harvesting this season, which removed many but not all of the large patches. The south end of the lake is beginning to approach this same degree of infestation.

The largest new patch found this year was about 20 ft in diameter and all the patches have had growths under 10 inches tall. We have found patches in depths up to 8 ft and although we have snorkel surveyed the entire shoreline, we have undoubtedly missed finding some patches or plants, particularly in deeper water. Essentially all the patches shown on the map outside the shaded areas have either been hand pulled or covered by barriers.

We are unsure why the *Hydrilla* spread so far this season. The spread from 2010 to 2011 was much less. In August 2011 the Town funded 4 days of hand pulling by two SCUBA divers, which removed a lot of *Hydrilla*, but also generated a lot of escaping fragments, which could have started new plants. Although we have never observed turions (winter buds) on the Mystic *Hydrilla*, our understanding is that they

form very late in the season and can spread the plant as the growth breaks up going into winter. We had a very mild and ice free winter 2011-2012, compared to the cold, ice locked winter of 2010-2011. We also have a lot of waterfowl on the lake that pull up and feed on aquatic plants.

This year the diver assisted suction harvesting work appeared to generate far fewer escaping fragments than the SCUBA divers did in 2011. Also the IPA volunteers have been very careful about fragments when hand pulling, and they only pulled out individual plants and small patches where fragment control was easiest. Opaque benthic barriers were used to cover and kill large patches, avoiding the need for extensive hand pulling. We had exceptionally clear water this summer, with Secchi depths of up to 5.2m in August, which allowed plenty of light to fuel the plant growth.

The Town Conservation Division will be requesting significantly increased funding for battling *Hydrilla* next season and you are urged to express support for this funding to your town councilor.



To see this map in color, download the Newsletter from the IPA website, [www.indianponds.org](http://www.indianponds.org).

## THE STORY OF PALS *(Continued from page 1)*

One of the most visible and popular features of this effort was the PALS Snapshot. Beginning in 2001, volunteer samplers fanned out and sampled ponds in each of the 15 Cape towns. CCC staff supplied the volunteer training and sample logistics and the Coastal Systems Program, School for Marine Science and Technology at UMassD (CSP/SMASST) supplied free laboratory services. Volunteers used a sampling protocol developed by the CCC and CSP/SMASST staff that provided insights into the water quality conditions throughout the water column of each pond sampled. During the first Cape Cod PALS Snapshot, 195 ponds and lakes were sampled. This sampling provided the most comprehensive sampling of Cape Cod ponds that had ever been completed.

The PALS sampling protocol was designed to provide a meaningful snapshot of water quality conditions in a given pond, but repeated over a number of years or more frequently during one or more years provides a fuller picture of the pond's characteristics. The protocol includes measurements at the pond of clarity (with a Secchi disk) and profiles throughout the water column (1 m increments) of temperature and dissolved oxygen. In addition, a minimum of two water samples for lab analysis are collected at each pond, usually at the surface and 1 meter off the bottom. In deeper ponds, additional samples at 3 and 9 meters could be added to the sampling.

The temperature and dissolved oxygen profiles provide information on whether the water column is mixed or whether there are layers of different temperatures (known as stratification). The dissolved oxygen readings also provide information on whether there is significant oxygen demand from the sediments (e.g., deep low oxygen) or high phytoplankton growth (e.g., mid-depth high oxygen); both of these generally indicate that the pond is in trouble. Secchi readings are taken because clarity is related to phytoplankton populations; less clarity usually indicates more dense populations, which are usually reflective of higher phosphorus inputs.

Phosphorus is one of the chemical lab analyses that is completed on the pond water samples collected during the PALS Snapshot. Phosphorus is usually the key nutrient in lake ecosystems; up to a point, adding more phosphorus produces more phytoplankton and fish.

Since more phytoplankton trap and retain more phosphorus, a pond can slowly increase the amount of phosphorus. Much of the phosphorus is retained in the sediments, which is where

the phytoplankton settle after they die. This phosphorus can be released back into the water column by low oxygen conditions. If these conditions develop, the phosphorus released can have the effect of adding multiple years' worth of phosphorus to the pond during one summer or, in some cases, a few days. In these circumstances, you'll get an algal bloom, which is often toxic blue-green algae. Thus one can see why dissolved oxygen readings and phosphorus concentrations are important components of the PALS Snapshot.

Other PALS Snapshot laboratory measures are: a) nitrogen, b) chlorophyll a, c) phaeophytin, d) alkalinity, and e) pH. Each of these measures and some of their relative relationships provide added insight into the conditions in the pond and potential management solutions for impaired conditions. The Snapshot laboratory results, along with the field-collected readings, are sent to the towns from CSP/SMASST each year in the spring following the PALS Snapshot.

PALS Snapshots have been completed each August/September since 1991. Volunteers in each town have generally been coordinated through a local PALS coordinator and a town water quality board, but some towns, such as Barnstable, have had multiple coordinators through different organizations. While I was at the CCC, we strived to ensure that ponds were sampled in each of the 15 Cape towns; an average of 414 samples from 160 ponds was collected during each Snapshot. Over the 12 years of the PALS Snapshot, over 4,000 water samples have been collected. These samples represent over \$400,000 worth of laboratory costs alone; addition of volunteer and staff time indicates that the Cape has collectively invested significantly in developing basic information about our ponds and lakes.

In the years since the initiation of the PALS Program, many towns and organizations have taken the next steps of developing the refined pond information necessary to implement effective water quality management for individual ponds. Just as much effort has been undertaken to understand the characteristics of each of the Cape's estuaries through the Massachusetts Estuaries Project, we need similar efforts to address the characteristics of ponds of concern. Of course, given the number of ponds, this will require a concerted effort, but much could be saved by developing a coordinated effort.

That's not to say that towns have been waiting. Over the course of the PALS Program, the number of pond-specific studies and implementation of management goals has increased dramatically. In Barnstable alone, projects have been funded to better characterize and/or implement management activities for the following ponds: Mystic,



## THE STORY OF PALS *(Continued from page 4)*

Middle, Hamblin, Wequaquet, Bearses, Red Lilly, Lovells, Mary Dunn, Joshua, Micah, and Long. Many Cape towns are tackling similar efforts.



**A volunteer sampler deploys a Secchi disk to measure water clarity.**

At CSP/SMASST, where I now work, we have continued to help the PALS program move into a more holistic phase of integrated data collection and development of lowest-cost management options. This phase includes continued basic long-term data collection (often expanded beyond the late summer PALS period), collecting targeted specialized data, and synthesis of these data into pond management options. Our efforts in collected targeted data have included: 1) sediment cores incubated to measure phosphorus regeneration potential, 2) freshwater mussel surveys to understand potential endangered species issues, 3) sonde (electronic water quality sensor) deployment with continuous readings to measure rapid dissolved oxygen changes, and 4) autonomous underwater vehicle deployment to measure refined and updated bathymetry and water quality snapshots. Integration of this type of data has helped provide towns and other organizations with better understanding of the ponds we are trying to manage and, with this better understanding, better expected management outcomes. It has also provided opportunities to move toward more complete and comprehensive water resource management options that address pond water quality within the same framework that also addresses estuary and drinking water management at the same time. If we can embrace these integrated philosophies, we will sustain the environmental and economic benefits that proper water management provides.

Many of the communities on the Cape have expanded their pond efforts beyond basic sampling, but at the core, the need for basic sampling and the volunteer advocacy that basic sampling initiates still continues. Volunteers became the local pond captains in town hearings and the advocates for funding to implement water quality management. Many PALS volunteers have become members of town boards and the understanding of pond functions gained through the PALS Program has provided an opportunity for action to address water quality concerns. The PALS Program has allowed great strides in developing information for management options, but much remains to be done to ensure that the information becomes action and that those actions provide the best opportunities for desired outcomes. In this sense, the PALS Program and its focus on pond sampling and advocacy is still needed. In some ways, the PALS Program was initiated in response to a legislative directive, but at its core, it was truly initiated in response to the need to ensure that every Cape resident or visitor could stroll down to the beach, jump off the dock, or start the boat motor and find that the water around them was everything they wanted.

*-Ed Eichner, Senior Water Scientist, UMASS*



**A water scientist uses a sonde for specialized testing.**

*[Editor's Note: The IPA has participated in every annual PALS Snapshot sample since 2001. Having comparative pond data available through the PALS program has been critical to the management of all three Indian Ponds.]*

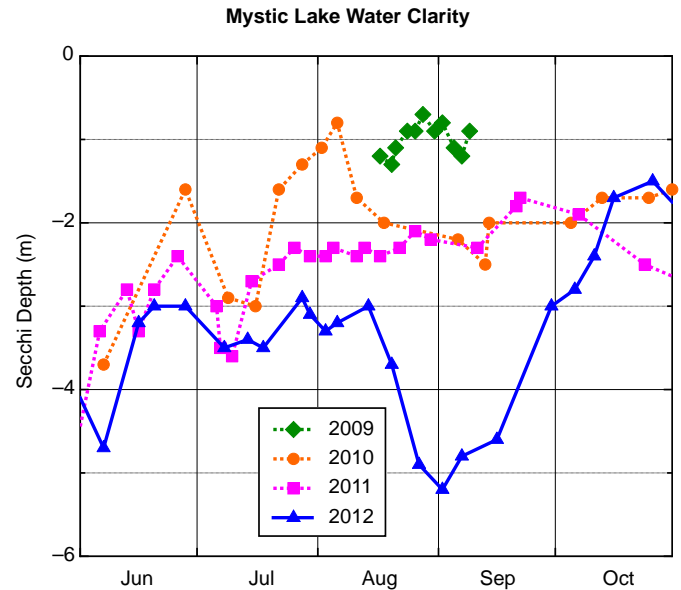
## MYSTIC LAKE WATER CLARITY DRAMATICALLY IMPROVES – THEN WORSENS BY FALL

As the summer Newsletter went to press in mid-August, Mystic Lake was experiencing its best midsummer water clarity since 2008 with a Secchi depth of 3m (9.8 ft). The water clarity rapidly improved to an astounding 5.2m (17 ft) by the end of August. This is the best summer water clarity measured in over three decades, since the 5.5m Secchi depth measured in August 1980. [Editor's Note: Secchi depth is water clarity as measured with a disk divided into black and white sectors, which is lowered on a measured line into the water until it completely disappears, then raised until it reappears. The average of the depths at which it disappears/reappears is the Secchi depth.]

While the overall improved water clarity likely resulted from the alum treatment, this dramatic late August improvement may have been aided by the almost 7.5 inches of rain that fell over the last half of July and first half of August. This significant rainfall could have caused an influx of iron-containing ground water to the lake. The iron binds phosphorus in the lake water thus further reducing the controlling nutrient for algae blooms.

As the updated plot of Mystic Lake water clarity shows, the dramatic improvement was temporary. By the end of September the lake was back to the 3m Secchi depth it had experienced for most of the early summer. Unfortunately the clarity continued to worsen through October, reaching a low for the season of 1.5m (4.9 ft) on October 26.

This period of worsening clarity corresponds to the "turning over" of the lake. This event occurs every fall as the surface waters cool and sink, causing mixing of the water that has remained below the thermocline all summer. Over the summer



this deep water has lost its dissolved oxygen and has accumulated phosphorus from the bottom sediments. When remixed into upper waters, it provides this critical nutrient to fuel fall algae blooms. The water clarity plot shows that less dramatic algae blooms occurred starting in mid September in 2010 and 2011.

Middle Pond also experienced the dramatic water clarity improvement, with the Secchi depth increasing to 6.6m (21.6 ft) at the end of August. However, like Mystic this was followed by a worsening to a season low of 3.2m (10.5 ft) towards the end of October. Hamblin Pond maintained excellent clarity this summer, comparable to last summer.

--Bob Nichols

## INVASIVE WATER HYACINTHS FOUND IN MYSTIC LAKE

In late October five floating water hyacinths were found in a northwest cove of Mystic Lake. These large free floating plants were undoubtedly discarded from someone's water garden into the lake. Water hyacinth is an aggressive exotic aquatic plant native to Brazil and is considered to be invasive and can form dense floating rafts of plants in southern states where it has become established. It is not known how well it over winters in our climate. The bottom line is: **NEVER DISCARD WATER GARDEN OR AQUARIUM PLANTS IN LOCAL WATER BODIES.** This irresponsible practice has resulted in many water bodies becoming infested with invasive plants.

## FINAL STATE ANALYSIS OF 2012 MARSTONS MILLS HERRING COUNT COMPLETE

The Diadromous Fisheries Biology & Management Program of the MA Division of Marine Fisheries (DMF) has analyzed the raw herring count data for the Marstons Mills River. They have a new program that they use to generate the run size estimates. The population estimate (PE) was generated using a 2-way stratified random sampling design. The following are the summary statistics for the 2012 count.

PE (2-way, 3 period)	87,308 (+/- 6,327)
Total counts	479
Start Date	3/21/2012
End Date	5/19/2012
Total Number of Days	60
Number of Active Counters	34
Total Counting Time (minutes / hours)	4790 / 79.8
Mean counts per day	7.9

The mean counts per day is less than the nine counts scheduled because the state model included the days we suspended the count.

The good news is that the State's new program estimates that the total 2012 run in Marstons Mills was somewhere between 80,000 and 95,000 total herring, which is a higher number than was projected using a simple extrapolation of the raw data. Hopefully this great run is not an anomaly, but instead the start of an improved trend compared to the past several years.

--Annette Nichols

## OUT ON A LIMB

Barnstable Land Trust (BLT) has gone out on a limb to help preserve two critical parcels that lie on the shore of Middle Pond. Both projects will safeguard surface waters and groundwater and protect vital habitat.

"Save Fuller Farm" is an initiative to preserve 23 acres of rolling farm fields and woodland paths that surround an abandoned cranberry bog. The old farmhouse on Route 149 dates to 1870 and is being considered as a possible office and educational center for BLT. Acquisition of Fuller Farm will help to preserve the historic character of Marstons Mills and protect Turtle Cove, a sensitive area of Middle Pond where rare mussels reside. \$90,000 remains to be raised before December 15<sup>th</sup>.

"Help the Herring Run" is focused on the preservation of the last remaining undeveloped lot along the fishway that leads herring from the Marstons Mills River to their spawning grounds in Middle Pond. The 1.17 acre parcel is strategically important due to its location at the head of the herring run where shifting sands often impede waterflow. Acquisition of this land provides vital access for maintenance of the run. \$95,000 is needed by June 30<sup>th</sup> to purchase the land.

To make a donation go to [www.bltn.org](http://www.bltn.org) or send a check to BLT at P.O. Box 224 Cotuit, MA 02635.

--Jaci Barton, Executive Director of BLT

*PHOTO CREDITS: Page 2, C. Bizinkauskas, G. Cronin, R. Gough; page 3, map, Bob Nichols; page 5, Ed Eichner; page 6, chart, Bob Nichols; page 8, Dave Reid.*

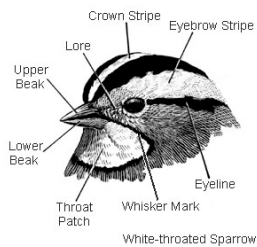
## A LESSON WELL LEARNED

I learned a lesson recently and I thought it might be helpful to pass it on to you.

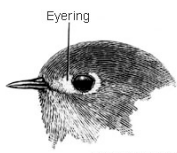
We have a very good friend from Michigan that we don't see often enough. She is a very competent birder and we love to go out with her whenever and wherever we can arrange it. About ten years ago, she visited us here on the Cape and while we were sitting at breakfast one morning a male Rose-Breasted Grosbeak suddenly appeared at one of our feeders. Now, mind you, that bird had never before visited us and, for that matter, has never been here since, even though the Cape is well within the area of his range. We like to remind Coleen that when she comes to visit us, strange birds show up so she should come more often.

Well, about two weeks ago another stranger showed up. We didn't get a good look at it for the first week because every time it would notice us it would disappear. It finally became accustomed to us standing by the slider so it stayed at the feeder long enough for us to get a good look. We pulled out every book in my library in an effort to identify it. I was pretty sure it was a female because it was predominantly brown, not at all fancy like a male would be.

I don't know if you have had the experience of trying to look through a book to find a specific bird, but to me, all the females look the same and, in a book, they all look the same size. Anyway, there are these things called "Field Marks" to which I have never paid much attention. Field marks include such things as shape of the beak, eye lines, eye rings, etc. There are four key areas to begin your study: Size & Shape, Color Pattern, Behavior and Habitat (where you see the bird). I have always left that sort of stuff to my guide but now the more we tried, the more I wanted to know what this bird was.



White-throated Sparrow



Ruby-crowned Kinglet

So, let's see. It was far bigger than any sparrow or finch in the yard. It had a distinctive white eye line, a very streaked breast, heavy white wing bars, and a really big, thick bill, even thicker than the Cardinals in the yard and definitely bigger than the Sparrows. Using that information I was able to zero in on the species and again we got a big surprise. Our strange visitor was a female Rose-Breasted Grosbeak. The day that I identified her was the last time we saw her. It was time for her migration to begin. In the winter they fly South to Central America and Northern South America.

So, in summary, Field Marks can be very helpful in differentiating one bird from another when they all look the same or fairly close. The concept is worth a few minutes of study. Most good bird books have a section on Field Marks in the front.

--Dave Reid

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