

THE IPA NEWSLETTER

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

Spring 2012

A quarterly publication of the Indian Ponds Association, Inc.

Vol.12 No. 2



IPA ANNUAL MEETING ON SUNDAY, JULY 15

The 54th annual meeting of the Indian Ponds Association will be held this year on Sunday, July 15, at 4:00 pm. Weather permitting, we will again meet outdoors at the lovely home of Jon and Debby Halpert, 470 Turtleback Drive, Marstons Mills, overlooking Mystic Lake and Middle Pond. All members whose dues have been paid are welcome to attend and vote. A short business meeting will include election of Directors for the coming year and presentation of the Edward Schwarm Memorial Scholarship to two college-bound high school seniors. Nominees for election to first terms as Directors are Christine Bizinkauskas, Greg Cronin, and Roberta Gough; those up for re-election are Bob Nichols, Gay Rhue, and Emily Wheeler. The business meeting will be followed by a presentation by our guest speaker, Ken Moraff, Deputy Director for Ecosystem Protection at the US Environmental Protection Agency. Educated at Cornell and Harvard Law, Ken has been deeply involved in environmental issues on Cape Cod, particularly the nitrogen problem, and we expect his remarks to be authoritative and enlightening.

Following the meeting, we will gather for wine and hors d'oeuvres under the trees to enjoy the afternoon and the company of our neighbors.

In case of rain, the meeting will be held indoors at the home of Lew and Nancy Solomon, 28 Heath Row, Marstons Mills. Be sure to note the date on your calendar! For those who have not yet paid their dues, this can be done when you register at the meeting. We look forward to seeing you.

Holly Hobart

RECORD NUMBERS OF RIVER HERRING RECORDED FOR 2012 MIGRATION

The annual river herring migration began on the Marstons Mills River on March 21, 2012. This was two weeks earlier than the earliest recorded run since formal record keeping began using the Massachusetts Division of Marine Fisheries (DMF) protocols in 2006. The first week of the run started slowly, with only 33 fish reported. The water temperature cooled, and there were only very intermittent fish observations over the next two weeks. Formal counting was suspended for a portion of this period.

On Day 22 of the run, the fish returned in earnest, so the formal counting was formally restarted on Day 23. Days 27–29 (April 16–18) were each significantly higher than any previous single-day count since recording began in 2006.



River herring entering the flume at the Middle Pond herring run on April 13, 2012. Photo by Robert W. Kelley.

The official total number of fish logged for 2012 at the Mill Pond station was 8,892 fish. This is the number counted in nine 10-minute periods distributed in three blocks of time over a 12-hour day (7 am to 7 pm). The 2012 count was thousands higher than previous years, and nearly 460% higher than the average of the last six years. Projecting this statistical sample of data to the total run, more than 71,000 fish crossed the Mill Pond ladder between the hours of 7 am and 7 pm this year.

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The IPA is a 501(c)(3) organization and a registered public charity. All dues and contributions are tax deductible.

This newsletter, with a circulation of over 650, 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.

EDITOR'S NOTE – STEPPING DOWN

Eleven years ago in July 2001, I produced the first IPA newsletter, a 4-page effort. The present issue will be the 40th for which I have had the honor and pleasure of serving as editor. The purpose in having a newsletter was to provide an historical diary of the events affecting the three Indian Ponds and, in so doing, pass along important information and scientific findings to area residents and others.

The newsletter has evolved into an educational tool that has vastly surpassed my initial expectations. It is gratifying to know that it has received many accolades by readers, and that other pond associations have learned in this way from the IPA's experiences.

I have had a wonderful time because of all the friends I have found who share my love and concerns for the ponds and who have helped by writing articles, providing information and ideas, and assisting in assembling and mailing the newsletters. Without the generous help of many, it would have been an impossible task. Thank you so much.

Holly Hobart has graciously offered to take the editor's reins. I am confident the newsletter will continue to serve the IPA well in the future.

Geri Anderson

RECORD NUMBERS OF RIVER HERRING RECORDED FOR 2012 MIGRATION

(Cont'd from page 1)

More than 50 Barnstable residents participated in the 2012 count. Some of the counters have participated every year since 2006; however, there were also many new counters this year. Several counters provided dozens of counts, which was essential to help us establish a solid statistical database.

The previous newsletter expressed concern about the extremely low counts for the last several years. Only 53 total fish were reported for the 20 days of formal counting in 2011.

The previous high count was in 2008, with 5,232 fish recorded at Mill Pond. River herring become sexually mature at nominally 4 years of age, so it is likely that many of the fish in the 2012 run are the newly mature offspring of the 2008 spawning. The alewives migrate earlier than the bluebacks, and the males arrive in the spawning streams before the females. Based on the water temperature, it is likely that the peak days included both species. Age 4 is the earliest spawning age for both species; however, both species are able to spawn for another ± 3 years, so it remains unclear why the years after 2008 had much lower counts.

River herring suffer relatively high rates of mortality throughout their life cycle, with less than 1% of all eggs surviving to migrate to the sea as juveniles, and 70% annual mortality of adults. The adult spawning mortality is highly variable from area to area and year to year¹.

River herring feed primarily on zooplankton, and in the May 2012 sampling of Mystic Lake and Middle Pond, there appeared to be a more abundant supply of zooplankton than observed in the last two years. The zooplankton, which feed on tiny algae in the water, are essential for control of algae, but are also essential to feed the herring.

The scientific literature is somewhat mixed as to whether the higher number of migrating river herring will increase or decrease the phosphorous levels in the ponds. Increased phosphorous levels are a key factor in algal blooms, and the zooplankton consume algae. The herring fry will incorporate phosphorous as part of their food intake and those that survive will take it with them when they move to the ocean. However, a large percentage of spawning adults and the new fry will consume the zooplankton and, in turn, will die or otherwise be consumed by the freshwater fish population in the ponds, such as yellow perch, bass, and pickerel. The phosphorus in their bodies will, therefore, remain in the ponds.

So, what does this mean for the herring population and our Indian Ponds? Only time will tell.

Annette Nichols

¹ UMass Cooperative Extension, MA DMF, Marine Recreational Fisheries of Massachusetts, River Herring.

2012 SCHWARM SCHOLARSHIPS AWARDED TO TWO GRADUATING SENIORS FROM MARSTONS MILLS

The IPA is pleased to announce that this year's recipients of the Edward Schwarm Scholarships are Amanda Kennedy and Carolyn Morin. Amanda and Carolyn were selected by the IPA Scholarship Committee based on their academic achievement, extracurricular activities, and community service related to the mission of the IPA. They will each receive a \$1000 award at the annual meeting on July 15.

The Schwarm Memorial Scholarship was established in 2005 in memory of Edward Schwarm, a former IPA Director and Officer who died in May of 2005. Due to the generosity of IPA members and the Schwarm family, two scholarships will be given this year.



Amanda Kennedy

Amanda Kennedy is the daughter of Peter and Kim Kennedy of 444 Mystic Drive, Marstons Mills. She is a senior at Barnstable High School where she has been a member of the National Honor Society. She has also participated in winter and spring track, field hockey, drama club, church lecture, and also volunteered at the Cape Cod Hospital. She grew up enjoying Middle Pond and worked with friends and family to keep the beach

area clean, collected "lake weed" samples, and has counted herring during their annual spring run. Amanda will be attending Emmanuel College in the fall, with plans to continue graduate work in speech language pathology.

Carolyn Morin is the daughter of Jacque and Martha Morin of 104 Berry Hollow Drive, Marstons Mills. She will also be graduating from Barnstable High School, where she has been a member of both the National Honor Society and the Spanish Honor Society. She was a member of the Barnstable High volleyball team for the past four years. In those four years, the team won three state championships, where she has learned endless life lessons both on and off the court. Carolyn will be attending Bridgewater State University this fall majoring in elementary education. As a teacher, she plans to place an emphasis on raising environmental awareness with her students.



Carolyn Morin

We wish both Amanda and Carolyn great success in college and in their career pursuits.

Gay Rhue

CELEBRATE THE FOURTH OF JULY – JOIN THE BOAT PARADE

The annual Fourth of July boat parade will be held again this year. We invite boats of all sizes and shapes to participate. Last year's parade, as the year previous, was an excellent example of the diversity that can be expected. Decorate your boat with flags, bunting, ribbons, balloons. Wear an appropriate costume. Use your imagination. Have fun and celebrate the nation's birthday!

Participants should gather at the northwest corner of Mystic Lake at 3:00 pm on Wednesday, July 4. The parade will proceed counterclockwise around Mystic Lake, stopping at each beach to present flags, and then continue through the cut into Middle Pond to do the same.

This event is not sponsored by the IPA, nor can the IPA be responsible for any accidents. Individuals will be responsible for their own safety.



A portion of the flotilla of boats that participated in the July 4, 2011 parade on Mystic Lake and Middle Pond. Photo by Bob Nichols.

FINAL REPORT ON MYSTIC LAKE ALUM TREATMENT

Dr. Ken Wagner of Water Resource Services has issued a comprehensive final report documenting the Mystic Lake alum treatment and the year of post-treatment monitoring included in the project. The 120-page report, "Internal Phosphorous Load Inactivation in Mystic Lake, Barnstable, Massachusetts, 2010", is available as a pdf file on the IPA website at www.indianponds.org. The report completely documents the project basis, planning, permitting, execution, and all related monitoring and also includes much of the available historical water quality data.

This article summarizes the results of the treatment and the recommended follow-up actions that are presented in Wagner's report. The trials and tribulations in the lead-up to the treatment and the treatment itself have been described in the many past IPA newsletter articles on the subject, which are available at www.indianponds.org.

Goal of the treatment

The goal of the treatment was to reduce the amount of phosphorous that is released from the sediment in the pond during the summer stratification period. During this period, the deepest waters become devoid of oxygen, causing iron-bound phosphorous in the sediment to be released into the water. This so-called internal loading of phosphorous was determined to be the largest source of phosphorous to the pond water and the principal cause of algal blooms. The alum treatment, which actually involved the addition of both alum (aluminum sulfate) and sodium aluminate (as a buffer), was intended to permanently bind much of the phosphorous in the upper layer of sediment to aluminum, thereby eliminating it from ever mixing into the water.

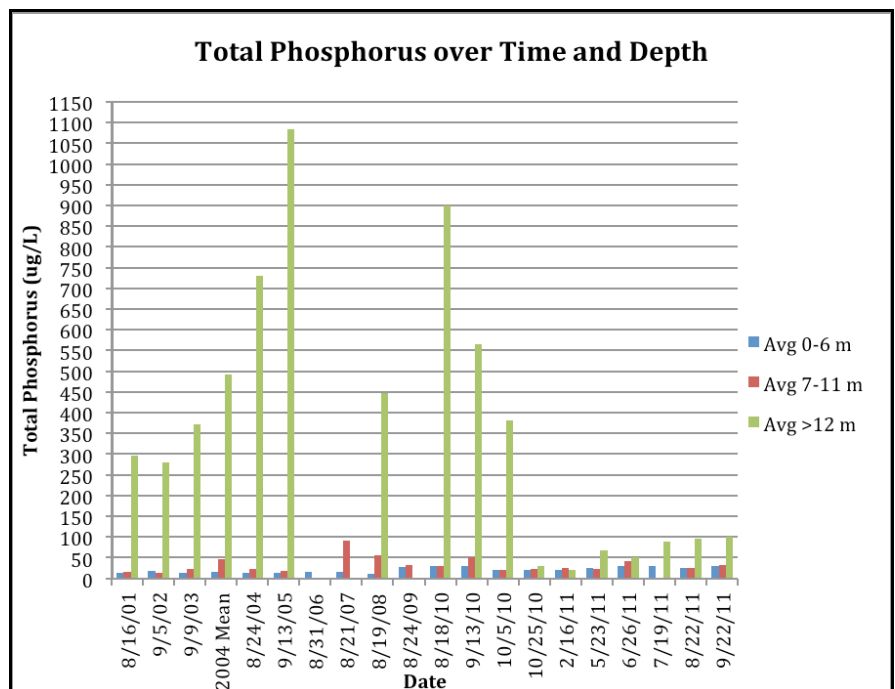
Sampling shows level of treatment success likely affected by mussel kills

The results of water sampling in the decade before the treatment, as well as sampling during and for one year post treatment, show that the in-water phosphorous mass peaked at 245 kg in the summer of 2010, just prior to the treatment that fall. Within 3 weeks after the treatment, the phosphorous mass had been reduced to just 86 kg, which matched the target of achieving a phosphorous concentration in the water of 10 ug/L, a level that would prevent algae blooms.

However, by the end of summer 2011 (one year post treatment), the in-water phosphorous mass had risen to 125 kg. The report cites several possible mechanisms for this increased phosphorous mass. Increased loading from the watershed due to rainy weather and release of phosphorous

from untreated or undertreated sediments are possibilities. However, the most likely source of additional phosphorous in 2009 and 2010 is the mussel kills that occurred in both years, which resulted in many millions of dead mussels. About 13 kg of phosphorous is contained in a million mussels, so the mussel kills certainly could supply the right order of magnitude of phosphorous to account for the increase.

The deep-water phosphorous concentration has been dramatically reduced following the treatment (see figure). The 2001–2010 range of deep-water phosphorous was 280–1093 ug/L, with a mean value of 574 ug/L. Three weeks after the treatment, this was reduced to 30 ug/L. By September 2011, it had risen to 100 ug/L, but was still well below the range measured over the past decade.



(Note: the 2006, 2007, and 2009 dates did not have a deep sample).

The treatment also appears to have altered the N:P (nitrogen to phosphorous) ratio in the direction to favor green algae instead of the toxic blue-green algae (cyanobacteria) that dominated the harmful blooms in 2009 and 2010, and was suspected of causing the mussel kills. In 2011, the lowest water clarity measured by Secchi disk was about twice as good as the lowest clarity in 2009 and 2010.

The unfortunate coincidence of a massive mussel kill just prior to the alum treatment has greatly complicated the situation. The mussel kill has not only provided additional phosphorous to fuel algal growth, but it has eliminated the filtering capacity of the mussel population, which removed algae.

Continued monitoring is recommended

Continued monitoring is recommended as the most important action to be taken over the next couple of years as Mystic Lake reaches a new equilibrium. It could take about 5 years for mussel phosphorus to work its way through the system. The recommended monitoring includes:

1. Sampling total phosphorus and total nitrogen throughout the water column.
2. Algal sampling as warranted by observations.
3. Zooplankton sampling in May and September.
4. Iron analysis to check for its availability as a phosphorus binder.
5. Retesting of sediment in the two areas where the aluminum dosage was limited to less than ideal by the permitting authority.

All of the above sampling was performed in Mystic Lake in mid-May. The same sampling was also performed at that time in Middle Pond to build an understanding of what has been happening in that pond. **The IPA funded this sampling of both ponds at a total cost of about \$4000 for the field sampling and laboratory analysis.** These data, along with the yearly PALS sampling that occurs in August, will give better insight as to the evolving condition of the ponds.

The IPA will continue to perform weekly or biweekly Secchi disk readings, dissolved oxygen profiles, and pH measurements in both ponds this summer season. The IPA will also

collect algae samples and send them for analysis as conditions warrant.

A supplemental study of groundwater input to Mystic Lake was also recommended. This would involve placing seepage meters at key locations, generally along the northwest shoreline, to measure groundwater entry to the lake. In addition, where groundwater influx is significant, littoral interstitial pore-water samplers would be used to collect incoming groundwater to be tested for dissolved phosphorus, nitrate, ammonium, iron, and pH. These results would help to determine what nutrient inputs are from groundwater, including wastewater from septic systems. **The IPA has decided to defer the groundwater measurement and testing, as this will be expensive, and wait to see how the ponds respond this year.**

The report also points out that other watershed inputs of phosphorus should not be ignored. **Reducing inputs from the cranberry bog north of Race Lane should be explored.** Storm water runoff is not typically significant with the sandy soils of the Cape, but should be controlled where it does occur. **Actions to limit phosphorus in land use, such as related to lawn fertilizers, should be employed.**

A review of all new data collected for the Indian Ponds should be performed in early 2013 to determine the next appropriate management steps.

Bob Nichols

BOB NICHOLS SPEAKS AT NALMS CONFERENCE

IPA Vice President Bob Nichols and President Holly Hobart attended the annual meeting of the New England chapter of the North American Lake Management Society (NALMS) held at the University of New Hampshire in Durham June 8–9.

This is a conference that focuses on issues concerning freshwater lakes and ponds, and brings together the experience and knowledge of academics, people from pond associations, vendors, consultants, and participants from state and local government agencies. Presentations were made on a variety of subjects of interest to pond and lake people. Bob gave a PowerPoint presentation entitled, “Lake Association Leads in the Discovery and Control of *Hydrilla* in Mystic Lake”, explaining the IPA’s ongoing *Hydrilla* project, from Bob’s first discovery of the invasive aquatic plant in 2010. He described the method of hand-pulling within a netted enclosure to prevent the spread of plant fragments, and the benthic barriers that he designed to shade the roots to prevent resprouting. Bob’s presentation featured his excellent photography of the entire process, including all the IPA volunteers who helped with the huge task of hand-pulling the newly-discovered invaders. **A pdf file of the presentation slides is available on the IPA website at www.indianponds.org.**

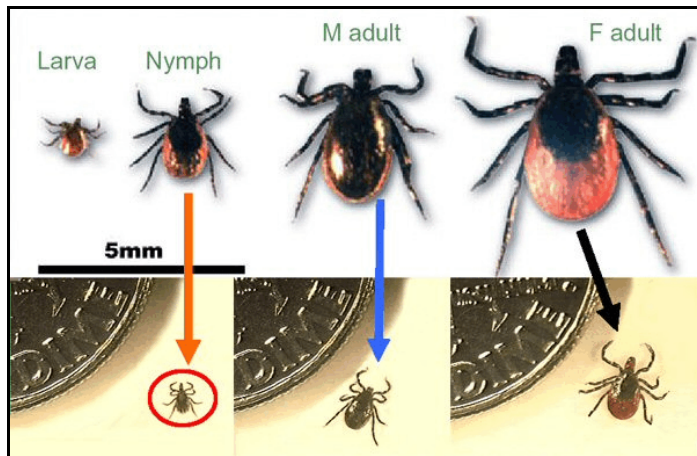
Dr. Ken Wagner presented a 4-hour introductory course on the identification of algae and zooplankton using microscopy, which was attended by both Bob and Holly, and also presented a PowerPoint talk on “Algae Blooms in New England: What to Expect Under What Conditions”. Other presentations concerned cyanobacteria, nutrient inactivation, climate change, invasives, and watershed management, all topics of great interest to the audience. It was an outstanding opportunity to network and to learn.

One particularly pleasing bonus for Holly and Bob was to meet Dr. James Haney, the biologist who supervised the testing of Mystic Lake mussel tissues for the presence of cyanobacterial toxins, and his graduate students who did the work. This team discovered elevated levels of microcystin, a liver toxin, in all of the mussels collected immediately after the first cyanobacterial bloom in 2009. Whether this was indeed the single cause of lethality is still not conclusive, owing to the possibility of neurotoxins also being present, for which Dr. Haney’s lab was not equipped to test. Dr. Haney has kindly agreed to provide a poster describing and illustrating this project to the IPA for its annual meeting in July.

Holly Hobart

MILD WINTER AND RISK OF TICK-BORNE DISEASES – WHAT’S THE STORY?

A common question I am asked is whether the mild winter will mean a higher degree of risk from tick-borne diseases like Lyme as well as Babesiosis and Anaplasmosis, both of which are on the increase. The answer is yes, there will be a higher risk even as we speak, but it has nothing to do with the mild winter.



Deer tick life stages: L-r: larva, nymph, male, and female.

The higher risk has everything to do with the total lack of an acorn crop last fall. Mouse populations increase in the year following a large acorn crop. They also decrease for the same reason. With no acorns in 2011, we have the following situation. Lots of acorns in 2010 resulted in a very large mouse population in 2011. Larval ticks that hatched late last summer had a good opportunity to feed, and get infected. Chipmunks and shrews are also important in this regard. Larval ticks then became nymphs and settled in for the winter.

We started to find nymph-stage ticks on April 20, 4 weeks ahead of schedule. This is important because the tick in question, the deer tick, that carries the bacteria that causes Lyme disease is the size of a poppy seed, difficult to detect, and cause over 80% of all illnesses. Without acorns, the mouse population crashed this winter. Nymph ticks are look-

ing for one meal only. If there was a large number of mice, every tick they encounter is one less that you or a pet would find. With very few mice, the ticks are going to be out there for a longer period of time, which increases the chances of them finding and attaching to a person or a pet.

2004 was another year when there was no acorn crop. The number of cases of Lyme disease increased 51% in 2005!

Tick-borne diseases are entirely preventable if you follow a 3-step plan: (i) protect yourself, (ii) protect your yard, and (iii) protect you pet. As far as personal protection goes, standard recommendations include tick checks, tumble-dry clothes, etc. I do find that there is confusion on the subject of repellents. Most people associate “repellents” with products that contain DEET. This is an option for exposed skin.



Deer tick nymph

The second type of repellent is the use of products to treat clothing, including shoes. These products contain permethrin and are sold under brand names like Ben’s and Sawyer. Stores that sell camping gear carry it, and some garden centers are just starting to stock it. I have not received a single tick bite since I began doing this...and I go looking for these creatures!

See www.capecodextension.org Natural Resources page to read a “Guide to the Prevention of Tick-Borne Diseases”.

Enjoy the outdoors, but take precautions because, **“One bite can change your life”**.

Larry Dapsis – Entomologist
Cape Cod Cooperative Extension
ldapsis@barnstablecounty.org

TOWN FUNDS ADDITIONAL MYSTIC LAKE *HYDRILLA* CONTROL

The Town of Barnstable has awarded a contract to Aquatic Control Technology of Sutton, MA for the same level of *Hydrilla* control as they provided last year, which involved two SCUBA divers hand-pulling *Hydrilla* over four days. This was very effective last year in helping the IPA keep this invasive plant under reasonable control.

On June 7, we noticed that a very small amount of *Hydrilla* has sprouted in two of the four general areas around the lake where we have been removing it the past two seasons. Once again, IPA volunteers will be needed to supplement the

Town-funded effort to keep the *Hydrilla* under control over the summer season. In addition, we need all users of the Indian Ponds to keep a sharp eye out for any new outbreaks of *Hydrilla* and to be mindful to insure that no plant fragments are on or in their boats when leaving Mystic Lake or transiting to Middle Pond. Refer to the Indian Ponds *Hydrilla* Watch color flyer, that was distributed with the newsletter last summer and is available on the IPA website at www.indianponds.org, for how to identify *Hydrilla*.

Bob Nichols

“HELP THE HERRING RUN”

We're getting close! Barnstable Land Trust (BLT) is two-thirds of the way toward saving a strategically and environmentally important parcel off Flume Avenue at the headwaters of the Marstons Mills River herring run. Each spring, the river's migrating blueback herring and alewives pass this point, relying on flowing waters to reach their spawning habitat in Middle Pond and Mystic Lake.

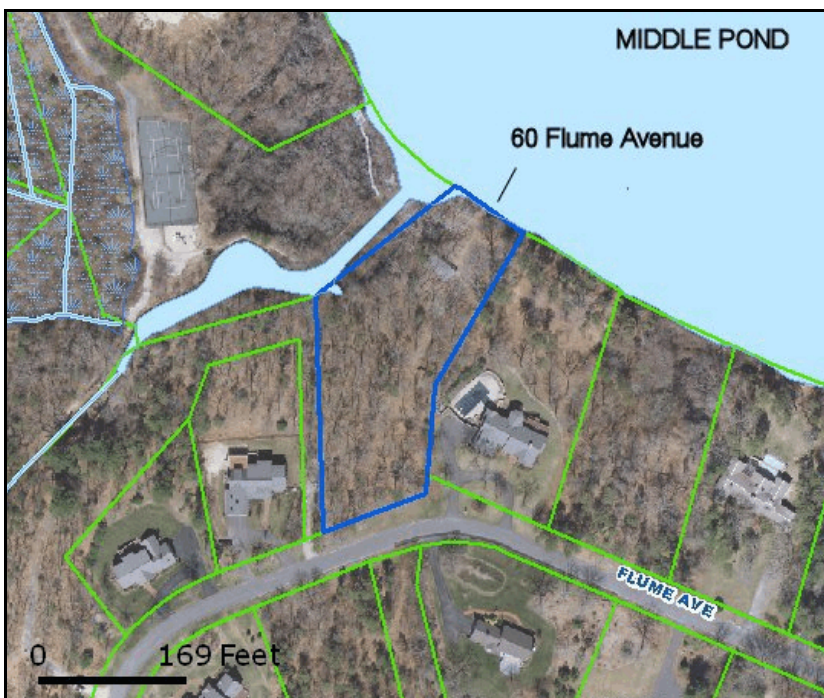
Preserving this 1.17-acre parcel will benefit humans and wildlife alike, thanks to its many conservation values, among them:

- It is up-gradient of seven C-O-MM wells, which provide drinking water to homes in Marstons Mills.
- It protects the water quality of Middle Pond, the herring run, the Marstons Mills River, the greater 3-Bay watershed, and Cape Cod's sole-source aquifer.
- It has 190' of frontage on wetlands on the herring run and 100' feet of frontage on Middle Pond, home to numerous rare species.
- It guarantees permanent access for maintenance of the run.
- It abuts town-owned open space along the herring run and extends the adjacent trail system.

\$105,000 remains to be raised to complete this vital acquisition and save *the last undeveloped parcel* along the herring run. Please “Help the Herring Run” by making a donation and spreading the word. Visit www.BLT.org to donate online or send a check to BLT, PO Box 224, Cotuit, MA 02635; for more information, call BLT at 508-771-2585.

Barnstable Land Trust is a member-supported, non-profit organization dedicated to the preservation of the open spaces and natural resources in the Town of Barnstable. BLT has preserved 985 acres of land through gifts, purchases, and conservation restrictions.

~ The Future Is in Our Lands ~



Map showing the Flume Avenue property to be purchased and preserved by BLT.

YEAR OF THE BEAR

The year 2012 will long be remembered for the visit to the Cape, the first in about 200 years, of a black bear. This young, 2-year-old 200 pounder, apparently swam across the Cape Cod canal and was first spotted on May 26 in Sandwich and then in West Barnstable. The curious bruin was subsequently sighted in various villages as it trudged eastward and northward, finally reaching Provincetown. As of this writing, its whereabouts have been daily reported in the newspapers and tv as it wanders the streets, alleys, and backyards of this tip-of-the-Cape village.

THE SWALLOWS HAVE COME BACK TO CAPE COD



Barn swallow

There are at least five different kinds of swallows on Cape Cod. The one that we are most likely to see flying around our houses and power line spaces is the **barn swallow**. You may occasionally run into a **bank swallow**, but unless you go to a more wilderness area like the Wellfleet Audubon area, you

probably will not run into the **violet-green**, **northern rough-winged**, or **tree swallow**.

The barn swallow is the most widespread species of swallow in the world, being found all across northern Europe, North America, and Asia. It is highly migratory and flies as far south as Argentina, South Africa, and northern Australia. This swallow can be identified by its shiny cobalt back and tawny underparts. It has the most deeply forked tail of all the swallows.

The barn swallow prefers open countryside to hunt, but they use man-made structures for nesting. You will find them under your decks, in the eaves for your porches, and, of course, in your barns. They have followed the expansion of man-kind to all corners of the world, including Cape Cod.



Bank swallow

All swallows feed on flying insects and only rarely take insects off the ground. You will see them soaring gracefully over open fields or water in search of their prey. The barn swallow, being more acclimated to human presence, includes suburban parks and ball fields, beaches, lakes, and ponds in its territory.



Violet-green swallow

Both male and female barn swallow participate in the hunt for a good nesting site, flying back and forth between two or more possible sites

until they narrow their choice down to the best possible spot. You will see them hovering over the top of each potential site while they assess its potential. They may use nests from a previous year, but avoid those infested with mites or other parasites. The nests are constructed of mud pellets mixed with grass and lined first with grass and then with feathers. Nest-building barn swallows are not above stealing nesting materials from a nearby nest. If the nest is built against a wall or beam, it is formed into a half-cup shape; if built on top of a beam, it forms a complete cup or bowl. The clutch size can range between three and seven, and a pair may have two broods a year.

Both parents participate in feeding the young. They may also get help from older siblings from previous clutches and from totally unrelated younger birds. An unmated barn swallow may kill the nestlings in an attempt to break up the parent couple in order to mate with the female.

Barn swallows have been quick to adapt to humans and their structures. For the most part, people have encouraged them to nest nearby since they feed on insects that harm us or our gardens. They used to be hunted in large numbers to provide feathers for milady's hats, but, fortunately, that practice has been eliminated.



Male and female barn swallows tending their nest.



Northern rough-winged swallow



Tree swallow