

THE IPA NEWSLETTER

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

Fall 2013

A quarterly publication of the Indian Ponds Association

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ON THE BOARD OF “A GREAT ORGANIZATION”

At my last IPA Board meeting, after having served the maximum number of terms as an IPA director that the bylaws allow, I mentioned to my fellow board members that it had been a wonderful and enriching experience. As a result of saying that, I ended up volunteering to write an article for the IPA Newsletter to elaborate.

Six years ago, I was asked to join the IPA Board. I'm embarrassed to say I'm not sure why I was asked or who asked me. Maybe I was asked because I have lived on Mystic Lake since 1983 and have been involved with Lynxholm's Regency Drive Homeowner's Association. Anyway, once I was informed of the IPA's mission to protect the lakes, I signed on. I didn't know what I was doing to help protect the lakes from, or in fact, if they needed protection. Because I believe our lakes are a little piece of heaven right here on Cape Cod, I was willing to learn and help in any way I could.

At my first Board Meeting I found an amazing group of very congenial people; all interested in maintaining the health and beauty of the lakes. There were people with diverse careers and wide ranging interests involved in the Association. From Woods Hole scientists, to a lady who sailed around the world with her husband, to individuals whose families have lived on the lakes so long that streets are named after them, and to another who grew up in New York City and recently moved to Hamblin Pond to farm, raise

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DO NATIONAL FLOOD INSURANCE CHANGES AFFECT YOU?

Although the proposed changes to the National Flood Insurance Program (NFIP) are not yet finalized, the issue has aroused curiosity among some of our members. People living on the coast or in low-lying areas subject to flooding during storms will certainly be interested in following the progress of the new regulations. Many are also concerned about whether their homeowner's insurance premiums may be affected.

The National Flood Insurance Program offers insurance to property owners if they live in a participating community. The Flood Insurance Reform Act of 2012 authorizes the Federal Emergency Management Agency (FEMA) to make changes to the way the program is run. One of these changes will require the NFIP to raise rates to reflect the true flood risk in every area of the country. The old flood risk maps have been re-drawn.

Flood insurance is not usually part of a homeowner's insurance policy, which protects against other types of risk such as fire and wind damage. Flood insurance is a separate policy that has been made available through the federal government to allow property owners to insure against the risk of floods, or if required by mortgage lenders. Since homeowner's policies do not normally cover flooding, they should not reflect changes in the rates for federal flood insurance. That said, homeowner's policy premiums have increased rapidly for Cape residents over the past several years to reflect potential damage from major storms, and it is possible that premiums may continue to rise for this or other reasons, but they should not rise on account of flood risk.

People who may live in flood zones and who are interested in knowing how their own properties could be affected should go to the official website of the Town of Barnstable,

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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.

BOB AND ANNETTE NICHOLS ARE MOVING TO NH

Bob Nichols, IPA Vice President for the past four years, and his wife Annette, will be selling their house on Mystic Lake. They plan to move a house on a small pond near Lake Winnepesaukee in New Hampshire, where they will live year-round. The IPA is deeply sorry to see them go, as both Bob and Annette, in addition to being the best possible neighbors and friends, have been heavy hitters on behalf of the IPA. They will be greatly missed. Both are engineers who retired to their summer home in Regency four years ago. They both fish, and have a boat that is seen on Mystic and Middle nearly every day during good weather. Bob has also been known to enjoy ice fishing. They are moving because they want to be closer to winter sports.

Since joining the IPA Board of Directors in 2009, Bob has been a proponent of better and more frequent water quality testing. He also led a team effort, consisting of IPA people, Town people, outside consultants, and participants from state agencies to prevail upon MA Natural Heritage to increase alum dosages to more effective quantities than had been previously approved, backing up the appeal with strong quantitative data. He charted depth soundings at more than 11,000 locations in Mystic Lake, which made it possible to apply alum with great precision to the places it was most needed. Bob was the first to notice a new aquatic plant growing near his dock and identify it as *Hydrilla*, and since that moment has tirelessly led the fight to eradicate it, inventing cost-effective benthic barriers and organizing team efforts at hand-pulling. He has worked closely with the Town to increase its participation in combating this invasive plant. Bob's charts, graphs, and photos have added quality and interest to every IPA Newsletter over the past few years.

Annette reorganized and led the annual spring herring counting project in 2012, and has worked as one of three members on the vitally important IPA Nominating Committee. She spent *hundreds* of hours hand-pulling *Hydrilla*. She has contributed articles to the Newsletter. She has always been ready to pitch in wherever needed with enthusiasm and cheer. Annette is a dedicated oarsman on the Barnstable Rowing team and participated in the Head of the Charles Regatta this spring.

Bob and Annette's contributions of talent and commitment have been huge; they've been good friends and we'll miss working with them. We wish them all the best in their new home by a pond in New Hampshire. It's a lucky pond to have them living on its shore!

--Holly Hobart

VOLUNTEERS NEEDED TO GET SOME EXERCISE WHILE HELPING TO REPAIR THE HERRING RUN!

Funding that the Town sought to rebuild the herring run was most unfortunately derailed, and sections of the run (the 400-foot flume below Middle Pond) will have to be repaired this winter so that herring can use the run in the spring. The Town's Natural Resources Department will lead the project. The work will consist of bracing the sides of the run with sheets of plywood, and may require working in the water. The dates they are expecting to work are December 5, 10, 12, and/or 17, but probably not all of these. If you would like to help, please contact Amy Croteau at Town of Barnstable Natural Resources Department, amy.croteau@town.barnstable.ma.us, for more detailed information on this vital project.

ON THE BOARD OF “A GREAT ORGANIZATION”

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chickens and pigs, and grow oysters in Barnstable Harbor. Over the years there were scientists, a postmistress, teachers, businessmen, housewives, and retirees like me. In fact, one Board member who grew up vacationing on Mystic Lake, as a result of being on the IPA Board, has become an expert on lake ecology and has given lectures on the subject.

I have learned that our lakes are really kettle ponds formed long ago by glaciers, that they are spring fed, flow down the Marstons Mills River into the herring run at Routes 149 and 28, and feed the Three Bays at Prince Cove. I now know that how we, who live near the lakes, care for them not only affects their viability, but also affects the health of the estuary at Three Bays.

I have learned that the lakes really are vulnerable and absolutely do need protection from a variety of invasive plants and other threats. I have seen the Association mount a successful effort to eradicate much of the grey willow that crowded our shores by involving lakefront property owners, the Town's Conservation Commission, and a private contractor. I have seen the IPA enlist the help of the Conservation Commission, consultants, and neighborhood volunteers in an ongoing effort to halt the spread of *Hydrilla*, which if left unchecked, could destroy the lakes. I have seen the IPA work patiently and successfully with a Massachusetts state agency that others have described as intransigent.

DO NATIONAL FLOOD INSURANCE CHANGES AFFECT YOU?

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www.town.barnstable.ma.us. Click on “Property Lookup” at the top of the page, enter information about the address or owner, and you will be presented with a list of properties. Click on “Map” to the right of your property's address. This will show a map of your property and its abutters. Click on the “Custom” tab at the top of the map. Then check one of the two “FEMA” boxes on the legend to the right of the map area and click “Refresh” at the top. The upper FEMA checkbox displays current flood zones, while the one below it refers to the new flood risk zones to be finalized in 2014. Compare the shaded areas on your property with the colors in the legend. If your property has no areas filled in color, it is not in any flood zone. Chartreuse means a 0.2% annual chance of flooding, while purple, pink and orange are the

I now know the kinds of fish, crustaceans, and plants that grow in our lakes. I learned that our lakes are home to rare varieties of freshwater mussels and that herring spawn in them. I have learned about algae blooms, mussel kills, and how to take measurements of the various parameters indicative of a lake's health. I even know how many pounds of poop a goose produces a day.



Lew Solomon

I have observed IPA Board members produce topographical maps of the lake's bottom, and develop websites and publications documenting data on the lake's vital signs that are used by the Association, the Town, our consultants, and other lake associations to gain knowledge. I have seen IPA volunteers removing debris around the lakes each spring, standing waist deep in water raking *Hydrilla* for hours, and parading around the lakes in boats flying the American flag on the Fourth of July.

What a great organization! I have served on other boards and never have I found it so rewarding, and learned so many things I never knew I wanted to know. I hope, after an appropriate hiatus, I am asked back. I'm also hoping that by writing this article, you, the reader, will be encouraged to get involved with the IPA.

--Lewis Solomon

colors that will potentially affect federal flood insurance rates. Try clicking on some of the other checkboxes, such as those for “structures” or “walkways” or “water” or “transportation” to see additional interesting features displayed.

If you have trouble with the maps or questions about their meaning in your particular case, your insurance agent and/or the GIS (mapping) service at Town Hall (508) 882-4624, should be able to help you.

--Alex Frazee

Photo and graphics credits: page 3, Lew Solomon; page 4 Chris Siderwicz, Cape Cod Airfield; page 5, graphics, Bob Nichols; page 6, teachers.rickards.leon.k12.fl.us; Page 7, Great Horned Owl, George Jameson, www.mbr-pwrc.usgs.gov, Barn Owl, en.wikipedia.org.

SIGNIFICANT LATE SEASON ALGAE BLOOM IN HAMBLIN POND

In September all three Indian Ponds experienced algae blooms, but Hamblin Pond had the worst. An aerial photo taken on September 23 shows a stark difference between the bright green Hamblin Pond and the dark blue adjacent Middle Pond (to view the photo in color visit the newsletter archive at www.indianponds.org).

The Secchi depth in Hamblin Pond deteriorated to 2.0 m in mid-September as the pond took on a green appearance. Secchi depth is the standard measure of water clarity in ponds and is the maximum depth below the surface at which a black and white 8 inch diameter disk can be seen.

As shown on the accompanying plot of Secchi depths, this was the worst water clarity observed in Hamlin Pond over the past several years. Google Earth imagery from July 29, 2007 shows evidence of a slightly less severe algae bloom in Hamblin Pond six years ago. In general the Secchi depth in Hamblin Pond has degraded in the past few years, which possibly indicates that the 1995 alum treatment has started to lose its effectiveness in limiting phosphorus in the water. The IPA will monitor the Secchi depth in Hamblin Pond closely over the next summer season to see if this trend continues.

The plot of Secchi depths also shows the mid September algae bloom to be the worst water clarity of the season in both Mystic Lake and Middle Pond, but neither were as bad as Hamblin Pond. Both Mystic and Middle continue to show year over year improvement since the alum treatment of Mystic Lake in October 2010.

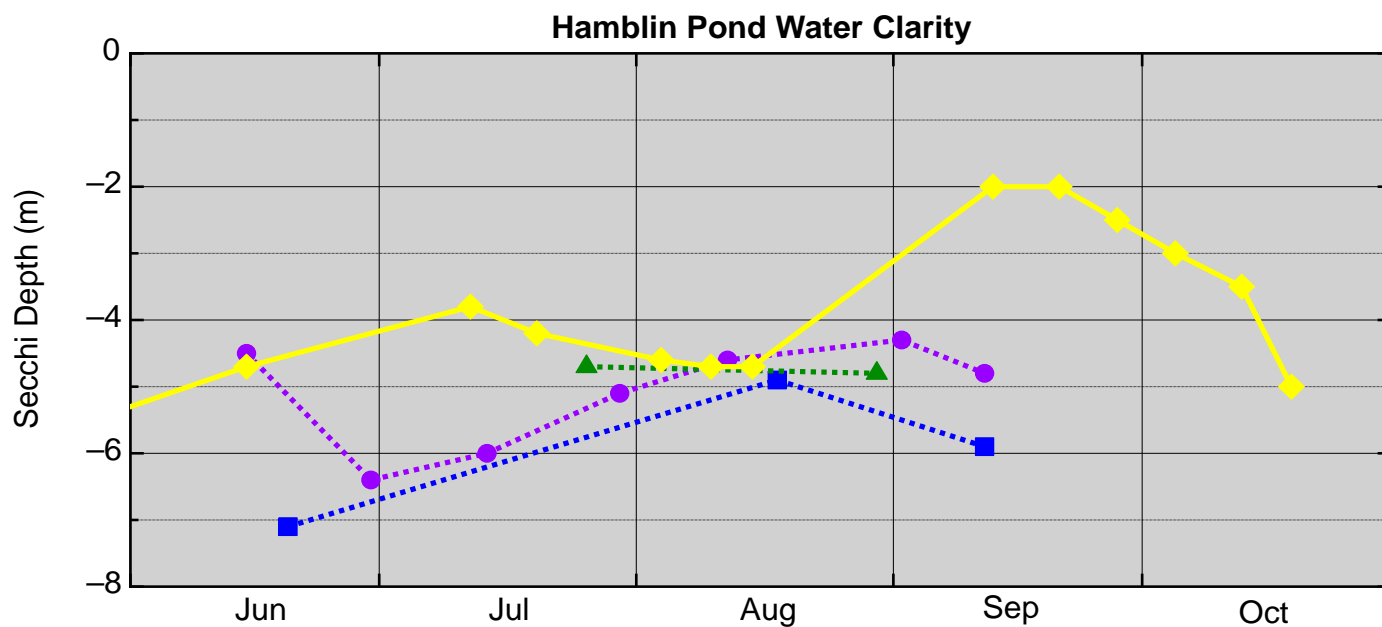
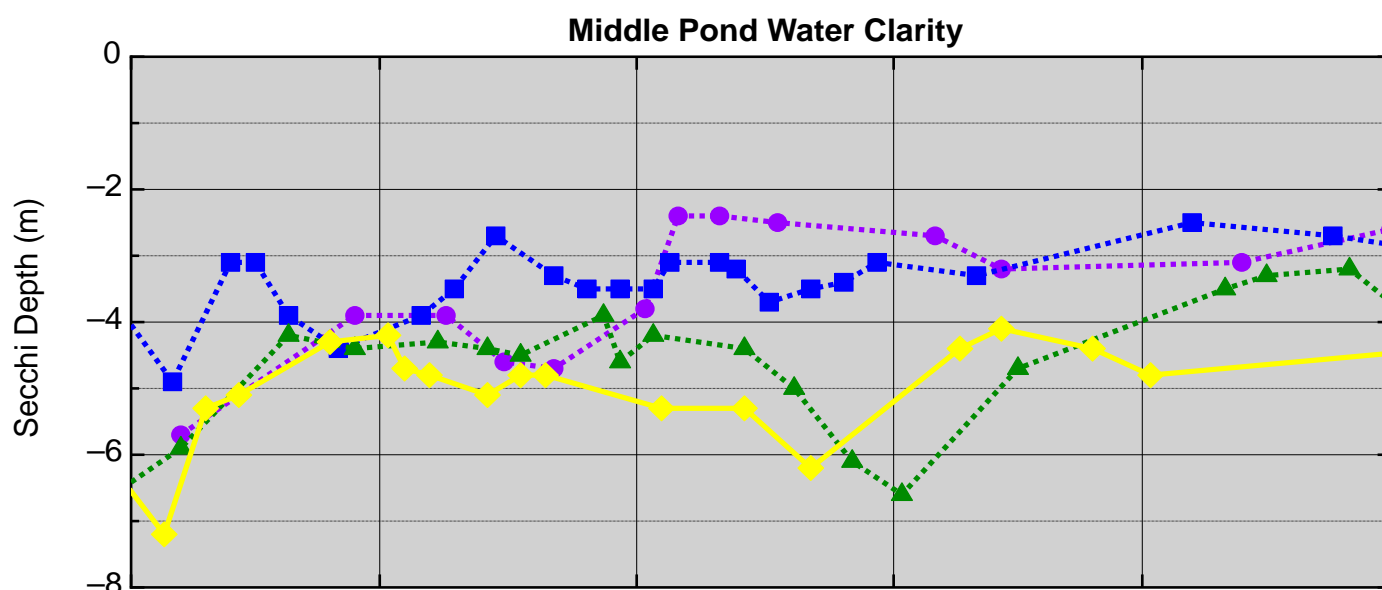
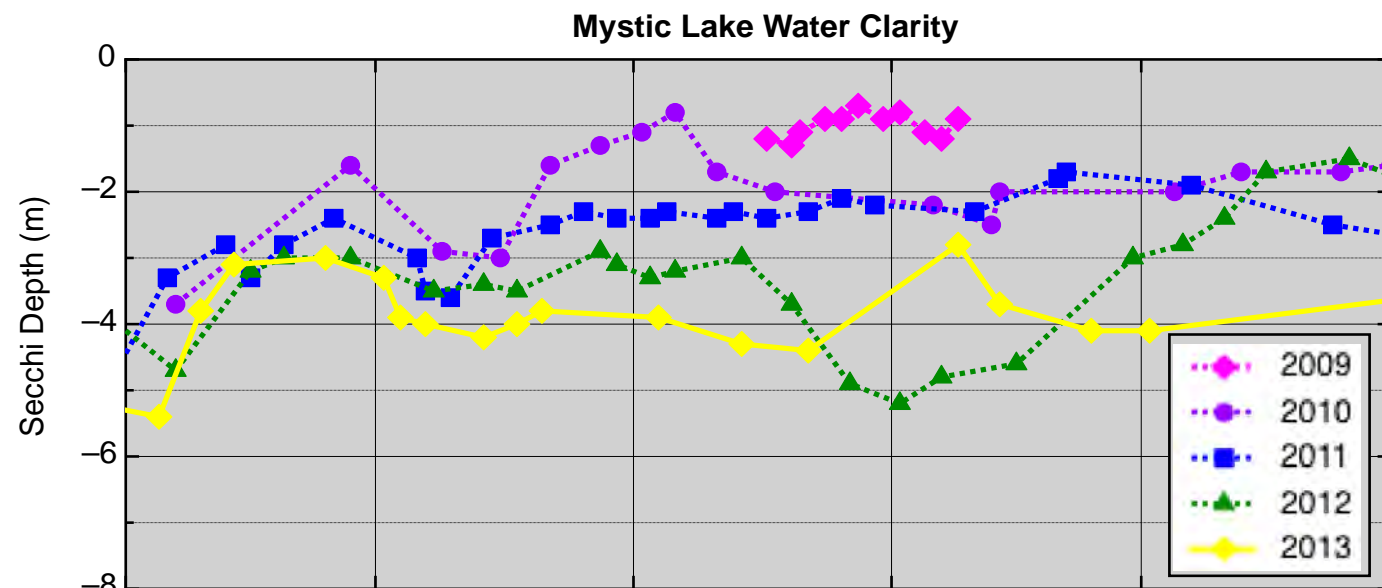
These mid-September blooms correlate with the early start of the fall "turnover," during which the upper waters begin to cool and the thermocline (the depth at which the water temperature changes most significantly) drops lower in the water column. This allows some of the cooler water that has remained sequestered below the thermocline all summer to mix into the upper water column, bringing with it phosphorus that has been released from the sediment, thus fueling fall algae blooms.

Alum treatments are employed to limit the amount of phosphorus that can be released from the sediment during the summer stratification period, when colder anoxic water is trapped below the thermocline. The water samples collected by the IPA at various depths in all three ponds during the PALS (Ponds and Lakes Stewardship) sampling in late August will show what the phosphorus levels were prior to this September bloom in Hamblin, but these results will not be available for several more months.

--Bob Nichols



Photo from September 23, 2013 shows a significant algae bloom in Hamblin Pond (left) compared to Middle Pond (right).



THE LIFE AND DEATH OF KETTLE PONDS

Lakes, including large ponds, appear to be permanent fixtures in the landscape, perhaps because they don't appear to change very much over the course of a single human lifetime. But lakes and ponds do have life cycles; they are created, usually by geological processes, they gradually mature, and eventually they disappear. Change, whether over decades or eons, is the constant condition of landforms such as mountains, plains, and rivers, and also of ecological communities. Such change goes on all the time, not always with observable speed, but inexorably.

The young pond. The Indian Ponds, and all "kettlehole" ponds on the Cape were created by the action of the Laurentide ice sheet that advanced from eastern Canada to cover New England from 25,000 to 12,000 years ago. When it reached the milder climate around the Cape, the glacier began to melt. The tremendous volumes of meltwater created a landscape of rushing streams. These streams carried immense amounts of clay, sand, gravel, rock, and boulders that had been scoured and gouged out of the northern lands and embedded within the glacier during the millennia when it was advancing southward. Occasionally in the long melting process, a large chunk of dense ice remained unmelted while the streams of meltwater deposited sand and rock around it, building up the land and eventually completely covering the chunk of ice. When the chunk finally melted, the unsupported ground caved in to reveal a depression in the earth that quickly filled with groundwater, creating a kettle pond.

At first, the newly-created ponds were devoid of life and very clear. They were pristine bodies of water in a bare but awakening land that was only beginning to become colonized by pioneer plants and insects. Plants, beginning with bacteria, algae, lichens, mosses and ferns, established themselves first, carpeting the rocks and barren ground and gradually adding nutrients to the soil that eventually allowed it to support a succession of flowering plants and shrubs. The warming climate and newly-available soil nutrients eventually fostered the arrival of trees, which continued the process of clothing the land and enriching the soil with their leaves and needles and wood. A similar process was happening *within* the kettle pond. As generations of pioneering water plants died they added their nitrogen and phosphorus to the available nutrients, promoting the growth of a greater variety of plants that could sustain communities of insects, worms and other invertebrates. The pond was becoming an ecological community.

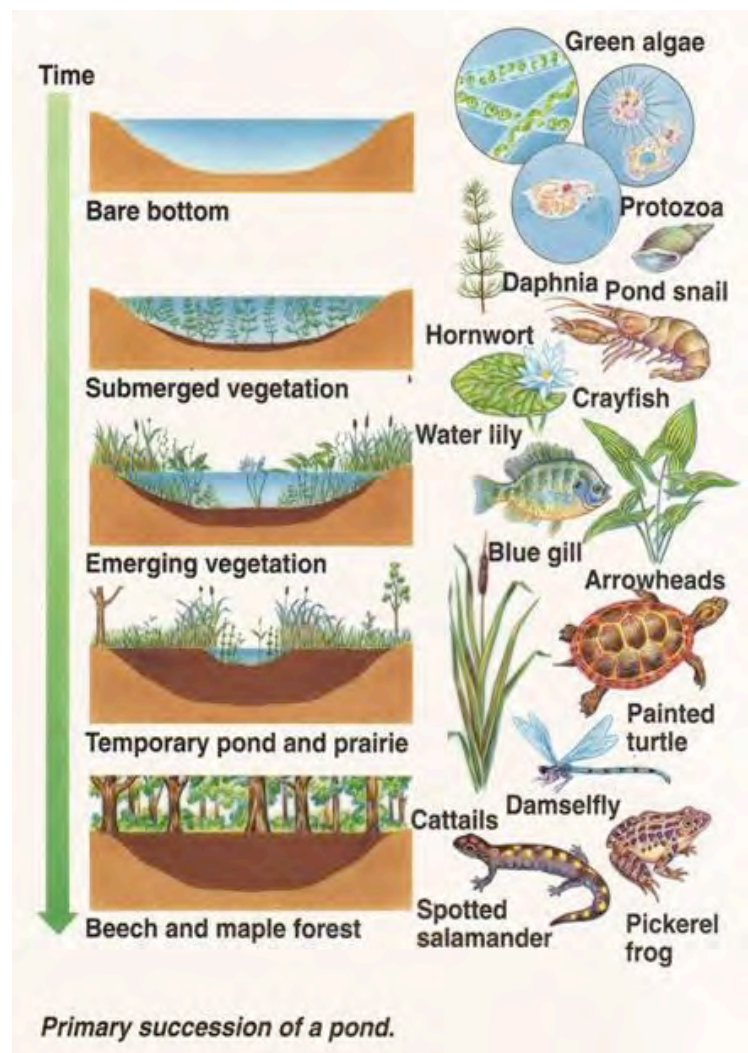
Fish and mussels arrived at the kettle pond by way of rivers and streams, or sometimes by the agency of early humans. People have always assisted the spread of other forms of life, intentionally or otherwise. Amphibians, reptiles, and mammals traveled overland and settled in or around the pond, birds brought invertebrate spores and eggs in their droppings, and a rich mix of life developed, nurtured and sustained by a complex web of interrelationships among the many species.

As pond-dwellers died, their bodies were consumed by bacteria and fungi. They added nitrogen, phosphorus, and other chemicals to the water and began creating layers of decaying plant material, **detritus**, over the sandy bottom in the deepest parts of the pond.

Trees, shrubs, and water plants dropped their leaves into the pond year after year, adding their detritus to the available nutrition and building up the layers of decaying matter. Over the millennia, these sediments deepened and other changes occurred. With the passage of time, **eutrophication**, the concentration of nutrients in the water, increased, the number of species supported by the pond increased, and the depth of the organic sediments overlaying the sandy bottom of the pond increased.

The mature pond. In the natural course of events, if the pond is a shallow one, or one without inlets and outlets, it rapidly becomes shallower as the layers of sediment build. Larger and deeper ponds evolve more slowly. The Great Lakes and Lake Baikal, the deepest lake in the world, for example, will not complete their life cycles for thousands or millions of years. Other factors also influence the speed of pond evolution such as temperature, pH, and the length of time the water resides in the pond before being replaced. Arctic and subarctic ponds have such short growing seasons and such small numbers of species that they evolve extremely slowly, if at all. Such ponds contain highly transparent water. Ponds with no inlets or outlets experience eutrophication more rapidly than those in which the water flows through and is continuously replaced.

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OWL PROWL

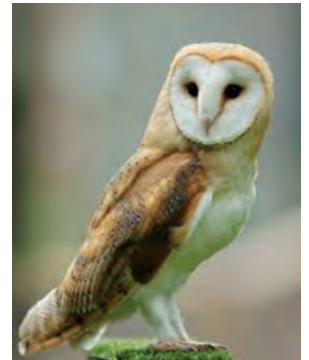
There are nineteen species of owl in North America. They are divided into two families, *Strigidae* and *Tytonidae*. Our area, Cape Cod, is in the all-season area of six of them and in the winter range of two others. I can hear them calling from my deck, particularly in the spring. I have been on several organized owl-prowls. In spite of all of the above, I have never seen an owl in this area or, for that matter, the United States. I had to go to Scotland to see a Snowy Owl, which is becoming quite common in Massachusetts, and go to Peru to see a Burrowing Owl, which is resident mostly west of the Mississippi and in parts of Southern Florida. While there we also saw the Tawny-Bellied Screech Owl, which is quite common in South American but doesn't come to the U.S.

Owls offer a wide variety of traits. Some are really big and some are really small. Some hunt by day but most hunt at night. Some are intensely curious, others will totally ignore you, if you happen to come upon them on an owl search. Not that they don't see you, you are just judged to be "not prey" and therefore not worthy of further notice. The Great Horned Owl, which is probably the one I hear off my deck, is found everywhere in North America, and parts of South America, but not in Central America, and is one of the largest owls. It is a powerful hunter and is quite willing to take game larger than itself such as rabbits and even skunks. It has also been seen to take very small critters like scorpions and frogs. It is the largest predator of the Osprey on Cape Cod and also takes the occasional Peregrine Falcon and house cat. This is the owl of most of the storybooks.



Great Horned Owl

Often confused with the Great Horned Owl is the Long-Eared Owl, since they both have the same long feather tufts on their head. The Long-eared is much smaller and skinnier but when it is alarmed it may stretch itself up to a tall posture in an attempt to intimidate. The Long-eared Owl is very quiet and often overlooked. It is strictly nocturnal and may roost in groups. The Barn Owl, which is the member of the other family (*Tytonidae*) is easily recognizable by its flat, heart shaped face disc. They are widespread in the world but scarce over much of their range, which includes the Cape. They are nocturnal and spend the daylight hanging out in barns and old buildings, caves and dense woods. One of the owls we do not usually see around here is the Burrowing Owl. This is one of the more curious species and is currently featured on a commercial on television hiding in the hollow of a tree. First he drops down below the opening of the hollow and then, as if he can't stand the suspense, he pops back up to check what's going on with the camera.



Barn Owl

Owls do exist on Cape Cod and I encourage you to get involved in an owl prowl when you can find them happening. They are occasionally run by Mass Audubon and are listed on their website at www.massaudubon.org.

--Dave Reid

THE LIFE AND DEATH OF KETTLE PONDS

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Whether slow or fast, in temperate climates the transformation proceeds predictably in ponds that do not experience external interference. As the sediments build up and the water shallows, more water plants invade and crowd the water column, particularly plants with floating leaves. Water lilies are an indicator species for this stage in the life of a typical pond. Terrestrial plants such as cattails also invade from the shoreline into the shallows, reducing the area of open water. Over time, rushes and sedges appear in the middle of the pond, and eventually what was a pond becomes a swampy depression in the ground, then as grasses move in, a damp meadow, and finally, as the process continues to its ultimate conclusion, shrubs and trees. This natural process is **primary succession** and the resulting forest, which remains relatively stable, is the **climax** vegetation.

Interruption and secondary succession. A disturbance in the external environment that upsets the equilibrium of the ecological community, such as a fire, flood, or landslide, causes the normal path of succession to be changed, and **secondary succession** comes into play. Secondary succession can also be initiated by man-made disturbances such as dams, water pollution, or the introduction of invasive plants. What happens next, and the course that secondary succession may take, is often unpredictable, particularly when the pond is confronted by a whole series of disruptive events such as eutrophication plus destruction of a key species plus alum treatment plus the introduction of invasive plants. This is what we are now seeing in Mystic Lake. Exploring the possible implications of such disruptions will be the subject of a future article.

--Holly Hobart

The bibliography for this article and the one to follow on this subject is too long to include here. For the complete list of source books and articles, please see www.indianponds.org.

“To preserve and protect the natural environment and ecological systems of the Indian Ponds and surrounding parcels of lands and watershed and to participate in studies and work with other agencies, individuals, and groups to educate the public, serve the community, and promote and preserve the Indian Ponds and surrounding areas.”

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