THE IPA NEWSLETTER

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

Winter 2012 A quarterly publication of the Indian Ponds Association, Inc. Vol.12 No. 1

MIDDLE POND WATER TESTING SHOWS INCREASED PHOSPHORUS LEVELS

The mussel kills and increased algal blooms experienced in Middle Pond in recent summers have raised concerns about a possible phosphorus problem in the pond. Phosphorus is typically the limiting nutrient in a pond and its concentration relates directly to the amount of algae that can grow. To address this concern, the IPA contracted with Water Resource Services (WRS) Inc. (Ken Wagner) to perform water sampling and plankton analysis in Middle Pond on two additional dates this past summer to supplement the PALS (Pond and Lake Stewardship) program sampling done every year in August.

Past PALS data, which are collected at three depths (0.5, 3, and 9 m), show a step-change in phosphorus concentration between August 2009 and August 2010. Prior to 2010, the phosphorus concentration in Middle Pond at all sample depths was typically below 15 ug/L. This placed Middle Pond among the ponds with the lowest phosphorus concentration in the Town of Barnstable. However, the August 2010 samples ranged from 26 to 37 ug/L and most of the 2011 samples were in the 20–45 ug/L range. This increased phosphorus concentration is in the range more supportive of algal blooms.

The 2011 WRS data collected in June and September were sampled every 2 m from the surface to the maximum 10-m depth. This provided a more detailed snapshot of the water quality than the more limited PALS sampling. The graph on the next page shows the phosphorus concentrations in the samples for each date, with the darker bars representing deeper sampling points. The graph clearly shows the step-change in phosphorus occurring between 2009 and 2010.

The 2011 phosphorus concentrations in Middle Pond were close to the 2010 levels and very similar to those measured in Mystic Lake at the same depths. However, even after the alum treatment, Mystic Lake does have a much higher phosphorus concentration (122 ug/L) at its deepest point (14 m), although much reduced from the extraordinary levels (660–1083 ug/L) found in the years preceding the alum treatment. The fact that the phosphorus concentrations at the deepest point in Middle Pond are not excessive near the water–sediment interface indicates that regeneration of phosphorus from the sediment is probably not a significant contributor. Regeneration of phosphorus from the sediment was a major contributor to phosphorus concentrations in Mystic Lake and was the reason for the alum treatment. *(Continued on page 3)*

WHICH HERRING ARE WE TALKING ABOUT?

When **"herring"** is mentioned to the typical Cape Codder, the person in question generally thinks of river herring, the fish that runs up many Cape Cod streams each spring to spawn. River herring can be either **alewives** (*Alosa pseudoharengus*) or **blueback herring** (*Alosa aestivalis*). However, there is another herring that lives nearby in the ocean: the **Atlantic herring** (*Clupea harengus*). Atlantic herring is a commercially important species and was recently mentioned in the *Cape Cod Times* newspaper as being in short supply in waters off Cape Cod because of overfishing there by large US trawlers.

Alewife

Both river herring and Atlantic herring bear some resemblance, but they are totally different species, even though they are members of the same taxonomic family Clupidea. Atlantic herring spend their entire lives in the ocean, while river herring spend part of their lives in freshwater. River herring are termed anadromous because they, like salmon, live their adult lives in the sea, but migrate to freshwater in the spring to spawn. *(Continued on page 4)*

– IN THIS ISSUE –

CALLING ALL COLLEGE-BOUND SENIORS!

The IPA is pleased to announce that it will offer two $1000 scholarships this spring to graduating high school seniors from Marstons Mills. The Schwarm Memorial Scholarship was established in 2005 in memory of Edward Schwarm, a former IPA director and officer. It is in his memory and the goals of the IPA to select students who will balance their professional careers with a continuing effort to preserve our environment.

The scholarships are available to any graduating senior residing in Marstons Mills and attending public or private high school. Applications are available at the Barnstable High School Guidance Office or on the IPA website at www.indianponds.org. **Deadline for submission is April 1.** We encourage our seniors to apply early.

Gay Rhue

DERELICT BOAT AND DEBRIS CLEANUP

On Saturday June 9 the IPA will sponsor its seventh annual cleanup of derelict boats and debris from around the shores of Mystic Lake and Middle Pond.Collection of such items is done by volunteers with boats that can tow away large items of debris such as abandoned boats or docks to the Race Lane beach/boat landing, where they will be removed and disposed of by the Town Highway and Solid Waste Divisions.

Owners of boats, floats, and docks are asked to be sure that these things are in good repair, well labeled, and can be identified and returned if they should drift away. Also, all boats should be tidily moored, docked, or properly secured on the shore and not left in such a state as to suggest abandonment.

If you are aware of any debris on your pond shore that you would specifically like to have picked up, or if you have lost something that you think may have drifted away and you'd like us to let you know if we find it, please alert us by calling Holly Hobart at 428-0235 before June 9.

We do not plan a cleanup of Hamblin Pond this year; however, if you live on Hamblin Pond and have debris or abandoned boats or docks on your property that need to be removed, please let us know by calling the number above.

Anyone wishing to participate in the cleanup this year should meet at 9:00 a.m. on Saturday June 9 at the Race Lane beach. Please bring a boat with motor, and equip yourselves with gloves, rope, and boots or stout water shoes, as items of debris are often broken and have sharp edges or exposed nails.

Holly Hobart

ALL IPA MEMBERS ARE INVITED TO THE IPA ANNUAL MEETING

SUNDAY, JULY 15, 2012
4:00 PM
JON AND DEBBY HALPERT'S
410 TURTLEBACK ROAD
MARSTONS MILLS

IN MEMORIAM

Kevin A. Galvin, January 23, 2012

The IPA and the Marstons Mills community owe a deblt of gratitude to Kevin Galvin for his generous efforts to initiate and provide leadership for many local environmental and historical issues, including the annual river herring count.

He will be profoundly missed by all.

MIDDLE POND WATER TESTING SHOWS INCREASED PHOSPHORUS LEVELS

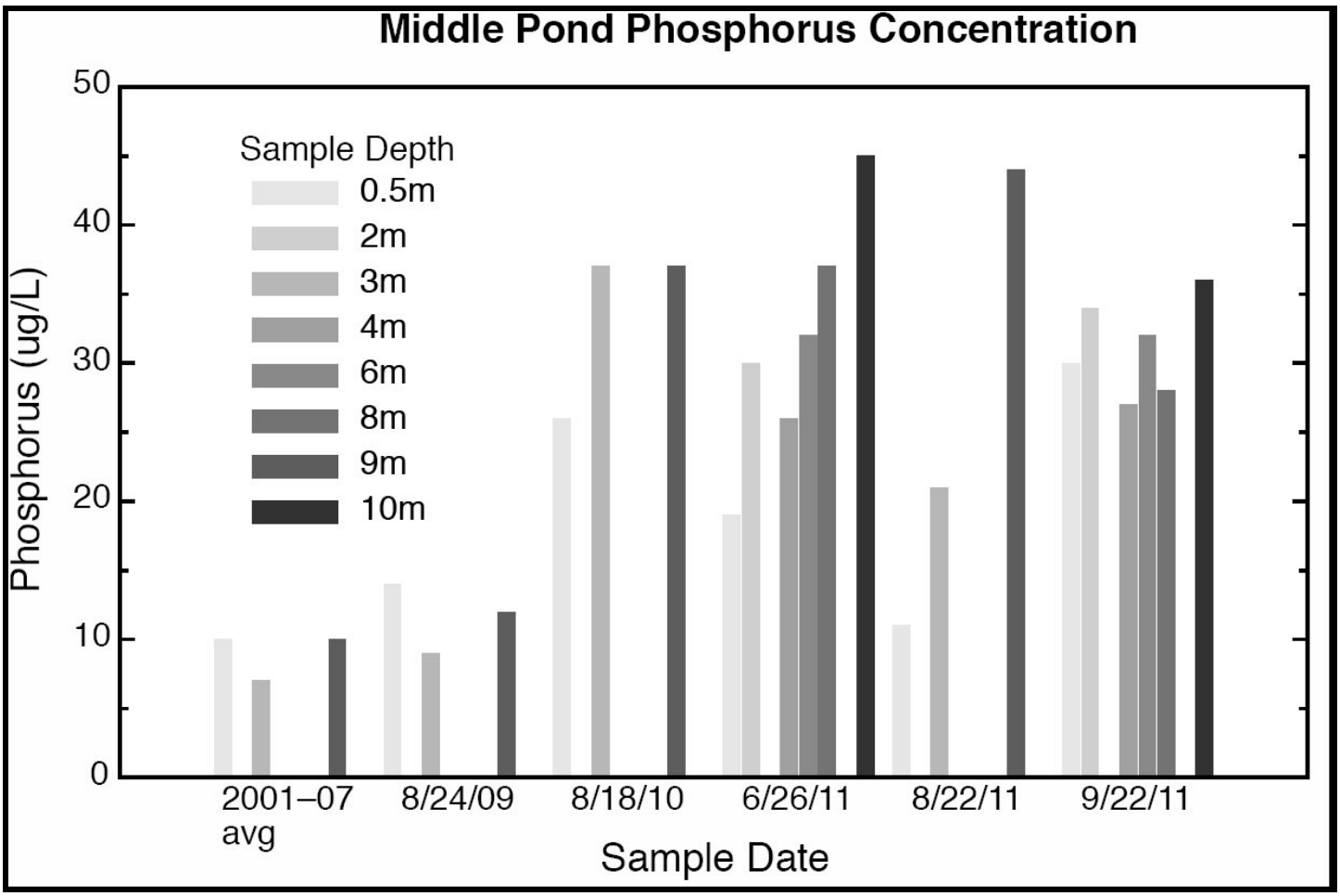
(Continued from page 1)

A possible major contributor to the phosphorus increase in Middle Pond is the decomposition of the mussels killed in the several major die-offs that have occurred beginning in August 2009. The late August 2009 die-off in Middle Pond, which was much worse in Mystic Lake, was followed by a more significant die-off in Middle Pond at the end of July 2010. A professional mussel survey of Middle Pond in June 2011 by Biodrawversity LLC, funded by the IPA, concluded that 85–95% of the Middle Pond mussel population perished in 2009 and 2010. Biodrawversity also performed a mussel survey of Mystic Lake in June 2010 and estimated that as many as 24 million mussels died in the 2009 kill in Mystic Lake. Conservatively, we can assume that the Middle Pond die-offs have also been in the millions of mussels.

A rough estimate of the potential amount of phosphorus released by decomposing mussels shows it to be of the proper magnitude to significantly contribute to the increased phosphorus concentration in the pond. The water volume of Middle Pond is about 2.23 billion liters; using a phosphorous concentration of 30 ug/L throughout the pond (about the average measured in 2010–2011), yields a total of 67 kg of phosphorus in the pond water. Based on the scientific literature, about 0.6% of a mussel's body dry weight is phosphorus, and a typical mussel's body dry weight is about 2 g. This would yield 12 kg of phosphorus per million decomposed mussel bodies.

Not all of the phosphorus from decomposing mussels would directly enter the water, but releasing the phosphorus that has long been tied up in the mussel population is a significant influx to the pond environment. Phosphorus also comes into the pond from many other sources, including groundwater (septic), waterfowl, runoff, flow from Mystic Lake, etc., but these sources were not likely to have changed markedly between 2009 and 2010. Therefore, it is likely that the decomposition of mussels in the die-offs caused the step-change increase in the Middle Pond phosphorus concentrations. It is also likely that phosphorus from the millions of mussels that decomposed in Mystic Lake has tempered the apparent benefits of the alum treatment. It may take at least another year or two for the ponds to reach a new equilibrium. It will be important to continue to monitor the ponds closely over the next couple of seasons.

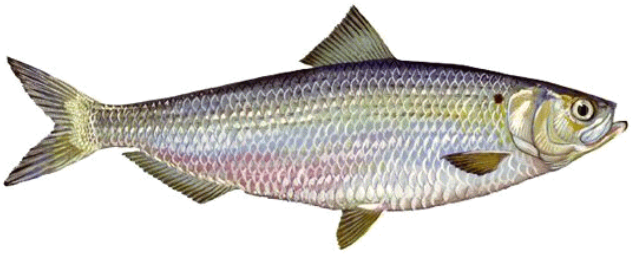
Bob Nichols



WHICH HERRING ARE WE TALKING ABOUT?

(Continued from page 1)

In addition to these three, other herring species that occur in the sea around Cape Cod include **hickory shad** (*Alosa mediocris*), **American shad** (*Alosa sapidissima*), **Atlantic menhaden** (*Brevoortia tyrannus*), **Atlantic round herring** (*Etrumeus teres*), and **Atlantic thread herring** (*Opisthonema oglinum*). Less prevalent is the gizzard shad (*Dorosoma cepedianum*), found mainly in bays and estuaries. Like river herring, American shad and hickory shad are also anadromous, whereas the other herring species spend their entire lives in the sea. Shad and menhaden are probably the most familiar of these, particularly to fishermen. Both American shad and hickory shad are important to sportfishing.



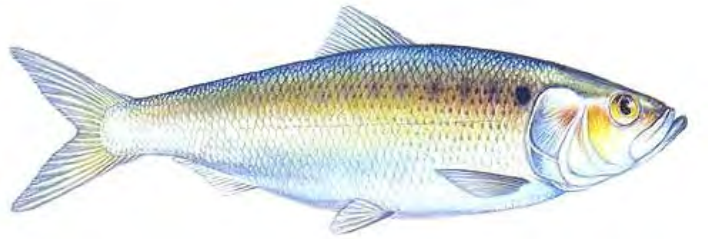
Blueback herring

American shad

Atlantic menhaden

American shad is the largest of the herring species, with a maximum length of about 30 inches. The largest American shad recorded by the International Game Fish Association weighed 11.2 pounds and was caught in the Connecticut River in 1986. Menhaden, also known as bunkers or pogies, support a large commercial fishery conducted by purse seines, with the fish processed mainly for fishmeal and fish oil. A tightly packed school of young menhaden being ravaged from below by a hungry school of bluefish and swooped upon from above by circling gulls and terns is a familiar sight to recreational fishermen around Cape Cod.

The distribution of river herring is confined to the east coast of North America. Like Atlantic herring, river herring also form schools. Blueback herring are found from Cape Breton, Nova Scotia to the St. John's River in Florida, while alewives have a more northerly range extending from Labrador and Newfoundland south to South Carolina. Alewives have also become landlocked in some parts of North American, including the Great Lakes, some of the New York Finger Lakes, and other similar lakes. River herring can attain a maximum length and age of about 15 inches and 11 years, respectively.



Hickory shad

Atlantic herring, one of the most abundant species in the ocean, is found on both sides of the Atlantic, lives in large schools, with individuals growing to a maximum length of about 18 inches and to a maximum age of about 18–20 years. Because of its wide distribution in the Atlantic, it comprises many separate, self-sustaining stocks that provide the basis for important commercial fisheries. Herring caught in the western Atlantic by US and Canadian fishermen are used for lobster bait, sold as sardines (small herring), or converted to fish meal or oil, but increasing amounts are now exported for human consumption. Smoked, salted, pickled, fresh, and frozen herring are more common in Europe. The pickled herring that you buy in local grocery stores is Atlantic herring.

Atlantic herring

Now, when you see or hear the word "herring", think twice before assuming it is Cape Cod river herring.

Emory D. Anderson

STATISTICAL SAMPLING OF MARSTONS MILLS RIVER HERRING RUN USING VISUAL COUNTS

The Marstons Mills River is home to the anadromous alewife (*Alosa pseudoharengus*) and blueback (*Alosa aestivalis*) herring. These fish are known colloquially as "river herring". Alewives begin to spawn in late March to mid-May when water temperatures reach about 10.5°C (50.9°F). Bluebacks spawn later in the spring (typically late April into June), when water temperatures reach 13.9°C (57.0°F). In recent years, the abundance of river herring in several runs in Massachusetts, including the Marstons Mills Watershed, has declined to historical low levels. The National Marine Fisheries Service has listed both species as "species of concern", so the MA Division of Marine Fisheries (DMF) established a moratorium on the harvest of river herring in 2005, which is still in effect.

In order to establish a relatively reliable and meaningful statistical count, DMF has published guidelines to volunteer organizations. These guidelines recommend that volunteer groups follow a two-way stratified random sampling design by having volunteers count for nine 10-minute counts in each 12-hour day. The counts ideally should include 3 in each of three daily periods (7–11 am, 11–3 pm, and 3–7 pm) during the active run.

The Marstons Mills Watershed has been participating in a visual counting program with volunteers using this method since 2006 to derive a reliable estimate of the annual river herring run size. Since this program started, the highest counts were observed in 2008, when 5,232 fish were counted at Mill Pond.

Counts have been much lower in the following years (1,332 counted in 2009, and 478 in 2010), with 2011 showing a precipitous drop to 53 fish observed crossing the ladder at Mill Pond. Meanwhile, anecdotal reports from other Cape herring counts in 2011 reported larger than usual runs.

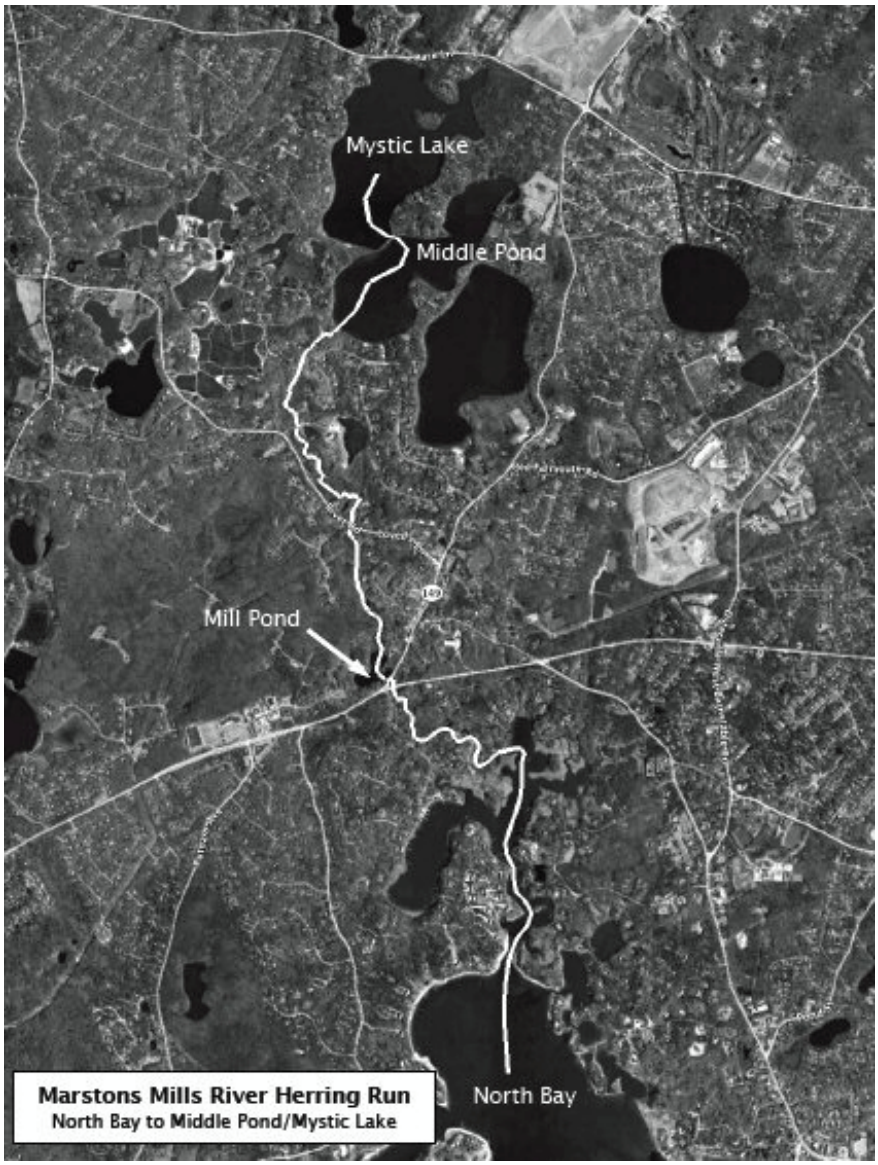
The Town's Natural Resources Division (NRD) has completed its spring survey of the river to ensure there are no barriers to the fish migration between Prince Cove and Middle Pond. It is important to have good volunteer count coverage during the 2012 migration to make sure we have sufficient data for a meaningful analysis, so that we can understand if the very low count in 2011 was an anomaly, or is indicative of very low river herring abundance.

The IPA is working closely with Three Bays Preservation (www.3Bays.org) to collect a statistically meaningful count to better understand this issue, since river herring are a key link in the transfer of nutrients from freshwater to salt water.

With the unusually warm winter, water temperatures are currently above normal, so it is anticipated that the 2012 run may commence earlier than usual. **Volunteer counters are always needed and welcomed** for 10-minute intervals every daylight hour of the day – **no experience necessary.** If you would like to help or have questions, **please call Three Bays Preservation** at 508-420-0780 or e-mail to info@3bays.org.

We will report the results of the 2012 count in the summer newsletter, as well as new information learned from the DMF and other related sources.

Annette Nichols



A SHORT HISTORY OF HAMBLIN POND

About 21,000 years ago, the Laurentide Ice Sheet that covered all of what we know today as New England, stopped advancing and started to melt. It would continue melting for the next 3,000 years. During this time, occasional large blocks of denser ice remained frozen, while around them the meltwater deposited sediments of rock, sand, clay, and silt. Over the years, these deposits built up around the dense blocks and eventually covered them completely. When these dense blocks finally succumbed to rising temperatures, they melted, leaving "kettle holes", hollows in the ground that filled with groundwater. Hamblin Pond and the other Indian Ponds (Mystic Lake and Middle Pond) were formed in this way[1].

Hamblin Pond is separated from its neighbor, Middle Pond, by an esker, a ridge of gravelly and sandy glacial drift. A small stream running from the pond's eastern shore connected it to Nantucket Sound. At the beginning of its existence, Hamblin, like its two closest neighbors, was very clear, deeper than it is today, and supported little in the way of life. As plants and animals gradually colonized the barren gravels, their decomposition added nutrients to the pond. The nutrients fertilized plants, which attracted migrating water birds. Mammals, fish, and invertebrates moved in from nearby areas, over land or by way of connecting streams and brooks[2]. The primeval forest grew up around the pond, and people came to live nearby.

In 1653, Roger Goodspeed was granted a tract of land near the three ponds, where he built a house that is still standing on River Road today. In 1703, Benjamin Marston arrived to run a fulling mill on the nearby river, and the settlement of Marstons Mills began to grow into a village of upland farmers and shoreside oystermen. What we know today as Route 149 was in the early days called "the road leading from the West Meetinghouse […] to Marstons Mills".

Over the years, people gave the pond different names at different times. One of the earliest non-native settlers was James Hamblin, who built his house near the ponds. For a time all three were called "Hamblin's Ponds". Later, the southernmost pond became known as "Lovell's Pond", possibly after Enoch Lovell, who owned what is now the Burgess House, and others of his family, who owned land south of the pond in the 1700s. The first Walker Atlas of 1880 called the three ponds the "Cotuit Ponds".[3] For a couple of decades in the 20th century, it was called "Clear Lake".

Taken in the 1940s, this photo shows a house built by Asa Hinckley overlooking Hamblin Pond beside Tracy's Brook. It was built in the early 1800s and is still standing on Route 149.

Burgess House

The little stream running from Hamblin Pond to Warren's Cove on Nantucket Sound used to be called Tracy's Brook. In the mid-1800s, the Marstons Mills Herring Company was formed to exploit the herring run in Tracy's Brook, which was once abundant. When the Barnstable landfill was created, in 1930, the stream was filled in. Today, its former course can be traced only by a swale overgrown with shaggy greenery, and the pond no longer has an outlet to the sea.

In 1930, George P. Hadley started the Clear Lake Duck Farm on 120 acres on the south shore of Hamblin Pond. Over the 26 years of the farm's existence, its name became ever more ironic as water quality in the pond became worse and worse. During its years of peak production in the early 1950s, the farm produced 125,000 ducks and 50,000 turkeys a year and employed 30 workers. The ducks were housed in long sheds along the shore that were connected by a narrow-gauge railway that was used to deliver feed. Other structures on the property were a breeding pen, incubator building, brooder houses, cold houses, killing house, and dwellings for the family members. During World War II and the Korean War, ducks were in demand because of meat shortages and rationing, but by the mid-1950s, ducks became less popular as a menu item while the price of the grain to feed them rose. Clear Lake Duck Farm became bankrupt and closed in 1956, leaving Hamblin Pond heavily polluted with duck manure and its waters green with algae.

Neighbors complained. The Town tried to kill off the algae by treating the pond with copper sulfate.[4] Finally, in 1995, the pond was treated with alum, which produced a transformation in water quality, although it killed a number of fish due to improper control of the water pH. Today, the pond has the best water quality of the three Indian Ponds. Fishing has recovered. The pond is stocked with trout and is home to many native

fish, frogs, and turtles. The chief problem on Hamblin Pond today is the encroachment of invasive terrestrial plants into the pond. European gray willow trees, *Phragmites* reeds, and purple loosestrife capture more and more of the shoreline each year.

Hamblin Pond is a treasure. One of the things we have learned about ponds is that it takes attention and effort to keep them healthy. Ponds are assailed by many threats these days: runoff from lawns and roads, phosphorus and nitrogen from septic systems, invasion by foreign plant and animal species, and littering by careless visitors. It is the mission of the Indian Ponds Association to monitor the health of our ponds and educate the public. It is the responsibility of everyone who lives near Hamblin Pond to understand the threats and take part in protecting this irreplaceable resource for future generations.

Holly Hobart

[1] Oldale, Robert N., *Cape Cod and the Islands, The Geologic Story*. East Orleans, Parnassus Imprints, 1992.
[2] Caduto, Michael J., *Pond and Brook, A Guide to Nature in Freshwater Environments*. Hanover, University Press of New England, 1985.
[3] Correspondence from Dr. J. W. Gould, November 12, 2011.
[4] "Clear Lake Ducks", by J. W. Gould, *The Barnstable Enterprise*, September 25, 2009.
[5] Eichner, Ed., *et al.*, *First Order Assessment of the Indian Ponds, Final Report, March, 2006*. Barnstable, Cape Cod Commission Water Resources Program.

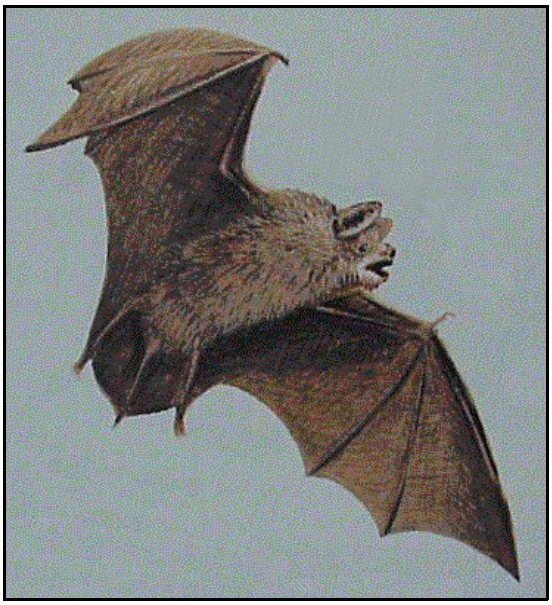
FACTS ABOUT HAMBLIN POND[5]

Area: 115 acres
Depth: 62 feet
Volume: 1,029,000,000 gallons

Aerial view in 1947 of the Clear Lake Duck Farm on Hamblin Pond showing the thousands of ducks along the shore.

BENEFICIAL BATS

OK. I know!! I know!!. Bats are not birds. In fact, they are one step closer to us humans than to birds. They are the only mammals in the world capable of "true and sustained" flight. With about 1,240 species of bats, they comprise approximately 25% of all living mammalian species.



Little brown bat

Although they are afraid of humans and view us as predators, all types of bats are extremely helpful to man. For example, a **little brown bat**, which inhabits our area, can eat up to 600 mosquitoes an hour, and that is great by me. The 20 million **free-tailed bats** that live in a particular cave in Texas consume 250 tons of insects in an evening. The more insects they eat, the less chemicals we need to employ to keep insects out of our crops. A colony of only 150 **big brown bats** can consume 18 million rootworms each summer. Other types of bats pollinate flowers and drop seeds that will grow into new trees and plants, thereby aiding the regrowth of cut forests. Even the scary sounding **vampire bat** contributes to our well-being. Their saliva is being studied in hope of discovering a new medicine for heart problems.

There are untold myths concerning bats. The greatest danger to bats is not knowing enough about them. For instance:

- **"Blind as a bat…"** Bats are not blind and can see very well. Most bats locate their food in the dark by sound or echolocation, but they are not blind.

- **Bats can get caught in your hair.** Bats are able to locate mosquitoes in mid-air and, therefore, are completely capable of avoiding something the size of your head.

- **Bats are dirty and have rabies.** Bats are actually very clean and groom themselves just like cats. They are mammals and, therefore, are susceptible to rabies just like any mammal, but they do not have rabies just because they are bats.

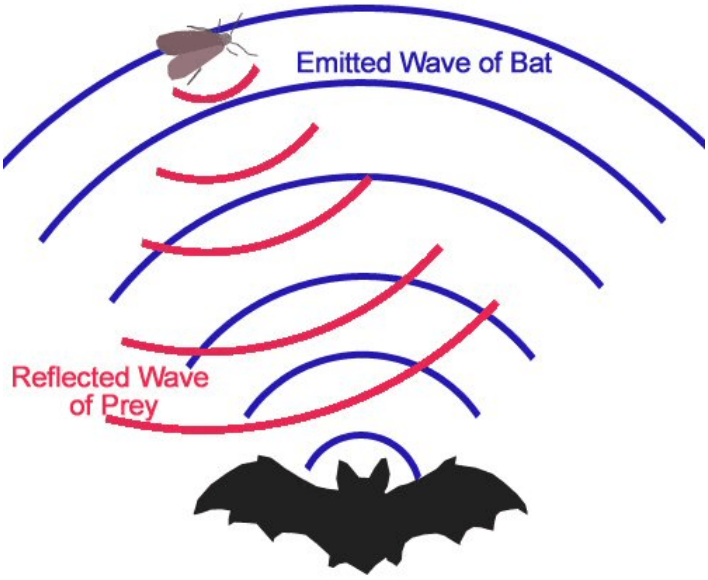


Diagram showing bat sending out high-pitch sound waves and the reflected waves returning from an insect, which allows the bat to visualize the location and size of the potential prey item.

Which brings us to the focus behind this article. Bats are wild animals and should never be handled without proper knowledge and procedures. As I said above, healthy bats will go out of their way to avoid contact with humans. It follows, therefore, that if you see one on the ground or on the floor of your house or garage, it is likely to be sick. Do not handle it. Call your town's animal control department and let them dispose of it.

Rabies in humans is very rare in the United States, but the most common source of rabies in humans is from bats. If you are bitten by a strange dog, cat, or a raccoon, you can usually go to the hospital or to your doctor where you can obtain a series of vaccinations that prevent the disease from harming you. The same procedures apply when you know that you have been bitten by a bat. A problem arises when you are not aware that you have been bitten by a bat.

Tens of thousands of people are bitten by rabid animals each year, but most are successfully treated by vaccination. Each year, there are only one or two cases of rabies that travel a full course. For instance, for the ten years from 1997 to 2006, there were only 19 cases. Rabies is a fatal disease, but even with the cases that go to full-blown rabies disease, medical procedures have improved to prevent fatality. At the end of last year, a case in Wisconsin was successfully treated using what is called the Milwaukee Protocol. However, using the same method, the most recent case on Cape Cod was unsuccessful.

The main lessons to be drawn from this article are that (i) bats are extremely useful to man, (ii) bats are wild animals and should never be handled, and (iii) we need to work for their protection and not attempt to destroy them as a species.

Dave Reid