

THE IPA NEWSLETTER

Mystic Lake, Middle Pond, and Hamblin Pond

Fall 2008

A quarterly publication of the Indian Ponds Association, Inc.

Vol. 8 No. 4



TOWN TO REMOVE GRAY WILLOWS

The IPA was recently informed by Rob Gatewood, Director of the Town's Conservation Division, that the Town intends to remove invasive gray willows from the waterfront of the 23 acres of former Danforth property adjacent to the northeast portion of Mystic Lake. Gatewood reported that the work would be done in the spring of 2009 and be confined to the northeast cove of the lake. This is an area containing the largest and oldest gray willows seen on any of the three Indian Ponds.

This work is made possible by a grant of \$7,500 recently awarded the Town by the Barnstable County Land Management Grant Program for this purpose. The Town's Conservation Division will provide \$2,500 in matching funds. According to Gatewood, most of the work will be done by Bartlett Tree Experts, with assistance provided by the Department of Public Works Highway Division. The same methods will be used as employed this past summer when gray willows were removed from nearly half of the 138 privately-owned waterfront properties on all three Indian Ponds.

In announcing receipt of the grant and the decision to launch this gray willow removal project, Gatewood indicated that the Town was happy to be part of the program initiated by the IPA. Clearly, the IPA is extremely pleased with this decision and wishes to extend its thanks and appreciation to the Town for joining with private property owners in helping to improve the shoreline biodiversity of native plants and their use as habitat for living organisms, some of which are rare or endangered.

(Continued on page 2)



Tom Rawinski of the US Forest Service examining a large gray willow in October 2006 on the Town-owned former Danforth property in the northeast cove of Mystic Lake that he estimated to be about 70 years old.

PUBLIC HEARING ON ALUM TREATMENT

The Town of Barnstable Conservation Commission will hold a public hearing on Wednesday, November 12 beginning at 6:30 pm at Town Hall to consider the request by the Town of Barnstable Conservation Division for the alum treatment for Mystic Lake. The Notice of Intent was filed on October 24 on behalf of the Conservation Division by Dr. David Mitchell of ENSR, the environmental firm contracted last year by the Town to conduct the design and permitting phase of this project.

According to Rob Gatewood, Director of the Conservation Division, it is not expected that the Conservation Commission will make a decision at the November 12 hearing, but will probably have to defer to a later meeting. This is because an opinion on the Notice of Intent is not expected to be available from the Massachusetts Natural Heritage & Endangered Species Program by November 12. Natural Heritage personnel had earlier raised concerns about the potential impact of the alum treatment on the endangered mussel species present in Mystic Lake.

All property owners abutting Mystic Lake have received notification letters regarding the hearing. Some members of the IPA Board of Directors are expected to speak in favor of the alum treatment, and all members of the public are invited to attend and express their views.

– IN THIS ISSUE –

- TOWN TO REMOVE GRAY WILLOWS
- PUBLIC HEARING ON ALUM TREATMENT
- IPA MEMBERSHIP AT ALL-TIME HIGH
- IPA PARTICIPATES IN PALS SAMPLING OF INDIAN PONDS
- IPA THANKS COASTSWEEP VOLUNTEERS
- MUSSELS, THE "DEAD ZONE", AND THE MYSTIC LAKE ALUM TREATMENT
- TOWN OF BARNSTABLE WASTEWATER WORKSHOP
- HERONS ON CAPE COD

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Newsletter Editor

Geri Anderson

IPA, Inc., P.O. Box 383
Marstons Mills, MA 02648

E-mail: info@indianponds.org

<http://www.indianponds.org>

Webmaster

John Anderson

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.

TOWN TO REMOVE GRAY WILLOWS

(Continued from page 1)

The Land Management Grant Program is sponsored by Cape Cod Cooperative Extension. The purpose of the program is to provide funding which will allow towns to develop and implement management actions that conserve, restore, and maintain the ecological integrity, productivity, and biological diversity of public lands, while at the same time providing public use and insuring public safety. Projects and actions eligible for funding include public land management actions (e.g. establishment or enhancement of new and diverse uses of open space or conservation land, diseased and dead tree removal, underbrush clearing, invasive species control, protection of identified endangered species, habitat improvement); recreational actions (e.g. establishment and maintenance of trails, improving public access, handicapped accessibility, parking areas); and education actions (e.g. trail signage if part of a larger project, interpretive trails, kiosks, and displays).

In light of the Town's decision to join the IPA effort to remove invasive gray willows from the shores of the Indian Ponds, those waterfront property owners who did not participate in this year's removal are encouraged to join their neighbors next year in "doing the right thing ecologically". As reported in the summer 2008 issue of this newsletter, owners who did not contract with Bartlett Tree Experts this year will have another opportunity to sign up next spring. Several property owners have already made inquiries.

To sign up for gray willow removal next year, contact Steve Heywood at Bartlett Tree Experts, P.O. Box 177, Osterville, MA 02655 (phone: 508-428-2397, fax: 508-428-2398, e-mail: sheywood@bartlett.com).

IPA MEMBERSHIP AT ALL-TIME HIGH

As of the end of October, the number of household memberships of the Indian Ponds Association stands at 179, an all-time high. This total includes 161 regular memberships (i.e. households living within the IPA area) and 18 FIPA memberships (i.e. households living outside the IPA area). With two months remaining in 2008, the total could be even higher by the end of December. This number compares with 172 in 2007, 153 in 2006, 141 in 2005, and 106 in 2004.

Most encouraging in the 2008 statistics are the 27 new memberships. This stems partly from new families moving into the IPA, but also from others simply deciding to finally join the organization. The publication and distribution of the IPA's new publication *A Resident's Guide to the Indian Ponds* has proven to be a positive stimulus for new memberships, as recipients have been impressed by the well-organized, professional nature of

the IPA and its meaningful mission of preserving and protecting the Indian Ponds and the surrounding watershed.

New members are always welcome. Annual tax-deductible dues are only \$20. To join, respond to the membership/donation form that you will receive in January/February with the winter issue of this newsletter, download an application form from the IPA website [\[www.indianponds.org\]](http://www.indianponds.org), or just send a check to the IPA at P.O. Box 383, Marstons Mills, MA 02648.

IPA PARTICIPATES IN PALS SAMPLING OF INDIAN PONDS

As it has done every summer since the program was begun in 2001, volunteers from the IPA again participated in the 2008 Cape Cod Pond and Lake Stewardship (PALS) Program "snap-shot" sampling of the Indian Ponds. This single-day sampling, coordinated by the Cape Cod Commission's Water Resources Office, includes a water clarity determination with Secchi disk, temperature and dissolved oxygen measurements from the surface to the bottom at 1-meter (approximately 3-feet) intervals, and 2-4 water samples (for laboratory analysis of total phosphorus, total nitrogen, chlorophyll a, pH, and alkalinity), at various depths.

This year's sampling of the Indian Ponds was done on August 19. Volunteer samplers included David and Nancy Dawson, Alex Frazee, Holly Hobart, Steve Paglierani, and Emory Anderson.

Similar volunteers throughout Cape Cod sampled hundreds of lakes and ponds from mid-August until the end of September. Results from all of these "snap-shots" are incorporated into an annual report which summarizes the status of the water quality of the Cape's lakes and ponds.

IPA THANKS COASTSWEEP VOLUNTEERS

On a September weekend every year, all beaches, pond shores, and river banks in the United States are cleaned up by crews of volunteers who unselfishly dedicate their time and effort to assure that a summer's worth of beach trash does not hang around to become a hazard for fish, birds, and other wildlife. The part of the program that covers Massachusetts is called "Coastsweep" and has been in existence since 1987. The volunteers record, on special data sheets, all the trash items they pick up. The data sheets are sent to the Ocean Conservancy in Washington, DC, where they are used to analyze trends in marine debris and make efforts to reduce the various types of waste at their sources.

Scout Troop 52 from Cotuit. They hauled off a whopping 300 pounds of trash to the dump, some of it construction debris and household trash that appears to have been dumped on the pond shore on purpose. They also found two hubcaps!



300 pounds of trash from Race Lane beach on its way to the dump.

Hamblin Pond's beach was cleaned by the Lavigne family of Steere Way and Boy Scout Troop 54. This public-spirited group has been cleaning up the same beach for the past several years, and said that the volume of trash this year was less than in previous years, a hopeful sign.

To all of the volunteers who participated in Coastsweep 2008, a heartfelt "thank you" from the IPA.

Holly Hobart



Race Lane beach cleanup crew. Left to right: Jeffrey Clark, Sandy Clark, Peter Chirigotis, Alex Lieberwirth, Councilor Fred Chirigotis, Angela Clark.

Over the past twenty years, the composition of the trash found on Massachusetts beaches has changed in some positive ways. For example, the number of tampon applicators has decreased markedly, indicating less contamination by sewage. Oil and lube bottles have also decreased, suggesting that more people are recycling their plastics. One item that consistently appears on the "Top Ten" list is cigarette butts. Some of these are left by beach goers, but they also wash in through storm sewers from city streets. They are not just an aesthetic problem, but are often found in the stomachs of birds and other marine animals, who mistake them for food. Like much other plastic trash, filter tips do not biodegrade, and will remain on beaches for many years after they are discarded.

The IPA has assumed the responsibility for cleaning up the public beaches on Mystic Lake and Hamblin Pond. This year, the Mystic Lake (Race Lane) beach was cleaned up by the Clark family of Whistleberry Drive, with the help of Boy



Hamblin Pond beach cleanup crew – Boy Scout Troop 54. From left to right: Sean Ford, John Hanright, Sydney Holway, Renee Lavigne, Nathan Ryan, Chris Bartley, Nick Atcheson, Spencer McKeown (hidden in back) Ben Ford, Eric Lavigne, Daniel Burke, Nick McKean and Matt McKean.

MUSSELS, THE “DEAD ZONE”, AND THE MYSTIC LAKE ALUM TREATMENT

Why are mussels of interest in the Indian Ponds?

In the previous issue of this newsletter, freshwater mussels in Mystic Lake were mentioned in three separate articles. Those articles reported that there are seven species in Mystic Lake and that the Massachusetts Natural Heritage & Endangered Species Program has raised questions about the possible impact of the proposed alum treatment on the well-being of these mussels. In addition, the new IPA publication, *A Resident's Guide to the Indian Ponds*, allocates a page to describe “Special Pond Creatures: Mussels”. Also, when waterfront property owners seek permission to install a dock, one of the issues they have to deal with in their request with the Town Conservation Commission is the potential impact on the mussels. Therefore, because of the considerable attention being accorded mussels relative to any proposed man-made impacts on the lake, including an alum treatment, we felt it appropriate to tell our readers more about this unique animal and how it is linked to the “dead zone” in Mystic Lake and the proposed alum treatment.

What are mussels?

The common name “mussel” refers to members of several different families of clams or bivalve molluscs that have a shell whose outline is somewhat elongated and asymmetrical compared with that of many other edible clams, the shells of which are often more or less rounded or oval in shape. Mussels possess a soft body enclosed by two separate shells hence the common name of “bivalve”.

How many species are there?

No other country in the world equals the United States in freshwater mussel variety. While all of Europe supports only 12 species, nearly 300 are found in the US. About 70% of these 300 species are considered endangered, threatened, or of special concern. Biologists view the mussels' plight as a serious warning for our global ecology as a whole — when mussels begin to disappear, it is a sign that other species, and entire ecosystems, may be in peril as well. There are 11 known species in Massachusetts, seven of which are found in Mystic Lake and Middle Pond. Three of these (triangle floater, Eastern pondmussel, and tidewater mucket) have been identified by the Massachusetts Natural Heritage & Endangered Species Program as being of “special concern” — meaning they are either rare or endangered. Hamblin Pond has no mussels today, although it may have when the pond had a herring run many years ago.



Triangle floater



Alewife floater

How can you tell them apart?

Illustrations of the seven mussel species found in Mystic

Lake are shown in this article. Careful examination reveals differences, sometimes very slight, in the shape of the shells. Species identification of specimens found in the lake may appear difficult, but books with taxonomic keys will quickly assist the interested person in determining the right species.



Eastern elliptio



Eastern lampmussel

Where do they live in the pond?

Most freshwater mussels live burrowed in sand and gravel at the bottom of rivers and streams. Only a few are adapted to the quiet water and muddy depths of lakes, ponds, and reservoirs. A survey of Mystic Lake conducted in August 2007 by personnel from ENSR, the environmental firm contracted by the Town to perform the design and permitting phase of the alum treatment, found that abundant mussel populations are located in the shallower, sandy areas of the lake at depths less than about 15 feet. With increasing depth, dissolved oxygen decreases and the sediment type changes to organic muck; this is accompanied by a decline in the relative abundance of mussels. There are no mussels at depths greater than about 30 feet or where dissolved oxygen is less than 1.0 parts per million (mg/L). In general, mussels prefer shallow, sandy, silt-free, clean bottom in areas with minimal wave action and winter ice disturbance.



Eastern pondmussel



Tidewater mucket

What do mussels eat?

Unlike most animals, which must travel in search of food, their food drifts to them, mainly decomposed or very small pieces of dead leaves (detritus) and very small microorganisms like algae, bacteria, and viruses suspended in the water. By drawing water inside their shells through a siphon, their gills filter out food and take in oxygen.

Do mussels move?

An adult mussel lives its entire life partly embedded in the bottom, active only in warm months. Mussels move by extending the foot out from between the shells and wedging it into bottom material. The body is then pulled along by contraction of the muscles within



Eastern floater

the foot. In areas of sandy bottom in Mystic Lake where mussels are abundant, the careful observer may see evidence of mussel movement (i.e. a telltale irregular trail in the sand).

Who eats mussels?

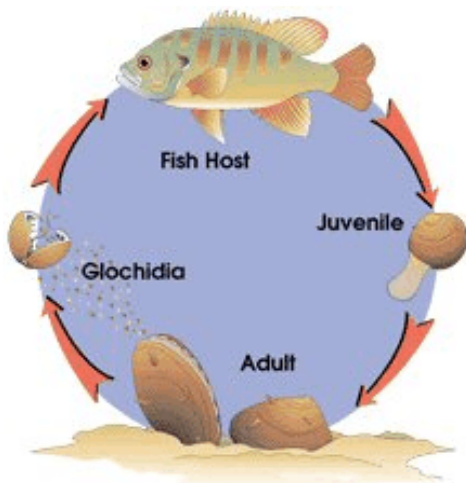
Freshwater mussels are food to a number of fur-bearing animals, waterfowl, and even some fish. Raccoons wade into the water and use their hands to feel around for mussels in the sediment. Otters and muskrats dive underwater in search of the mussels and, when they find one, use their sharp teeth to bite into the shell and eat the mussel. Most of the empty shells seen around Mystic Lake are probably leftovers from a predator's meal. Some ducks and geese also eat mussels. Contrary to saltwater mussels, which are a popular food item for humans, most people find freshwater mussels to be tough and not tasty.

How do mussels reproduce?

Freshwater mussels need a lot of luck to successfully reproduce. Their unusual life cycle begins when eggs held inside the female are fertilized by sperm released by a male and drawn inside her while siphoning water. After fertilization, the eggs develop into a larval stage called *glochidia*, which grow in the gills of the female where they are constantly flushed with oxygen-rich water. However, the next phase in the life cycle requires glochidia to attach themselves to a host fish or perish.

How do mussels attract host fish?

Just as a caterpillar has to metamorphose (or change) into a moth, a glochidium must also metamorphose into a mussel. Whereas a caterpillar makes its cocoon on a leaf or branch, a glochidium makes a cyst (or cocoon) on a fish. It is the job



Life cycle of a freshwater mussel.

of the mother mussel to make sure the glochidia get close enough to a fish so they can make a cyst. To do this, the mother mussel waves or displays part of her mantle (soft tissue that lines the inside of the shell) to make it look like a small minnow, insect, or worm that fish would like to eat. Fish are attracted and come close to the mother and try to eat the "lure". When they are close enough, or take a bite of the mantle, glochidia are released from the mother and hook onto the fish. Once the larval mussels attach to the fish, the fish body reacts to cover them with cells forming a cyst, where the glochidia remain for 2–5 weeks (depending on temperature). They grow, break free from the host, and drop to the bottom of the pond. If they land

in a suitable location, they will continue development and begin an independent life. The host fish is not harmed by the cysts.

What are the host fish for mussels in Mystic Lake?

Mussel glochidia are generally species-specific and will survive only if they find the correct species of fish host. For the seven mussel species found in Mystic Lake, the following are the host fish species:

Common name	Host fish species
Triangle floater	Largemouth bass, pumpkinseed, white sucker
Alewife floater	Alewife (river herring)
Eastern elliptio	Not definitely known, but thought to be sunfishes and possibly others
Eastern lampmussel	Pumpkinseed, smallmouth bass, largemouth bass, white perch, yellow perch
Eastern pondmussel	Not known
Tidewater mucket	Not known, but thought to be alewife (river herring)
Eastern floater	Pumpkinseed, yellow perch, white sucker

What is the "dead zone" in Mystic Lake?

A "dead zone" in a lake is an area that is deprived of dissolved oxygen and where there is no life. In Mystic Lake in the summer, the "dead zone" is the portion of the lake deeper than about 30 feet and under a surface area of about 41 acres or 29% of the lake's area. Measurements of dissolved oxygen from the surface to the bottom taken by IPA volunteers in Mystic Lake at bi-weekly intervals during 2004–2006, and less frequently in years before and after, have shown that dissolved oxygen levels during the summer become very low (less than 1 part per million or mg/liter) at depths of about 30 feet and deeper.

What causes a "dead zone"?

Cape Cod ponds less than 30 feet deep are well mixed from top to bottom because wind blowing over the surface circulates the water. In such ponds, both temperature and dissolved oxygen tend to be relatively constant from surface to bottom. Middle Pond, with a maximum depth of 31 feet, is a good example of such a pond. In deeper ponds, such as Mystic Lake, which has a maximum depth of 47 feet, the wind cannot mix the entire water column, which stratifies into layers by temperature in the summer, with the coolest, densest layer at the bottom. This water, deeper than 30 feet, is isolated from the atmosphere by the layer of warmer water above. The oxygen in this lowest layer of water is quickly used up by bottom-dwelling bacteria as they digest dead algae and other organic matter that falls to the bottom. The more algae in the pond, the quicker the bottom water runs out of oxygen. Fish and other animals, such as mussels, cannot live in deoxygenated water. The term "dead zone" describes this relatively lifeless area at the bottom of the pond. In Mystic Lake, this "dead zone" occupies the bottom 15–17 feet of the lake, an area beneath about 41 acres of

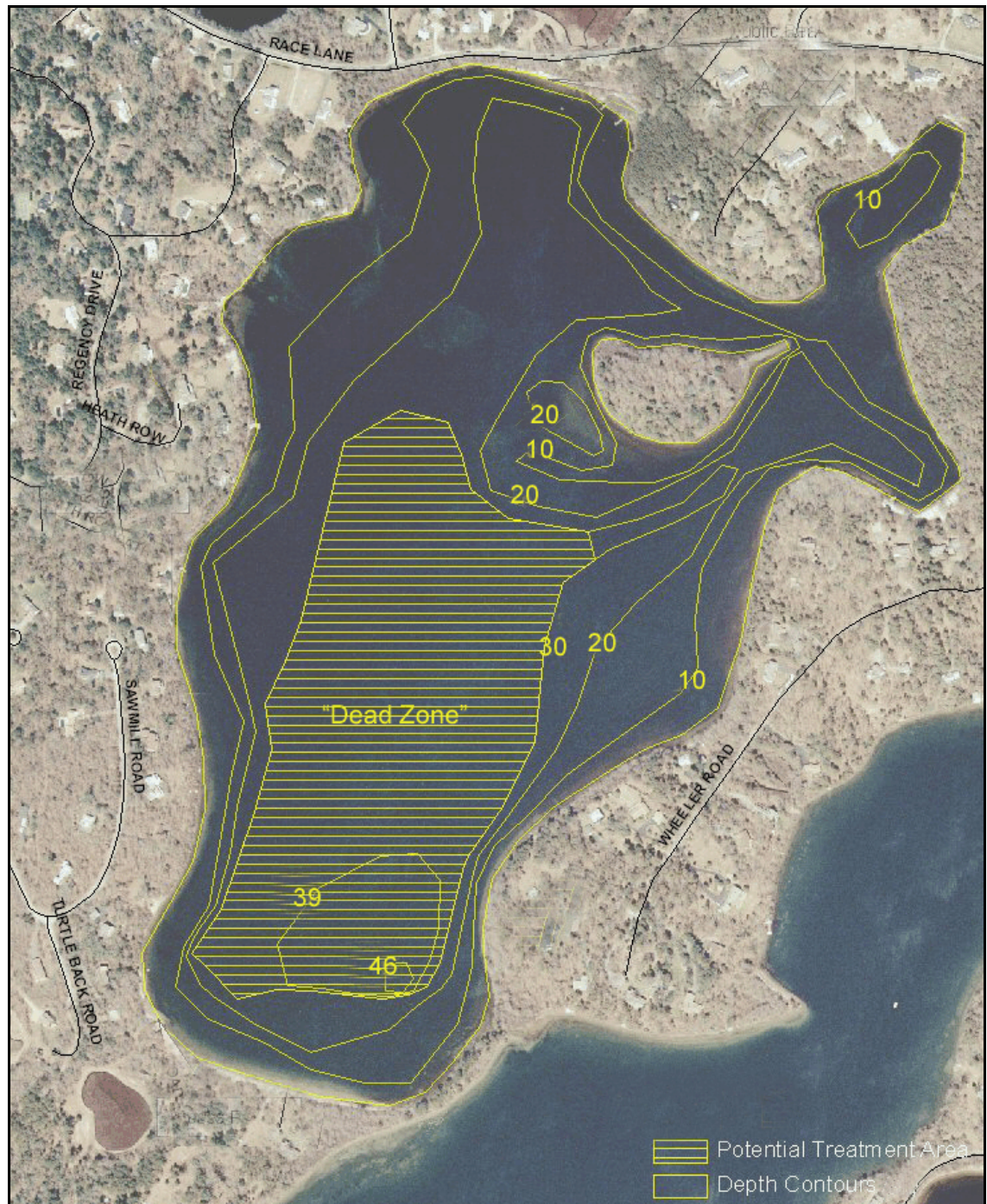
the lake's surface, as shown in the hatched portion of the diagram on the right. In conditions of low oxygen, phosphorus is released from the sediments and fertilizes the growth of yet more algae in the upper layers of the lake. When these algae die and sink, more oxygen is consumed and the "dead zone" increases in size.

Why is the alum treatment important to the welfare of the mussels in Mystic Lake?

The alum treatment is intended to reduce the regeneration of phosphorus from the sediments of the "dead zone". When applied, alum falls to the bottom of the lake and combines with the phosphorus to create the insoluble aluminum phosphate, which remains on the bottom. Less phosphorus in the water means less fertilizer to promote the growth of algae. Reducing phosphorus will eliminate the algae blooms that make the pond unpleasant in the summer months. There will be less dead algae falling to the bottom and consuming oxygen as they decay. This will make more oxygen available to fish and mussels, shrink the "dead zone", and create more habitable area within the lake.

Will the proposed alum treatment adversely impact the mussels in Mystic Lake?

The simple answer is "no". The proposed alum treatment will be implemented only in areas of the lake not inhabited by mussels. Since mussels are most abundant in depths less than about 15 feet and are not found in depths greater than 30 feet, and since the alum treatment is aimed only at the portion of the lake deeper than 15 feet, the potential for any overlap of treatment areas and mussels is minimal. According to ENSR, the alum treatment is expected to reduce the internal phosphorus by about 50% and restore the lake to a



The hatched (horizontal lines) portion of Mystic Lake is the area proposed for an alum treatment. This is the area deeper than 30 feet, which constitutes about 41 acres or 29% of the lake's 148 acres and is a "dead zone" in the summer where there is very low dissolved oxygen and no life. Depth contours are in feet. Modified slightly from a figure provided by Dr. David Mitchell of ENSR.

more desirable and healthy state of water quality. Consequently, it is anticipated that the treatment will not harm the mussels or the phytoplankton food supply for the mussels, but will, in fact, be beneficial to them and to all other living creatures, including fish, in Mystic Lake. **Previous alum treatments of Ashumet Pond (Falmouth) and Long Pond (Brewster/Harwich) caused no ill effects to their mussel populations.**

Emory D. Anderson, PhD

TOWN OF BARNSTABLE WASTEWATER WORKSHOP

Presentations were made October 16 at a Town Council meeting on the status of the Town's Comprehensive Wastewater Management Plan (CWMP) and new state legislation affecting funding for wastewater (sewage) treatment. Town Manager John Klimm said that wastewater planning is "one of the most significant issues facing us as a Cape Cod community."

Senator Rob O'Leary said that he had made this issue one of his highest priorities. O'Leary said that the newly-passed **legislation** he had originated **will make combined federal and state funding for wastewater treatment projects available to towns at 0% interest for up to 30 years.**

Andrew Gottlieb, Executive Director of the Cape Cod Water Protection Collaborative, reviewed the details of the State Revolving Fund (SRF) program. Through the SRF, each state maintains revolving loan funds to provide permanent sources of low-cost financing for a wide range of water quality infrastructure projects. Funds to establish or capitalize the SRF programs are provided through federal government grants of 80% and state matching funds equal to 20% of the total. Gottlieb explained that Massachusetts leverages this fund with bonds that raise \$3 for every \$1 in the fund, which make it possible for the fund to sustain itself at a lending level of \$200 million annually.

Each state can set specific loan terms, including interest rates (0%—market rate) and repayment periods (up to 20 years). States have the flexibility to target resources to their particular environmental needs, such as contaminated runoff from urban and agricultural areas, wetlands restoration, groundwater protection, brownfield remediation, estuary management, and wastewater treatment.

The O'Leary legislation makes the SRF loans available to towns during a 10-year period beginning in 2009 for nutrient (nitrogen and phosphorus) reduction projects. Such projects must meet certain criteria, one of which is that the project cannot be to correct a violation of an existing nutrient standard. This is to reward communities for planning and being proactive and not waiting until the situation has deteriorated to where they are in violation of federal standards. No town on Cape Cod is currently in violation of such standards. Another requirement is that a town's plan must comply with a regional wastewater management plan. Third, and possibly most important, is that a town must insure that the total amount of wastewater does not increase as a result of the infrastructure improvement. This is called "flow neutrality".

A town has the option to decide how connections to sewage facilities will be handled, such as making them mandatory for a certain area, and also to determine the terms of the betterment.

This new loan program at 0% interest is expected to have a waiting list, so applying early would be advantageous for Barnstable. Many communities won't be ready to go in 2009, the inauguration date for the program.

Mark Els, Barnstable's Director of Public Works, gave a progress report on the Town's Comprehensive Wastewater Management Plan (CWMP). Work started on this plan in 2002 and will probably continue for the next several years. It began with a determination of the Total Maximum Daily Loading (TMDL) of nutrients from the watershed and all other sources that could be accommodated by a given estuary without causing excessive algal growth. In saltwater estuaries, nitrogen is the harmful element; in freshwater lakes and streams, it is phosphorus.

About 17% of the Town of Barnstable is currently sewered. The Hyannis wastewater treatment facility is currently undergoing an \$8 million upgrade and expansion expected to be completed this coming winter. The existing plant removes nutrients, which Title V septic systems cannot do.

Two phases of the CWMP will be ready for funding and implementation within the next 20 months: Wequaquet Lake and Stewart's Creek. Following that, another 24 areas have been identified as needing replacement of existing septic systems. These will be prioritized and appropriate—possibly different—solutions will be applied to each. It is unlikely that the entire Town will end up on a single central sewage treatment system.

One of the remaining items is developing the model of allocating costs. Barnstable is committed to allocating 100% of the capital cost, operation, and maintenance to users. Also, in order to be eligible for 0% financing, the Town must adopt land-use controls to limit flows into the system to the amount authorized under zoning and wastewater regulations as of the date of the CWMP.

All of the speakers stressed the Town's intent to have public input at every stage of this huge project.

In a question and answer session following the speakers, one of the Council members asked what would happen if we do nothing. The answer was that water quality in the estuaries would continue to be degraded and would become unfit for swimming and fishing, according to state standards. This would make the Cape a less attractive place to live or visit, affect property values, and cause widespread economic harm. A more serious problem is that the Town would be in violation of the federal Clean Water Act. Not only would that prohibit the Town from qualifying for 0% financing, but **the problem would likely end up in the courts, meaning that a judge, rather than the Town, would be in control of the solution.**

For more information about this subject, go to the following websites:

www.CapeKeepers.com, www.town.barnstable.ma.us,
<http://www.mass.gov/dep/water/wastewater/cwsrf.pdf>, or
<http://www.epa.gov/owm/cwfinance/>.

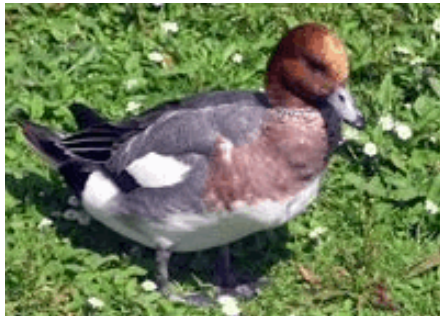
Holly Hobart

HERONS ON CAPE COD



American wigeon (male front, female back)

you'll be the envy of all your off-Cape birding friends if you tell them you can see a Eurasian wigeon any time you want, all winter long. You may even find yourself with winter guests instead of just summer. Now, back to the main story.



Eurasian wigeon

On Cape Cod, we have a variety of herons and egrets, most of which you can see on all of the Indian Ponds. The most obvious is the **great blue heron**. The great blue is the largest and most widespread heron in North America and can be found year-round on Cape Cod and in most of the United States. It can be found along salt water shores as well as inland ponds. An all-white form, known as a great white heron, can be found exclusively in Florida.



Great blue heron

Although its preferred diet is fish, it isn't a bit above taking an occasional frog, other amphibian, bird, or small mammal. They congregate around fish hatcheries and, if they find that you have a koi pond in your back yard, you'll have a friend for life.

As I said, they live and breed on Cape Cod, but since they need to be near open water to find food, you may not see too

much of them around ponds that freeze over.

Less obvious and more secretive is the little **green heron**. The green heron sticks very close to the shore and wades out among the weeds and grasses. It can be very difficult to see because it tends to stand still and let small fish approach, rather than wading out after its food, as does the great blue. One of its distinguishing characteristics is its yellow legs.



Green heron

The green heron is one of the few tool-using birds. It will, regularly, drop bits of bread, feathers, insects, or earthworms on the top of the water and stand patiently waiting for some small fish to be attracted by its offering.

While the green heron can be found all over the eastern United States during the summer, it does migrate down to Mexico in the winter.

The third heron that you will sometimes see is the **black-crowned night heron**. You'll see this guy mostly in the evenings when he comes out to feed, generally standing still at the water's edge waiting to ambush small fish, crustaceans, frogs, aquatic insects, and small mammals. He can be found in the same areas that all the other herons frequent during the day.

The night heron is the most widespread heron in the world, being found on five continents including North and South America, Europe, Asia, and Africa. Other interesting facts about this bird are that it will nest in trees right beside other herons. It will also nest in groups in the same trees and apparently doesn't distinguish between its own hatchlings and those from other nests, and will brood chicks not its own.



Black-crowned night heron