

THE IPA NEWSLETTER

Mystic Lake, Middle Pond, and Hamblin Pond

Winter 2005

A quarterly publication of the Indian Ponds Association, Inc.

Vol. 5 No. 1

THE BLIZZARD OF 2005

We've just experienced a series of snowstorms that have left an indelible mark on Cape Cod. The post-Christmas storm on December 26, which dumped up to 18 inches of snow on Cape Cod and left some 25,000 residents without electrical power for up to several days, produced the image of a winter wonderland while destroying innumerable trees, branches, and shrubs under the weight of the snow. Most recently, the record-breaking storm of January 22-24 with hurricane-force winds brought unprecedented amounts of snow (33 inches in Marstons Mills) that, coupled with forecasts of continued sub-freezing temperatures, promises to keep snow with us for some time. To find out how weather affects the ponds, see the articles on page 5.



Winter scenes of Mystic Lake taken after the December 26 storm (left) and after the January 22-24 storm (right).

Photos by Paul Craig

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LATEST ON THE POND STUDY

Major progress continues to be made on the IPA pond study. On November 2 (Election Day), the tenth and final collection of physical measurements and water samples was completed by volunteers Dave and Nancy Dawson, Alex Frazee, and Emory and Geri Anderson from Mystic Lake, Middle Pond, and Hamblin Pond, respectively, marking the completion of the first of six major tasks in the study. In late November, the Cape Cod Commission's Water Resources Office completed draft reports on two additional tasks: 1) review of existing data and preparation of a Quality Assurance Project Plan, and 2) preparation of a water budget and the delineation of the watershed for each of the three ponds. Members of the IPA Board of Directors have reviewed these two draft reports and provided comments back to Commission staff.

A fourth task, preparation of a phosphorus budget, is currently underway by the Water Resources Office. The fifth and six tasks consist of the preparation of draft and final project reports, respectively. These are expected to be completed by late spring or early summer.

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This Newsletter 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.

PRESIDENT'S LETTER



Emory Anderson

The IPA Board of Directors has met twice since the mailing of the Fall 2004 issue of *The IPA Newsletter*. Most of our energy has been devoted to ways and means to increase membership and to fund the pond study. At the December 6 meeting, we approved an operating budget for 2005 for the IPA, and on January 31, we authorized the Cape Cod Commission to complete the remaining two tasks of the pond study.

I'm pleased to report that we ended 2004 with 130 regular and FIPA (Friends of the IPA) members. Our goal for 2005 is to retain those and recruit 20 new members. Only with the help of a strong and supportive membership is our organization able to continue the important work of protecting and preserving the Indian Ponds and their surrounding watershed through the publication of our quarterly newsletter and other educational materials, by sponsoring scientific studies such as our current first-order assessment of the Indian Ponds, and representing your interests in interactions with Village and Town officials.

It has been extremely gratifying to witness the generous outpouring of contributions from our members in support of the pond study. When applications to two different funding sources (U.S. Environmental Protection Agency and The Cape Cod Foundation) were unsuccessful, we had no choice except to turn to our members for help. And you responded wonderfully! Since the beginning of 2004 and as of this writing, nearly \$6,800 has been received in special donations. These together with some existing funds in the bank have brought us close to our goal. However, we still ask for your tax-deductible contributions as future activities and studies in support of our mission will necessitate future expenditures. In particular, it is possible that recommendations emanating from the current pond study will call for further study, monitoring, or some type of actions, any of which will most likely require financial support from the IPA.

Emory D. Anderson, PhD

LATEST ON THE POND STUDY *(Continued from page 1)*

The findings from the overall study will not be made available until they are presented in a public forum later in the year. The Board is planning to schedule this presentation for the IPA Annual Meeting in July. However, a few interesting facts and information from the water budget and watershed draft report are given below.

The three Indian Ponds are located in the Sagamore Lens, one of six independent groundwater flow cells of the Cape Cod Sole Source Aquifer. The aquifer in our area is approximately 250 feet thick, with an average recharge rate of about 27 inches of water per year. Groundwater moves through the sand and gravel aquifer at a rate of about 1 foot per day. Our ponds, termed kettle ponds, have been described as "windows on the aquifer" because the pond water levels reflect the top of the aquifer. The water table fluctuates over a range of 5-10 ft, with the lowest in many years recorded in October-November 2002. On average, Mystic Lake and Middle Pond are both 44 ft above sea level, while Hamblin Pond is 41 ft above sea level. Hamblin is the deepest at 63 ft.

The direction of groundwater flow in the Indian Ponds watershed is northwest to southeast. The average amount of water in Mystic Lake is 913 million gallons, in Middle Pond 589 million gallons, and in Hamblin Pond 1,029 million gallons. There is normally an equilibrium in-flow and out-flow of water from each of the three ponds via groundwater. When water is released from Middle Pond at the surface through the herring run, for example, there is a reactionary increase in the groundwater hydraulic gradient along the upgradient (i.e., northerly) pond shorelines and a corresponding increase in the rate of groundwater flow into the pond. Hence, pond water levels should not be measurably lowered as long as the duration of the herring run operation is limited and the water flow is moderate. However, if excessive amounts of water are released or pumped out (i.e., for cranberry bog use) for an extended period of time, a noticeable temporary drawdown of pond levels would result. The current management plan for the herring run agreed by the Mass. Division of Marine Fisheries, the Town's Division of Natural Resources, and the IPA should not have any adverse impact on pond water levels.

Emory D. Anderson, PhD

SUGGESTED NEW YEAR'S RESOLUTIONS FOR RESIDENTS OF IPA AREA

If you're looking for some New Year's resolutions, the following two articles offer some ideas on how to be kinder to our environment, particularly the Indian Ponds environment.

HOW LAWN CARE AFFECTS THE INDIAN PONDS



Sheila Place

It's winter on Cape Cod, not the usual time to talk about lawn care, but let's look ahead to pleasant, warm days and think about our property as part of something bigger than the lot on which our house sits.

Your property is part of a **watershed**, an area of land from which all the surface and groundwater flows from higher elevations downhill to a common body of water. For many of us, the bodies of water affected by our activities are the Indian Ponds. Regardless how far we live from a body of water, our property is part of a watershed. Therefore, how you care for your yard can affect both water quality and water supply.

It's hard to imagine that a green, flourishing lawn could pose a threat to the environment. However, the fertilizers and pesticides you apply to your lawn are potential pollutants. Improperly or excessively applied, these chemicals can wash off your property and end up in ponds, bays, and the aquifer upon which we depend for our drinking water. Pollutants don't observe property lines; they go wherever the water takes them. Excess nitrogen and phosphorous, two key ingredients in fertilizer, may cause these waters to become overgrown with unsightly and foul-smelling algae and weeds. This growth may cause fish kills, lowering of waterfront property values, and the pollution of swimming beaches

Fertilizers and pesticides are not the only problems with typical lawn care. Watering your lawn helps move pollutants down-slope to water bodies and unnecessarily drains the drinking water supply and lowers pond levels during the drier summer

months. The summer is a critical period for fish; stream flow and pond levels are at their lowest and water temperatures are at their highest. Additionally, the watering of lawns often intensifies drought impacts.

It is possible to have a healthy, safe, and attractive yard and to protect both water quality and supply at the same time. Here are some suggestions:

- Mow to a height of 2-3 inches so that more water will be retained and the roots will be stronger and more tolerant.
- Water deeply and infrequently. Place sprinklers in areas where water won't be wasted. Make sure irrigation systems are not running unnecessarily, such as in rainy periods.
- Use organic or slow-release fertilizers, and be careful not to apply excessively.
- Choose grasses and plantings adapted to soil, moisture levels, and sunlight on your property. This can reduce the need for fertilizer and watering.
- Use alternatives to grass, such as ground cover and flowering plants.
- Plant a combination of trees, shrubs, and ground cover in areas where water drains from your property. These plants will intercept and filter fertilizers or pesticides and eroded soil before they wash into the pond, lake, or bay.

Even though we're in the middle of a Cape Cod winter, it's not too early to think about caring for our lawns and our environment.

Sheila Place

Information from a publication of the MA Dept. of Environmental Protection

DISPOSING OF HAZARDOUS MERCURY-CONTAINING PRODUCTS

Why are mercury devices and fluorescent bulbs a problem? The mercury is released when fluorescent bulbs and other mercury devices are broken, burned in waste-to-energy plants, or buried in landfills. The phosphor powder found inside all fluorescent bulbs contains mercury which is a necessary ingredient in these bulbs. Bulbs and mercury devices must be recycled or managed as hazardous waste to prevent mercury pollution.

Why is mercury a problem? Mercury is toxic to the human nervous system and mercury that is inhaled or swallowed can cause a variety of physical symptoms, including inability to

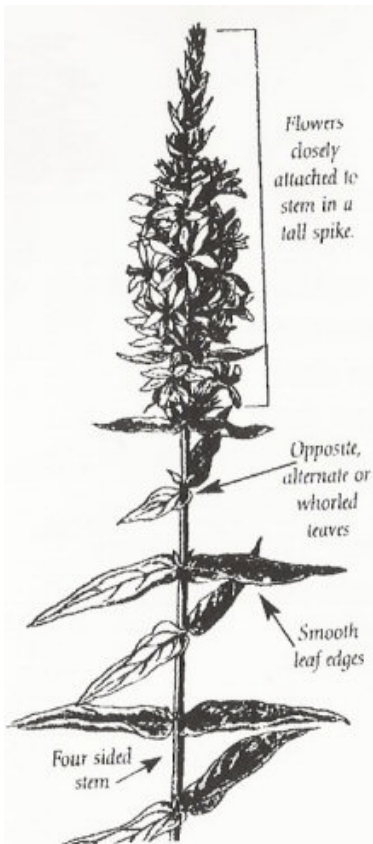
coordinate body movements and impairment of hearing, speech, and vision.

How should I dispose of mercury devices and fluorescent bulbs? DON'T throw them away. On Cape Cod, all towns accept fluorescent bulbs and mercury devices for recycling at town recycling centers. Look for the **Universal Waste Shed**. Mercury-containing products are also accepted at town Household Hazardous Products Collections.

Information from Barnstable County Hazardous Materials Program

YOUNG PONDWATCHER'S – INFORMATION PAGE

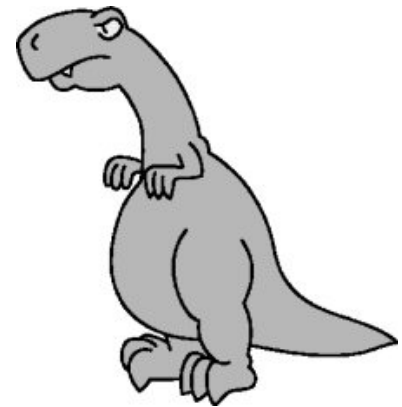
PURPLE LOOSESTRIFE



Taken from "A Guide to Selected Invasive Non-native Aquatic Species in Massachusetts"

Purple loosestrife is an invasive wetland weed that came to the eastern United States about 200 years ago from Eurasia. Seeds may have traveled accidentally in ships or people may have planted purple loosestrife on purpose since it was used as a medicine for stomach problems. People spread purple loosestrife across North America to add color to wetlands and water gardens. It now causes problems in all 50 states except Florida. Purple loosestrife clogs irrigation canals and replaces native plants in wetlands and along lake and river shorelines. It is so bad in some places that people nickname it "Marsh Monster" and Exotic Invader."

Purple loosestrife grows and spreads quickly in wet soils. It grows to almost six feet tall. Each plant flowers for about four months and produces two to three million seeds. Mowing purple loosestrife in roadside ditches spreads the seeds that stick to the mowing equipment and are carried to new areas. New plants also shoot up from the roots. Small amounts of plants can be dug out by hand. Herbicides are often used, but the most promising control might come from four different insects brought in from Europe that feed only on purple loosestrife leaves, roots, and seeds.



MARSH MONSTER

I know a weed with an unusual name
When it invades a wetland it is never the same

For it grows so fast, dense, and tall
That good native plants barely live at all

Wildlife and fish are harmed by this weed
Because life is tough when it's hard to feed

With pretty purple flowers it's easy to find
Look in the wetlands and keep it in mind

Purple loosestrife is the name of this invasive weed
And control would be easy if not for the seed

So I won't pick the flower that helps the weed spread
I'll show it to others to remove it instead

Taken from "Understanding Invasive Aquatic Weeds" published by the Aquatic Plant Management Society, Inc.

PURPLE LOOSESTRIFE GROWING IN LAKE WEQUAQUET

The January 2005 newsletter of the Wequaquet Lake Protective Association reports that purple loosestrife is growing along highways, in wetlands, and also along the shores of Lake Wequaquet. Since this lake is relatively close to our Indian Ponds, we should be aware that this species can be easily dispersed via wind, water, on the feet of animals, or by human activity (boats, kayaks, and canoes that are transported from lake to lake).

WINTER PRECIPITATION AND POND LEVELS

The Cape has been fortunate to enjoy ample quantities of precipitation this winter in the form of rain and lots of snow. According to data gathered in Barnstable, 15 in of precipitation has fallen since November 2004 including over 50 in as snowfall. This is over one third of our average annual precipitation amount.

How will all of this snow impact the pond levels this year? The surface of the pond, or water table, actually fluctuates up and down throughout the year. The rise and fall of the water table is a natural part of the groundwater system. And in spite of the snow and cold, water levels are already on the rise.

For those folks living around the ponds, it's hard to see a change as the surface of the ponds lies buried under snow and ice. But deep in the ground, the aquifer is slowly being recharged as the rain and melting snow percolate into the ground. Groundwater moves slowly by the force of gravity through the interconnecting pore spaces until it reaches a discharge area, where it seeps into a nearby wetland, stream, or pond through its sandy sides and bottoms. As more and more groundwater is replenished, the pond levels will rise in response.

This groundwater recharge process can be slowed, however, if temperatures are extremely cold. Typically, there is no recharge in the winter when the ground is frozen, but recharge can occur

SMEDLEY

by Gordon Nelson



during midwinter thaws. Water is stored in the snow pack and saturated frozen ground throughout the winter. Once the ground thaws, the melting snow and spring rain recharges the groundwater, raising the water table to its annual high level until the first leaves of spring come out and millions of thirsty trees intercept the recharge through their vast root system. In the vicinity of the Indian Ponds, the annual spring high water level is about 45 feet above mean sea level.

*Gabrielle Belfit, Hydrologist
Cape Cod Commission
Water Resources Program*

HURRICANES AND FRESHWATER BODIES



Paul Craig

After having weathered perhaps one of the worst winter storms to hit Cape Cod, at least in terms of the amount of snowfall, it may seem strange to talk about hurricanes. However, winter storms and summer-fall hurricanes can both have major impacts on our freshwater ponds.

The 2004 hurricane season was very active, with a dozen named storms. Four of these – Charley, Frances, Ivan, and Jeanne – hit Florida and made na-

tional news headlines for weeks on end, raising the awareness level among residents of coastal regions from Florida to Maine.

In considering the impact of a hurricane, most people think in terms of safety and protection of life and property – and this is certainly the first order of business when a major storm approaches. Mitigation is the first line of defense!

But a hurricane casts a wide shadow on coastal communities. Beyond the poignant images of uprooted trees, overturned homes, and forever changed lives, there are many more subtle effects. Perhaps as a mental retreat from the harshness such images, I started considering what possible effects a hurricane could have on the freshwater bodies of Cape Cod.

A hurricane requires a massive amount of energy to swirl about with wind speeds up to 200 mph – the equivalent to multiple atomic explosions. It has been estimated that harnessing just one percent of this energy could supply all the power, fuel, and heating needs of the United States for an entire year. Talk about a wind farm!

And then comes the rain. Hurricanes also require a continuous supply of water to replace what is dumped in the form of rain in the dense bands that can extend hundreds of miles from the storm's center. Seawater evaporates and travels up the storm eye wall before condensing in the air above the storm. Salt levels in freshwater bodies can elevate and disturb the pH of the water.

Lowered dissolved oxygen levels have been observed in lakes after flooding by hurricane-induced rains. Bacterial decomposition of organic matter carried by the floodwaters into our lakes sucks the oxygen from the water. Other contaminants can be blown into streams and lakes.

While we can prepare our homes and critical buildings for an approaching hurricane, there is not much we can do about the myriad natural effects which will follow. Fortunately, our lakes, much like the resolve of coastal dwellers who choose to live next to the most powerful force in nature, are very resilient.

Paul Craig

A BIG THANK YOU

to all who have paid their 2005 dues (\$20) and to all who have provided donations to help cover the cost of the pond study.

If you have not renewed your membership for 2005, please send your check today in the pre-addressed envelope included in the letter you received from the IPA in mid-January. If you have never been a member and wish to join, please use the "2005 Membership/ Donation Form" included in this newsletter.

All IPA members will receive a free copy of the final report of our pond study. Joining now will guarantee you a copy of this important report.

TEST WELLS DRILLED ON FORMER DANFORTH PROPERTY

In October-November, under the direction of the Centerville-Osterville-Marstons Mills (COMM) Water Department, wells were drilled at a number of sites in Barnstable, including two locations on the former Danforth property in Marstons Mills, to test their potential for future municipal water supply development. The two sites tested in Marstons Mills were on the 23 acres northeast of Mystic Lake and on the Cape Cod airfield. Drilling and test pumping was done by the R.E. Chapman Co., and laboratory soil and water analysis and evaluation was performed by Earth Tech. A draft report of the results of these test drillings was provided by Craig Crocker, COMM Water Department Superintendent.

Test wells of 2.5-in diameter were drilled at each location. At the Mystic Lake site, a well was driven to a depth of 91 ft below ground surface (BGS); the static water level was measured to be 18 ft BGS. In a 2-hr pumping test conducted on November 30 at a rate of 37 gallons per minute (GPM), the water level was lowered 1.7 ft in an adjacent test well (2 ft away) by the end of the pumping, but recovered 20 minutes after pumping ceased. Preliminary results indicated that a municipal well would be capable of producing about 700 GPM or 1.0 million gallons per day (MGD). Iron and manganese were not detected, nitrate was well below the drinking water limit, and the pH

(6.4-6.7) indicated less corrosive water than is typical of Cape Cod.

At the Cape Cod airfield site, a well was driven to a depth of 116 ft BGS, with the static water level was measured to be 40.5 ft BGS. Preliminary testing was inconclusive relative to yield and water quality due to the deep static water level.

Based on the test results from the two sites, further testing was not recommended at the Cape Cod airfield. However,

the Mystic Lake site was deemed to be the most promising of all the sites tested in terms of water quality and potential yield. Earth Tech recommended that other test wells be installed at this site and that a prolonged pumping test be performed to further evaluate well yield and water quality.

Although the Mystic Lake site holds promise for a future municipal well, Crocker has indicated that the District currently has no immediate plans to install other test wells there or do further pumping tests, and that it could be 5-10 years before any well there might become operational. This would be dependent on various factors such as population growth and associated water usage.



Test drilling near Mystic Lake

Photo by Geri Anderson

Emory D. Anderson, PhD