

# *the* Water Column



A Publication of Maine Volunteer Lake Monitoring Program

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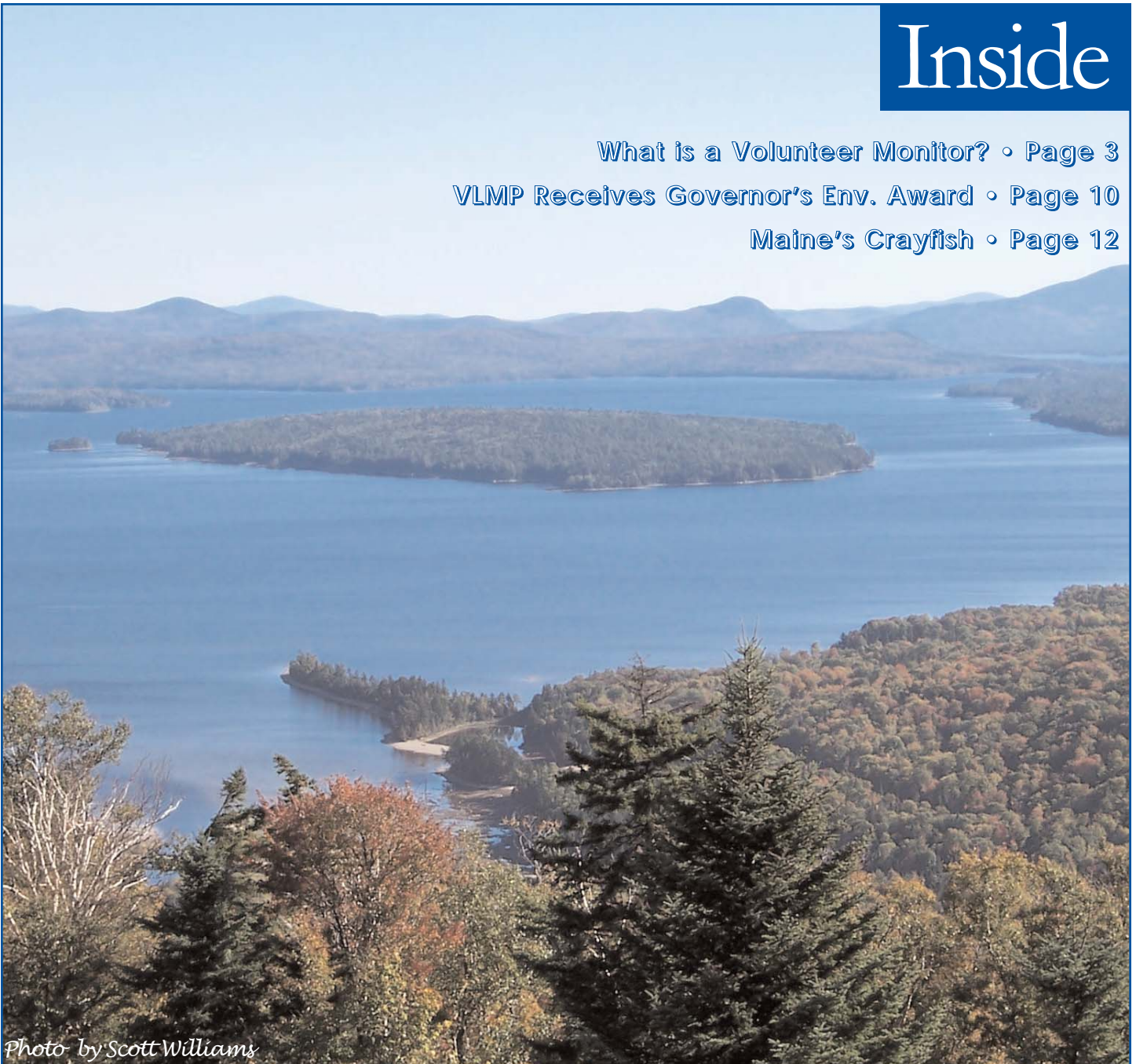
Winter 2006

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*Photo by Scott Williams*

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# Lakeside Notes



By Scott Williams  
Executive Director

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## What is a Volunteer Lake Monitor?

While the answer to this question at first seemed obvious to all of us, it has recently been the subject of discussion among VLMP staff, directors and some of our volunteers. From our perspective, the answer is all-inclusive. Anyone who collects any form of lake data and who voluntarily provides the data to the VLMP, is a volunteer lake monitor.

In light of this simple, but encompassing definition the possibilities are almost unlimited. For starters, several hundred volunteers take, document and submit several thousand simple, but very valuable, Secchi disk readings, without which much less would be known about the water quality of Maine's lakes and ponds. A growing number of these volunteers are going through special training to collect data for other indicators of lake water quality, including total phosphorus, dissolved oxygen, chlorophyll a, and more.

During the past few years, more than 1,500 volunteers have been trained to collect information about invasive aquatic plants through the Maine Center for Invasive Aquatic Plants (MCIAP) "Plant Patrol" workshops. Many of these volunteers have gone on to collect and submit data to the VLMP. The formation of the Center, a branch of the VLMP, has made it possible for volunteers to receive training to undertake invasive aquatic plant screening surveys, in order to (hopefully) rule out the presence of invaders. Some volunteers have taken this process a step further by conducting surveys of native plant communities in their lakes and ponds. All of this information is extremely useful, and it clearly falls within the broad definition of "lake data."

Last year the VLMP launched the "Metaphyton Monitoring" project. This is an example of a concept that came into being as a direct result of many questions from the general public. For several years, inquiries have been on the increase about "that green, slimy, cotton candy-like stuff" that some people think is becoming more prevalent. We have urged those who are asking the questions to get involved and help us

gather data that might some day help provide the answers to their questions.

One of our volunteers stopped by this morning to discuss his concern over a perceived increase in the growth of "green slime" on the surface of the rocks near his shorefront property, and in general, around the lake shoreline. This is another example of a commonly asked question for which the answers are slow in coming, other than to acknowledge that the observation (and concern) is one that has been voiced by many others in recent years. While we can speculate about possible causes for these phenomena, without data all of the information is anecdotal. There is very little available information to draw from. Although there is presently no methodology in place for volunteers to monitor the growth of "green slime" on submersed rocks, one could be developed.

Many of our volunteers are long-term residents or visitors of a particular lake or pond. Over the years they have become familiar with a great many of the features and characteristics of that body of water. And they are the first to recognize when something has changed, or is in the process of changing. Indeed, such observations have often been the impetus that has motivated a volunteer to become involved in monitoring their lake. That's why, even though we don't have *all* of the answers about Maine lakes, many questions *can* be answered, thanks to our large and growing family of volunteer lake monitors, which under the broad definition used above, now consists of more than 700 individuals! It's comforting to know that such a large team of informed, concerned and hard working volunteers are watching over the quality of Maine's lakes.

# A Sense of Purpose

By Mary Jane Dillingham  
VLMP President



I think it is good to reflect upon our daily tasks, habits, obsessions, patterns, thoughts, and question if what we are doing is worth the energy and how it relates to the "Big Picture." In science, data collection is very important, and often absolutely necessary, to draw accurate conclusions. Snapshot data collections can explain much, especially when changes occur suddenly, but having a baseline is very important. Without data, one's assumptions have much less credibility, if any. This process must begin by attempting to determine the question(s) that we are trying to answer, in order to be sure that there is a rational basis for the collection of specific lake data. Next, consider what action should be taken when it is discovered that runoff is contaminating a pond with pesticides, fecal bacteria, phosphorus, sediment, or other contaminants. What if the water in front of your camp doesn't meet safety standards for contact recreation (swimming)? How does one explain to parents that children in diapers pose a contamination risk and shouldn't be wading up to their waists at the local beach? Ignorance is bliss after all - or is it? Once the data are in hand and reasonable conclusions drawn, what is the appropriate course of action to take in order to protect the health and well being of those around you?

The opportunity to put this process to the test arose this past summer for the Auburn Water District (the environment in which I spend the "non-volunteer" hours of my day.) This past year was very intensive for us at Lake Auburn. In late 2004, through our water quality testing, we noticed an acute issue that could seriously affect the way we treat our drinking water. The cost of not identifying and addressing the source of contamination could be in the millions, because an entirely new treatment system could be required. Because our customers expect safe drinking water at a reasonable cost, we set about planning our actions. We put together a plan that proved to be excellent. We found our smoking gun and some smoldering ones. We challenged traditional viewpoints, solicited excellent resources including our very own lake expert, Scott Williams, and opened our minds to a clearer understanding of the lake. In the end, we can concentrate our efforts to remedy problems, better inform water utility regulators and the public, and predict future problems. We have learned much, have a better understanding of our watershed, and reinforced our sense of purpose. It is better to know. Ignorance can be very costly.

Those of you who collect lake data in any form are doing a very important part in protecting and understanding Maine lakes. Although you may sometimes question the purpose, I can assure you from personal experience that without the data you are simply guessing. As you already know, our lakes are resources of exceptional quality and value that deserve protection for many different reasons. Keep up the great work!

*Mary Jane Dillingham is also the Water Quality Manager for the Auburn Water District and the Lewiston Water Division, a water utility that provides drinking water from Lake Auburn to 46,000 people in the Lewiston-Auburn area.*

## Upcoming Events

### Maine Milfoil Summit

March 3, 2006  
University of Southern Maine Lewiston-Auburn  
Campus  
To register and for more information contact  
Lakes Environmental Association at  
lakes@megalink.net 207-647-8580

### Maine Water Conference

March 22, 2006  
Augusta Civic Center  
Register online at  
[www.umaine.edu/WaterResearch/mwc](http://www.umaine.edu/WaterResearch/mwc) or con-  
tact the University of Maine George Mitchell  
Center at 207-581-3244  
or UMGMC@maine.edu.

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## VLMP Annual Meeting

June 3, 2006  
University of Maine at Farmington

### Call for Presenters

The 2006 VLMP Annual Meeting will be a joint conference with the New England Chapter of the North American Lake Management Society and the Maine Congress of Lake Associations (COLA).

Friday, June 2<sup>nd</sup>, will include a series of workshops for which we are seeking organizers.

Saturday, June 3<sup>rd</sup>, will include the VLMP Annual Meeting and technical presentations.

We are seeking presentations in any area of lake and watershed management.

For more information about presenting at the meeting please contact Dave Halliwell (Maine DEP): 207-287-7649 or [David.Halliwell@maine.gov](mailto:David.Halliwell@maine.gov). Applications are due by March 1

Look for more information about the VLMP Annual Meeting including the registration form in the next edition of the *Water Column* and our website.

# Successful Year-End Appeal Makes New Volunteer Training Boat A Reality

For the past two years the VLMP has conducted a year-end fundraising campaign. This effort has been not only successful, but also very gratifying, because a high percentage of the contributions have come from volunteer monitors.

Thanks to the many generous donations received from volunteers, lake associations and others, the VLMP is very close to being in a position to purchase a boat, motor and trailer, designed to be used to train volunteer monitors. We hope to be able to put the new equipment into service this spring.

Please consider a donation to the "Boat Fund" so that this long-awaited vision for the VLMP can be realized in 2006. Imagine...a training boat for volunteers, made possible by volunteers!



# Littorally Speaking

## Other Aquatic Invaders on Maine's Radar



Roberta Hill, Program Director, *Maine Center for Invasive Aquatic Plants*

By now, most of you are familiar with the eleven invasive aquatic plants on Maine's official watch list: Brazilian elodea, curly-leaf pondweed, Eurasian water-milfoil, European frogbit, European naiad, fanwort, hydrilla, parrot feather, variable water milfoil, water chestnut and yellow floating heart. It is also well known that four of these invaders: variable water milfoil (and an invasive hybrid of this species), hydrilla, curly leaf pondweed and Eurasian water milfoil have now been confirmed in Maine.

While our focus of late has been on learning how to recognize these "eleven most unwanted" invasive aquatic plants, and to distinguish them from their native Maine look alike, it is important that we do not become so focused on the task at hand, that we lose sight of the bigger picture. Maine's lakes, ponds, streams and wetlands are threatened by a wide array of non-native invaders--some plant, some animal. Some have been here in Maine for decades; others are relatively new to our region, and are only now beginning to appear on Maine's radar screen. *Here is just a sampling of some of the other invaders that you may want to keep your eyes open for while out and about on your favorite bit of water.*

**Zebra Mussels** (*Dreissena polymorpha*) Zebra mussels are thought to have been introduced to this country as accidental "stow aways" attached to hulls, or in the ballast water of ships entering the Great Lakes from Europe. Since they were first discovered in this country in 1988,

these tiny, freshwater bivalves, have become a major aquatic pest throughout much of the Midwest. Spreading to

### Zebra Mussels



In 2005 a Courtesy Boat Inspector detected-and successfully averted-some zebra mussels that were on a boat entering Lake Winnepesaukee in New Hampshire.

*Photo by S. van Mechelen, Courtesy of NOAA Great Lakes Environmental Research Laboratory*

New England, primarily by way of boating activity, they have now impacted waters in Vermont and are known to be on the move elsewhere in New England. (Indeed, last summer a Courtesy Boat Inspector on Lake Winnepesaukee in New Hampshire detected-and successfully averted-some zebra mussels that were hitching a ride on a boat from New York.) Zebra mussels begin life as tiny free-swimming larvae, called *veligers*. It is during this stage that they are most readily transported from one waterbody

to another (attached to boating gear, in bilgewater, bait buckets, etc.) and are difficult to detect. After two or three weeks, the veligers "settle out" in the waterbody, attaching by way of strong, threadlike filaments to just about any hard surface they encounter. Rocks, sediment, wood, intake pipes, moorings, boat hulls, native mussel beds, are all at risk of colonization. Zebra mussels are voracious filter feeders, straining out major portions of the phytoplankton population and effectively starving out many native zooplankton species. The gap created in the food web may cascade through the entire ecosystem. *Zebra mussels have not yet been detected in Maine. If you suspect that you have found this invader, please notify MCIAP or Maine DEP immediately. Prevention is our best hope for protecting Maine waters from this invader. See "An Ounce of Prevention" on page 7.*

### Chinese Mystery Snail

(*Cipangopaludina chinensis malleata*) Chinese mystery snails, native to parts of Southeast Asia, were brought to this country as a food source for Asian markets. It is believed that imported snails may have been intentionally released in some areas to create a locally-harvestable supply. Since introduction, Chinese mystery snails have spread to many parts of the U. S., and can now be found in a number of Maine lakes and ponds. Chinese mystery snails are distinctively large; at the size of a walnut or golf ball, they are half-again as large as Maine's largest native freshwater snail.

continued on page 6

## Other Aquatic Invaders Continued...

Though they spend a good portion of their lives under the water surface, half buried in the bottom sediments, Chinese mystery snails may also be encountered with their "trap doors" sealed up tight,

### Chinese Mystery Snail



Chinese Mystery Snail –  
Photo by Martin Kohl,  
Courtesy of Gulf States  
Marine Fisheries  
Commission

floating along at the water's surface. When these large snails die, they often wash up on shore, where their dark, olive-colored shells can be easily seen (and smelled!). Chinese mystery snails prefer the quiet waters of lakes, ponds, roadside ditches and slower portions of streams. Once in a body of water, the Chinese mystery snail may be transported, as adults or in larval form, via bait buckets and water holding areas on boats. Like other snail species, this species may serve as a vector for various parasites and diseases. *Chinese mystery snails occur in a number of Maine waterbodies. The best known control of this species is prevention. See "An Ounce of Prevention" on page 7.*

***Glossostigma* sp.** (*species identification is under analysis and confirmed ID will soon be released*) - This low-growing, mat-forming invasive aquatic plant is a relative newcomer to North America. *Glossostigma* was first identified in the U. S. in 1992, in a single location in

southern Connecticut. It has since (as of 2005) spread to nineteen known locations in Connecticut, New Jersey, Rhode Island, and Pennsylvania. It is believed that *Glossostigma* may even be more widely occurring, but its diminutive size and peoples' lack of familiarity with the plant have allowed it to remain largely unrecognized. Pairs of leaves, resembling tiny green rabbit ears, occur along dense networks of slender rhizomes. Leaf size varies depending upon growing conditions; most are 1/2 to 1 inch long. *Glossostigma*, once established, can form a dense monoculture (averaging 10,000 to 25,000 plants per square meter) on the lake floor, carpeting the bottom from the shoreline to depths greater than two meters. Where exposed at the waters edge, *Glossostigma* behaves as an annual—flowering, fruiting, and then dying back each winter. Submersed, it is a hardy perennial; remaining green and growing year round. Because of its short stature, this invader is not considered to pose much of a threat to recreational activity (boating, swimming, etc.). However, the ability of the plant to form dense, monotypic mats makes it an ecological threat to native plant and animal communities. *Glossostigma has not yet been detected in Maine. If you suspect that you have found this plant, please notify MCLAP or Maine DEP immediately.*

### Starry Stonewort (*Nitellopsis obtusa*)

Starry stonewort is a green *macroalga* (a complex, multicellular algae that resembles a higher plant). Native to Eurasia, and believed to have been introduced to this continent through ballast water contamination; starry stonewort was first recorded in North America in 1978,



Photo by Robert Capers

growing in the St. Lawrence River. It has since spread to many sites along the St. Lawrence, and to portions of the Great Lakes region, (especially around Lake Ontario, parts of Michigan and New York). Though not yet known to be present in New England, Maine's proximity to infestations in the St. Lawrence River valley warrant concern.

### Nitellopsis



From:  
www.kranswieren.nl

Like Maine's native stoneworts, *Nitella* and *Chara*, starry stonewort forms dense colonies of upright, plant-like "stems" sprouting whorls of slender, tentacle-like branches. Distinctive to *Nitellopsis*, are the tiny, cream-colored, star-shaped reproductive structures called "bulbils" that occur at the base of branch clusters. Even before they are evident to the naked eye, the bulbils can be detected by feel, by gently squeezing the stems at the whorls. The tiny bulbils are distinctly "firm" relative to the soft "gelatinous" feel of the rest of the algae. *Starry stonewort has not yet been detected in Maine. If you suspect that you have found this invader, please notify MCLAP or Maine DEP immediately.*

There are other invaders, now fairly common in parts of Maine, that you are almost certain to encounter in your travels in and around the waters of the State—wetland plant species such as European common reed (*Phragmites australis*) or purple loosestrife (*Lythrum salicaria*). Both species are now so well established in some parts of the State, that eradication is pretty much out of the question, and the best we can hope for is to help control their spread. Also becoming more common are the four species of invasive crayfish now found in Maine. (Please see Will Reid's and Matt Scott's article on page 12 for more on these armored invaders.) If you are interested in obtaining a more comprehensive listing of aquatic invaders of concern in Maine, please see the "advisory list" published in Maine's Action

Plan for Managing Invasive Aquatic Species, available online at [www.maine.gov/dep/blwq/topic/invasives/inv-plan.htm](http://www.maine.gov/dep/blwq/topic/invasives/inv-plan.htm). Also, a section titled "Other Aquatic Invaders on Maine's Radar Screen," featuring the above invaders and more, will appear in the new VLMP/MCIAP publication, Maine's Field Guide to Invasive Aquatic Plants, due out this spring.

And finally, when considering the "big picture," there is perhaps one more thing we should all keep in mind. The encroachment of invasive species is now one of the leading causes of extinction in fresh water ecosystems. For all of our progress in protecting them, endangered species are perhaps more vulnerable now than ever. As part of Maine's early detection team, you are not only doing your part to save your own favorite lake or pond from the ravages of aquatic invaders, you are also a crucial part of the front line force working to protect Maine's (and the world's) endangered species. You should be very proud of that!

## An Ounce of Prevention . . .

Preventing the spread of invasive aquatic species will help keep our native ecosystems healthy. To help stop the spread of these and other invaders, please follow these simple steps:

- ⊕ Learn how to identify invasive aquatic species. Attend an Invasive Plant Patrol workshop this summer!
- ⊕ Remove mud, plants, fish, and animals from all of your equipment and drain all water from the bilge and livewells before leaving launch areas.
- ⊕ Clean your equipment with hot water or a pressure washer and allow it to dry for five days before transporting it into a new body of water.
- ⊕ If you have snails or other animals in an aquarium and you no longer wish to care for them, you should find a new *aquarium* home for them. DO NOT RELEASE THEM IN THE WILD!
- ⊕ Never release any plants or animals into a different body of water from which they came.

(Adapted from the Michigan Department of Natural Resources website, [www.michigan.gov/dnr](http://www.michigan.gov/dnr))

# Fast Food

By Llummo: Llines



All winter I see as I look at my Pond  
a vast wide expanse, the water is gone.  
Today there was ice, but also I saw  
some clear open water, result of the thaw.

On the edge of the ice, an exciting new sight,  
a humongous Bald Eagle, just down from her flight.  
So what are you doing out there on my ice?  
Although I must say, you look very nice.

Why are you sitting, so quiet and still?  
Your wish might be fish, your belly to fill  
but how can you catch them from there on the ice?  
You have to dive down, only that will suffice.

For hours on end as you circle the sky  
things great and small picked up by your eye.  
You know what you want, and go after that,  
a fish, or a bird, small dog, or a cat

But then as you waited I saw what it was.  
A ready made meal, so close to your claws.  
You'd been sitting for hours just waiting to seize  
that burger king meal, fresh out of the freeze.

But you know more, much wiser than I.  
You see what you saw from way up in the sky,  
A dead floating beaver, a lunch to be had  
though poor Mr. Beaver has long been quite dead.

No matter to you, to you it's a treat  
as anything is that once has been meat.  
So it drifts to the edge and you respond to the chance  
without hesitation and only a glance.

With effort indeed for something so gross  
you hooked in your claws and pulled him in close.  
Not easy, but then a hero like you  
can accomplish great feats no others can do.

With a great deal of effort and quite a big fight  
you hooked him and pulled him up into the light.  
And then you consumed him without help of spice  
right there in the open far out on the ice.

The following day you came back with a friend  
but Alas! Sir Beaver had come to an end.

Not long ago it seemed eagles were gone  
but seeing you now I'm no longer forlorn.

# Lake Lingo

By Scott Williams



Fred Weston and Craig Killingbeck measure DO and temperature on Long Pond.  
Photo by Linda Bacon

## dissolved oxygen

The concentration of oxygen that is dissolved in lake water can tell us a great deal of information about the health and function of lake systems. Dissolved oxygen, referred to commonly as "DO," (pronounced "dee oh") is the amount of free molecular oxygen that exists as tiny bubbles in the water. DO is measured in parts per million (ppm), or milligrams per liter (mg/l), with use of a meter or a chemical kit. Combined with Secchi disk transparency readings, total phosphorus concentrations and knowledge about the background color level of lake water, we can learn much about the quality and nature of individual lakes and ponds from DO data.

Several physical factors influence the degree to which oxygen is dissolved in water, including elevation, barometric pressure, salinity and water temperature. Water temperature could be said to be the strongest of these, if all other factors could be held constant (which they generally cannot). The relationship between water temperature and the solubility of oxygen is inverse, which simply means that colder water is able to hold more oxygen in solution than warm water. If there were no other forces bearing on the solubility of oxygen in lake water, the warm water near the surface during the summer period of thermal stratification would always hold less oxygen than the colder water near the bottom of the lake. However, there are certainly other factors that affect DO

concentrations in stratified lakes (see # 3 below). The amount of DO that can be held in the water in equilibrium with the atmospheric pressure, the water temperature, and salinity is known as the *saturation concentration*. Actual concentrations of DO measured in lakes and ponds are sometimes expressed as a percentage of the saturation value for a given temperature.

The concentration of dissolved oxygen in lake water is important in three major respects:

1. Oxygen is essential to the survival of nearly all forms of aquatic life, such as fish, zooplankton, bacteria and other microorganisms, algae and rooted plants. Oxygen is produced during the process of photosynthesis, and consumed during respiration - two essential metabolic processes for plants. The low DO stress threshold varies from one species to the next, but nearly all forms of animal life become stressed when levels fall to 5 ppm, or less. For some coldwater species of fish the critical point is considerably higher.
2. The concentration of DO in lake water influences a number of important environmental attributes. The most notable, pH, is a very important regulator of chemical cycling in lake ecosystems. In addition, very low concentrations of oxygen in lake water can promote the migration of phosphorus from the bottom sediments to the overlying water, where it may become available to algae. This process of "internal phosphorus recycling" is directly influenced by DO levels in the water.
3. As organic matter (primarily algae) accumulates in nutrient enriched lakes, oxygen levels in the deepest areas during the summer stratification period can plummet. Bacteria consume oxygen in the process of breaking down the organic matter that builds up near the bottom. By documenting the rate at which this process occurs, especially during the late summer months when water temperatures are warmest, it is possible to determine the extent to which organic enrichment is taking place. Over a period of time this information can be used to complement other forms of lake water quality data, that measure change.

Volunteer lake monitors can be trained to collect DO data in their lakes if they are willing to spend extra time on the water and maintain the equipment if needed. The collection process is considerably slower than taking a Secchi disk reading. DO readings should be accompanied by water temperature data, and sets of temperature/DO readings should ideally be taken at multiple depths in the water column, several times during the summer monitoring period. Relatively inexpensive chemical kits can be used to check DO concentrations, in combi-



nation with a calibrated thermometer and a device for "grabbing" samples from multiple depths. Meters and probes that are designed to measure DO and water temperature obtain readings more quickly, but not necessarily more accurately. Reliable DO meters require a considerable financial investment and have periodic maintenance and specific calibration routines that must be followed.

Regardless of the method chosen, it is important that folks monitoring DO have a reasonable understanding of why it is important in lake ecosystems, what to expect for readings in typical Maine lakes, and how to properly "care for and feed" the equipment chosen to obtain the readings. The VLMP will conduct at least one DO monitoring workshop during the summer of 2006. Dates, times and locations for all workshops will be posted on the website as soon as the information is available.

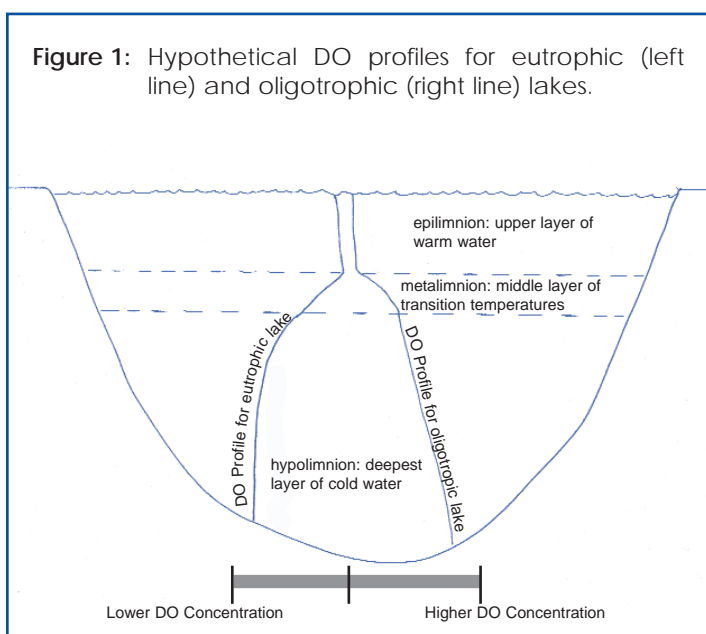


Figure 1 illustrates a thermally stratified lake during late summer, where the warmest water is in the surface layer (epilimnion), temperatures drop rapidly in the middle layer (thermocline or metalimnion), and the coldest water is in the deepest layer (hypolimnion). The two vertical lines represent hypothetical DO concentrations (profiles) in the water column. The profiles relate to the bar at the bottom of the diagram that shows relative DO concentrations in the water.

The line on the right could be typical for a lake with very low concentrations of nutrients and algae (oligotrophic). Oxygen levels increase in the thermocline as water temperature cools, and are highest in the cold hypolimnion. The line on the left shows typical DO concentrations for a nutrient-enriched lake (eutrophic). DO levels begin to drop rapidly in the thermocline, and are extremely low in the hypolimnion. Bacterial decomposition of the excess organic matter in the water has resulted in near depletion of the DO. In reality, the two lines would be very close together in the epilimnion. Many Maine lakes exhibit conditions that fall within the two extremes during late summer.

# Passings



Eddie and Kay Mayer

According to the records, Eddie Mayer collected 517 water quality readings from the lakes in the Belgrade chain during his 30 years as a volunteer lake monitor. But that impressive statistic does not begin to tell the story of a much-admired individual who made a significant contribution to Maine lakes and enriched the lives of all who were fortunate to know him.

Eddie and his wife Kay, who survives him, were important, but quiet supporters of the Belgrade Lakes Association. Eddie was instrumental in securing hundreds of conservation acres in the Belgrade area, in addition to being a major figure in bringing the 6,000 acre Kennebec Highlands project to fruition. His sharp wit and expansive intellect provided friends and family with endless stories on a broad range of subjects, including lake water quality, geography, the art of home brewing, photography, and much more.

I first met Eddie a little more than a decade ago at a volunteer recertification workshop on Great Pond in Belgrade, at which time he was in his early 80's. Although it was my intention to run him through the QC process with his dissolved oxygen monitoring gear, it soon became evident that he was more interested in determining my qualifications and knowledge of the subject matter. It was a humbling experience. Nobody had warned me about Eddie!

A few years ago the VLMP recognized a small group of volunteers who had been continuously active in the program for a quarter century. Eddie was among this distinguished group, but true to form, he made it very clear that he did not wish to be recognized publicly. I last saw him at a QC workshop on Long Pond two summers ago. He was among a group of volunteers in a boat that was passing by ours, following the recertification process. As they went by, Eddie announced "since I'm only able to see out of one eye now, I'll just multiply the Secchi reading by two!" His sense of humor never failed him.

Eddie's contribution to the VLMP and to Maine lakes was extraordinary. We will always be grateful for what he has left us.

S. W.

# VLMP Receives Governor's Award for Environmental Excellence



Volunteer Lake Monitoring Program staff receive the Governor's Award for Environmental Excellence from Governor Baldacci and Maine DEP Commissioner Dawn Gallagher. *Left to right: Gov. Baldacci, Scott Williams, Roberta Hill, Jim Entwood, Dawn Gallagher.*

**O**n November 11, 2005 the Maine Volunteer Lake Monitoring Program was honored to be presented the "Governor's Award for Environmental Excellence" by Governor John Baldacci at a ceremony in Hallowell. The Governor cited the 35 year history of the program, the excellent work of volunteers, and the value of volunteer data to the State of Maine. VLMP staff accepted the award on behalf of the many dedicated volunteer monitors who have worked tirelessly to protect Maine lakes through the acquisition of credible data.

We have printed below a few of the congratulatory responses from friends, collaborators and volunteer monitors. **To all of Maine's volunteer lake monitors, let there be no doubt that this deserving award was made to you!**

## Your responses

FANTASTIC! This is great news for all of you and the state's waters too. This is especially well deserved recognition for those who take the time and effort to keep this outstanding group of volunteers educated, inspired and organized. - *Josh Royte, The Nature Conservancy*

YAY!! CONGRATULATIONS!!!!!!!!!!!! :):) - *Liz Petterson, Hancock County Soil and Water Conservation District*

Congratulations to all at the VLMP on receiving the Governor's Award for Environmental Excellence. You are truly deserving of this recognition for all of your efforts in monitoring and protecting Maine lakes and aquatic environments. You are a growing organization that has forged a unique and critically needed partnership with the DEP. Your training of volunteers (citizen scientists) and your advocacy on behalf of lakes statewide has made you a role model for environmental organizations in Maine and beyond. I wish you the best in your future endeavors and am thankful for the role you play in safeguarding Maine's aquatic heritage. - *Dan Buckley, President Maine COLA*

Yahoo!! And congratulations ☺ I can not think of a more deserving candidate! I hope that the Governor's recognition of your tremendous efforts and the value of our lakes and ponds remains a fixture in his mind and gets translated into additional support of all kinds for our priceless lakes. Thanks for all you do! - *Rebecca Kurtz, Rangeley Lakes Heritage Trust*

Well deserved! Congratulations. - *Paul Hunt, Portland Water District*

Congratulations from LEA. It's nice to see you and lakes get some acknowledgment. - *Peter Lowell, Lakes Environmental Association*

Congratulations all (staff, board and volunteers) for receiving the Governor's Award for Environmental Excellence and for the recognition of all your hard work, passion and motivation! This award is another reason - added to many others - that makes me feel very pleased to be associated with VLMP and MCIAP. - *Laurie Callahan, VLMP Staff*

Congratulations!! You deserve this award!! - *Don Cameron, Maine Natural Areas Program*

I am thrilled that the Maine Volunteer Lake Monitoring Program received the Governor's Award for Environmental Excellence. This honor is richly-deserved. For thirty-five years, data collected by devoted volunteers have proven invaluable to government agencies, lake associations, and other entities responsible for assessing environmental conditions and trends, and restoring and protecting Maine's lakes and ponds. Every year, the VLMP works equally hard at educating and providing technical support to thousands of interested citizens and professionals. In their new home at the Woodbury Brackett Environmental Center, the VLMP offers the public even greater access to lake-focused resources and training. Congratulations and continued success to everyone at the VLMP! - *Sandra Fanciullo, U.S. Environmental Protection Agency*

# LakeSmart

## Update ~ Winter 2006

After the second full season of LakeSmart, a program of the Maine Department of Environmental Protection, requests for the program have exceeded our expectations. Thanks to many enthusiastic LakeSmart leaders, like Michael Dixon pictured here, more and more lakeshore residents are asking to be LakeSmart.

If you have not heard of LakeSmart, it is a program that promotes lake friendly landscaping. LakeSmart offers training programs but the heart of the program is a site visit to an individual's property. The evaluator, a Soil and Water Conservation District staff person, evaluates properties on or near lakes to see if the owner qualifies for an award or recognition. They generally make recommendations for improvements that will protect water quality as well as increase the beauty of your property.



The Maine Department of Environmental Protection has granted 68 LakeSmart Awards to lakeshore property owners such as Michael Dixon (above) who improve their property to protect water quality.

In Maine, there are now 68 LakeSmart award properties and 85 properties that are recognized in one or more of the four basic categories:

1. Driveway and parking areas
2. Structures and septic systems
3. Yard Recreation Areas and Footpaths
4. Shorefront and Beach areas

This past summer we added a new optional category called "Undeveloped Lands" to recognize those people who have undeveloped lots around the lake that further protect water quality.

Although the main focus of LakeSmart is the property evaluation, there will be two workshops this coming summer. The first workshop will be held on July 22, 2006 in Otisfield at the Seeds of Peace Camp and the second one will be held on August 2, 2006 in Rangeley at the Rangeley Lakes Heritage Trust. If you want more information or want to register for a workshop go the [MaineDEP.com](http://MaineDEP.com) and click on LakeSmart.

DEP will be taking requests for future workshops or a short version of training called LakeSmart Walk 'N Talks. A Walk 'N Talk is a two hour informational walk around two lakefront properties to learn the basics of lake friendly landscaping and the process of a LakeSmart evaluation.

DEP and the Soil and Water Conservation Districts are cooperating to provide additional support to the lakes already participating in LakeSmart. We are using social marketing to assist lake associations to promote the program and to get additional LakeSmart award properties. Our objective is to have LakeSmart signs on 15% of lakeshore properties. Research shows when 15% of the group/community has adopted a new practice, it has the critical mass to spread on its own momentum. Thanks to some enthusiastic lake association members and diligent evaluators, we have one lake, Long Pond in Parsonsfield, very close to our 15% objective!

Please contact us if you are interested in promoting this program to spread lake friendly landscaping and yard practices on your lake. Call Christine Smith at Maine DEP 287-7734 or email [Christine.p.smith@maine.gov](mailto:Christine.p.smith@maine.gov).

# The Crayfish of Maine

## Natives and Invasives

By William Reid and Matthew Scott

### About the Authors

Will Reid has been a volunteer lake monitor for Wesserunsett Lake, Madison since 1982. His interest in crayfish started in 1968 with a



Will Reid

Master of Science research project and continued with a Ph.D. study in 1971, both at the University of Maine. Since 1996, he and Matt Scott have collaborated on a number of efforts concerning the crayfishes of Maine. In 2005, they investigated the crayfish of the Dennys River watershed in Washington County as part of an Atlantic salmon program project.

Matt Scott is an aquatic biologist with nearly four decades of experience working with (and in) Maine waters. His interest in crayfish extends through his entire profes-



Matt Scott

sional career. He has collaborated with Will Reid on a number of crayfish research projects, including most recently the Denny's River investigation. Matt is the VLMP Regional Coordinator for Washington County, where he is also a certified volunteer water quality monitor for Pleasant River Lake. He is the former Director of the Lakes Division at the Maine DEP, former Deputy Commissioner of the Maine Department of Inland Fisheries and Wildlife, and he is presently the Chair of the Maine Board of Environmental Protection. Matt is a founding father of the Maine VLMP.

Thanks in large part to the efforts of the Volunteer Lake Monitoring Program, most readers are well aware of the presence and threat posed by invasive aquatic plants in Maine. Indeed, many readers have been trained by the VLMP in the identification of invasive aquatic plants and have been actively involved in boat inspection programs. Most readers, however, are probably not as familiar with invasive aquatic animals. It is therefore the purpose of this article to provide some information on one type of aquatic animal present in Maine - crayfish - and ask for some help.

Crayfish, or “fresh-water lobsters” as Thoreau called them, are important in the dynamics of aquatic ecosystems, feeding on plants, animals, and detritus. They are not indiscriminate omnivores, but instead can be chiefly carnivores in lakes and streams and even modify ecosystems. When animal protein sources are inadequate, they become facultative herbivores. They are prey for many animals, some of which are common loon, great blue heron, belted kingfisher, mink, otter, raccoon, brook trout, smallmouth bass, largemouth bass, white perch and American eel. In Maine, they have been found to be particularly valuable forage for brook trout and smallmouth bass. They have also been found to be valuable as environmental indicators as illustrated by the high levels of mercury found in analyses of tailmeat from Maine crayfish.

There at least eight species of crayfish in the State. They are the:

1. Appalachian Brook Crayfish (*Cambarus bartonii bartonii*)
2. Spinycheek Crayfish (*Orconectes limosus*)
3. Virile Crayfish (*Orconectes virilis*)
4. Calico Crayfish (*Orconectes immunis*)
5. Allegheny Crayfish (*Orconectes obscurus*)
6. Rusty Crayfish (*Orconectes rusticus*)
7. White River Crayfish (*Procambarus acutus acutus*)
8. Red Swamp Crayfish (*Procambarus clarkii*)

Of these eight species, we feel that the first three are definitely native and that the fourth probably is. However, some others outside of Maine who study crayfish feel that the third and fourth species listed above are non-native. All apparently agree the last four have been introduced and the Maine Invasive Aquatic Species Action Plan lists these four in its Advisory List of Invasive Aquatic Species. Whatever the actual number of introduced species is, the important point of concern is that two of them are notorious as invasives and have caused problems both in this country and even on other continents. These are the Rusty Crayfish and the Red Swamp Crayfish.

The Red Swamp Crayfish was introduced into Maine as part of an illegal live fish bait shipment from Arkansas around 1980. The Rusty Crayfish, Allegheny



Red Swamp Crayfish

Crayfish, and White River Crayfish have also been in Maine for decades, probably having been brought here as bait. In particular, the Rusty Crayfish and the Red Swamp Crayfish are aggressive species. They have demonstrated elsewhere that they are "invasives" as defined in the Maine's Invasive Aquatic Species Action Plan in that they are non-native (nonindigenous) organisms that "... may threaten the diversity or abundance of native species or the ecological stability and/or uses of infested areas." The Plan's concerns about the impacts of the four species include displacement of native species of crayfish, reduction of biodiversity, disruption of food webs, degradation of habitats, and degradation of recreational experiences. An additional concern is that where invasive aquatic plants are present, fragmentation of these plants by crayfish feeding on them could facilitate the expansion of the plants.

An ironic twist regarding invasive species of crayfish concerns the Spinycheek Crayfish. We have found it to be a very secretive, apparently docile creature here in Maine and in aggression trials conducted by others, it was dominated by the Rusty Crayfish. However, where introduced in Europe, it has proved to be a serious invasive. A fungal plague carried by Spinycheek Crayfish has proved lethal to European crayfishes.

There has been no coordinated, systematic statewide study of the distribution of crayfish in Maine. As a result, there is a lack of adequate knowledge about their distribution, let alone which species are native and non-native and which ones are the most serious invasives. A good start in addressing this deficiency would be to study systematically the distribution of crayfish in Maine as well as to investigate those waters where the invasive species are known to be present to determine what, if any, harm they are causing, and

to see if they have spread. We do not know what waters these species may have spread to or what impacts they have had. Such basic knowledge is necessary to make intelligent management decisions regarding allocation of control efforts and funding. In addition, a manual regarding the crayfishes of Maine that we are drafting could eventually be a valuable resource for biologists and naturalists who are interested in identifying the species they find and knowing more about them. Funding is needed, however, to complete that effort.

*As they have with transparency monitoring, invasive aquatic plants, metaphyton, and Gleotrichia, VLMP monitors who are interested could help regarding crayfish.* Simply reporting where crayfish have been observed would allow us to crosscheck our records and to follow up with field surveys of those waters where crayfish have not been previously reported. If details in addition to the name and location of the body of water can be provided, that would be helpful, but not necessary. Such details could include when they were observed (even just the year(s) would be helpful), the specific location in the body of water, abundance, habitat, color patterns, size, how often they were observed, etc. The essential information, however, is the body of water.

If you would like to contribute information, you can send it to either or both of us. Your help in this effort would be most welcome and greatly appreciated!



White River Crayfish

**Crayfish observations can be reported to either:**

**William F. Reid, Jr.**  
26 Coburn Ave.  
Skowhegan, ME 04976  
wmreid1@verizon.net

**Matthew Scott**  
RFD #1, Box 428  
Belgrade, ME 04917  
mscott@clinic.net

## In Our Back Yard

# Ice Is An Indicator

**T**he possible effects of Climate Change can be seen throughout the globe, from earlier spring weather to changes in planting zones, as well as changing rain and snow patterns. But did you know that there is evidence of a changing climate right here in Maine? And for many of us, it is right in our backyards!

Late winter and early spring is the perfect time for Mainers to observe climate change and key pieces of evidence in our ice, water and air! Ice cover on rivers and lakes is a good climate change indicator to observe since there is a long history (150 years) on a number of Maine lakes and rivers. The date of ice-out has been important over the years for transportation, annual log drives, and the end of ice fishing season. This has led to recordings of ice-out dates for some Maine lakes since before the 1850's (Sebago Lake starts in 1807)!

Researchers at the United States Geological Survey (USGS) use this historical information, along with current research, to identify trends in climate change over the years. Changes in ice thickness, date of ice-out on rivers and lakes, timing of high seasonal flows (spring melt and run-off) and winter air temperatures are all

indicators that the USGS measure and analyze in order to identify significant trends.

So what is our ice cover telling us? According to USGS researchers, although there is a great deal of year-to-year variability, there has been a significant change in the past 30 to 40 years. There have been other periods of change, but not as dramatic. This is evidenced by warmer average winter air temperatures and measurements of thinner ice. There is an overall trend in many river and lake ice-out dates, documenting spring run-off dates are occurring from one to two weeks earlier. For more information, see the USGS web site: <http://me.water.usgs.gov/reportsx-sub.html#climate>.

How does this change affect us? While some might be joyful at the possibility of milder and shorter winters and longer growing seasons in the years to come, others that enjoy winter may not be so happy. This warming trend could also harm cold water fish habitat, such as the Atlantic Salmon or trout, that can be sensitive to changes in stream flow and water temperatures. And as this trend continues, there are additional consequences that can affect all of us – changes in precipita-

tion patterns, rises in sea level, loss of coastline, changes in ocean currents and even possible changes in the availability and quality of our water resources right here in Maine!

So what can you and I do about these changes in our climate? We can keep our eyes on the ice and other indicators of climate change and alert others to what's going on in our environment. You can encourage your friends and neighbors to switch to renewable energy sources wherever possible and practice energy conservation (such as combining trips and car pooling, turning down the thermostat, and shorter showers). Together we can make a difference to clean up the air and put the freeze on our energy bills.

*This column was submitted by Tamara Whitmore, AmeriCorps Intern, with the Maine DEP's Bureau of Land and Water Quality. In Our Back Yard is a weekly column of the Maine Department of Environmental Protection.*



# Brackett Environmental Center News



## Maine's Lake Campus and Volunteer Training Center

By Richard Jennings  
*Brackett Center Volunteer*

**W**e have all been hearing about global warming. Despite our growing awareness and concerns, we still seem to be lacking the motivation to do something about it. Perhaps the experience of this winter (or lack thereof) in South Central Maine will be the wake up call we need. In any case, we continue to do what we can here at the Brackett Environmental Center, to mitigate human impact upon, and to some degree help restore, Nature's balance.

In reporting our activities since the last Water Column we'll start with good news. That is, the Thank You's: first to Dick Thibodeau for the chest freezer, (and no, this isn't for ice cream and other goodies, but rather those slimy green things you volunteers pull out of the lakes and send in, much to Roberta's delight); second, for the tremendous help from Sarah Winslow and Jackey Bailey with the Virtual Herbarium, (*have you visited it yet? [www.mciap.org/herbarium](http://www.mciap.org/herbarium)*), and several other important projects.

In November the Regional and Data Water Quality Coordinators met at the Brackett Center to review the 2005 season and offer suggestions for 2006. Also in November, Invasive Plant Patrol Regional Coordinators and groups dealing with invasive infestations met for a series of roundtable meetings. We are very pleased to have these opportunities to incorporate volunteer feedback into the program.

We welcome your involvement in the work of the Center!

- If you have a topic that would be of general interest for our Summer Community Lecture Series, please contact the VLMP office.
- Those with strong backs are needed to help with the spring landscaping projects. Mark Fuller has some very interesting thoughts which will further bring out the environmental thrust of the Center. Contact the office to sign up.
- Evidence is mounting that painting the Center is not only a good idea, but necessary. Should you like to help with this project, please call.

Planning is very much in progress for the series of summer workshops, and as schedules are developed, this will be announced on the Website, as well as in the Newsletter.

## Fall Coordinator Meetings at the Brackett Center



Data Coordinator David Hodsdon (left), and Regional Coordinator George Bouchard (right) discuss issues of volunteer and data management with VLMP Executive Director Scott Williams at the annual Water Quality Coordinator Meeting.

Meg and Gerry Nelson represented the Lovell Milfoil Committee at a meeting of Regional Invasive Plant Patrol Managers.



Jim Chandler (far right) presents his pioneering work with benthic barriers to control variable-milfoil at a meeting of Maine's Plant Control Managers.

Front Row: Joel Bloom, 2nd Row: Karen Hahnel, Lew Wetzel, John McPhedran, 3rd Row: Paul Gregory.

## Wish List

Rototiller  
Gardening Tools

### Professional Services

Roofing  
Flooring  
Electrician  
Painter



Maine Volunteer  
Lake Monitoring Program  
24 Maple Hill Road  
Auburn, Maine 04210