the Water Column

A Publication of Maine Volunteer Lake Monitoring Program

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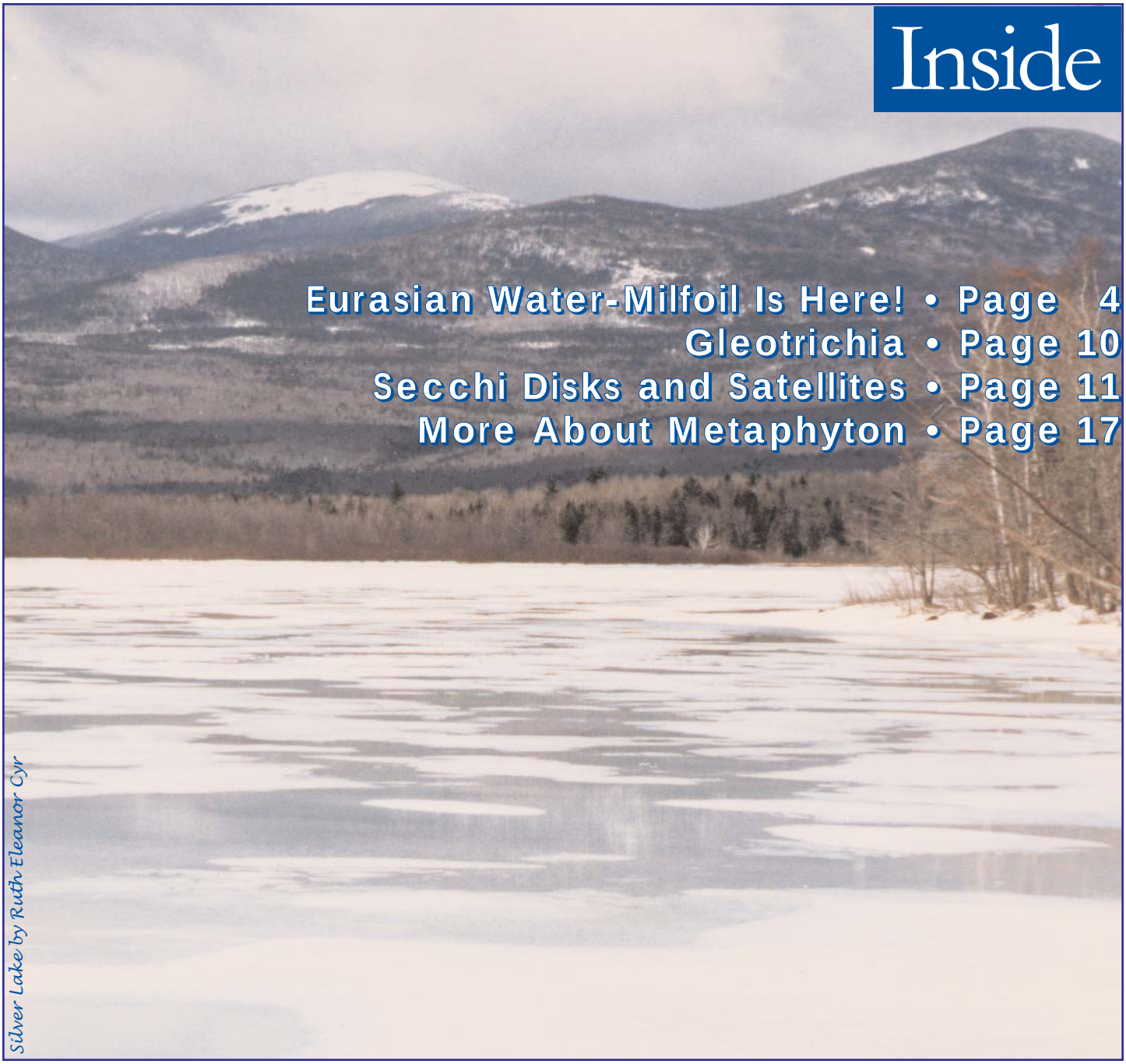
Inside



Silver Lake by Ruth Eleanor Cyr

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Mary Jane Dillingham
VLMP Board President

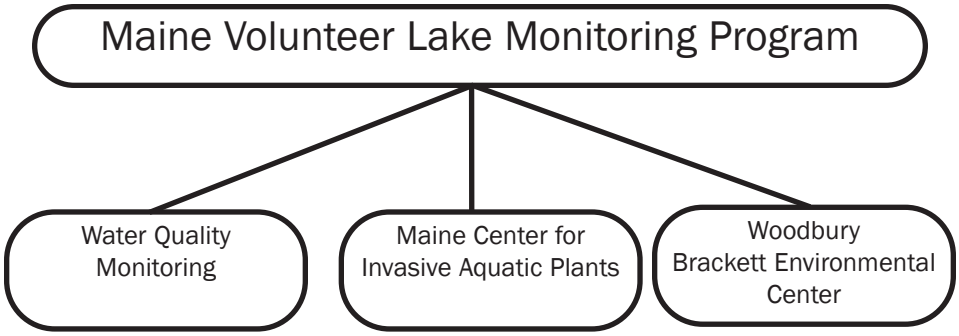
Thoughts from your President

Hello Everyone!

Spring is around the corner. It is a long sweeping corner though. I am an active equestrian and ride almost every day, even in the winter. There is a lot of hay burning going on lately. I am also a motorcyclist, but the bikes are in the house where they remain warm and silent. I sit on them once in a while, dreaming of those twists and turns, long impressive burnouts and even an occasional wheelie. Winter has always been a good time to make plans for what lies ahead and the things I hope to achieve.

This is the time of year the VLMP budget is planned and approved. The Directors set plans to meet the budget. Staff plans for the coming monitoring and training seasons. So what is different this year? The Board of Directors and staff have had some time to get acquainted with their new home. It is apparent that the Woodbury Brackett Environmental Center is a bonus to the VLMP. So many factors make this a perfect home for the program. We recognize the issues that need to be addressed, and are working on determining and meeting the financial commitment that goes along with them. Also, the VLMP continues to grow. Some of what is on the horizon includes an updated strategic plan, more volunteer training sessions, evening environmental lecture series at the Brackett Environmental Center, a new boat, office furniture, increased staffing, all of which will require some serious fund raising efforts. The Maine Center for Invasive Aquatic Plants can boast only supreme success. A combination of being part of the VLMP, having a place to call home at the Center, dynamic staff, and the desire of concerned, caring people to keep invasive plants out of Maine promise to keep it a very successful and growing program. With all this in the plans, it is important for the public to be aware of who we are, why we exist and how this program can improve the quality of their lives.

The structure of the VLMP structure has changed as we have grown, as is shown in the diagram below:



Opportunity doesn't usually wait when it calls. When it knocks, you had better just answer the door and check it out, ready or not. If it works, great and if not you tried. I think the VLMP has been very forthright in grasping opportunities, and that is great. For all of our friends who have recently helped support our goal of raising money for the program we are very grateful for your support. The recent campaign has thus far raised $4,700 dollars towards our goal of $15,000. Maybe when those income tax refunds come in, more will be on the way. We can always dream a little. Stay warm.

Lakeside Notes

By Scott Williams

Scott Williams
Executive Director

Falling Through the Ice

Maine's lakes and ponds evoke so many blissful images and happy memories for those who spend time learning about and enjoying them every year. It's easy to forget that they also have the potential to cause injury and death! Mindful respect of that potential can save your life, whether you are boating and swimming in the summer, or ice-fishing and cross country skiing in the winter.

The weather throughout Maine during the past several weeks has been cold enough to create a thick cover of ice on most lakes and ponds in the state. However, one should never make assumptions, especially when visiting a waterbody that is unfamiliar. Remember that the ice near, or over flowing water is likely to be much thinner. Always be prepared for the unexpected. PFD's can be equally valuable in the winter, both in terms of providing an extra layer of insulation against the cold, and to help you survive falling into the water. A lightweight coil of rope or even heavy string attached to a small stick in your pocket could be used to throw to a rescuer, or to someone who is floundering in the water. It takes just a short time to put together a small winter emergency pack, designed for such a need.

We recently learned of a website link to an excellent video that provides viewers with detailed instructions on how to survive a fall through the ice. If you spend any time on the ice, taking a few minutes to watch this valuable piece could save your life, or that of a friend or family member. To view the video from the VLMP website click on Links, and then on "Emergency Ice Survival and Rescue Video".

Documenting Ice-Out Dates

Speaking of ice on lakes and lake monitoring, do you, or someone in your lake community routinely document the "ice out" date in the spring? You may be aware that research focusing on changes in the duration of ice cover on New England lakes has revealed that over the past century things appear to have been changing! If you are able to reliably monitor this event, the information could be valuable in the future. For more information about the historical study, check out the links on the left, or visit the VLMP website to go directly to the video and the ice out study links. Barring unexpected scheduling problems, or a very severe winter, when the next issue of *The Water Column* arrives at your door (or screen), the ice should be out!

Ice-Out Study on the Web

Historical Ice-Out Dates for 29 Lakes in New England
http://me.water.usgs.gov/OFR02-34.pdf

Map of Lakes in the Hodgkins/James Ice-Out Study
http://me.water.usgs.gov/iceout.html

The Water Column:

Welcomes your articles, photos, and stories.
Please write to us for submission guidelines.

Eurasian Water-milfoil is Here!

By Roberta Hill

The good news is, the Maine Department of Environmental Protection is acting swiftly to combat this much-dreaded invader.

The EWM growing in a Scarborough pond is well established, forming thick extensive mats.

Last fall, Eurasian water-milfoil (EWM), one of the most aggressive of all invasive aquatic plants, was identified in a small, unnamed quarry pond in the southern Maine town of Scarborough. The Maine DEP wasted no time in setting its "rapid response" plan in place. The water level of the pond was partially drawn down in the late fall to reduce opportunities for the invasive milfoil to migrate downstream, to expose the plants, roots and seeds to freezing and drying conditions and to limit the water volume in the pond to facilitate future control measures. According to Paul Gregory, of the Maine Department of Environmental Protection, "further actions to control and eliminate the invasive plants will resume this spring." Control methods being considered include "dredging and herbicide treatments, possibly a combination of both."

In addition to implementing a battery of control strategies in the 28-acre pond, the DEP is working with local residents and businesses to determine, if possible, the source of the introduction. The infested pond is on private property and offers no boating, swimming or fishing—activities most often associated with the introduction of invasive weeds in lakes and ponds.

Work has also begun to ensure that this plant has not—and will not—be spread to other waterbodies. "DEP biologists have conducted surveys of the outlet stream and nearby waters to determine whether the plant is isolated to the quarry pond," says Gregory. Initial scans of the area suggest that it is, but reconnaissance will continue in the spring and additional survey help is being sought from Invasive Plant Patrollers, local lake associations and the Maine Department of Conservation's Natural Areas Program. Continued surveillance of area ponds, lakes and streams, by trained surveyors is seen as essential ensuring the successful containment, if not eradication, of this "most unwanted" plant. If you would like to know how you can be more involved in Maine's "early detection" effort please see *Invasive Plant Patrol* on page 5.

The EWM infestation was first reported to DEP in late October by the concerned landowner, and verified by Don Cameron, a botanist with the Natural Areas Program. The highly invasive and rapidly growing milfoil is well established in the pond, forming dense, expansive mats, suggesting that that the plant has been thriving in the pond for several years.

Eurasian water-milfoil is the fourth invader on Maine's official "watch-list" to have been positively identified in Maine. The first to arrive, variable water-milfoil, is the most widespread, currently known to occur in 21 Maine waterbodies. The other two aquatic invaders known to be in Maine, hydrilla and curly leaf pondweed, are, like the EWM, known to occur in one waterbody each. Maine's watch-list currently includes a total of eleven "prohibited" invasive aquatic plants that are believed to pose an imminent threat to Maine waters.

Efforts to prevent, detect and manage aquatic invasive plants are made possible by boater participation in the Maine Lake and River Protection Sticker program.

Update from the
MAINE CENTER FOR INVASIVE AQUATIC PLANTS

It is amazing to think that 2003 was MCIAP's first year as an official entity in Maine. The Center has come a long way in a very short time, a tribute to the many statewide partners, volunteers, summer interns, journalists and others who have lent their interest and support to the program. 2004 was a banner year. We invite you to share some highlights from 2004, and a preview of some of the initiatives underway for 2005.

Invasive Plant Patrol (IPP)

Roughly 450 individuals participated in a total of 20 IPP training sessions in 2004, bringing the total number of IPP participants to date to over 1250. In addition to expanding the size of Maine's volunteer force, we continued our work to enhance the IPP program both in scope and substance. Increased opportunities for advanced training were offered in 2004: one workshop specifically designed for IPP coordinators; two on-lake workshops providing hands-on instruction for conducting a screening survey, and one advanced plant identification workshop, in which MCIAP co-presented with State botonist, Don Cameron from the Maine Natural Areas Program.

The scope of the workshop outreach also continues to grow. Adding Washington and Piscataquis Counties to the list of Maine counties served in 2004, we are now down to the final two "unserved" counties: Knox and Sagadahoc—obvious targets for 2005. Participants added to the ranks this year represent a wide array of backgrounds and interests including: lake association members, VLMP water quality monitors, teachers, high-school and college students, Maine DOC park staff, Maine wardens, journalists, professionals and others. In short MCIAP continues to train as many "watchful eyes" across the State as possible.

The IPP "Certification" program was launched in 2004. The goal of certification is to encourage and support individual and group commitment to annual collection and submission of IPP survey data. As of 2004, any patroller who had participated in at least one basic IPP workshop and who wished to become "certified" was asked to make a formal commitment to the annual submission of data. Our goal for 2004 was to certify 100 patrollers; to date we have certified over 130! MCIAP provided all certified monitors with an ID card; the first 100 to be certified also received a free bucket scope. Data provided by Certified Plant Patrollers will become part of the statewide database. We will continue to expand this program in 2005.

Each IPP workshop has a story. At the July 28 workshop the dinner break entertainment included belly dancers, posing here with a piece of milfoil!

A new initiative for 2005 is the Invasive Plant Patrol Coordinators Working Group. The group, comprised of individuals involved in developing and coordinating multi-lake or region-wide IPP programs, will meet two times each year to share information and ideas and coordinate efforts. Our first meeting this January was a resounding success. There was so much "cross-pollination" of ideas going on it seemed like spring! If you are currently collaborating with

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Invasive Plant Patrol Workshop Offerings in 2005

- Basic IPP Workshop (5 ½ hour workshop providing all you need to know to get started as part of Maine's early detection team)
- Invasive Aquatic Plant Screening Survey Field Methods (half-day workshop on the lake!)
- IAP Manual Control Methods for SCUBA divers and non-divers (classroom instruction followed by practice in the field)
- Advanced Aquatic Plant Identification I and II (Two distinct workshops, each focusing on a different aspect of aquatic plant life and different plant groups)

The 2005 workshop schedule will be available later this winter. If you are interested in hosting a future workshop and/or would like to receive an email announcement and you are not already on the MCIAP Email Update list-serve, please contact Roberta Hill.

LAKE LINGO

By Scott Williams

Food Chains and The Food Web

The concepts of food chains and food webs are essential to our understanding of the interactions of biological communities in lakes and ponds. Organizing this information into chains and webs illustrates these dynamic processes. Although the structure of the concepts can be complex, it basically comes down to "who is eating who"!

A typical food chain begins with nutrients and microbes in the water column or bottom sediments, which are consumed or metabolized by phytoplankton (algae - primary producers), which in turn are eaten by zooplankton (herbivores), which are consumed by small fish (planktivores), which are eaten by bigger fish (piscivores). Of course, it's not that simple, because some small fish eat algae, and some juvenile piscivores eat zooplankton, and some organisms eat pretty much anything (omnivores). People and waterfowl also work their way into the picture, although it is a matter of debate as to whether or not we (humans) should be considered actual components of lake ecosystems. So it makes more sense to think about these relationships in terms of a web (Figure 1) than a chain. Even so, for the purposes of illustrating a complex concept, the information is often presented in a linear fashion.

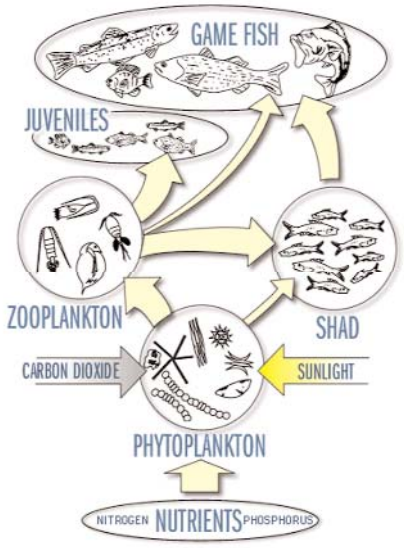


Fig. 1: A Typical food web for lakes and ponds.

Food chains and webs are also helpful in conceptualizing the transfer or flow of energy in lake ecosystems. Ecological pyramids (Figure 2), which look much like food chains, illustrate how energy in lakes and ponds begins with sunlight and nutrients, and flows up through the primary energy producers (algae) to the consumers (fish and other higher organisms).

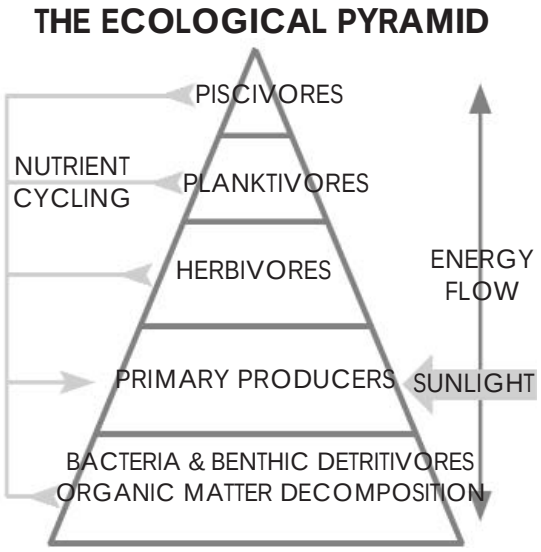


Fig. 2

Illustrations used with permission by WOW. 2005. Water on the Web - Monitoring Minnesota Lakes on the Internet and Training Water Science Technicians for the Future - A National On-line Curriculum using Advanced Technologies and Real-Time Data. (http://wateronthewb.org). University of Minnesota-Duluth, Duluth, MN 55812.

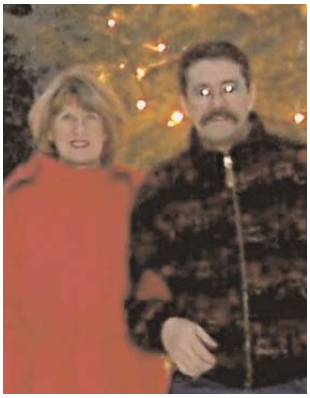
As we learn more about these interwoven relationships, it is not difficult to see how changes in one level of a pyramid, web or chain could result in disturbances to the delicate balance of a lake ecosystem. The manipulation of any element, whether inadvertent or intentional, may result in unexpected effects. Three common forms of manipulation are increases in phosphorus levels from watershed development, changes to fisheries and the introduction of invasive species. Each of these has the potential to cause significant changes in lakes and ponds. "Biomanipulation" is an emerging form of lake management that may hold promise to restore balance to impaired lake ecosystems. But the manipulation of complex natural systems, whether intentional or not, always carries risks of unknown consequences!

VLMP Annual Meeting

Saturday July 30, 2005
8:30am-1:00pm
Central Maine Community College
Auburn

Volunteers in Action

Bruce Fenn and Susan Therrien-Fenn, VLMP Regional Coordinators for Kennebec County



Susan and Bruce are actively volunteering in their communities to help protect Maine's Lakes

"Our children often tell us how they hope that one day they will be fortunate enough to be the "fourth" generation to spend the summer months on Great Pond!"

Hello everyone! My name is Sue Therrien-Fenn, and my husband Bruce and I will be serving as the new Kennebec County Volunteer Regional Coordinators. We want to thank the VLMP for giving us this opportunity to say "hello" and to provide you with a little background information about ourselves.

During the winter, we reside in the beautiful little mountain town of Newry. Once the temperature drops and Sunday River is covered with snow, we both enjoy spending time on the slopes. However, Bruce's winter passion is teaching physically and mentally challenged individuals how they can enjoy the beauty and fun of winter by participating in the Maine Handicap Ski Program!

While Bruce is on the slopes working with the disabled, I enjoy doing volunteer work for the Androscoggin Home Care and Hospice Program. After caring for my Mother who lost her five-year battle with Breast Cancer, I am passionate about spending time, and truly connecting with families who have made the difficult decision to care for their terminally-ill loved one in their own home.

Once the warm weather returns, we pack our bags and head to our camp in Belgrade Lakes. We are blessed to live on beautiful Great Pond, which is one of the 7 sister-lakes in the Belgrade chain of Ponds. Purchased by Bruce's Grandfather in the early 1900's, "camp" has been a summer home for the past three generations. Our children often tell us how they hope that one day they will be fortunate enough to be the "fourth" generation to spend the summer months on Great Pond! Given our immense concern for the preservation and protection of this precious resource, Bruce and I are actively involved in many lake programs and watershed initiatives.

Currently, Bruce is the President of the Belgrade Lakes Association, and has served on the Board of Directors for the past 4 years. He is a certified Scuba Diver and he participates in the DEP Invasive Aquatic Plant Rapid Response Team. Three years ago he spearheaded the effort to conduct Level 1 invasive plant screening surveys, not only on Great Pond and Long Pond, but also organized and conducted surveys on the Belgrade Sister Lakes as well. In the September issue of "Yankee Magazine" he was one of eight individuals who were singled out and profiled as "Freshwater Warriors", individuals who are taking grassroots actions to combat a host of environmental threats.

Because we have made a commitment to participate in endeavors, which involve both of us, I too am actively involved in the Belgrade Lakes Association. Currently I am serving as Recording Secretary, I chair the BLA Water Quality Committee and I also serve as the BLA Volunteer Courtesy Boat Inspection Program Coordinator for Great Pond.

Both Bruce and I are proud to serve as certified VLMP Water Quality Monitors for Great and Long Pond. We are also VLMP Certified Invasive Plant Patrollers, we volunteer in the Great Pond Courtesy Boat Inspection Program and we are active members on the Belgrade Regional Conservation Alliance's Milfoil Committee.

We are thrilled to have the opportunity to participate in this VLMP program, and we look forward to working with Pat Bell, the Data Coordinator for Kennebec County. We are anxious to meet and to get to know all of the Water Quality Monitors in Kennebec County. Within the next few months, we'll be sending a letter to each volunteer to personally introduce ourselves and to get every monitor's input on how we can best work together. Until then, please let us know if you have any questions or comments you'd like to share with us. We can be reached by phone at 207-824-0845 or you can email us at Fenn@megalink.net.

Littorally Speaking

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

Maine's Newest Invader: Eurasian Water-Milfoil

Eurasian water-milfoil (EWM), scientifically known as *Myriophyllum spicatum*, is one of the world's most notorious and troublesome invasive aquatic plants. Native to Europe and Asia, *M. spicatum* was first introduced into the waters of North America in the 1940s. It has been spreading here with a vengeance ever since. Eurasian water-milfoil has now been confirmed in nearly every state in the US and in most Canadian provinces.

Eurasian Water-Milfoil, collected and photographed by Don Cameron

An extremely aggressive and well-adapted plant, *M. spicatum* is able to thrive in a confounding array of environmental conditions. It grows well in both still and flowing waters, tolerates mild salinities and can survive under ice cover. The submersed plants grow rooted in water depths from 1 to 10 meters (over 30 feet), generally reaching the surface in depths of 3 to 5 meters. It is adaptable to a wide variety of substrate types, though fine fine-textured, inorganic sediments seem to be favored. Eurasian water-milfoil is a powerful competitor that prevails primarily by "outgrowing" its neighbors. The slender stems--many having wintered over, intact--have a significant head start early in the growing season, and may be well on their way to the surface by the time that native plants are just breaking dormancy in the early spring. Where *M. spicatum* plants do reach the surface they branch profusely, forming a dense floating mat (or *canopy*) that, according to some accounts, is "thick enough for a mouse to dance on." The dense canopy typically forms early in the season before native plants are able to reach their optimum growth potential. In this way Eurasian water-milfoil effectively chokes and/or shades out all other plants in the area.

The resulting loss of biodiversity in lake and pond ecosystems cascades through the food web, causing losses in richness from the microscopic zooplankton to the top predator species. Well-established infestations often render waters unsuitable for boating, swimming, fishing, and other recreational uses, and can even interfere with power generation and irrigation by clogging water intakes. The excessive volume of plant material in a waterbody can cause flooding as well as a decline in water quality, as thick mats of vegetation restrict circulation, and decaying organic matter causes oxygen in the water to decline. The stagnant mats of vegetation can also provide a haven for mosquitoes.

Raising havoc just beyond our borders for decades, it has been known for some time that this plant posed and imminent threat to Maine waters. It is precisely for this reason that *M. spicatum* is one of the eleven plants on Maine's official invasive aquatic plant "watch-list." Finding this plant actually thriving here in our midst has provid-

ed new incentive to all of us to take a moment to learn how to spot this plant "in a crowd." This way, when we are out doing what we love to do on the water, we will be better prepared to recognize a suspicious intruder. Early detection of an aquatic invader provides the best, and often the *only*, hope of eradication. At the very least, early detection provides an opportunity to manage an infestation in a way that minimizes "collateral damage" to lake ecosystems.

Identifying Eurasian Water-milfoil

Like most other milfoils, Eurasian water-milfoil is a submersed aquatic plant with feather-like, finely divided leaves. The leaves of EWM are arranged around the stem in clearly defined whorls (radiating like the spokes of a wheel from a shared "hub" on the stem).

The leaves of Eurasian water-milfoil are feather-like and arranged in whorls

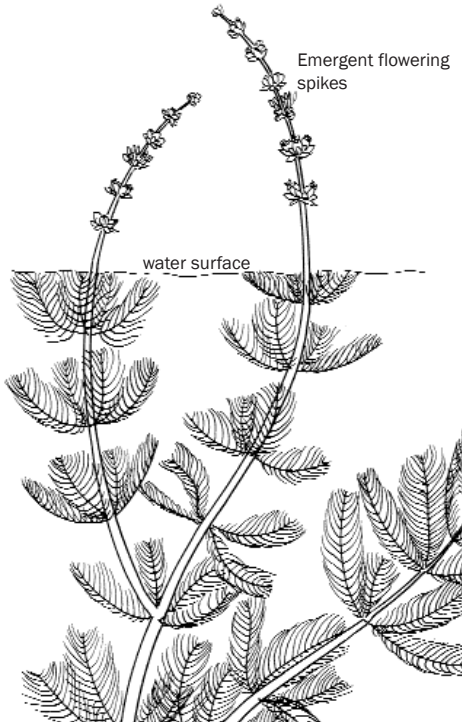
Each whorl typically contains four leaves. It should be noted that while the leaves of most milfoil species radiate around the stem, in some species they do not appear in clearly defined whorls, but are instead more scattered. This can be an aid in distinguishing EWM from some other milfoils.

EWM has a delicate habit, with the whorls of leaves spaced quite openly along supple stems, (generally with 1 to 3 centimeters between whorls). By comparison, the whorls of variable-leaf water-milfoil, the other invasive milfoil that is known to be present in Maine, are typically tightly packed (1-3 millimeters apart) along robust stems giving this plant its characteristic "bottle brush" appearance.

The leaves of EWM are generally elongate, sometimes (but not always) with a blunt, "snipped off" appearance at the tip. Each leaf is comprised of numerous (12 to 24) pairs of thread-like leaflets, arranged along the mid-vein like the barbs of a feather along the shaft. Since the leaves of most other milfoil species generally have less than 14 leaflet pairs, counting leaflets may be helpful in distinguishing EWM from other milfoil species. *However, all leafy milfoils display a wide range of vegetative variability.* In some cases Eurasian water-milfoil leaves may have as few as 5 leaflet pairs. Checking numerous leaves from different stems and different locations on the stems will increase the accuracy of the "leaflet count." In many cases, other structures, such as the emergent flowering stalk, may be needed to confirm identification.

Eurasian water-milfoil flowers form on a spike that emerges from the water surface. Like the leaves, the flowers are arranged in whorls. The leaves that appear with the flowers, called bracts, are shaped like tiny blades and have smooth outer margins. The flowers are typically larger than the bracts, the male flowers occurring closer to the tip of the spike, the female flowers toward the base. Each female flower produces four tiny (2 - 3 mm) nutlike fruits. Flowering spikes may emerge from the water by early summer and may continue to occur for several months, but not all colonies produce flowers.

Eurasian water-milfoil flowers are typically larger than the bracts



Eurasian water-milfoil has a delicate open habit with whorls spaced 1-3cm along the stem.

Eurasian water-milfoil is extremely hardy. It survives winter primarily as rootstalks, but whole plants and stem fragments also commonly survive through the winter. Unlike some other milfoils, EWM does *not* form winter buds—small compacted leafy structures that over-winter in the sediments. EWM produces many seeds, and though it has been thought for some time that seeds did not play a significant role in reproduction, there is growing evidence to suggest that they may. The tendency of milfoils—including EWM—to hybridize, suggests that some seeds are surely viable and that sexual reproduction in milfoils is not rare. Like most of the leafy milfoils, EWM reproduces very successfully and rapidly through the formation of plant fragments. In the late summer and fall the plants become brittle and easily break apart. The fragments will float to other areas, sink, sprout roots and start new plants. Powerboats and other activities that disturb the plants can cause fragmentation at any time during the open

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GLEOTRICHIA

By Roy Bouchard

Roy Bouchard is a Biologist in the Lakes Assessment Program at the Maine DEP

Have you wondered about the tiny off-white dots that appear in your lake during mid to late summer? They are often described as looking like "tapioca", but each dot is actually a colony (see magnified photo below) of Gleotrichia, a blue green alga that volunteers may be able to help monitor in the future. Let us know if you think you have seen "G" in your lake. This is one algae that is relatively easy to identify with low-level magnification. S.W.

Magnified Gleotrichia Colony

They're called gleotrichia (glee-oh-trick-ee-ah). The minute floating dots that appeared and stayed in many lakes last summer, are not a new phenomenon. They often appear mid-summer for a short time, then disappear. Over the last 4-5 years however, there have been more frequent complaints about the density and duration of these growths in a few ponds. This year, they arrived early, proliferated, and stayed throughout most of July and August in two lakes in the Belgrade chain.

Here in Maine, gleotrichia is known to be present in lakes of the Androscoggin watershed, Togus Pond, and many others. It is likely present in several other lakes in the Belgrade chain, including Messalonskee, but we have not yet had the high densities reported upstream. Gleotrichia is a blue-green alga (really a bacteria) but it is not the type that usually makes a lake "go green" as in East Pond or China Lake.

Puzzlingly, it seems to be present only in lakes with good water clarity. Clear water normally means that there is low phosphorus fertility so most algae do not grow prolifically. One reason for the high growth of Gleotrichia is that it over winters as resting cells on the lake's bottom, then grows its summer colonies (groups of similar cells bound together) on the sediment surface where light can reach it. These colonies absorb lots of phosphorus in the process, which is in short supply in the surface water of the lake. When they are well developed, these algae release from the sediment and float to the surface, where they multiply their colonies in the light environment.

One of the problems with Gleotrichia is that it tends to float in the top few feet of water. Wind driven currents can concentrate the tapioca-like orbs in one part of the lake or another, and high densities result, especially in coves. As quickly as they appear in an area, they can diminish, though usually they don't go away completely until late in the season.

The phenomenon is not generally a health concern. There are reports in the literature that it may cause a skin irritation that could be mistaken for Swimmers' Itch when it is thick in the water and ingesting a lot of it can cause stomach upset. While most of us would not drink lake water anyway, children should be always be cautioned not to swallow water while swimming (and not just because of algae).

What is the significance of these recent reports of high densities? Is this a permanent state of affairs or will it change for the better or worse? Most research on Gleotrichia has been conducted in the mid-West and Washington state. There is not a lot of information on how persistent this will be or whether it will naturally decline over time, like many biological populations of plants and other wildlife. What is known is that Gleotrichia can move a lot of phosphorus from the sediment into the lake water that normally would not get there, but there is no indication that is will lead to worse conditions down the road. It is also known that there are few direct ways to control this condition - - these lakes are just too large and complex for conventional tools to work. Hopefully studies contemplated with Colby College over the next year will help us answer several questions about how our lakes operate, and Gleotrichia may be one of the topics researched.

This condition certainly does indicate that our lake bottoms have enough nutrients to sustain repeated growths of Gleotrichia. That should prompt us to do everything we can to prevent phosphorus loading from run-off sites in the watershed. While such preventative actions may not affect Gleotrichia blooms in the short term, they could help over time and are absolutely needed to avoid more obnoxious, lake-wide algae blooms in all Maine lakes.

Quality Counts!

By Linda Bacon

Little did the creator of the Secchi disk ever suspect that this simple low-tech device would play such an important role in "space-age limnology". The transparency readings that volunteers use to help us understand Maine's lakes and ponds just became even more valuable! S.W.

Linda Bacon
Biologist, Maine DEP and
VLMP Technical Advisor

What do you think of when you hear the term *Remote Sensing*? If you have one of those indoor/outdoor thermometers with a gismo that slips out the window to monitor conditions outside, then you have a *Remote Sensing* device. The upstairs thermostat that calls for heat from the furnace in your basement is another common *Remote Sensing* device. What would you think about satellites remotely sensing the transparency of your lake? Sound a bit futuristic? Well the future is here!

Landsat 7 orbits the earth taking pictures continuously using sensors that 'see' much more than the human eye. Scientists have used this technology to map land cover (forest type, agricultural lands, wetlands, urban areas), to track land-use change over time, and to examine flood conditions like the recent Tsunami in the Indian Ocean. The satellite passes over the exact same area once every sixteen days. As you might guess, the satellite can only 'see' the earth's surface on days that are free of clouds.

Since 1999, Wisconsin volunteer monitors have assisted the University of Wisconsin in the development of a tool to monitor water quality conditions over much of that state. Since Landsat 7 passes over the same land area every 16 days, these dates are known well in advance. The volunteers were encouraged to collect transparency readings on or adjacent to those days so that the University researchers might use the volunteer data to 'ground truth' what the satellite 'saw'. *(The term 'ground-truthing' is lingo associated with satellite data that defines a process very similar to what we do when shopping for a car or house. We can't just take the advertiser's word that the car in the photo is in mint condition, or that the house in the realtor's add is not an outrageous money-pit…we need to go see for ourselves!)*

The University of Wisconsin researchers encouraged the volunteer lake monitors in their state to monitor their lake the days the satellite was scheduled to pass over each area. Data collected the day before or after the date of the satellite pass was used as well. The volunteers' participation has allowed the University to successfully calibrate computer programs that enable satellite imagery to be used to predict Secchi Disc Depth and other water quality parameters on lakes in the state that are not regularly monitored.

Would you like to be part of a similar effort in Maine??? If you could collect transparencies within a day of the following 2005 dates, we will probably use your data. The highest priority dates are highlighted and occur when Maine lakes are most likely to have nuisance algal blooms. Only days that are relatively cloud-free will yield satellite data useful to the project. If volunteers obtain transparencies on or near these days from 150 - 200 lakes, that data would provide the foundation for 'ground truthing' step needed to calibrate the model.

The VLMP and DEP are looking for some funding to develop a program in Maine that is similar to Wisconsin's. Because grant funding has dwindled recently, it might take a few years to secure the funding to purchase the satellite imagery and support the necessary research at the University of Maine to calibrate a model for Maine. So the results of the effort won't be immediate. On the other hand, we will be more likely to obtain a grant to develop the model if the transparencies data have already been obtained.

So, maybe we've hit upon another great (useful) excuse for all of us to get out on our favorite lake when the weather is looking clear! We need a catchy name for the project, so feel free to make suggestions to the VLMP Staff!!! Keep up the good work!

2005 Landsat 7 Overpass Dates

May 13
May 29
June 14
June 30
July 16
August 1
August 17
September 2
September 19
October 4
October 20

For a summary of the Satellite Lake Observatory Initiative at the University of Wisconsin check out: http://tidris.ersc.wisc.edu/sloi/pub/lakespace.htm

Welcome New VLMP Staff

The VLMP welcomes aboard Laurie Callahan as the MCIAP Special Projects Coordinator

My principle "roots" are in New England. After H.S. graduation, I attended the University of Vermont (A.S. in Medical Laboratory Science). I later attended the State University College at Oneonta, NY (B.S. in biology, minor chemistry) and the University of NH (M.S. degree in Biology, focused on aquatic biology, limnology and stream benthic macroinvertebrates). Through the years I have worked as a medical lab technician and technologist, tissue culture technician, college biology/microbiology lab instructor, water quality analyst and aquatic biologist.

Lakes, ponds, rivers and coastal areas of Vermont, New Hampshire, Massachusetts and Maine have been a major source of enjoyment through my life— recreationally and professionally. My involvement with several native and invasive aquatic plant projects and programs in VT, NH and ME during the last few years has led me to the VLMP/MCIAP.

I am married to Tim Callahan (quality assurance manager, photographer and accomplished "we-can-do-it!" kind of guy) and the very proud mother of Jessica, a college student majoring in theatre studies in Boston.

I look forward to my new position as MCIAP Special Projects Coordinator and especially to meeting and working with all of you!

Look Forward to "Ice-Out"

From: In Our Back Yard a Publication of Maine DEP
Ideas from an article by Warren P. Balgooyen.
Edited by Maine DEP staff.

Ever been on the shore of a lake or river when the ice went out? It is a fascinating experience, both to see and to hear.

Ice-out begins in late winter as the sun becomes stronger and starts to melt the ice. Weakening ice can be heard to "groan" as the wind buckles it. As the ice melts, its structure changes and it forms pencil-like crystals arranged vertically through the ice mass. The ice becomes crystallized or "honey combed". If you are lucky enough to be nearby a lake or river the day of ice out, you may hear a "tinkling" sound. The pencil-like ice crystals fall against each other like dominoes when the waves of open water nibble at the ice edge, creating that special sound.

Any weedy areas and rocks, logs, or any other solid objects in the water will absorb the sun's rays and heat up the water around it. Even a leaf blown out onto the ice will melt its way downward in the ice. Often a band of open water develops along shorelines before the ice weakens over the deeper, middle part of a lake.

After ice out, the surface water warms to 39°F or 4° C. This is the temperature at which water is most dense (heaviest) so the heavier water sinks to the bottom. This process is called spring turnover. Now the water can freely mix, with the help of wind and currents.

Turnover is an important event. The mixing water carries up nutrients (food) from bottom sediments to the surface. The bottom sediment is filled with nutrients and when that nutrient-rich water floats to the surface in fall and spring, it carries up nutrients to the algae and other plant life as part of the food web.

The mixing also brings oxygen down into the bottom waters. This replenishment is vital to the fish that live deep in the lake.

As the temperature warms, all the living organisms that have been dormant in the lake come to life and start growing again. Frogs, turtles, crayfish, snails, and larval insects, which spent the winter dug into the mud, now rouse themselves and start swimming. Open water also brings our spring visitors, such as loons and migrating waterfowl headed for northern breeding grounds.

Spring overturn also happens to be the best time for spring fishing because the mixed uniform water, now filled with oxygen, brings trout and other fish up from their deep winter retreat. They can be found at any depth at this season.

Ice out is a time of quiet on the lake. Some folks love that first open water paddle just to see what's going on. Sometimes the winter ice has moved things around and left some surprises. With everything waking up and the lake getting restless, it's a good time to keep your eyes and ears open to the wonders of spring.

Eurasian water-milfoil

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water period. This is why milfoils are so easily transported from one body of water to another on boat trailers or fishing gear. Once they have been introduced in a new lake or pond, water currents can move new fragments around, resulting in new colonies throughout the waterbody. *This plant has been known to infest an entire lake within two years of introduction to the system.*

It is important to note that Maine is home to five different species of leafy *native* water-milfoils (as well as one "leafless" species). With all the vegetative variability within each species, and the potential for hybridization between species, distinguishing between a friend and a foe may not be easy. In addition to the other water-milfoils, Eurasian water-milfoil may be confused with other aquatic plants that are native to Maine, including water marigold, coontail, bladderwort, water crowfoot and mermaid weed. *To be on the safe side, all leafy milfoils found in Maine waters should be considered "suspect," until a positive identification has been confirmed.*

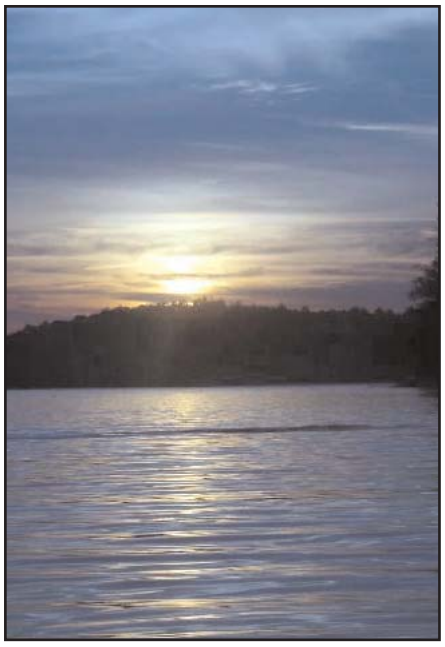
The discovery of Eurasian water-milfoil in Maine underscores the importance of vigilance and persistence in efforts to prevent our lakes and ponds from becoming choked with invaders. This discovery also makes it clear that invaders may not always first appear at "high risk" areas, such as public boat launch sites. State and other professional human and financial resources to address this threat are stretched over nearly 6,000 lakes and ponds throughout Maine. Volunteers who have been trained to conduct courtesy boat inspections and invasive plant screening surveys (Invasive Plant Patrollers) will play an increasingly important role in the process of protecting our waters from environmental catastrophe.

To date over 1,250 volunteers have been trained by the Maine Center for Invasive Aquatic Plants (a branch of the Maine Volunteer Lake Monitoring Program) to survey Maine waters for the presence of invasive aquatic plants. *Nearly all of the known infestations in Maine waters were first detected by alert and informed citizens.* The Invasive Plant Patrol program is made possible with support from the Maine Department of Environmental Protection, and boater participation in the Maine Lake and River Protection Sticker program. For more information on how you can get involved in this important effort please contact the Maine Center for Invasive Aquatic Plants at 207-783-7733.

Illustrations in this article used with permission from University of Florida - Center for Aquatic and Invasive Plants

WINNER

Maine Lakes Photo Contest



Congratulations to **Joseph Howes** for having his photo of West Pond selected for the cover of the 2004 Annual Report.

We would like to thank all who sent us their photos. There were many beautiful entries and it was challenge to select just one.

Maine Center for Invasive Aquatic Plants Virtual Herbarium

Be on the lookout for a new resource to help you distinguish "friend from foe." Maine's Virtual Herbarium will be launched March 22 with crisp photographs, drawings and descriptions of both invasive and native aquatic plants.

www.mciap.org/herbarium

2005 Upcoming Events

Advanced Water Quality Monitoring Workshops in 2005

The VLMP will offer one or more advanced water quality monitoring workshops during the spring/summer of 2005. The workshops will be offered to volunteer monitors with at least one year of experience who would like to explore the option of expanding the scope of lake monitoring beyond Secchi transparency. The focus of the sessions will be on monitoring total phosphorus, chlorophyll a and dissolved oxygen and temperature.

The workshops will provide attendees with background information about the need and value of advanced water quality monitoring data, sampling methods and procedures, and equipment types and costs.

The number of workshops offered and location(s) will depend on the level of interest. Please contact the VLMP if you are interested in more information.

Watershed Stewards Program at the Brackett Environmental Center

We are pleased to announce a collaborative effort between the VLMP and the University of Maine Cooperative Extension. From mid-April through early June, 2005, a series of eight evening Watershed Stewards workshops will be offered to the public at the Brackett Environmental Center in Auburn (VLMP offices and meeting center). This program provides 25 hours of training in a wide range of lake-related topics, including watershed assessment and NPS abatement, watershed stewardship initiatives to protect water quality, lake water quality dynamics, data interpretation, invasive aquatic species, and more. In return, attendees are asked to commit a minimum of 25 hours of service to their watershed.

The cost of the program is $20 (waived under special circumstances) for individuals or couples. For more information, or to register:

Call 207-581-2971 (UMCE) or 207-783-7733 (VLMP)
Workshop Dates: April 13 - June 1.
Sessions will be held on Wednesday evenings from 6:30-9:00 PM
Woodbury Brackett Environmental Center in Auburn

Bucket Scope Building Workshop

Build your own Bucket Scope! The Maine Center for Invasive Aquatic Plants' newest workshop for summer 2005 will teach you the techniques, materials, and special tricks involved in making your own bucket scope. We will provide attendees with the materials and will have all necessary tools on hand. Richard Jennings of Lovejoy Pond will guide you from the first cut to the final test.

This workshop is designed for those who want a basic view scope for aquatic plant surveys. Participants will also gain skills and plans needed to conduct their own bucket building workshops!

Workshop registration is limited to 20 attendees. Please contact us for more information and to register: 207-783-7733 or vlmp@mainevlmp.org

Richard Jennings of Lovejoy Pond volunteered in 2004 to make 100 Bucket Scopes for MCIAP. This year he will share his experience with volunteers by leading a workshop at the Brackett Environmental Center.

2005 Upcoming Events

Maine Stream Team Summit

Friday, April 8, 2005

8:30 am—3:00 pm

University of Maine

Hutchinson Center Belfast

Purpose of the Maine Stream Summit

- Hear what local groups are learning from the streams they monitor and about their stewardship projects
- Provide opportunities for students to share their work
- Recognize the successes of local monitoring and stewardship groups
- Help groups locate resources, meet people with similar interests, and generate new ideas
- Attend educational workshops on a variety of topics related to streams and environmental stewardship
- Provide an opportunity for professionals to share of information and resources

For more information and to request a registration form contact Erin Crowley at

1-888-769-1036 (toll-free in Maine)

or e-mail: mstp@maine.gov

Maine Water Conference March 22, 2005

The 2005 Maine Water Conference will be held on Tuesday, March 22, 8am-4pm at the Augusta Civic Center, Augusta, ME. The VLMP is one of the sponsors of this year's Conference, which was started by the Senator George J. Mitchell Center for Environmental and Watershed Research as an annual forum to discuss water resource issues in Maine.

The Maine Center for Invasive Aquatic Plants' new on-line resource the **"Virtual Herbarium"** will be formally launched at the Conference.

Congressman Tom Allen will give the keynote address at this year's conference. Representative Allen will address current federal policy and legislation and its effects on water resource issues in Maine.

Individual Registration

The registration fee is $38 and includes all conference sessions, breaks, and lunch. There is an additional charge for registrations received after March 11.

To register, and for more information on the workshop session see the Maine Water Conference website www.umaine.edu/waterresearch/mwc

New England Chapter of the North American Lake Management Society Annual Meeting

June 3-4, 2005
On Golden Pond:
21st Century Lake Management
Plymouth State University
Plymouth, New Hampshire

The meeting will feature opening remarks from the NEC NALMS Chair, Dr. Dave Halliwell (Maine DEP), and from Dr.Steve Kahl with Plymouth State University. Technical sessions include topics from Lake and Watershed Ecology, Algal Ecology, and Mercury in Fish to Volunteer Monitoring.

For more information and to register contact Amy Smagula asmagula@des.state.nh.us 603-271-2248

Update MCIAP

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folks from other lakes in your area on invasives prevention, and are interested in learning more about the coordinators working group, please contact Roberta Hill at 207-783-7733 or mciap@mainevlmp.org

MCIAP Supporting Invasive Aquatic Plant Prevention Initiatives in Maine

In addition to the IPP workshops, MCIAP staff provides ongoing technical assistance to individuals and groups involved in invasives prevention work throughout the State. Thanks to modern technology, much of this interaction takes place through a fairly brisk and constant stream of phone calls and emails. But our home at the Brackett Environmental Center has opened up many new opportunities for good old-fashioned face-to-face communication. It is pretty quite here right now, but during the height of the field season, the Center received daily visits from colleagues, volunteers and others-- to discuss issues, ask questions, drop off plants for identification, attend meetings, or just to check things out. Roughly 140 aquatic plant specimens were sent in or dropped off and identified by MCIAP staff during the 2004 season, including the three invasive plants taken from out of state boats by courtesy boat inspectors. (See *Three Strikes They're Out*, in the Fall 2004 issue of the *Water Column*.)

One of the best success stories of 2004 was the release of MCIAP's new *Quick Key to Ruling out Maine's Eleven Most Unwanted Invasive Aquatic Plants*. Waterproof and tear-resistant, the foldable Key easily stuffs into a shirt pocket when you going out on the water. Want to know if this or that plant is one of the invaders on Maine's watch list? Run it though the Key by answering just a few questions and you will know right away if the plant is "suspicious" or safe. The Key provides step-by-step instructions for what to do if you find a suspicious plant. The hand-out has been extremely well-received and the high demand (from those in Maine and beyond) has forced us to reprint a full two years earlier than expected!

Work also continues on the expansion and improvement of MCIAP's web-based resources. In addition to the posting of lots of new information and material on the website, much effort went into the construction of two new on-line resources. The *Maine Lakes Forum* featuring an Invasive Aquatic Plants Exchange was launched last fall. The *Virtual Herbarium*--an easy-to-search, Maine-based, library of plant images and descriptions where visitors can explore a wide (and growing) array of native and non-native aquatic plants--will be formally launched at this year's Water Conference on March 22.

2004 was a bonus year for media coverage! VLMP's Executive Director, Scott Williams was featured prominently in "Bioinvasion" a PBS Quest documentary. The program aired numerous times and prompted great feedback. WCSH News featured the VLMP in two separate stories, one introducing the Woodbury Bracket Environmental Center, the second featuring an IPP workshop and MCIAP volunteers. A press release this fall regarding the three Courtesy Boat Inspection success stories, led to a major front-page article in the Coastal Journal Sunday edition.

New for 2005

Be on the lookout for several exciting new resources and programs in 2005:

Manual Methods for Controlling Variable Watermilfoil: A Maine Sourcebook - "Best Management Practices" for manually controlling variable water-milfoil in Maine.

Photo by Christina Steinbrecher

Diver Jim Chandler hand pulls variable water-milfoil at Lily Brook. In 2005 MCIAP will publish a methods manual for controlling variable water-milfoil.

Friend or Foe? Hands-on Learning Kit - In addition to a poster, some informational literature, a teacher handbook and a student activity book, the Friend or Foe Kits feature a class set of Quick Keys and a collection of true-to-form plastic plants (both invasive and native). Students learn about the threat of invasive aquatic plants and practice determining which plants (among those presented in the Kit) may be invaders. The Kits will be ready for a pilot release this fall.

On-line Invasive Plant Patrol Workshop - Can't make it to a workshop in person? Need a refresher? This on-line workshop will present all the information you would receive at a basic IPP workshop in an colorful, engaging, interactive

format. (No refreshments served though, sorry.) The on-line IPP workshops will be developed for a general audience, but one group we really hope to reach through this initiative is Maine's "lap-top" students.

Pulling Together In Maine - If funding is secured, (we have applied for a grant from the National Fish and Wildlife Foundation and our prospects look promising) MCIAP will launch an initiative in May of 2005 called Pulling Together In Maine. One of the primary objectives of the project is to provide additional financial and technical resources for those engaged in IAP management efforts in the State. Cross your fingers; we will keep you posted!

Internship Opportunities at the VLMP in 2005

Internship positions at the VLMP offer opportunities to work closely with professional staff, volunteers and lake communities. Learning experiences abound for motivated students. There is great potential for exposure to a wide range of individuals, organizations and experiences through this program.

A rich array of resources are available to interns for independent study in the areas of water quality, sustainable watershed land use practices, watershed management, invasive aquatic species prevention, detection and management, and volunteer community service. Interns will also be exposed to the operation of a nonprofit organization.

All interns should be prepared to assist with administrative tasks that are essential to the successful training and education of volunteers in all areas of the program. Applicants should have strong writing and oral communications skills. Interns will be working primarily from the Brackett Environmental Center in Auburn. Some travel will be necessary.

Internship Positions Available in 2005

- Activities Coordinator for Volunteer training workshops and other events
- Lake Friendly Landscape Coordinator. Developing and initiating conservation landscape, sustainable community gardening, projects for the B.E.C.
- VLMP Annual Meeting Conference Coordinator
- Field Assistant

For more information about the 2005 Internship Program at the VLMP, please contact:

Jim Roby-Brantley, *Program Coordinator*
Maine VLMP, 24 Maple Hill Road, Auburn, ME 04210
vlmp@mainevlmp.org, 207-783-7733

WANTED:

Volunteers to Monitor Metaphyton

The Fall 2004 edition of The Water Column contained an article about metaphyton in Maine lakes, in which the suggestion was made that volunteer lake monitors could play an important role in moving forward our understanding of this phenomenon. We received many comments and questions about the article. There appears to be strong interest among volunteer monitors to participate in this project.

As a result, the VLMP will launch a metaphyton monitoring initiative in 2005. The details of the process are still being worked out. Interested volunteer monitors who are scheduled to attend a recertification workshop in the spring will be provided with instructions and materials for getting started. A special training workshop may also be scheduled for others during the early summer - the time and location of which will be announced at a later date.

If you are interested in participating in the metaphyton monitoring project, please contact the VLMP office at vlmp@mainevlmp.org, or 207-783-7733. You will be contacted in the spring with additional information.

Metaphyton Bloom Photo by Roland Paegle, Barrows Lake

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

SAVE THE DATE

VLMP Annual Meeting

Saturday July 30, 2005

8:30am - 1:00pm

Central Maine
Community College

Auburn

The Water Column is partially supported by grants from the Strout Family Foundation and the Roy A. Hunt Foundation.