Success on the Songo River and Brandy Pond!

By Christian Oren

After eleven summers of hard work, LEA is declaring victory in the battle against milfoil in the Songo River and Brandy Pond. When the project was first begun, huge patches of milfoil as big as football fields choked the entire length of the Songo. Now, boaters can pass through the river without ever seeing a single stalk of the plant. Never before has such a large and extensive invasive aquatic plant infestation been brought under control in the history of the State of Maine. The dozen or so infestations in Brandy Pond were also persistent, but seem to have been quelled by years of repeated harvesting.

We declared victory on the Songo for two main reasons. First, the density of milfoil on the entire length of the river was much lower than we had seen in previous years. Even at the height of the growing season, there was only one plant for every 100 feet of shoreline, or less. Four years ago, there would be hundreds in the same stretch of shoreline. Second, there is no known milfoil in the main channel for boat propellers to chop up and spread. The majority of the plants seen this year were confined to the remote backwaters, away from boat traffic. With so few plants, the work on the Songo drastically changed. Continued on Page 6

LEA's Milfoil Control Team Headed for Sebago Lake

LEA's milfoil program is poised to expand and re-focus in 2016. The success of the Milfoil Control Team on the Songo River and Brandy Pond has bolstered confidence, but has left the crew with much less work to be done. "It's like having a Navy SEAL group doing kindergarten lessons," said Peter Lowell. Because of this, LEA has decided to expand its milfoil program into Sebago Lake. The purpose of expanding the program is to share our resources and expertise. It would be a shame to disband this marvelous team, especially when there is so much work to be done on Sebago. LEA aims to insure that the plant removal efforts on Sebago Lake are coordinated, technically sound, financially supported and sustainable. However, accomplishing this will be difficult. The work on Sebago Lake will be more complicated and financially demanding than previous efforts. Funding needs to be raised and local groups and towns need to be coordinated and united if the program is to be a success. To head this effort, LEA has hired Christian Oren as project manager.

Christian brings nine years of expertise removing milfoil, and he co-led the LEA team with Adam Perron over the past summer. He already started work in Sebago when he oversaw LEA’s plant removal projects on Frye Island and Pickerel Cove in September of 2015. As a project manager, Christian will identify infestations, review current control efforts and develop a lake-wide strategy for long term removal and control of milfoil. He will produce a budget, secure grant funding, and appeal to municipalities and landowners for financial support. Christian will also develop a public information program to keep landowners, towns and the press informed about plant control status and progress.

There is much work to be done, but LEA is optimistic. The LEA crew has the expertise to remove milfoil, and Sebago Lake is in need. Crews will start removing plants from Sebago in 2016, concentrating on Sebago Cove. It is expected that the program will take at least ten years to control the infestations to the same extent seen on the Songo River and Brandy Pond. If LEA is to fulfill its mission, we have no choice other than to take on this enormous challenge.

What the GLEON Buoy is Telling Us

The data flowing in from the new Highland lake remote sensing buoy is providing some remarkable opportunities for understanding tipping points. With assistance from Colby College Professor Dr. Whitney King, LEA is using the deluge of oxygen and temperature data to study Highland Lake’s oxygen depletion. While we have known of the problem for years, we now have better tools to track this condition over time and look at other factors to help us better understand the lake. Professor King is using a method that analyzes how much of the lake is oxygen depleted for how much time each summer. The analysis produces an anoxic factor that can be tracked over time to help identify how close the lake may be to its tipping point, or the point when it will experience algae blooms.

The buoy shows that the lake’s cold, bottom waters lose their oxygen very early in the summer. This is likely caused by a chain reaction that starts with the introduction of phosphorus-laden sediments, which fertilize algae in the sunlit and warmer upper waters. The short-lived algae die, drift to the lake bottom and are decomposed by bacteria in a process that consumes oxygen. Since these bottom waters are stagnant and isolated after stratification is established in early summer, their finite supply of oxygen is not replenished by wind mixing until cold fall weather breaks down the stratification.

Highland Lake has surpassed an anoxic factor of 20 - a threshold that triggers concern. Continued on Page 3
Sediment Research

by Peter Lowell

LEA’s research on lake bottom sediment chemistry has revealed some important information that adds to our understanding of tipping points for area lakes. When a lake reaches its tipping point, dramatic changes in water quality occur in a short period of time. The trigger for tipping is usually a high level of phosphorus, the “food” algae need to grow. Phosphorus comes to the lake attached to soil particles, so erosion control is a key to maintaining water quality. The process is relatively simple: add phosphorus, grow algae, algae die and decompose, oxygen is consumed.

Sediment research is aimed at a secondary source of phosphorus that exacerbates conditions caused by watershed phosphorus inputs. When the bottom of a lake loses its oxygen during summer stratification, sediments can release stored phosphorus back into the water columns – a double whammy of nutrients! If sediments contain high levels of aluminum and lower levels of iron, phosphorus is bound by the aluminum and will not re-cycle into the water column.

Island Pond, Little Moose Pond and Bridgton’s Beaver Pond had excellent aluminum levels – good news for long-term water quality. All of our other lakes had healthy aluminum to iron ratios in their sediments, including Highland Lake, which can use some good news because of its severe anoxia. Back Pond, Crystal Lake, Long Lake, Moose Pond and Peabody Pond were found to have higher levels of iron. Fortunately, these lakes do not experience anoxia (loss of oxygen in deep waters) yet.

The other condition found in every one of our service area lakes was a beneficial ratio of aluminum to phosphorus in the sediments. This finding is crucial, since it means that our lakes are unlikely to recycle bottom sediment phosphorus – very good news!

Changes Coming to 2015 Water Testing Report

By Amanda Pratt

A preliminary look at this year’s water testing data suggests that 2015 was a good year for many of the 40 lakes and ponds in LEA’s service area. The final results will be available in our annual water testing report, due to be released by January. This report summarizes all of the data we collect in the year on each lake and pond we test. For the first time, the report will include not only our traditional water testing results (clarity, phosphorus, etc.), but also results from advanced testing. For this reason, lake-specific reports on Gloeotrichia, total algae, and digital temperature monitoring will no longer be issued separately; however, there will be overall season reports for each of these projects. As always, all of our reports will be available on our Web site, www.mainelakes.org. We encourage you to find out more about your favorite lake!

These preliminary findings seem to indicate that there is hope for our lakes by reviewing land-use standards and applying new technologies for controlling erosion and sedimentation in stormwater runoff. This research tells us that we should target our resources to meet the challenge of keeping phosphorus inputs from lake watersheds as low as possible to prevent anoxia and algae blooms. The Back Pond, Crystal Lake, Long Lake, Moose Pond and Peabody Pond watersheds should be given special consideration, as should anoxic lakes like Highland.

The mystery factor is climate change. Storms are intensifying and ice-out is coming much earlier, giving algae a longer growing season. As we re-vamp our lake protection standards, we need to try to factor in climate change or all of our stormwater controls will be overwhelmed. LEA is now working with area planning boards and code enforcement officers to review the science and develop protection strategies.

From the President

Orrin Shane

As the new President of the LEA Board of Directors, I am delighted for the opportunity to help LEA fulfill its mission to preserve and restore the high water quality and the traditional character of Maine’s lakes, watersheds and related natural resources. I see a great future for LEA, its new Maine Lake Science Center, and the new initiatives described in this newsletter. It is a real pleasure to step in and continue the great work of past Boards and Board presidents.

The Maine Lake Science Center is off to a great start, hosting a limnology class from the University of Southern Maine, numerous meetings related to lake monitoring and lake health, and a very successful Board strategic planning retreat. The new Center is open, warm and inviting, and a wonderful place to house researchers or hold an event. Many thanks to all who helped make this vital addition to LEA possible!

LEA is playing a leading role in Maine’s battle against milfoil and invasive aquatic plants invading our lakes. Although LEA can rightly claim a victory in eradicating milfoil from Brandy Pond and the Songo River, a bigger challenge faces our milfoil teams as they take on the task of eradicating this nasty weed from the bays and shallows of Sebago Lake.

With a look to the future, LEA has added significantly to its toolkit for monitoring lakes. From a GLEON buoy on Highland Lake and new buoys to be deployed, to a state-of-the-art fluorometer for measuring the relative amount of algae in water, to deep sediment testing for aluminum and iron, LEA continues to bring new technologies on line for monitoring lake health. So I say Owward! And let’s get to work.

Lake Committees – A New Approach

The LEA Board of Directors has approved by-law changes that foster the creation of LEA lake committees. The committee approach re-vamps the way we provide services to the 40 lakes in our service area. It is a simple process that starts with a meeting on each lake, asking residents to identify which extra services they would like to receive from LEA: advanced water testing, a CRI program, a wash station, watershed projects or educational events. A meeting facilitator is selected from among the lake residents and the end result is a lake plan that LEA staff and resident volunteers carry out. Lake watershed residents will help raise funds and spread the word about projects and events. The facilitator is the liaison with LEA until the next year’s meeting, where an evaluation is done and a new plan is defined.

LEA will continue to offer the standard resources that are funded by membership support like basic lake testing, educational programs, Milfoil control, technical assistance for landowners and towns, and advocacy for lake protection. LEA will offer book keeping services for special project funds to support lake plan components. Since donations come to LEA, they will be tax-deductible.

This process can be followed where a lake has its own association or can serve the functions of a lake association. If you are interested in this process for your lake, please contact Peter Lowell (lakes@leamaine.org) or Jenny O’Connor (jenny@leamaine.org).

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A shoreline buffer is the lake’s last line of defense.
Visit the Holt Pond Preserve for a magical experience.

What the GLEON Buoy is Telling Us

Continued from page 1

The factor means that the lake has lost enough oxygen during the summer to deplete the entire lake for twenty days. This is a hypothetical situation, since the lake will never lose all of its oxygen at any one time because wind continually mixes it into the lake’s upper waters. The anoxic factor, however, is a way of quantifying the amount of oxygen depletion the lake is experiencing over the course of a season. The anoxic factor was only 3 in 1977, so although the lake has had an historic pattern of oxygen depletion, the condition appears to be dramatically worsening.

Dr. King is now working with LEA to identify lake respiration rates. The biomass in a lake, usually algae and plants, produces oxygen during sunny times of the day when they are photosynthesizing. After dark, oxygen is consumed. The rates of consumption and “breathing out” of oxygen provide a measure of the growth of the biomass over time. Continual oxygen readings from buoy sensors at various depths provide this information.

Chlorophyll readings give a metric for the quantity of algae. So, by knowing population quantity and population growth, we can gauge how close the lake is to generating an algae bloom.

Buoy data also continually shows water temperatures at each depth. Most lake basins are shaped somewhat like a cone with the deepest waters occupying relatively little of the lake’s bottom lands. We have calculated how much sediment is in contact with bottom waters at each depth around the rim and bottom of the lake, like the amount of area you would ice on each layer of an oddly-shaped cake. As you travel up the water column, the amount of bottom area exposed to lake water per meter of depth increases. Studying the amount of exposed sediments and the water temperature at each depth adds another research dimension. As climate change warms our lakes, warmer waters heat the sediments they are in contact with. When and where oxygen is depleted, warmer sediments release more phosphorus back into solution than cooler sediments.

Alyson Smith Named Science Center Manager

Alyson Smith, Center and Project Manager of the Maine Lake Science Center, graduated from the University of Maine, Orono with a bachelor’s degree in education in 1984 and received a master’s degree in educational administration from the University of Southern Maine in 1991. She moved to Maine with her family in high school and has lived in Harrison for the past 25 years. Prior to joining LEA, Alyson had been in education for 30 years, most recently as a sixth grade STEM teacher at Harrison Elementary School. She had participated in LEA’s programs with her classes. Environmental stewardship and use of the outdoors as a classroom has always been a priority. Alyson’s love of the environment, passion for teaching and learning, her sense of community, and belief that everyone can make a difference made for a natural affiliation with the Lakes Environmental Association. One of her favorite activities is to swim in Crystal Lake with her dog, Lucy. She also loves to ski, hike, kayak, and generally be outdoors.

Since joining LEA in August, Alyson has taken over the day-to-day affairs at the center. She has acted as host to researchers-in-residence and visitors, recruited center users, worked with LEA education staff to develop multi-faceted education programs, written grants to support the center’s financial obligations, and established partnerships with organizations and groups with similar missions. Getting the center outfitted with necessary supplies and equipment has been ongoing. The center’s future is very promising, and the view from her window is pretty awesome too!

Alanna Doughty - Our New Educator

After years of patient waiting, I am finally a part of the LEA education crew! I really don’t know what took me so long. I grew up in Sebago and attended Lake Region High School. Although I was greatly influenced by my fourth grade teacher, Anita Quinlan, it wasn’t until K Bolduc took us to the Everglades that I was reminded how amazing it is to learn about the world around me, and that my brain needed to be stretched and exercised. No more worksheets! I went on to study Ecology and Environmental Science at Alaska Pacific University, spent a short time at the College of the Atlantic and finally graduated from the University of Maine in Orono, after taking time to make snow at Sunday River and live in the backwoods of Vermont.

During college, I had the opportunity to work for Outward Bound in Maine and Florida and lead high school students into the woods on canoeing and backpacking trips, and always had my Newcomb’s Wildflower Guide handy, connected. See you outside!

“Everyone hold on! I need to look this up!” Then I was able to deckhand for Ocean Classroom on the tall ships, Spirit of Massachusetts and Harvey Gamage, with high school students for a semester at sea. I will never forget watching the wild horses run on Cumberland Island off the coast of Georgia. Or the sunset from a hammock on Isla Mujeres. Or being on the open ocean in the middle of a thunderstorm. Go sailing. Really.

After returning to Maine, I decided to pursue a Masters degree in Education, and graduated from the USM ETEP program with a K-8 general certification and a K-12 ESL certification. I am now back in Sebago, and spend as much time in the woods and wetlands as I can, with my daughter and our Puerto Rican rescue dog, Gypsy. When we are not in the woods, we are in the kitchen baking! I am so excited to be working in the district I grew up in, and hope to inspire my students to explore, engage, and learn about themselves and where they live, and how it’s all connected. See you outside!
USM Students Visit Highland Lake

By Colin Holme

This past summer, Dr. Karen Wilson brought a group of limnology students from the University of Southern Maine to practice water quality monitoring in Highland Lake and its outlet, Stevens Brook. LEA hosted the students with the help of local lakefront property owners Bill Grady and JoAnne Diller, who donated their time and pontoon boats to transport the students on the water.

After introductions at the boat launch, the group went out to LEA’s fully automated sampling buoy moored at the deepest portion of the lake. There, they learned about the buoy’s monitoring equipment, how it transmits data and why this information is so valuable to the class was given data from earlier that day and season-long information on oxygen and temperature, plus information on how these components interact with each other.

Next, Dr. Wilson led the students through both shallow and deep water lake sampling to observe the physical differences between these two areas that are isolated from each other because of pressure and temperature differences during the warmer months. The strong, sulfurous smell emitted by water with no oxygen permeated the air as the students processed samples collected within a few feet of the bottom.

The class then pulled specialized nets through the water column to get samples of the lake’s zooplankton community. The nets strain the water and push the zooplankton, which are tiny animals that eat algae, into a small collection jug for later analysis.

Back on the shore, LEA’s researcher, Amanda Pratt, explained the life cycle of Gloeotrichia and why this individual species of algae is a current study topic. Because Gloeotrichia colonies are in the same size range as many zooplankton, the sampling methods are very similar and the students were able to quickly see the practicality of their recent exercise.

A few hundred feet from the Highland launch, the class once again picked up nets to learn more about water quality. These nets, however, were very different and the study site was no longer the lake but instead Stevens Brook, just below the Shorey Park dam. Here, the students turned over rocks in a fast section of the stream to dislodge small aquatic creatures called benthic macroinvertebrates. The critters were collected in downstream nets and were briefly studied before release back into the stream.

Taking a simple water sample from a stream, river, or brook is not usually the best way to assess water quality since pollutants and nutrients can quickly move through these systems. Instead, aquatic insects are often used to gauge the water quality as they are full-time residents and their quantity and species type can tell a lot about long term conditions in the stream.

To end the day, the students toured the Maine Lake Science Center with its 50-seat conference room, researcher housing, lab and office space nestled in sixteen acres of woodlands adjacent to Pondicherry Park. With the new center up and running, LEA will be hosting more field excursions for undergraduate and graduate students and will be encouraging guided academic studies and research on our waterbodies and the role they play in the community.

“IT was a magical day!” USM student Matthew Jones

Citizen Science – Join in the Fun!

by Alyson Smith and Alanna Doughty

You don’t have to don a lab coat to be a scientist. Slip into your favorite walking shoes, grab your camera, a pencil and note pad, and a keen sense of observation and you, too, can be a citizen scientist. Citizen science is the practice of public participation and collaboration in research to assist scientists in increasing scientific knowledge. Citizen scientists can support professional researchers in a lot of ways — by submitting data, sharing experiences or spreading valuable information. Scientists benefit from having a lot more data to analyze and a pool of volunteers willing to help.

Volunteers have varying levels of expertise, from kids in their backyard to members of high school science clubs to amateur astronomers with sophisticated home equipment. Modern advances in technology make citizen science more accessible today than ever before.

Citizen science programs vary in type and scope. You might prefer to work on a local level, like collecting data on nutrient levels in an area stream. Some popular citizen science projects are nationwide. Many of the large scale citizen science projects have Web sites where you study up and learn protocols before heading into the field. Here are some to check out:

• National Geographic FieldScope is working in the field of informal science education, encouraging participation in data-collection, data visualization, and analysis. See the webpage: education.nationalgeographic.com then click on programs and fieldscope. This is a web-based mapping application tool that allows participants to contribute as citizen scientists investigating real-world issues. NatGeo FieldScope enables citizen scientists to upload their own field data, including measurements, field notes and digital media, such as photos and videos—and to see them in relation to data from peers and professional scientists.

• Data from the Gulf of Maine Research Institute Vital Signs page: vitalsigns.me.org/field-missions or the Audubon Gulf of Maine Research Institute Vital Signs page: vitalsigns.me.org/field-missions or the Audubon Society: maineaudubon.org/about/citizen-science

• FrogWatch USA (https://www.zaz.org/frogwatch) is the leading citizen-science program of the Association of Zoos and Aquariums. This program allows groups and individuals to learn about wetlands in their communities by reporting the mating calls of local frogs and toads.

• BugGuide guidebug.net/node/view/15740 is an online community where naturalists share their photos and observations about a variety of creatures, including spiders and other insects. They use the in-house expertise of scientists and amateur experts to collect information and identify a diversity of bug species in the United States and Canada.

• Climate and climate change are the focus of Project BudBurst (http://budburst.org). Project BudBurst is a network of people across the United States who monitor the leafing, flowering and fruiting of plants. This project fosters collaboration among gardeners, scout troops, hikers, botanists, ecologists, government agencies and educators to monitor climate change and its impacts on plants.

• Involved on the local level can benefit scientists and land users alike. A single land owner making one poor choice might not make a huge impact, but over time and space, many land owners making poor choices will certainly have a great impact on the quality of our watersheds. On the flip side, it is not one of us making a good choice for the environment that will change things, but collectively if we all roll up our sleeves and step up we can be part of a greater solution. We all know we can bike more, recycle, eat more fruits and vegetables -- but we can also practice citizen science to become a part of collective research. Scientists are utilizing more and more of the data gathered by citizens. Online platforms such as the Vital Signs project at Gulf of Maine Research Institute and the Take Action: Citizen Science drop down on Maine Audubon’s Web site link individuals and families to projects that interest them and they are passionate about helping.

Citizen science benefits individual researchers and groups like the Maine Forest Service, the Maine Department of Environmental Protection, the Fish and Wildlife Service, national groups and other citizen scientists. Projects typically provide identification cards and protocols in which to gather data and a place to post your information. You can learn out in the field and become a part of a collective solution. What an exciting and meaningful way to get children and families practicing science! Classrooms can also become involved; imagine delving into a project with your students over the course of an entire school year – watching them learn and develop new skills and an understanding of how we are all a part of a greater picture.

Whether you’re interested in amphibians or birds, aquatic invasive species or butterflies, the wooly adelgid or how climate change is affecting zone creep, there’s a research project out there for you.

And if you have a research question you want answered, develop your own field mission and post it for other citizen scientists. For more information about these Maine-based resources please visit the Gulf of Maine Research Institute Vital Signs page: vitalsigns.me.org/field-missions or the Audubon Society: maineaudubon.org/about/citizen-science

You have the knowledge and power to become a part of a greater solution. Roll up your sleeves and join in.
Interconnectivity Between Sebago Lake and Its Upland Waters

By Colin Holme

A plan just released by the Cumberland County Soil and Water Conservation District offers a unique perspective on how the waterbodies within the Sebago Lake watershed affect the quality of the largest water supply in the State of Maine. The document, “Sebago Lake Subwatershed Assessment and Prioritization,” was compiled by the Conservation District with numerous partners including LEA, the Portland Water District, the University of Southern Maine, two state agencies, the Town of Standish and the U.S. Environmental Protection Agency.

Because the study looked at the entire Sebago watershed, many of the lakes and ponds examined are within LEA’s service area and our strong, decades-old testing program provided needed background data for the evaluation. While the ultimate goal of the project is to determine how to protect Sebago Lake by prioritizing where to apply limited resources, the document also provides an interesting assessment of the lakes and ponds in the area and changing land use patterns over time.

Unlike many other water supplies across the country, drinking water from Sebago Lake is not filtered before it is distributed to greater Portland. Because the water is extremely clean to begin with, it is instead treated only with ozone and ultra-violet light to make it potable. The reason the water is so clean is because the vast majority of the watershed is still naturally forested. In fact, according to the study, 82% is forested. This number is important because past studies have shown that when watersheds fall below 75-80% forested, water quality noticeably declines.

The report also states that from 1987 to 2009, green space and forested land in the watershed decreased by 3.5%. If this trend continues, Sebago Lake could be dangerously close to the 75-80% threshold within 25 years. Although the water quality of Sebago is currently excellent, the document also states that transparency in the lake has declined since 1990 and phosphorus, the nutrient that controls algae growth, has been increasing since 2006. The study determined the majority of nutrients are coming in from Sebago’s immediate watershed, including the Crooked River. The second largest contribution, which was still only 10%, comes from Long Lake.

Upper watershed lakes were also assessed for a variety of parameters such as land cover change, quality of partnerships around each waterbody, existing water quality conditions and trends over time. In LEA’s service area, Adams Pond, Brandy Pond, Crystal Lake, Otter Pond, Trickey Pond and Woods Pond all were ranked highest in land cover change during the study period of 1987 to 2013. In these watersheds, the amount of developed area increased between 5 and 12% in this time period. These numbers are concerning and emphasize the importance of properly installed and maintained stormwater controls.

Because it takes the whole community working together to keep a lake clean, the commitment level of local partners was evaluated within each watershed. This ranking primarily took into account whether there have been successful partnerships in the past and how likely it is that a whole watershed project would be undertaken in the future. While there were several small ponds at the very bottom rank within our service area, most fell in the middle ground. Keoka Lake stood out as having very active partners, an ability to provide matching funds or other support and the ability to bring new strategies to the table.

The Maine Lakes Science Center – What's Up?

LEA’s new science center is up and running at least two years ahead of schedule. This is because of the generosity of an anonymous family foundation and sixty-one other donors. Foundation support has also given the project a real boost, with gifts coming from the following: Margaret Burnham Charitable Trust, Davis Conservation Foundation, Fields Pond Foundation, Kendall and Anna Hart Charitable Foundation, Stephen and Tabitha King Foundation, Morton Kelly Charitable Trust and Norcross Wildlife Foundation. The public fundraising campaign will begin in January and run throughout 2016. Its goal is to raise $1,200,000 to fund land and building purchase, site and building construction and staff and operations through 2020.

Dr. Bridie McGreavy is the Consulting Executive Director and Alyson Smith is the Center and Program Manager. Peter Lowell is acting as Interim Director as the facility navigates its first year. Lead gifts allowed us to jump start the center project and begin the very important work of accelerating lake research. Researchers and many events have already been hosted. All aspects of the center are working extraordinarily well: researcher housing, classroom, lab, conference room and offices.

A common question is when LEA will move its offices to the new building. That will not happen since our year-round staff of seven and our seasonal staff of nearly fifty rely on our Main Street building and its many facilities. The primary purpose of the Maine Lake Science Center is to encourage and support researchers to come to the Lakes Region to conduct their work. Housing, lab space and meeting rooms are provided as an incentive. The conference room and class room are added benefits that allow LEA to host more people for lectures, workshops and meetings and to bring students to the center for indoor and outdoor classes.

In October, Bridgton Boy Scout Troop 149 finished a 300-foot boardwalk that links the science center with Pondicherry Park’s Willet Brook Trail. The walkway traverses a boggy stretch of SEBAGO land and allows students at Stevens Brook Elementary School ready access to the center. The project was initiated by Josh Axtman as his Eagle Scout project and involved dozens of volunteers from the troop and LEA.

LEA is proud to be part of this network, which uses state of the art technology for lake research.

Who Will Get the Next Buoy?

The exciting news that came in the fall of ’15 is that a lead gift has been received by LEA to establish a buoy program for Long Lake. Just as the Lake Hotspot Model was eventually applied to most of LEA’s 40 lake watersheds, we’re working to expand the buoy network in the region. We estimate the initial cost of the newest buoy and maintenance costs will be $50,000. The gift came from Madeline Wilder in memory of her husband, Joe, a longtime LEA board member. A campaign is underway to fund the purchase and installation, hopefully for the summer of 2016.

This lake-specific campaign will give landowners on the lake a feeling of ownership and stewardship. The valuable data will give LEA essential tools for evaluating the lake’s tipping point and helping to avert serious water quality problems. This type of process will be encouraged on other lakes as we look to expand Global Lake Ecological Observatory Network buoys in the Lakes Region. LEA is proud to be a part of this network, which uses state of the art technology for lake research.

Why the Emphasis on Highland Lake?

Everything we learn about a sensitive lake like Highland benefits our understanding of all lakes. LEA is using Highland as a testing ground in preparation for broad-based research. Highland Lake became the focus of scrutiny twenty years ago when a graduate student, Lexi Andrews, created a Lake Hotspot Model for the lake. Her computer model examined the land uses in the watershed, along with soils, slopes and drainage patterns. With this tool, Lexi was able to map all 5,178 acres of watershed land for phosphorus export potential. The map was then used to field-check sites for the erosion and sedimentation that fertilize algae growth in the lake. Two watershed projects resulted in “repairs” to erosion sites in an effort to reduce the lake’s nutrient load.

Highland was chosen to host LEA’s first remote sensing buoy because of its extremely fragile water quality, the extensive information on its watershed, its proximity to our offices, the lake’s medium size and its relatively low amount of boating traffic. LEA needed a lake with all of these characteristics to test this new technology.
Is Shoreland Zoning Working?
By Colin Holme

Understanding and complying with Maine’s shoreland zoning laws is one of the best ways waterfront landowners can keep their lake clean and protect their investment. These laws were crafted based on scientific studies and carefully worded to be applicable to the both natural and developed lots. To govern this wide variety of conditions and still allow for sensible development, the rules evolved to be both flexible and detailed. However, these qualities combined with the many different uses around the water have made the laws complex. And unfortunately, this complexity sometimes results in misunderstanding, misinterpretation and abuse of the regulations.

Because of these problems, groups like the Maine Lake Society (formerly the Congress of Lake Associations) and LEA have continued to push for better regulations and more clarity regarding the existing laws. This past summer, Representative Gary Hilliard of Belgrade put forward a bill at the request of the Maine Lake Society, with input from LEA to improve provisions of shoreland zoning and establish a stakeholder group to study the effectiveness of the rules. While the content of the bill is being carried over to the next session, the legislature did direct a working group to evaluate compliance and enforcement of shoreland zoning regulations and the Maine Municipal Association agreed to host the group.

The working group was formed in the summer of 2015 and is made up of lake groups (including LEA), town employees, municipally elected officials, and representatives from real estate and development, general contractors, municipal planning, Maine Audubon, and regional conservation districts. The study group also requested input and participation from the Maine Department of Environmental Protection’s shoreland zoning unit and the Department of Economic and Community Development (DECD), however both these requests were declined. The shoreland zoning unit provides guidance and support to municipalities on these regulations and the DECD provides training and certification for local code enforcement officers in shoreland zoning.

To achieve the goal of evaluating compliance and enforcement of shoreland zoning regulations, the working group sent out two statewide surveys. The first survey was to code enforcement officers who are primarily responsible for administering and enforcing shoreland zoning regulations in most towns. The questionnaire was sent out to 274 code officers throughout the state and 80 responses were received. The survey covered everything from general support for shoreland zoning laws to problems that are consistently found when enforcing the regulations.

The first survey indicated that the biggest compliance challenge was in the tree and vegetative cutting rules. The results also showed that code officers felt that landowner education, increased inspections and more training would all result in a reduction of shoreland zoning violations. Overwhelmingly, code officers also felt that the state’s shoreland zoning personnel were extremely helpful although very understaffed.

The second survey went out to members of active lake associations throughout the state and was returned by 65 people. The results of this survey revealed that tree cutting was the most frequently reported violation to lake associations. The vast majority of respondents also felt that they had only a partial understanding of tree and vegetative cutting standards and nearly ¼ felt that shoreland zoning training for lake associations would be beneficial. After receiving, reviewing and analyzing the results, the working group will send a report back to the legislature’s Joint Standing Committee on Economic and Natural Resources. To address concerns over tree and vegetative cutting, the work group is recommending that landowners notify the town before cutting in areas directly adjacent to the water (within 100 feet of lakes, ponds, rivers, and wetlands and 75 feet of streams). While detailed cutting regulations apply to this area now, the state shoreland zoning guidelines do not currently require a permit or notification for cutting in this sensitive area. This relatively simple addition to the standards will require people to contact the town code enforcement officer and become aware of the specific rules before cutting. Another recommended change is to have “before” and “after” photos submitted for permitted work within the shoreland zone. This system is already in place and working for the state’s “permit-by-rule” program that applies within 75 feet of the water. The working group believes this requirement will increase compliance with the existing regulations because landowners will be more likely to adhere to the rules if documentation of permitted work must be provided to the town. While not synonymous with site visits, this addition will give code officers another tool to better evaluate work in the shoreland zone with only minimal impact on staff time.

Finally, the working group is also looking into avenues for increased training opportunities for both code officers and landowners. This could be done through a variety of methods and one concept discussed was having qualified groups jointly lead trainings on specific issues that are consistent with state training requirements for code officers. Larger lake groups with paid staff were also identified as a possible training source for lake associations.

While changes to shoreland zoning are often slow moving, LEA is optimistic that the legislature can act on these recommendations in their next session.

For more information about the working group or the survey results, please contact Colin Holme at colin@leamaine.org

Success on the Songo River and Brandy Pond!

Continued from page 1

Because of the low density of milfoil, we stopped using the bottom barriers and the suction harvester to remove plants. These methods work for removing large volumes of plants, but they are also cumbersome and potentially harmful to the native plants. The low density of plants did not warrant these methods. Instead, we slimmed down our crew to small groups of 2-3 divers who focused on doing surveys and hand removal. These small crews are more efficient, cost effective, and have a negligible effect on the ecosystem. However, if a patch was found, the crew was always able to use the harvester and bottom barriers to bring the area under control.

The success of the Songo is a victory for LEA, and a victory for all of Maine. An infestation as widespread as seen on the Songo has never before been brought under control. This proves that while it may be a large and daunting task, it can be accomplished. This victory also propels us forward as we look to the future. Some work will still have to be done annually on the Songo River and the pond. They will have to be continually monitored for latent plants, or fragments brought in from Sebago. However, now a smaller crew can manage the river with less time and money invested. This allows us to set our sights on a much loftier target - Sebago Lake. As long as Sebago Lake remains heavily infested, it is a major threat to area waterbodies. Milfoil fragments continue to make their way into the Songo River and Brandy Pond from the lake, and other clean waterbodies. As a Long Lake area resident, Sebago is larger and will be more complicated than the Songo, but our success gives us confidence in our ability to replicate this on Sebago Lake.

A main reason for our success is the support we receive from an anonymous family foundation, the Town of Naples, The Maine DEP and area residents.

An algae bloom can be caused by 15 parts per billion of phosphorus.
First Glimpse of 2015 Gloeotrichia and Algae Monitoring Results
By Amanda Pratt

Lakes are often referred to in terms of their “health,” which can be a good way to conceptualize lake processes. Like the human body, lakes are complex systems made up of many components which must work in harmony in order to function properly. In this analogy, you can think of algae as being similar to cholesterol in the human body: It is necessary in small amounts, there are good kinds and bad kinds, and high levels are a big concern. Think of our algae monitoring program as a sort of cholesterol check for the lakes and think of Gloeotrichia echinulata (Gloeo) as LDL cholesterol — the bad kind.

The summer of 2015 was the third season of LEA’s Gloeo monitoring program and also marked the beginning of our total algae monitoring program. We began monitoring Gloeo, a cyanobacterial algae, in conjunction with Bates College researchers in 2012 on Long Lake. In 2013, we expanded this testing to a number of other lakes and began counting samples in-house. We sampled even more lakes in 2014 and 2015. Recently, we were able to purchase a new microscope through a grant from the Norcross Wildlife Foundation. This allowed us to magnify samples enough to be able to count other algae, many of which are much smaller than Gloeo colonies. All of the data we collected is still being analyzed, but the following sections provide a preliminary look at our results.

GLOEEO RESULTS
LEA sampled 30 sites on 24 lakes and ponds for Gloeo are both 2014 and 2015. Of these 30 sites, 20% had no Gloeoolonies in either year. Forty percent of sites (on 7 different lakes and ponds) are above our concern threshold of greater than one colony per liter. Three lakes – Long Lake, Moose Pond, and McWain Pond — had levels over 10 colonies per liter in 2015. The remaining 40% had some trace of Gloeo in at least one sample, but the overall abundance was very low.

Gloeo appears in lakes in the late summer, usually peaking between late July and early September. We sample most lakes in one spot (Long Lake is the exception with 4 sample sites), and this summer we sampled priority lakes (those that had high levels in the past) four times and the rest once. While the highest amount recorded in the year has increased each year we’ve sampled, overall levels do not appear to be increasing everywhere. Moose Pond had the highest level of Gloeo in any lake this year with 192 colonies per liter. This amount would be highly visible in the water column, but it is less than concentrations in some other lakes in Maine, such as Lake Auburn and some of the Belgrade Lakes.

While the exact numbers are highly variable, the lakes with the highest Gloeo levels tend to be the same each year. We are most concerned about Gloeo levels in Long Lake, Moose Pond, McWain Pond, and Keoka Lake — which had the highest level in 2014 at over 70 colonies per liter despite having levels under 10 colonies per liter this year. The lakes with lower levels of concern — those with levels around 1-5 colonies per liter — tend to be the same each year too. They include Brandy Pond, the north and south basins of Moose Pond, Crystal Lake, and Peabody Pond. Although many lakes continue to have low numbers of Gloeo, it is still important to monitor these lakes so that we are aware of any changes over time.

ALGAE RESULTS
Algae monitoring focused on six categories of algae - green, cyanobacteria, diatoms, golden/yellow, cryptomonads, and dinoflagellates. Green algae is the largest group of algae. Cyanobacteria are actually a type of bacteria very similar to algae and are most common in the late summer. High levels of cyanobacteria are often correlated with high phosphorus levels. Diatoms are distinguished by their hard silica shells, which remain preserved in sediments. They’re most common in the spring and fall when lakes mix. The Golden/Yellow algae category contains relatively few species but are often common in low nutrient lakes such as ours. Cryptomonads are small, motile algae, none of which were identified during sampling although they were likely present. Finally, dinoflagellates as a group are made up of only a few species, however, they are very common. All algae were identified to genus level, which is one step above species level.

One of the most basic and informative measurements we can make with our data is the percentage of cyanobacteria in a sample. Because cyanobacteria are of particular concern to water quality, knowing how much there is relative to the total amount of algae is important. The lakes with the highest average percentage of cyanobacteria are Woods Pond, Moose Pond, and Peabody Pond. Other lakes sampled include Keoka Lake, McWain Pond, Hancock Pond, Sand Pond, Long Lake, Trickey Pond and Highland Lake.

A total of 49 different kinds of algae were identified across the ten lakes sampled. Among the most common were westella (green), tabellaria (diatom), dinobryon (golden/yellow) and merismopedia (cyanobacteria). Samples were collected between July and September.

In 2016, we plan to collect monthly samples starting in May and continuing through September. This will help us to better understand seasonal patterns in algae populations.

We will continue to develop and refine our algae and Gloeo monitoring programs as needed. Algae are the basis of lake ecosystems, making their study essential for us to have a clear, well-rounded picture of how well a lake functions. Gloeo and algae information tailored to each lake will be available in our water testing report due out in January. There will also be separate reports released this winter on the season’s overall Gloeo and algae results. These will be posted on our website, www.mainelakes.org

2015 Courtesy Boat Inspections
Courteous boat inspection totals were down slightly this year, LEA and other lake associations noticed a drop in inspections, likely due to unfavorable weather in the beginning of the season. The Woods Pond Water Quality Committee and the Sebago Pines Property Owners on Sebago Cove utilized DEP grant money to start CBI programs at their boat launches. LEA aided organizations with hiring, training and scheduling their inspectors and we are happy to report that the programs were a success. We hope to continue to strengthen these new programs in future years. The chart shows total inspection numbers for all fourteen boat launches covered by LEA-trained inspectors in the summer of 2015.
Milfoil Discovered at Naples Public Launch

Variable Leaf Milfoil from Long Lake Trailer

Business as Usual
Not Good Enough for Maine’s Lakes
by Peter Lowell

The Maine Lake Science Center project began six years ago when LEA staff became concerned that water testing guidance had changed very little in decades. It seemed that there must have been advances and new technologies, so we set out to investigate. Roberta Scruggs conducted a series of interviews with professors at several of Maine’s colleges and universities. Indeed, there had been progress in researching climate change, toxic algae, remote sensing, sediment chemistry, sediment cores and several other important factors and technologies.

While interviews were revealing research advances, LEA partnered with the Maine Lakes Society and Maine’s regional lake associations to form the Lake Leaders working group. Soon, the leaders were meeting with researchers. Proposals were developed and new testing protocols and equipment were put to use.

The leaders meet every spring and fall to share ideas, discuss issues and take joint action. At the new Maine Lake Science Center, LEA proudly hosted the fall 2015 Lake Leaders meeting and co-hosted a climate change dinner lecture with the Maine Lakes Society. The Maine lake protection has made huge progress in the last five years. Let’s hope we respond to the new knowledge and research findings.

Fluorometer Results Show Patterns in Algae Distribution
By Amanda Pratt

This year for the first time, LEA was able to measure chlorophyll profiles (readings taken at a series of depths) in a number of lakes. Instead of having to collect and filter samples, then pay to have them analyzed, we got immediate results in the field using an instrument called a fluorometer. The fluorometer is set up in a way similar to our temperature and oxygen meter, with a digital hand-held display and a probe on a long cord that allows us to take measurements at various depths. The probe at the end emits a blue light, which is absorbed by chlorophyll-a pigments within algae and then reflected at a certain wavelength. The probe measures how much light is reflected, which gives an indication of the relative amount of chlorophyll (and thus, algae) in the water at that depth.

Profiles were taken to the same depth as core samples. This means that the profiles encompassed the top layer of water but did not aim to measure the deeper, hypodinamic water, where chlorophyll values are expected to be low because of a lack of light. Looking at the resulting data, a clear pattern emerges. Estimated chlorophyll levels gradually increase with depth, often becoming significantly higher by the last depth reading.

The likely reason for this is that the chlorophyll profile measures down to what’s called the metalimnion — a thin layer of water separating the upper warm and lower cold layers of a lake. The temperature and density of water changes rapidly in this area, which often causes algae to accumulate there. This can be especially true when light can penetrate to the depth of the metalimnion (clarity and metalimnion depth are often similar due to the effects of the sun’s rays on water temperature).

In some profiles, the chlorophyll initially increases, but then decreases below a certain depth, such as the June 10th profile in the accompanying graph. This could be due to a lack of sunlight reaching the deeper waters, preventing algae growth (The secchi depth — a measure of light penetration as well as clarity — was 5.4 meters on the 10th versus between 7.1 and 7.5 meters on the dates of the other two profiles). While we will still collect chlorophyll core samples for filtering and lab analysis as we always have, the fluorometer allows us to learn even more about the dynamics of our lakes in a flexible and cost-effective manner. Keeping up with technological advances in lake monitoring, such as fluorometry, is an important part of LEA’s commitment to the lakes.

When the Town of Naples decided to crack down on non-residents using the boat launch on Long Lake in 2015, they approved a budget to increase boat inspections at the Long Lake launch. Historically, LEA assisted the Town with their inspection program, but this year we played more of a advisory role as the process evolved into more than just inspections.

One of the biggest changes to their program was the hours that an attendant would be on duty. Due to the drastic increase in Town funds, they were able, most days, to have an attendant at the launch from 7am-9pm. This increase in coverage played a large role in a disturbing discovery at the launch on July 4.

After the fireworks at the causeway ended, several boats left the lake by way of the public launch. Despite the late hour, the Town of Naples attendant was still on duty checking boats. As one particular boat left, the attendant found a handful of plants stuck on the trailer. This was a boat that had been inspected earlier in the day with a clean bill of health.

The entire group of plants was brought to LEA for identification. Most of the plants were harmless natives but one was suspected of being variable leaf milfoil, the most common aquatic invasive plant in Maine and one that the LEA has spent years eradicating in the Songo River and Brandy Pond. The sample was sent for genetic testing and was verified as invasive milfoil. The LEA plant control crew surveyed the launch the day the plant was brought to LEA and no other suspicious plants were found.

It is likely that the plant fragment was brought into the lake on another trailer and was floating at the ramp. We do not know of an active infestation in Long Lake, and the hope with the CBI program is to continue to prevent the spread of invasive aquatic plants. Naples proved the value of expanded inspections.

Three chlorophyll profiles from Long Lake’s North Basin, showing chlorophyll increasing with depth in July and August. The June 10th profile shows chlorophyll values increasing between 0 – 4 meters, then decreasing.

Always test your soil before applying fertilizer.
The Maine Lake Science Center – Ready for Business

by Alyson Smith

After more than six years of preparation, activities are cooking at the new Maine Lake Science Center (MLSC). The Center has hosted workshops, researchers and students from various universities, receptions to showcase the facility, the Maine Lake Society, the Maine Lake Leaders, and it has enabled the entire LEA staff and Board of Directors to meet in one space for LEA’s strategic planning workshop.

The purpose of the MLSC is to build collaborations and networking opportunities within the scientific community and provide researchers with facilities to attract them to western Maine for the purpose of studying and preserving Maine’s lakes. The Center will also provide expanded opportunities for watershed education programs serving students, land-use professionals, the business community, and the public to promote knowledge to action to protect and preserve our natural resources.

The Center is operated by part-time staff. Bridle McGreavy is the consulting executive director and Peter Lowell is the interim executive director. Dr. McGreavy has provided a strong link between the Center’s mission and outside resources, including programs and researchers concerned about lake health and social science. Current scientific research is needed to define and achieve changes in policy and behavior. Unless our knowledge generates action, the data gathered will simply be academic. Lowell brings his 40+ years of experience and work with LEA to this venture. His unyielding enthusiasm has brought together the efforts of many to create not just a building, but a program for the healthy future of our lakes.

A research director will be responsible for working with the executive director to identify and recruit researchers, write grants and conduct priority research. It is anticipated that this position will be filled in 2016.

The Center and project manager is responsible for the day-to-day affairs at the Center. Alyson Smith has acted as host to researchers-in-residence and visitors, recruited Center users, worked with LEA education staff to develop multi-faceted education programs, written grants to support the center’s financial obligations, and established partnerships with organizations and groups with coordinating missions.

The Center began hosting workshops in July in the 50-seat conference room. It sits on an 16-acre wooded lot in the heart of Bridgton. With help from volunteers and the Bridgton Boy Scouts, a trail with boardwalks connects to the Pondicherry Park trail system. Students will be able to walk from Stevens Brook Elementary School via the trail system to participate in learning activities at the MLSC and along the way. Plans are in the works to add to the trail system on the property to include an interpretive trail.

The Maine Master Naturalist Program (MMNP) will utilize the Center for a course home base from May until September 2016. MMNP’s goal is to create an ever-widening ripple, a network of citizen-naturalist volunteers who share their knowledge, insights and enthusiasm about Maine’s varied natural communities. It is clear that LEA’s mission “to preserve and, when necessary, restore the high water quality and the traditional character of Maine’s lakes, watersheds, and related resources” will continue with the active work of traditional and social scientists at the Maine Lake Science Center. Our lake stewards play an important role in carrying out this mission. As evidenced by the high level of enthusiasm and action, we know we are blessed with an abundance of stewards in the Lakes Region.

The Center at 51 Willett Road is open to the public Tuesdays and Thursdays from 10:00 – 12:00 and by appointment. Call (207) 647-3318 or e-mail Alyson Smith (Alyson@leamaine.org) if you would like to visit.

Sixth Graders Raise Their Own Salmon

For several years, LEA has helped local sixth graders raise land-locked salmon in their schools. LEA partners with the Department of Inland Fisheries and Wildlife to provide the schools with eyed eggs for the students to raise. An egg becomes “eyed” when it is fertilized. This process happens in a fish hatchery. Our local hatchery is in Casco and the staff there work closely with LEA to make this program a success.

When the eggs are delivered to the schools, the water in the tanks should be around 3°Celsius. Each school receives 300 eggs for each working tank they have. Harrison Elementary owns one and Lake Region Middle School owns three. The eggs take approximately two months to hatch. Once they have hatched, students watch their growth progress and wait for the right time for them to be released. After hatching, each fish has a yolk sac attached to its body. This is where the fish get their nutrients while they are growing. If timed correctly, the students will not need to provide additional food to the fish before they are released.

Despite some egg mortality, each student is able to release several small salmon, called fry. Some students observed their fry hiding in the vegetation as soon as they were released while others quickly swim into the deep. The small size of the fry (about 1.5”) means that few will survive to become adult salmon. The program teaches students about the natural and human-made obstacles salmon must face upon release. More importantly, students study water quality issues and the pristine habitat needs of cold water species like salmon.
Landowners and lake research are our best hope for lake protection.

LEA Volunteers – Late Summer and Fall

Thanks to the following folks for helping LEA with many projects, keeping our costs down and increasing productivity!

Office and Mailings: Jane Forde, Paula Lowell

The Caplan Series: Susan Gallo, Ursula Duve, Jesse Dubin, Jean Preis, Danielle D’Auria, Dr. Samuel Roy.

Paddle Series: Sports Haus.

Science Center Trail: Lori Thomae, David Thomae, Bob Zawistowski, George Erickson, Janice Goodchild, Laura Cleveland.

Troop 149 Boy Scouts led by Josh Axman

Science Center Receptions: Chris Lowell
Holt Pond Preserve: Ryan Curtis, Nance Webster
Water Testing: Josh Gluck, Leah Howard, Brie Holme
LEA Office grounds: Q-Team, Perennial Point of View
Program Photography: Mariah McGee

Avian Haven uses methods which can clear lead objects from the system quickly, but once symptoms begin to show, it is often too late. The spread in the bloodstream is swift. Signs of lead poisoning include abnormal behavior, such as a loon beaching or walking inland. It is not natural for a loon to walk on land for any distance. Their anatomy allows them to be expert swimmers but going onto land is awkward and can be dangerous.

To the dismay of all involved, the Hancock loon did not survive. While this is a sad and heartbreaking outcome, there was an important lesson learned. It often takes a terrible loss to provoke change. The Hancock/Sand Pond Association asked LEA if there was anything we could do to help get the word out so courtesy boat inspectors at the Hancock Pond boat launch spoke with fishermen and offered to trade their lead tackle for lead-free. Next summer, we hope to implement a similar program at other boat launches.

The Law (from Maine Audubon’s Web site) - “In 2013, the Maine legislature passed LD 730, An Act to Protect Maine’s Loons by Banning Lead Sinkers and Jigs. The law bans the sale and use of lead fishing sinkers one ounce or less. A ban on bare lead-headed jigs 2.5” long or less will be phased in, with a ban on sale starting September 2016 and a ban on use in September 2017.”

This law is a great step toward protecting Maine’s wildlife from exposure to lead, but it’s just one step. I hope that someday all lead fishing tackle will be banned in Maine. There are already cheap alternatives on the market for those willing to make the switch. We can all do our part in protecting loons from lead poisoning. If you are an angler, replace all lead tackle in your collection, not just the switch. We can all do our part in protecting loons from lead poisoning. If you are an angler, replace all lead tackle in your collection, not just the lead objects from the system quickly, but once symptoms begin to show, it is often too late. The spread in the bloodstream is swift. Signs of lead poisoning include abnormal behavior, such as a loon beaching or walking inland. It is not natural for a loon to walk on land for any distance. Their anatomy allows them to be expert swimmers but going onto land is awkward and can be dangerous.

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Thank you to everyone involved with the rescue of the Hancock loon. Each summer, LEA receives several calls from concerned citizens who have injured or dead loons and other birds on their property. While we do everything we can to help, the real thanks goes to Kappy Sprenger and organizations like Avian Haven and Maine Audubon.
LEA's Natural Resources Education for 2016

Last summer, LEA saw an increase in interest in our public education programs. While this is exciting, it also opened up some questions about the registration process. In order to reward our members while continuing to attract new faces, we have come up with the following policy:

“Members will be given two-week advanced notice of programs and sign-up opportunities. Then, one week ahead of the event, sign-up will open for non-members who have asked to be on a waiting list.”

Most programs will be listed in our newsletters and on our Web site. At least once a month, LEA will send an informational e-mail about current projects and upcoming events and activities. If you have not given LEA a current e-mail address but would like to receive these updates, please contact Mary Jewett.

LEA’s Natural Resources Education starts in December with a trip to the Holt Pond Preserve. Grab your snowshoes and join us during Christmas vacation on an exploration of this beautiful preserve. We always hope for snow so we can do some animal tracking, but there will be plenty to see even if we don’t need the snowshoes. This event is great for families and outdoor enthusiasts. LEA can provide snowshoes to anyone who needs them.

Winter at LEA wouldn’t be the same without a beautiful nighttime walk to admire the evening sky. This season, LEA board member and Maine Master Naturalist, Leigh Hayes, shares her knowledge of the night sky at the Bridgton Highlands golf course. Snowshoes can be provided if needed.

During February and April vacations, kids and families have an opportunity to get to know the new Maine Lake Science Center. For both weeks, we will offer indoor and outdoor activities that will introduce people to the new center and the surrounding forest and trails. These activities will be fun and appropriate for kids ages 5 and up. Sign up early to save your spot!

March and April may not be the nicest weather months but there is an event that happens this time of year which gets every nature lover excited. Big Night is the annual migration of amphibians from their forest habitats to vernal pools to reproduce. In March, LEA will hold a Big Night training session for anyone interested in learning more about this amazing phenomenon and the amphibians who call Maine home. Usually Big Night occurs sometime in the first half of April (depending on the weather). LEA hosts a Yahoo group to communicate with people interested in participating in a Big Night road watch. If you are interested in coming out on Big Night to help save frogs and salamanders, join our group by contact Mary at mary@leamaine.org.

Anyone who spends time outside in spring knows that May is the month of birds! Resident birds are seeking mates and claiming territories while thousands of migrants are making their way north. Many different species appear in the Lakes Region in search of food, rest or nesting spots. LEA will host three bird walks in May. The first two Fridays, we will meet at the Bob Dunning Bridge in Bridgton at 7AM. The bridge, leading into Pondicherry Park, provides ideal viewing opportunities and a mix of habitats.

The last event in the spring is one of our most popular. Longtime LEA friend and botany enthusiast, Ursula Duve, will be back at Holt Pond teaching about the different wildflowers in bloom. Each year, the species vary somewhat depending on the weather so there’s always something new to see. This year, we are combining botany with birding in an attempt to see everything spring has to offer all at once. Binoculars are strongly recommended for these birding events. LEA has a limited numbers of pairs so let us know if you need to borrow one.

These events are free for members and cost $5 for non-members. To register, please contact Mary Jewett.
What do you get for your LEA membership?

Last summer, nearly all of our events were filled to maximum capacity with many people turned away. As an LEA member, you receive early notification and reservations for the LEA Natural Resources of the Lakes Region series. Some of the events that sold out quickly were the loon presentations (Over 100 people came to our loon events!), mushroom talk and walk, and the ever popular orchid walk at our Holt Pond Preserve. Become a member and never miss another event!

Membership also gives you the satisfaction of knowing that you are doing your part to promote water quality on your lake. Your membership dollars help us fund water testing on 40 lakes, help us keep invasive plants out of these lakes and allow us to provide FREE advice to members who want to reduce erosion and maintenance costs on their property. LEA Membership is the best way to join us in the fight against water quality decline in the Lakes Region.

LEA has some very loyal members! Join me in honoring our most long-standing members:

- C. Martin and Patricia Berman
- Hu and Ray Caplan
- Mr. and Mrs. Theodore D. Jennings
- Peter and Paula Lowell  Audrey MacIntyre
- Babette Radner  Norman and Ruth Stacy

These lake-loving folks have been with us consistently for the past 40 years or more! Thank you for your unbelievable commitment to lake health and environmental education. We appreciate all you do.

The Year of the Recovered Member

LEA is doing exciting things. The completion of the Maine Lake Science Center building project, new and more advanced water testing, the automated baooy in Highland Lake, sold out public education events and the taming of the milfoil infestation on the Songo River are just a few of the things that LEA worked on in 2015. We are making a huge effort to educate the public, not only about issues that affect water quality, but what LEA is doing about it. I am happy to say that you were listening: in 2015 LEA recovered more members than ever before. As of October 31, more than 250 lapsed memberships were renewed. We can credit the hard work of the LEA staff, quality programs and great communication with the public of the Lakes Region for this mass rejoining. Your membership directly affects our programs. If you are a lapsed member please consider renewing your membership today!

This is What You Get!

Your support for LEA has resulted in some extraordinary accomplishments, especially over the past few years. All of our work is strengthening lake protection in an effort to understand lake tipping points before it is too late. Maine researchers are warning that the water quality we cherish, but take for granted, could deteriorate dramatically within twenty years if we do not take action. You will see a lot of information in this newsletter that highlights LEA’s Maine Lake Science Center, advanced lake testing, advocacy, education and our aggressive program to fight Milfoil in Brandy Pond, the Songo River and Sebago Lake. Your help and loyalty has made this possible as we build cost-effective and productive programs and expand our excellent staff.

This is What You Get!

Are you an LEA member? Please join in the struggle to protect our lakes

Name: __________________________ Email: __________________________

Winter Address: ______________________________________________________________________________________

Summer Address: ______________________________________________________________________________________

☐ Check enclosed ☐ Charge my credit card $________
☐ Visa ☐ Master Card Exp. Date _____________

Account #: __________________________

LEA Members Keep Us Going

You can join LEA with a contribution of any amount. Just mail this form and a donation to LEA, 230 Main Street, Bridgton, ME 04009

You can also join or renew at: www.mainelakes.org

Gift Levels:
☒ $500 Benefactor
☒ $100 Patron
☒ $250 Sponsor
☒ $500 Lake Steward
☒ $75 Family
☒ $125 Individual
☒ Any other amount $________

I’d like to make an additional donation to the:
☒ Intern Program
☒ Milfoil Program
☒ Environmental Education Program

Yeats to Date Members on LEA Lakes

<table>
<thead>
<tr>
<th>Waterbody</th>
<th>Shorefront Lots</th>
<th>9/30/2015*</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keyes Pond</td>
<td>46</td>
<td>18</td>
<td>39%</td>
</tr>
<tr>
<td>Woods Pond</td>
<td>109</td>
<td>37</td>
<td>34%</td>
</tr>
<tr>
<td>Cold Rain Pond</td>
<td>3</td>
<td>1</td>
<td>33%</td>
</tr>
<tr>
<td>Highland Lake</td>
<td>431</td>
<td>137</td>
<td>32%</td>
</tr>
<tr>
<td>Stearns Pond</td>
<td>66</td>
<td>20</td>
<td>30%</td>
</tr>
<tr>
<td>Brandy Pond</td>
<td>205</td>
<td>61</td>
<td>30%</td>
</tr>
<tr>
<td>Songo River</td>
<td>45</td>
<td>13</td>
<td>29%</td>
</tr>
<tr>
<td>Long Lake</td>
<td>1102</td>
<td>287</td>
<td>26%</td>
</tr>
<tr>
<td>Keoka Lake</td>
<td>96</td>
<td>24</td>
<td>25%</td>
</tr>
<tr>
<td>Foster Pond</td>
<td>44</td>
<td>10</td>
<td>23%</td>
</tr>
<tr>
<td>Granger Pond</td>
<td>31</td>
<td>7</td>
<td>23%</td>
</tr>
<tr>
<td>Back Pond</td>
<td>34</td>
<td>7</td>
<td>21%</td>
</tr>
<tr>
<td>Sand Pond</td>
<td>83</td>
<td>17</td>
<td>20%</td>
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<tr>
<td>Peabody Pond</td>
<td>99</td>
<td>20</td>
<td>20%</td>
</tr>
<tr>
<td>McWain Pond</td>
<td>109</td>
<td>21</td>
<td>19%</td>
</tr>
<tr>
<td>Moose Pond</td>
<td>602</td>
<td>115</td>
<td>19%</td>
</tr>
<tr>
<td>Bear Pond</td>
<td>37</td>
<td>7</td>
<td>19%</td>
</tr>
<tr>
<td>Trickey Pond</td>
<td>112</td>
<td>21</td>
<td>19%</td>
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<tr>
<td>Hancock Pond</td>
<td>169</td>
<td>30</td>
<td>18%</td>
</tr>
<tr>
<td>Papoose Pond</td>
<td>40</td>
<td>7</td>
<td>18%</td>
</tr>
<tr>
<td>Little Pond</td>
<td>6</td>
<td>1</td>
<td>17%</td>
</tr>
<tr>
<td>Perley/Pickeral/Lily</td>
<td>6</td>
<td>1</td>
<td>17%</td>
</tr>
<tr>
<td>Crystal Lake</td>
<td>129</td>
<td>20</td>
<td>16%</td>
</tr>
<tr>
<td>Beaver Pond</td>
<td>13</td>
<td>2</td>
<td>15%</td>
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<tr>
<td>Adams Pond</td>
<td>15</td>
<td>2</td>
<td>13%</td>
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<tr>
<td>Island Pond</td>
<td>27</td>
<td>3</td>
<td>11%</td>
</tr>
<tr>
<td>Little Moose Pond</td>
<td>18</td>
<td>2</td>
<td>11%</td>
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<tr>
<td>Kezar Pond</td>
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<td>5</td>
<td>10%</td>
</tr>
<tr>
<td>Middle Pond/Mud Pond</td>
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<td>4</td>
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<tr>
<td>Bog Pond</td>
<td>13</td>
<td>1</td>
<td>8%</td>
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<tr>
<td>Sebago Lake</td>
<td>1710</td>
<td>96</td>
<td>6%</td>
</tr>
<tr>
<td>Long Pond</td>
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<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Crooked River</td>
<td>752</td>
<td>8</td>
<td>1%</td>
</tr>
<tr>
<td>Duck Pond</td>
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<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Holt Pond</td>
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<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Jewett Pond</td>
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<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Otter Pond</td>
<td>10</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Pleasant Pond</td>
<td>8</td>
<td>0</td>
<td>0%</td>
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<tr>
<td>Total</td>
<td>6340</td>
<td>1006</td>
<td>16%</td>
</tr>
</tbody>
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*Total current members include everyone who joined or renewed in the previous 365 days.