Moose Pond Matters
SUMMER 2015

Loons on Moose Pond: the other summer visitors

by SUSAN FARNSWORTH

Each year, when we arrive in Maine for the first time of the season, I am always excited to see the loons that share our beautiful pond. They arrive before we do, as soon as the ice is out, dressed in their black and white mating plumage. The loons have a lot to accomplish in a short period of time. Between April and November, they will arrive at the pond, maybe with a mate, but also maybe looking for a mate, locate a suitable nesting site—one that is safely away from the many predators of their precious eggs, hopefully hatch one or two chicks and proceed to raise them and say goodbye all before the end of November. One of the highlights for me is watching this all unfold over the course of the weekends I spend on Moose Pond.

Over the past 30+ years, the state's loon population has been monitored by Maine Audubon. Environmental factors such as lead in fishing tackle, discarded fishing line, and heavy boat traffic had made it challenging for loons to successfully nest and raise their chicks.

The loons have a lot to accomplish in a short period of time

The Annual Loon Count takes place each year on the third Saturday in July, when citizen scientists take to the waters to help count the loons. We have been participating in the count for a number of years, rain, shine or pea-soup thick fog to do the best we can to monitor the loon population on Moose Pond.

The count for 2014 yielded a total of ten adults and three chicks. I am not convinced that the ten adults are full-time residents—sometimes, after the mating season is over, adult loons will fly to other lakes to visit with other loons. I think this just happened to be the case during the count. I believe there are generally six adults that have claimed territory on the pond.

Over the past few years, there have been only two loon counters on Moose Pond. Since the count is only supposed to last one hour at maximum, from 7 to 8 a.m., it is nearly impossible for two counters to survey the entire lake.

At the 2014 Moose Pond Association Annual Meeting in August, we asked for volunteers who were interested in participating and I am happy to report we are now planning for the 2015 count with a few more volunteers.

Last year was an exciting one to be watching the loons on Moose Pond. For several years prior to 2014, we seemed to have had an odd number of adult loons. Unfortunately, the un-attached loon (likely male) will try to win over the affections of the already paired female by challenging her male partner. The ultimate result had been a non-nesting pair and thus no chicks in the upper or middle basin. At the lower basin there seemed to be a pair that successfully mated every other year. For me, on the middle basin, this meant many boat trips to the lower basin to see the loon family and enjoy watching the chicks grow.

In 2014, on the upper basin, the first nesting pair in about nine years rewarded us with two chicks—Lily and Leon. Within days, they moved to the middle basin.

Weekends suddenly revolved

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SUSAN FARNSWORTH

Boaters be aware! A loon chick hatched the first week of July and swam for a couple of days. It is now missing and presumed dead. Chicks from a second nest on the pond are due to hatch soon.

Moose Pond Association Meeting
Saturday, Aug. 22 9 am
Shawnee Peak

All are welcome to come and hear about the state of the lake and what MPA is doing.

For many, summer is the season when the lure of Moose Pond is strongest. Swimming in its clean, refreshing waters or fishing in the still of the early morning delights us. The Moose Pond Association strives to be sure those experiences will be enjoyed in years to come.

In this second annual newsletter, you can read about what we're doing, both around the pond and under the surface, to maintain the good water quality that we know is so precious. You will find articles that discuss the increased water quality testing and Courtesy Boat Inspection program, both paid for by your membership contributions. Additionally, we offer information about the upcoming Route 302 roadwork, ideas on how to minimize the environmental impact of your property, and an article on Moose Pond loons and the Audubon Society loon count program.

Two years ago, the Lakes Environmental Association started taking core samples and studying the algae Gloeotrichia echinulata in the pond. Last year, additional testing included more detailed temperature recordings. This year, we have hired LEA to conduct testing for other kinds of algae. This testing, when conducted annually, will provide the ability to understand trends in Moose Pond water quality, both good and bad.

This testing will occur in conjunction with a number of other lake associations and in partnership with the new Maine Lake Science Center that the Lakes Environmental Association has established. We need to understand just how fast Moose Pond and other local lake water quality is being affected before negative trends become irreversible. The science center's connection to the worldwide science community will be a great asset in helping us find solutions to the problems we encounter. We want Moose Pond to be at the head of the list when help is needed.

These stories and others are all in our newsletter. If you have ideas or stories to tell please let us know. More information is always available at our Web site: www.moosepondassociation.org.

The mission of the Moose Pond Association is to do the following: "Maintaining and Improving the Health of Moose Pond." Our best hope for helping the pond is an informed and caring public. We can all contribute to a cleaner lake, free of invasive plants, so please take a moment to read the news. We'll count on your support to make Moose Pond a place for people to enjoy for all time.

Best regards,

David Ehrman, *President*

Meet the board of directors

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The board is looking for directors from the south and north basins. Terms are three years, two meetings a year. If you are interested, talk with any of the directors.

**Founding member*

Moose Pond leads in boat inspection hours

Moose Pond's Courtesy Boat Inspection Program is running full steam ahead. Recognizing that prevention is the key to keeping invasive plants out of the lake, the association has wholeheartedly supported the program. In fact, the number of boat inspection hours here is among the highest in the region.

Wearing bright yellow shirts proclaiming "Courtesy Inspector," employees and some volunteers will check hundreds of boats this summer at both the Route 302 and Denmark launches. At Route 302, an inspector will be on hand from 8 am to 6 pm on weekends in June and then every day from June 29 to Labor Day, plus two more weekends into September. The Denmark launch will be staffed from Friday through Sunday until Labor Day.

The boat inspection program is paid for with grant money from the Maine Department of Environmental Protection and the Moose Pond Association membership. Last year, the grant was for $1,600 and the MPA contributed $11,860. The funds from the state come from the "milfoil sticker" that is purchased with boat registrations.

In 2014, the inspectors checked 1,250 boats in Bridgton and 367 in Denmark. Forty-eight plants were found, but none turned out to be invasive.

Judy Pelletier is now in her fourth summer inspecting boats.

The Denmark boat ramp is staffed by milfoil inspectors Fridays, Saturdays and Sundays.

The CBI program at Moose Pond works in conjunction with the Lakes Environmental Association. Mary Jewett of LEA, manages the program.

Questionable plants that are taken off of boats and trailers are given to LEA for identification. "Ninety-nine percent of the time we can identify it, but if we can't we send it to the VLMP (Volunteer Lakes Monitoring Program) to get verification. They can actually do genetic tests," Jewett said.

Identification of the plants is not as easy as it sounds. The bad ones often don't look that much different from the native plants in Moose Pond. Even lily pads are suspects. There is a type called yellow floating heart that is invasive and is now in waterways in Vermont, Massachusetts, New York and Connecticut. Vigilance, not complacence, is the key, Jewett said, noting that variable leaf water-milfoil is "right at our doorstep in Sebago Lake. The goal is for Moose Pond and Highland Lake and Trickey Pond and many others to never have to have plant control, just have a courtesy boat inspection program. Besides the harm invasive plants do to the lakes and ponds, Jewett pointed out that removing it is costly. "Once it is there, it is really expensive to control. There's the cost of the scuba divers and the boat and barriers. Prevention is always the best."

So, at the two boat launches this summer, boaters and passers-by will see the yellow shirts, worn by high school students working their first job, retired people doing a little summer work and MPA members volunteering their time, all with the same goal: to keep invasive plants out of the pond and educate the public.

Boat Washes

Boat wash stations, are available just south of the Denmark launch and at the West Bridgton Fire Station, near the Route 302 launch. Spraying any plant fragments off of your boat, motor and trailer will help stop the spread of invasive plants.

Advanced Water Testing Initiatives

Water testing on Moose Pond is keeping up with the advances in lake science. And lake science may be the key to maintaining clean, clear water.

For the past two summers, LEA has amped up the water testing program on Moose Pond due to direct support from the Moose Pond Association. Assistant Director Colin Holme, and researcher Amanda Pratt, plus their crew of interns, have collected and analyzed concentrations of the blue-green algae Gloeotrichia echinulata, as well as aluminum and iron.

In the water, Gloeo looks like round pinhead-sized yellow-green dots, that resembles pine pollen, suspended throughout the water column.

As a cyanobacteria, Gloeo is associated with high nutrient lakes and thus bad water quality. Therefore, it came with great surprise during 2013 that this "bad" algae was found on Moose Pond. Pratt stated, however, that the "numbers in Moose Pond were fifteen times lower than the highest recorded level in Maine, from Long Pond in the Belgrade Lakes Region."

While the middle basin was sampled in 2013, the north and south basin sampling locations were added in 2014. A total of 23 samples were collected from these sites between June and September 2014. The north and south basins had low levels of the algae, with a maximum of 0.9 colonies per liter in the north and 1.5 colonies per liter in the south basin.

Summer 2014 intern Danae Winkler tests for dissolved oxygen and water temperature.

In the middle basin, the maximum was 16.2 colonies per liter, nearly identical to the 16.6 colony per liter peak at this site in 2013. The date of this peak was also nearly the same in both years, occurring within the first week of August. The middle basin Gloeotrichia peak came after two weeks of sustained higher temperatures, which likely triggered the algal growth. The average level in the middle basin was 6.2 colonies per liter (up from an average of 4.1 colonies per liter in 2013). This site had the fourth highest peak and average Gloeotrichia levels of the 24 lakes sampled.

LEA also took a core sample to test the ratio of aluminum (Al) to iron (Fe) present in the lake sediment. Reportedly, "this ratio has been shown to predict the risk of sediment phosphorus release in acidic lakes. A ratio under 3 indicates a high risk of phosphorus release, while a level above 3 indicates that phosphorus will be bound by aluminum, lessening the availability of phosphorus in the water column."

The results indicated that the middle basin is most at risk with a ratio of Al:Fe less than 3, and the upper and lower basins are at moderate risk with a ratio of 3-6.

Phosphorus trapped in sediment plays a role in the life cycle of Gloeo and other algal growth. Increased amounts of phosphorus cause the Gloeo colonies that enter the water column to grow dramatically.

Though it is a naturally occurring nutrient in soil, historical uses of the land, plus ongoing development probably contributed to an excessive amount of phosphorus finding its way into the pond.

Based on the results of the past two years, the MPA has hired LEA to continue regular sampling of Gloeo. In addition, LEA will add baseline monitoring of all algal species—thus creating a more complete picture of Moose Pond's ecosystem. The association has also contracted with LEA to expand the traditional water testing program in both the north and south basins, which includes taking chlorophyll and phosphorus samples. The historic collection of data will help LEA and MPA make informed decisions for Moose Pond.

We're grateful to have a local organization that can carry out these important tests and is on the cutting edge of determining what steps we can take to avoid a decline in water quality.

Claire Sevcick collects water for Gloeo tests.

As Moose Pond property owners, there are a few quick fixes you can make now that will help with the long term health of the lake:

- fix erosion on your camp road
- empty your septic tank every few years
- create narrow, curvy pathways to the water
- use rain bars and other techniques to divert water run-off into the pond
- increase the vegetated buffer
- wash cars with phosphorus-free soap

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around watching for the new family and trying to get as many pictures as possible, all of course while staying far enough away so as to not disturb them. The loon pair on the lower basin also hatched one chick that I named Junior.

They say that truth is stranger than fiction and this proves to be true in nature as well. After a few weeks, the loon adults and only one chick (Lily) were visible on the middle basin. Of course, loon chicks can be easy prey for the eagles and also, when they are very young, even large fish, so we naturally thought the worst. Upon our trip down to the lower basin, we came across Leon toward the bottom of the middle basin—completely by himself. As much as we wanted to intervene, we didn't know the first thing about capturing a loon so said a prayer and wished poor Leon well, knowing that his chance of survival without parents was slim.

The following weekend, we again saw Lily and parents in the middle basin, but were so disappointed that Leon had not been reunited. Upon checking on the family in the lower basin, we were amazed to see Leon now with Junior. What we assume happened is that Leon drifted down to the lower basin, came across the other family and decided to join.

We watched this new family for some time over the rest of the summer. We never saw the adults actually feed Leon, however, they somehow were ok with him hanging out. He evidently was able to feed himself and learn by watching the other family raise Junior.

We said goodbye to Leon, Junior and Lily at the end of October when we left for the season. As loons only come to the inland waters to mate, it will likely be 4 + years before the three youngsters make the trek back to Moose Pond in search of mates to raise their own families.

As you head out onto the water this season with all of the water toys that provide so much family fun, please just remember to keep an eye out for these beautiful birds—they try hard to stay out of our way—we can try to give them some room to raise their families.

For more information about loons and Maine Audubon please visit maineaudubon.org.

Data from the HOBO® Sensors

Just as a taking a person's temperature helps assess human health, checking water temperature reveals a lot about a lake's overall health.

To get a better idea of temperature patterns in Moose Pond, LEA began monitoring the temperature using in-water data loggers in 2013.

The loggers, also known as HOBO® sensors, are small, digital temperature sensors that have been programmed to record readings every fifteen minutes at various depths.

At the deepest section of each of the pond's three basins, you'll see an upright buoy—this is the sensor, which stores data until LEA retrieves it.

The measurements allow researchers to examine a temperature profile of the pond and infer its effect on diverse characteristics such as stratification (lake layering), ecology, habitat and nutrient loading. They can see how it fluctuates over time due to weather.

LEA's Assistant Director Colin Holme says, "With the new HOBO sensors we can see when and how stratification forms and breaks down—it can also sometimes partially break down, such as when winds dig down deep enough to grab some of the cold, high nutrient water and bring it to the surface."

Comparing temperature data over a number of years allows LEA to make observations about climate change in our region. So what did the sensors tell LEA and MPA about Moose Pond?

Last year, the temperature reached a maximum of 82.2°F in the north basin on July 3rd and 18th, 80.6°F in the middle basin on July 23rd, and 82.8°F in the south basin on July 3rd. The epilimnion, or top and warmest layer of water on the lake, was located between 0 and 5 meters for most of the summer in the middle and south basins, and between 0 and 3 meters in the north basin.

The metalimnion, or middle layer, is characterized by a large temperature change, known as the thermocline—the spot where you suddenly feel the chilly water as you dive in. This occurred around 4 meters in the north basin, between 5 and 7 meters in the south basin, and between 5 and 9 meters in the middle basin. The hypolimnion is everything below the middle layer.

Stratification deepened in all basins in mid-September, signaling the beginning of fall turnover—the time when the upper waters that had been warmed by summer's sun cool down. Complete mixing, or turnover, occurred in the north basin on September 12th, the middle basin on November 2nd, and in the south basin on October 22nd.

If you are wondering how Moose Pond compared to other lakes in the area—in 2014, LEA reports that most of the lakes recorded their maximum temperature on July 23rd. In future years we'll be able to see temperature trends.

50/50 FUNDING: Subtle improvements in pathways and plantings can have a big impact on reducing erosion. Funding is available to help homeowners with this sort of work.

Guardrails to replace causeway granite

The Moose Pond causeway in 1924, in the Model T era. Postcard shared from the Bridgton Historical Society collection.

The Maine DOT plans to replace the split-stone granite with guardrails.

Despite the town's objections, when the Moose Pond causeway at Route 302 is re-paved, the granite blocks installed in the 1950s will be replaced with a guardrail.

The Bridgton selectmen learned about the plan in February and wrote to the Project Manager at the Maine Department of Transportation. "We are requesting that the aforementioned guardrails be eliminated from the project. As you may or may not be aware, the granite stones have been in place for a number of years and have proven to be an effective barrier. It is our understanding that there was a review of the accident record for this stretch of road which did not reveal a notable number of accidents.

Natural beauty and tourism are a major economic engine for the Town. The Causeway is a scenic, much-photographed area of Town both from land and water. Marring the vista with guardrails will diminish the attractiveness of the area and possibly have future economic impacts," says the letter signed by Chairman Bernie King and the other members of the board.

In response to the board's concerns, Bradford Foley, Highway program manager wrote that "In the interest of traveler safety, the Council decided that our current overlay project is the right opportunity to address the lack of appropriate barrier from the roadside hazards in this area. The Council's decision is primarily based on the continued prevalence of 'run off the road' accidents in Maine and the ever increasing occurrence of distracted driving."

Officers of the Moose Pond Association David Ehrman and Steve Cavicchi, attended meetings and actively corresponded with many officials at the Maine DOT to try to get some improvements in runoff management, safety and beautification to the causeway while the repaving is happening. Their efforts focused on installing better drainage to handle the runoff from the road, widening the road so the breakdown lane could be larger and adding parking at Sabattus Island to encourage those stopping to photograph and enjoy the scenery at the causeway to park well off of the road. They also proposed a bicycle lane and making the causeway a no-passing zone.

Despite their efforts and the many congenial emails back and forth, however, the DOT engineers and others explained that for various reasons, economic and scientific, the MPA ideas won't be floated.

Maine DOT Improving Route 302

The potholes and dirt shoulders of Route 302 will soon be a thing of the past. Starting this summer, a contractor hired by the Maine Department of Transportation will resurface one section of Route 302 and rebuild another.

The road will be reconstructed from Stanley Hill Road in Fryeburg to Stack Em Inn Road by Sportshaus. This involves digging up the existing pavement, installing 18 inches of gravel and six inches of pavement, according to Bob Carrell, DOT project manager.

Concurrently, four miles of Route 302 from Sweden Road (Route 93 intersection) to Stack Em Inn road will be re-paved, including the Moose Pond causeway.

The exact dates for starting the project and where it will begin and end will be determined at a pre-construction meeting with the contractor, Alvin J. Coleman & Son, Inc, of Conway, NH. A meeting date has not been yet been scheduled.

The two-year projects are due to be completed by June 16, 2017. Carrell said that as part of the specifications, the contractor is obliged to provide a Soil and Water Pollution Control Plan to the DOT. This will show the steps to be taken to protect the waters of Moose Pond, along with any other water bodies and streams around the roadway.

Bridgton's Maine Lake Science Center set to open

Exciting things are happening in Bridgton on behalf of our lakes and ponds. With the opening of the Maine Lake Science Center, lake protection will climb to a higher level.

Last August, the Board of Directors of Lakes Environmental Association purchased a 17-acre property adjacent to Pondicherry Park for the center. Site work was completed in November. By December, attention turned to the building—a former family cabin tucked into the woods.

Acting as CEO for the building project, LEA's Executive Director Peter Lowell has overseen the changes to the structure. The center offers a fifty-seat conference room, three researcher housing units, an education center, research lab and offices.

Lowell says, "Although the center is new, work on the concept has been underway for seven years, starting when LEA became concerned that Maine's lakes were not benefitting from advances in water quality testing and research. Staff visited several lake programs around the country and began to develop relationships and partnerships with Maine's academic community.

Two years ago, we formed the Lake Science Advisory Board, made up of lake researchers and experts from Maine to California. The board is a collaborative effort among researchers who are working together to identify research needs and priorities and to pursue research grants.

As we learned about new technologies and new tests, we began to expand our lake monitoring program to include temperature sensors, sediment analysis, algae research and even the hi-tech remote sensing buoy. This year, we have added a fluorometer to take field measurements of chlorophyll at various depths."

While various local contractors remodeled the building, the LEA staff and numerous volunteers, including board members, completed the menial tasks. The finished product will be a state-of-the-art facility. Dr. Bridie McGreavy, former educator of LEA, will serve as the center's first consulting executive director beginning in 2016.

The new Maine Lake Science Center is located adjacent to Pondicherry Park.

McGreavy is excited about the potential. "The Maine Lake Science Center will serve as a partnership hub for lake-related research at local, state, national, and eventually international scales," she says. "We intend to use sustainability science to help connect biophysical and social science with decision making about lake policy issues in many different contexts. We want to improve knowledge and education about lakes, and we also want to involve people in the science in ways that will improve the relevance, trust in, and use of science for many types of lake protection strategies."

The Moose Pond Association fully supports this endeavor and is excited about learning from additional testing procedures.

With the advent of the Maine Lake Science Center, the testing regime will be revamped. LEA's researcher, Amanda Pratt, has already been conducting new water quality tests, such as for the algae Gloeotrichia, that will develop a baseline of scientific data for Moose Pond. HOBO sensors are anchored in each basin, providing temperature readings every fifteen minutes. Combined with the data collected by LEA for the last 44 years, this current research will identify trends happening below the surface.

Once more researchers are working at the Maine Lake Science Center, it is hoped that we'll have a better handle on how to bring data and practice together to protect the Moose Pond and the other lakes in the region.

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