



LEA Lake News

Fall/Winter 2021-'22

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The Future of Our Lakes

Colin Holme

For almost two years now, it has felt as if LEA has been swept up in a fast-moving river. Instead of paddling in our own chosen direction, our focus has been navigating the rapids and keeping ourselves dry. I am not just referring to COVID-19, although that has certainly been part of it. I am talking about the development boom, rapidly spreading invasive species, polarized politics, warming lakes, and an exponentially growing demand for the work we do.

The specifics that are causing me anxiety at LEA might be different than what bothers you -- but I bet there are some similarities, and everyone I know seems concerned about the state of things.

Despite this gnawing apprehension, I have also witnessed a renewed urgency in protecting the environment, building our community, and supporting those in need. This is more than just a silver lining--it is the way forward.

Individual members and donors, just like you, have stepped forward to help us get through this turbulent time, and it has



Peabody Pond from Bald Pate Mountain

made a huge difference. In the summer months, we have over 60 employees. The majority are seasonal and check boats for aquatic hitchhikers, pull invasive milfoil, and help test the water in our lakes. But our waters exist year-round and so our monitoring, research, education, training, and land use programs run continuously under the direction of our year-round staff of nine.

Still, we struggle to keep up, and all our staff wear multiple and varied hats. Right now, every type of development is booming in the area. This field provides good

jobs and fuels local businesses. But when things happen quickly, particularly building and construction, shortcuts are often taken to speed projects up and cut costs. Stormwater and erosion controls are sometimes afterthoughts or only addressed on paper. Our planning and land use manager, Lauren Pickford, and I are continually reviewing projects that come before code officers and planning boards, but when the market is hot, it is difficult to keep up. Several planning boards in this area now contract with professional planners to aid with review, and this is extremely helpful but no substitute for a dedicated lake advocate like LEA. Additionally, landowners and code officers often turn to our staff to navigate shoreland zoning and land use laws. But the demand is more than we can support, and we have to make hard choices about where we focus our time and efforts.

With recreational boating flourishing, there is renewed urgency in helping to defend against aquatic invaders and a palpable need for more boater education. On Long Lake, we found invasive milfoil in several new locations this past summer, and this plant continues to pop up in the Songo River and Brandy Pond. We are able to control it in these waterbodies, but plant populations are more robust in other parts of Sebago Lake and Sebago Cove. For the last two years, approximately half of



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Maggie Welch - *Staff Researcher*
Mary Jewett - *Educator and Invasives Prevention*
Alyson Smith - *MLSC Center Manager*
Jenny O'Connor - *Office Manager*
Alanna Yanneli - *Conservation and Milfoil*
Lauren Pickford - *Planning and Land Use Manager*
Shannon Nelligan - *Educator and Field Technician*

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our milfoil control budget (\$100,000) has come from a single foundation grant. That funding is running out this year. Will lake-front landowners step in to help us keep this growing problem under control? The amount of money we need to make this program sustainable is similar to the cost of a lot of new boats today. Despite these boats selling faster than they can even arrive at the marina, we struggle to raise the funds. I hope that more people come to realize that boating is only a pleasure if the lake is clean.

On a lighter note, our education and training programs continue to be popular and well-attended. While we had to pause in-person and hands-on activities (which are our specialty) for a short while, we are back at it, with lots of built-in safety protocols. Hands-on, immersive learning is as old as humanity, effective, and fun, so we are going to continue to do as much of it as possible. But there is no denying the power of digital, and we continue to ply these waters to ensure our message reaches the largest audience possible. Whether in-person or virtual, the hardest part is distilling complex issues down to bite-sized chunks that can be absorbed by a society with little free time.

Even with uncertainty and volatility almost everywhere you turn, our water moni-

toring and research programs have only expanded. We are sampling on the lakes year-round, we just started a new five-year project to monitor loon productivity, and we utilize amazing advanced technology that allows us to measure nutrient concentrations at minute levels and count and document algae species. It's impressive and it is working. We have a better handle on lake water quality than ever before and a network of partners to help us disseminate our findings. When we have seen alarming trends, we have worked with lake associations to obtain large federal grants to fix problems in the watershed that are impacting water quality.

I am very proud of all of LEA's successes and, as a member and supporter, you should be too because you made it all happen. But that doesn't stop me from being deeply concerned about the future of our lakes, and we certainly have not won the battle. For that to happen, we are going to need many more people to join the effort and contribute. If a neighbor or friend needs a reason to join, have them take a look at the lakes to the south of us. Many of these waterbodies are green with algae and too many to count are packed with invasive plants and animals. In fact, that large grant for invasives control work that I mentioned earlier was from a foundation

whose representatives saw firsthand the devastating effect of milfoil on lakes in Massachusetts, and they had the foresight to recognize that we still have a fighting chance in Maine.



Loon Project Moves Forward

Maggie Welch

In 2003, an oil spill in Buzzards Bay, Massachusetts resulted in the death of a large number of loons. Those who survived continued their migration to inland waters, and many were documented in Maine. Even if they made it out of Buzzards Bay, their likelihood of survival and reproduction plummeted. Although loon populations have been slowly increasing since the early 1980's, infrequent oil spills combined with common occurrences like nesting site loss, nest disturbance, watercraft collision, fishing line entanglement, and lead poisoning threaten to undo progress made by past conservation efforts. To help mitigate the negative impacts from the Buzzards Bay oil spill, LEA recently began a collaborative 5-year-long project to establish an organized loon conservation effort. Through this project, we will quantify the success of artificial nest platforms on loon productivity, establish a volunteer loon monitoring network, provide education to help minimize watercraft

collisions, and set up lead fishing tackle exchanges.

After initially announcing the project, we were flooded with potential volunteers. If you are one of those generous people who expressed interest, thank you!

Over the summer we worked to establish field monitoring protocols, data collection methods, and internal infrastructure so we can accept, track, analyze, and organize a wide variety of information on individual loon popu-

lations. Now that the framework of this project is solidified, our attention has turned toward identifying sites for loon raft placement and teaching volunteers the methods we will use to gather and report data. Next spring we will begin systematically collecting data on local loons.

If you have any interest in helping with this project, please contact LEA's staff researcher Maggie Welch at maggie@mainelakes.org. Data collection and environmental observation begin this winter by noting ice-in dates.



A Bright New School Year

After a school year like no other, LEA is returning to a normal routine. Students in our area are back to school full-time, field trips are a go, and LEA instructors are permitted to teach inside, if necessary. In mid-October, LEA educators guided 6th and 7th graders through invasive plant

activities in Pondicherry Park. The goal was to help the students identify terrestrial invasive plants, and then give them the opportunity to release energy by pulling the plants out of the ground.

The Pondicherry field trip is great because it has multiple impacts on our community. First, the students learn valuable lessons about data collection, plant identification, and stewardship. Second, we have a very real problem with invasive plants in the park, and over the last three years, hundreds of preteens have worked tirelessly to eradicate them.

It's not perfect -- masks are required, but that is easy. We occasionally have to adjust schedules, due to students or teachers having to quarantine, but we are back to

seeing students face-to-face and getting them outside, which is a wonderful way to learn.



Mary out with students

Removing all the bittersweet!

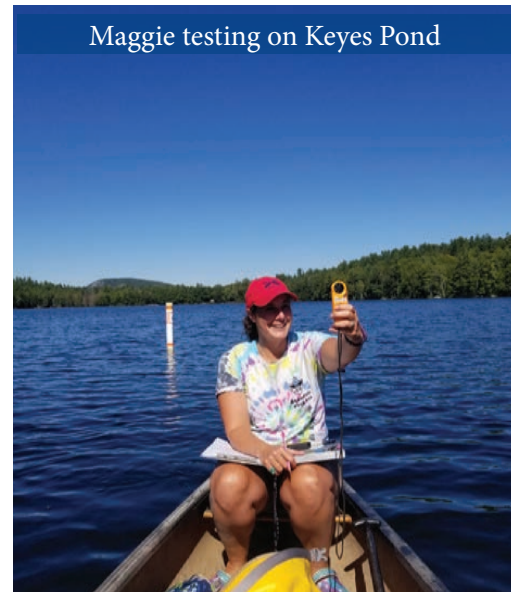
2021 Water Testing Highlights

The 2021 water testing season began in early May when staff researcher Maggie Welch and educator/field technician Shannon Nelligan (then lead intern) deployed LEA's high resolution temperature monitoring buoys while taking the first round of early season clarity readings. Our full complement of regular water testing activities began in mid-May, and we welcomed intern Erin Antosh to the team in June. The regular water testing season concluded in late September after the last clarity readings were taken. Our high resolution temperature buoys remained in place until November, when cooler temperatures had already turned over our lakes. Overall, waters were a little clearer than average early in the season during the drought but slightly less clear towards the end of the season, when we experienced more rain. Clarity tends to lessen with rainfall because storm runoff washes sediment from the ground into lakes. The sediment floats around in the water column, physically decreasing clarity until it settles out and also providing a food source for

algae, which can further decrease clarity. There were three distinct temperature peaks in the season, and these periods of warm water provided conditions conducive to algae growth. Many of the lakes within our service area saw high algae activity near the thermocline and at the surface. Multiple lakes had high densities of the cyanobacteria *gloeotrichia*, and we received several reports of skin and eye irritation during these periods. While it was not possible for us to determine if the *gloeotrichia* was responsible for these skin and eye irritations, it is known to cause dermatological problems. If you have sensitive skin, it is likely best to wear eye goggles and shower after swimming in waters when *gloeotrichia* is prevalent. An unusual *nostoc* (another type of cyanobacteria) bloom was reported along the shores of Highland Lake, and we confirmed its occurrence in the wetland at the Highland Research Forest. It was reported in other lakes outside of our service area this year as well.

As always, we are indebted to the many generous landowners who provide us access to the water and/or boats so that we can get out to our testing sites. We will be back on the water again once the lakes freeze over so please check our website and social media for our 2021 water monitoring reports (available mid-winter) and program updates.

Maggie testing on Keyes Pond



Interns Shannon Nelligan and Erin Antosh at Holt Pond Preserve

Trails, trails, trails!

Alanna Yannelli

Thanks to generous grants from the Davis Conservation and Maine Community Foundations, LEA staff and our dedicated friends have been improving the trails at the Highland Research Forest, along the Stevens Brook, at the Pinehaven Trail at the Maine Lake Science Center, and at the Holt Pond Preserve.

We have been busy building new skiable boardwalks and wider, smoother paths for cross-country skiing at the Highland Research Forest, and we've made new brochures, trail maps, and signs for the Research Forest kiosk and at the Holt Pond Preserve. Due to the incredible amount of traffic on the Pinehaven Trail, we again invested in the low elements challenge course. Our Holt Pond team spent time raising the boardwalks by installing plastic culverts under the walkway and building new boardwalk sections. Finally, keep an eye out for short trail re-routes at Holt Pond and the Research Forest.

Over the past few months, the Bridgton-Lake Region Rotary Club has stepped in to help maintain and steward the Pinehaven and Stevens Brook Trails. We're also partnering with the Rotary Club Bridgton Historical Society to offer cleanup walks and looking at possible future projects, like historic interpretive signage that highlights the rich mill

history of the Stevens Brook, with the Rotary and We continue to work with regular trail stewards at the Highland Research Forest and at Holt Pond Preserve, but we could still use some more hands and able bodies! (Contact alanna@mainelakes.org if you're interested.)

Local Boy Scout Camden Scorza re-created our animal print signs on the Pinehaven Trail with a webpage linked to species information. He also built infiltration steps over a steep section on the lower Stevens Brook Trail with construction materials donated by Hancock Lumber and P&K Sand and Gravel, and Hayes True Value.

Our board education committee has been working on a revised and updated Holt Pond Field Guide. This self-led walking guide covers some of the unique features seen while exploring the trails at Holt Pond and should be available next spring.

If you regularly use our trails, let us know what you think and please remember that all of our trail construction and upkeep is made possible by donations, grants and volunteers! Share your adventures with us on social media! @lakesenvironmental on facebook and Instagram, #pinehaven-trail, #holtpondpreserve, #highlandresearchforest



Rotary clean up



Volunteers and staff at the HRF

IRA RMD LEA NOW!

Charlie Tarbell, LEA Treasurer

Note: This is another in a series of articles around legacy funding for LEA.

If you have obtained the ripe old age of 70½ and find yourself in possession of an Individual Retirement Account (IRA) then the title of this piece will not be just alphabetical nonsense to you. Indeed, at age 70½, the tax laws require you to begin taking what the Internal Revenue Service (IRS) refers to as “required minimum distributions” (RMDs) from your IRA. These RMDs can be a source of welcome additional income for you and your family. However, if you have held off on taking distributions until 70½, RMDs might not be so welcome, as they are also taxed at your current marginal ordinary income tax rate. This is despite the fact that many “old” IRAs consist largely of the accumulation of long-term capital gains that would otherwise be taxed at 15%.

But there is good news. The owner of an IRA can contribute part or all of their annual RMD directly to LEA, and LEA will receive the entire face amount of the contribution, free from the tax burden that you would otherwise face. IRA RMD donations to LEA NOW (that is annually, as opposed to holding those amounts until your death to convey) are a way to help LEA continue to do their good work while at the same time avoiding the tax bite on your RMDs. RMD donations will also enlist you in the LEA Lakes Legacy League. Please consider LEA when you mull over what to do with your IRA RMDs. Financial advisors know just how to execute these donations. In addition, Colin or I would be happy to discuss the matter further with you.

Lake Ecology Course and Professional Trainings at the MLSC

Alyson Smith

This past July, LEA again offered our Lake Ecology course for high school students. With field trips to Long Lake, Stevens Brook, and the Holt Pond Preserve, attendees examined lake, stream, forest, and wetland ecosystems. This three-day exploration in watershed science gave students hands-on experience with environmental monitoring and research. Lab analyses of field samples at the Maine Lake Science Center allowed for further investigation and data-driven discoveries in limnology and human impacts on lakes and their watersheds.

Student feedback:

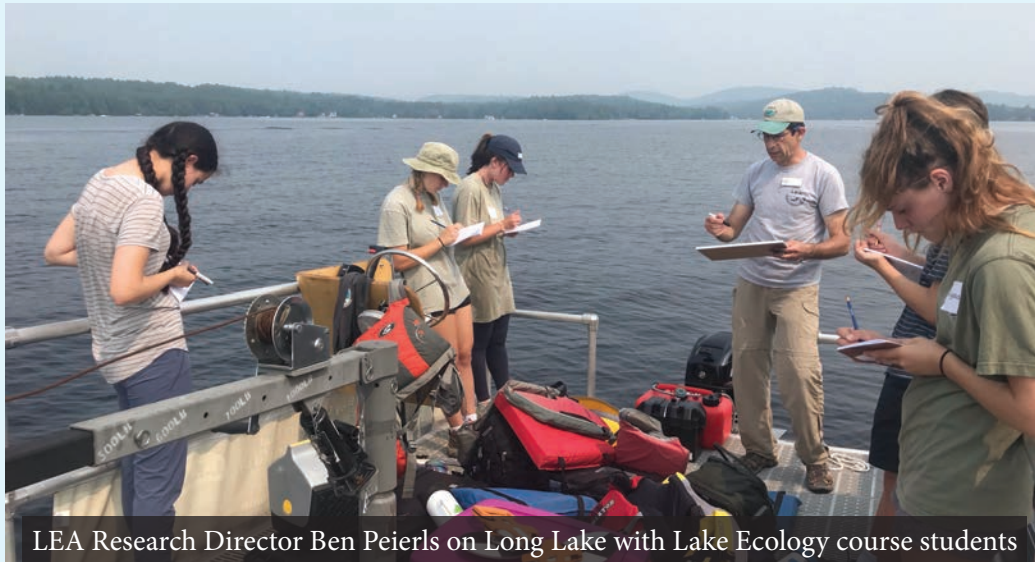
I learned more about the impact I cause on my environment with the hands-on approach, and the way we learned things made it much more memorable and fun. (Fiona)

I definitely benefitted from the outdoor and experiential approach. I had learned about a lot of the concepts we covered in a classroom, but I had never seen the application of these concepts in the field and the lab. (Maya)

My favorite parts of this course were when we did the sampling and BMIs

[benthic macroinvertebrates] catching ourselves then brought it back to the science center and break it down into data which I have seen before in school. It was really cool because I was able to understand the real stuff that goes on behind the data and numbers. I can find out where it all starts and where it comes from. (Laura)

Some of my favorite parts of this course were when we were out in the field testing water and gathering BMIs. I liked when we walked through woods and wetlands and learned about plants and other things. (Everett)



LEA Research Director Ben Peierls on Long Lake with Lake Ecology course students



Lake Ecology student collecting BMIs

Three Maine Department of Environmental Protection contractor certification trainings took place at the Maine Lake Science Center this past spring and summer. Participants learned why erosion control practices

are important, how to properly install and maintain conservation practices, and learned about regulations aimed at protecting water quality.

More contractor certification trainings will take place this fall, winter, and next spring, including courses geared for landscapers and homeowners.

If you or someone you know is interested in signing up for next year's Lake Ecology course or any of these trainings, please contact Alyson at alyson@mainelakes.org.



Learning erosion control at MLSC

Did you know that excavation and landscape contractors need to be certified by the Maine Department of Environmental Protection to work in the shoreland zone? Is your contractor certified? You can check here: <https://www.maine.gov/dep/land/training/ccec.html>.

Coming Through for Milfoil Removal

Alanna Yannelli

When I started working at LEA six years ago, Peter Lowell sent me out to see our milfoil crew in action to better understand what it was all about. I met the three-person crew on a lovely September morning and kayaked around looking for fragments and plants as two divers swam and one attended the harvester.

It seems like only a short while ago, but things have changed a lot in the last six years. The threat of invasive aquatic species has only grown, and in response, we have increased the size of our control crew and the scope and area of our work.

This past year, we had 19 crew members on four boats working in Sebago Lake, Sebago Cove, the Northwest River, the Songo River, Brandy Pond, and Long Lake. This was made possible by funding from members, shoreline owners, and the second year of a large grant from a private foundation. In addition, generous land-owners provided needed dock space and headquarters for each operation.

For many seasons now, Drew and Dottie Betz graciously shared a strategically-situated peninsula near Sebago State Park with our crew. This point of land is central to our work areas and allows us easy access to Sebago Cove, the Songo and Northwest Rivers, and Frye Island. It is an ideal

space to build and rebuild the 20 by 30 foot benthic barriers (thick plastic sheeting interwoven with rebar that is laid to smother milfoil). It is a spot that is dear to our hearts and has been vital to the success of our milfoil program in the Songo River, and we couldn't be more grateful to be able to use it.

Along the Northwest River we've been taken in by Joe and Lynn Borst. They provided parking, a dock, and gear space that allowed us to do an incredible amount of work in the Northwest River over the past two years. This year, we laid benthic barriers to cover over 66,000 square feet of monoculture milfoil patches and harvested nearly 400 bags of this nuisance plant in the Northwest River alone. The Borsts also bought "I donated to stop invasive aquatic plants" stickers for every member of their road association to proudly display on their non-motorized watercraft. We are lucky to be able to interact with such kind and thoughtful folks!

Sebago Cove saw an enormous amount of work done this year with many waterfront owners directly supporting milfoil removal. With the help of Sebago Cove Estates, we were able to dock in the Cove, saving daily travel time and allowing us to attend to the work at hand.



LEA diver, Spencer, with milfoil

Also helpful were Cove landowners Charlie McIntyre and Joann Brown, who rallied neighbors to work together. All this teamwork resulted in over 675 bags of milfoil removed and another 60,000 square feet of this invader smothered with benthic barriers.

The busy Songo River continues to keep us on our toes (or flippers). Despite having a crew working there all summer, we still were finding and removing rogue patches of milfoil late into September. We cannot stress enough that boating through milfoil chops and spreads it. We've worked exceptionally long and hard to keep the main channel in the Songo clear, but boating into lagoons and coves can sometimes lead you right to a milfoil patch! We need your help to literally steer clear of plant patches, raise your propeller as needed, and leave the lagoons and coves be. Please explore these areas via canoe!

With more new boaters and more boaters visiting from farther away, the threat of invaders continues to increase, but our Courtesy Boat Inspectors continue to routinely pick off plants before they enter our waterways. Ultimately, however, it is up to each of us to check our boats, propellers, and trailers and safely drain and dry any bilge tanks before launching to a new waterbody. If we are going to succeed, we need everyone on-board!



LEA diver, Morgan, on milfoil mountain

Notes From the Lab Bench

Ben Peierls

The LEA Lake Science Center laboratory was humming again this year with more instruments, more samples, and more questions.

Credit for most of the analytical “heavy lifting” of summer 2021 goes to lab intern Hanna Holden. A biochemistry major and star volleyball player at St. Joseph’s College of Maine and hailing from Stoughton, MA, she came to us highly recommended by her professor, Dr. Emily Leshner. Within two weeks, Hanna learned the multi-step protocols and high-tech instrumentation and began running samples.

Measuring lake water phosphorus—a key water quality indicator—was our primary objective again this year. With Hanna’s help, we perfected the operating procedures, and we conducted more parallel sample comparisons with the state laboratory. Our state-of-the-art autoanalyzer continued to perform very well with good repeatability and low detection limits; we reliably detected phosphorus concentrations less than one part per billion (ppb), or the

equivalent of one teaspoon out of 1.3 million gallons of water.

Even so, a few measurements differed from state laboratory values by as much as eight ppb, a difference close to typical lake concentrations. In response, we re-examined our protocols and performed several different field and laboratory subsampling tests. So far it seems the inclusion of random, large, phosphorus-containing particles (a tiny animal, for example) in a subsample could occasionally impact our measurements. This fall and winter we will work to settle this question and improve our confidence in this important analysis.

On top of over 500 samples analyzed for phosphorus, Hanna extracted and analyzed almost 150 samples for chlorophyll *a* (another critical water quality indicator). So far, our measurements agree with the state-run values to within about one ppb—very good given that values typically range less than ten ppb and we were using a fluorescence-based method different from what the state lab uses.

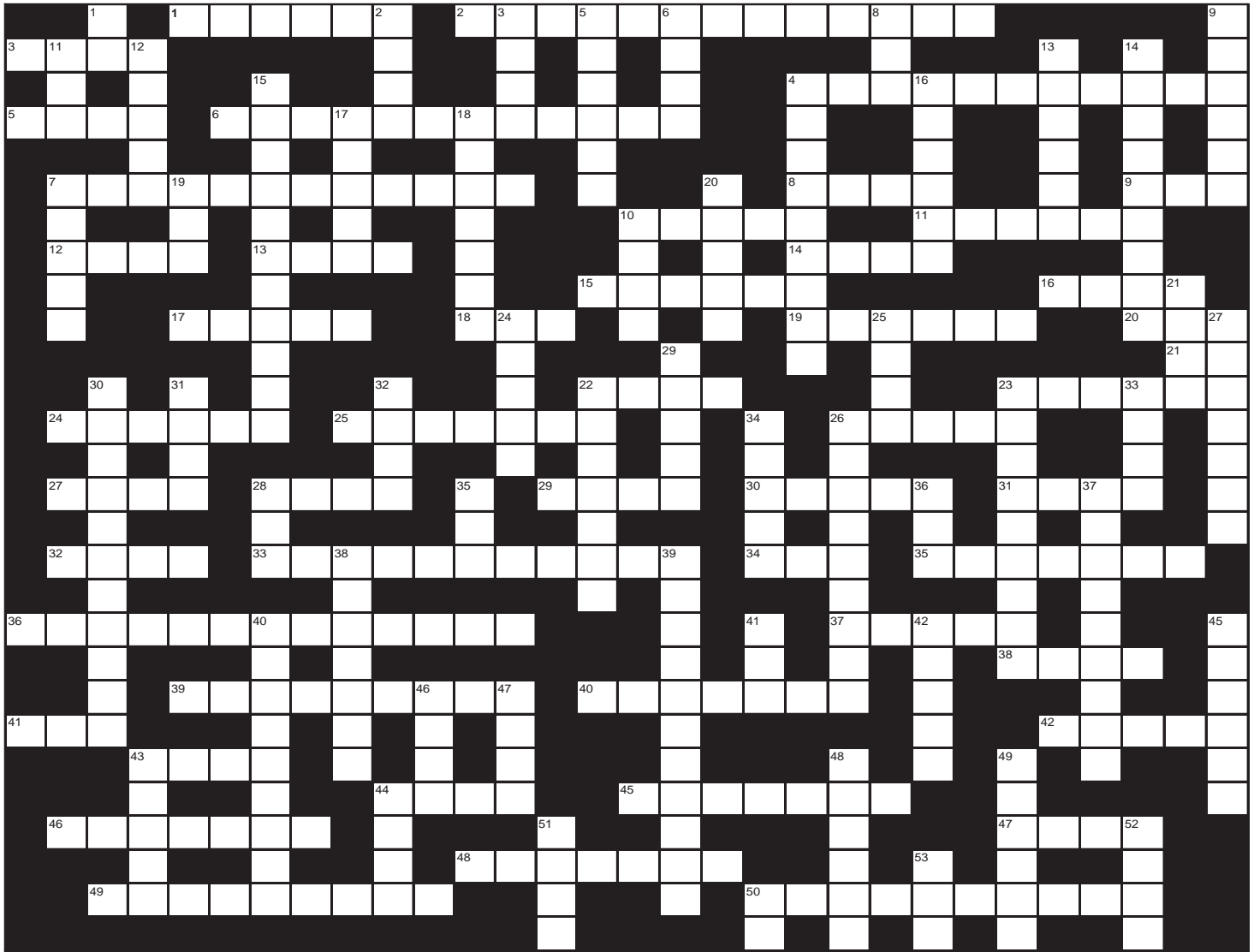
While we have demonstrated that we can analyze our own phosphorus and chlorophyll *a* samples, we still need accreditation in order to share that data with Maine DEP for their lake management activities. The accreditation process includes developing a quality system, creating a quality assurance manual with all procedures, doing proficiency testing for each analysis, and getting the laboratory inspected. With luck, we will have this in place before next season.

We also continued to put our new FlowCam to use this summer. In case you missed the last issue, the FlowCam is a specialized instrument that uses image analysis to do automated counting and characterizing of algae in lake water samples. We collected data from dozens of lake water samples, which provided good practice in basic machine operation. With Maggie’s newly acquired algal identification training, we can now move on to training the FlowCam software to better identify and monitor algae, including potential harmful species, in our lakes.



Lab intern Hanna, running the autoanalyzer

Crossword Puzzle



Across

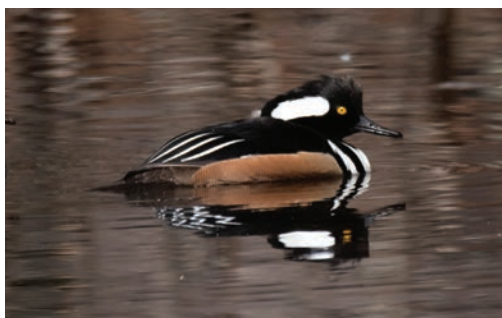
- | | | |
|---|--|---|
| 1 Day when many weekenders arrive in Maine | 18 Testing equipment manufacturer Yellow Springs Incorporated | 34 To be victorious in a contest |
| 2 Blue-green algae | 19 Synonym for fall | 35 Tea-colored lakes have a lot of natural ____ |
| 3 We all must play a _____ to keep our lakes clean. | 20 The Maine Lake Science Center houses our wet ____ | 36 Invasive aquatic plant with sharp-barbed fruits |
| 4 66-acre preserve in downtown Bridgton | 21 3.14159265359 | 37 Micro____. Used for magnification |
| 5 It turns out COVID-19 wasn't one | 22 Good lake condition for kayaking, bad for sailing | 38 A poorly maintained camp road has ____ in the spring. |
| 6 The variety of species in an ecosystem | 23 Annual LEA supporter | 39 "Who cooks for you, who cooks for you allll?" |
| 7 Vapor turning into a liquid | 24 Back, Middle, Mud, Little Mud, and ____ Pond | 40 Invasive insect recently discovered in Bridgton ash trees |
| 8 Snake-like fish | 25 Winding curve or bend in a river | 41 Peat-accumulating wetland, like Holt Pond |
| 9 Bring this to the lake | 26 A reproductive cell created by fungi and ferns | 42 Brookies are a type of _____ |
| 10 When the lake freezes over | 27 Another name for a thin coating of algae on your boat | 43 Gulf of Maine Research Institute |
| 11 A group of loons | 28 Decaying vegetation found in a bog | 44 LEA works to conserve this bird |
| 12 The shore, or the water's _____ | 29 Left side of the boat | 45 Instrument that uses microscopic image analysis of water samples |
| 13 Long, Highland, and Sebago | 30 Shade of orange worn during hunting season | 46 Water wears away land |
| 14 Metal sticking out of a wooden dock that you don't want to step on | 31 Likely needed at boat launches to lakes with lots of invaders | 47 An amphibian |
| 15 A disk used to measure water clarity | 32 A raised barrier, often used to control water | 48 A body of permeable rock which can contain groundwater |
| 16 Loon Echo Land Trust | 33 Member of the sunfish family with red-orange spot on ear flap | 49 Water is able to pass through |
| 17 When it's ____ there is low visibility for boating | | 50 A nutrient that can feed algae |

Crossword Clues

Down

- 1 Infrared
- 2 Mythical northern creature purported to inhabit Holt Pond; also a brand of fancy coolers
- 3 365 days
- 4 Flowers that return every year
- 5 New to the something
- 6 It floats and instruments below collect data
- 7 A partnership of organizations, Sebago ____ Waters
- 8 ____ a sample (nothing to do with jogging)
- 9 Start "hatching" from its water-larva state starting in May
- 10 The middle of the month
- 11 Long ____ this area was covered by a glacier
- 12 Poison
- 13 A tool used for gardening
- 14 A mill for grinding grain
- 15 A person who studies inland waters (lakes, rivers, streams, etc.)
- 16 An unpaired fin on a fish's back
- 17 They ____ a beer made with Sebago Lake water.
- 18 Study of the relationships between living organisms
- 19 A female deer
- 20 ____ and quiet can be found at the lake
- 21 ____ worm or something used for measuring
- 22 38-mile river that originates in Bethel
- 23 Red-breasted, hooded, and common
- 24 Multiparameter probe that LEA uses, name comes from French "sounding line"
- 25 Mainer way of covering boat, house, car, ATV, motorcycle, etc.; also used to kill milfoil
- 26 Bizarre "spaghetti-faced" mole burrows through mud or snow
- 27 A hobby common to many naturalists
- 28 Baby dog
- 29 Nautical hardware that is used to secure a line
- 30 Wetland ____ is a process that determines which parts of the landscape are wetlands.
- 31 Where you steer the boat from
- 32 Chemical used to fend off insects
- 33 What you are waiting for when you are fishing
- 34 A crescent-shaped lake formed in the abandoned channel
- 35 Courtesy Boat Inspector
- 36 Eastern newt life stage between aquatic and adult. Red ____
- 37 A small stream that flows into a larger stream
- 38 Widespread invasive animal: the chinese ____ snail
- 39 Related to dragonflies, distinguished by wings folded when resting
- 40 An organism that gains energy only from plants
- 41 Your favorite lake association
- 42 Salty waterbody
- 43 Web-footed long-necked migratory aquatic bird
- 44 You were sailing, then this happened and now you are just floating
- 45 A type of cyanobacteria (see page 5)
- 46 Norwegian City near many lakes
- 47 Lakes like less ____
- 48 Crooked River is their spawning habitat
- 49 Positively charged ion
- 50 Scale measuring acidity or basicity
- 51 Natural layer of fallen leaves and pine needles
- 52 Gravel roads can lose as much as 1/2 inch of surface material per year via this
- 53 Parts per billion

Crossword Hints



Pop-up Walks

Are you craving a walk in the woods? Would you like to meet new people and explore LEA's hiking trails? If so, please join our pop-up walks email list. We started offering pop-up walks last winter, which allowed us to take advantage of the best weather and trail conditions. Previously, we had set up a calendar of walks months ahead, only to face rain, blizzards, and extreme cold or ice on some of the dates scheduled.

With pop-up events, we look at the weather forecast for the coming week and determine which day will be the best to go out. We then reach out to a list of people interested in attending. Sometimes the walks are themed, like wildflowers, spring birds, or animal tracking in the winter. Other times we simply lead a group walk through the woods and the focus will depend on the interests of those attending.

If you would like to sign up for our pop-up walks, please email mary@mainelakes.org or sign up online at mainelakes.org/events-calendar/sign-up/. We try to host walks to the Holt Pond Preserve or the Highland Research Forest every 2-3 weeks, and we'd love to see you there!



Fall pop-up at Holt Pond

Visit mainelakes.org for game solutions.

Buoy Business

Ben Peierls

In a recent email, long-time LEA member Tom Rosen remarked on how warm Long Lake seemed during October. He had been checking the buoy temperature data that is on our website, and he was curious as to how this year compared with others. I sent him plots of past data, but a simpler visualization of the differences between years was in order. I generated a plot (see image) that shows daily mean near-surface temperature for each year the Long Lake buoy has been deployed.

October 2021 was definitely one of the warmer on record by as much as 5 °F. Looking back over the year, however, temperatures were about average for September, below average for July and early August, and quite warm for early June. This pattern occurred because water temperature responds very closely to local weather conditions. Each year of buoy data gives us highly detailed information about lake stratification (layering) and mixing.

Continuous buoy data over multiple years allows us to track the influence of climate and climate change on our service area lakes.

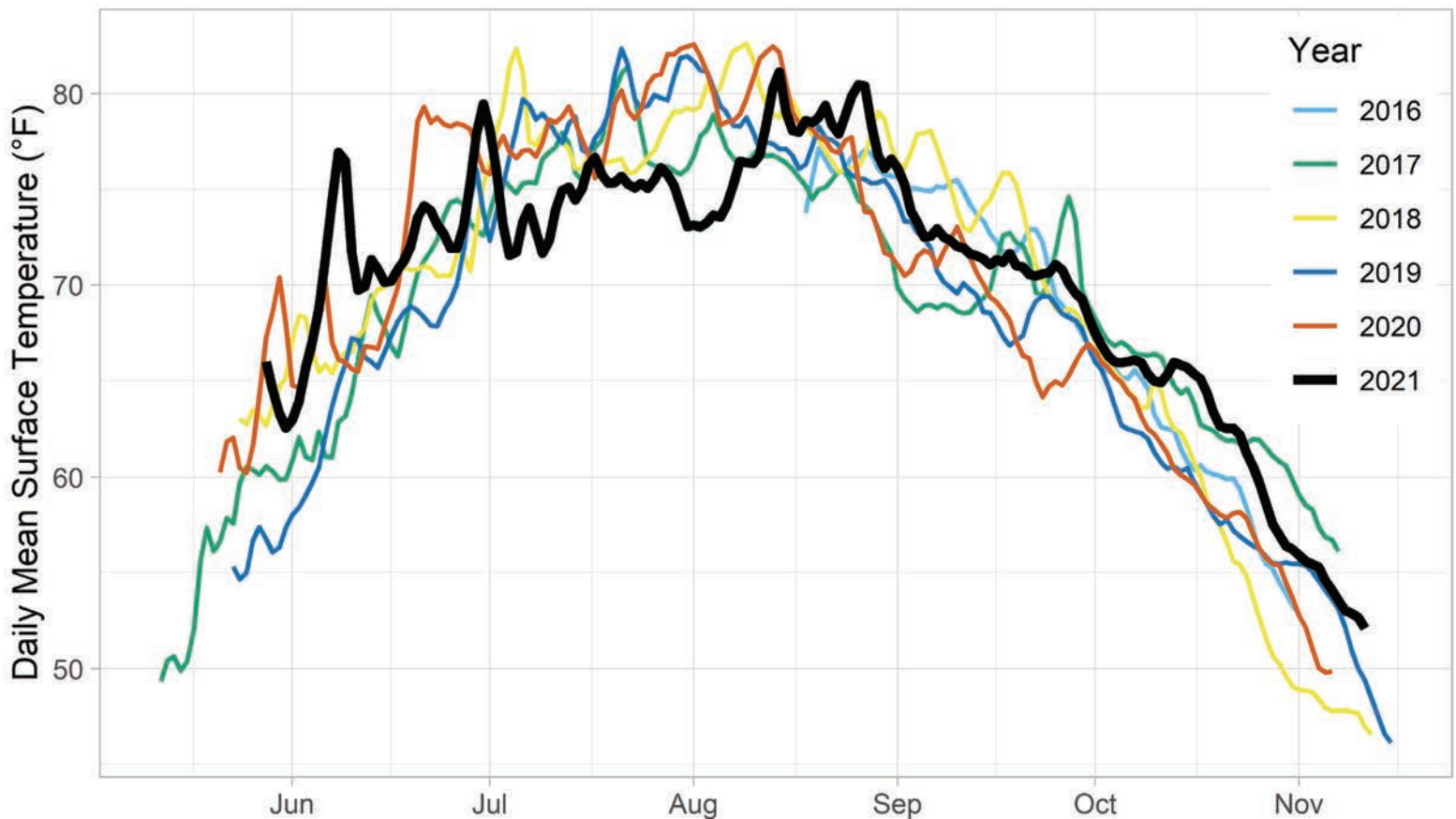
We now have seven (Highland Lake) and five and a half (Long Lake) years of automated buoy data. This is an amazing record, although that is still short when it comes to long-term trends in water quality. On the other hand, that amount of time is long when it comes to equipment technology and durability. Some of the buoy electronics are no longer available and several sensors have succumbed to the harsh conditions of 24/7 lake deployment. Since we would really like get many more years of data, we are planning to move forward on much-needed upgrades and replacements.

One upgrade to our buoy system that did happen this year was on our custom pontoon boat. Thanks to support from Steve and Dorothy Gilman and installation

help from RPM Marine Service, Great Northern Docks, and Martin's Propeller Repair, we now have an up-to-date 30 HP outboard with remote controls securely mounted on the boat. This upgrade means more rapid and reliable transportation to and from the buoy sites. In addition to buoy work, this boat provided the perfect platform for Lake School class activities and was even used for invasive plant surveys; it has become quite the valuable member of our fleet.



Long Lake-North Buoy



Partners in Protecting Trickey Pond

Colin Holme

Trickey Pond in Naples is one of the clearest lakes in the state of Maine. Our staff and interns who do bi-weekly water quality monitoring measure the clarity using a simple device called a Secchi disk. This disk is an eight-inch black and white paneled circular plate that is lowered straight down into the water and viewed from the surface through a scope. The deeper you can see it in the water, the clearer the lake. The average Secchi disk reading for all lakes monitored in the State of Maine is around 16 feet deep. The long-term Secchi average on Trickey Pond is about 33 feet. But lately, that number has been declining. The average reading in 2020 was 30 feet; in 2021 it was 32 feet.

Declines in water clarity can be caused by several factors. In this case, the two most likely culprits are increasing algae concentrations and/or more particulate matter in the water column. Our water monitoring has revealed that there is an increasing trend in chlorophyll concentrations over time in Trickey Pond. Chlorophyll is the green pigment in all plants and is an indicator of the amount of algae in the water. There is also likely more particulate matter in the pond from runoff and increased boat traffic (which can churn up bottom sediments and plants).

While LEA has been working with local representatives, agencies, and lake associations state-wide to increase environmental awareness around boating, we have also been partnering with the Trickey Pond Environmental Protection Association (TPEPA) and landowners in the watershed to address stormwater problems that were identified in a recent erosion survey. This past summer, LEA provided funding and designs to correct ero-

sion problems at three sites adjacent to Trickey Pond Road and two sites at Camp Skylemar. While we played an important role, TPEPA was instrumental in working with the road association and finding contractors. At Skylemar, the camp owners were able to install the recommended conservation practices with their own equipment and staff.

These improvements are a fantastic

start, and there is even more good news for Trickey Pond. With the help of Cumberland County Soil and Water Conservation District, TPEPA recently applied for and has been awarded a large federal clean water act grant to fix more problems in the watershed. LEA is looking forward to working with both groups next year to help retain and improve Trickey Pond's phenomenal water quality.



Newly installed rubber runoff divider

Transitioning from intern to full-time staff

Shannon Nelligan

For the past three summers I have been working for LEA as a water testing intern, traveling from lake to lake, collecting and analyzing water samples. Throughout this time, I have learned about water quality and the importance of keeping our lakes clean, as well as how they are connected to our community and economy. It has been a great experience, and in September I was offered a year-round position at LEA. While I will continue water testing, I will also be teaching in the schools and offering walks, hikes, and talks for the public.

Going forward as a field technician and educator, I am excited to continue to learn from the community, teach about

the Lake Region's resources and wildlife, and guide others as they explore our interconnected waters.





Woodland Owner Appreciation Day

Alanna Yannelli

LEA's focus is protecting water quality and forested watersheds are our biggest ally. Without woodlands surrounding our lakes, shading feeder streams, and holding soil in place, our work would be much more difficult.

Our service area, and much of Maine, is under incredible developmental pressure. This has been especially true for the last two years. We know that haphazard growth can greatly impact lakes and streams so we've been reaching out to landowners to share information and resources to keep woodlands intact.

We've partnered with the Portland Water District (which provides drinking water to over 200,000 Mainers from Sebago Lake) and local resource professionals to host a day to thank property owners of ten or more forested acres. We want landowners to have the resources needed to continue to connect with and manage their land sustainably, both environmentally and economically.

This October, we gathered at a local Tree Farm in Naples owned and managed by the Chaplin Family (hence the name of nearby Chaplin's Mill Road). Professionals from a wide variety of organizations discussed managing land for long-term pine growth, wildlife biodiversity, and resiliency from changing climate, as well as providing sustainable income.

One participant stated, "It was wonderful to meet other landowners who have similar goals for their woods and the resource organizations available to help meet those goals." It was only part of a day together, but we were happy to

introduce landowners to professionals with a wide range of expertise in all aspects of woodland management.

A huge thank you to our partners:



If you're interested in learning more about your woods, a great first step is contacting your district forester. These experts, who are different from private foresters, work for the Maine Forest Service and can walk your land with you and talk about your goals. Please contact alanna@mainelakes.org if you have other questions and we'll connect you with a local resource professional.



Let the stream act like a stream

Lauren Pickford

Our clean lakes, ponds, streams, and rivers are unique, making Maine one of the last strongholds in the United States for landlocked salmon and native brook trout. Still, hundreds of miles of high quality habitat have been off limits for these fish in our area because of undersized or poorly constructed road crossings. To help remedy this issue, LEA just embarked on a five-year project stemming from a United States Department of Agriculture grant to find and fix road crossings that are negatively impacting our streams and the fish that live within them.

In the coming months, we will be working with landowners and municipalities to reconnect fragmented waterways and install stream crossings that are less likely to flood. This can mean replacing an undersized pipe with a larger open bottom culvert, using a bridge instead of a culvert, or removing an unused dam and allowing the stream to return to its natural state. While the solution for each project will vary depending on the site, the principle idea is the same: allow the stream to act as a stream.

Most old culverts were installed with only road infrastructure in mind. Fish and other species that called the stream home were not usually thought of during construction. However, today we know better and an open bottom culvert with stream banks can provide safe passage for fish and animals that would otherwise go up over the road. We've seen tracks of minks, raccoons, foxes, and even the neighbor's cat on these banks!

Not only do these culverts protect and support wildlife, but they also benefit people. Crossings designed to meet StreamSmart standards (which we will be using) prevent flooding by having the capacity to allow higher flows during storms, and they also have an extended lifespan of 50-75 years. Although a larger investment initially, a properly sized open bottom culvert can save landowners and taxpayers money in the long run.

With our partners at Sebago Clean Waters, LEA has already identified a handful of sites that are flood-prone and blocking miles of stream habitat for native brook trout and other species. This fall, we began collecting data on a couple crossings that we are hoping to restore in 2022. Both of these priority streams are tributaries of the Crooked River, which has a wild population of brook trout and smelts and provides nearly all of the spawning habitat for the landlocked salmon in Sebago Lake.

Next time you are replacing a culvert on your property, ask yourself if it could be a stream. Fish can survive in surprisingly shallow streams and water levels vary seasonally. Intermittent streams are important spawning habitats for fish and other aquatic life. If you are thinking of installing or upgrading a stream crossing, consider building it to StreamSmart standards, or give LEA a call to find out what might work best for both the stream and your road or driveway.



LEA partners Alex Abbot and Hadley Couraud measure stream features



Perfect candidate for an upgrade!



Stream with properly sized crossing
Photo: Alex Abbott



Lakes Environmental Association
230 Main Street
Bridgton, Maine 04009



Message from our President

Dear Members and Friends,

I recently arrived in California to visit family. This is a state where water is very much on everyone's mind, whether it's the drought and its parched landscape which fuels wildfires, a loss of water clarity in Lake Tahoe, or algae in the Salton Sea. All this has gotten me thinking about the importance of proper land management and its relationship to water. While climate change has exacerbated many of these problems, good land management practices can help lessen its impact.

Many landowners in Maine rely on their forests as a source of income, logging on a regular basis. We are blessed to have abundant forests in Maine, but that doesn't mean we can afford to be careless with them. Clearcutting and poor forestry practices can be a vector for sediments to get into our lakes and rivers. This in turn causes water clarity issues and increases the likelihood of nutrient overload. But long-term forest management can also be beneficial to water quality, and that is why we have added sustainable forestry to our roster of education programs. LEA recognizes the economic importance of woodlots. This fall, we partnered with other organizations to host the third annual Woodland Owner Appreciation Day, a free event focused on forest management. If you missed it this year, I hope you will plan to attend in 2022. By stewarding our forests with care, we can retain the natural beauty of the land, essential habitat for wildlife, and the high quality of the water in our lakes and rivers.

I encourage you to visit our website and follow us on Facebook, Instagram and YouTube. You can link from the website to our very first professionally-produced video. I find it quite inspiring! 2021 was a big summer for invasives, and we've seen some invaders move into new areas. You can find photos of invasive aquatics as well as some great underwater footage of our divers removing them on our Facebook page and website.

In August we were happy to have an outdoors, in-person annual meeting at beautiful Camp Skylemar and were treated by them to a wonderful cookout dinner. Thank you to Camp Skylemar and all who attended. It was much more fun than last year's Zoom meeting!

The staff has been working hard on boardwalks at the Holt Pond Preserve and the Highland Research Forest, just in time for the beautiful fall foliage and winter cross-country skiing. I hope you will have a chance to visit on your own or take a guided nature walk with one of our staff members. Please notify the office if you want to be put on the list for our winter walks and snowshoe hikes. There is always something new to learn at LEA, so please stay in touch. As always, you, our members, are the heart of our organization and I thank you for your support.

Best wishes for the holiday season ahead,

Lydia Landesberg, board president