# LEA Lake News

## Spring/Summer 2021

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# Cutting Confusion on the Shoreline

Colin Holme, Executive Director

For the past few years I have been co-teaching a course for real estate agents on maintaining the market value of lakefront properties. It is a fun class filled with lots of information on lakes, waterfront property values, and the regulations that pertain to owning property on the water. During the course, I ask a series of questions to gauge attendees' awareness of lakefront regulations. They start off easy, but soon I get into questions regarding actual setback and cutting standards. This is when answers diverge and it becomes obvious that some of the agents, who are usually quite savvy when it comes to zoning, are unsure about some important waterfront laws. From my own experience, I think most waterfront landowners are in the same boat.

Because of the confusion around tree and shrub cutting on the water, I am going to devote the rest of this article to a couple important standards that every lakefront landowner should know.

If the lot is natural, everything under three feet in height is protected and needs to remain untouched within 100 feet of the lake. The one exception is for a six-foot-wide, winding footpath to the water. You cannot cut or remove shrubs, bushes, small trees, ferns, or any vegetation under three feet in height. This protection also includes leaving the "duff layer" (pine needles and leaves that sit on the ground). This vegetation and the spongy forest floor are what absorb and filter stormwater before it goes into the lake; they also provide habitat and refuge for a wide variety of species. If your lot is partially or fully developed, you are allowed to maintain what was developed legally before the regulations were adopted (lawn or other cleared areas, for example), but you cannot enlarge any existing "non-conforming" areas.

To allow for more flexibility, the standards regarding trees are more complex. Within 100 feet of the water, tree removal is regulated by a "point system". This system gives a numeric rating for each tree based on trunk diameter. To summarize, larger trees are worth more points and you need to maintain a certain amount of points in each designated grid within 100 feet. Thus, if you have a lot of trees, you can remove some. If you have few trees, then cutting is not usually an option. Additionally, you can't open up a large hole in the canopy. In this case, "large" is defined as an opening greater than 250 square feet (about 16 feet by 16 feet). This is hard to visualize but if you keep the canopy largely intact, you should have no problem meeting this standard. Neither of these rules apply to dead trees within the 100-foot zone – those can come out. To improve your view, you are also allowed to trim (or "limb") up a tree 1/3 of its total height. This "limbing" can only be done on the bottom portion of the tree. Dead branches above this height limitation can be removed. The tree cutting regulations are, admittedly, a little confusing. If you have questions, I recommend looking over the "Clearing or Removal of Vegetation" standards in your town's shoreland zoning ordinance. It is usually "Section 15. P". It is also a good idea to call your local code officer before you start. Lastly, and likely most importantly, hire a professional if you are unsure. A licensed arborist or forester can guide you through the process and help you avoid penalties and costly re-vegetation plans.

Whatever you choose to do, remember that vegetation helps keep our lakes clean and the rules are there to protect the narrow strip of land that serves as a last line of defense for water quality. Like a good carpenter who measures twice and cuts once, take the time to make sure you are doing it right the first time. Cutting a tree only takes a couple minutes but it take a lifetime for a tree to grow back.




230 Main Street
Bridgton, Maine 04009
207-647-8580
www.mainelakes.org

# Lake Ecology course and professional trainings at the MLSC

Alyson Smith, MLSC Manager

While we made it through 2020 with Zoom presentations and small in-person classes, it certainly was a bumpy ride. Like others, we have been easing back into a more robust schedule of offerings and LEA's Lake School courses, classes, and trainings are moving forward at full throttle!

For contractors, we are offering three in-person certification trainings this year. At these courses, participants learn why erosion control practices are important, how to properly install and maintain good erosion and sediment control, and the regulations around our lakes, ponds, rivers and streams.

In partnership with Maine Lakes (Society), Portland Water District, and Eaton Peabody Attorneys at Law, LEA offered three real estate continuing education classes this spring. This accredited course focuses on maintaining the value of lakefront property and the vital role that real estate agents play in relaying information about lakes to new property owners.

In May, LEA hosted a Beginning with Habitat presentation, which is a program designed to help municipal officials, landowners, and land trusts incorporate known, valuable habitat into conservation, planning, and development projects. The goal of this program is to maintain sufficient habitat to support all native plant and animal species currently breeding in the state.

Our three-day, immersive Lake Ecology course for high school students will take place July 20th - 22nd. During this course, students will explore lake, forest, and wetland ecosystems and gain a comprehensive understanding of watershed science. Through field trips, lab analyses, and data-driven discovery, attendees will dig into a variety of concepts in basic limnology and the impact humans have on lakes and our freshwaters. This class is taught by LEA's Science Center Research Director Dr. Ben Peierls, Staff Researcher Maggie Welch, and Educator/naturalist Mary Jewett. At press time, the class was full, but we do have a waiting list.

If you have questions about any of these trainings or LEA's Lake Ecology course, please contact Alyson at alyson@mainelakes.org.

*IF&W's Amanda Cross presenting at the MLSC this Spring*

# New trails at the Highland Research Forest

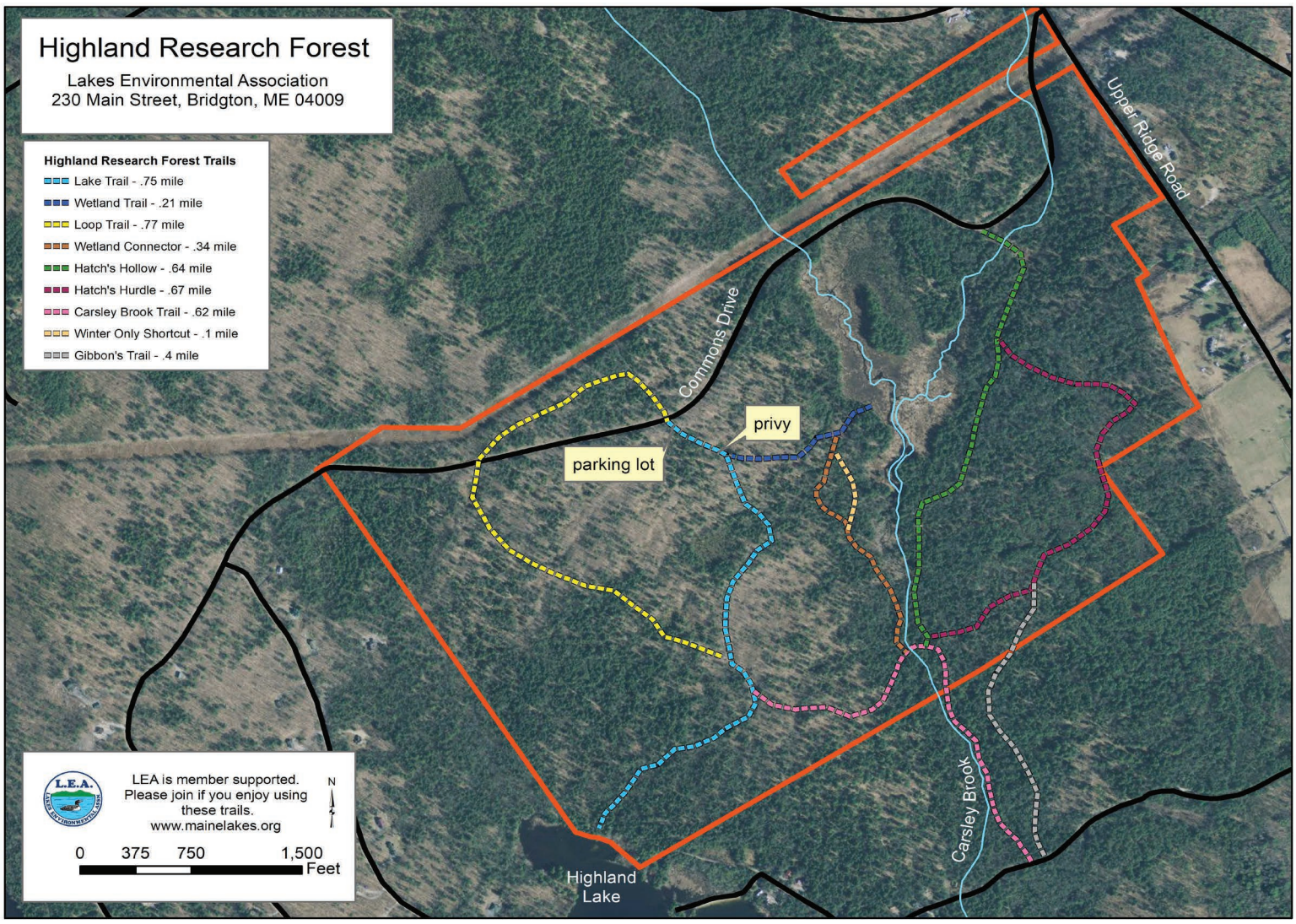
Alanna Doughty, Education Director and Milfoil Control

Working and schooling from home has offered many of us both opportunity and incentive to get out onto the local trails. Because of this, we've seen an astounding increase in trail use over the past year at the LEA preserves and the Pinehaven Trail at the Maine Lake Science Center. This amplified use led us to team up with Roger Lowell to lay out and develop new trails at the Highland Research Forest.

For years, Roger has worked with numerous landowners to create and maintain an extensive cross country trail network from Middle Ridge in Bridgton out to the Highlands Country Club, Dragonfly Barn, and now the Highland Research Forest. Joining our existing trails at the research forest to another large, interconnected trail system that has rapidly grown under Roger's watch seemed like a win-win for everyone. After laying out the trails with us this past winter, Roger quickly went to work with a team that included former LEA board member Dan Richardson, long-time supporter and Paddle Battle champion Brooke Sulloway, and several others to clear and build the network.

While this winter's snow wasn't amazing, each day showed more tracks from people exploring and utilizing the new trails for exercise, to escape from Zoom, or to simply experience nature. While the trails are primarily developed for wintertime use and are not as smooth as many of our year-round trails, they provide access to lovely spaces, like Carsley Brook and the large wetland complex at the Highland Research Forest. As always, all are welcome to explore our wonderful new trails; just come prepared with good hiking shoes and a copy of our new map!


*Volunteers Dan Richards and Roger Lowell*



# Stream Explorers: Watershed citizen science

*Collecting macroinvertebrates*

One of the responsibilities of the Maine Department of Environmental Protection (DEP) is keeping tabs on water quality in the state. In the case of streams, it is a tall order as there are tens of thousands of streams, brooks, and rivers in Maine that flow through both our wildest and most urban areas. Because of this, it is virtually impossible for the DEP to regularly monitor all these waterways.

Enter the Stream Explorers! This is a volunteer-based program where people collect and identify macroinvertebrates and send their data to the DEP, helping to prioritize streams for more in-depth surveys. This initiative is a collaborative effort between Maine Audubon, the Maine DEP, the Portland Water District, and LEA. Our goal is to recruit, train, and support volunteers in the Sebago Lake watershed to explore streams and collect and identify macroinvertebrates.

Macroinvertebrates are aquatic insects (like dragonfly larvae) that you can see without a microscope. They clue us in to stream water quality depending on what species are present or absent. Typically, a more diverse group of aquatic organisms means a healthier stream ecosystem.

*Dragonfly larvae*

During our first season last summer, volunteers attended two online training webinars, an optional in-person identification day at LEA with live insects, and then signed up for a collection kit with all the tools they'd need for a successful day of stream sampling. Kits include an incredible guide developed by the DEP, data sheets, ice cube trays (for separating insects), D-nets for collecting samples, and a portable table. Twenty-four volunteers sampled twenty-six streams last summer, and many more folks have reached out to see how they can become involved.

This year, we're ramping things up to expand the geographical sampling range and grow partnerships. Data collection is also moving from paper forms to online data entry, which will streamline the process. We are offering more online and in-person trainings, and tripling the sampling kits available to meet the demand and allow us to distribute them to more associations and partners in the watershed.

Sampling for macroinvertebrates is really fun and an incredible way to learn about the small creatures inhabiting our streams and how these critters can indicate the quality of the water. To learn more about aquatic insect sampling, check out LEA's YouTube page and the macroinvertebrate videos we put together for students this year. If you're interested in becoming a Stream Explorer volunteer, please reach out to Alanna@mainelakes.org.

*Identifying macroinvertebrates*

# I Failed LakeSmart

Charlie Tarbell, President, Keoka Lake Association and LEA Treasurer

Here I am, president of the lake association, and my property failed its recent LakeSmart review. Sure, I was initially disappointed ... but what I learned through the process was even more important to me than the award that I was hoping for.

I've been spending summers on Keoka Lake my entire life. My sisters and I share a camp that has been in our family for five generations. Back in 2010, our camp garnered Keoka's first LakeSmart award. The property is a model of lake-friendly living. Then in 2012, I had the opportunity to buy a property on the north side of the lake. My wife and I relocated, remodeled, and retired on this property. I knew that the property was sub-optimal for a LakeSmart award, but I also knew that I could take steps, over time, to remediate its failings, and perhaps one day, earn another LakeSmart award.

And so we began making changes. We moved the driveway outside the buffer, relocated our leach field away from a nearby brook, installed crushed stone drip edges, began allowing the lakeside lawn to return to low bushes, and created a winding pathway to the lake to avoid trampling new growth.

Last summer, when I was approached by the new Keoka LakeSmart team for a review, I agreed, thinking that my accomplishments would surely garner an award.

The Keoka LakeSmart team, who are all neighbors from around the lake, arrived on a morning in early July. They were all friendly, professional, and seemed to have a great working rapport. First off, they asked me for a history of the property and for some basic facts about the place. Then, guided by their LakeSmart app, the four of us strode around the property reviewing various aspects (driveway, parking area, septic, roofline, buffer zone, shorefront, wooded areas, etc.).

The team clearly had a lot of knowledge of lake-friendly development best practices. At each juncture, they asked questions about what they saw and what I had done. They shared observations and recommendations about options to improve. They talked amongst themselves, but always included me. I found it fascinating and learned a lot. I was surprised, as I thought I already had a good handle on these issues to begin with, but their training and knowledge brought real value to the review and discussion.

The entire process took about 90 minutes. At the end, they handed me some materials and we parted ways. The interaction was friendly and helpful, and it was great to get to know some lake neighbors better. Alas, it was not a real surprise when I got the call about a week later and was told that my property did not yet qualify for a LakeSmart award. The shorefront buffer zone needed to be "built-up" a bit more with native plants that would stabilize the soil. Even though there was no erosion evident, the criteria for the award was clear, and my property still needed some work. I was encouraged to reapply after I had upgraded the buffer zone.

Although I did not get the coveted LakeSmart award, I did gain perspective, knowledge and a path forward. Indeed, the whole point of LakeSmart is not necessarily to notch a bevy of awards. No, the point of the review is to get exactly what I got out of it – guidance and direction as to how I can make my property as lake-healthy as possible. If all waterfront landowners got the same review and took the advice of the LakeSmart team, it would be a very good thing for the health of the lakes.

LakeSmart is a volunteer-run program, overseen by LEA in this area and managed by Maine Lakes of Belgrade. If you are interested in getting an evaluation or finding out more about this program, please call LEA's main office at 207-647-8580.


# "You can check out, but you can never leave"

Charlie Tarbell...again

This is the third in a series of articles that I have written for the LEA newsletter. This series focuses on the importance of bequest funding for LEA. Last year, I introduced the LEA Lakes Legacy League (LLLL), an LEA honor society which spotlights those individuals who have recognized LEA in their estate planning. Since then, we have had an influx of new interest in the LLLL because as many of you are aware, advancing age makes you think about your legacy.

Legacy is newly important to me. In early March, I suffered a spontaneous splenic arterial bleed. After initial diagnosis in the Norway ER, I was transported by ambulance to Maine Medical Center in Portland for emergency surgery. The trip, aside from being delightful because for once I was not driving, gave me time to think. After consideration for my wife and kids, I began to consider whether my IRA arrangements for LEA were, indeed, "ironclad." If this was indeed "the end," had I made the correct provisions? Unbeknownst to me at the time, I faced a 40% chance of fatality. Needless to say, I survived. But the "incident" prompted me to revisit my planning and to make sure that my arrangements for my wife and kids (as well as LEA) were indeed solid and irrefutable. Happily, that concern is behind me now and I can 'rest in peace,' knowing that LEA will be a beneficiary of my largesse.

If you, too, are interested in recognizing LEA in your estate planning, part of your legacy would be ensuring the organization's continued future success in protecting our lakes. Among the benefits is perpetual recognition of your designation at LEA's annual meeting – even after you are gone. It is truly a unique and lasting way to give; with apologies to Eagles' "Hotel California," "You can check out, but you can never leave."

## Milkweed Dreams

by Robert M. Chute

On a hill beside the lake milkweed pods
split silently, taking days to create an improbable
cotton field caught in light of a low slung Maine
late October sun. Growing to white gold before
sunset, before a cold clear night when hunter's
moon, a magic naked diver, hangs bewitched and bare
above the water. The bashful moon waits for
a cloud to cover her. The night waits for the
slightest breeze when milkweed seeds may drift off
unseen, as faces in a dream you know you
had but can't remember. Seedpods open as
two small hands in supplication. Signal: Please,
let this breeze carry us to fertile ground, not lakes
or this dream is one from which we never wake.

## Gone but not forgotten

On April 28th, Robert M. Chute, one of the founders of LEA, passed away at his home on Middle Range Pond in Poland. Bob served in the Air Force, was chairman of the Biology Department at Bates College, published books on biology and poetry and ran for U.S. Congress. He grew up on the shores of Long Lake and attended primary school in Naples. In addition to being instrumental in LEA's formation, Bob was one of the founders of the Congress of Lake Associations.

# Where the stream hits the road

Over the next five years, LEA will be working with public and private landowners in the Sebago Lake watershed to improve where our roads cross streams. Every day, we drive over these crossings with little thought about their construction or the stream below. Unfortunately, most of these crossings are undersized, meaning they restrict the flow of the stream and increase the velocity of the water. This is bad for stream fauna (especially brook trout) and can cause flooding and erosion.

Specifically, we will be looking to upgrade old, round corrugated culverts that limit fish passage and narrow a stream's natural width. Culverts that hang above the streambed where they outlet and double culverts that split the volume of low flow streams are of particular concern.

For the majority of sites, we are hoping to work with private landowners who may have camp or logging roads that cross a stream. If the site is deemed problematic, we will be able to provide engineered designs, permits, and funding to correct the crossing. We are also looking to partner with municipalities in the watershed to fix larger sites on public roads that have already been identified as limiting brook trout habitat.

This work is part of a larger Regional Conservation Partnership Program grant from the Federal Natural Resource Conservation Service. This grant was applied for by the ten-organization collaborative Sebago Clean Waters, of which LEA is a part. If you are interested in finding out more about this project or eligibility, please contact LEA's executive director, Colin Holme, by calling the office at (207) 647-8580 or emailing colin@mainelakes.org.

# Invasives Update - Plant Control

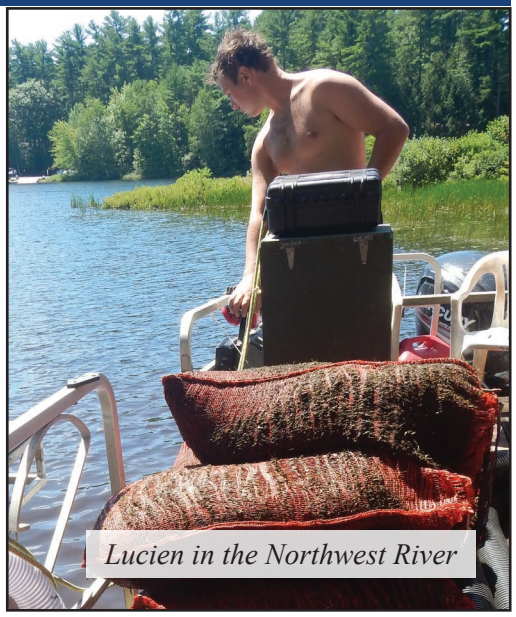
Thanks to the dedicated work of our milfoil team last year and significant investment in our boats and equipment, we are beginning the 2021 milfoil control season in a very strong place.

We left Long Lake, the Songo River, Frye Island, and Brandy Pond in great shape in 2020, and our crews in Sebago Cove and the Northwest River Cove made substantial progress removing this invasive plant from these heavily infested areas.

Again, we will have a crew of 20 working on these waterbodies, but starting this year our Education and Conservation Director, Alanna Doughty, will be overseeing the program. As many of you know, Alanna loves being out in the field, taking on big tasks and getting her hands dirty – plus she is a superb communicator. We are lucky to have her step into this role. She will have lots of help learning the ropes from our veteran crew captains Tommy Chagrasulis and Lucien Sulloway. More than half the dive team is returning from last summer and several crew members have multiple years of experience under their (weight) belts.

We are continuing to upgrade our fleet of milfoil control boats. Early this past winter, we purchased another suction harvester from the Joint Milfoil Board of the towns of Tuftonboro and Wolfeboro in New Hampshire. These towns decided to contract out for control work and their loss is our gain, as this boat has a high quality setup and a reliable four-stroke motor. It is an extremely valuable addition to our program and will allow each of the four teams to operate their own suction harvester all season long.

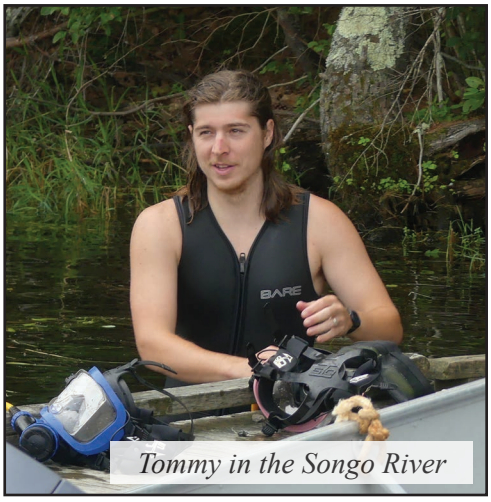
In Sebago Cove, we are revisiting the pay-to-play strategy that was established by the milfoil control group Save Sebago Cove, who previously worked in the waterbody. We are adopting this policy because some property owners in Sebago Cove are currently paying an outside contractor to do work only in front of their docks and several other owners have approached LEA about having this type of work done in front of their properties. While we have no qualms with hiring outside contractors to do this type of work, we also need to make our program financially sustainable. Last year, our program in Sebago Cove cost over $55,000. We received less than $10,000 from state funding for the Cove, $2,000 from the town of Naples, and just over $8,000 from Sebago Cove residents (which is a big increase from previous years – thank you supporters!) The remaining $35,000+ to run the program at this level was funded by LEA and a private foundation. We would like to keep operating at this level in Sebago Cove and the pay-to-play approach should help improve our bottom line. If you would like to get on our list for site work in 2021, please contact Alanna@mainelakes.org. Additionally, we will be sending out an informational letter in the early summer.



*Lucien in the Northwest River*

Lastly (and unfortunately), we are again going into the removal season with the uncertainty of COVID-19 looming overhead. While there is much to be hopeful for at press time, the virus is still a concern and keeping our crews safe and healthy will again be a top priority. In addition to separating out our teams to reduce possible transmission and investing in gear to reduce sharing of equipment, we are encouraging all our crew members to get vaccinated. With any luck, we will have a repeat of last year, where everyone remained healthy all season!

*Variable Milfoil*




*Tommy in the Songo River*

# New Infestations & Legislation

2020 was an exciting year in the invasives world. Maybe exciting isn't the best term. Mob-like? Stressful? Suspenseful (like, what is going to happen next?!)? However you word it, for better or worse, Maine's lakes had a very busy summer.

Let's dive right in. Boat inspections were up 13% from 2019, from about 90,000 to 103,000, making 2020 the first time we topped 100,000 inspections statewide in a single summer. The state also raked in a half million dollars in additional funding (up 30%), thanks to the increase in the Lake and River Protection sticker fees. That funding boost will continue into the future, giving plant control and boat inspection programs a much-needed infusion.

*CBI Annie O'Connor at Highland Lake*

Now for some bad news. Maine added two plant infestations to the list last year, bringing us up to 31 infested lakes. The first is fairly mild, as these things go, with a small amount of variable milfoil found near the boat launch on Androscoggin Lake. A full survey of the lake will be conducted this summer, but the Department of Environmental Protection is hopeful this infestation will be easy to manage.

The second discovery is much more worrisome. Late in the summer, Brittle Waternymph, also known as European Naiad, was discovered in Lake Arrowhead in Waterboro. Naiad is arguably the most aggressive invasive plant in Maine, possibly in New England. It spreads through fragmentation but also produces thousands of tiny seeds, which can easily move to other waterbodies on and in boats. As some readers know, Lake Arrowhead is already home to the most widespread infestation of variable milfoil in the state. We are very concerned about this discovery and will be monitoring progress of the surveys and control work done this summer.

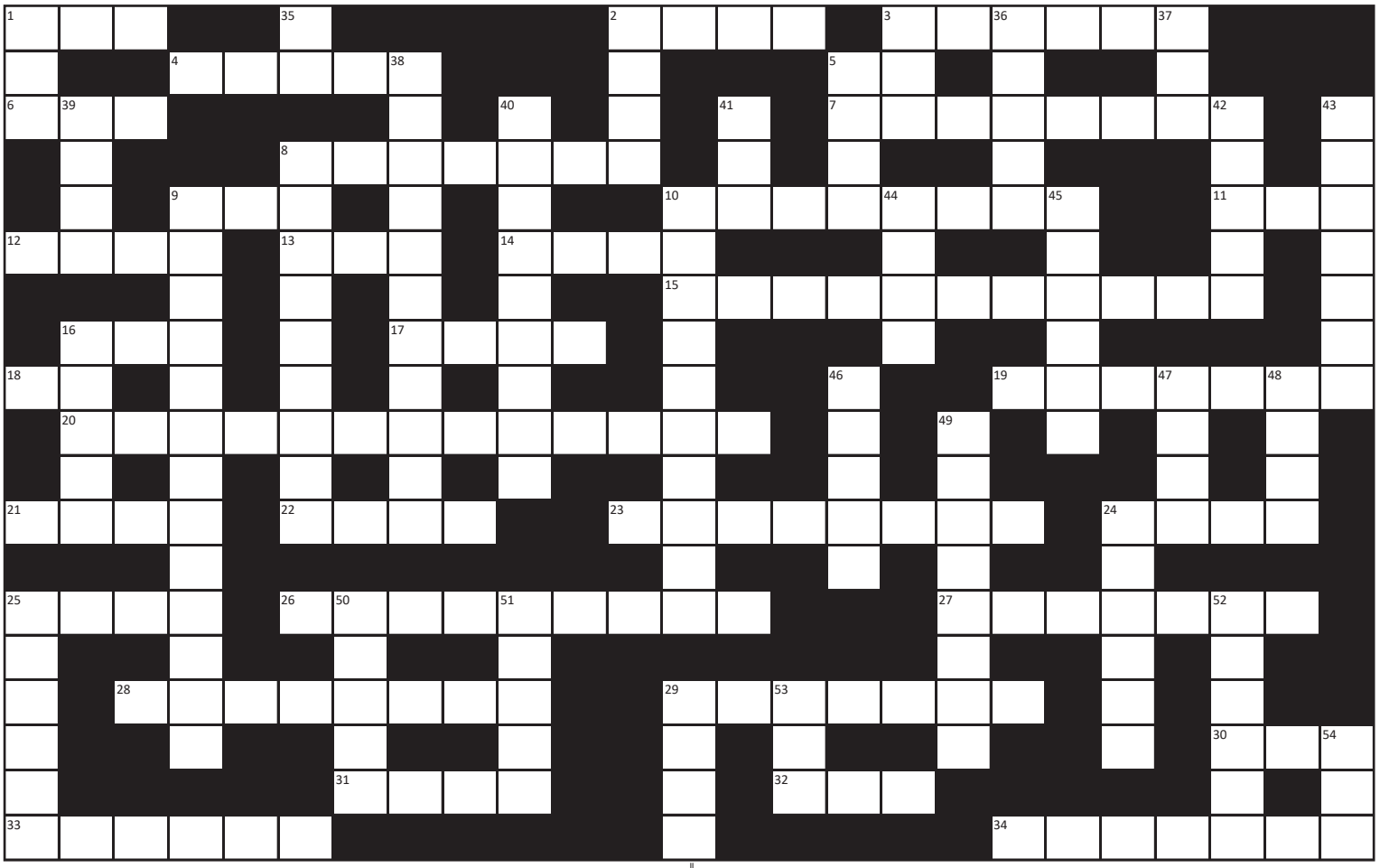
*CBI Kelsey Wilcox holding milfoil*

**LD 184**

Clean Drain Dry
Protect Maine Waters

Despite strong support from many organizations, LD 184 "An Act to Minimize the Propagation of Invasive Aquatic Plants" proposed by local representative Walter Riseman was killed in the Environmental and Natural Resources Committee at the legislature earlier this spring. This bill would have required boaters to pull plugs and drain standing water from their vessels when traveling between lakes. LD 184 was considered "low hanging fruit" with regard to protecting our lakes, with dozens of states around the country having similar statutes in place. Passage would have helped prevent the spread of both plants and invasive animals, such as zebra mussels and Asian clams. We are disappointed by this outcome but will continue to advocate for similar bills in the future.

# Crossword - Warmer Weather



## Across

1 Unit for measuring lake phosphorus

2 _____Rain Pond in Naples

3 Data____ or someone who practices silviculture

4 Rainbow, Brook & Lake _____

5 Opposite of northwest

6 Tachometer measurement/local marine business

7 Boat that makes a big wave

8 Not needed to understand tree cutting standards but good before calculus

9 Maine planning agency dissolved under LePage

10 A popular summer lake activity

11 Federal equivalent of DEP

12 The summer sky we hope for

13 Formerly known as the VLMP

14 43,560 square feet

15 Maine's fruit of choice (plural)

16 Location of famous Maine national park

17 Freshwater "fish" that resembles a lobster

18 Local school that overlooks Long Lake

19 Pond in Sebago, Bridgton, and Naples

20 Rain, snow, hail, and sleet

21 We use meters but most people around here use _____.

22 Salmon and trout ____ clean water to live.

23 Corn Dog look-alike plants near water

24 Plants begin this way

25 Naples _____ and Tackle

26 Species that are not native to a location and cause harm

27 Small singing frogs

28 Annoying insect

29 Doing this to trees gives you a better view of the lake

30 A group or non-profit

31 Number of times you can expand a non-conforming camp by 30%

32 A type of paddle?

33 A small concentric wave

34 Cool night insect/ local boutique

## Down

1 Photosynthetic Active Radiation

2 Best way to describe LEA sweatshirt

3 Your local lake association!

5 One way to get across the lake

8 Erosion is the largest source of _____ to lakes.

9 Erosion and _____ control

10 Largest source of drinking water in Maine

16 Trees, leaves & syrup

24 Pump your _____ tank regularly!

25 Aquatic mammal that chews wood

29 Rope on a boat

35 Dissolved Oxygen

36 Blue-_____ algae (cyanobacteria)

37 Ribonucleic acid

38 Zone of rapidly changing temperature and pressure in a lake

39 Vernal _____

40 Two-hulled watercraft

41 Condensation on grass

42 Mature ones can absorb 100 gallons of water per day

43 We use a Secchi disk to measure this.

44 _____ Dick, famous water novel

45 Rain___, solution for 52

46 Base of the aquatic food web

47 Not an acid

48 Legal document associated with property

49 A preserve owned by LEA

50 _____toxins are associated with some blue-green algae

51 ___fly, also last name of Oliver and Sharon

52 A common name for stormwater

53 A "season" in Maine people try to avoid

54 ___wings (fringed polygala), spring flower

Visit www.mainelakes.org for game solutions.

# The grass is green, and so is algae - Jumble

| | | | | | | |
|---|---|---|---|---|---|---|
| P | H | O | P | Y | C | |
| C | C | S | I | H | E | |
| R | O | T | U | T | | |
| O | N | L | O | S | | |
| D | L | E | P | D | U | |

Now, rearrange the circled letters to find to the answer to the puzzle.

Too much ☐☐☐☐☐☐☐☐☐☐ in a lake causes an algal bloom!

Crossword and Jumble Hints







# Family donates islands to LEA

Last fall, Bill and Donna Callahan decided to donate two small islands and the southern half of a larger island in the beautiful north basin of Moose Pond to LEA. This amazing and generous gift by the Callahans will help ensure these picturesque islands remain wooded and undeveloped forever.

North of the Route 302 causeway, Moose Pond gets progressively shallower and is a spectacular spot for wildlife viewing, fishing, and paddling. The clump of islands donated by the Callahans is near the Wildhaven common area and close to the east shore of the pond.

Please keep an eye out this summer for canoe or kayaking adventures to these islands. The scenery is breathtaking and you are almost sure to see bass, pickerel, and turtles in your travels. Thank you, Bill and Donna Callahan, for making such a wonderful donation to our organization!

*Colin with Donna and Bill Callahan*

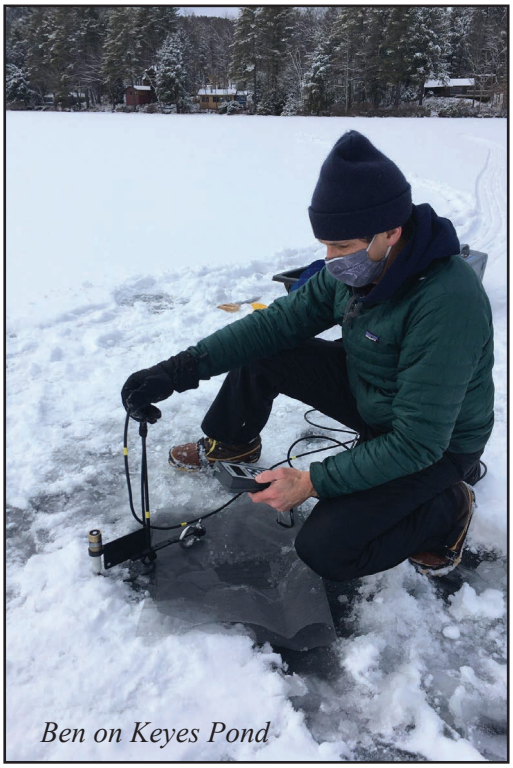
# Winter Lake Monitoring Report

Winter is probably the last thing on your mind as summer envelopes you. But as you enjoy all the pleasures of warm water lake activities, give a moment to reflect on the frozen conditions just a few months ago. Other than the hardy anglers who can reap the rewards of ice fishing, most people tend to think of ice-covered lakes as essentially dormant. A recent surge in interest from the lake research community has changed this perception, and we now know that much more is going on under the ice than we once thought. With that in mind, and because winters are changing, LEA lake monitoring now includes regular winter-based field work.

LEA staff first ventured out in 2018 for preliminary, through-the-ice data collection on four different lakes and on nine different dates. Over the next two years, we continued and expanded winter field work, slowly refining our skills, and adding to our understanding of winter lake conditions and the possible connections to summer water quality.

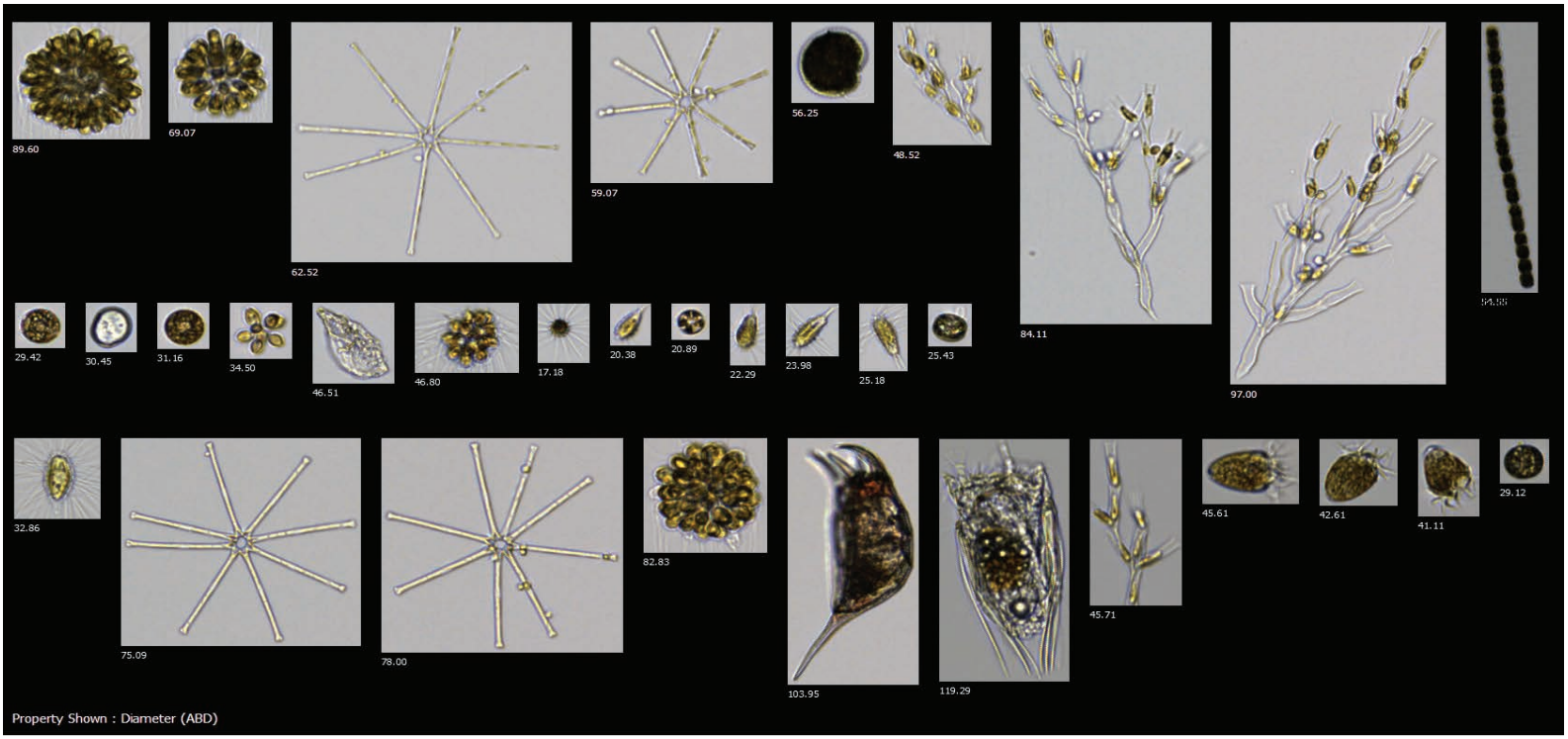
Winter 2021 was our most ambitious year yet with 11 lakes and a total of 28 visits. And this was accomplished during a milder-than-normal, and therefore shorter, season. Using our sonde, we recorded almost 550 individual measures of temperature, oxygen, chlorophyll, turbidity, and more. We also collected water samples for phosphorus analysis and identified algae using our new FlowCam. This field work was the focus of a webinar Ben presented in over the winter, which was viewed statewide and is available online at www.lakes.me/maine-lakes-conference and features underwater video and some dramatic lake ice sounds.

We were so fortunate that Mary could join Maggie for much of the field work and thanks also goes out to Rebecca Gould and Bill Buckley, Ann and Dan Lasman, Bob Mercier, Ken Sharples, and Jane Lichtman of Camp Tapawingo for lake access. We are also very grateful to the lake associations that supported this effort.



*Ben on Keyes Pond*


*Mary and Maggie on Sand Pond*
Photo Credit: Allagash Brewing




# Going with the flow - again

Ben Peierls, MLSC Research Director

You may have noticed that I have often used the word "flow" when communicating our scientific research endeavors at LEA. In past newsletters, I reported on the custom-made flow-through system for our sonde, which we used to survey lake surface water quality conditions. I have also described how we can now measure phosphorus at the Science Center using an instrument that is considered a continuous flow analyzer. Now, let me introduce you to the FlowCam.

The FlowCam is a flow imaging microscope that can rapidly capture particle images and then count and measure those particles. It automates identification and quantification of algae and other microscopic organisms in lake water. We knew about this technology from past demonstrations, including one at last year's Researcher Retreat. An exceptionally generous gift from Steve and Dorothy Gilman (see article by Colin) last December allowed us to acquire our own FlowCam from Yokogawa Fluid Imaging Technologies, a Maine-based company in Scarborough that grew out of research done at Bigelow Laboratory in East Boothbay. Flow imaging microscopy works by passing particles in water (e.g., algae) through a thin glass tube, past a magnifying objective and a light source. A camera captures images of each particle (up to several hundred per sample) and the software analyzes each image for many different shape and size characteristics. The identity and density of each unique particle (algae) type is then determined. Our version has a laser, the light from which generates a fluorescent signal that can separate algae from cyanobacteria and both of those from non-living particles. What would take hours by manual microscope methods, is accomplished in minutes.


We are just beginning to learn the fine points of operating the FlowCam, though we did manage to capture images from several of our winter lake water samples (see collage). With this technology, we will be able to efficiently document current algae communities, detect changes and trends, and monitor for the presence and growth of harmful species in our lakes. Let the data flow!

# Giving the gift of science

Colin Holme

It took me many years to fully grasp the tremendous breadth and depth of community support for LEA.

When I started at the organization, one of my primary tasks was running the water testing program. At first, I was uncomfortable asking our members for access to their property or help getting out on the water. I didn't want to be a bother, so I did many tasks myself or asked other staff members for a hand.

Over time, I got to know and work with so many wonderful people on and off the water that I began to recognize how much our members wanted to be a part of our work. This level of community involvement and collaboration is what really drives LEA and sets us apart from many other larger non-profits. However, I am still sometimes awestruck when an individual or family steps forward with just what we need at just the right time.

This happened last fall when Steve and Dorothy Gilman approached LEA about making a special gift to the organization as part of our 50th Anniversary Campaign. I had known the Gilmans for a few years, as they were active members and regularly attended LEA events, but it wasn't until talking to them that I learned of their keen interest in the Maine Lake Science Center and our land conservation efforts.

It is no surprise that Steve and Dorothy are LEA members. They have a three-season camp on Brandy Pond where we have conducted watershed surveys, installed conservation measures, removed extensive patches of invasive milfoil, and done water testing since the 1970s. Although their year-round home is outside Boston, Steve's parents went to Deering High School in Portland and his family has a long history in Maine, including owning the Lobster Shack in Cape Elizabeth. One of the aspects of LEA that resonated with the Gilmans is LEA's emphasis on data-driven decision making. This is something they both feel very passionate about and it dovetails with Steve's long career as a scientist and executive in the pharmaceutical industry.

After talking to them about our current work, Steve and Dorothy stepped forward with a very generous donation to help fund equipment needs and the new FlowCam at the Science Center. The FlowCam is a device that allows for rapid identification, categorization, and quantification of algae species via automation (see Ben's article for more details) and was on our wish list for years. To put it succinctly, it is an amazing piece of technology.

We are so fortunate to have people like the Gilmans among our membership. Although help comes in many different forms, this is what LEA members do, and it has allowed us to not only protect our local lakes, but also to lead the way for others in the state.

# Commercial solar: Good or bad for our lakes?

In the last year, development of medium-scale, commercial solar projects has taken off in the Lake Region. While there are many environmental benefits of solar energy, there are also environmental costs to developing all these new power generation sites. Past research has revealed that converting undeveloped forestland to a site covered with solar panels has a positive benefit for the climate as a whole, but there is an effect on the local landscape. At LEA, we are interested in mitigating that development impact to help ensure these projects don't negatively impact water quality.

Stormwater and erosion control systems are usually the first items on the agenda when LEA reviews large development projects. These are things like detention basins, culverts, ditches, and temporary erosion control measures, such as silt fences and mulch. If these systems are undersized, poorly designed, or improperly sited, dirty runoff can get into nearby water sources and pollute our lakes, rivers, and streams.

In this past legislative session, LEA opposed LD 1097, which was a bill that would have exempted solar energy projects of less than ten megawatts from review by the Maine Department of Environmental Protection (MDEP). Fortunately, this bill did not pass. Numerous solar farms have been proposed and approved in our area in the last year, and almost all of them have been under five megawatts. These projects require a significant amount of land to be cleared, leveled, and permanently developed. Five megawatt projects usually require around 20 acres of land to be cleared, so a ten megawatt exemption would have given 40-acre projects a pass from review by the MDEP.

It is important to realize how much the actual site location can influence the overall impact of a solar project. Sites over or near waterbodies and wetlands tend to be more detrimental to water quality. Projects that are built on areas that have been previously developed often have the least impact. However, influencing overall project siting usually requires proactive planning by the town.

There are many benefits to these clean energy projects but their impact on the landscape and environment, just like other types of development, needs to be considered and professionally reviewed. For this reason, LEA will continue to weigh in on these projects (and other large-scale development) at both the state and local levels.

# Insect pests threaten our hemlocks

Brie Holme - Portland Water District

The eastern hemlock, *Tsuga Canadensis*, is a very long-lived evergreen tree native to Maine and the eastern U.S. The oldest eastern hemlock on record lives in Pennsylvania and is at least 554 years old! Nicknamed the "redwoods of the east," some grow to over 170 feet high. Hemlocks play an important role in water quality because they filter stormwater and provide shade that keeps water cold and full of oxygen -- the conditions that trout and landlocked salmon require. Hemlock foliage provides food and shelter for many species, including white-tailed deer, moose, migrating birds, barred owls, and snowshoe hares, to name a few. Even the root systems of hemlocks play an important role by holding soil in place and preventing erosion.

**Elongate Hemlock Scale**

Hemlock tree infested with Elongate Hemlock Scale

Unfortunately, there are two threats to hemlocks in the area – the aphid-like hemlock woolly adelgid and the elongate hemlock scale. Both pests are from Asia and were accidentally introduced to the United States. The woolly adelgid first reached Maine in 1999; the elongate hemlock scale was first seen in the state in 2009. Often found on the same trees, they have spread up the coast and are now moving inland. The Maine Forest Service has confirmed the presence of both pests in three towns around Sebago Lake: Frye Island, Raymond (Neck), and Standish. The adelgid kills hemlocks by sucking their sap and likely injecting toxic saliva while feeding. The needles dry up and fall off the tree and buds are killed, preventing new growth. Elongate scale also kills hemlocks by sucking sap, which results in needles turning yellow and falling off.

Photo Credit: USDA

But there is good news… There are things you can do to reduce the likelihood of these pests coming to your yard and thriving in your trees. If detected early enough, there is usually time to save the trees, so regular monitoring is key.

To check for woolly adelgid, look for white woolly masses on the underside of hemlock twigs. These masses are usually about 1/16-inch to 1/8-inch in diameter. Elongate hemlock scale is identified by yellow or brown scales and a white, waxy substance on the underside of hemlock needles. Report your findings to the Maine Forest Service by calling (207) 287-2431 or by submitting their on-line form. You can also request to have your district forester identify the insect and discuss different control options, which include cultural, mechanical, biological, and chemical methods.

If you do find these invasive insects on your property, chemical control may seem like the easy way out, but it's important to consider the risks the pesticides pose to groundwater, your well, and our lakes. The insecticides typically used are highly water-soluble, meaning the risk of groundwater contamination is high if the chemicals come in contact with soil. Some methods, such as soil drench or soil injection, are more likely to cause lake or groundwater contamination than others. If you are considering chemical treatments, keep in mind that it is illegal for a contractor to apply insecticide without an appropriate license and that use is generally prohibited within 25 feet of the water. These pesticides are highly toxic to aquatic insects, which are important to freshwater ecosystems, and they are also classified as neonicotinoids, which are poisonous to bees.

**To reduce the risk of your trees becoming infested:**

- Do not buy or move hemlock trees or seedlings from infested areas.
- Monitor your trees for signs of these insects.
- Remove bird feeders in the spring and summer (April through August) to reduce the number of birds drawn to your trees. Birds can transport these invaders short and long distances.
- Prune hemlock branches likely to come in contact with delivery vehicles.
- Let the Maine Forest Service know if you think you have found either species.

**Hemlock Woolly Adelgid**

Hemlock tree infested with Hemlock Woolly Adelgid

Lakes Environmental Association
230 Main Street
Bridgton, Maine 04009

# Help us help loons

In 2003, there was a terrible oil spill in Buzzards Bay, Massachusetts. When the Bouchard 120' oil tanker hit a bedrock ledge, it ripped a hole in the hull, spilling out around 98,000 gallons of oil into water. Over 100 miles of shoreline was covered in the viscous black liquid that left birds, fish, and marine species injured or killed.

The impacts of that accident have probably faded over the years. Sitting on the south side of Cape Cod, Buzzards Bay may seem distant from our pristine waters, but then again, not everyone takes I-495 and I-95 to get to Maine. As a crow flies, the bay is about 150 miles south of the Lake Region. However, the crows aren't making that trip, loons are.

Late winter, LEA teamed up with Maine Audubon, Maine Lakes (Society), and several other partners to apply for funding from the United States Fish and Wildlife Service to help mitigate some of the damage done to Maine's loons because of this oil spill. This funding comes as a result of a long litigation process which resulted in the parties responsible for the spill paying a settlement, which is being distributed (via competitive grants in our case) by the federal government.

This spring we were notified that this joint proposal will be funded and we are now embarking on a multi-year project to better understand loon populations in our area, increase reproductive success of this iconic bird, and reduce natural and anthropogenic mortality rates. **But we can't do it alone. We need your help to take on a task this big!**

Loons are an integral part of living on the lake and this grant will give us an opportunity to systematically understand how well they are doing and to help improve the survival rate of their young. Specifically, we are looking for folks who are interested in regularly monitoring and tracking easily observable loon behavior (from a safe distance). We will be offering workshops and materials to help build and site loon nesting rafts in areas where existing nests have had limited success. We are also interested in working with local businesses to offer lead tackle exchanges (to lead-free products) for anglers.

If you would like more information about this upcoming project, please contact LEA's staff researcher Maggie Welch at maggie@mainelakes.org.