

SEBAGO LAKE

WATERSHED NEWS

Photo credit: Patrick Keeley

SUMMER 2019

Portland Water District · 225 Douglass Street · Portland, Maine 04104-3553 · 207.761.8310 · www.pwd.org



Better Beach Practices Protect Maine's Best Water

By Laurel Jackson

There is something special about Sebago Lake. Every day, it supplies the people of Greater Portland with the drinking water that fuels their day-to-day lives. It also supports recreation year-round, especially in the warmer months when people retreat to camps and beaches around the lake to enjoy the spectacular but brief Maine summer. Sebago is able to serve as a drinking water supply and recreational destination because of its tremendous size and excellent water quality. All of us are fortunate that it is able to serve many functions.

Sebago Lake is naturally clean, clear, and low in bacteria. Bacteria are microscopic organisms that live everywhere in the environment. Most are harmless and many are even beneficial to humans, but others cause illness and infection. In order to keep the water around the Portland Water District's intakes as clean as possible, State law prohibits bodily contact within two miles of the intake pipes. Outside the two-mile limit, there is no restriction on swimming and many beaches are crowded throughout the summer.

From Memorial Day to Labor Day, the Portland Water District monitors *E. coli* bacteria levels weekly at beaches around Sebago Lake. *E. coli* live in the



Photo credit: Mark Hunt

intestines of warm-blooded animals and enter the environment as part of fecal waste. The source of *E. coli* bacteria in Sebago Lake may be people using the beach, but it can also come from animals or be carried along in runoff after a rainstorm. Regardless of the source of the pollution, the Environmental Protection Agency recommends closing the beach when the amount of bacteria exceeds a level that they have established to be potentially harmful.

There are things that beachgoers and beach managers can do to minimize the risk of *E. coli* contamination.

1. Keep human waste out of the water

Nobody wants to swim in a toilet. Ingesting human waste has the potential to cause serious illness. If keeping diapers out of the water is not possible, caregivers should change babies' diapers and take children to use bathroom facilities frequently. Taking a pre-emptive approach to keeping feces out of the water may be the most pragmatic option. Always dispose of diapers in a sanitary manner.



Photo credit: Mark Hunt

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2. Dispose of food waste

Animals come out overnight and scavenge for chips, cookies, and sandwiches left on the beach. At the same time, they go to the bathroom and leave a source of *E. coli* right next to the water. Disposing of food in tightly closing garbage bins or carrying it out when you leave can help prevent animal scavenging.

3. Take out garbage

Animals have extraordinary senses of smell, and even if your garbage bin has a lid on it, it may not be enough to deter a persistent raccoon. Manage the garbage so that it is not a food source for nearby wildlife.



Photo credit: www.pixabay.com

4. Don't feed wildlife

It may be tempting to share a sandwich with the fluffy duckling nearby, but feeding wildlife disrupts their natural instincts. If a food source is available, animals will take up residence and your beach will become their kitchen AND their bathroom.

5. Clean up after dogs

Many beaches already prohibit dogs, which is good for water quality. On beaches where dogs are allowed, clean up dog waste and dispose of it appropriately.

Maintaining good beach practices is the best way to prevent illness due to bacteria. However, it is not uncommon for a beach to occasionally have a high *E. coli* level. This presents a great opportunity to investigate the cause and identify ways to improve your beach practices. Sometimes, an obvious cause can't be identified. One thing to pay attention to is patterns. A high *E. coli* result once per season isn't great cause for alarm, but repeated beach closures indicate a recurring issue that may be solved

through better beach management. For example, the District helped a monitoring program member whose beach had been having persistent high *E. coli* results. We were able to identify a wildlife pathway that went through their property where animal scat was evident. By regularly raking the beach and removing animal waste, the beach manager was able to greatly reduce the number of beach closures and the negative impact to water quality.

Sebago Lake is Maine's most valuable natural resource. It sustains the lives and livelihoods of the people of Greater Portland, supports a vibrant recreational economy, and brings joy to those who use it on a daily basis. It is up to us to minimize our own impact on the lake so that it can continue to serve these many functions into the future. A drinking water supply can also be a fun place to play, as long as we respect it and use it responsibly.



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Point Sebago Beach



Photo credit: Kathy Maxsimic



Photo credit: Bruce Douglass

Insect Pest Threatens Our Hemlocks

By Brie Holme

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 are an important part of riparian habitats on the banks of rivers and streams where they provide shade that keeps the 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.

Unfortunately, there is a new threat to the hemlocks around Sebago Lake – a sap-sucking, aphid-like insect called hemlock woolly adelgid (HWA). Originally from Asia and accidentally introduced to the United States in 1951, this insect pest first reached the Maine border in 1999. It has spread up the coast of Maine and is now moving inland. The Maine Forest Service (MFS) has confirmed the presence of HWA in three towns around Sebago Lake: Frye Island, Raymond (neck), and Standish. HWA kills hemlocks by sucking their sap, and probably injecting toxic saliva while feeding. The needles dry up and fall off the tree and buds are killed, preventing new growth. But there is good news! There are things you can do to reduce the likelihood of HWA coming to your backyard and thriving in your trees. And if HWA is detected early there is usually time to save the trees, so regular monitoring of your hemlocks is key. To check your hemlocks, look for white woolly masses at the base of needles on undersides of hemlock twigs. The woolly masses are usually about 1/16-inch to 1/8-inch in diameter. Report your findings to MFS by calling (207) 287-2431 or by submitting their on-line

form. You can also request to have your MFS district forester come identify the insect and discuss control options with you. Control methods include cultural, mechanical, biological and chemical methods (for descriptions of control methods and much more information on HWA, visit the MFS Hemlock Woolly Adelgid website: maine.gov/dacf/mfs/forest_health/insects/woolly_adelgid.htm).

If you do find HWA on your property, chemical control may seem like the easy way out, but it's important to consider the risks the pesticides pose to ground water, your well, and Sebago Lake. The chemicals typically used to control HWA are highly water soluble, meaning the risk of groundwater contamination is high if the chemicals come in contact with soil. Some methods of pesticide application, such as soil drench or soil injection, are more likely to cause lake or groundwater contamination than others. If you are considering pesticide application, keep in mind that it is illegal for a pesticide applicator to apply insecticide without a pesticide applicator's license, that it is illegal to apply pesticide in any manner other than described on the label, and that terrestrial broadcast application of pesticides is prohibited within 25 feet of the mean high water line of any lake or pond in Maine. HWA pesticides are highly toxic to many insects other than HWA, including aquatic insects, an important part of lake and stream ecosystems. They are also in the class of chemicals called neonicotinoids. Neonicotinoids are known to kill honeybees so it is important not to spray when bees are active.



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What you can do

Visit the Maine Forest Service Website for a list of things you can do to prevent the spread of hemlock woolly adelgid: maine.gov/dacf/mfs/forest_health/insects/hemlock_woolly_adelgid.htm



FREE SHRUBS!

Enhance your waterfront property with a free native shrub! Please contact us at kness@pwd.org to learn more.

Photo credit: George Case

Allowing Public Access While Providing Security

By Paul Hunt

The Safe Drinking Water Act requires that we maintain a Watershed Control Program. Ours has six main components. They are:

1. Water Quality Monitoring
2. Security
3. Inspection and Direct Actions
4. Environmental Education
5. Environmental Outreach
6. Land Acquisition, Land Conservation and Land Management

Here's a brief description of the second component of the program, Security. A description of our Water Quality Monitoring Programs was part of our Winter 2019 issue.



Photo credit: Mark Hunt

Security

The Lower Bay of Sebago Lake is a popular place. It is the part of the lake where we withdraw 22 million gallons of water every

day. It has one of the lake's busiest boat launches and a new public swimming beach. In the winter hundreds of ice fishermen set up shop on the ice of Lower Bay. And that's just on the water. Lower Bay is also where you find the many homes and businesses of Sebago Lake Village and the intersections of the busy routes of 35, 114 and 237. Finally, the water is ringed by

2,500 acres of woods owned by the District to help keep the water clean. Much of this land, known as the Sebago Lake Land Reserve, is open for public access.

In order to accommodate the many tens of thousands of residents and visitors to Lower Bay, the District provides water and land security year round. The concept behind both of these efforts is the same: the lake and land around it can provide clean drinking water and recreation access as long as some reasonable rules are followed.



Photo credit: Mark Hunt

Water Patrol

The 1913 Maine Legislature established a 2-mile "no bodily contact" zone around the water intakes to protect water consumers from water-borne disease. Later amendments to that law further established a smaller, 3,000-foot "no trespassing" zone. This means that in most of Lower Bay you can use a boat but can't swim. We have security staff who greet boaters at the Standish Boat Launch and who patrol the water by boat

throughout the summer to ensure the law is respected. We also patrol the ice in the winter so that ice fishermen are aware of the no trespassing zone.



Photo credit: Mark Hunt

Land Patrol

Since 2005, our lands around Lower Bay have been divided into a red "no trespassing" zone right near the water and a green "access by permit" zone just back from that. We have fenced and posted the red zone and established visitor kiosks at a dozen access points to the green zone. We see more than 25,000 visitors to this land every year and, as with the Lower Bay water users, the vast majority know and follow the rules. We patrol the land throughout the year and groom and maintain access trails.

No one would state that having thousands of people on the water and land around Lower Bay poses no risks to water quality. Human activity adds risk. But we have found that establishing clear

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An Innovative Partnership: Sebago Clean Waters

By Karen Young and Laurel Jackson

Sebago Lake is a rare and magnificent natural resource. While the lake serves as a drinking water source for one sixth of Mainers, it is also highly valued for its beauty, recreational opportunities, shoreline real estate, and contributions to the local economy. As many already may know, Sebago Lake has excellent water quality. The naturally clean, clear water is largely a result of the forest surrounding the lake.

Forests are natural water filters. The overhead tree canopy cushions raindrops to prevent soil erosion. Erosion is bad for water

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Photo credit: Mark Hunt

rules and posting them, patrolling all year long, talking with people, and, yes, occasionally issuing violations protects the land and water around Lower Bay and preserves it as a precious community recreation resource.

You can view a short video about our security programs here: <https://www.pwd.org/videos>



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because it carries soil, pollutants, and nutrients into waterways and these nutrients are food for algae.

Sebago Lake is surrounded by forests. The land between Bethel and Standish that surrounds and drains to Sebago Lake – its watershed – is 84 percent forested, yet only about 10 percent of those forests are conserved. If too much of that unprotected forest gets converted to non-forest uses, things will be forever changed. Sebago Lake will certainly be less clean and the quality of the other lakes, ponds, rivers and streams in the watershed will also lose their purity. The forests do other vitally important things, too. Without those forests we will lose woods jobs and wood products. We will lose forest habitat and will have less healthy fisheries. Our towns will be more prone to flooding and our lands less able to adapt to changes in climate. Even our air will be less clean.

The forests provide all those benefits, while also naturally purifying drinking water.

So what's being done to protect those



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vital forests? The Portland Water

District and land trusts, including Loon Echo Land Trust and Western Foothills Land Trust, have been

conserving Sebago Lake's forests for decades but we need to increase the pace of that work to outpace forest loss. Sebago Clean Waters (SCW) has formed for just this purpose. A partnership of nine non-profit organizations, SCW's mission is to protect water quality, community well-being, a vibrant economy, and the health of fish and wildlife in the Sebago watershed through voluntary forest conservation. Like anything precious, conserving land will require money. The partnership is launching a drive to create a land conservation fund to conserve Sebago Lake's forests. To learn more, visit sebagocleanwaters.org.



Karen Young is the coordinator of Sebago Clean Waters. She can be reached at kyoung@sebagocleanwaters.org



WHAT'S MAKING WAVES AROUND SEBAGO LAKE

LOON ECHO LAND TRUST WELCOMES NEW EXECUTIVE DIRECTOR

Loon Echo Land Trust (LELT) welcomed Matt Markot as its new executive director in January 2019. His previous work included support of LELT's stewardship and conservation easement programs, as well as work with Sebago Clean Waters. LELT cares for 2,850 acres of conserved land in the Sebago Lake watershed including working forests and many trails open to the public.

THE IMAGES OF SEBAGO LAKE CALENDAR: 15 YEARS OF BEAUTY AND APPRECIATION



Photo credit: Rich Antinarelli

The fifteenth Images of Sebago Lake Calendar will be published in the fall of 2019. You are invited to share your photos for consideration. Over 150 photographs from 47 amateur photographers were submitted last year. Once submitted, a committee of Portland Water District staff reviews and selects photos that show the lake in all seasons.



Photo credit: Chip McCarty



Photo credit: Rich Antinarelli

The deadline for submissions is August 4, 2019, and submitted photos must be at least 1 MB in size. Each photographer may submit up to five different photos. The calendars will be available for free at the beginning of December and all photographers will receive a complimentary copy! For more information or to send photos, email sebagolake@pwd.org. Please note: Our email system does not accept attachments larger than 10 MB.



SEBAGO LAKE SYMPOSIUM

The 2019 Sebago Lake Symposium was an enormous success with around 165 engaged stakeholders in attendance. Plans

are underway for another symposium to be held at Saint Joseph's College in the winter of 2021.

SEPTIC SYSTEM INSPECTIONS REQUIRED FOR REAL ESTATE SALES ON LAKE SHORES

Starting in 2020, all sales of homes and businesses located in the shoreland zone of any Maine lake will require a septic system inspection from a certified inspector. This has been the law for properties in the Maine coastal zone for many years and this new law will provide Maine lakes with the same protection provided to the ocean. The purpose of the inspection is to inform both the buyer and seller about the condition and function of the septic system. Poorly functioning septic systems can pollute lakes and streams and not all failing septic systems are obvious to the untrained eye of a home buyer. An inspection at the time of sale is a perfect time to be sure a house has a properly functioning system. Finding out a month or a year after you buy a house that it needs a new septic system would be a hardship for almost any homeowner.

WATER WATCH

Sebago Lake Monitoring Buoy Can Help You Catch More Fish

By Nate Whalen

Fish can be fickle. That is why it is called fishing, not catching. I once overheard an angler say that 90% of the fish are in 10% of the lake. I do not know if that is true or not, but it would certainly help to fish where the fish might be. The Sebago Lake Monitoring Buoy can help you target fish by helping you find the thermocline.

To understand what a thermocline is, you should know that the temperature in Sebago Lake, like most large and deep lakes, changes in a predictable way as the seasons change. In the spring, right after ice out, the water temperature is about the same from the surface to the bottom. This is because during “spring turnover” the lake water is fully mixed. Early spring is when the smelt migrate to spawn in the streams and the predatory fish chase them around the shallows. In mid-May as the surface water temperature warms, a warm upper layer forms. Because this warm water is less dense than the cold water below it, it floats and doesn’t mix. Below that upper warm layer a thermocline develops. This is a temperature transition layer between the warm water above and the cold water below.

Once the thermocline is established or, as we say, “sets up,” Sebago Lake is essentially divided into three layers from top to bottom. The top layer is the warmest, heated by the sun. The middle layer, the thermocline, is a section through which water temperature varies from warm to cold in a narrow zone. The bottom layer is the coldest. Since the density of water

is dictated by its temperature, these boundaries between the layers migrate upward or downward relative to each other depending on wind and weather conditions, but do not mix for the duration of the summer. During the summer, predatory fish tend to hang around the thermocline layer for a several reasons. There is a lot of algae in the thermocline because the density change from warm to cold water tends to cause suspended algae in the warmer top water to settle there but not sink further. Zooplankton (tiny freshwater crustaceans) eat the algae, the smelt and other bait fish eat the zooplankton, and the salmon and lake trout eat the smelt. The thermocline also has cool, oxygen-rich water that salmon and lake trout require to live.

Before you go fishing for salmon and lake trout, check out the Sebago Lake Monitoring Buoy water temperature data at pwd.org/Sebago-lake-monitoring-buoy. Scan the list of water temperature readings. Look for two readings with the greatest difference between them and you’ve found the depth of the thermocline. On Sebago Lake it is usually between 20 and 50 feet below the surface. You can also check on the wind and weather conditions at the lake by following the link to Saint Joseph’s College weather station. Additionally, the buoy data is available via the LIVE Datacenter app that you can download to your smartphone.

Temp- 3ft (F)	51.91
Temp- 10ft (F)	49.62
Temp- 16ft (F)	45.29
Temp- 23ft (F)	44.99
Temp- 30ft (F)	45.01
Temp- 36ft (F)	44.82
Temp- 43ft (F)	44.43
Temp- 50ft (F)	44.20
Temp- 56ft (F)	44.02
Temp- 63ft (F)	43.91
Temp- 80ft (F)	43.70
Temp- 96ft (F)	43.64
Temp- 112ft (F)	43.57
Temp- 122ft (F)	43.37

Sebago Lake temperature data indicating no thermocline is present.

Temp- 3ft (F)	65.07
Temp- 10ft (F)	63.14
Temp- 16ft (F)	62.51
Temp- 23ft (F)	58.95
Temp- 30ft (F)	49.92
Temp- 36ft (F)	47.02
Temp- 43ft (F)	46.70
Temp- 50ft (F)	46.25
Temp- 56ft (F)	45.87
Temp- 63ft (F)	45.43
Temp- 80ft (F)	44.79
Temp- 96ft (F)	44.41
Temp- 112ft (F)	44.20
Temp- 122ft (F)	44.07

Note the thermocline between 23 and 30 feet, indicated by the 9 degree change in temperature.



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Sebago Lake Water an Important Ingredient in Beer

By Laurel Jackson

In recent years, the craft beer industry has grown exponentially in Maine. Greater Portland alone has more than 20 breweries – and all of them use Sebago Lake water. The water from Sebago Lake is excellent for making beer because so little has to be done to prepare it for the brewing process. In fact, the water is so clean it does not even need filtering at the source before treatment. Sebago Lake is one of only about 50 lakes – out of 13,000 such drinking water supplies in the country – that does not require filtration.

According to Portland-based Allagash Brewing Company's brewmaster Jason Perkins, the average beer is more than 90 percent water. Perkins says "As a brewery, it's not a stretch to say that water is our most important ingredient. Because of the extremely high quality of the water in Sebago Lake, our primary water source, there is very little we need to do before we use it. Prior to brewing, we'll only make minor pH and recipe-specific calcium adjustments."

The Portland Water District has been monitoring water quality in Sebago Lake for over 40 years. The lake remains one of the cleanest,



Photo credit: Kathy Maxsimic

clearest lakes in Maine and an ideal drinking water supply. The reason the water is so clean is because the area surrounding Sebago Lake is mostly forest. Forests are natural water filters and if they were lost the quality of water in the lake would decline. For this reason Allagash supports the conservation of the forests around Sebago Lake. When asked how their beer may be affected if water quality were to decline, Perkins said that the beer would be just as good, but it would cost more to make. "If the water quality deteriorated, we (and/or the water district) would need to install expensive equipment to mitigate the change," explains Perkins.

For Allagash, it makes smart business sense to invest in water protection and

sustainability but it is also important to the brewery that they be a positive member of their community, both local and global. When it comes to water, Luke Truman explains, "We're an advocate for watershed protection across the state of Maine and beyond. Clean water is necessary for us as a brewery and those supplying our ingredients. We do not take clean water for granted and feel it's our responsibility to speak up." One way Allagash has spoken up has been to be an early supporter of the Sebago Clean Waters effort.

Sebago Clean Waters, a new partnership of nine non-profit organizations, has formed for the purpose of protecting woods, wildlife, and way-of-life in the Sebago Lake watershed. Allagash Brewing Company was



the first to donate to Sebago Clean Waters. "The creation of Sebago Clean Waters is a unique approach to combating the risks facing the Sebago watershed. It is an honor and a privilege to be involved with such out-of-the-box thinkers," Truman explained. Investing in forest conservation and watershed protection will help keep Sebago Lake clean and that benefits water-drinkers and beer-drinkers alike.

Special thanks to Luke Truman, Jason Perkins and the entire Allagash team.



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The Sebago Lake Watershed News is published by the Portland Water District.

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