SEBAGO LAKE
WATERSHED NEWS

Photo by Rich Arthinarelli

SPRING 2015

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Walk the Watershed

By Laurel Jackson

It's well known that Sebago Lake is one of the state's most popular destinations. But did you know that the watershed provides just as many opportunities for recreation and enjoying nature?

In this article we'll share some spectacular must-see places to visit in the Sebago Lake watershed. While you explore the area, you'll expand your appreciation for Sebago Lake as you follow the journey the water takes through the watershed.

Even streams as far away as Bridgton eventually flow to Sebago Lake. In Bridgton, visit **Pondicherry Park** for a walk through 66 acres of woodlands, wetlands and fields. Stevens and Willett Brooks meander through the property. Because they are in the Sebago Lake watershed, the health of these streams in Bridgton can affect the water quality of the lake many miles south. The park is owned by the town and Lakes Environmental Association often hosts educational events there. Naturalist-guided walks including a "signs of spring" walk, May bird walks, and a "blooms and birds" walk are planned for this spring. Pondicherry Park is a great example of a park that promotes land conservation, public recreation, and environmental education. Visit mainelakes.org for a map of the park or to learn about guided walks and events.

A little farther south in the watershed, an exceptional place to view the lake is from the top of **Douglas Mountain** in the town of Sebago. With 2.8 miles of trails, the hike to the summit is short, but steep. At 1,416 feet, Douglas Mountain is the highest point in southwestern Maine and a stone lookout tower at the top offers exceptional panoramic views of Sebago Lake. From the lookout, notice how green the landscape is surrounding the lake. The watershed is predominantly forested which is why the lake has exceptional water quality. The forest acts as a natural filter. Studies suggest that a "tipping point" exists where water bodies experience degraded water quality when forest cover within the watershed drops below 75-80%. The Sebago Lake watershed is 81% forested so it is very important to protect the existing forest. For directions to Douglas Mountain and trail descriptions, visit mainetrailfinder.com

The Portland Water District maintains trails around the lower bay of Sebago Lake in Standish. The area is called the **Sebago Lake Land Reserve** and it is open to the public for all types of low-impact recreation. A trail where hikers are rewarded with access to a sandy beach is the Pond Road section of the Sebago to the Sea trail. As you hike along

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Photo by McKayla Redfern

The Sebago Lake Land Reserve offers over 13.5 miles of trails

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this trail, notice the different types of forest plants. There are ground covers, low shrubs, leafy deciduous trees, and tall pines. All of the plants play an important role in protecting water quality. The forest canopy overhead slows rainfall which prevents rainwater carrying pollutants from flowing directly to the lake in large surges. Soil is the biggest pollutant to lakes and rivers in Maine. It contains phosphorus which can cause harmful algae blooms and degrade water quality. Shrubs and ground covers provide a web-like root system which holds soil in place and prevents it from getting into the lake. For more information on the Sebago Lake Land Reserve trails, visit pwd.org.

In addition to the hikes outlined here, there are many more conserved forest lands that are open to public recreation. The Sebago Lake State Park, Western Foothills Land Trust, Loon Echo Land Trust, and many watershed towns all offer hiking trails. While enjoying the trails, take a moment to remember that it is all connected, and it all leads back to Sebago Lake. That is why the Portland Water District supports land conservation throughout the watershed. Conserving forested land provides recreation opportunities for all of us and is good for water quality.

Photo by LEA

While crossing the Bob Dunning Bridge at the entrance to Pondicherry Park, look up at the tie beams made of 16 different native tree species. How many can you identify by their bark?

Right: Photo by Mary Jewett

Exploring historic Kneeland Spring in Pondicherry Park.

Photo by LEA

An AMC-built bridge in Pondicherry Park

› WHAT IS A WATERSHED?

It is the land area that drains to a certain water body. Although there are smaller lakes, streams and rivers within the Sebago Lake watershed, all that water ultimately ends up in the lake. The Sebago Lake watershed is 450 square miles and stretches from Standish all the way to Bethel.

Laurel Jackson is a water resources specialist at the Portland Water District. She can be reached at ljackson@pwd.org

Native Plant Spotlight: PINK LADY'S SLIPPER *(Cypripedium acaule)*

Pink Lady's Slipper *(Cypripedium acaule)*

Size: Grows to 6 - 15 inches tall

Foliage: Leaves have parallel veins and are opposite each other at the base of the plant. Flowers are whitish pink to magenta.

Bloom time: June

Soil conditions: Rocky or mossy slopes in pine or hemlock forests; acidic, well-drained soil under birch or other deciduous trees

Pink lady's slipper is a wildflower that belongs to the orchid family. Its beautiful flowers make it one of the gems of Maine's forests. Pink lady's slippers need specific soil conditions to survive, and they grow very slowly. It takes many years for a seed to grow into a mature flowering plant. An interesting feature of the plant is that it needs a certain type of fungus to be present in the soil for its seeds to grow. Pink lady's slipper seeds do not have food reserves that seeds often have. The threads of the fungus break the seed open and attach to it. The fungus then provides the seed with food and nutrients that it needs to grow. Once it reaches maturity and can produce its own nutrients, it returns the favor and provides food and nutrients for the fungus. This type of relationship is known as a symbiotic relationship, one where two organisms benefit from the relationship.

Its slow growth, specific habitat requirements, and the need for the soil fungus make pink lady's slippers very susceptible to being over picked in nature. Please do not pick lady's slippers if you see them, but feel free to take lots of pictures!

Be on the lookout for this interesting plant on the Sebago Lake Land Reserve!

Photo by Colin Holme

Photo by Sarah Plummer

Vernal Pools - *Jewels of the Sebago Lake Land Reserve*

By Hannah Shute

It's almost spring, and soon our dramatically - seasonal northeastern corner of the world will come alive again!

Days are longer and hope for a fruitful growing season is in the air. As the temperature rises, snowmelt and spring rains fill shallow depressions in woodland habitats, forming vernal pools. Vernal pools, which are particularly common in glaciated landscapes of the northeastern U.S., are broadly defined as semi - permanent or temporary pools that typically fill during the spring and fall and are dry during summer months or drought years. Generally smaller than an acre, vernal pools do not have water that flows in (inlets) or out (outlets), creating unique wetlands that are isolated. Because they are not wet all the time, fish cannot live in them. Vernal pools serve as breeding, feeding, and resting grounds for many different species—from small insects to great blue herons. Although they provide a habitat for many spectacular species, their brief and humble nature causes them to be underappreciated. But, their importance is greater than you may think.

Helping a wood frog cross the road on Big Night

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Considered to some as the "Jewels in the Crown" of northeastern landscapes, vernal pools support a rich variety of obligate—or dependent upon—species, both invertebrate and amphibious. Some species, such as the delicate fairy shrimp (a small crustacean), rely exclusively on vernal pools for their entire life cycle; various strategies allow them to breed and live during wet periods but still survive dry periods. Others, such as the yellow spotted salamander, are only dependent upon vernal pools for reproduction. Amphibians (frogs and salamanders) spend most of their lives in the upland forest but move to a pool when it's time to breed. Vernal pools are safe and critical breeding habitat for some of Maine's migratory breeders. Some species could breed in other wetland areas, but offspring are more likely to survive in pools without fish or predaceous diving beetles. A handful of species breed exclusively in vernal pools.

In Maine, one of our more vocal and early migrant breeders to arrive at vernal pools are wood frogs. Essentially frozen under mud and leaves, they overwinter in surrounding forested habitat where they spend the majority of their life. As spring arrives, they start to "thaw" and adults make their way to the pool to breed (if you're near a pool, you may hear the quack-like raucous choir sung by the male wood frog). Chances of survival increase when amphibians travel under the protection of a forested habitat. From a wood frog's perspective, sections of continuous forest surrounding the vernal pool are just as important as the pool itself. Sometimes, a wood frog's journey can be hundreds of meters; a substantial distance if you're only three inches long!

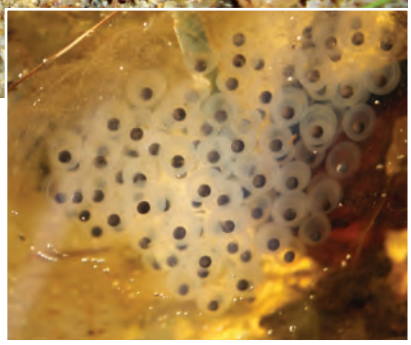
Wood frog

Wood frog eggs

Wood frog

You can find many vernal pools scattered about the Sebago Lake region, especially on PWD's Sebago Lake Land Reserve! In 2013 and 2014, PWD commissioned a vernal pool migration study on the Land Reserve to understand what types of creatures migrate to a certain vernal pool. The continuous forest surrounding the vernal pool is a perfect setting for wood frogs and spotted salamanders, which were the most abundant species found in the study.

Yellow spotted salamander



Spotted salamander eggs

Other species recorded included the spring peeper, American toad, green frog, eastern red-backed salamander, four-toed salamander, gray tree frog, and pickerel frog. Turtles and ducks were commonly seen feeding at the vernal pool as well. If you find yourself on the Land Reserve, the Wetland Loop allows you to get up close and personal with this unique wetland. A renovated boardwalk, to be finished at the end of this summer, will bring visitors through the middle of the pool—easily the neatest feature on the Land Reserve.

The humble nature of these ecosystems causes them to be often overlooked. Vernal pools contain plants and animals that serve as the base of a food chain which supports many levels. They can also play a role in the water quality of surrounding water bodies by filtering pollutants and slowing spring runoff. If you slow down and look closely, you may discover a secretive world—one that offers invaluable services. Comprehending the value of vernal pools is more than half the battle towards preserving.

JOIN US FOR BIG NIGHT 2015!

Interested in the incredible amphibian spring migration to vernal pools? Start your spring off with District educators, wood frogs, and spotted salamanders by participating in Big Night! Participants may witness migration and mating behaviors of vernal pool species and assist with road crossings, which pose the biggest risk to amphibian migrations. Typically, these migrations occur in late March or early April. Big Night is dependent upon the weather - in particular, successive nights that exceed 40ºF and provide the cover of rain. These conditions translate into one thing for wood frogs, spring peepers, and spotted salamanders – ice and snow become moving water and provide conditions for the next generation of vernal pool species to begin.

To participate, contact Environmental Educator Carina Brown by e-mail at cbrown@pwd.org or phone, 774--5961 x 3320.

Hannah Shute is an environmental educator at the Portland Water District. She can be reached at hshute@pwd.org

Spring Events

By Sarah Plummer

Photo by Brian Peterson

ORDER YOUR RAIN BARREL

PWD is once again offering rain barrels at a discounted price of $63.30 (includes tax and handling). This is over 50% off the retail price!

Rain barrels provide an innovative way to capture rainwater from your roof and store it for later use. Water collected by rain barrels can be used to water lawns, gardens, and indoor plants. This water would otherwise run off your roof or through downspouts and become stormwater, picking up pollutants on its way to a storm drain, stream, or lake. Here's a way to conserve water and reduce polluted stormwater runoff.

Please visit www.pwd.org for ordering and pick up information. Ordering deadline is April 24, 2015.

For more information about rain barrels, contact Kirsten Ness at kness@pwd.org.

JOIN US FOR NATIONAL DRINKING WATER WEEK

The first week of May, PWD celebrates National Drinking Water Week with a variety of events. Activities are designed to connect customers, neighbors, and partners with the drinking water source and system as well as the local ecology and resources. Our line-up this year includes a tour of the system and laboratory at the Sebago Lake Water Treatment Facility, up-close encounters with Maine birds of prey (provided by Wind over Wings), a presentation featuring historical photos of PWD, and a display of historical and current water infrastructure (pipes, hydrants, etc.).

Details and registration information will be available via our mailing list (email sebagolake@pwd.org to subscribe), or on our website (www.pwd.org) and Facebook page by late March. For questions or to register by phone, call 207-774-5961 ex. 3319.

Photos Top to Bottom:

National Drinking Water Week - Wind Over Wings

Vernal pool exploration at Little Lake Stewards Story Time

Trail Day

Kayaking on Sebago Lake

Crafting at Little Lake Stewards Story Time

CELEBRATE SPRING AT TRAIL DAY ON THE SEBAGO LAKE LAND RESERVE

The third annual Trail Day will be held on Saturday, May 16 on the Sebago Lake Land Reserve. Trail Day showcases both the recreational opportunities on the Land Reserve and its function as a forested filter that protects our source of drinking water, Sebago Lake.

This year, Trail Day will offer an exciting array of activities for various ages and interests, led by PWD experts and local partners. Hosts and activities will include:

- **Presumpscot Regional Land Trust:** *Nature hike on the segment of the Sebago to the Sea Trail that runs through the Land Reserve*
- **Sebago Trails Paddling Company:** *Intro to Recreational Kayaking Clinic and kayak paddling on the Otter Ponds*
- **Department of Inland Fisheries & Wildlife:** *Learn to Fish kids' event through IF&W's "Hooked on Fishing" program*
- **Portland Water District:** *Trail run, fitness walk, and kids' nature hike & craft*

All events are free and will end by late morning with snacks and water provided by PWD. Last year, over 130 people attended Trail Day, with waiting lists created for some events. Registration information will be available via our mailing list (email sebagolake@pwd.org to subscribe), and on our website (www.pwd.org) and Facebook page by late March. For questions or to register by phone, call 207-774-5961, ext. 3319.

LEARN MORE ABOUT OUR EVENTS

During the past year, the District has also offered preschool story time events, group kayak trips on Sebago Lake, and a winter snowshoe series in the Lakes Region and Greater Portland area. To join our email list to learn about our events, send your email address to sebagolake@pwd.org.

Sarah Plummer is the environmental education coordinator at the Portland Water District. She can be reached at splummer@pwd.org

What's Making Waves Around Sebago Lake

By Chad Thompson

Amphitheatre construction on the Sebago Lake Land Reserve

NEW AMPHITHEATER AND WETLAND BOARDWALK PLANNED FOR THE SEBAGO LAKE LAND RESERVE

2015 will be an exciting time on the Sebago Lake Land Reserve starting with the completion of an outdoor 150-person amphitheater. This amphitheater will be used for environmental education programs by PWD as well as a resource for local schools and other outdoor educational opportunities. Also scheduled in 2015 will be a re-design and re-build of the existing boardwalk through the middle of the wetland and vernal pool behind PWD's Ecology Center in Standish.

STANDISH TOWN BEACH AND ICE FISHING ACCESS FACILITY

The Town of Standish's beach committee is in the process of finalizing the site design of the proposed town beach and ice fishing access facility to be located off of Route 114 near Harmon's Beach. The project received preliminary approval by the planning board in December 2014, and the final details of the stormwater plan are currently being worked out with the MDEP. The proposed project is located on Portland Water District land outside the 2-mile, no bodily contact area on the west shore of the lake and will consist of a 100 vehicle parking lot, picnic tables with BBQ pits, a small building to house portable toilet facilities, and direct access to the beautiful sandy beach known as Sand Bar Beach. There will also be an access road to provide snowmobiles, ATVs, and ice shacks with winter access to the lake.

DEVELOPMENT OF A SEBAGO LAKE WATERSHED MANAGEMENT PLAN

The Cumberland County Soil and Water Conservation District, in partnership with Portland Water District, Lakes Environmental Association, Maine Forest Service, Maine DEP, the Town of Standish, and various other lake stakeholders are currently evaluating data for the entire Sebago Lake watershed to determine water quality protection focus areas. Results of this first- attempt effort will be published in a 5-year management plan to be available in the fall of 2015.

CROOKED RIVER FORESTS CONSERVED

Loon Echo and Western Foothills Land Trusts recently partnered to acquire 791 acres of land for conservation. The five parcels are located in the towns of Harrison and Otisfield and two of the parcels have frontage on the Crooked River. The land trusts will conserve the land as a community forest which will allow for timber harvesting as well as low-impact recreation. The Crooked River provides 38% of the inflow to Sebago Lake and protecting forested land also benefits water quality. The Portland Water District contributed $268,000 to this $1,100,000 project.

TENNY RIVER CONSERVATION EASEMENT FINALIZED

In December 2014, Loon Echo Land Trust and the Boy Scouts of America completed their project to conserve 28 acres of land on the Tenny River in Raymond. With the help of the land trust, the Boy Scouts of America purchased the land and put a conservation easement on it. The easement means the land will forever be forested. Adjacent to its camp, the Boy Scouts plan to use the land for outdoor education. The Tenny River flows into Panther Pond which flows into Sebago Lake. The Portland Water District contributed $5,000 to the project.

PWD led a winter snowshoe trek on the Crooked River community forest land in Otisfield.

The stone was replaced in this infiltration trench at Chadbourne's Landing as part of the Sebago Lake Erosion Control Project.

SEBAGO LAKE EROSION CONTROL PROJECT COMPLETE

PWD and Cumberland County Soil and Water Conservation District partnered on the Sebago Lake Implementation Project – Phase II, which successfully wrapped up at the end of 2014. During three construction seasons, 15 projects were completed to reduce erosion entering the lake in the towns of Standish and Frye Island. The total project cost was $186,521 with $78,996 coming from federal sources and $107,525 in cash and in-kind match from PWD, municipalities, and landowners. This project directly benefitted Sebago Lake water quality by keeping an estimated 47 tons of sediment per year from entering the lake.

Chad Thompson is the source protection coordinator at the Portland Water District. He can be reached at cthompson@pwd.org

Collecting insects from the Crooked River

WATER WATCH

Monitoring Stream Health

By Nate Whalen

While the streams that flow into Sebago Lake are quite healthy, we are always tracking pollution levels.

We use both instant testing and long term testing. Each method has different goals. For an instant test, we fill bottles of water from the streams and test them for pollutants that may be in the water at that point in time. For a long term test, we put bags of rocks in the stream and a month later we count the number and types of bugs that colonized the bags of rocks. This method gives an indication of overall stream health because the test is done over a larger time span.

Instant testing is used to find immediate, often short term problems. We test for *E. coli* bacteria and turbidity, and the tests are completed in one day. *E. coli* is a type of bacteria found in the intestines of warm blooded animals. Is there a failing septic system dumping septic waste into the stream? Our testing program would let us know. Turbidity is a measure of water cloudiness. Are ATVs driving through the stream and disturbing the streambed? That would probably lead to a high turbidity test result. These types of random events are serious and do occasionally happen.

In 2014, none of our samples from the Crooked River revealed high E.coli bacteria or high turbidity (cloudy water). The 1952 Brook often has cloudy water due to naturally occurring iron bacteria in the stream. Standish Brook had four tests that revealed unhealthy E.coli bacteria levels. We have done extensive testing and surveys of Standish Brook but have not found a source of the high *E. coli*. The brook drains through Standish Village so the culprit could be neighborhood dogs, for example, or residential septic systems. We plan to investigate the situation further.

We also look for evidence of pollution that doesn't have an obvious source and that slowly affects the streams over many years. If, in the future, too much of the forest is cut down and replaced with housing subdivisions, roads, and stores, the result would be more polluted runoff and not enough forest to naturally filter out the pollutants. This would cause the number and type of bugs living in a stream to change. Aquatic insects spend their entire life cycle connected to the water. Adults lay eggs in the streams and the eggs hatch into larvae. These larvae (immature wingless bugs) spend months or even years growing and maturing in the stream before they change into flying

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Smith Mill

adults which lay more eggs. Think of the example of a caterpillar changing into a butterfly. The same thing happens to dragonflies, mayflies, black flies, and many others. These insects have specific water quality needs. Some can only live in very clean water while others can tolerate less clean water. If we find bugs that can only live in very clean water, we know the streams are healthy.

In the Northwest River, Muddy River, and the majority of the Crooked River, we find the types of insects that can only live in very clean water. In the southern portion of the Crooked River we find more insects than any other place upstream. This means more food, or nutrients, are present. An increase in the amount of nutrients is bad for the lake because nutrients are food for algae. More algae means murkier water which, at its extreme, can impact recreation, property values, and drinking water quality. For more information on our stream monitoring programs, visit www.pwd.org

The Crooked River at Bolster's Mills

Nate Whalen is a water resources specialist at the Portland Water District. He can be reached at nwhalen@pwd.org

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