

SEBAGO LAKE WATERSHED NEWS

SUMMER 2017

Photo by John Stetson

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Silent Spring Comes to Sebago Lake

By Paul Hunt

You have likely heard of “Silent Spring”, the 1962 book written in Maine by Rachel Carson which alerted readers to the impact of pesticides on the environment. Maybe you have read it.

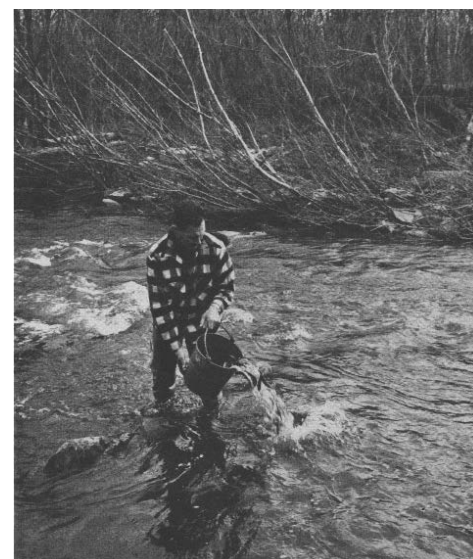
According to Wikipedia:

“*Silent Spring* was met with fierce opposition by chemical companies, but it spurred a reversal in national pesticide policy, led to a nationwide ban on DDT (Dichlorodiphenyltrichloroethane) for agricultural uses, and inspired an environmental movement that led to the creation of the U.S. Environmental Protection Agency.”

Though the book is well-known in the environmental community, you may not know that the issue it describes dramatically impacted the fisheries of

Sebago Lake. Fortunately for all of us that enjoy the lake today, the Maine Department of Inland Fisheries and Wildlife (Maine IF&W) took decisive action to address the problem.

This dramatic period in Sebago Lake’s history was described in a report entitled “The Sebago Lake Study.” Written by Stuart DeRoche, a fisheries biologist from Gorham, it was published in 1976 by the Maine IF&W (then known as the Department of Fish and Game). According to the report, in 1957 the average 4 year-old salmon in Sebago Lake was 19 inches long and weighed about 2 pounds. By 1963 there were far fewer salmon being caught and the typical 4 year-old was just 15 inches long and weighed less than a pound and a half. DeRoche was very clear about the cause of this decline, stating that the near collapse of the salmon fishery was the result of the spraying of DDT that started in 1957. Beginning that year, DDT was sprayed around the shore of the lake and up the Songo and Crooked Rivers twice each summer to control mosquitoes and black flies. The report



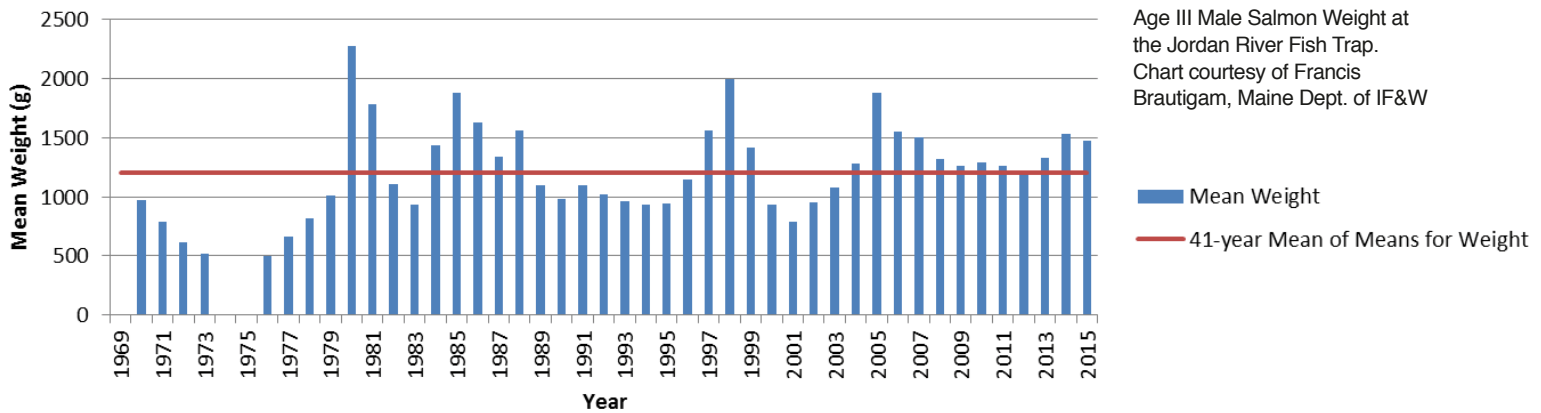
Stuart DeRoche stocking salmon in the Crooked River

concludes that the DDT wiped out the minnows which starved out the salmon. There were also dramatic declines in most of the other fisheries.

The spraying was stopped in 1963 and, remarkably, by around 1970, helped by an aggressive stocking program, the salmon fishery had largely rebounded and the concentration of DDT assayed in the fat of the salmon being caught was back down to what they called “very low levels.”

Because of how we think of DDT today, it is really shocking to read the report and to read such matter-of-fact sentences about the spraying of DDT in places we all know so well like Jordan Bay, the Crooked River, the Northwest River, Scribner’s Mills, and Bolster’s Mills. Because the very thought of spraying DDT today seems so outrageous, the descriptions seem surreal. You can’t help

Jordan River LLS (Age III+ Males)



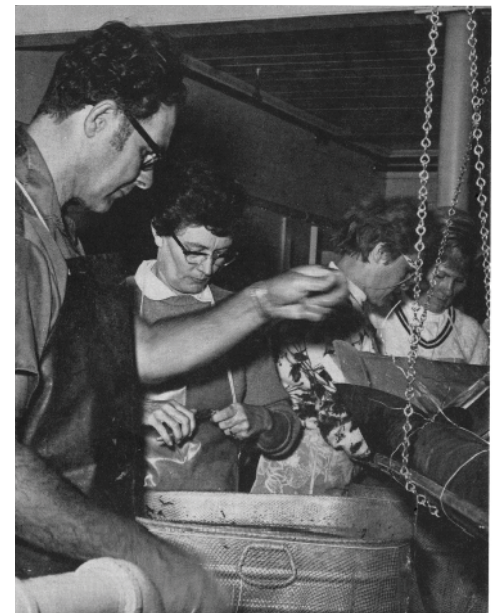
but think, “What were they thinking?” The rapid response by the state was quite impressive: once DDT was thought to be the cause, the spraying program was stopped, and the study to track the rebounding of the fisheries was initiated. In addition to collecting samples for analysis of fish tissue, the state biologists conducted an extensive assessment of the fisheries of the lake including techniques such as electrofishing, gillnetting, SCUBA diving, fin clipping for fish identification, stocking, and creel surveying that went on for the next ten years. The fisheries biologists would trim the fins of raised fish in various ways so that when they were caught the pattern of fin markings could be used to determine where the fish had been released. This way they could determine how the fish were moving through the lake and watershed. And they used creel assays to estimate the numbers of fish of what sizes and ages were in the lake. Creel assays involve surveying fishermen about how long they fished and the numbers, types, and sizes of fish they caught. It was amusing that they had to factor in the level of experience of the fishermen – noting the numbers caught by experienced vs. inexperienced fishermen. Admittedly, I would have been in the second group.

The intensive fish restocking effort was in response to the DDT spraying but it coincided with the removal of the Crooked River dam at Scribner’s Mills and the construction of a fishway at Bolster’s Mills. Before those changes on the Crooked River, there were no

salmon caught above the Scribner’s Mills dam. Afterwards, many fish made their way up the river to spawn. Fish were also stocked in the lake itself, in the Northwest River, in the Jordan River, and in Mile Stream on the Casco-Naples line. They found that no salmon that were released in the lake were ever caught in the tributaries, but fish that were released in the tributaries did return to them. They further reported that marked fish were only caught in the tributary in which they were released and a fish did not travel higher up the river than the spot at which it was released. This honing instinct seems almost miraculous. As the actor Jeff Goldblum said in Jurassic Park, “Life finds a way.”

As an aside the report recounts the introduction of lake trout to Sebago Lake. This was initiated in 1962. It was done because (1) salmon were only being caught in water less than 60 feet deep and (2) the lake trout – which were transported here from the Finger Lakes region of New York State – were known to prefer water more than 80 feet deep. So it was believed the lake trout would not compete with the salmon and would be a new, complimentary fishery for the lake. As you may know, most believe this has been less than successful – maybe because lake trout eat the same smelt and other food that salmon prefer. It is my understanding that the growth of the lake trout fishery has adversely impacted the salmon fishery.

It’s sobering to realize that a well-intentioned human action – trying to control mosquitoes – could have such an immediate, devastating effect on a 10,000-year-old fishery in a trillion-gallon lake. But it’s all there documented in clinical, scientific language



Finclipping salmon for future identification

with little doubt expressed about cause and effect. The lake is not invincible and the work we all do today to protect this lake matters.

We all owe a tremendous debt to Maine’s fisheries biologists of the 1960s who took the actions that restored the fisheries of Sebago Lake.

Read the Sebago Lake Study on-line at: www.pwd.org/sites/default/files/the_sebago_lake_study.pdf



Paul Hunt is the environmental services manager at the Portland Water District. He can be reached at phunt@pwd.org

Sebago Lake Recreational Forecast

By Nikki Becker



A PWD employee recording a MAREPS

The National Weather Service (NWS) Forecast Office in Gray, Maine issues a recreational forecast for boaters on Sebago Lake from ice out through Columbus Day each year. This forecast is available via NOAA Weather Radio and on the web at www.weather.gov/gyx/recreation. On the webpage there are highly detailed forecast and WEB graphics available for specific points on the lake.



Nikki Becker is a meteorologist at the National Weather Service in Gray, ME. She can be reached at nichole.becker@noaa.gov

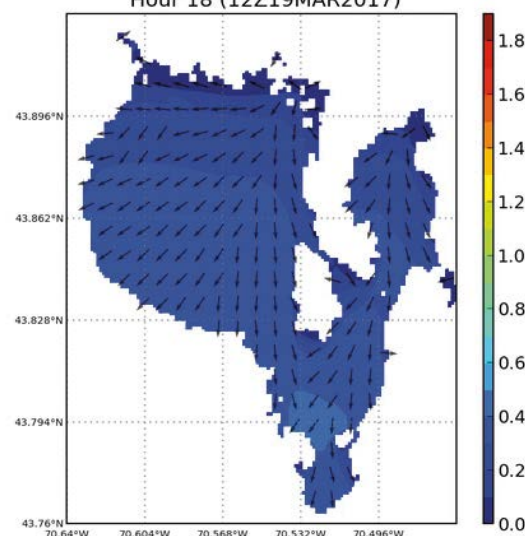


Photo by Bruce Chapman

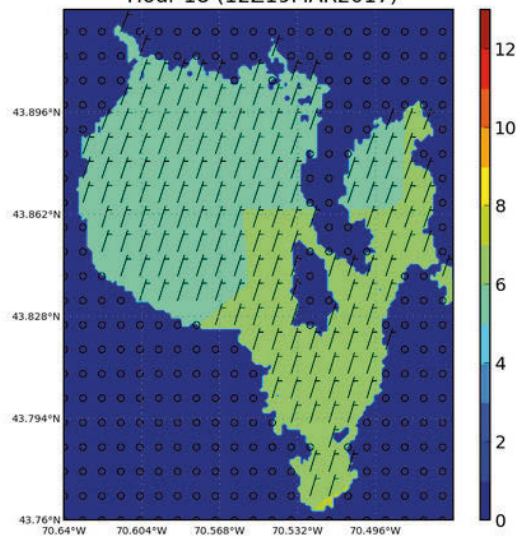
Since 2012, NWS Gray, Maine has worked in partnership with the Portland Water District (PWD) to provide daily marine reports (MAREPS) on Sebago Lake. These reports are the ground truth observations used to verify and calibrate the Sebago Lake Recreational Forecast. PWD provides both visual and instrument observations that include: wave heights, wind speed and direction, water temperature, and current weather conditions. We also encourage the general public to report MAREPS to us via email or text at gyx.skywarn@noaa.gov or by phone at 207-688-3216. We can also be found on Facebook and Twitter (@NWSGray) where you can also submit MAREPS.

Boaters should continue to be aware that this is an experimental forecast initiative and therefore further adjustments may occur based on user feedback. You can provide feedback to the email address listed above.

NWPS Significant Wave Height (ft) and Peak Wave Direction
Hour 18 (12Z19MAR2017)



NWPS Wind (knots)
Hour 18 (12Z19MAR2017)

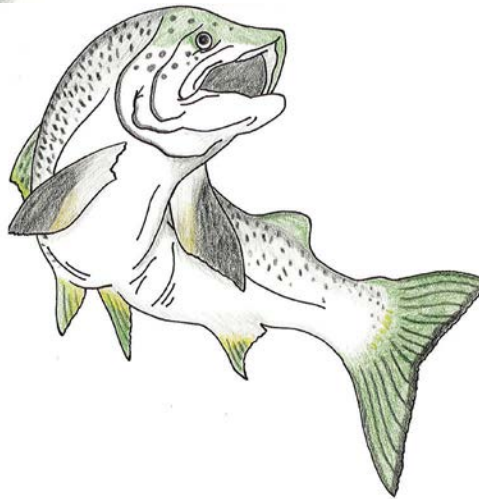


Top: Experimental Sebago Lake Model Wave Height Forecast with 90 meter (295 feet) horizontal resolution
Bottom: Experimental Sebago Lake Model Wind Forecast with 90 meter horizontal resolution.

SEBAGO LAKE *Believe It or Not!*

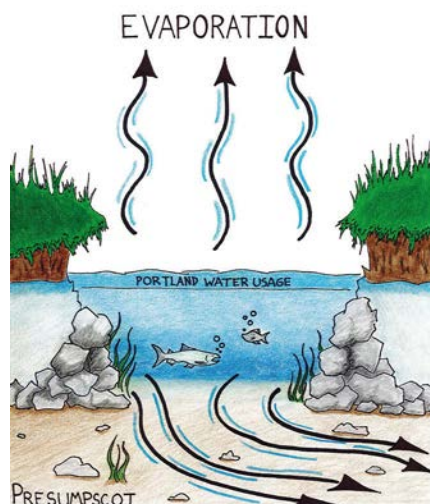
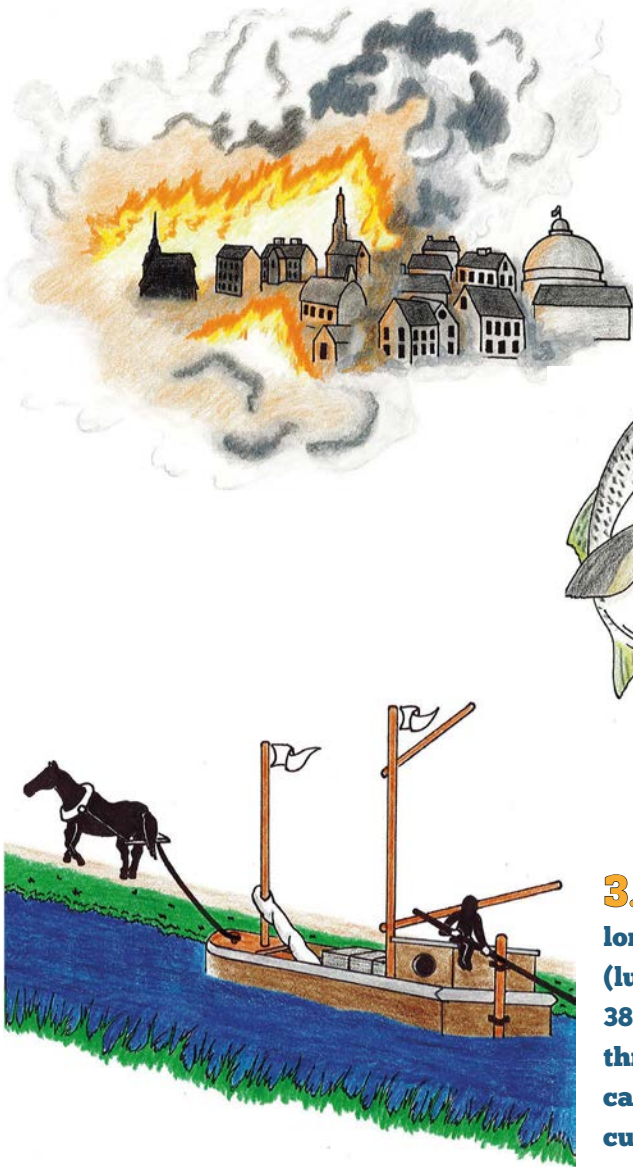
Artwork by Jared Stevens

1. The first drop of water from Sebago Lake reached Portland on Thanksgiving Day, 1869. Sebago Lake was chosen as the drinking water source by the Portland Water Company as a result of the Great Fire in Portland on July 4, 1866. The massive fire destroyed one third of the city and left more than 10,000 people homeless.



2. Sebago is one of only four lakes in Maine that are home to landlocked salmon. Landlocked salmon originated as sea-run salmon but gradually adapted to fresh water. They weren't blocked from a return to the sea...they just stopped going!

3. The Cumberland and Oxford Canal was a 20-mile long, hand dug canal used to move people and goods (lumber, firewood, gunpowder, apples, etc.) along a 38-mile water route from Harrison to Portland and back through Sebago Lake from the 1820s to the 1870s. The canal had 28 locks to move boats upstream against the current. Songo Lock is the only one still remaining.



4. For every gallon of Sebago Lake water used by the Portland Water District (15% of Maine's population), 2.5 gallons evaporate off the surface and 25 gallons flow out through the Presumpscot River. PWD uses less than a foot off the top of the lake in a whole year!



5. Forests cover 87% of the Sebago Lake Watershed. Forests slow and absorb rainwater and snowmelt, protect soil from erosion, and trap nutrients, sediments, and bacteria. The mostly forested Sebago lake watershed is a natural filter that produces some of the cleanest water in the Northeast.



6. Sand and gravel piled almost 200 feet deep beneath the Otter Ponds in Standish is evidence that the outlet to Sebago Lake once flowed through there to reach the sea in what is now Saco. Sediment dumped by glacial ice blocked that outlet about 15,000 years ago and a new one formed at White's Bridge - through which it still flows today.



7. Famed American author Nathaniel Hawthorne spent his summers at Sebago Lake near Thomas Pond in the town of Casco. By his own account he "ran quite wild...fishing all day long, or shooting with an old fowling piece..."



8. The name Sebago comes from the Abenaki word "Sobagwa," also spelled Sebecco, Sebagok, and Sebagook. It means ocean or great ocean, and has also been interpreted as "big bay," "great lake," or "big stretch of water." The Abenaki used the same word to refer to the Atlantic Ocean and other expansive bodies of water. Sebec Lake in Dover-Foxcroft is derived from the same word.

WATER WATCH

Good News about Sebago Lake Water Quality

By Kirsten Ness

Photo by Neil Hiltunen

*PWD tested Sebago Lake for **Cryptosporidium** monthly in 2006-2007 and again in 2015-2016 and did not find evidence of **Cryptosporidium** in any of the samples. This is great news for our 200,000 customers in the greater Portland area because **Cryptosporidium** is a waterborne parasite that can cause intestinal illness.*

The source of the parasite is waste from infected humans and animals. It can survive in the environment for long

periods of time because of a protective outer shell; this form of the parasite is known as an oocyst [oh-uh-sist]. Because oocysts cannot be seen by the naked eye, we filtered each water sample using a filter that is specially designed to catch oocysts. The filters were then sent to a laboratory for examination.

A 1993 outbreak caused by *Cryptosporidium* in Milwaukee, WI, sickened over 400,000 people and killed over 50, making it the worst documented outbreak of waterborne disease in US history. That outbreak led to the creation of a regulation that deals with treating drinking water to “inactivate” *Cryptosporidium*. Ultraviolet (UV) light inactivates *Cryptosporidium* and other disease causing organisms by destroying their DNA, which

means they are not able to reproduce and make people sick. Although we have never found any evidence of *Cryptosporidium*, as required by federal mandates we added UV light to our treatment process in 2014.

Cryptosporidium is not an uncommon parasite in lakes that have human and animal activity such as shoreline development, recreational use, and agricultural activity on the land surrounding the lake. It is probable that *Cryptosporidium* has been introduced into Sebago Lake but it has not been found at our drinking water intake pipes in Lower Bay. This is likely due to the two-mile no bodily contact zone and the forested shoreline around Lower Bay. Because people are not allowed to swim in or even touch the lake in that zone, the risk of contamination in Lower Bay is very low. Additionally, the land around Lower Bay is primarily forested which means that the activities that could introduce *Cryptosporidium* are not present.



The filter used to look for *Cryptosporidium*



Kirsten Ness is a water resources specialist at the Portland Water District. She can be reached at kness@pwd.org



PWD WELCOMES NEW GENERAL MANAGER

The Portland Water District welcomed Ms. Carrie Lewis as its new General Manager on March 6, 2017. She replaces Ronald Miller, who retired after 20 years as General Manager, the longest tenured leader in PWD history. Ms. Lewis is a well known and respected leader in the water sector. Since 1997, she served as the superintendent of Milwaukee Water Works and led the organization to national recognition for providing high quality water, water quality monitoring, environmental stewardship, public outreach, and efficient operations. Prior to that, Ms. Lewis served as Milwaukee Water Works first water quality manager.

Ms. Lewis holds a Bachelor of Science in Biology from McGill University and Master of Science in Civil Engineering from the University of Calgary. She is originally from

the New England region, and recently moved from Milwaukee to Portland. She and her husband, Terence, have two grown sons.

SERVICE AREA SUMMER CAMPERS CONNECTING TO SEBAGO LAKE FOR RECREATION AND DRINKING WATER

District Educator Carina Brow will roll out a new education program targeting greater Portland-area summer camps that visit Sebago Lake. The program's goal is to connect campers to Sebago Lake as not just a recreation destination, but also as their source of drinking water. Lessons will be delivered to campers around the time of their field trip to a Sebago Lake beach. Through fun, interactive lessons campers will learn about the number one lake pollutant – soil – and the ways in which forests minimize erosion and filter runoff.

WATER CONNECTIONS EVENTS

The District's Water Connections event series has started off strong in 2017. With these recreational events we intend to connect Sebago Lake watershed residents and our customers to the resources that affect the lake's water quality. In January, PWD partnered with Loon Echo Land Trust and the Lakes Environmental Association to host a snowshoe event at Intervale Preserve in Harrison. The 21 attendees embarked on a 3-mile snowshoe trek with views of the Crooked River and discussions about land conservation. At the end of

April, the District partnered with the Sebago Lake Anglers Association and the Maine Department of Inland Fisheries and Wildlife to host an event focused on the connection between protecting drinking water and healthy fish habitats. The 20 attendees were treated to a fly-casting clinic, fisheries discussions with live brook trout, and live macroinvertebrates (insects) that showcased one of our monitoring programs.

Upcoming event topics slated for the summer and fall will provide information about Sebago Lake monitoring and sustainable forestry. To learn more about these upcoming events, follow us on Facebook (facebook.com/MyPortlandWater/) and join our email list (email sebagolake@pwd.org).

TWO GREAT WATER QUALITY YEARS FOR SEBAGO

Sebago Lake is one of the clearest lakes in Maine. 2015 and 2016 were among the clearest since 1976. Sebago's average water clarity, as measured with a Secchi Disk, is 34 feet. The past two years, we have been able to see the Secchi disk 40 feet below the surface of the lake! One reason may be the lack of rain. Rain washes pollution into the lake and without rain, the lake is more clear.



Fly casting clinic





ROGER MOSLEY: an Asset to Sebago Lake

By Heather True

Standish Public Works, led by Roger Mosley, Standish's Public Works Department Director, is a very important player in helping to keep Sebago Lake clean. Roads – and the movement of water over and around them – can be one of the biggest sources of pollution to a lake. For many years Roger has worked with PWD to correct erosion problems on town roads. Often PWD – through EPA grant programs – can provide some of the funding while Roger provides his expertise and the town's equipment

and crew (often called an “in-kind contribution”) to get the work done. In just the last 5 years the Town has contributed nearly \$10,000 of in-kind contributions to address several eroding roads.

Roger has also served on project committees and met with PWD and Cumberland County Soil and Water Conservation District staff to agree on ways to best keep Sebago Lake clean. Roger's knowledge, willingness to do what it takes to protect the Lake, and friendly disposition make him a leader in the lake's protection.

In the coming year, through an EPA-funded grant awarded to PWD by the Maine Department of Environmental Protection, several more Standish erosion sites on Smith Mill Road and Moody Road will be fixed. As always, we are looking forward to working with Roger.

Thank you, Roger, for all that you do.



Heather True is a project manager at the Cumberland County Soil and Water Conservation District. She can be reached at htrue@cumberlandswcd.org

Background Photo by Rich Antinarelli

The NEW *Lakes Like Less Lawn* is Available



Looking for planting advice for your waterfront property? Copies of the new and improved *Lakes Like Less Lawn* publication are now available at the Sebago Lake Ecology Center in Standish, Mon.-Fri. 8-4:30. The publication explains how to manage your property in the most lake-friendly way. It features plants native to the northeast and gives plant descriptions, sunlight and soil moisture requirements, and indicates which of the plants are deer resistant. Advice on how to plant and a list of non-native invasive plants to avoid is also included. Come on in for your free copy, and be sure to ask about our Lakescaping Grants if you're interested in a free site visit and matching grant to install your plants and protect the lake.



Purple cone flower Photo: Colin Holme



Rain garden



High bush blueberries

Photo: Colin Holme



Crested iris

Prefer to receive this newsletter by e-mail? Let us know! sebagolake@pwd.org





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

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