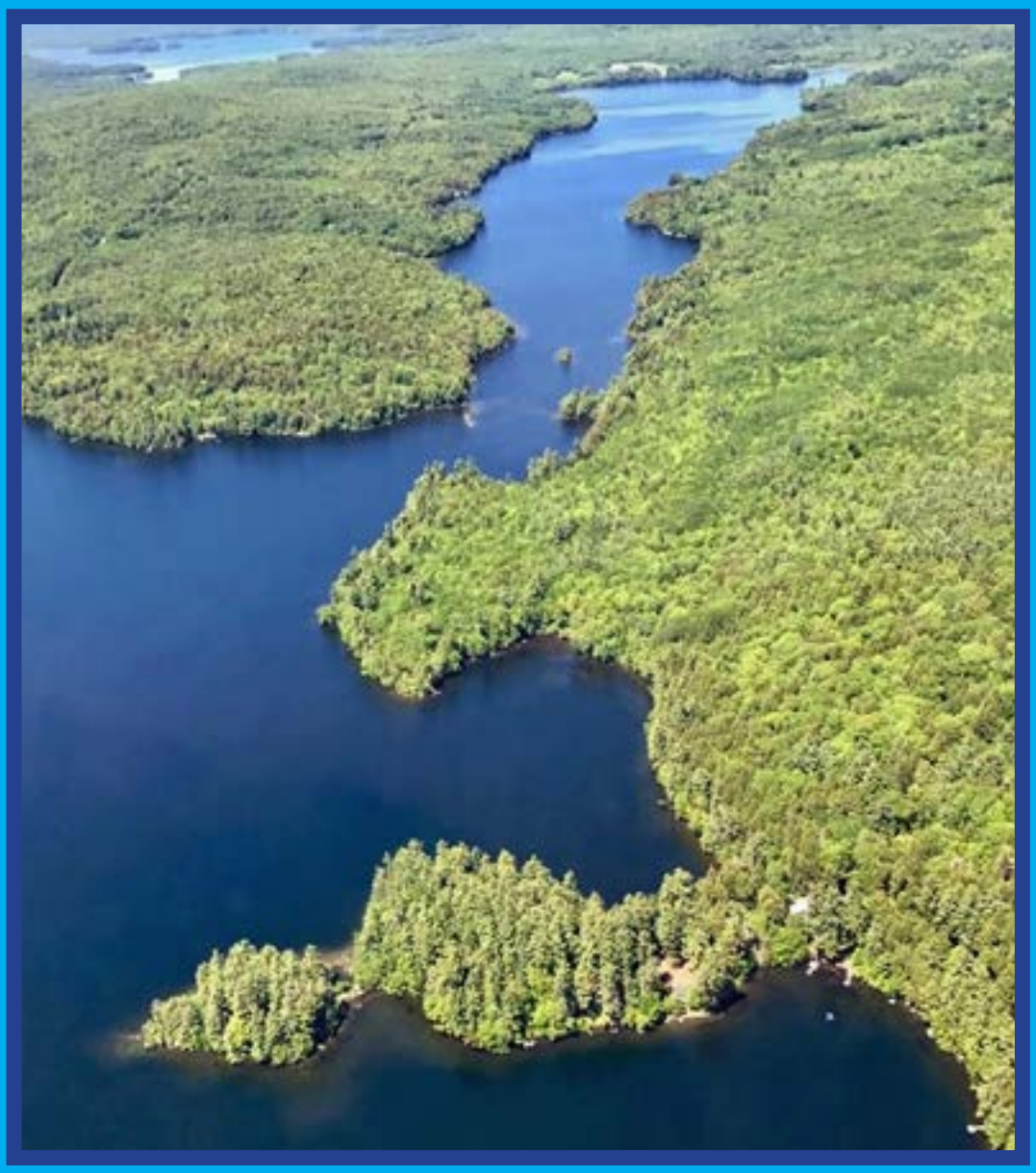
McGrath Pond - Salmon Lake Association

Stewards of Our Belgrade Lakes



Spring 2021 Newsletter

President's Message

Lenny Reich

It's with great pleasure that I write to you once again as the McGrath Pond – Salmon Lake Association President, having been the first person to hold the office more than 30 years ago. Since that time, water quality in both McGrath and Salmon have improved somewhat, primarily through the Lake Association's efforts working with its members. At a time when most lakes in the region have seen declining water quality, it's an accomplishment we can be proud of.

Having said that, I should also point out that our Watershed Survey in the fall of 2017 found over 100 properties in need of remediation. Keeping our lakes clean and clear is a never-ending effort that takes the whole lake community, not just a few devoted people. Unfortunately, our neighboring lake to the northwest has recently suffered devastating algal blooms because too many shorefront owners there didn't think they needed to be concerned about runoff. If you didn't see the green water in person, these photos serve as warning: https://www.7lakesalliance.org/post/testing-for-algal-toxins

Developed out of the 2017 Survey, our 2018 Watershed-Based Protection Plan – available for download on the MPSLA website under "Projects" — lays out the work to be done around Salmon and McGrath over the course of a decade. So far, with matching funds of more than $64,000 supplied by U.S. EPA and administered by Maine DEP, MPSLA and 7 Lakes Alliance have collaborated with property owners to remediate some of the worst runoff problems. A new round of grant applications is just now getting underway for grants in 2022 and 2023. If your property was identified as needing work and you are ready to move forward, please contact MPSLA's Kim Hallee or Charlie Baeder of 7 Lakes Alliance

Important changes have happened around the Belgrade Lakes watershed since we founded MPSLA in 1989, including the creation of 7 Lakes Alliance as both a land trust and lake trust with increasingly important roles in both areas. The Youth Conservation Corps (YCC) is a major program of 7 Lakes that provides "boots on the ground" conservation work to waterfront property owners at very low cost. Perhaps they have worked on yours. You can find more information about YCC, including a contact link, on the 7 Lakes website under "Water/ Erosion."

7 Lakes Alliance is an important ally for all the lake associations, as we share many common values and goals. For example, it is currently ramping up efforts to improve water quality throughout the lakes. Part of that effort will involve year-round monitoring of both flow

rate and phosphorus concentration in the streams coming into and flowing between the lakes, which will give a far better picture of the external nutrient/phosphorus load on every lake in the watershed.

This is a big deal. We will be able to locate and eliminate or significantly reduce the worst polluting sites for all the lakes. Full funding is yet to be secured, but a few of the monitoring devices will be in place during the spring of '21, so we should start to get some answers this summer. A complete picture of what is happening in the entire watershed will likely emerge over several seasons.

For about 18 months, ending last fall, I sat on Belgrade's *ad hoc* Moorings Committee, charged with looking at two issues and making recommendations to the Selectboard. First, should there be limits on placing moorings in Town water, which extends 200' out from shore? Beyond 200' is State jurisdiction, and neither anchoring nor mooring is permitted. And second, should Belgrade prohibit overnight stays on houseboats?

The Selectboard agreed to do both, and Belgrade voters approved the resulting ordinance by secret ballot during their March 2021 vote. The limitation on moorings is one every 50' of shorefront owned. With this new ordinance in hand, town manager Anthony Wilson plans to approach other municipalities with which Belgrade shares the lakes to begin adopting common regulations.

Coming out of this entire process, the *ad hoc* Moorings Committee morphed into a permanent Lakes Committee, which is essentially a conservation committee tasked with lake and stream oversight. Its only authority is to make recommendations to the Selectboard. Each of the three lake associations in Belgrade has one member among the seven on the committee, and I continue on as MPSLA's representative.

Finally, if you have any issues or concerns you would like to see addressed, any ideas that you would like to pursue, please get in touch. It's my pleasure to serve.

All the Best –
Lenny

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Lenny Reich

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Renee McCafferty
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Website
www.mcgrathpond-salmonlake.org

Calendar of Upcoming Events

July 4th – McGrath Pond Independance Day Flotillia – 3 PM Pleasant Point Park

July 10th – Are You Buff Enough? How to Become LakeSmart-er – 9 to 11 AM
(details to follow on website/facebook)

August 12th – MPSLA Annual Meeting – 6 PM Pleasant Point Park
August 13th - Rain Date - Notification by 3 PM Email
BYO Lawn Chair

FACEBOOK MPSLA WEBSITE

Partner Organizations

Town of Belgrade
Town of Oakland
7 Lakes Alliance
Camp Tracy
Whisperwood Lodge & Cottages

Business Sponsors

(See Pages 6 & 22)

Watershed Futurist
$1000 +

Camp Modin
www.modin.com

Hammond Lumber
www.hammondlumber.com

Wheeler's Camps
wheelers-camps.com

Lake Futurist
$500 - $999

Watershed Steward
$250 - $499

Lakepoint Real Estate
www.belgradelakepoint.com

Somerset Stone & Stove
www.somersetstonecenter.com

Lake Steward
$100 - $249

Amy Bernatchez
Lakepoint Real Estate
207-314-2353

Belgrade Boat Storage and Marine Repair
www.belgradeboatme.com

Boy Locksmith
207-872-5862

Day's Store
www.go2days.com

Golden Pond Wealth Management
www.goldenpondwealth.com

Hamlin's Marine
www.hamlinsmarina.com

Higgins Construction
higgi@roadrunner.com

Integra Services
207-314-6341

Korner Store and Deli
www.kornerstoreanddeli.com

Maine Eye Doctors PA
www.maineeyedoctors.net

Novem Inc
info@novem.technology

RonNona LLC
ronnona@roadrunner.com

Sheridan Construction
www.sheridancorp.com

Smile Solutions of Maine
smilesolutionsofmaine.com

The Thirsty Mule
www.thethirstymule.com

Titan Tire Chain and Custom Welding
207-465-4144

Members

Watershed Futurist

Camp Modin
Hammond Lumber
Wheeler's Camps

Lake Futurist

Camp Kennebec Alumni Association
Mal & Ellen Dawson
William Pullen
Lenny Reich & Barbara Allen
Bruce Roberts & Susan Feiner
Lucille Rossignol
Rob & Tricia True
Doak Wolfe & Gordon Smith

Watershed Steward

Lakepoint Real Estate
Somerset Stone & Stove
Dr. Jeffrey S. Poulin

Lake Steward

Amy Bernatchez Lakepoint Real Estate
Belgrade Boat Storage and Marine Repair
Boy Locksmith
Day's Store
Golden Pond Wealth Management
Hamlin's Marine
Higgins Construction
Integra Services
Korner Store and Deli
Maine Eye Doctors PA
Novem Inc.
RonNona LLC
Sheridan Construction
Smile Solutions of Maine
The Thirsty Mule
Titan Tire Chain and Custom Welding
Anonymous
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Mary Chambers
Karl W. Broekhuizen & Darcy Bourassa
Daniel DeLorey
Mark & April Gray
Jason & Amy Grenier
Marilyn Hall
Harvey, Lisa, & Isabella Morrill
Lewis Lester & Jeanne Ives
Dirk & Cathleen Kershner
Neil Korostoff & Stacy Levy
Robert & Barbara Merrill
Brian Mountain
Kelly Pinney-Michaud
Michael Poulin
Robert & Gayle Radder
Peter & Sheila Rancourt
Robert & Joyce Ray
Adam Rodgers
Jeff Rosato
Kay Rutherford
David Sandmel
Bill & Susan Scott
Christie & Phil Souza
Bob & Jean Taylor

Member

Jenny & Craig Allen
Anonymous
Dan & Zaharoula Alexander
Dawn Beatson
Don & Terry Borman
Dan & Brenda Breton
Jonathan & Amy Brier
David & Jennifer Christiansen
Ken, Nicole & Colleen Crabiel
Chet Dalgewicz
Robyn Deveney & Phyllis Capanna
Mary Ellen Donat
Wayne & Sandi Dorr
Angel Drolet
Judith Ellis
Susan Fesenmaier & Lloyd Bennett
Carol Fisher
Alicia & Andy Forster
Mike & Caryl Giggey
Nancy Hale
Kim & Dave Hallee
Peyton Helm
Megan Hevenor
Keith & Karen Hotchkiss
Jim & Jenny Hurley
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Trudy Kaplan
Anna & Terrance Kendig
Jeffrey S. Klein
Perry & Blen Lakin
Barb & Ken Leach
Kay & John Macklin
Doug & Candee McCafferty
Cynthia, Laurence & Ryan McCarthy
Ed & Beth Medema
William Moore
Zlatko & Helen Necevski
Michael Oudyn
Elizabeth Pellerin
Robert Plummer
Robert & Sylvia Poulin
Jonathan Ralton
Sue & Scott Rosenberger
Marge & Joe Ryan
Jody Sataloff
Richard & Cynthia Sayles
Joan & David Schneider
Lori Seto & Kyle Kelso
Everett Sparks
Wendy & Rich St. Pierre
Michael Stein
Robert Thompson
Jay Weitecha & Cassie Marden
Danielle Wain
Diane & Don Wood
Bob & Charlene Zabrowski
Dick & Maggie Zieg

McGrath Pond – Salmon Lake Association

Not a Member?
It is never too late to join the crowd!

As stewards of our two lakes, your membership dues help fund:

Narrows Preserve
Invasive Plant Patrol
LakeSmart Inspections
Courtesy Boat Inspections
Water Quality Improvement
Education and Outreach Programs
Department of Environmental Protection Grants

MEMBERSHIP CATEGORIES

Individual --- $35
Family --- $50
Lake Steward --- $100
Watershed Steward --- $250
Lake Futurist--- $500
Watershed Futurist --- $1000

PayPal

If you prefer to make Donations by check, please click

Membership Form

The MPSLA is a 501(c) 3 nonprofit organization

What Are 319 Grants?

Charlie Baeder - 7 Lakes Alliance

History of Maine DEP 319 Grants
McGrath Pond and Salmon Lake watershed

This Maine DEP grant program provides section 319 US EPA Clean Water Act funding to fix erosion problems that have a negative impact on lake water quality. Project funds can be used by private landowners, road associations, businesses, and towns, and projects require a 50% match from the landowner. Funds are restricted to lakes that are impaired or threatened – McGrath Pond and Salmon Lake are considered threatened lakes because of development.

McGrath Pond and Salmon Lake have received Maine DEP 319 grant funding since 2000. Steps in the process of getting funds are:

1. **Survey** properties along the lake and in the watershed to identify erosion problems
2. **Plan** to fix the problems identified in the survey
3. **Fix** identified erosion problems through a combination of grants and local funds

A first survey of erosion problems on McGrath Pond and Salmon Lake was conducted in 1998 and three grants were completed between 2000 and 2007 – Phase I, Phase II, and Phase III.

A second survey was conducted fall 2017, a new plan was completed in 2018, a Phase IV grant was awarded to 7 Lakes Alliance in 2018, and work was conducted in 2019 and 2020 which included erosion control measures at Camp Tracy and Pleasant Point Park:

Best Management Practices (BMP) were implemented at Camp Tracy with Bluestone, Rip Rap, Turnouts, and Erosion Control Blankets to help limit runoff.

BMP including Erosion Control Mulch, Native Plantings, and Stone were executed at Pleasant Point to impede the flow of sediment into McGrath Pond.

The photo on the right poses an interesting problem – The rushing water will be going towards the lake; how best to slow it down and give it time to soak into the ground?

The Answer - a terraced rain garden.

These four photos show just a small sampling of the work toward erosion control that 7 Lakes Alliance has been able to provide through DEP funding on McGrath Pond and Salmon Lake this past year.

A new grant will be submitted in 2021 – Phase V – which, if awarded, will provide funding in 2022 and 2023. Future Phase VI and VII grants are planned. Surveys and plans must be updated every 10 years to qualify for this grant funding.

If you have an erosion problem or are aware of a problem, please contact MPSLA or 7 Lakes Alliance to get our technical help. A small problem may be fixed by a homeowner or the Youth Conservation Corps. A larger problem – for example, the rebuilding of a driveway, ditch, culvert, or camp road – may be an excellent project for the 319 grant program. We'd like to help and we will be in the watershed this April and May resurveying sites identified in 2017 to see whether they are still good candidates for the new grant we plan to submit this year. If we miss you this spring, no problem, we will be working in the watershed this summer and would be happy to meet you then.

(207) 495-6039

www.7lakesalliance.org

charlie.baeder@7lakesalliance.org

Charlie Baeder

"Funding for this project, in part, was provided by the U.S. Environmental Protection Agency (EPA) under Section 319 of the Clean Water Act. The funding is administered by the Maine Department of Environmental Protection in partnership with EPA."

Protecting Our Lakes

DEP Grant Funding - Bill Scott

Photos - Susan Scott

The McGrath Pond and Salmon Lake Watershed Survey was completed in 2017 and the results listed several sites on the ponds that were contributing to nonpoint source pollution (polluted runoff). Our Association at West Lake Meadows was one of the sites.

THE PROBLEM

McGrath Pond has many unnamed streams that feed into it; one of them flows through our land, into the neighbor's property and delivers sediment directly into the pond. Aerial photos from 7 Lakes Alliance have shown a delta that is growing in size on the northwest side of the pond adjacent to our shoreline. Sediment coming from the creek is a major player in this developing delta. Above is a 2020 photo taken of the delta to the left of our beach area.

THE SOLUTION

The goal of our remediation project was to reduce the amount of nutrients being washed into the pond from our stream. With assistance from 7 Lakes Alliance, we received a Department of Environmental Protection (DEP) 319 Grant and began a two-year process focusing on (1) creek bed stabilization, (2) road reshaping, and (3) ditching.

CREEK BANK

Decades ago, railroad ties and automobile tires were used to shore-up the banks of our stream. The timbers and tires needed to be removed as they were pollutants in their own right and had outlived their intended purpose.

After their removal, the sides of the creek bank were shaved back to create a more gentle slope as shown on the right. Bluestone rip rap was then placed on the banks of the creek to prevent further erosion.

The DEP 319 Grant required plantings every three feet along the top of the stream bank. We were able to harvest ferns, lilacs, and hostas from the property and transplant them to satisfy this requirement.

ROAD WORK

The camp road consists of both asphalt and gravel sections. The driveway is a steep asphalt road that runs perpendicular to the pond from McGrath Pond Road to where the first cottage is located. A gravel road then travels parallel to the pond and connects to each of the cottages and their parking pads.

Our first concern was working with this gravel section of the road. Erosion was evident as you could see small rivulets forming and washing dirt and sediment to the bottom of the drive when it rained (photo on left). This sand would eventually enter the stream near the culvert. We used bluestone (indigenous to our area) with fines to reshape the gravel road. When compacted, the fines work like glue interlocking the larger stones , creating a firm but permeable surface. The second photo on the right was from the same area (also taken during a rain storm) shows how we have alleviated much of the soil/sand runoff by adding gravel and reshaping of this section of road.

The asphalt camp driveway, from McGrath Pond Road down to the cottages, represents a separate set of problems. Art Grindle, Erosion Control Coordinator for 7 Lakes Alliance, made a site visit and had several suggestions. He concluded that road sand and debris would flow down the slight incline on McGrath Pond Road and then shoot straight down our asphalt drive and wash into our creek at the bottom of the hill. He suggested that a large ditch or swale with rip rap be installed to the right of our drive that would funnel this runoff into the vegetation before it would have the chance to get to our asphalt drive.

Through his recommendation, we were able to get the Town of Oakland to dig the above trench and armor it with stone to divert the water and runoff.

There were also ditching concerns that needed to be addressed on the entry drive. Ditches had filled with sand over the years and in places, the ditches were actually level with the road or higher than the road itself. This resulted in water rushing down the road and channels being formed where the ditches should have been. The outcome was nutrients, road debris, and sand being washed into the creek rather than being diverted into vegetation. This was corrected through the excavation, reshaping and seeding of the ditches. Erosion control blankets were used to prevent further erosion while grass was being established in the new ditching.

The entry drive itself needed repair as there were sections that consisted of broken asphalt, pot holes, and vehicle tire depressions. The crown of the drive was basically non-existent. Charlie Baeder, Director Conservation Programs at 7 Lakes Alliance, recommended placing crushed bluestone gravel with fines over the top of the damaged areas of asphalt and cutting out sections of the asphalt where the bluestone would transition into the asphalt. This method was used on Peninsula Drive on Long Pond with excellent results. We did a site visit to this road and much to our surprise, we found the inserted sections of bluestone gravel to be as good as and often superior to the sections of asphalt. We were also amazed at the hardness and compactness of the bluestone. Rick Labbe, who had completed the work on Long Pond, recommended spreading calcium chloride or magnesium chloride on the crushed stone which would harden the surface and help alleviate damage from snow plowing. Photo on right shows the completed job.

There are six cottages in our Association of Raymond's Cottages Condominiums at West Lake Meadows (formerly Quirion's Camps). We have been fortunate to have received over $18,000 in DEP grant funding since 2001. These funds have allowed us to help protect the pristine quality of our pond and beautify our property as a byproduct.

The biggest pollution culprit in McGrath Pond and Salmon Lake is polluted runoff or nonpoint source (NPS) pollution. These pollutants will increase phosphorus levels which in turn can cause an algae bloom. The last thing we would want on McGrath Pond or Salmon Lake is a major algae problem like North Pond is witnessing this year or East Pond has had in the past. If you are one of the 105 nonpoint source pollution sites listed as in our survey, please consider contacting 7 Lakes Alliance or LakeSmart as funds are available to help mitigate erosion issues. Please do your part to protect our great natural resource.

Bill & Susan Scott

Water Quality Update

Dr. Danielle Wain - Lake Science Director
7 Lakes Alliance-Colby Water Quality Initiative

Throughout Summer 2020, on both ponds, the 7 Lakes Alliance continued to collect profiles of temperature and oxygen, in addition to Secchi disk readings and water samples for phosphorus analysis. Much thanks to Whitney and Jan King, who got the measurements started in early spring and summer, and to volunteers Rich St. Pierre on McGrath and John Loomis on Salmon who ferried me out to the sampling buoys in the second half of the summer!

Since 2015, the 7 Lakes Alliance and our Colby interns have collected temperature and oxygen profiles, in addition to Secchi disk readings (water clarity) and water samples for total phosphorus (TP) analysis. From our monitoring, we can see how important water quality metrics, such as the average P and Secchi disk transparency (SDT), change from year to year. These metrics are one way of classifying the trophic state of the lakes, which essentially tells us if we have good (oligotrophic), medium (mesotrophic), or bad (eutrophic) water quality. The State of Maine has defined thresholds for water quality based on SDT and TP. An average SDT reading between 13 ft and 26 ft is defined as medium water quality (> 26 ft is good and < 13 ft is bad). An average TP value between 4.5 and 20 ppb is defined as medium water quality (< 4.5 ppb is good and > 20 ppb is bad). All of the Belgrade Lakes are in the medium range, except for North Pond.

McGrath Pond is relatively shallow, so it does not stay stratified by temperature and continually gets mixed up by the wind. In McGrath, the average SDT in 2020 was 20 ft, slightly lower than the average of 21 ft over the previous five years (Figure 1, left). The average phosphorus was 14 ppb, slightly higher than the average of 11 ppb from the previous five years (Figure 2, right). Despite the slight decline in water quality in 2020, these metrics are still well within the medium water quality range.

In Salmon, the average SDT in 2020 was 20ft, which is 2 ft better than in the previous five years (Figure 1). Salmon is deep, so it remains stratified through much of the summer and loses oxygen near the bottom. This can lead to the release of phosphorus from the sediments.

To classify the water quality of a lake based on phosphorus, we typically just use the concentrations in the surface layer (this is based on the procedure that the state uses). The average phosphorus in the surface layer of Salmon was 16 ppb in 2020, slightly higher than the 13 ppb average from the previous five years (Figure 1, right).

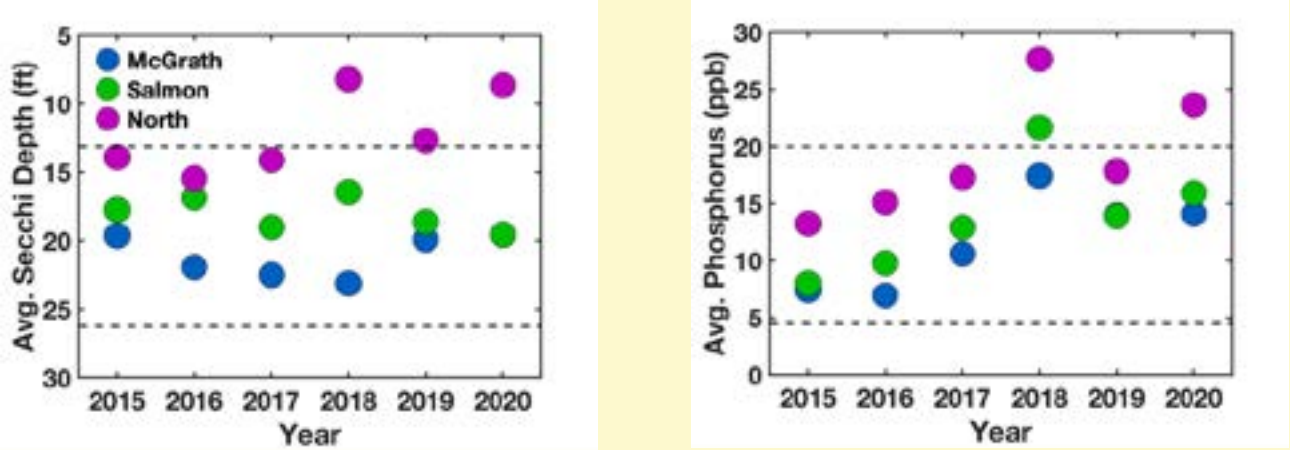

Figure 1. (left) The average Secchi disk transparency in the lakes since 2015, with comparison to North Pond. The two water quality thresholds are plotted as well. (right) Volume averaged phosphorus concentration in North and McGrath, and epilimnion averaged phosphorus concentration in Salmon, since 2015. The two water quality thresholds are plotted as well.

After the bloom in North Pond in 2020, many users of the lakes have been concerned that this might happen to their lake as well. As can be seen in Figure 1, both Salmon and McGrath have had better SDT and less phosphorus than North Pond over the past 6 years, and have mostly stayed within the medium water quality range with both metrics. The historical data for McGrath actually shows that water clarity has improved since the 1980s! Our regular sampling on McGrath has not indicated that there is cause for concern at the moment.

The loss of oxygen in the deep water of Salmon leads to the release of a lot of phosphorus from the sediments over the course of the summer (up to 800 ppb in the deepest part – the highest in the Belgrades!) This phosphorus is trapped deep by the temperature stratification, and there is no light for algae, which is why the water clarity in Salmon in the summer remains good. But year-round residents know that in November the lake turns green, as all this phosphorus gets mixed to the surface and provides fuel for algae. While the situation currently appears stable, changes in weather and climate could possibly cause this phosphorus to mix up earlier in the summer.

Salmon Lake Shoreline
November 2020

Salmon Lake Water Sample
November 2020

Colby College did a toxin analysis of the green water sample (photo on right) and they did NOT detect Microsystin, the most commonly observed toxin in Maine. So even though the water was gross, it was not unsafe.

We are fortunate to have our Colby interns back for 2021 and we will continue to keep an eye on the lakes! To keep the lakes stable, all property owners need to do their part to help reduce the amount of phosphorus entering the lakes by building buffers and other best management practices. You can contact Art Grindle at 7 Lakes Alliance or Kim and Dave Hallee at MPSLA to help make your property LakeSmart!

(207) 495-6039

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Dr. Danielle Wain

LakeSmart

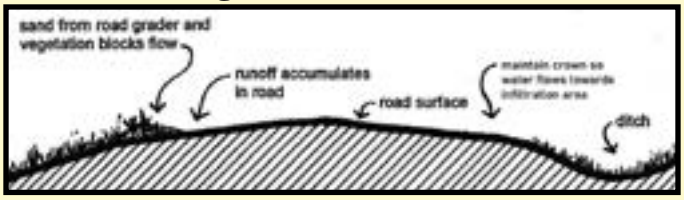
Kim & Dave Hallee

During the years that Kim and Dave Hallee have been LakeSmart evaluators for McGrath Pond & Salmon Lake, they've worked with many folks to fix runoff problems. Phosphorus getting into the water is the lakes' enemy, and it's not just in lawn fertilizer. The number-one lake pollutant is eroded soil carried in storm-water runoff from yards and roads. Phosphorus naturally attached to soil particles feeds algae in the lakes. Growing numbers of algae turn the water murky, and a full–fledged bloom ruins lakes for everyone, creating that sickly green that sinks property values. Belgrade Lakes Association (the lake association for Long Pond and Great Pond) recently boiled down the first commandment for keeping our lakes clear to this pithy statement::

KEEP THE DIRT OUT OF THE LAKE!

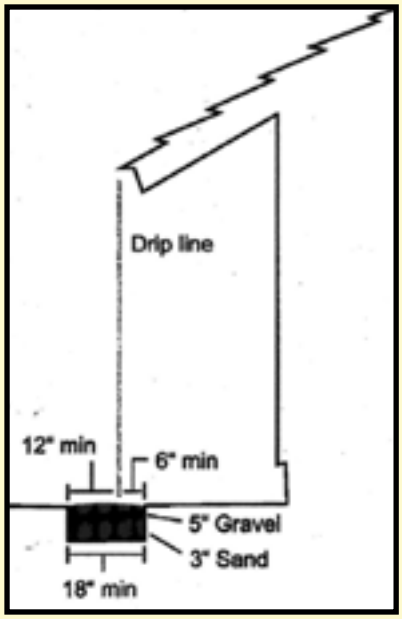
Here's how to do it –

Crown your driveway: Shape roads and drives so that rain sheds off the driving surface and is directed to areas where it can soak into the ground.

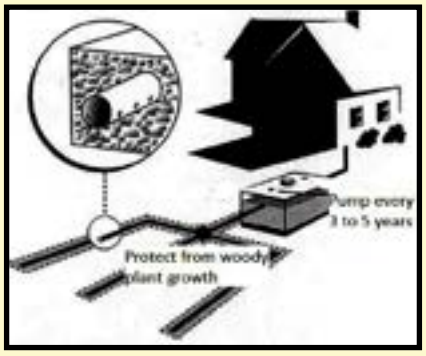


Keep parking areas defined: Minimize the area of compacted/non-permeable land.

Don't let the drip from roof edges erode the soil below: Stone-filled trenches capture water and provide a broad area for water to soak into the earth.



Care for your septic system: Pump the tank based on service provider recommendation, and prevent woody plant intrusions into the leech field.



Limit lawn area: Grass actually does a poor job of soaking up rain. Create and maintain paths that limit water going straight to the lake:

Curved footways and steps of stones or erosion-control mulch absorb soaking rains and minimize compaction of soil.

Maintain and plant trees of all sizes on your property: Trees provide shade, calm the winds, slow down raindrops, buffer noise, and cool the air with their evaporation. Tree roots support and stabilize soil.

Buffer by the lake: Provide a wide buffer area to naturalize the shorefront, a 10-foot minimum. The variety of plants and leaf litter will help capture runoff before it reaches the lake. Buffers provide privacy, limit noise and glare.

Preserve the shoreline: Encourage plant life down to the water's edge. If bank undercutting has occurred, a DEP permit will be required to armor the shoreline with stone or other effective measure. Secure and cool riprap with plants.

UNDERCUTTING UNTREATED

TREATED WITH RIPRAP

GUIDANCE AND RESOURCES

LakeSmart Coordinator
Kim Hallee, 314-0881 or khallee@gwi.net

Erosion Technical Support – Youth Conservation Corp
artgrindle@7lakesalliance.org

Matching Grant Opportunities – 319 Funds
charlie.baeder@7lakesalliance.org

'Conservation Practices for Homeowners'-Factsheet Series
https://www.maine.gov/dep/land/watershed/materials.html

https://www.lakes.me/lakesmart

Kim & Dave Hallee

Good News and Bad News

About Water Quality

Bonnie Sammons

(Photos: Robyn Deveney)

THE GOOD NEWS:

The water quality of a significant number of rivers, streams and lakes in Maine has improved.

According to the recent report of the Maine Climate Council, this comes as a result of laws and regulations that were enacted to mitigate the effects of development, agriculture, and forestry practices on water quality.

Water quality improvements also come about through the efforts of MPSLA, other Lake Associations and organizations that share the common goal of protecting Maine's lakes by assessing threats, making recommendations to remediate them and helping implement the recommendations. Their efforts include:

- MPSLA's 2017 watershed survey identified 105 lakefront properties, roads or public areas that presented erosion hazards and made specific recommendations to fix those problems. Several such surveys have been completed around the Belgrade Lakes Watershed over recent decades.

- Scores of volunteers monitor for invasive plant species, take secchi disk readings of water clarity and assist Colby water quality monitoring activities.

- Grants acquired through Lake Association efforts help property owners implement erosion control measures.

- LakeSmart coordinators do free analyses for Lake property owners to help them protect water quality by installing better buffers and other features to slow erosion that carries phosphorus into the lake.

With all of these excellent efforts one might conclude that we are doing all that we can to protect our water quality. But there is one threat to our lakes - indeed to our ecosystems and planet that we can and must do more about.

THE BAD NEWS:

The recent Maine Climate Council's Report reveals issues that require further action. Climate disruption is having several impacts. Among them:

- Maine Lake surface temperatures have increased by 5.5 degrees since 1984, more than the global average. Warming temperatures can
    - Eliminate cold-water adapted species
    - Decreased ice thickness and duration
    - Alter food webs

- More intense rainfall events facilitate
    - Stormwater transport of soil, nutrients and other pollutants into lakes
    - Higher nutrient levels that shift biota to less-desirable species including
        - Nutrient-loving invasive species
        - Cyanobacteria and possibly toxin-producing algal bloom species

In addition to protecting water quality because we love the lakes, there are practical considerations. Common sense suggests that shoreline property values decrease when water quality suffers and indeed studies corroborate this. This causes a domino effect with respect to property taxes by shifting the tax burden from shoreland properties to upland properties. Studies cited in the MCC Report estimated that Maine lakes generate annual revenue of approximately $4 billion (amount adjusted for inflation). Locally, Colby Economics Professor Michael Donihue's 2015 study of the economic impact of the Belgrade Lakes states, "We find an estimated annual impact of $6.8 million in spending, including multiplier effects, and support for 68 full and part-time jobs in the watershed."

Clearly there are a multitude of reasons for us all to seek to maintain the quality of the lakes and other Maine waters.

WHAT CAN BE DONE ?

Starting right here in Maine, the newly created Maine Climate Council recently published a report titled, "Maine Won't Wait: A Four-Year Plan for Action." It sets out strategies for adaptation and mitigation over the near term by looking toward how to best deal with inevitable climate changes while also reaching the statutory goals of reducing emissions 45% by 2030 (compared to 1990) and 80% by 2050. The report is well worth reading to get ideas of what each of us can do.

Climate disruption is a local, national and global problem. We need actions that can impact the country and the world. A solution that is receiving a lot of attention is embodied in a bill that will be introduced in Congress this year: The Energy Innovation and Carbon Dividend Act (when reintroduced in the 117th Congress, it will likely have a new name). Referred to locally as Cashback Carbon Pricing legislation, it has numerous benefits. When enacted it will reduce carbon emissions 40% within a decade, stimulate the transition to renewable energy as the price on fossil fuels adjusts upwards to reflect its true cost, and generate 2 million new jobs in the renewable energy sector. A unique feature of the bill is that it is revenue neutral, immediately returning all fees collected to US households. It is the only one of a dozen carbon pricing bills under consideration that does so. It avoids reliance on complicated regulations to do what must be done to avoid the worst impacts of climate change: put a price on carbon-based fuels that is commensurate with the damage that has been done by using them. Will enacting climate legislation help maintain our water quality? There is a long chain of interconnected events that leads from burning carbon based fuels to impaired water quality and a multitude of other negative impacts. The chain must be broken. There is no silver bullet that will change our climate change trajectory. To protect water quality and every aspect of our life support system, we will have to pull out all the stops - with a price on carbon leading the charge as a key component of an overall plan.

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