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A Message from the President

Greetings all,

Autumn is transitioning into winter but it was a very colorful and warmer one than usual. The boats are off the lake, summer cottages are closed up for the winter, and the migrating waterfowl have been visiting the lake as they fly south.

It's a good time to reflect on the past summer at Province Lake. It was challenging given the COVID 19 pandemic. An upside was the opportunity to be outside enjoying the lake. Hopefully, many of you have gained an even greater appreciation for our lake. We very much missed seeing you in person at our Annual Meeting and hope we can gather again face to face next summer on Saturday, July 17 at Edge Lake Farm. In spite of the challenges, you invested and actively supported the mission of the PLA as reflected in our 150 members, the majority of whom donated above our basic membership level. Thank you!

We experienced a significant drought with accompanying low lake levels but did not have any significant cyanobacteria blooms. Our NH Lake Hosts and Weed Watcher were diligent in keeping the lake invasive free again and we are grateful for all their efforts. The Rt 153 beach clean ups were very successful. The beach was heavily used this summer and in addition to the usual trash we were able to remove unused moorings thus reducing strike hazards and general debris. Our loons were unable to produce a chick this year but we hope that next summer will be more successful. And the baby eagles that were displaced when their nest fell were rescued and later released to the wild. In August, we experienced very high winds, and reported waterspouts, from Hurricane Isaias. There was a lot of property and tree damage, particularly on the Wakefield side of the lake.

Unfortunately, more extreme weather seems to be the trend but there are positive infrastructure improvements for the lake. The NH DOT replaced the Rt 153 culvert, which greatly improves inflow to the lake from the South River. The guardrail was slightly extended toward the NH/ME state line, further protecting the shoreline. The Town of Wakefield resurfaced a short stretch of Bonnyman Rd adjacent to Rt 153. The Town of Effingham and NH DES have engaged CMA Engineering to evaluate the Bailey Rd culvert and bridge. We hope this will lead to a replacement structure that will improve the South River outlet. AWWA and NH DES is working on a 319 grant proposal to further address septic, erosion runoff, infrastructure and educational opportunities in 2021. We greatly appreciate all the efforts of our partners to improve our lake and water quality.

Your care for the lake is reflected in the brisk sales of properties around the lake. Province Lake is clearly a very desirable lake to own property on and enjoy for all it has to offer. With your continued support, we hope this to be the case far into the future. It's never too late to become a member so please consider joining the PLA if you haven't had the opportunity to do so yet in 2020. Your investment in our lake makes all the difference.

Best wishes to you and your loved ones for a healthy and happy holiday season. Be well.

Lorie for the PLA



Your PLA at Work

Save the Date:

Annual Meeting: Saturday, July 17 at Edge Lake Farm, hopefully we might be able to meet face to face.

Articles



AS THE LAKE FREEZES, THINK SAFETY FIRST!

by Jon Samuelson

Now that summer has passed and we are well into fall, winter enthusiasts start to get excited about the upcoming season. Part of that is the inevitable freeze of the lake and the yearning to venture out on it either for a walk, skate or a ride on a snowmobile/ATV. However, you must be careful in those early times of the freeze. Here are some key things to consider before you venture out (abbreviated from the NH Fish & Game website)

- It is not advisable to drive cars and pickup trucks on the ice.
- If on foot, cut test holes as you make your way out to assess the thickness.
- “Rule of Thumb” on thickness ... There should be a minimum of six inches of hard ice before individual foot travel, and eight to ten inches of hard ice for snow machine or All-Terrain Vehicle travel.
- Be careful in areas with a current such as inlets and outlets.

- Stay off the ice along the shoreline if it is cracked or squishy.
- Don't gather in large groups.
- If you do break through, don't panic. Move or swim back to where you fell in, where you know the ice was solid. Lay both arms on the unbroken ice and kick hard. This will help lift your body onto the ice. Carry a set of ice picks; they can help you pull yourself out if you do fall through the ice; wear them around your neck or put them in an easily accessible pocket. Once out of the water, roll away from the hole until you reach solid ice.

These are just some of the things to consider ... to read the full text, please go to this [link](#). At the link, you will see there is also a handy trifold brochure that you can download. Stay safe this winter if you are a winter user of the lake.

Ice In and Out on Province Lake	
ICE IN	ICE OUT
1/3/2012	3/19/2012
12/26/2012	4/11/2013
11/29/2013	4/18/2014
11/29/2014	4/16/2015
1/4/2016	3/15/2016
12/11/2016	4/16/2017
12/16/2017	4/20/2018
11/23/2018	4/16/2019
12/1/2019	3/27/2020
Snow Accumulations At Province Lake	
SEASON	INCHES OF SNOW
2011-2012	49
2012-2013	88
2013-2014	86
2014-2015	104
2015-2016	32
2016-2017	132
2017-2018	103
2018-2019	90
2019-2020	72
AVERAGE	84

Many of you who totally enjoy everything about Province Lake have gone to your winter homes which are often in busier and warmer locations. I can tell because, as a full time resident of Effingham, it is very quiet here. I am one of those strange people who actually enjoys the winter months. Yes, I certainly enjoy warm weather and all that it brings – swimming, boating, cookouts, sitting out with a drink and admiring the lake view in the evening (morning too, but the drink is different), etc. Some of the things I love about the lake in the winter are; total quiet, the lake white and solid enough to walk on, no outdoor chores, reading by a cozy wood stove, wearing comfy sweaters, breathing in the crisp clean air, spending uninterrupted time in my shop making stuff, etc.

But what I really want to let those who are away know, is what the lake is doing while you are gone. First it is interesting to note that water is one of the rare compounds (hydrogen and oxygen) that expands with decreasing temperature. That expansion of water becoming ice is a significant contributor to the breakdown of rocks/mountains. It is also the reason that ice is on the top of the lake – since ice is less dense than water, it floats. If ice contracted, became denser than water it would sink. That would result in lakes freezing from the bottom up leaving little or no room for the survival of fish and other aquatic organisms.

During late fall, the surface waters of the lake cool, and at approximately 39 degrees Fahrenheit, the ice formation process begins. At this temperature, surface water molecules begin to spread apart, resulting in the surface water layer of the lake becoming less dense than the water lying underneath. The more the surface water cools, the more the molecules spread apart and the less dense the surface layer becomes. Around 32 degrees Fahrenheit, the less dense surface water layer freezes into ice which then floats on the denser water below.

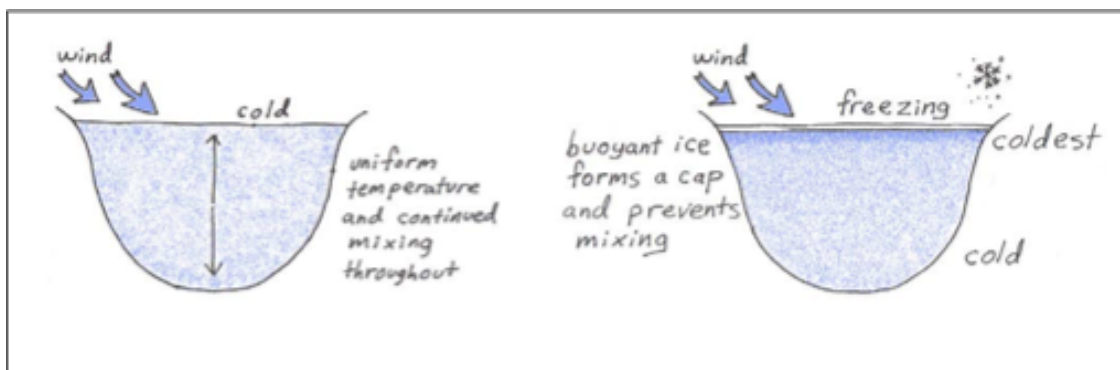
The ice surface continues to get thicker during the winter assuming relatively consistent temperatures below freezing (32 degrees F). PLA with UNH has done some winter water sampling which required boring a hole in the ice. Ice thickness in March has often been in the two to three-foot range. That is a very safe thickness to walk, ski or snowmobile on. Once the ice is thick and solid the quiet is gone on the weekends – snowmobiles are very popular during the winter and often several can be seen (and heard) cruising rapidly across the lake.

The solid ice is surprisingly in motion during the winter. Frozen lakes have the ability to create their own, unique music and the sound can be unbelievable—often described as electronic music or sound effects that would accompany lasers. As the temperature fluctuates during winter, lake ice expands and contracts. The freezing and thawing causes the ice to move, sending sound waves throughout the ice. The sounds, which can be haunting to those on the ice, may seem nearly impossible to be a natural phenomenon and are heard best when the ice is free from snow cover and when major temperature fluctuations

occur. To hear some amazing examples of winter lake music, visit www.youtube.com/watch?v=OC7_zpyqCrU

You are undoubtedly aware of the PLA concerns regarding erosion and the introduction of phosphorus (which accelerates plant growth leading to dissolved oxygen reduction and algae blooms removing more oxygen and leading to dead zones in the lake). Winter does not mean there are no water quality concerns for a few months. The ice itself reduces dissolved oxygen. Since the ice seals the lake off from the atmosphere, no additional oxygen is mixed into the lake during the winter. When snow covers the ice, sunlight is not able to penetrate into the water so algae and plants are unable to make additional oxygen through photosynthesis. As the winter progresses, the amount of oxygen, which is vital to the survival of the organisms living in the lake, is reduced. If the snow and ice cover remain for a lengthy period, it is possible that all the oxygen in the lake will be used up before the ice melts causing organisms—particularly fish—to perish.

Luckily, when the ice cover melts in March or April, the lake will mix with the atmosphere, bringing precious oxygen back to our lake.



Did you know that improper snow storage and removal practices can damage lake quality? Snow often contains trash, nutrients, sediment, salt, sand, and pollutants from vehicles. When space for snow storage is limited, some businesses and residents may plow snow into wetland and stream areas—some may even plow snow right into rivers and lakes! These practices often cause violations of state water quality standards and degrade the health of our waterbodies.

Landowners are responsible for the snow removal practices that are conducted on their property. Here are some tips that will help you protect the quality of your local lake, while allowing you to “dig-out” after the snowstorms that are surely headed our way.

- Avoid blocking culverts and catch basin inlets, vegetated swales, and stone-lined drainage channels with plowed snow. Storing snow in these areas can cause flooding.

- Avoid plowing snow onto bare soil and dirt roads that are unstable or steep. The ability of these surfaces to absorb snow melt is very low. Plowing snow onto these areas could cause soil erosion and generate polluted runoff water.
- Plow snow only off of hard surfaces that do not absorb water, such as driveways and walkways. Do not plow snow off of vegetated areas.
- Identify appropriate areas to store snow and communicate this with the plow operator.
- Install markers to identify the locations of planters, soil mounds, and bare soil.
- Deposit and store snow only in areas that can infiltrate snowmelt such as vegetated areas that are not connected to streams and are not wet (marshy) part of the year. If no such snow storage area exists on your property, design an infiltration system adjacent to your driveway that has a low, landscaped berm around it to contain meltwater from plowed snow.
- As a last resort, have the snow hauled away, but make sure that the snow will be deposited in an appropriate location.

What does winter mean to the creatures in the lake – they don't have the ability to go south for the winter – just finding a ride to the airport is enough of a challenge.

During a typical New Hampshire winter, lakes and ponds are sealed off from the rest of the world with a thick layer of ice for at least a couple of months. The aquatic organisms that weren't able to go south in search of warmer waters face the challenge of adjusting to water temperatures low enough to freeze their homes and declining levels of oxygen which could cause them to suffocate. To deal with these adversities, frogs, turtles, and fish have adapted many unique strategies which allow them to survive.

Frogs: As the air temperature drops throughout the fall, the body temperature of frogs (and other amphibians and reptiles) drops as well, alerting them to head for their overwintering site. Some frogs overwinter by burrowing down in the thick layer of decomposed leaves along the shoreline where their bodies may partially freeze. They don't freeze completely, however, thanks to a high amount of glycerol or glucose that their bodies produce which acts like antifreeze. Other amphibians and reptiles that can't tolerate freezing spend their winter at the bottom of the lake in the mud where the ice can't reach.

Turtles: Most turtles burrow into the mud and become inactive during the coldest winter months. However, some turtles have an unusual ability to survive very long periods of time without oxygen—in fact, their metabolism can continue uninterrupted without needing oxygen. These turtles enjoy their normal activities throughout the winter. Take a look under the ice this winter and you might see a painted turtle or snapping turtle swim by!

Fish: Like other cold-blooded animals, fish adjust their body temperature to decreasing water temperatures and can modify their metabolism to tolerate cold.

Some fish are able to reduce the amount of fat in their bodies and produce an antifreeze-like substance inside their bodies—trout, salmon, and yellow perch are particularly good at this. This allows them to remain active during the winter, but their movements are slow. These fish often migrate to the deepest part of the waterbody where the water is the warmest. Other fish, such as bass and sunfish, unable to tolerate the cold water, spend the winter in a resting state by burying themselves in the mud and leaves at the edge of the waterbody. Amazingly, bullheads, and other members of the catfish family, can completely freeze during winter and thaw in the spring without being harmed!

Although, the activity level of these cold-blooded aquatic animals drops during the winter, it typically does not stop entirely. Instead of going into a state of inactivity (commonly referred to as ‘hibernation’) like some warm blooded animals, certain fish and many turtles and frogs go into a period of reduced activity called ‘brumation.’ During a warm spell, like a January thaw, they may get heated up enough to venture out of their winter home.

Their biggest winter threat: The biggest threat to the aquatic organisms that stay behind in New Hampshire each winter is not the cold weather—it’s the loss of winter habitat. Man-made alterations along the shoreline (such as retaining walls) can prevent frogs and other amphibians and reptiles from reaching their vital overwintering habitat on land. Unfortunately, the removal of natural vegetation along the shoreline can eliminate overwintering habitat altogether. Also, water level drawdowns conducted too quickly during autumn can strand organisms out of the water before they are able to relocate to their overwintering site, causing them to perish. And, drawdowns conducted too deeply can result in ice reaching the lake bottom farther from shore and to a deeper depth in the lake than in previous years, adversely impacting the amphibians and reptiles that spend the winter in the lake bottom.

You can help protect our lakes and the animals that live in them! If you own property along a lake, one thing you can do to keep your lake healthy is to keep or replant vegetation along the shoreline. By doing so, not only will you provide critical overwintering habitat for frogs and other amphibians and reptiles you’ll beautify your property and reduce the amount of pollution that flows into the lake.

Significant segments of this article have been contributed by NH LAKES. NH LAKES is the only statewide, member-supported nonprofit organization working to keep New Hampshire’s lakes clean and healthy, now and in the future. The organization works with partners, promotes clean water policies and responsible use, and inspires the public to care for our lakes. For information, visit www.nhlakes.org, email info@nhlakes.org, or call 603.226.0299.

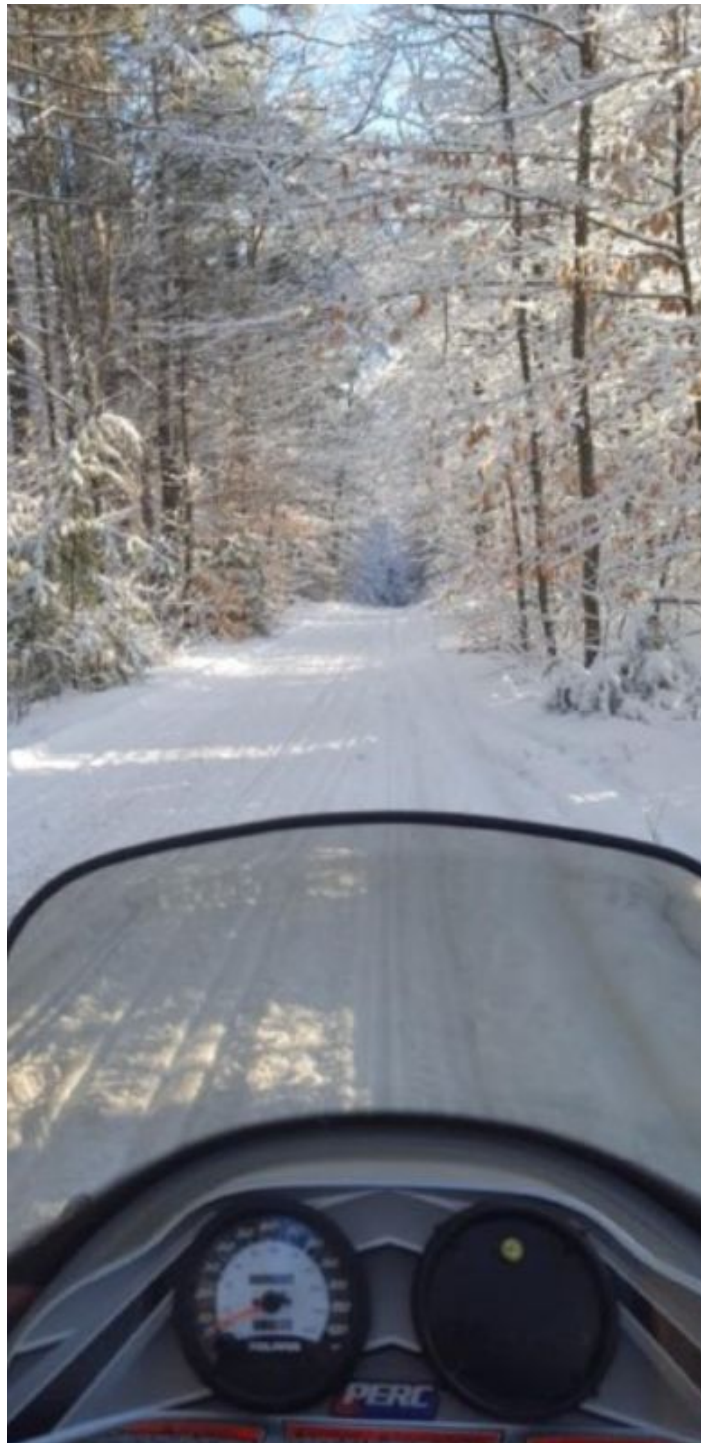




photo supplied by D. Luce

 [PLA Facebook Page](#)

 [PLA Website](#)

Links to our partner websites,

 [Acton Wakefield Watershed Alliance \(AWWA\)](#)

 [Moose Mountain Regional Greenway](#)

 [NH Lakes Lay Monitoring Program](#)

 [NH Lakes](#)

 [Green Mountain Conservation Group](#)

About the PLA

Membership in the PLA is open to anyone who has a love and concern for Province Lake. The PLA has an active membership and we encourage all to become members by completing a brief membership form and paying annual dues. Click [here](#) to join and to see membership information. 100% of PLA membership fees and donations go into projects and related work focused on Province Lake water quality.

Our mailing address is:

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PLA is a 501(c)3 charitable organization and as such all donations are tax-deductible to the full extent allowed by law. Our EIN is 23-7337832

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