



PROVINCE LAKE THIS MONTH

A Message from the President

Hi Everyone,

Well, winter has certainly arrived though Mother Nature has been a bit fickle with days near 40 and then below zero in the same week! We have made it through the darkness of the winter solstice, the shortest day of the year, and are now thankfully seeing the days gradually becoming longer.

"Ice in" was reported December 8th, which is one of the earliest, and activities on the lake, have picked up. Ice fisherman, snowmobilers, snowshoers and kite skiers have been spotted on the lake. It is also the time to take a moment to enjoy the quiet beauty of a sunny "bluebird day" view, a sunrise or sunset or a blowing snowstorm across the frozen lake.

January found members of the Board meeting with some of our partners, including Linda Schier from Acton Wakefield Watersheds Alliance and Dr. Jim Haney from UNH, to continue to investigate ways to keep Province Lake healthy. More will come in future newsletters.

As the winter progresses, the ice conditions will continue to change, both above and below the ice. It is important for those who venture out to pay attention. We have included helpful information as reminders of safe practices. For those who have ever wondered about the freezing process of a lake you will enjoy the article, courtesy of New Hampshire Lakes Association, entitled *How Do Lakes Freeze?*

As we issue this third edition of *Province Lake This Month* please let us know if there are topics you would like to see addressed or just have some general feedback.

Enjoy the rest of the winter; spring will be here before we know it. Be well,

Mindy Schuman-Vye

President, Province Lake Association

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Why Is There a Water Control Device (Dam) on Province Lake?

This is a question that many people ask so we thought this would be a good time to answer it. When the culverts under Bailey Road were replaced around 1988-1989, it was observed that summer that the lake area was significantly reduced. This had adverse effects on the lake by allowing more weed and vegetation growth to the point that the lake was choked full with this vegetation. Also, the reduced lake area extended shorelines out several tens to a hundred feet from the normal lake shoreline in the shallow portions of the lake. So, what could be done to restore the lake to the original level?

A plan was drawn up in 1994 to install a water control device, a dam, that would bring the lake level back to the original level of 480 ft. above sea level. This dam was constructed with a concrete abutment and six removable stop logs to maintain the lake level at 479.5 feet above sea level. The dam was installed in 1994-1995 and the first operation of the dam started in the spring of 1995.

Records are kept measuring the lake level from the top of the concrete abutment that is closest to Bailey Road to maintain the lake level at 479.5 feet. Adding or removing stop logs achieves this. Usually, all stop logs are placed in May after snowmelt runoff has stopped. Another provision of the dam operating plan requires flow into the South River at all times. This provision may require the lake level to be lower than normal in dry summers to maintain flow to the South River. All stop logs are removed around October to lower lake level to minimize shoreline damage from ice in the winter and early spring.



Upstream (lakeside) and Downstream views of the Dam with the boards installed

How Do Lakes Freeze?

This article was originally published by the New Hampshire Lakes Association (NH LAKES), the only statewide, member-supported nonprofit organization inspiring the responsible care and use of New Hampshire's lakes to keep them healthy for the benefit of current and future generations. To find out more, visit <http://www.nhlakes.org>.

We're lucky in New Hampshire—our lakes typically freeze during winter. This provides us with another great season of fun on the lake. While many of us are looking forward to the cross country skiing, ice skating, snow shoeing, ice fishing, and snowmobiling opportunities that our favorite lake will soon offer, we must wait patiently for the ice to form and become thick enough to support us and our recreational gear.



Our frozen lakes in winter offer lots of fun activities

How does a lake freeze? - Since early August when New Hampshire's lakes typically achieve their warmest temperatures, our lakes have been cooling off and starting the freezing process. Here's how it happens...

As the air temperature drops during late-summer, the temperature of the upper layer of the lake drops, too. The cooling surface water becomes heavier and denser—eventually to the point that it sinks toward the lake bottom and forces warmer, less dense water to the surface. The process of the upper layer cooling and sinking occurs until the temperature of all the water in the lake drops to approximately 39 degrees Fahrenheit—the point at which water reaches its maximum density.

At some point in November or December, as the air temperature and the water at the lake surface becomes colder than 39 degrees Fahrenheit, something rather unique happens—the water molecules at the surface spread apart and the surface water becomes less dense than the water below. This is unique because typically in nature as things get colder they contract not expand. This expansion allows the cooler surface water to float upon the slightly warmer (and more dense) than the water just below it. Once the surface water cools to approximately 32 degrees Fahrenheit, the water molecules crystallize into interlocking lattice-like patterns and ice is formed. The ice takes up more room than the water it was made from which makes the ice lighter (and less dense) than the water below it, allowing the ice to float on top of the water. If the ice was denser than liquid water, then it would sink and lakes would freeze completely from the bottom up. Since most aquatic organisms can't survive being completely frozen, this would cause big problems in lake ecosystems!

Shallower lakes usually freeze before deeper lakes since shallower lakes contain less water that needs to be cooled down. And, lakes freeze from their perimeter towards the center since there is less water in the shallower areas that needs to be cooled.

How does the ice become thicker? - Once an ice film has formed on the surface of the lake and the air above the ice continues to be colder than the ice, the ice will thicken. The cold air above the ice causes heat to leave the lake water under the ice and from the ice itself. This causes the water below the ice to freeze into successively deeper layers. As the winter air gets colder and colder, the ice gets thicker and thicker until we can stand—and sometimes even drive—on it without falling through.

Why don't lakes freeze completely? - At some point, the ice layer itself on a lake will act as an insulator, preventing the cold air above the ice to remove heat from the unfrozen water below. This is why lakes don't typically freeze completely from top to bottom. The ultimate thickness of the ice layer depends on many variables including the size and shape of the lake, the air temperature, and the duration of the cold air above the ice. In some cases, very shallow lakes or lakes on mountaintops may freeze completely, but this is not often the case in New Hampshire.

Have a safe and enjoyable experience on our lakes this winter! - No matter what winter activity you enjoy most out on the lake, we hope that you have a safe and enjoyable experience. If you go out onto a lake that appears to be frozen, it is extremely important that you follow basic ice-safety guidelines. For a copy of the "Safety on Ice" brochure, visit the New Hampshire Fish and Game Department's website at <http://www.wildlife.state.nh.us/outdoor-recreation/documents/ice-safety.pdf> or call the Public Affairs Division at (603) 271-3211.

Use Caution on the Ice

News from the New Hampshire Fish and Game Department

Contact us at www.wildnh.com/about/contact.html
For information and online licenses, visit www.wildnh.com
Subscribe to NH Wildlife Journal magazine at www.wildnh.com/pubs/wj-magazine.html

Contact:

Col. Kevin Jordan: (603) 271-3128
Major James Juneau: (603) 271-3128
Becky Johnson: (603) 271-3211

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CONCORD, N.H. -- New Hampshire Fish and Game Department officials urge outdoor enthusiasts to exercise caution when enjoying winter activities near the ice.

"Caution is in order for those going out onto the ice, especially early in the winter," said Fish and Game Col. Kevin Jordan. "With uneven temperatures, some areas may look safe, but don't count on it. We are urging people to check the ice thickness before you go out onto any frozen waterbody."

Because of the unpredictable ice conditions, it is not advisable to drive vehicles onto the ice, Jordan said. Those on foot should carefully assess ice safety before venturing out by using an ice chisel or auger to determine ice thickness and condition. Continue to do this as you get further out on to the ice, because the thickness of the ice will not be uniform all over the waterbody.

Though all ice is potentially dangerous, the U.S. Army Cold Regions Research & Engineering Laboratory in Hanover, N.H., offers a "rule of thumb" on ice 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.**

Keep in mind that **thick ice does not always mean safe ice**. It is possible for ice to be thick, but not strong, because of varying weather conditions. Weak ice is formed when warming trends break down ice, then the slushy surface re-freezes. Be especially careful of areas with current, such as inlets, outlets and spring holes, where the ice can be dangerously thin.

Tips for staying safe on the ice include:

- Stay off the ice along the shoreline if it is cracked or squishy. Don't go on the ice during thaws.
- Watch out for thin, clear or honeycombed ice. Dark snow and ice may also indicate weak spots.
- Small bodies of water tend to freeze thicker. Rivers and lakes are more prone to wind, currents and wave action that weaken ice.
- Don't gather in large groups or drive large vehicles onto the ice.
- If you do break through the ice, 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. A set of ice picks 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.

Ice safety is also very important for snowmobilers. Don't assume a trail is safe just because it exists; ask about trail conditions at local snowmobile clubs or sporting goods shops before you go.

To download a brochure from Fish and Game called "Safety on Ice - Tips for Anglers," visit www.wildnh.com/outdoor-recreation/documents/ice-safety.pdf

Your PLA at work

- ❖ We are adding a new vessel to our fleet to help protect the lake. Peter Dinger is making a glass bottom boat that we will use for our weed watching cruises. Below is the before photo and stay tuned for further updates!



- ❖ We have compiled WELCOME PACKS for new owners around the lake. Please let us know of any new owners near you, or that you are aware of, so we can reach out to them. We are happy to provide Welcome Packs as well to anyone who leases their property and would like to have a copy available for their renters. Please email us to request a pack at <mailto:provincelakemembers@gmail.com>
- ❖ We have added an [Important Info](#) link to our website dedicated to supplying helpful information to the residents and visitors of Province Lake
- ❖ If you have a topic you would like to see addressed or if you would prefer to opt out of receiving the Newsletter please let us know. You can always contact us at provincelakemembers@gmail.com.

Then and Now



Ice Harvesting

For more photos go to: <https://goo.gl/images/So7kc2>

Calendar of events and items of interest

February 2018

Sat, Feb 24 is the Little Trackers Family Snowshoe Walk at Branch Hill Farm in Milton Mills. Details for this and other MMRG events at mmrg.info

March 2018

Sat, March 3 is the Green Mountain Conservation Group Annual Meeting. Contact www.gmcg.org for details.

Thurs, March 22 is World Water Day. See www.worldwaterday.org for more info.

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 of 153 members 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.

Links to our partner websites:

Action Wakefield Watershed Alliance (AWWA) <https://awwatersheds.org/>

Moose Mountain Regional Greenways <http://www.mmrg.info/>

NH Lakes Lay Monitoring Program <http://www.cfb.unh.edu/programs/LLMP/nhlmp.htm>

NH Lakes <http://www.nhlakes.org>

Province Lake Association, PO Box 24, Effingham, NH 03882

Phone (207) 200-3234

www.provincelake.org and follow us on Facebook at [Province Lake Association](#)

The PLA Board

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Ice House on Province Lake

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