Rainy Lake Conservancy <info@rainylakeconservancy.org>

Rainy Lake Conservancy Newsletter, Spring 2026

Rainy Lake Conservancy <info=rainylakeconservancy.org@hubspotfree.hs-send.com> Wed, May 20, 2026 at 8:30 AM
Reply-To: info@rainylakeconservancy.org
To: info@rainylakeconservancy.org

A Voice for Conservation in the Rainy Lake Watershed

May, 2026

rainylakeconservancy.org

To Members and Friends of the Rainy Lake Conservancy:

As a cottager, this is the time of year when I start thinking about my return to Rainy Lake. Once April arrives, I start checking the Rainy Lake One Stop webcam to see what the ice is like on the lake.

This February I was able to visit our Echo Island—a longtime hope to see the lake during the winter. Just after sunrise, on a clear but frigid Saturday morning, I set off on skis from Camp Kooch-i-ching's mainland base. After crossing the Tilson Bay ice road, I skied across Deer Island and headed toward American Narrows. I cautiously looked for signs of any open water around the narrows, and just as I was feeling pretty safe, I heard the low "whumpff" when the top layer of snow settles under the disturbance of a skier. While I know intellectually that this is a normal sound, it was still pretty disconcerting out there all alone in zero degree weather! Then, as I approached Home Island, there was a bald eagle perched in a tall pine. As I assume eagles need open water, I was back to higher alert. After seeing no down trees on the cabin roof and finding the floating dock safely locked in ice and tied to the shore, I snapped a few photos, skied through the short trails across the island, and then returned the three or four miles back in my ski tracks to the mainland. A fox had followed me, as I could see its prints on top of my tracks. It was exhilarating to experience these special Rainy Lake places in a new way.

Thanks to Joe Gauss for sharing some of his special places in the North Arm in this edition of the newsletter. And thanks to Phyllis Callaghan for continuing our series of Rainy Lake memories. I hope that others will consider sharing stories and photos of some of their special Rainy Lake places in future newsletters.

The conservancy is focused on protecting the qualities of the lake that make it special. We remember our friends and family members who are no longer here with us, but I think we find comfort in visiting the places and the settings—the trees and the rocks and the bays—that we enjoyed with them. I think we are members of the Conservancy because we value a future where our children and grandchildren will be able to experience the wonder and joy of being in this beautiful place. We value the ecosystem and good water quality that support a diverse flora and fauna, and we stay vigilant to ensure that the water stays clean and invasive plants are prevented or controlled.

– Dave Siebert

RLC Land Acknowledgement

Like all North American conservation organizations, RLC recognizes that the lands and waters we are focused on today have been the homelands of peoples for a long time before us. Our board wanted to have a formal and respectful way of stating this acknowledgement, and thus we created and voted to use the following statement:

The Rainy Lake Conservancy works in the watershed of Rainy Lake, which is part of the ancestral homeland of the Anishinaabe people. We acknowledge and honour the Anishinaabe people as caretakers of the land and water since time immemorial and as our neighbours, friends and vital members of our community.

We welcome any suggestions to improve this important statement.

RLC Volunteers Contribute to Rainy Lake Water Quality Research

by Paul Anderson

The Federation of Ontario Cottagers' Associations (FOCA) has recently published an excellent report on water quality in Ontario lakes, including Rainy Lake. Their Lake Partner Program (LPP) and its volunteers have worked for over 28 years to better understand the conditions of Ontario's lakes and how lake stewards, like the Rainy Lake Conservancy, can ensure their health and resiliency into the future. Several current and past RLC members have participated in the Ontario Lake Partner Program from 2002 to 2025. You can join by going to: https://foca.on.ca/lake-partner-program.

Total phosphorus (TP) is a key indicator of nutrient levels in lakes, measured in micrograms per liter (µg/L). It includes both dissolved and particulate forms of phosphorus.

Rainy Lake's TP levels in recent years have generally ranged between 10–15 µg/L, indicating relatively good water quality. The lake has maintained TP concentrations that are typically below the eutrophication threshold of 20/µg/L, which helps prevent excessive algal growth and supports aquatic ecosystem health.

In comparison, recent TP concentrations reported for the main part of Lake of the Woods are 20–30 µg/L. TP concentrations above 20 µg/L are considered elevated and likely contribute to the frequent algal blooms experienced.

The comprehensive report from the Ontario Lake Partner Program, detailing water quality on Rainy Lake, is available on the RLC website under "News" or at https://irp.cdn-website.com/51154248/files/uploaded/DOC+FOCA+Lake+Data+Rpt+Rainy+Lake.pdf.

Conservation Easement Monitoring

by Barry Sampson

When the Rainy Lake Conservancy agrees to become the holder of a conservation easement, it agrees to become a steward of the property and protect the conservation values of the easement in perpetuity. We do this by doing annual monitoring visits to each

property for which we hold an easement. This monitoring allows us to meet our legal obligations as holders of the easement and allows for early detection of any potential problems on the land, changes to the property by natural processes and prevention of easement violations. It also allows us to develop a personal working relationship with each landowner if they so desire.

Our monitoring season begins in early summer and is usually concluded by early September. Monitoring is done by one individual from our group of trained volunteer monitors. Landowners are contacted to arrange a time and date for the monitoring visit. Before the visit, monitors review any documents pertaining to the property such as the easement document itself, the baseline inventory report, past years' monitoring reports and any photos taken in previous visits. Landowners are encouraged to participate in the monitoring walk. On the day of the visit the monitor will walk the property either with or without the landowner. Any changes to the property will be documented, including natural changes or any new buildings or changes in the building envelope. Monitors will try to visit any of the rare features documented during the baseline inventory. After the visit, a standardized monitoring form will be filled out by the monitor and submitted to the conservancy monitoring program.

Our monitoring program exists to ensure that current landowners are complying with the terms of the original easement. Our goal is to detect problems as soon as they occur to prevent them from becoming serious violations that may require legal intervention. As properties change hands from the original landowner who placed the easement to new owners, it becomes even more important for the conservancy to make sure that the original intentions of the conservation easement are being followed.

If you would like to become a volunteer monitor, please contact a current board member and indicate your interest.

Update on Mining Activity and its Potential Impacts on Rainy Lake

by Paul Anderson and Dave Siebert

Mining exploration and development are increasing right now in the Rainy Lake-Lake of the Woods watershed because global demand for critical minerals is rising, the region's bedrock is known to contain valuable metals and governments and industry are actively reassessing mineral potential across the basin. Minnesota residents are fully aware of the

mining controversy across Northern Minnesota, and Ontario residents are seeing their provincial government actively streamlining regulations to facilitate mining.

On April 16, legislation passed the US Congress that repeals a Biden-era moratorium on mining in this area through 2043. This law change will likely restart the state and federal mining permit processes for the controversial Twin Metals Minnesota's (a subsidiary of the Chilean mining company Antofagasta) proposal near Babbitt, Minnesota. This proposed copper and nickel mine is a site located five miles southwest of and directly upstream of the Boundary Waters Canoe Area (BWCA) and Quetico Provincial Park. A good summary of what is happening and the potential threats can be found at https://www.savetheboundarywaters.org/current-threats.

In addition to the legacy of significant iron ore and taconite mining, the Rainy Lake watershed contains nickel, copper, gold and lithium, all of which are now in high demand for electrification, batteries and clean-energy technologies. Historically, gold and iron mining shows that mineralization in the region is widespread, although the only current active mine near Rainy Lake is the Rainy River Gold project located 65 km northwest of Fort Frances.

What does this all mean for Rainy Lake? Based on discussions with Minnesota and Ontario mining experts and environmentalists, Paul has created a simple overview of the most significant existing and near-term potential mining activity upstream of Rainy Lake, shown in the table below. Additionally, there are many reports of promising exploration across the watershed. An example is the Libra Energy Materials Flanders lithium site just south of the Namakan River and west of the Lac la Croix community.

You will note that acid mine drainage (AMD) shows up under the risk column for several of the mining sites. AMD is widely considered one of the most critical global mining pollution issues. AMD forms when sulfide minerals in mine waste react with oxygen and water, producing sulfuric acid. This acid then dissolves metals into water, creating the potential for highly contaminated drainage to the surrounding environment.

Gold, copper and nickel mining often expose large amounts of sulfide minerals. When these oxidize, AMD becomes one of the most severe and long-lasting environmental impacts of these operations. The Steep Rock and Dunka sites also experience AMD because of sulfide-bearing waste rock and exposure of sulfide-bearing formations; you can learn more about those sites at https://waterlegacy.org/ and **https://irp.cdn-website.com/51154248/files/uploaded/Steeprock%20Project%20Update%20021224.pdf**

Regarding the Rainy Lake environment, wild rice ecosystems are highly vulnerable to sulfate pollution from AMD, which not only damages the plants themselves but also increases mercury methylation in surrounding waters, leading to higher mercury levels in fish. This connection is well documented in Minnesota's wild rice regions, where sulfate-driven mercury release poses both ecological and public-health risks.

It is unclear at this time how any of these mine proposals might impact the waters of Rainy Lake. Understanding the amount and degree of contaminant transport over many kilometers is complicated due to regional hydraulic gradients, dilution effects and groundwater flow. Current studies by the International Joint Commission on the cumulative impacts of mining (**https://www.youtube.com/watch?v=AcuZIUwWxC0**) and other ongoing research and water-quality monitoring throughout the watershed should help answer this question over the next few years.

EXISTING AND POTENTIAL MINING ACTIVITY UPSTREAM OF RAINY LAKE (Mar 2026)

SITE	LOCATION	MINING TYPE	STATUS	RISK TO THE WATERSHED	Pathway to Rainy	NOTES
Steep Rock	Atikokan, ON	Iron Ore	Ceased operation in 1979, rehab underway	AMD, elevated sulphate, sediment, contaminated groundwater	Direct via Seine River	1951 sediment release into the Seine River reached Rainy
Hammond Reef	Atikokan, ON	Gold	EA completed, project on hold	AMD, cumulative effect with Steep Rock	Direct via Seine River	Very large pit
Moss Lake	Kashabowie, ON	Gold	Proposed, exploration underway	AMD, no EA at this point	Drains into Upper Seine	Part of the broad NW Ontario mining corridor
Dunka Mine	Babbitt, MN	Taconite	Inactive	AMD and metals runoff	Boundary Waters and border lakes	Long legacy of environmental issues
Minntac	Mountain Iron, MN	Taconite	Operating	Sulfate – exceeds Minnesota 10 mg/L wild-rice sulfate standard.	Pike River, Lake Vermilion, border lakes	Pollution problems remain unresolved
Twin Metals	Babbitt, MN	Copper-Nickel	Proposed, politically contested	Very High AMD, mobilization of metals	Boundary Waters and border lakes	Duluth Complex holds major Cu-Ni and PGE deposits

AMD = Acid Mine Drainage
PGE = Platinum Group Elements

Our Rainy Lake Story

by Phyllis Callaghan

During the 1950s, Dale and I were teenagers living in Fort Frances, where the lake and river were part of everyone's lives: family picnics at the Point, Canada Day celebrations, powwows, swimming at the town dock, spring fishing at the Ranier Rapids and outings on the lake. All great memories!

After completing university, we married, became teachers and proud parents to Sean, Ben and Paddy. In those early years, we used to spend our summer holidays on Lobstick Island, near the Rainy Lake causeway. We lived in a little cabin without electricity or running water. Life was beautiful!

Then, in 1971, we heard of a small property on Rest Island that might be for sale. When we pulled up to the shore and saw the towering pine trees, sandy beach and bunkhouse cabins, we knew we had to have it. Buying it turned out to be one of the best decisions we ever made! We soon met our neighbours from nearby islands and developed friendships that we've cherished for over 50 years.

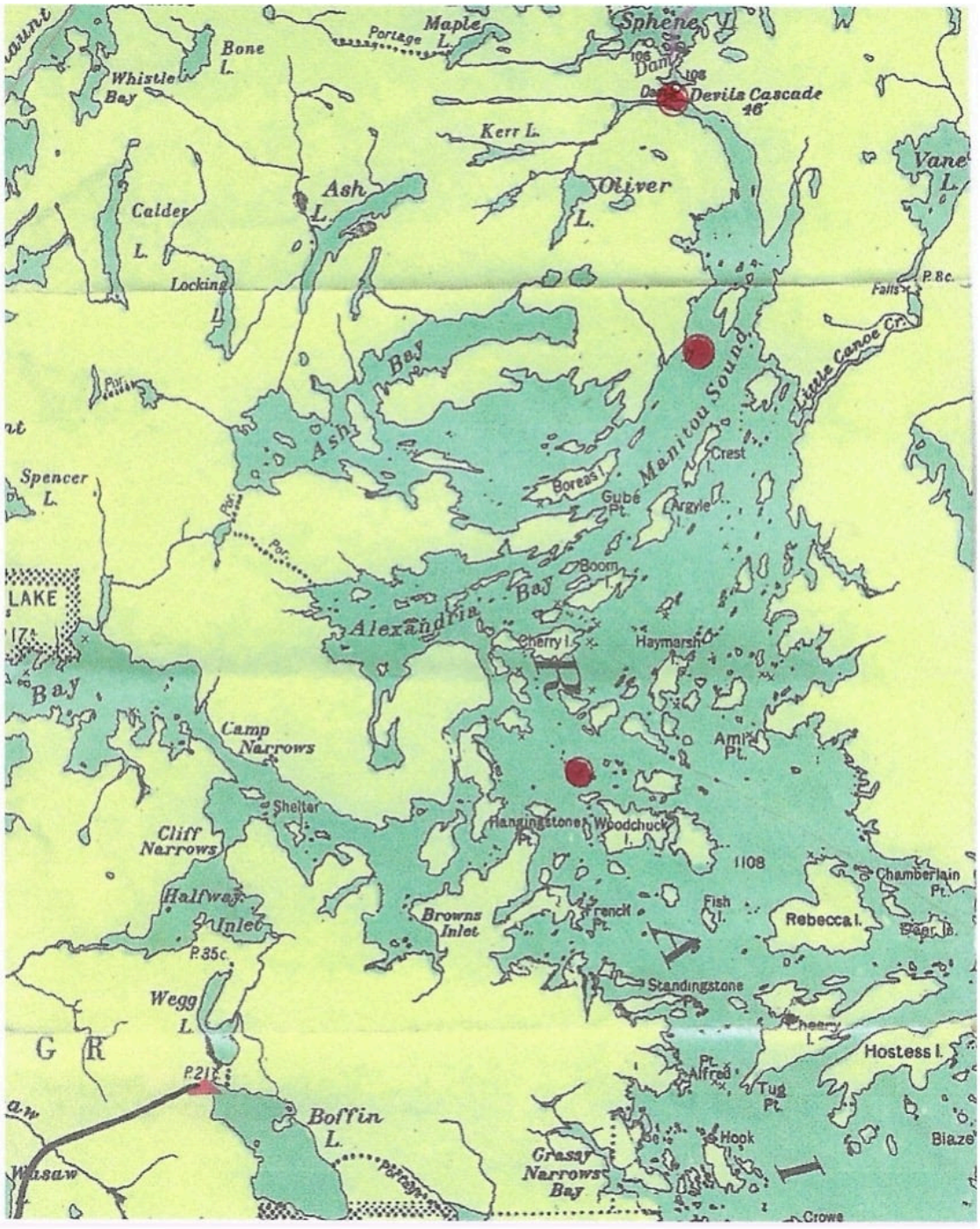
Our two sons loved the freedom of speeding off to town in our 14-foot skiff to visit their grandparents and go to the movies at the local theatres. The long summer days were spent fishing, swimming, playing cards, working on projects, hanging out with friends and visiting with my sister and her husband at Noden Island. On rainy days we often passed the time reading. Cabin diaries record the lists of books the kids read and reflect how we all enjoyed being close to nature—the star-filled skies at night, northern lights, exciting storms, the presence of otters, mink, deer, eagles and other birds and the black bears in the fall.

Alas, as we all know, things don't stay the same! The bubble burst in 1979 when our cabin burned to the ground one night while Paddy, then 14 years old, and I were alone. Dale was up north fishing, and the boys were in town. Paddy and I escaped in a small rowboat to Lysnes' Copenhagen Island where we stayed the rest of the night. Thank goodness for kind neighbours! After the disaster, Dale cleaned up the mess and made plans for the next cabin. By the fall of 1980 our new log cabin was up, thanks to builders from Thunder Bay and friends who donated the red pine logs from their rural property. The logs were trucked from Thunder Bay, towed across the lake from Rocky Inlet, peeled and lugged up the hill to the new site, which gave us a fine view down the bay to Home Island.

In 1997, our lives again took an unexpected turn when we learned that the Ontario government was holding roundtable discussions to decide how and what Crown land should be set aside from development. Our role involved attending the Boreal West Lands for Life meetings in our area. To help meet the goal of 378 new protected areas in the province, we proposed that the Crown land on Rainy Lake islands be designated as conservation reserves, which would restrict mining, logging and building but leave them open to the public for picnics, berry-picking, fishing, trapping and enjoying nature. It turned out that the Crown land on 1,800 islands were protected as part of the Rainy Lake Islands Conservation Reserve. Then, in 1998, neighbours received news that Goose Island, a 350-acre island near the Mermaid, was about to be developed into a significant number of building lots. It's a story too long and complicated to include here, but suffice it to say that most of Goose Island is now owned by the Nature Conservancy of Canada and is open to the public for basically the same activities as those permitted in conservation reserves.

In 1999, those of us who were involved in the Lands for Life and Goose Island stories founded the Rainy Lake Conservancy (RLC), a Canadian charity formed to preserve the natural, traditional and historic values of Rainy Lake and other parts of the watershed. With many Americans and Canadians, we've been actively involved for over 26 years, working to achieve those goals. RLC members, boards and supporters have done a terrific job helping to ensure that Rainy Lake still has clean water, uncluttered shorelines, abundant wildlife and places where the public can enjoy the peace and tranquility of this unique part of the world. RLC has become a respected voice for conservation in the watershed, true to its mission of working with partners on research, land conservation and

public education. It's reassuring to us that our family members Sean and Paula, Ben and Justine and Paddy continue to support the efforts of the conservancy to preserve the lake for future generations.



Into the Wild:
Exploring Rainy Lake's North Arm

by Joe Gauss

When the ice releases its hold and boats once again skim across Rainy Lake, there’s one direction that promises real escape: north. The North Arm is where open water, rugged shoreline, and quiet exploration come together for a day that feels both remote and rewarding.

The journey begins at the causeway bridge, a clear dividing line between the energy of the South Arm and the calm beyond. Slip beneath the bridge and the transformation is immediate. Summer homes thin out, boat traffic fades, and the lake opens wide. With only scattered islands and light traffic—mostly anglers and supply runs—the North Arm feels refreshingly untamed.

Devil's Cascade

Point your bow up the main channel toward Devil’s Cascade, the North Arm’s most dramatic destination. The distance is similar to that of a run to Kettle Falls, and navigation is straightforward, though a chart or GPS is helpful since buoys are widely spaced. The reward is worth the effort.

At the lake’s northern edge, water surges through a broad set of rapids, pouring south into Rainy Lake. Once held back by a dam, the flow now runs free, creating a powerful spectacle—especially in spring, when snowmelt sends water roaring over the rocks. Tie up along the shoreline, stretch your legs on the nearby trail, and follow the rapids upstream to the lake above. It’s a place that reminds you just how alive this landscape can be.

Steamboat Shoal

Leaving the Cascade, take the western route past Waller Island into Manitou Sound. Roughly halfway through, a green buoy marks Steamboat Shoal, an underwater time capsule from the early 1900s. A steam-powered supply boat once ran aground here and sank, leaving behind a visible boiler and scattered metal remains resting about 20 feet below the surface.

Drop anchor, grab your snorkel, and explore. While rumors of rum-running cargo linger from the Prohibition era, the real thrill lies in discovering a quiet piece of lake history firsthand, suspended beneath the clear water.

North Arm Mermaid

The final leg of the adventure winds south past Hogsback, Argyle and Haymarsh Islands into Berry Narrows. Stay centered through the channel and continue on to a small cluster of rocky islands. Just to the west, perched improbably on a tiny outcrop, sits the North Arm Mermaid.

The metal sculpture—an unexpected and playful landmark—marks the perfect final stop before turning back toward the causeway via the canoe channel. By the time you return, you'll have logged miles of open water, uncovered hidden stories and experienced Rainy Lake at its wildest and most rewarding.

Impacts of Climate Change on Your Trees and Waterfront Property

by Wolfgang Bielefeld

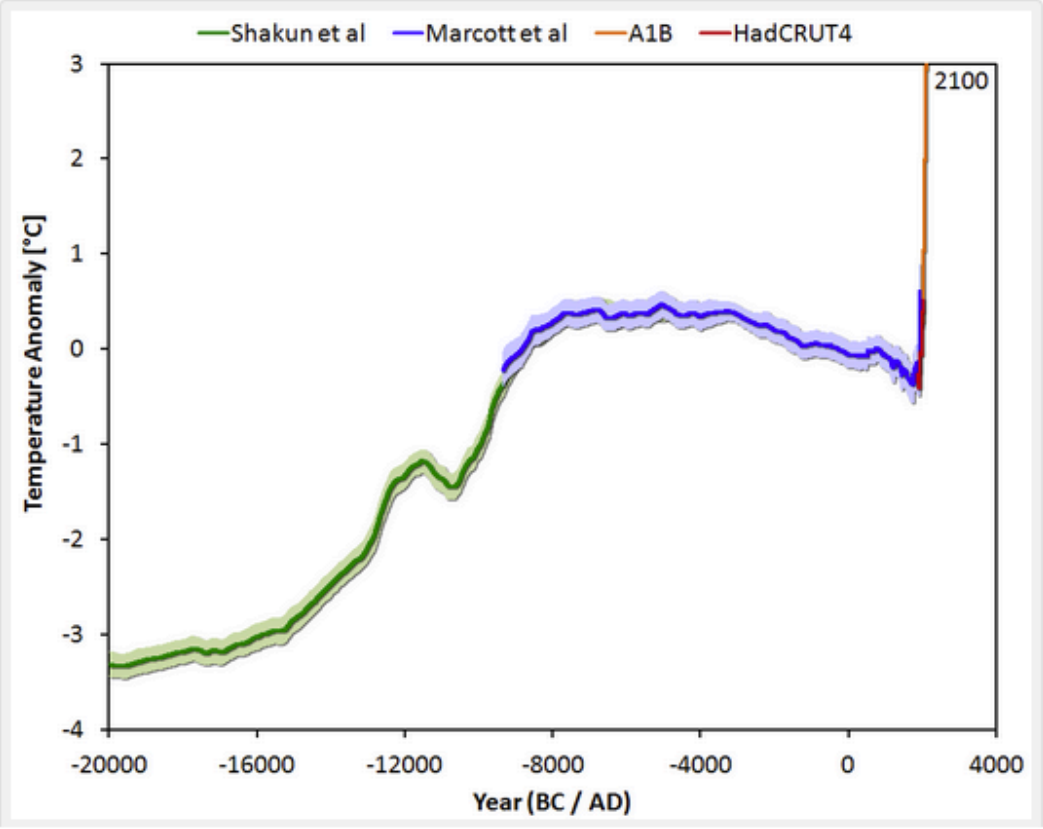
We've all been told that the earth is warming and that there will be consequences. Besides the consequences on the global level we've been told about, it makes sense to wonder about what may happen at the local level and what we could do about it. Two helpful guides have recently been published that illustrate the climate-related changes that might be expected in Ontario, specifically on trees and waterfront property, and present best management practices to deal with them. Both are very well researched, comprehensive and informative. This article will review facts about global climate change, consider what this means for Canada and Ontario and present information from these guides that property owners can use to address climate-related impacts on their trees and waterfront property.

Climate change has ramifications on many levels. On the global level, the Earth is currently in an interglacial period, which started about 12,000 years ago. In fact, the land that was once covered by glaciers is still rebounding from the weight of the ice sheets that covered it. The southern shore of Hudson Bay is some of the fastest rising land, rising around a half inch per year and likely to rise another 100 meters. Also, the northern shore

of Lake Superior is rising faster than the southern, causing the entire lake to tilt southward.[1]

Temperatures have also risen during this interglacial period. It is important to note that while the average temperature changes presented below may only be a few degrees, this is enough to have dramatic impacts. The Royal Society notes, “Even though an increase of a few degrees in global average temperature does not sound like much…warming of just a few degrees will be associated with widespread changes in regional and local temperature and precipitation as well as with increases in some types of extreme weather events. These and other changes (such as sea level rise and storm surge) will have serious impacts on human societies and the natural world.”[2]

The graph below combines several recent analyses to illustrate changes since the last ice age.[3]



Recent estimates of the increase in global average temperature since the height of the last glacial period are 4 to 5°C (7 to 9°F). The graph projects temperature change to the year 2100. This and other projections and forecasts presented in this article are based on scientific models that rely on available data coupled with theories, hypotheses and assumptions about how the biosphere works and future conditions. While the theories

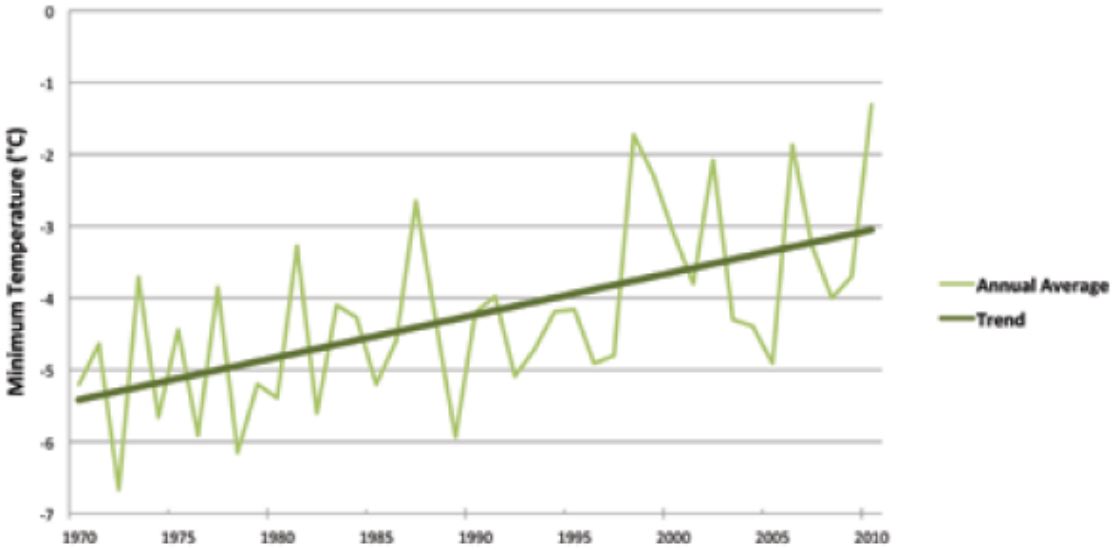
may differ somewhat between analyses, leading some specific predicted future values and levels to vary, what is important for us is that there is general agreement about the patterns and trends.

The graph shows a temperature spike at its termination. This is indicative of the fact that in the past 200 years, carbon dioxide (CO_2) in the atmosphere has risen more than 40 percent (much of this since the 1970s), contributing human-caused additions to the planet's temperature. In the past century alone, global temperature has climbed roughly ten times faster than the average rate of interglacial recovery warming.[4, 5] There are long- and short-term consequences to these heightened temperature increases. In the long term, the CO_2 and other greenhouse gases we add to the atmosphere will linger there for hundreds to thousands of years, meaning that slowing or decreasing global temperature increases will be difficult.[6]

The effects of rising temperatures are being felt in Canada. Canada's average annual temperature has increased by 2.4°C (4.3°F) from 1948 to 2024, with warming trends far exceeding the global average, particularly in northern regions. Winter shows the most dramatic change. With the exceptions of 2014 and 2022, average winter temperatures have remained above the baseline average since 1996. The linear trend indicates that average winter temperatures across the nation have warmed by 3.6°C (6.5°F) over the past 77 years. Average summer temperatures have risen by 1.8°C (3°F) over the same period.[7]

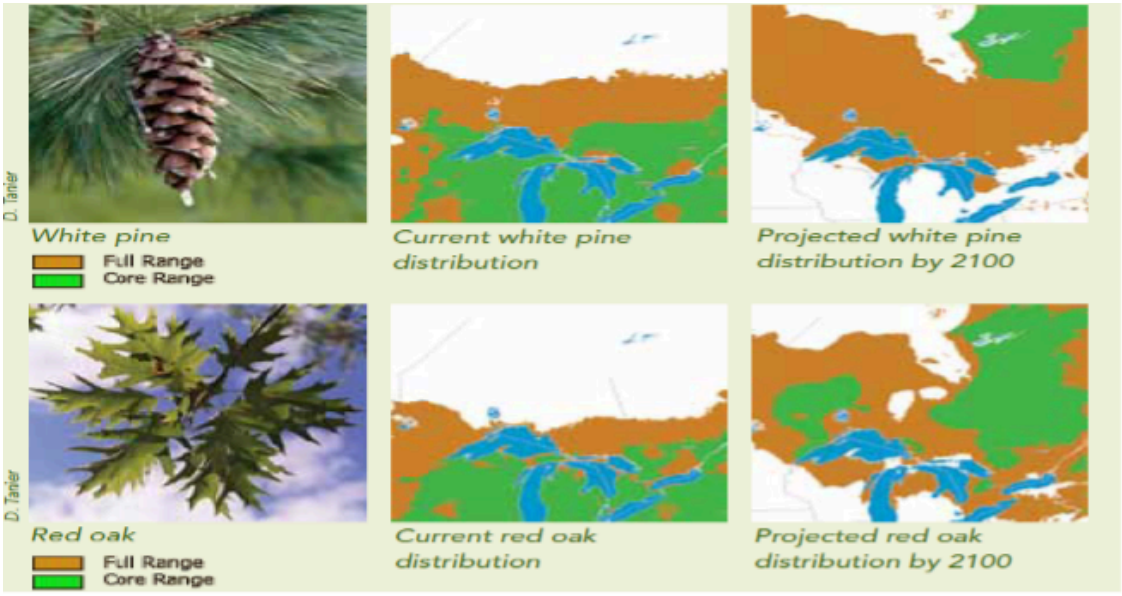
Rising temperatures bring about a host of changes that cascade through the biosphere. Given the facts above, it is natural that we would have pressing concerns about the short- and intermediate-term impacts of these changes on our homes and property and how we can best prepare for and respond to them. Given Canada's expanse and diversity, however, climate change is expected to affect Canada's regions somewhat differently. What is presented below will focus specifically on Ontario.

Managing Your Woodlot in a Changing Climate has been published by the Ontario Ministry of Natural Resources and Forestry (OMNRF).[8] The guide notes that northern Ontario has experienced rising temperatures, changing precipitation patterns and more extreme weather events. Data shows that between 1970 and 2010 minimum temperatures over the north Ontario region increased by an average of 2.5°C (4.5°F). The graph below shows how this has been reflected in milder winters over this period.



Rainfall patterns and their consequences are more complex. Over the last century, Ontario has become slightly wetter in some parts of the province, but the slight increase is well within the variability of annual precipitation over time. However, in areas with smaller increases in precipitation there may not be sufficient moisture to offset the more significant rises in temperature and the evapotranspiration of trees associated with increased temperatures. This may mean forests will experience increased moisture stress and the risk of wildfires in some ground cover types may increase. Ontario is also experiencing more frequent extreme rain and storm events, and more flooding and drought. Woodlands affected by extreme events such as tornadoes, windstorms, ice storms, summer heat waves, droughts, floods and wildfires can take decades to recover, and forest ecosystems may change as a result.

Also expected are changing tree habitat ranges, including the replacement of boreal with temperate forests as shown in a Canadian Forest Service tree species study.[9]



In summary, the projected changes in temperature and precipitation are most likely to affect trees due to:

- Longer growing seasons
- More winter rain and earlier peak stream flows
- Shorter frozen ground operating season
- Drier soils in summer
- Increasing abundance and outbreaks of pests and disease
- Increasing invasive species and new pathogens from southern climates
- More frequent extreme weather events including heavy rain, wind and ice storms
- Changing habitat ranges, particularly for southern edge species
- Decoupling of co-evolved ecological processes that may affect woodlots in unknown ways (e.g. insect pollination, seed production, host hardiness, wildlife interactions)

The guide concludes with the top seven actions tree owners can take. They are listed below along with some of the specific suggestions given (see the guide for more details):

- **Keep the forest you have and enhance it if possible –** Identify opportunities for afforestation and to restore and/or enhance connectivity between natural areas.
- **Practice sustainable forestry –** Maximize forest health and carbon storage potential.
- **Plant diverse tree species –** Plan for the regeneration and establishment of a diversity of native species by considering both current climate conditions and projected changes over the next 50 to 100 years.
- **Improve forest health –** Remove unhealthy trees, reduce overcrowding and diversify age and structure.
- **Consider new species –** Consider adjusting species composition to match current and future site conditions and establish more drought-resistant

species (e.g., oaks, hickories and pines) in areas prone to drought.

- **Manage pests and disease –** Understand which insects, diseases and invasive species might be expected and monitor deer populations.
- **Stay informed –** Use the links provided for additional resources. See also *A Guide to Stewardship Planning for Natural Areas.*[10]

The second guide, *Managing Your Waterfront Property in a Changing Climate* has been published by the Federation of Ontario Cottagers' Associations (FOCA).[11] The guide follows the format of the OMNRF guide. It provides details on some of the most problematic issues facing waterfront property owners. These include the northern movement of species habitats, variable temperatures leading to unpredictable weather and damage, drought causing wetlands to dry up and decrease water quality, warmer temperatures helping insect pests and disease to overwinter, and invasive species outcompeting local ones.

In summary, the projected changes in temperature and precipitation are most likely to affect waterfront property and shorelines due to:

- More frequent extreme weather events including heavy rain, wind and ice storms
- Drier soils in summer
- Increasing invasive species and new pathogens from southern climates
- Changing habitat ranges, particularly for species along the southern edge of Ontario
- Changing ecological processes that may affect shorelines in unknown ways (e.g. insect pollination, breeding, plant hardiness, wildlife interactions)
- Increased erosion of shorelines
- An earlier spring freshet
- More ice-free days on inland lakes in the winter months
- Longer growing seasons
- More winter rain and earlier peak stream flows

The guide concludes with the top five actions waterfront property owners can take:

- **Keep your shoreline natural and enhance it if possible** – A naturalized shoreline is generally considered the best multi-purpose approach to protecting the lake's edge. Protect the natural shoreline by replanting areas that lack vegetation and maintain those areas where it already exists.
- **Keep aquatic plant populations intact** – Aquatic plants support the insects that fish eat and are a primary food and habitat source for birds. In addition, aquatic plants help stabilize loose sediment and are an effective natural breakwater, keeping waves from eroding the shoreline.
- **Maintain and improve your waterfront property's health and biodiversity** – Enhance biodiversity on your property by leaving rock piles, fallen tree limbs and brush piles untouched so they can function as wildlife habitat. Re-vegetate bare grounds near streams, rivers and lakes and encourage native species of flowers,

shrubs and trees to limit your maintenance work and provide shelter to native species.
- **Manage pests and disease** – Understand which insects, diseases and invasive species might be expected at your waterfront property and be on the lookout for them with regular monitoring to enable early intervention and easier management.
- **Stay informed** – Use the links provided for additional resources. Sign up to receive FOCA's free monthly Elert (electronic newsletter) at https://foca.on.ca.

Sources:

- Canada (Ontario) Beneath Our Feet. (n.d.) "Ontario: The Geology of Rising Land - Isostatic Rebound." https://www.ontariobeneathourfeet.com/rising-land-isostatic-rebound; Gloege, L. (2021, April 3) "Why Lake Superior Is Tilting." Medium. https://medium.com/the-environment/why-lake-superior-is-tilting-ff88dca8ed3x.
- The Royal Society. (2020, March 15) *17.* "Are Climate Changes of a Few Degrees a Cause for Concern?" https://royalsociety.org/news-resources/projects/climate-change-evidence-causes/question-17/; Intergovernmental Panel on Climate Change. (2021, August) *Climate Change 2021: The Physical Science Basis*. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf
- Hagelaars, J. (2023, March 19) "The Two Epochs of Marcott." https://ourchangingclimate.wordpress.com/2013/03/19/the-two-epochs-of-marcott/.
- Riebeek, H. (2010, June 3) "Global Warming." NASA Earth Observatory. https://science.nasa.gov/earth/climate-change/global-warming/.
- The Royal Society. (2020, May 15) "Climate is Always Changing. Why is Climate Change of Concern Now?" https://royalsociety.org/news-resources/projects/climate-change-evidence-causes/question-6/.
- Buis, A. (2019, October 9) "The Atmosphere: Getting a Handle on Carbon Dioxide." NASA. https://science.nasa.gov/earth/climate-change/greenhouse-gases/the-atmosphere-getting-a-handle-on-carbon-dioxide/.
- Environment and Climate Change Canada. (2024, July 11) Winter 2023/2024, "Climate Trends and Variations Bulletin." https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/trends-variations/winter2024/CTVB_Winter_2024-Bulletin_EN.pdf.
- Ontario Ministry of Natural Resources and Forestry. (2015) *Managing Your Woodlot in a Changing Climate*. https://docs.ontario.ca/documents/4491/managing-your-woodlot-in-a-changing-climate.pdf.
- Canadian Forest Service. (n.d.) Canada's Plant Hardiness Site. http://planthardiness.gc.ca.
- Ontario Ministry of Natural Resources. (2012) *A Guide to Stewardship Planning for Natural Areas*. https://files.ontario.ca/mnrf-stewardship-planning-natural-areas-en-2019-10-02.pdf.
- Federation of Ontario Cottagers' Associations. (2016) *Managing Your Waterfront Property in a Changing Climate*. https://foca.on.ca/wp-content/uploads/2016/06/FOCA_ClimateChange_ManagingYourShoreline_FINAL_2016.pdf.

Starry Stonewort: Coming Soon to a Lake Near You!

by Pat Donohue

In gradual increments, so that we sometimes don’t notice, climate change is having its effect on the environment of the Rainy River basin. One of the threats to Rainy Lake’s ecosystem is the encroachment of non-native aquatic species. Zebra mussels and spiny water fleas are two of the most notorious species to gain attention, in part because they have gotten a strong foothold in many lakes in Minnesota and Ontario. Not so well-known, but just as critical, are the invasive aquatic plant and algal species. The Invasive Species

Center, the Minnesota DNR, the Ontario MNR and the University of Minnesota are researching and making recommendations on managing these invaders. One species not yet found in Rainy Lake—but which experts fear could be there soon—is the starry stonewort (*Nitellopsis obtusa*).

Starry stonewort (SS) is native to Europe and Asia and was first documented in North America in 1974, invading through the St. Lawrence River. In Ontario it was first identified in 2009 and is currently known to be present in the St. Lawrence River, Lake Ontario (Presqu'ile Bay), Lake Simcoe, Lake Scugog, Stoney Lake, Lake Erie and the Trent-Severn Waterway. (Invasive Species Center)

In Minnesota it was found initially in 2015 in Stearns County in the central part of the state, and research by the Minnesota Aquatic Invasive Species Research Center (MAISRC) at the University of Minnesota in August of 2025 found that starry stonewort has spread to four lakes in Hubbard and Beltrami counties up north next to Koochiching County.

Characteristics

SS is freshwater green algae of a group called *Charoceae.* It is a green macroalga with whorls of long narrow branchlets. Starry stonewort is similar in appearance to native grass-like algae such as other stonewort and muskgrass, commonly found in Minnesota lakes, but can be distinguished from other grass-like algae by the presence of star-shaped bulbils.

SS grows in dense colonies that can form mats on the surface of the water that can interfere with watercraft recreation and can potentially displace native plants. These mats can grow as tall as seven feet in water 30 feet deep and may destroy fish-spawning areas, alter water chemistry and inhibit water flow. SS is tolerant of both salt and fresh water and tends to grow on sand and gravel in both shady and sunny areas.

Research

Current research on starry stonewort in Minnesota focuses heavily on early detection, management efficacy and climate-driven spread, led by the MAISRC. Key projects include evaluating multiyear treatment outcomes, monitoring spread via "Starry Trek" citizen science and studying impacts on wild rice. It is dioecious, i.e., it has the male and female reproductive organs in separate individual plants. Until recently the great majority of SS identified in North America are male. Starry stonewort reproduces asexually through small, star-shaped white bulbils produced on clear threads called rhizoids. Bulbils are small nodules that appear on the stem of an existing plant, sometimes in place of a flower.

These nodules contain the exact same genetic material as the parent plant, so the plant doesn't need to be fertilized by the pollen on a passing bee in order to create offspring. The bulbils then fall from the parent plant to anchor in sediment and sprout new plants, allowing it to survive harsh conditions and spread efficiently. It is thought that SS is brought into waterways by boats, trailers and other recreational water equipment. (MAISRC)

However, a 2022 study in Ontario revealed a significant discovery: Female reproductive structures (oogonia) were found on starry stonewort in Lake Simcoe and Lake Scugog for the first time, challenging the previous understanding that only male plants existed in the waterways of North America. This discovery indicates a potential change in its reproductive ecology, allowing for sexual reproduction beyond just asexual fragmentation. (The Lake Simcoe Region Conservation Authority, 2026) This may also have implications for managing the spread of SS.

A comprehensive summary in *FACETS Journal* (Feb., 2025) looked at management approaches to SS over a decade-long period across 38 lakes in Indiana, Wisconsin and Minnesota. The study looked at both copper-base algaecide intervention and methods of physical removal of SS. For both methods, results were mixed, though on the small-lake scale there was some evidence that both algaecide and hand-pulling methods could reduce populations in infested lakes. The authors of the study concluded that future management should include monitoring of untreated reference areas and unmanaged reference lakes as a control measure. The authors suggest that monitoring of this type would "also increase understanding of the impacts of management on native plant communities." (FACETS)

Community and Government Action on SS:

- **Stop Starry Stonewort**: Minnesota Lakes and Rivers together with county aquatic invasive species coordinators, tribes and state agencies

As it became apparent that SS was on its way to creating a major impact on recreational lake activity and the lake environment, Minnesota Lakes and Rivers took action. They, in partnership with various stakeholders, introduced the first statewide containment strategy to empower boaters with tools to clean, drain and dry boats. They also developed an idea to put boat-cleaning stations at the exits from those lakes that had identified the presence of starry stonewort. The stations contain a wet/dry vac with a high-pressure hose. The idea is to empower the public to take the responsibility to "clean, drain, dry and dispose" in an all-out effort to mitigate the spread of SS.

A detailed video is available on the website of Minnesota Lakes and Rivers.

Started in 2017, Starry Trek is a statewide event where Minnesotans across the state gather to help search for new populations of aquatic invasive species like starry stonewort. In August 2025, 162 volunteers participated in the annual Starry Trek event in Minnesota. These participants searched 249 public water accesses across 210 lakes to detect the invasive algae starry stonewort, contributing to statewide early detection efforts.

Starry Trek is organized by the Minnesota Aquatic Invasive Species Research Center and the University of Minnesota Extension in partnership with the Minnesota DNR.

Walt Jones (left) and Brad Matuska, Aquatic Invasive Species Detectors program volunteers, use their training to screen a variety of plants and other species and submit

suspicious finds.

Community Pull: Whitefish Area Property Owners Association

In September 2024, starry stonewort was discovered in Rush Lake. The Whitefish Area Property Owners Association determined to mount an effort to contain it, in consultation with the Minnesota DNR and MAISRC. The area of infestation was marked with buoys, and a chemical treatment was applied. In addition, volunteers gathered at Rush Lake for a “community pull” inside an area of about an acre, as divers hand-pulled the mats from the lake.

Ontario’s Invading Species Awareness Program offers these recommendations:

- Learn how to identify starry stonewort and how to prevent accidentally spreading this species with your watercraft or fishing equipment.

- Once established, it is almost impossible to eradicate. Avoid infested areas or reduce your speed when travelling near starry stonewort infestations. Your propeller can break off fragments and spread the bulbils to new areas. New populations can grow from small pieces of the species.

- Inspect your boat, trailer and equipment after each use. Remove all plants, animals and mud before moving to a new waterbody.

- Avoid planting starry stonewort in your aquarium or water garden. Aquarium hobbyists and water gardeners should only use native or noninvasive plants and

are encouraged to ask retailers for plants that are not invasive.

- Never release unwanted aquarium plants or pets. Return or donate unwanted plants to a garden center or pet store, or put them in the garbage. Aquatic plants can be composted or mulched on land more than 30 miles from the nearest body of water.

- If you find starry stonewort or another invasive species in the wild, please contact the Invading Species Hotline at 800-563-7711, or search for the Invasive Species in Ontario project on https://www.inaturalist.org/projects/invasive-species-in-ontario to report a sighting.

Resources/References:

+ Ontario Invading Species Awareness Program, https://www.invadingspecies.com

+ Ontario Ministry of Natural Resources, https://www.ontario.ca/page/ministry-natural-resources

+ Invasive Species Centre, https://www.invasivespeciescentre.ca/news-stories/newsletter/

+ Minnesota Aquatic Invasive Species Research Center, University of Minnesota https://www.maisrc.umn.edu

+ Minnesota Department of Natural Resources https://www.dnr.state.mn.us/invasives/aquaticplants/starrystonewort/index.html

+ Minnesota Lakes & Rivers Advocates, https://www.mnlakesandrivers.org/

+ *FACETS,* https://doi.org/10.1139/facets-2024-0104

Science Words: Wildlife “Schedule” Terminology

by Ann Sampson (contents aided by AI)

Wildlife activity patterns are ways animals divide up the 24-hour day to survive—avoiding predators, finding food and coping with temperature. These schedules matter, as animals are balancing predator vs. prey dynamics, temperature (especially important in places like Canada), human activity and food availability.

Here’s a breakdown of the three main “schedules” you’ll hear about:

Crepuscular animals are active at dawn and dusk. These animals are most active during twilight—low light but not full darkness. Examples are white-tailed deer (this is why you often see deer along roads right at sunrise and sunset), moose, rabbits and some insects (like mosquitoes). Advantages of this strategy include cooler temperatures than at midday, less risk from daytime predators and enough light to see without being fully exposed.

Nocturnal animals are active at night; they sleep or hide during the day and come out after dark. These animals exhibit the following adaptations: excellent night vision or hearing;

quiet movement; and sometimes heightened smell. Examples are owls, bats, raccoons and coyotes. Being active at night helps avoid humans and daytime predators.

Diurnal animals are awake and active in daylight hours. Examples are most birds, squirrels and butterflies. Advantages of this strategy include good visibility for hunting or foraging and activity during warmer temperatures, which is important in cold climates.

Many animals don't stick strictly to one category year-round. White-tailed deer are mostly crepuscular, but can become more nocturnal during hunting season. Bears are generally diurnal, but shift based on food and human activity.

Our Mission

The mission of the Rainy Lake Conservancy is to work with property owners, governments and the local communities to preserve and protect the natural beauty, historic features and ecological and recreational values for present and future generations within but not restricted to Rainy Lake.

Renew your membership here, or become a member here.

Thank you to our photographers, Jeff Kantor, Burgess Eberhardt, Wolf Bielefeld, and Phyllis Callaghan; to Helen Martineau who edits; Kristin Bannister who produces; and to contributors Dave Siebert, Don & Rhoda Dickson, Fiona Ryle, Tony Elders, Jesse Gates, Wolfgang Bielefeld, Ann Sampson, Barry Sampson, Paul Anderson, Phyllis & Dale Callaghan, and so many more.