GEORGIAN BAY LAND TRUST
gblt.org

FALL 2023

LANDSCRIPT

PROTECTING **GEORGIAN BAY'S** WILDERNESS LANDS

Bird Research on Georgian Bay

photo: Stefani Matis

Species Spotlight: Spotted Turtle

Tips to be an environmental steward at the cottage

Why are there fewer loon chicks?

Summer Research Updates:

Prairie Warbler and Whip-poor-will work

By Stefani Matis and Bradley Squarek, Summer Research Students, Georgian Bay Land Trust

Georgian Bay Land Trust staff Aaron Rusak and Bradley Squarek, and Western University PhD candidate Andrew Beauchamp measure and tag a Prairie Warbler.

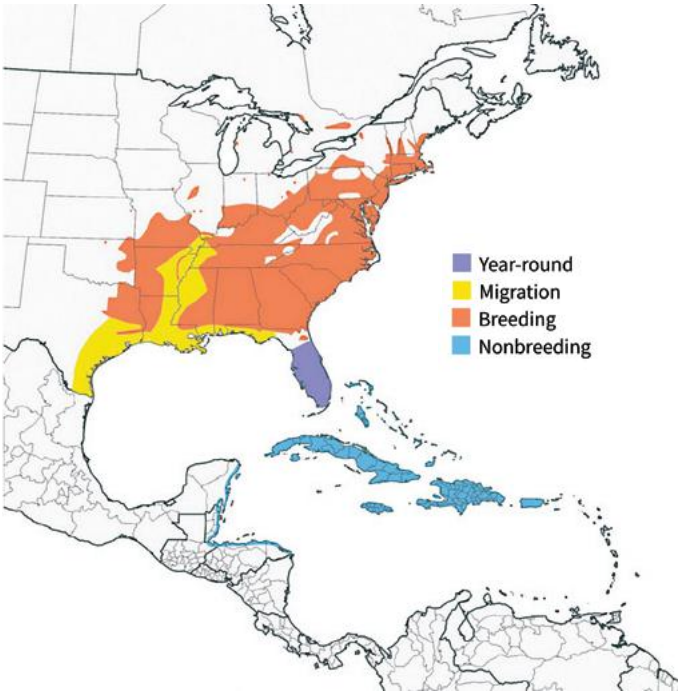
This summer, the Georgian Bay Land Trust expanded our scientific research work to better understand and protect the species of the bay. Our Protected Areas Manager Aaron Rusak spearheaded two exciting new projects, one on Prairie Warbler territory size and habitat usage, and the other on Eastern Whip-poor-will breeding habitat. Research Students Brad and Stef (that's us!), and Conservation Interns Evan and Joe had the pleasure of helping out with these projects this summer.

Learning About Prairie Warblers

Prairie Warblers are beautiful yellow songbirds that can be identified by their distinct "zee-zee-zee" call during their breeding season. You may have heard some this summer! Eastern Georgian Bay is the most significant breeding area in Canada for Prairie Warblers. They hardly breed anywhere else in the country, preferring our rocky shores over anything else. Take a look at the range map for Prairie Warblers—you might need to take out a magnifying glass to find the sliver of orange over Georgian Bay where our population of warblers breeds each summer.

Drawn in by the complexity of their breeding range, we set out to research a few questions: How does the Georgian Bay population of Prairie Warblers differ from the population in the United States? What do they like about Georgian Bay?

Range map for Prairie Warblers displays the regions in which the species is present at different times of year



map: allaboutbirds.org

Here is a Prairie Warbler nest with four hatchlings found by our research students earlier this summer. Prairie Warblers make use of juniper bushes to support their nests, like the one in this photo. A white egg shell is visible in the top right corner of the nest. Photo by Brad Squarek

Prairie Warbler. Photo by Stefani Matis

And finally, how can we protect their habitat? To do this we tracked individual Prairie Warblers throughout their breeding period starting in early June. Partnering with Andrew Beauchamp, a PhD student in Biology at the University of Western Ontario, we banded and tagged 30 male Prairie Warblers using 15 long-burst and 15 short-burst Motus tags. The long-burst tag signals will be picked up by Motus towers across North America as the birds fly south this fall, providing us with information about migratory routes and over-wintering grounds. While they were not the focus of our summer research, the insights they provide will be extremely valuable in understanding if the Georgian Bay population overwinters in the same locations as their American counterparts. Conversely, the Prairie Warblers wearing short-burst tags emit signals every 7 seconds that can be picked up by a handheld radio tracking device, and were central to our work this summer.

The Research Students and Conservation Interns spent long days following these birds around their habitats. We took point data at each Prairie Warbler detection, and noted the surrounding vegetation, and the bird's behavior. Was the bird singing? Was it near its nest? Was it fighting another male for territory? We were able to get approximately 25 detections from each individual Prairie Warbler during the tracking period. These detections will help establish more accurate male territory sizes and further develop our understanding of the species as well as its breeding habits and requirements in the Georgian Bay area. An amazing achievement of this study was the discovery and documentation of four nests, and the identification of several more probable nest sites.

Going into this project, we had some assumptions about our research results, but by the end of the field season we discovered how much more we have to learn about this species. As expected, all nests were found in areas meeting three criteria. They were all in common juniper bushes, on open rock barrens, and within 100 feet of shore. The main vegetation used to perch on was white pine, common juniper, red oak, and white cedar. Unexpectedly, some birds left their original territories for different ones after already being established for quite some time, and in one unique case, a male was observed protecting a nest with fledglings that were not his own. Unfortunately, we had one mortality and one bird with notable damage to its tag and tail feathers, both likely the result of altercations with predators.

To our surprise and delight, every individual had a unique personality and habits that kept us on our toes and excited to track them every day. Some males were absent from their original habitats for short periods but would return a few days later. Some males enjoyed island hopping making them particularly difficult to track, but finding them again was extremely rewarding. We are excited to see if any of the Prairie Warblers we tagged will return to Georgian Bay next year! Thank you to everyone who gave us access to their properties for this project.

This project was supported by the James L. Baillie Memorial Fund of Birds Canada with funds raised through the annual Great Canadian Birdathon, and by the Bill and Betty Wasserfall Memorial Award of the Ontario Bird Banding Association. Both of this summer's research projects are also supported by the donors to our Big Day fundraiser, including matching funds from the Weston Family Foundation, Jackman Foundation, and an anonymous donor. Thank you all!

Looking Into Eastern Whip-poor-wills

The Eastern Whip-poor-will is a familiar species to most and a symbol of cottage country. They are hard to detect in the daytime, preferring to camouflage on tree branches, but are easily recognized by their night song that repeats a high-pitched "whip-poor-will, whip-poor-will". In some areas the species continues to thrive, but in many locations a decreased presence has been reported. The species is of conservation concern and is listed as 'Near Threatened' by the International Union for Conservation of Nature, or IUCN for short. Fortunately, the species appears to have persisted in the Georgian Bay area. Whip-poor-wills may prefer Georgian Bay

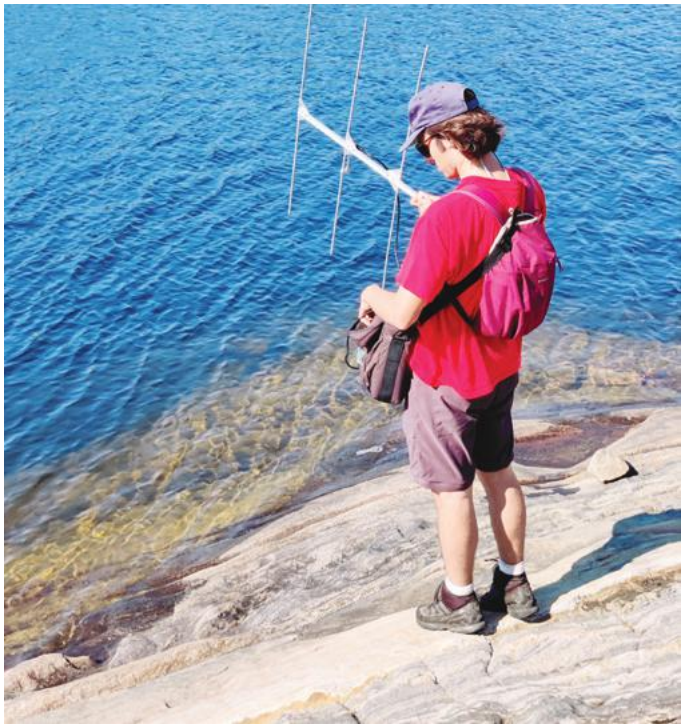
because of its unique open rock barrens surrounded by dense forest and wetlands. As the moonlight hits these rock barrens, Eastern Whip-poor-wills are able to hunt for moths and other insects.

In order to proactively preserve this iconic species and its habitat, we are undertaking a three year research project to learn about Eastern Whip-poor-will nesting requirements. Whip-poor-wills are not picky when it comes to nesting; they lay their eggs directly on the ground beneath bushes on top of dead leaves. They typically lay 1-2 small white eggs with brown speckles similar to another nightjar species, the Common Nighthawk. If you think you may have come across any Eastern Whip-poor-will nests in your travels/around your cottage we would love to hear from you!

As Research Students, we began the summer with nocturnal presence/absence canoe surveys around the Go Home Bay area. Adopting the Whip-poor-will's night time schedule, we set out in our canoe at dusk, often returning to the field station after midnight. The purpose of the presence/absence surveys was to identify sampling locations with a high probability of Whip-poor-will nesting. As we canoed around Go Home Bay, we hugged the shoreline and stopped every 500 m or so to listen for Eastern Whip-poor-will calls. In total, we surveyed approximately 50 km of shoreline, likely detecting 30+ individuals! When calls were detected, we noted the direction and strength of the call. With this information as a starting point, we began day-time walking surveys around rock barrens in an attempt to locate nest sites and to collect site specific data. During canoe surveys we heard additional species of interest including Barred Owl and Common Nighthawk.

Despite much effort, no specific nest sites were found, however we did find breeding evidence in the form of fecal sac deposits (like many bird species, Eastern Whip-poor-wills deposit their young's waste in a location away from their nest in order to avoid attracting predators). These results highlight the importance of next year's study, which will involve catching and tagging the birds in a similar fashion to this summer's work with Prairie Warblers. This approach will allow us to more reliably observe nesting habitat and land use and will facilitate our nesting surveys.

Here is an Eastern Whip-poor-will nest with two eggs. Eastern Whip-poor-wills lay their eggs directly on the ground on top of leaf litter. Up close, the eggs have small brown speckles. Photo by Aaron Rusak

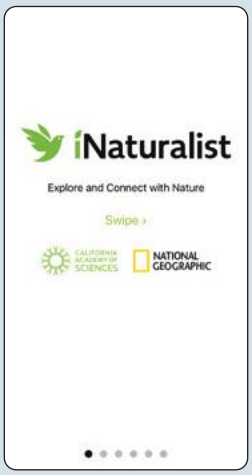


Picture of Brad Squarek tracking short-burst tag Prairie Warblers on Long Island, Go Home Bay in June. Photo by Stefani Matis

Research Student Stefani Matis drives the boat between monitoring sites. Photo by Brad Squarek

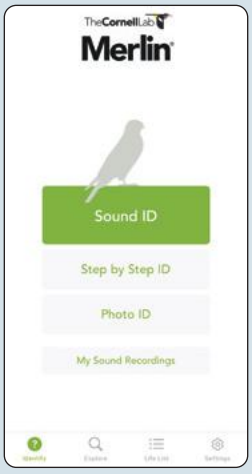
Stef and Brad's Nature App Recommendations

Being out in the field all summer is a great opportunity to learn to identify new species of plants, insects and animals. Here are a few great applications to help you connect with the species around your cottage.



iNATURALIST: iNaturalist is an app/website for community based science. It is used to document all living things around the world, and provides a platform for scientists to interact with everyday naturalists such as yourself! When you post an image, the site will provide you with species recommendations to help with your own personal identification, and experts can also work together to confirm your ID. Environmental groups, such as the Georgian Bay Land Trust, can then use this data to help inform what species are on our properties, and it is a great tool to help you grow your own naturalist skills.

SEEK: Seek is an app used for in-the-field species identification, and is particularly useful for identifying plants. All you have to do is open the in-app camera, point it at the species you are trying to identify, and Seek will tell you what it thinks it is looking at right on screen. You can then take a picture of the species to gain some more information, and even post your observation directly to iNaturalist. Seek will also tell you if this is a species you have observed before, so you can start to see trends in common species while challenging yourself to grow your list of unique observations.



MERLIN: Merlin is an incredibly useful app to assist with bird identification. There is a step-by-step identification process based on physical characteristics of the bird you saw, which it then uses to recommend species that are present in your area. There is also an in-the-field audio identification tool that listens to the bird calls around you, and then highlights which birds are calling and when. This is an incredibly useful tool for learning new bird calls, and finding birds that like to hide in the canopy rather than coming out to say "Hi"!

eBIRD: The eBird app and website is a great way to track your birding and provide data for scientists. Hundreds of thousands of birders use this app to update checklists on the go, manage their lifetime bird list, and keep in touch with the birding world. Submission data is public for all users, meaning that you can browse eBird's maps to explore which birds other people have been seeing near you, and upload your own sightings to share with the community. Data gathered on eBird has been used in numerous scientific studies, and its impact continues to grow.

Property Spotlight:

Southeast Wooded Pine Island

If we ran a popularity contest for Georgian Bay Land Trust properties, there's no doubt that Southeast Wooded Pine Island would rank near the top of the list. Its smooth pink rocks, gorgeous views over the open bay, varied landscape features and good swimming opportunities make it a perennial favourite for picnickers. But that's not all that makes this island special.

Situated among the Pine Islands group, in the open waters west of Go Home Bay, Southeast Wooded Pine might at first glance seem like a relatively barren outer island. But in fact, this 7-acre piece of land supports five different vegetation community types and the numerous animals that use them. In addition to rock barrens (not really barren at all), there is its inner white pine forest and three different types of wetlands filling its rock depressions: meadow marsh, Leatherleaf bog, and seasonal and permanent ponds, which are home to tadpoles, snakes, and more. At least 42 different plant species grow on the island, and a number of birds nest among the trees. For a while, Southeast Wooded Pine was even home to a nesting colony of Common Terns, and Killdeer can occasionally be seen laying their eggs on the open rock.

As an outer island, Southeast Wooded Pine is also an important stopover site for migrating birds. Numerous species of shorebirds and waterfowl can be seen on its rocks and in the surrounding waters, often feeding or taking shelter when bad weather drives them from the skies. And it's not just birds. One of the most magical things to witness on Southeast Wooded Pine is the late-summer gathering of Monarchs, who use this island as a resting place on their long journey to Mexico. If you arrive at the right time, you can see dozens of them clustered on trees and flitting about vegetation, fueling up for their southbound migration.

This island's striking landscape has inspired numerous people over the years—from its glassy western pool to the remarkably flat elevated and pockmarked rock on its southern end. Members of the Group of Seven painted here, and many artists have followed in their footsteps since.

Southeast Wooded Pine Island was privately owned until 1982, when its owner Joan Robinson made the generous and forward-thinking decision to donate it to the Nature Conservancy of Canada (NCC). Twenty years later the NCC transferred ownership to us. We are so honoured to be entrusted with the stewardship of this truly remarkable place, and look forward to protecting its wild beauty and habitats in their natural state forever.

Visitors are welcome at Southeast Wooded Pine Island and hundreds enjoy its beauty every year. Please remember that, like all Georgian Bay Land Trust properties, camping and fires are not permitted, and visitors should "leave no trace" on the island's landscape or wildlife.

Land Donor story: Kerry & AJ Mueller

In 2022, Kerry and AJ Mueller donated a 65-acre conservation easement to the Georgian Bay Land Trust. The easement allows them to retain ownership of the land near their home on Otter Lake, while ensuring that it will remain in its natural state forever. We're so grateful for their decision, and decided to ask Kerry a few questions about the experience:

Can you tell us a little about the time you've spent on Otter Lake?
It's been wonderful! We've been on Otter Lake for 26 years, first cottaging and then spending time in all four seasons there. I'm from Sudbury, so I was really looking forward to getting back to living in a rocky lake environment.

What's your property like, and what does it mean to you?
We have two properties now. We live on one, and look across the lake at the other. I love to kayak in the mornings and would kayak by the undeveloped one and admire its natural beauty. Then nine years ago it came up for sale, and we decided to buy it with the idea of conserving it somehow. It has always been undeveloped, and is 65 acres with 3,600 feet of shoreline. The place for us means tranquility and discovery. There's a sense of peacefulness when there, and lots of habitat and elevation variety. There's a large pond fed by a creek, nearly 100 year old trees, vernal pools, and high rocky areas, with lots of moss and lichen.

What made you decide to place a conservation easement on your property?
We wanted to conserve it for longer than our lifetimes with an organization that would help look after it too. I attended a webinar put on by the Georgian Bay Land Trust about doing exactly that and then got in touch.

Why did you choose a conservation easement over an outright donation of land?
We wanted to maintain some connection and control—it felt like double protection for the land. With the easement, we can pass it on to our family or sell it with the restrictions. There's a little less of a tax advantage with an easement vs an outright donation, but the tax advantage is still a huge incentive—the difference wasn't enough to deter us.

Why do you think conservation is important?
There's not enough land conserved for nature, especially in corridors to allow species to move as they need to. With climate change, animals are going to need to move more than ever, and this property connects to a lot of other wild land. We humans need to leave room for other species and protect them so they can thrive. We're losing too many too fast.

What would you say to someone who is considering conserving their land?
Really look into it and do it. I think you'll have a great feeling of having made a difference for yourselves and the planet. It's a wonderful learning experience. You'll connect with a lot of other nature lovers and leave a wonderful legacy.

Thank you Kerry and AJ for your amazing gift to nature!

Do you own land that you would like to preserve in its natural state forever?

The Georgian Bay Land Trust works with individuals who wish to preserve the land they love and leave a legacy for the future. Learn more at **gblt.org/landowner**.

Species Spotlight:
Spotted Turtle *(clemmys guttata)*

A male Spotted Turtle. Photo by Laura Wolf

A female Spotted Turtle. Photo by Tom Murray

One of Georgian Bay's smallest and most adorable turtles is also, unfortunately, its most endangered.

Spotted Turtles are true to their name: the only Georgian Bay turtle with obvious, yellow spots all over their shells. (Blanding's Turtles can have tiny dots, but nothing as clear as these spots). Adult Spotted Turtles measure around 9-13 cm in length, making them Georgian Bay's second smallest turtle, and quite vulnerable to attacks by predators. You can tell the sexes apart by the orange colouration females have in their eyes and around their chin.

These are hardy, cold-weather turtles, and are usually the first to emerge from hibernation when the ice starts leaving their overwintering sites in April. They breed early in the season, sometimes when the water is only 2˚C, and lay their eggs in May or June. Most of their time is spent in shallow wetland habitat, where they feed on a variety of plants, invertebrates, and carrion. Spotted Turtles don't travel long distances, and tend to concentrate in small, localized populations. They hibernate together or alone in wetland burrows, where they can maintain a body temperature of 1-2˚C all winter, and absorb oxygen from the water. If things get too hot in mid-summer, they will burrow into land or wetlands to aestivate (a summer version of hibernation, where they can spend weeks in a state of torpor).

Although once common, there are now only about 2,000 Spotted Turtles left in Canada. All of these are found in Southern and Central Ontario, with a number making their homes in wetlands around Georgian Bay. Population numbers are continuing to decline, and Spotted Turtles are no longer found at a majority of sites where they were historically observed.

Because of their cute appearance and small size, Spotted Turtles are unfortunately very vulnerable to poaching for the pet trade, and entire populations have been wiped out when the wrong person has learned of their location. If you see a Spotted Turtle in the wild, you've had a lucky encounter that comes with responsibility too. Consider yourself a protector of this rare species, and never reveal the locations of your sightings in any online posts or other public materials.

Spotted Turtles are also suffering from the same things that threaten other turtles: habitat destruction (especially wetland destruction) and road mortality. Because they don't sexually mature until 11-15 years of age, and because so many turtle eggs and hatchlings die each year from predation, it takes a long time for a Spotted Turtle to replace itself in the population. All turtle species rely heavily on the long lifespan of their adult females, who are able to keep laying eggs through the entirety of their adult lives, to sustain their populations. In the case of Spotted Turtles, this lifespan is at least 50 and perhaps up to 100 years. When a turtle is killed too soon, for example from a vehicle strike, this can remove decades of potential offspring and have a serious impact on long-term numbers.

Fortunately, turtles are tough, and are exceptionally good at recovering from injury and withstanding other forms of hardship. If we take a little more care in our activities—protecting their wetland habitats, paying attention when driving, and assisting with recovery efforts—we can give them a fighting chance.

Do you have a species you'd like to see spotlighted in an upcoming issue? Send us your suggestion at ***info@gblt.org****.*

Maamwi Anjiakiziwin project funding extended

Maamwi Anjiakiziwin
Together • Renewal • Land • Life

We're delighted to announce that Maamwi Anjiakiziwin, the multifaceted project to help Georgian Bay's species at risk, will continue with government funding for another three years.

Maamwi Anjiakiziwin (which means "together, renewal, land, life" in Anishinaabemowin) is a collaborative project between the Georgian Bay Biosphere, Shawanaga First Nation, Magnetawan First Nation, the Georgian Bay Land Trust, and community partners. It was initially funded for four years (2019-2023) through Environment and Climate Change Canada's "Community Nominated Priority Places" program, which supports collaborative efforts to improve outcomes for species at risk in ecologically significant areas.

Over the project's first four years, partners saved and hand-raised thousands of turtle eggs from roads under construction, installed seven new Motus towers to monitor migratory birds, developed Best Management Practices to guide roadwork in the region, developed new mapping to prioritize land for conservation, and more.

This new funding is for a three-year extension of the project, which will continue with much of the same work while making some changes in response to what we've learned. Some new directions for the next three years include an increased focus on community land use planning, and greater collaboration with partners to review policies, bylaws, and plans that impact at-risk species. We're so grateful to Environment and Climate Change Canada for continuing to support this work.

Learn more about Maamwi Anjiakiziwin at maamwigeorgianbay.ca.

Thank You Eleanor

We're sad to say goodbye, but so grateful to Eleanor Proctor for an amazing year of work as our Land Procurement Assistant. Eleanor's passion for Georgian Bay and its plants, animals, and people is infectious and was present throughout every aspect of her work. In her efforts to help us protect the most ecologically important parts of Georgian Bay, Eleanor conducted highly personalized outreach to landowners, did copious amounts of research, and made connections with community groups and like-minded people everywhere she went. She was ready to jump into every aspect of land trust work, and frequently helped with tasks outside her job description, including assisting with summer fieldwork and stewardship, writing educational articles, and conducting fundraising activities. She was generous with her time, knowledge, and enthusiasm, and quickly became an integral part of our team. We're so grateful for everything Eleanor contributed to the Land Trust, and wish her all the best with her next adventures!

Welcome Stef!

We're delighted to welcome Stefani Matis to our year-round team, as she steps into the role of Land Procurement Assistant. Stef was one of our Research Students this summer, and did an outstanding job carrying out fieldwork for bird research projects and land protection work. Prior to working with the Land Trust, Stef completed a double major in environmental science and biology at Trent University, and worked as a Conservation Technician with Friends of the Rouge Watershed. She has a particular interest in insects and has volunteered with the Mottled Duskywing Conservation Project at the Cambridge Butterfly Conservancy. Stef's enthusiasm for conservation work has been clear since the moment she started, and we're thrilled that she has decided to stay on the team. We know she will continue to be a great asset to the Land Trust.

Georgian Bay **QUERY:**

How can I be environmentally-friendly while closing my cottage?

Answered by Jenna Kentel, Landscape and Wildlife Technician, Georgian Bay Biosphere

For some, the changing leaves and chilly weather signal that another incredible cottage season has come to an end. As you prepare to leave for the season, it's important to think about environmental stewardship. As a cottage owner in eastern Georgian Bay, it's not just the scenic views and tranquil surroundings that make your property special, it's also the critical habitat and wildlife that call it home. Being a good steward is essential because in sharing the land with wildlife, we are responsible for preserving the habitat they depend on. When preparing to close your cottage for the winter season, it is important to close it with the land and wildlife in mind.

Here are some tips on being a responsible steward as you close up your cottage for the season:

Actions that Support Natural Habitats

Leave your yard natural. Enhance wildlife habitat by leaving your yard in its natural state this fall. Leaves, rotting logs, and brush piles can provide shelter for small mammals, pollinators, reptiles, and amphibians. Additionally, leaving dried flower heads like sunflowers, asters, and goldenrods from your garden can serve as a natural food source for birds, while the stems and leaves provide homes for hibernating insects.

Preserve the night sky. Light pollution can negatively impact wildlife, such as birds or insects, as they migrate or forage. Before you go, ensure all outdoor light fixtures are turned off to reduce light pollution. Additionally, when using lights at the cottage, consider making outdoor lighting changes, such as installing shields or switching to motion detectors. Not only does this benefit wildlife, but it also enhances your stargazing experience!

Check for invasive species. Help prevent the spread of invasive species by thoroughly removing, cleaning, and properly disposing of all plant and animal material from your vehicle, boat, trailer, or any other equipment before removing them from your property and then again before coming back to your cottage in the new year.

Keep it icy. Do not use ice bubblers if you intend to keep your dock in the water during the winter. These devices, designed to agitate and warm the water to prevent ice formation around your dock, can have adverse consequences. Not only can they alter critical aquatic habitats and disrupt overwintering turtles, but they also pose significant human safety risks. It's worth noting that many municipalities have bylaws prohibiting the use of de-icing methods for docks, and there can be legal repercussions for operating dock bubblers.

Actions that Help Individual Species

Bird proof your windows. Birds mistake the reflection of the sky or trees on windows as a clear path, causing injury or death to birds from window strikes. Reduce the risk of birds crashing into windows by simply closing your blinds, shades, or external shutters. Consider adding decals (spaced 2 inches apart) or tinted films onto your windows to make them visible to birds.

Dispose of your garbage responsibly. It can be a risk to wildlife, such as bears, if they rely on human food sources. Avoid attracting bears and other wildlife to your home by taking all garbage and food with you. Ensure anything left behind (like birdseed) is in air-tight containers. Clean all appliances, cupboards, and barbecues to remove crumbs and grease. Store barbecues and outdoor cooking appliances in indoor spaces.

General Stewardship Practices

Properly store hazardous material. Make sure that any hazardous materials, such as gasoline or oils, are either taken with you or properly stored to reduce spills or leaks into the environment.

Be smart about your septic system. When using a septic system, all liquids that flow down your drain end up in your septic system, and eventually, the output will be released into the environment. Contaminated or nutrient-rich wastewater that enters the environment can impact water quality and wildlife. Always take care of your system by limiting your inputs. Do not add grease or fats, and use natural/phosphate-free soaps or detergents to minimize environmental impacts from your septic system. It is also crucial that you are on top of pumping your tank every few years to prevent any major back-ups, leaks, or other issues from occurring.

Plan stewardship for the spring! Over the winter is a great time to think about your property and how to continue creating a naturalized space. Two great starting points are:

- Restoring natural shorelines. Natural shorelines and vegetative buffers are crucial in providing a protective barrier against erosion and fostering biodiversity. Protect existing natural areas and create a vegetated buffer zone with native plants, trees, or shrubs to restore shoreline buffers.
- Native plant gardening. Embracing native plant gardening fosters a more natural, diverse, and less meticulously maintained green space. Transforming traditional lawns into gardens, meadows, shrub areas, or "rough" habitats is strongly encouraged wherever feasible. This transition reduces the need for intensive maintenance, significantly boosts biodiversity, and lends a hand to wildlife with natural food sources and shelter.

As a cottager, your role in preserving Georgian Bay's natural beauty and ecology is crucial. By taking simple actions, you can help ensure a healthier environment for your visits, the land, and the wildlife that call this place home.

GEORGIAN BAY BIOSPHERE MNIDOO GAMII

Check out the Georgian Bay Mnidoo Gamii Biosphere's **Life on the Bay, Building in the Biosphere Tool**, and **Planting for Pollinators** guide to learn more about how you can sustainably live with nature! The guides can be found online at: **https://georgianbaybiosphere.com/conservation-guides**

Fallen logs like this can be an important part of the ecosystem

Keeping or restoring natural shorelines is a great way to care for the environment at your cottage

LandMark Speaker Series:

The Canadian Lakes Loon Survey

This past spring, we were delighted to be joined by Dr. Doug Tozer for a talk on the Canadian Lakes Loon Survey. Doug is Director, Waterbirds and Wetlands at Birds Canada, where he leads the Great Lakes Marsh Monitoring Program, the Canadian Lakes Loon Survey, and the Long Point Waterfowl and Wetlands Research Program. Here's what he had to tell us about declining loon populations, and what his team is doing to help.

Photo: Peter McPhedran

The Common Loon has long been associated with peace, wilderness, and a healthy environment. These days, they are also an indicator of environmental trouble, as pairs produce fewer healthy chicks, and the population faces potential decline.

Birds Canada has been conducting the Canadian Lakes Loon Survey since 1981, relying on a team of volunteers to survey loons throughout the breeding season, and collect data that can be used to assess long-term trends. Volunteers are trained to conduct standardized surveys on their local lake, and to record how many 6-week-old chicks each loon pair is able to raise per season (once a chick reaches 6 weeks, its chances of surviving to adulthood are much greater). Over 700 lakes have been surveyed over the past 40 years, and we have great data on "productivity" (number of 6-week-olds raised) across most of the Common Loon's breeding range in southern Canada.

What this data shows is that Common Loon productivity has declined by about 20% since the early 1990s, averaging a decline of 1.4% per year. 30 years ago, each pair was producing on average 0.6 6-week-olds per year – now that number is 0.45. These Canadian averages have been replicated in a separate 30-year study done in northern Wisconsin.

What are the drivers of these declines? Doug's team has considered over a dozen factors in their analysis of the data, including: lake area, longitude, fish mercury contamination, pH (acidity) of lake water, shoreline development, boating activity, Bald Eagle and Double-crested Cormorant occurrence, average maximum temperature, and average precipitation. They've discovered that loons do best on bigger lakes (which have more fish), and that productivity is lower and declining faster in northwest Ontario than in the southeast part of the province. Surprisingly, they have found no overall relationship between shoreline development or boating activity and productivity declines, despite knowing that this can harm loons. There is likewise no negative relationship with Bald Eagle or Cormorant populations.

Doug's group found the strongest correlations with low productivity when they measured lake acidity and fish mercury contamination. They have long known that acidity is bad for loons, and mercury is a neurotoxin which can make loons sluggish and less motivated to feed and protect their young. Chicks with mercury contamination have weakened immune systems, and don't do as well in conserving energy or avoiding predators. Doug and his team have now come up with what they call the "acid-mercury-climate" hypothesis to explain the recent declines. It goes like this: Lakes have a baseline amount of mercury and acidity from acid rain decades ago. Fossil fuel emissions are increasing this pollution, and raising average lake temperatures. These warmer and more acidic lakes are a perfect breeding ground for acid-loving bacteria, and these bacteria capture mercury from the water. As the bacteria are consumed, mercury enters the food chain, eventually making its way in increasing amounts to the fish that loons eat.

Doug says there are likely other interactions we don't understand yet, and that more factors need to be considered, including: organic pollutants, oil spills on wintering grounds on the Gulf coast, botulism, emaciation syndrome, emerging diseases like avian malaria, and lead poisoning from fishing tackle. Next steps include studying these problems, as well as looking more closely at regional differences, both in breeding and wintering habitats, to identify locations that might be causing trouble.

According to Doug, the Canadian Lakes Loon Survey has been a huge asset in tackling these problems, because of the head start it has given researchers. Loons are long-lived, so the adult population has not yet suffered from the breeding declines in recent years. If we didn't have this team of volunteers monitoring nesting pairs, scientists might not have become aware of the shortage of young until steeper population declines had occurred. Thanks to the dedication of the community, scientists like Doug will be better able to understand and protect this symbol of wilderness for future generations.

For more information on the Canadian Lakes Loon Survey, read its 40-year report at birdscanada.org/loons.

The importance of native host plants for butterflies and moths

By Aaron Rusak, Protected Areas Manager, Georgian Bay Land Trust

This summer was an incredible summer for flowering plants, with species like Boneset and Cardinal Flower appearing frequently across Georgian Bay. Lots of flowering plants means lots of butterflies, and although we had fewer Monarchs, I still observed many other species throughout my time in the field. However, despite the importance of flowering plants to butterflies and moths, we often forget to talk about the other side of the equation: host plants.

Flowering plants are great for the adult stage of a butterfly's life cycle. They use flowering plants as a main source of food throughout their adult lifespan. But before they become a butterfly, they first have to go through the perils of being a caterpillar. This is where the host plants come in. Butterflies and moths, like many insects, are very specific in the species of plants that they lay their eggs on. Most people know about the interaction between Monarchs and milkweed species (in the *Asclepias* genus). Although milkweed is great for Monarchs, our other species of butterflies require different plants. For example, the fritillary butterflies often lay their eggs on violet species, like Georgian Bay's Lanceolated Violet, *Viola lanceolata*. The skippers found in Georgian Bay regularly use species in the legume family. Bog Coppers, which are regularly found in the wetlands around the area, require American Cranberry, *Vaccinium macrocarpon*, to feed on in both the adult and caterpillar stage. Often when we talk about attracting butterflies, we only talk about the flowering plants that butterflies use. However, if you really want to increase the number of butterflies in your area, host plants are necessary to support that stage of the butterfly's life cycle.

Even more forgotten are moths, a group of species often thought of as the butterfly's drabber cousin. However, the number of moth species in the area vastly eclipses the number of butterfly species, with almost 1,000 species of moth observed in Georgian Bay, as compared to only 80 species of butterflies. Although many of our moths are drab, it's hard to say that moths such as the Painted Lichen Moth or Rosy Maple Moth are anything like that. Moths are also very specific in what they choose to eat, many feeding on oak, but some being as specific as to require the submerged roots of alder plants. Attracting moths isn't as glamorous as attracting butterflies, but it is likely more important.

Host plants allow moths and butterflies to lay their eggs and provide food for the caterpillars that will eventually turn into the adult form. Allowing a wide variety of moths and butterflies to call your cottage home is important for one other reason: it provides food for birds. Regardless of the food source for adult birds, most birds choose to feed their young using caterpillars. They're a quick, easy source of energy for young birds, being both easy to process and high in nutrients. It stands to reason that the more caterpillars there are in an area, the more breeding birds the area can support. And attracting butterflies and moths doesn't require any planting, it only requires providing the space for native plants to grow and flower. There are many flowering plants that we call 'weeds', but many of them are essential to certain species of insects. The Georgian Bay ecosystem is all connected, so often what we call a weed, something like the Hummingbird Clearwing moth might call home.

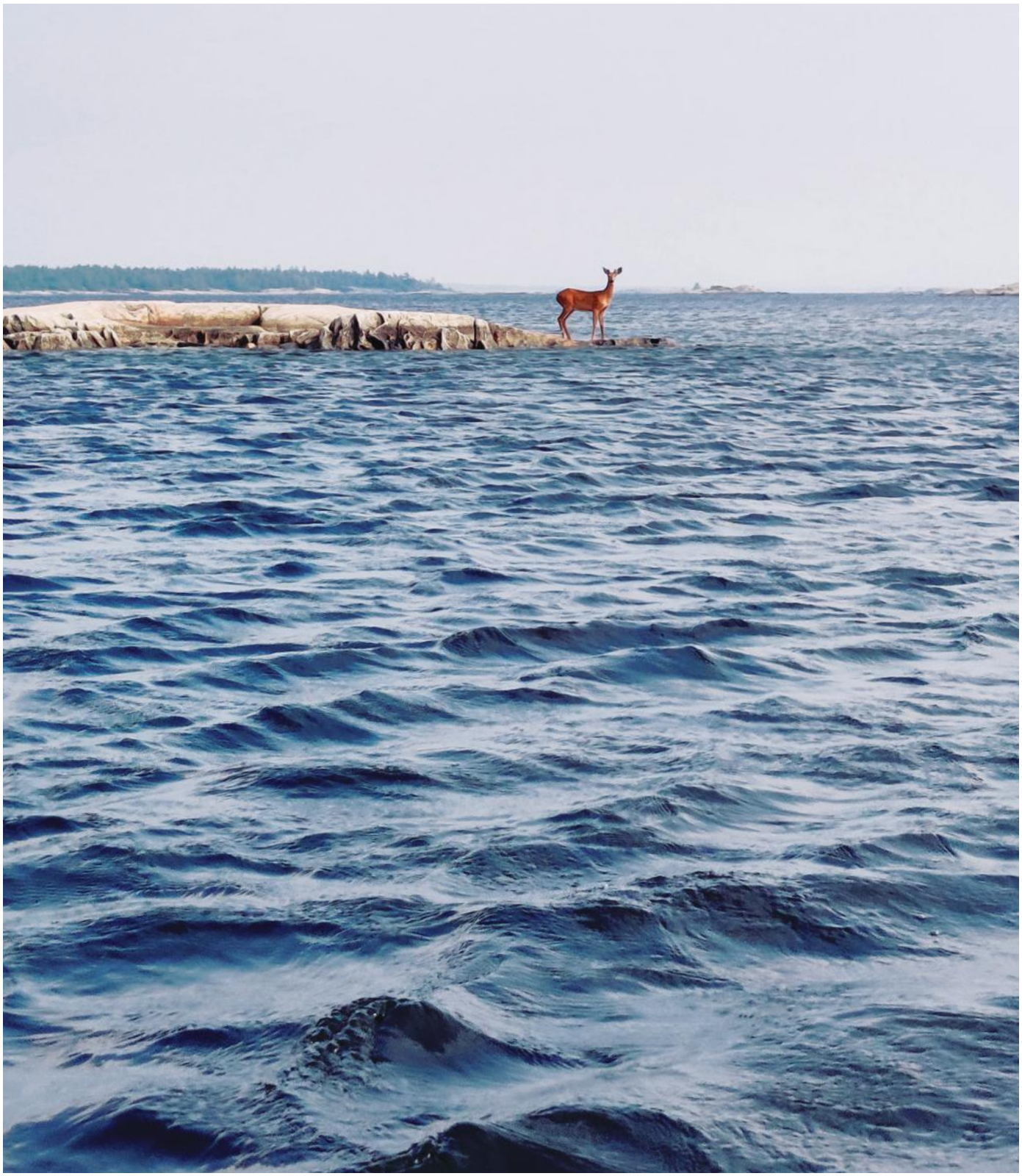
Bog Copper and American Cranberry - Photo by Tom Murray

Monarch on Milkweed - Photo by Shawn Haokang-Wu

Georgian Bay
Snapshot

Visitor by the Water
By Stefani Matis

Summer Research Student Stefani Matis took this photograph while en route to a conservation property. We'll have to imagine where the deer was headed!



Bayscapes is back!

Join us in Toronto on November 3 as we gather for our first in-person Bayscapes since 2019! The event will look a little different than in the past, but what won't change is the opportunity to see all your Georgian Bay friends in the fall, while supporting the conservation of the place you love.

If you can't make it, you can still bid on all the wonderful art, experiences, and items online from October 27 - November 4.

Visit **gblt.org/bayscapes** for details.

Conservation is a choice – please make it your choice

Saving a balance of Georgian Bay's natural spaces takes a community of people like you: people who value nature and the outdoors, and who understand that wild and biodiverse places are critical to our quality of life and to generations to come.

Your donation will help protect more of Georgian Bay's most important wilderness lands, forever. Give now using the enclosed envelope or at gblt.org/donate. Thank you!

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The Georgian Bay Land Trust acts to preserve the wilderness lands of eastern Georgian Bay and the North Channel through strategic conservation planning, land securement, stewardship, conservation research, and education.

We are a registered Canadian charity (#13195 8811 RR0001)

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