

THE HALIFAX FIELD NATURALIST



No. 193
December 2023 to February 2024



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Return address: HFN, c/o NS Museum of Natural History, 1747 Summer Street, Halifax, NS, B3H 3A6

HFN is incorporated under the Nova Scotia Societies Act and holds Registered Charity status with the Canada Revenue Agency. Tax-creditable receipts will be issued for individual and corporate gifts. **HFN** is an affiliate of Nature Canada and an organisational member of Nature Nova Scotia, the provincial umbrella association for naturalist groups. **Objectives** are to encourage a greater appreciation and understanding of Nova Scotia's natural history, both within the membership of HFN and in the public at large, and to represent the interests of naturalists by encouraging the conservation of Nova Scotia's natural resources. **Meetings** are held (except for July and August) on the third Tuesday of every month at 7:30 p.m. in the auditorium of the NS Museum of Natural History. **HFN Field Trips** are held at least once a month; it is appreciated if those travelling with someone else share the cost of the gas. **Participants** in HFN activities are responsible for their own safety. **Memberships** are open to anyone interested in the natural history of Nova Scotia. Forms are available at any meeting of the society, or by writing to: Membership Secretary, Halifax Field Naturalists, c/o N.S. Museum of Natural History. Members receive **The Halifax Field Naturalist**, along with its included **Programme**, quarterly. Our membership year is from January 1st to December 31st, and new memberships received from September 1st to December 31st of any year are valid until the end of the following membership year.



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FEES

Student	\$15.00 per year
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Supporting	\$35.00 per year

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Halifax Tide Table - Jan., Feb., Mar.15



GRAPHICS All uncredited illustrations are by H. Derbyshire or from copyright-free sources. **Front Cover** - Frozen waterfalls, Panuke Lake, (a 'finger lake' stretching from Windsor to St. Margaret's Bay), Lesley Jane Butters; p. 11 - American Toad, Rebecca Betts; **Back Cover** - Pines after a snowstorm, William Smithey; p.15 - **Tide Table** - Canadian. Hydrographic Service, Fisheries & Oceans Canada.

HFN NEWS AND NATURE NOTES

NATURE NOTES



SEPTEMBER'S MEETING

Judy Keating had workmen digging ditches near a wetlands in her Glen Haven area and as she was digging soil there to use in her garden, up came **two eels** which were still alive! She took them to her waterfront in Frostfish Cove. Also, about two weeks ago, she heard a sound over head and looked up to see a flock of about **a dozen Nighthawks** flying by with their distinctive white wingbands. This morning (September 16th) as she was pulling up her blind, she saw a Doe with three young fawns; she had never seen **triplet fawns** before.

Mary Kennedy saw a bird that she thought might be a Yellow-throated Warbler. An audience member mentioned it was probably the **Common Yellowthroat Warbler**. Becky Parker reported seeing **Black-bellied Plovers** and an **Egret** at Salt Marsh Trails, while Mike Bradfield reported the return of the **Great Blue Herons** in the Public Gardens.

Susan Moxon mentioned there were no **Loons** on her lake until a about month ago; since then they have been extremely active and very noisy and have been calling every night.

This past summer Regine Maass and family had **two Catbirds** in their garden. They would become very agitated when they came out to do some work, but they couldn't find any nest, and they had disappeared by the end of July. They also had a noticeable **lack of bees and wasps** but observed **quite a few bumblebees and lots of Japanese Beetles**.

Judy Keating heard what sounded like pups yelping in her neighbourhood; she thinks what she heard were **Coyotes**. Living nearby in West Dover Becky Parker reported that she had heard the same yelping, thinking also that they were coyotes. She also noted **fewer Snowshoe Hare** around this year (the Coyotes?).

Bernie McKenna had **Robins nesting** in his High-bush Blueberries. Well protected from below but not from above he thinks the 4/5 crows he feeds may have gotten those fledglings. However, there were more nesting Robins whose young fledged successfully. Also, **A Goldfinch** was trying to feed on one of his old Sunflowers which had dropped its head; it finally pulled off the petals to get to its nutritious seeds.

Stephanie Robertson saw a new-to-her phenomenon at Melmerby Beach. Terns and different types of gulls were continually flying around in large circles. Looking toward the sun, the different light allowed her to see that they they were scooping up flying insects



in the air. Gareth Harding mentioned that seabirds often gather to eat the myriad **seasonal, just-emerged flying ants**.

Susan Moxon reported that two years ago, she had a plethora of **June Bugs** banging on her screen door but that this year there were none. An entomologist told her that **June Bugs are in decline**.



OCTOBER'S MEETING

Jennifer Hahn spotted a **green Sweat Bee** on a bright purple thistle (apparently this is the 'official' bee of Toronto). Max Raissi reported that the **Puffins** in Newfoundland and New Brunswick are dying off because there is not enough fish for their young. All chicks have been reported dead in their nests. This has been going on for a year or two. When he lived there years ago there were many Puffins; now there are hardly any.

Gillian Webster spotted **5 Godwits** and some **Semi-palmated Plovers** in Wolfville's harbour. Gareth Harding saw **a Bald Eagle** at an Avondale dyke. Ron Arsenault spotted **Amur Maple** and an **escaped Privet** on the Northwest Trail in Clayton Park. On Sept. 29th, Carol Morrison saw some **Alder-leaved Buckthorn** in Westphal.

On this year's Sept. 14th fungi bioblitz, Lara Gibson saw **70 types of mushrooms - 50 species plus some slime moulds**. Shirley McIntyre reminded us to report any invasives we find to iNaturalist. Bernie and Heather McKenna saw **a plethora of mushrooms (but no Chanterelles)** on the Uniacke Trail.



NOVEMBER'S MEETING

Mike Bradfield has seen **a Mink** at the Public Gardens for about a month. (Recently we met up with Mike and he says it is no longer being seen there - Ed.) Lesley Jane Butters reported that recently, growing tomatoes had been found under some rubble near the Waegwoltic's kitchen in the entirely fire-demolished club house. She said they were particularly tasty! Shirley McIntyre reported **quite a few Green Turtles** in the Bay of Fundy. There were three in Scot's Bay; two were dead but one was alive. On October 1st. Judy Keating saw **a Red Fox** in Glen Haven. She also reported that **a female Moose** had been seen in the St. Margaret's Bay area. Gareth Harding reported a bumper year for **Mountain Ash berries**, and also their consequent hordes of **Bohemian Waxwings** taking advantage of the feast.

PANDEMIC PIGEONS

– Grace Beazley

– **How the Pandemic Brought Pigeons to My Home Above the Trees** In the Spring of 2023 I had a ‘Eureka moment’. Why? Well, from 2010 until 2020, there were never any Pigeons around my eighth floor apartment, but during the Covid-19 pandemic, urban Pigeons inundated the roof top terrace and balconies of 5800 South Street. Daily, for two-and-one-half years, Pigeons constantly flew back and forth between the roof of The Sobey Cancer Support Centre on the corner of South and Wellington Streets and our place. The largest count on one sighting was 36.

These ‘homing’ birds are disease-carriers and I was not keen for them to be leaving their ample guano on my balcony, others’ balconies, the rooftop terrace, nor on the ramp into the parking garage! Regularly, I cleaned up my balcony, following HRM’s Waste Educator’s suggested way to dispose of their droppings safely. That is, I wrapped the droppings in newspaper, paper towels, toilet tissues, etc. and put the package in the garbage, grumbling all the while. I was not very happy with this situation.

Pigeons detect motion quickly, so shooing them away was easy, but of course only temporary! As I got more disgruntled, my husband Richard did some research and learned that one way to discourage Pigeons from visiting was to spray them with water; it is not allowed to poison or hit them physically. So – he bought a child’s water gun! At every opportunity I shot a stream of water at them. Applied conscientiously, it led to a significant decrease in their visits to my balcony, but it did not deter them visiting other balconies and the roof.

The presence of at least 15 Pigeons daily was very wearing on me after many months, and I wanted the owners of the building to do something about this situation. Other tenants did too. Finally, in the spring of 2023, the owners hired a company to rid our building of these annoying and dirty pests. After a few months, the number of Pigeons decreased dramatically, and so did the guano! I grew more happy as the days went by and there were fewer and fewer Pigeons, and finally, usually only a persistent three or so, the same or different, who knows.

To myself, I kept wondering why those urban Pigeons decide to visit so often during the Covid-19 pandemic. It then dawned on me that my building’s balconies and rooftop terrace were closed to tenants for months during the worst of the pandemic, and this had offered an attractive, human-free home for them.

At the beginning I mentioned that I had a Eureka moment in the spring of 2023. Yes, the reason these urban Pigeons started visiting our balconies and rooftop terrace was that they had found a new and spacious urban cliff where they could safely build their nests and raise their young!

NEW AND RETURNING



Lauren Burke
J. Brown & John Shimeld
Susanne Retter & family
Thea Smith
Norris Whiston

SPECIAL ARTICLES

iNATURALIST –

– Lara Gibson

– And All the Details on How to Use It

Have you ever wanted to keep a record of the organisms you see on your travels? Headed to a new place and wondered what you might find? Wondered what the best season is to find Comb Jellies, or Great Blue Herons? iNaturalist can help you do all these things.

iNaturalist is a crowd-sourced natural history platform where users can upload photos and/or sounds of the organisms they encounter. This platform also acts as a community hub for discussion boards and group events such as the global City Nature challenge. Through peer review of the observations, a database has grown which is increasingly being used for scientific purposes.



While iNaturalist originally started in California, there are now other, regional sites all around the world. **If you are posting from Canada, you should log onto the iNaturalist.ca site.** After posting, selected records are shared with the Global Biodiversity Information Facility (GBIF), which can be accessed by researchers around the world.

iNaturalist can be used either through a computer interface, or as an application. The app is available in both Android and IOS versions; it has slightly less functionality than the computer version, but if you have data on your device you can use the app to upload your finds while you are in the field. The computer version asks for the same data as the app but here you can also read about various organisms, compare your find to other organisms that it could be mistaken with, look at the time of year these animals

are most abundant in an area, or use the map to see what else can be found in a particular area.

Over time the observations you make will build up a record of what you have seen in the places you have visited, creating a life list of the taxa you have seen and how often you have seen them.



How to Upload From the App

In your phone setting, allow the app to access your photo library and ensure that your location settings are on. In the app, click on 'observe', and then choose to use either the camera, the photo library, or to record sound. Choosing the camera will allow you to take a photo and directly upload it as an observation. Choosing the photo library will allow you to choose a photo you have taken in the past. You can upload up to four photos at a time. If you have more than four photos to share you can edit your post after uploading it to add additional photos.

After choosing your photo, you will be prompted with a screen that asks you to identify what you have seen, and to record other fields such as the date, place, whether you want to share the location of your observation, if the organism is wild, and if you are adding the observation to a project.

Clicking on 'What did you see' will allow you to type in what your organism is, or – if you are connected to the internet – the Artificial Intelligence (AI) system embedded in iNaturalist will make suggestions based on the photos that have been previously submitted. You can then evaluate the suggestions and choose the best match, or enter the taxonomy you do know. For example, you might be looking at an aster, but not know what species it is. The AI system will probably suggest several options and you can choose one of them, but you could also just enter aster into the system. There are volunteers (and you could be one of them!) who will look at the photo and suggest a further identification or – agree with the identification you submitted. When three community members agree on an identification the observation is considered 'Research Grade' and then the data would be shared with the Royal Ontario Museum and the GBIF.

The second required field is the coordinates of where you made your observation. If you have the location services on your phone turned on, or are using a GPS-enabled camera, the location will automatically be filled in for your observation from the meta-data stored with your photo. However, if the field is missing you can click on the map and navigate to the location and select where you made your observation by clicking on the location on the screen.

After inputting a photo or a sound there are a couple of optional fields. You can indicate if the ob-

servation is captive (domesticated) or cultivated, add the observation to a project, and add any notes about your observation.

The prompt about captive/cultivated organisms is to prevent the GBIF database from being flooded with pets and garden plants! These observations will not become research grade, but will be included in your own life list. You can also imagine a situation where finding an escaped garden plant in a wilderness area could alert managers to take action, and prevent the further spread of a non-native plant or animal.

Once you have filled out all the data for your observation, you hit the 'share' button at the bottom of the screen. If you are connected to the internet, this will add your observation to the system, and allow others to review your entry.

Uploading an Observation from your Computer

The process of uploading an entry through the computer interface is similar to the app. You start by going to iNaturalist.ca and logging in. From the main page you will see your profile icon on the upper right menu and to the left of your profile a green circle with a white centre and green arrow pointing to the top of the page. Clicking on this circle will bring you to the upload page.

You start by uploading the photos from your computer. The difference here is that if you upload multiple images, the system will recognise them as multiple observations. If the pictures you uploaded are all of the same organism, you can combine the observations by dragging one on top of the other.

The system will ask you for all the same fields as in the app – Where was your photo taken? Is your animal cultivated or domesticated? Is your photo part of a project? Once you fill out the fields you hit 'submit'.



'Good' Photos

If you can, you should aim to include several photos in your observation. With more than one photo, an overall view can give the reviewer a better sense of the organism, and potentially, the type of habitat in which it is found. You should also add close-ups of its various features, and if you can, multiple angles of it. Multiple photos give reviewers the best possibility of seeing the features they need to make a definite identification.



Other iNaturalist features

Beyond creating a life list and travel log from your own photos, you can also use iNaturalist to see what you might find in a particular region, or to learn more

about a particular taxa. In both the app and computer version there is an 'explore' tab. In the app, clicking this 'explore' tab will bring you to a map; you can expand this and move it to be centred on any part of the globe. The pins on the map indicate a location with an observation, and touching the pins will bring you to the observation. You can also get a sense of what is in the region by changing from the map to the 'grid' or 'list' view. These two views delineate what has been seen in the area – starting with the most recent observation. You can also click on the 'magnify glass' and type in the name of an organism. From here you can choose to search for that organism in the region, or in your observations. This is how you can go to a particular region and see what you might find there before you travel.

Through the website you can also use iNaturalist to learn about an organism. Typing in the name of an organism, or clicking on the name through an observation, will bring you to an 'about' page. Here you will see a representative photo of the organism, 'thumbnails' of other photos, a list of people who have made the most observations, the most identifications of the organism, and a chart of when the organism is most observed during the year.

At the bottom of this 'about' page is a map showing where these organisms are most likely to be found globally, but again you can navigate in the map to focus on a particular region. Above the map you'll find other tabs; the 'about' tab links to the Wikipedia page for that organism, and the 'taxonomy' tab will list the full taxonomy from kingdom to species. Similar species will show you what organisms are commonly mistaken for the species, and the 'status' will list the International Union for the Conservation of Nature (IUCN) status, and also indicate if the organism is rare or introduced in Canada.



Projects

'Projects' are a way to collect observations from a particular area (i.e. Blue Mountain/Birch Cove), or a particular area between specific dates (i.e. the City Nature Challenge), or to track sightings of specific organisms (i.e. 'Tagged Trumpeter Swans of Ontario').

The City Nature Challenge will automatically collect all observations within HRM between April 26th to April 29th, 2024. Because this is set up as a 'collection project', you don't need to sign up for the event – you just need to go outside on that weekend and make a few observations. Any observation made within HRM boundaries on those dates will automatically be added. At the end of the weekend the observations we made as a collective group are compared to other participating cities around the world.

Another example of a 'project' is our Blue Mountain/

Birch Cove Lake Wilderness Area. In this project any observation within the boundaries of the proposed park is collected from any time of year. If you wanted to see what observations had been made you could type in the name of the project in the search bar, and click on 'view observations'. This will return all the observations in this place since the project started.

Overall, iNaturalist is a multifaceted website which is a great place to start learning about the organisms you see, a place to curate your own life-list or travel-list, connect with other naturalists who can help confirm your identifications, and a place to explore when and where various organisms are likely to be found.

I hope this introduction to some iNaturalist's tools will get you started, and also inspire you to upload an observation or two during this year's City Nature Challenge.



CITY NATURE CHALLENGE 2024

As most of you already know, The City Nature Challenge (CNC) started in 2016 as a competition between San Francisco and Los Angeles. It is now an international event, motivating people everywhere to document wildlife in and around their cities, using biodiversity recording apps such as iNaturalist. Run by the Community Science teams at the California Academy of Sciences and the Natural History Museum of Los Angeles County, this annual four-day end-of-April global bioblitz's goals are to connect people in urban/metro areas to their own immediate and local nature, to build community interest in-person and online around CNC, to make the results available for science/management/conservation, to grow global biodiversity documentation, and to initiate fun and friendly competition and global collaboration.

2023 CITY NATURE CHALLENGE RESULTS

482 cities participated, with more than 66,000 people making 1,870,763 observations within the four days of the challenge. There were 57,227+ species (including 2,570+ rare/endangered/threatened species); and 66,394 observers. Surprisingly, the most observed species globally was *Anas platyrhynchos* – the Mallard Duck. La Paz, Bolivia took the triple crown with the most number of observations, species, and observers.



IMPACT

Since 2017, the CNC has been the largest annual observation recording event on iNaturalist, and resets both the 'baseline' of the observations coming into (and the number active users on) iNaturalist after each CNC. Not only does the CNC engage new people in observing nature during the event itself, it also highlights the value of this work and inspires some participants to become biodiversity observers year-round.

! 2024 City Nature Challenge Dates !

26th-29th April – Making observations

30th April to 5th May – Uploading & ID'ing

6th May – Results announced

For more info visit – citynaturechallenge.org!

HFN TALKS



NS MAINLAND MOOSE 19 SEPT.

Nature Nova Scotia's (NNS) President and biologist Bob Bancroft brought us up to date with the present state of our mainland Moose *Alces alces americana*. The moose (or elk) is the only species in the genus *Alces*. It is the tallest and second-largest land animal in North America, only falling short of the American bison in terms of mass – the world's tallest, largest and heaviest extant species of deer.

In the 1970s and 80s there were plenty of Moose in Nova Scotia – the devastating 'feller-bunchers' and other giant and deleterious forestry machines had not yet been introduced. Back then, horses were used to work the forests and they left a much smaller footprint and no extensive, irremedial damage. Bob showed us a picture of how forests used to look back then – thick, varied, and with many waterways, lakes and ponds.

Moose need a lot of different forest vegetation, up to 60-70 lbs. per day! It is also essential for them to have access to aquatic plants in order to be supplied with all the minerals they need to thrive and reproduce. The production of those huge antlers especially depend upon large amounts of good nutrition and varied browse. Young Moose themselves need enough to gain five pounds a day in order to thrive.

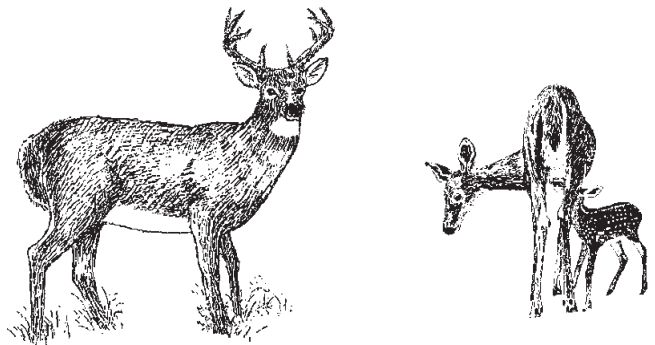
There also needs to be enough 'cover' for Moose in order to hide from omnivorous Black Bears and Coyotes. Once large and active logging roads go into areas, first the White-tailed Deer increase (Moose are subject to mortality from the Deer parasite *Parelaphostrongylus tenuis*), and then the Coyotes. Moose then gradually disappear from these areas. Having enough of that essential forested habitat is vital to the growth and success of our Moose populations. But now, in much of our once traditional Moose areas, clear-cutting has ruined and erased the type of environment they require. Nova Scotia's mainland Moose was declared Endangered in 2023, but our government has never identified nor designated any core habitat, as was required by its own Endangered Species Act. They have actually allowed habitats with confirmed Moose activity to be both clear-cut and/or mined; Bob illustrated with an aerial view showing six or so large swathes of clear-cuts.

Twenty-one years ago, in Gerry Parker's 2003 Eastern Moose status report, there were found to be only an estimated 1000 mainland Moose remaining in

certain areas in our province: 150 near the Tobiatric; 600 in Cobequid; 25 in Pictou Co.; 80 in Guysborough and Antigonish; 20 in Ship Harbour; 30 on the Chebucto Peninsula; and 70 or 80 in the southeast corner.

Nature Nova Scotia has set up a Mainland Moose Research Project in order to start active advocacy for this magnificent animal, with surveys, events, and public education. They're research includes bringing back core habitat, vegetation management, traditional and cultural uses, and ecotourism.

In August 2023 they held a Species at Risk Mainland Moose Webinar Event, and in October a Chebucto Peninsula Moose Meeting for a guided stroll through Moose territory to learn about recognising moose tracks, their pellets, and other signs such as shed antlers. Moose droppings are the size of chocolate-covered almonds, while deer droppings are the size of chocolate-covered raisins! Moose hoofprints are much larger than those of deer, while cow prints don't have the extra two little marks to the rear of their hoofprint as Deer and Moose do.



A really ingenious idea – NNS is providing free trail cams for private Chebucto Peninsular land owners to set up and maintain in hopes of spotting this elusive mammal – along Herring Cove Road, Sambro, Hatchet Lake, Hammonds Plains, Tantallon, and Seabright. (There are about 30 known Moose on the Peninsula.)

To report sightings, and/or send pictures of Moose signs and Moose, contact info@naturens.ca or jess.lewis@naturens.ca.

ORCHIDS & FUNGI – SOME CLOSE RELATIONSHIPS

17 OCT.

– Stephanie Robertson

John Crabtree started out his presentation by telling us about the recent (Oct. 15th) annual Fungi Foray. It encompassed four trails with 20 people for each trail and each of these trails presented different environments.

One of the more exciting finds was the discovery of a 'fairy-ring' – a fairy-ring which was 60-70 ft in diameter! At that size John realised it must have been there for a very long time; it was ID'd as *Epista erina*. A spoor print was taken and it turned out to be yellow (not the usual pink). With later research, he found on a Minnesota website that it was a variety which did indeed give yellow prints.

The *Cortinarius* sp. is the largest genus of fungi in North America – there are ± 1,000 of them! Of those, there are 300 which occur here in Nova Scotia.

Reference books John recommended were firstly, as the very best book, "Mushrooms of Ontario". Next in line was "Native Orchids of Nova Scotia" by Carl Munden. He said that this is the best reference for our Nova Scotian orchids.

Bogs are great places to find native orchids. John has found 20 of the 39 wild Nova Scotia orchid species listed for the province. Orchids have no endosperm (the tissue which surrounds and nourishes the embryo in the seeds of flowering plants) and instead have evolved to get their vital nutrients from associated fungi. To survive and be successful, their habitat *must* include fungal mycorrhizae (a fungus's giant network of filaments which exist underground).

One of his first slides (digitally manipulated) elicited much laughter as he was shown as a miniature human beside a giant mushroom.

First off, he discussed non-orchid/fungi relationships. The first was the Ash Tree Bolete *Boletinus merulioides*. As the name implies this mushroom is found on the ground under ash trees. Oddly, this fungi has no mycorrhizae! It is the vegetative part of the fungus, the mycelium, that is associated with the roots of the ash tree in a symbiotic relationship. The fungus obtains carbohydrates from the tree and in turn helps the tree roots absorb nutrients from the soil. Also, the Ash Tree Bolete also has a relationship with the Leafcurl Ash Aphid *Prociphilus fraxinifolii*. Its mycelium forms little knots of tissue which surround and protect the aphid and in exchange the fungus gets nutrients from the aphid's honeydew.

The Blue-pored Polypore *Albatrellis* sp. (it has distinctive blue spores) is only associated with Hemlocks. *Inonotus obliquus*, commonly called Chaga, is the dense, seemingly matted and burnt-looking fungus commonly found on and associated with birch. It is becoming more popular and well-known for making a nutritious tea with supposedly anti-cancer, immune-

boosting, and cholesterol-lowering properties.

We saw a salamander beside an *Amanita bisporigera*, an extremely poisonous amanita also known as the Death or Destroying Angel. All amanitias have a white- to cream-coloured spore print. Then we saw the perennial plant (not a fungus) white Indian Pipes or Ghost Fingers *Monotropa uniflora*. They have no chlorophyll (so sometimes can be mistaken for fungi) and thus have lost entirely their ability to photosynthesize. Instead, they are 'mycoheterotrophic', meaning they obtain nutrients by parasitizing a type of fungi that associate with other plants and tree roots. These mycorrhizal fungi help the plants take up water and nutrients that might otherwise be inaccessible. Indian Pipes are found in dark, shady woods with rich, moist soil and plenty of decaying leaves and other plant matter. They're commonly found near dead stumps and near beech trees too, which also prefer damp, cool soil.

John listed and illustrated for us all of the 20 native wild orchids he has found here, along with a few of their necessary associated fungi. He also showed us a Crab Spider *Misumena vatia* which he had managed to spot. This spider has the ability to change colour! There is always much more to find out about from each of John's interesting mushroom and fungi trips and talks.



CARBON RUN

23 NOV.

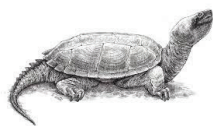
– Bernie McKenna

The Nova Scotia Retired Teachers Association very generously offered HFN members reserved seating at their above presentation which was given at the Woodlawn Public Library. Seven of our members (myself included) gladly took advantage of this gracious offer, and all are so glad we did.

This very professional presentation was given by Dr. Shannon Sterling (a Dalhousie environmental scientist) and Dr. Eddie Halfyard (an ecologist) with the Nova Scotia Salmon Association. Their company, Carbon Run, works with Nova Scotians across the province to restore our rivers to their previous states and in doing so to fight climate change. Their talk explained the situation we're in, the necessary steps needed to help rectify the situation, and Carbon Run's logical approach to help do so.

Through their research they have found that when water quality is restored rivers once again regain their natural ability to markedly support and increase biodiversity while drawing down carbon dioxide out of the atmosphere.

In closing this is a very brief account of the presentation we were given. It was informative, enlightening, and presented in such a way as to be easily absorbed. Hopefully, somewhere in the fairly near future, HFN will hear lots more from Carbon Run and the positive results of their efforts.



NATURE GOOD NEWS 19 DEC.

– *Bernie McKenna*

Clarence Stevens, back by popular demand, gave us reason to be optimistic amidst the mass of negative nature news we all receive throughout the whole year. He highlighted a number of encouraging items, as well as some interesting points, with his consistently entertaining and informative manner. He excels at this!

✱ With 2022 being the Year of the Tiger in the Chinese calendar, Clarence began by expanding on that year's information about tigers. Worldwide last year (2023), the estimate of total tigers in the wild was 3000 – down dramatically from the 10,000 population in years past. Recent figures show there are now 5574 tigers and the number seems to pretty much be holding. There are 13 countries in which tigers survive in the wild and encouragingly all 13 of them have tiger conservation programmes in effect.

✱ Again, in the Chinese calendar, with 2023 being the Year of the Rabbit, Clarence noted that Australia would likely argue that the last few decades have been the 'Decades of the rabbit'. Introduced there in 1950, they rapidly took over and consistently resisted all means of control. Now the tide has turned and the new biological controls put in place are finally having measurable effects, and these controls do not affect other wildlife – neither native nor introduced.

The best rabbit control system is not to release pet rabbits in the first place, as they do tend to multiply. Here in Nova Scotia there are two rabbit rescue organisations – 'Rabbit Rescue' which has rescued over 1200 rabbits since their start-up, and 'Honey's Bunnies' which works hand in hand with Hope For Wildlife to also rescue rabbits.

Canada has three members of the rabbit family – hares, rabbits, and Pikas, the latter being only found at higher altitudes in both Alberta and B.C. There are two types of Pikas – the Collared and the American. They have a valuable digestive ability in that they can eat highly toxic plants. Like Marmots they harvest plants in the summer, dry them, and then store them for their winter food supply. As with many species world wide, climate change and habitat loss is directly affecting their populations.

Pikas are thought of as 'climate sentinels', as they are especially more affected so very rapidly by our

changing climate conditions. B.C. scientists have developed a method to individually identify Pikas so that they'll be able to assess the health of specific animals, and hopefully – to recognise and rectify problems before negative effects get out of hand.

✱ A new 60 K walking trail is being developed, primarily in west King's County. It's a section of the defunct Dominion Atlantic Railway. Though not complete, it is being worked on at this time.

✱ Also of note, the Cape Split Hiking Trail has been identified as Nova Scotia's best trail. This trail was fairly recently enlarged – now a portion of it is a loop and so it is not entirely a one way trip.

✱ Sackville area have their own piebald (but mostly white), White-tailed Deer which freely roams around especially in the Millwood area, no doubt enjoying the food variety in any unfenced yard (just one look at her is ample payment for any plant nibbled). It should be interesting to see the colour of her 2024 fawns.

✱ in the same vein, 1/2 dozen albino Red Squirrels have been reported this year. Clarence said the amount of solar radiation seems to be at least a partial cause. It also affects birds and amphibians through their egg laying because the eggs are exposed to more radiation.

✱ Habitat decline may be contributing to the increase in Bobcat sightings. This, combined with their prey population fluctuations, is very likely forcing them to come closer to humans, much as it has with Coyotes.

✱ In 2023 the number of hurricanes also increased noticeably and the hurricane season is now 2 or 3 weeks longer so we have more hurricanes. Luckily, most stayed out to sea this year and other than Idalla which was a category 4 hurricane and which severely damaged the southeastern USA, the others were of less concern. Idalla was nicknamed the 'flamingo hurricane' as it hit in August and scattered flamingos over a very wide area to places where they had never seen before. Occurring in August was a positive as it happened early enough to allow the birds to get back to their home areas fairly well.

✱ Three southern aquatic species that showed up in increased numbers in our waters were Portuguese Man of War jellyfish, Pipefish, and schools of Banded Butterfish. Again, climate change is a big factor in this as it is with other newcomers to our waters.

✱ Clarence also saw the usually more tropical Flying Gurnards (flying fish) and Blue Crabs while snorkelling here. Gurnards don't actually fly but do manage to glide a fair distance. While plentiful, the Blue Crabs, at least so far, don't seem to be reproducing here, but in the future it may happen.

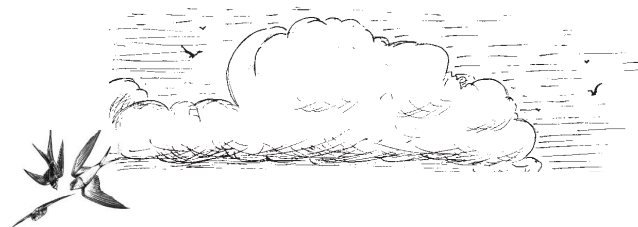
✱ We all saw firsthand the terrible effects of the recent forest fires this past year. However, forest fires are a normal and natural cycle, although not if started by humans. Devastating as they are to us, they

are actually a good thing in that they create varied habitats for wildlife, many of which benefit from the increased food or browse opportunities.

* Clarence, being a Turtle Patrol originator, said that despite the fires and floods destroying nests, it was still a banner year for baby turtle numbers. Average Snapping Turtle baby-to-nest percentage went from less than 10 per nest to 25 or so! More baby Snapping Turtles and baby Painted Turtles were found than ever before and another first was that six baby Wood Turtles were found and released.

* All and all there was much in his talk to be en-

couraged and optimistic about. That's not to say all is now rosy, far from it. I think as naturalists we have to be like farmers and fishers – there's always next year. Looking ahead, Clarence is booked for a return visit in December 2024.



HFN FIELD TRIPS

McINTOSH RUN –

– Gareth Harding & Bernie McKenna

Date: Saturday, Sept. 30th

Place: Spryfield

Weather: Warm and hazy

Leader: Gareth Harding

Participants: 22



– **Halifax's Backyard Wildernes** McIntosh Run, initiated and built by an enthusiastic group off-road trail bikers, was officially established in 1994 as the McIntosh Run Watershed Association (MRWA). In collaboration with the city of Halifax, and support from local donors, the trail has been extended from Long Lake in Spryfield to NorraWarren Drive (~16 km) with plans to extend it all the way to Herring Cove.

We started off at NorraWarren Drive in great form with some 22 enthusiastic, chatty naturalists on a warm, fall day with a weather forecast that the high haze would burn off. Well, we had not gone two minutes on our way when our fearless trail leader, myself, had an uncomfortable feeling that the trail was not as I remembered it. We promptly returned to the three-way junction and took the next left path but I still couldn't recognise any familiar landmarks of our intended path to McIntosh Run. With a great deal of hilarity our group promptly reversed direction again. We returned to our first trail choice and persisted on ignoring a further new trail option to the left. The trail we had initially followed eventually turned out to be the correct one, as I gradually began to recognise familiar boulders and clearings. The forest, in general, has a fairly open canopy of stunted Red Maple and a lesser contribution of Toothed Aspen and the occasional Paper Birch. Here, a healthy, scattered under-canopy of young 4 to 6-foot Balsam Fir is established in patches beneath the maples with Sheep Laurel and Bracken dominating the remaining well-lit areas. Beneath the Laurel was a vibrant ground cover of Wintergreen and other eastern-shore ground plants.



The trail bifurcates on an exposed granitic outcrop where one has the choice of a steep descent fashioned by thrill-seeking trail bikers, or a circuitous route to the right for the more mature hiker. Most of the trail is underlaid by granitic rock. This resulted from molten lava flowing towards the surface of the planet by melting the heavier overlying rocks during the Devonian Period – some 418 to 362 million years ago. We passed over a coarser grained rock with a few inclusions of surrounding and overlying rock that existed at that time. The closer the lava reached the surface, the finer grained was the resulting granite. This was due to the warmer conditions deeper in the earth's crust forming granite with larger crystals and fewer surviving intact inclusions of surrounding rock. Over this longtime interval, the overlying rock formations have been eroded away by the weather, wind, continental uplift, and glaciated periods. The last of four recent glaciations left the area 10,000 years ago, leaving large areas of smoothly rounded granite exposed. The combination of rock type and glaciers resulted in only minimal depths of acidic soil, with the notable exceptions of where the glacial till is mounded as drumlins, such as Citadel Hill in Halifax.

We paused on top of the exposed granite outcrop to observe the vegetation. Several species of lichens were encrusted on the glacial sculptured rock, grading into 6-inch-high Broom Crowberry and waist-high Huckleberries, Bayberries, taller Grey Birch, etc. and a lone Black Spruce. Broom Crowberry is very characteristic of the exposed granite outcrops in these backlands but unlike the co-inhabiting boreal species such as Jack Pine, Black Spruce, Golden Heather, and Greenland Stitchwort which are northern relicts from the last glacial retreat, the Broom Crowberry has a more southerly distribution to the Pine barrens of the southeast USA. Both Broom Crowberry and Jack Pine are also known to be adapted to a wildfire-shaped landscape. The broom crowberry apparently requires a wildfire for its seeds to germinate as do the

Jack Pines for their closed cones to open and release their seeds. We didn't reach as far as the recently burnt (2009), backland barrens on this walk but regeneration of Jack Pines of up to 6 feet tall is well underway. Some of these young pines bear some open cones, so seeding is an ongoing process with these first colonisers.

Following the more gradual trail down the drop from the exposed granite outcrop brought us to a lower, shady level (~100 feet) where some of the trees reached greater heights of up to 70 feet. The upper forest canopy was more extensive with much less sunshine reaching the forest floor compared to the upper, more open Red Maple forest we had just passed through. Again, the forest here was predominantly Red Maple followed by Large-toothed Aspen and Paper Birch. Balsam Fir were scattered and young Red Spruce rare and scarce. Interestingly, the Red Maples, like the dwarfed maples in the open canopy that we had first passed through, were also likely to be found in tight ringlike clusters, rarely as a single trunk. This species is known to sprout suckers around its stump after the tree is harvested for firewood. David Patriquin points out that this also occurs after a severe brush fire. However, I've noticed Red maples with the same growth pattern in both Point Pleasant Park, well off the trails, and in the boggy backland maples which may mean some other cause for this growth pattern – perhaps insect, parasite, or disease infestation? The Toothed Aspens along the trail were badly infected with a bark canker throughout our walk. They are a sad sight compared to the ~100 ft Toothed Aspens in the mature canopy of the Williams Lake backlands. We observed woodland ferns such as Wood Ferns growing in the semi-shade, Polypody Ferns on the top of boulders, and Cinnamon Ferns already turning orangey-brown in moist glades. We had one young boy with a blue t-shirt in our group who was providing a side show – climbing every boulder, ledge, and tree trunk he came across. His mother had recently come back from the Northwest Territories and she confirmed that she raised free-range boys much as my own parents had raised their children.

The trail parallels West Pine Island Lake which became visible as the understory thinned out as we progressed along it. Several types of pretty little toadstools were noticed on the edge of the trail plus a large, tan-coloured Bitter Bolete. We came across both the bright yellow and whitish Clavaria mushrooms of which the later are quite tasty fried up in butter with a fall trout. Bernie pointed out the dark Chaga mycelium, *Inonotus obliquus*, on some of the Paper Birches, which are ground to a fine powder in China and Russia to produce a tea rich with antioxidants.



A lone American Toad was observed in the moist woodland closer to the lake. Both Bernie and I had noticed oak seedlings up to three feet tall scattered along either side of the path. We could not locate any further off the trail nor a single larger, let alone mature, tree. The Inspector Poirot in us came to the obvious conclusion that some nature enthusiast had been planting acorns along the edge of the path over the last five or six years! (There are plenty of local Red Oak around York Redout and William's Lake backlands). It certainly was aster time of the year with the goldenrods now mainly in seed. We noted both New York and Rough Asters in the blue category, and Small White, tall Flat-topped White, and Whorled White Wood Asters in the White Aster category. The birds seen and heard were predictably Crows, Blue Jays, and a Downy Woodpecker at this time of year, though I did see a pair of Palm Warblers the following day when I returned to verify my memory of some observations.

People were well spread out by this time and we were beginning to feel hungry so everyone chose a rock or log to sit on and eat their lunch. The lake is quite shallow at the southeastern end with protruding Pickerel Weed and a flotilla of lily pads. After lunch we headed back to our cars with Bernie and I taking up the rear so nobody got left behind.

There was a brief period of anxiety here because the energetic blue-shirted young lad was nowhere to be seen! In the end, Bernie and I took the last right turnoff which was one short of the correct path – much to the amusement of all still lingering around when we returned – as the young lad in blue was waiting for his mother by the cars!



McNAB'S ISLAND NATURE TOUR

- Don Flemming

Date: Sunday, Oct. 15th

Place: McNab's Island

Weather: Sunny and warm

Leader: Mike Crowell

Participants: a few dozen

On this beautiful, autumn Sunday a few dozen adventurous souls boated out from the Halifax Waterfront to participate in the Friends of McNab's Island Society "Fall Foliage Tour".

Once disembarked at the Garrison Pier near Maugher Beach on the west side of the island, we were greeted with a Mi'kmaw song and drum ceremony acknowledging that McNabs Island is traditional, unceded Mi'kmaw territory, and that we are all treaty people. Afterwards, participants were assigned to various tour groups.

I joined the Nature Tour led by Mike Crowell, a terrestrial ecologist and volunteer with the Friends of McNab's Island. The tour focused on the northeast portion of the island between Finlay Cove and Ives Cove.'

Numerous articles about the flora, fauna, and history of McNab's Island have appeared in our newsletter over the years, including:

- * Janet Dalton's article 'McNab's Island Fall Clean-Up', containing an overview of the island's history and a list of some of the flora and fauna species that were seen (Winter 2012 #145).

- * Janet Dalton's write-up of the HFN talk, "McNab's Island - A Gem in Halifax Harbour", presented by Carolyn Mont. This contains an excellent history of the island (Spring 2014 #154); and,

- * Denyse Contrasty's article describing the Olde English Garden, the Tea House Education Centre, and an overview of the island's native Acadian Forest (Fall 2016 #164).

Since these and other items about McNab's can be found in the archived newsletters on the HFN website <http://halifaxfieldnaturalists.ca>, the intent of this article is to provide a sampling of the observed native flora and fauna along with notes from Mike's descriptions which will, hopefully, be of interest to an otherwise knowledgeable reader.

The fall colours were less than their usual spectacular display this year, the foliage having a predominant brown caste. Mike explained that this was caused by the arrival of Hurricane Lee in late September. In addition to the physical damage created by the strong winds, salty sea spray was carried inland causing osmotic stress that literally sucked water from the cells of the leaves, which quickly turned brown and shrivelled.

The native flora on McNab's is comprised of species typical of an Acadian Forest. Over the years, most of the island was cultivated, the woodlots harvested, and several hundred non-native trees and shrubs introduced. "Today, the island's forests are of various ages. Older forests date to the 1800s and are comprised of Red Maple, Beech, and Red Spruce with an understory of Hay-scented Fern." – (McNab's Natural History, The Friends of McNabs Island Society).

White Spruce *Picea glauca* is also abundant on McNab's Island. It has an ability to withstand salt spray and is therefore the dominant spruce found near the coast. It will also tolerate competition with grasses,

and so is quick to colonise old abandoned fields. Also known as Cat Spruce, its needles smell like cat urine when bruised. White Spruce therefore does *not* make a good Christmas tree, not only because of the odour, but also due to the fact that its needles fall quickly once the tree has been cut and brought indoors. Prickly needles are common to both Red and White Spruce, but the latter have a bluish hue ('glauca' translates as blue-green).

Many of the White Spruce on McNab's have been parasitised by Dwarf Mistletoe *Arceuthobium pusillum*, a tiny shrub whose stems bury themselves in the host's cambium layer. Dwarf Mistletoe may seriously injure its host evergreen, causing unusual twig development and deformities that are sometimes called 'witches' brooms'. Although this can slow the growth of the White Spruce or other evergreen host, it does not kill it.



Witch's Broom

There are four species of hemlock in North America, but only Eastern Hemlock *Tsuga canadensis* is found as a native here, including on McNab's Island. Eastern Hemlock is the densest softwood in the province and, due to its strength, was often used to make mine shaft beams and railroad ties. Because of its high tannin content, the bark was used in tanning leather. Mike explained that hemlocks exhibit 'allelopathy', a biological phenomenon in which biochemical compounds are released into the environment. In the case of hemlock, these compounds inhibit the germination or establishment of other nearby plants. During our tour, it was noted that although the hemlocks viewed were just across the path from a large growth of Japanese Knotweed (see below), no Knotweed (or other plants) grew under them.

Buds of the Yellow Birch *Betula alleghaniensis* are the favourite winter food of the Ruffed Grouse *Bonasa umbellus*, and both of these species are found on McNab's Island. Grouse can be seen high in the branches of these trees at dusk, busily filling their crops with buds. They don't tarry since they are exposed and vulnerable to predators, so their haul is digested overnight in a safer spot (buried under snow if possible). Scratching a twig of Yellow Birch releases oils that have a wintergreen-like odour and this makes the wood and bark very good for starting fires, even when wet. Yellow Birch is easily spotted, as its bark has a unique bronzy/metallic colour and its leaves are elongated compared to those of the White Birch *Betula papyrifera* which is also known as Paper (from papyrifera – 'bearing paper') or Canoe Birch.

As is the case throughout most of our province, Red Maple *Acer rubrum* is the most common hardwood on McNab's, growing in almost all soils – from



swamps to dry and rocky uplands.

Many of the native Beech *Fagus grandifolia* seen on McNab's had deformed trunks with cankers. Mike explained that this is a problem found in beech trees throughout North America and is brought about by a disease caused by the *Nectria* fungus. The spread of this disease is aided by an insect which causes 'beech scale'. These insects pierce the bark to suck on the tree's sap and then wind-borne fungus spores infest and scar the damaged tissues.

The leaves of the Trembling Aspen *Populus tremuloides*, sometimes commonly referred to as Poplar or Quaking Aspen, have an airfoil shape which causes them to move and tremble in the slightest breeze. This movement helps to break up the boundary layer of air on the surface of the leaf, making photosynthesis more efficient.

Mike showed us examples of Downy Alder *Alnus viridis* and Speckled Alder *Alnus incana* explaining that, although they are closely related and share many characteristics, they can be easily distinguished by the shape and colour of their leaves. A Downy Alder leaf is larger and broader, usually oval or elliptical with a serrated, toothed margin, and as the name implies has a slight downy texture on its underside. A Speckled Alder leaf is smaller and narrower, and has a finely serrated margin. Alders bear nitrogen-rich nodules and therefore drained alder flats can be very fertile and, once cleared, are suitable for growing leafy vegetables.

For many decades, the invasive species Japanese knotweed *Reynoutria japonica* has been proliferating on many areas of the Island. Until a few decades ago, White-tailed Deer *Odocoileus virginianus* have been known to slow down its expansion by eating its young shoots, but since the arrival of Coyotes on McNab's the deer population has collapsed. The good news is that another invasive species, the Japanese Beetle *Popilla japonica*, has been found to 'skeletonise' the Japanese Knotweed's foliage by consuming only the material between the leaf's veins. It is yet to be seen if their appetite for Japanese Knotweed will have a noticeable effect on its growth. The bad news is that these Japanese Beetles, as all too well known by local gardeners, also attack a wide range of other flowering and fruiting plants.

The Common Blackberry *Rubus allegheniensis* proliferates on McNab's Island (I can remember coming to the island in the late 50s and early 60s for family blackberry-picking expeditions). Mike noted that in order to germinate, blackberry seeds have to pass through the gut of a bird. This process scores the outside of the seeds and, once eliminated and dropped, they can wait in the soil for many years for the right environmental conditions to germinate, especially in the correct phosphorus/nitrogen ratio and warming soil.

A number of mosses were observed and discussed

during the tour, including – Red Feather *Pleurozium schreberi*; Wavy *Plagiomnium ciliare*; Polytrichum *Polytrichum piliferum*; and Sphagnum. Sphagnum is a genus of approximately 380 accepted species of mosses. Mike took a few minutes to focus on sphagnum, noting that it will grow on top of itself and, over time, create peat bogs that might be of the blanket or dome variety. In this way once relatively dry upland areas can evolve into wetlands. Sphagnum mosses are highly absorptive and contain an extensive list of minerals. Because they create acidity in water, they are also anti-bacterial. Being antiseptic and abundantly absorptive, it was once widely used as a poultice for wounds and even as diapers for babies.

Sensitive Fern *Onoclea sensibilis* is found on the island and derives its common name from its sensitivity to frost; their fronds quickly die and turn brown when the first frost occurs.

A Downy Woodpecker *Dryobates pubescens* and a Hairy Woodpecker *Dryobates villosus* were seen at different times on this nature tour. They are very similar in appearance and Mike advised that, if you see one at a distance and are not sure which type it is, a useful guideline is that if it appears that you could hold the bird in one hand, it is probably a Downy; two hands and it is probably a Hairy.

As the McNab's Island nature tour came to a close and we walked along the shoreline to return to the boat, a member of the group remarked on the amount of erosion that had occurred over the past couple of years. Mike pointed out two plants that help to mitigate that damage. One is the Northern Bayberry *Myrica pensylvanica*, which can grow in a variety of soil types and pH levels. It can tolerate infertile soil, strong winds, and salt spray and so, although also naturally found in forests, Northern Bayberry can grow along marine shorelines and its roots are useful for controlling erosion. Likewise, American Beach Grass *Ammophila breviligulata* is able to grow in impoverished soil and helps to build sand dunes by the intricate weave of its rhizomes, which can extend up to four feet beneath the sand. The more sand that collects around its stems, the more this Beach Grass is stimulated to produce rhizomes and send up shoots. It is therefore also an important factor in dune stabilisation.





"From under ice / in a mid-winter thaw / a worm crawls, earth's colour"

– From "West End, Halifax - The Watchmaker's Table" (Goose Lane Editions, 2008), by HFN Member Brian Bartlett

NATURAL EVENTS

- 4 Dec. Mercury at Greatest Eastern Elongation (view low in western sky just after sunset)
- 8 Dec. to 12 Dec. Earliest sunsets of the year in Halifax area (sunset at 4:44 AST)
- 12 Dec. New Moon
- 13-14 Dec. Geminids Meteor Shower (meteors radiate from constellation Gemini)
- 21-22 Dec. Ursids Meteor Shower (meteors radiate from constellation Ursa Minor)
- 22 Dec. Winter Solstice (first day of winter in the Northern Hemisphere) occurs at 11:21 AST
- 27 Dec. Full Moon
- 3-4 Jan. Quadrantids Meteor Shower (meteors radiate from constellation Bootes)
- 11 Jan. New Moon
- 12 Jan. Mercury at Greatest Western Elongation (view low in eastern sky just before sunrise)
- 25 Jan. Full Moon
- 9 Feb. New Moon
- 24 Feb. Full Moon
- 10 Mar. New Moon
- 20 Mar. Spring Equinox (first day of spring in the Northern Hemisphere) occurs at 12:01 ADT
- 24 Mar. Mercury at Greatest Eastern Elongation (view low in western sky just after sunset)
- 25 Mar. Penumbral Lunar Eclipse (moon passes through Earth's partial shadow, or penumbra). Greatest eclipse at 04:12 ADT

– Sources: *Sea and Sky Astronomy Calendar*, and as noted

SUNRISE/SUNSET - HFX WINTER & EARLY SPRING SATURDAYS, 44 39 N, 063 36 W (AST to 9 Mar., thereafter ADT)



2 Dec.	07:31	16:35	6 Jan.	07:51	16:49
9 Dec.	07:39	16:33	13 Jan.	07:49	16:57
16 Dec.	07:44	16:34	20 Jan.	07:44	17:05
23 Dec.	07:48	16:37	27 Jan.	07:38	17:15
30 Dec.	07:51	16:42			
3 Feb.	07:31	17:25	2 Mar.	06:49	18:04
10 Feb.	07:22	17:35	9 Mar.	06:36	18:13
17 Feb.	07:12	17:45	16 Mar.	07:23	19:22
24 Feb.	07:01	17:54	23 Mar.	07:10	19:31
			30 Mar.	06:57	19:39

– Source: www.timeanddate.com

ORGANISATIONAL EVENTS

Nova Scotia Bird Society <https://www.nsbirdsociety.ca> **Note:** NSBS presentations are via Zoom, 7:00 to 8:30 p.m.

- 14 Dec. to 5 Jan. Audubon Christmas Bird Count
- 25 Jan. "Waiting in the Wings: How Dinosaurs Gave Rise to Birds", presented by Dr. Darla Zelenitsky (U. of Calgary)
- 22 Feb. "Are Your Windows a Pain in the Glass?", presented by Paloma Plant (FLAP Canada)
- 28 Mar. "Understanding the Role of Feather Moults in the Winter Lives of Migratory Warblers", presented by Shae Turner (Thompson Rivers University)

Nova Scotia Institute of Science <http://nsis1862.ca> **Note:** All events are presented at Saint Mary's University in the Stephanie MacDonald Lecture Theatre (SMU Atrium 101), starting at 7:30 p.m. For online Zoom see <http://nsis1862.ca/public-lectures>.

- 4 Dec. "Overlooked no more: non-indigenous, invasive species in NS lakes and rivers", presented by Dr. Linda Campbell (SMU).
- 5 Feb. "Preliminary findings from a groundbreaking study of marine CO₂ removal in Halifax", presented by Dr. William Burt (Planetary Technologies)

Nova Scotia Wild Flora Society <http://nswildflora.ca>

- 5 Dec. to 19 Dec. (5, 9, 12, 16 and 19 Dec.) "Winter identification of Trees and Woody Plants of the Northern Forest", Eagle Hill. Online Mini-Seminar, 7:00 to 9:00 p.m. each day, tuition \$225.

Royal Astronomical Society of Canada, Halifax Centre <http://halifax.rasc.ca>

- 2 Dec. AGM, "Percival Lowell and the Canals of Mars", presented by John Badowski, start time 1:00 p.m. (Zoom + live at Saint Mary's University RM AT101, The Atrium)
- 6 Jan. Halifax Centre Members' Meeting, "New ESA probe launched to survey Europa", presented by Pat Kelly, 1:00 p.m. (Zoom + live at SMU RM AT101, The Atrium)

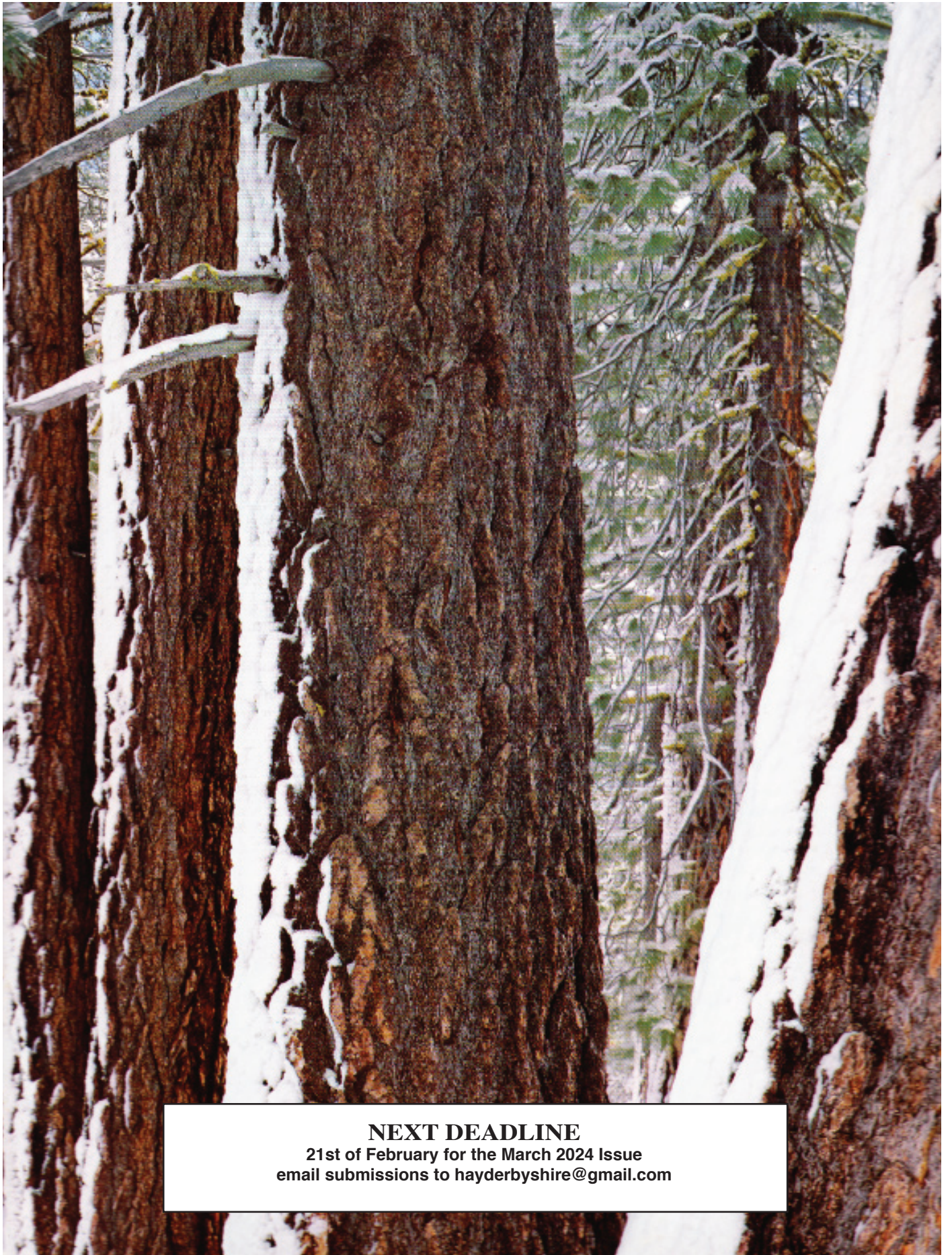
Young Naturalists Club <https://yncns.ca>

- 16 Dec. Nature Guardians - Xmas Bird Count, location to be announced, 12:00 to 15:00.

– compiled by Don Flemming



ALL TIMES ARE AST



NEXT DEADLINE

21st of February for the March 2024 Issue
email submissions to hayderbyshire@gmail.com