

*Blomidon  
Naturalists  
Society*



FALL 2018 NEWSLETTER  
VOLUME 45 · NUMBER 3



# THE BLOMIDON NATURALISTS SOCIETY



*The primary objective of the Society shall be to encourage and develop in its members an understanding and appreciation of nature. For the purpose of the Society, the word "nature" will be interpreted broadly and shall include the rocks, plants, animals, water, air, and stars.*

FROM THE BNS CONSTITUTION

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## BNS NEWSLETTER

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# Contents

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VOLUME 45  NUMBER 3

## CLUB NOTES & NOTICES

- 5 Editorial *by Howard Williams*
- 7 From the President *by Soren Bondrup-Nielsen*
- 9 Upcoming Events

## FIELD TRIPS

- 11 Geocaching & Natural History Field Trip *by Larry Bogan*
- 12 Monarch Open House *by Alison and Larry Bogan*

## NATURAL HISTORY

- 14 Nova Scotia Celebration of Nature 2018 *by Doug Linzey*
- 19 Nature Notes from a Recent Arrival—Year 2  
*by Howard Williams*
- 23 The Nature of Humans & Humans in Nature  
*by Soren Bondrup-Nielsen*
- 28 Celebrating 20 Years of Studying Sea Turtles
- 31 An Overview of Natural History Studies in Kings County  
*by Hilary Roberts*
- 34 The Hemlock Woolly Adelgid *by Hilary Roberts*
- 38 Nova Scotia Ambrosia *by Doug Linzey*

## CONSERVATION

- 42 Summary of Monarch Butterfly Rearing, Annapolis Valley  
*by Alison and Larry Bogan*

## WEATHER

- 47 Summer Weather 2018 *by Larry Bogan*

## ASTRONOMY

- 50 What's in the Sky? *by Patrick Kelly*

BLOMIDON NATURALISTS SOCIETY  
members are encouraged to share  
unusual or pleasurable nature sto-  
ries through the pages of the BNS  
Newsletter. If you have a particular  
area of interest, relevant articles and  
stories are always welcome. Please  
note that Shelley Porter is taking  
a leave of absence from her post as  
BNS Newsletter editor and chair of  
the editorial board. All articles and  
queries should be directed to Howard  
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Digital photographs should be  
submitted to

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**Next submission deadline:**

**November 30, 2018**

# Editorial

*Howard Williams*

✂ In this issue of the Newsletter it pleases me to introduce an article entitled “The nature of humans and humans in nature: not seeing the forest for the trees,” written by Soren Bondrup-Nielsen. It reflects Soren’s thoughts on issues relating to competition versus co-operation in nature.

Another article, entitled “An overview of natural history studies in Kings County” was written by Hilary Roberts, a research assistant working with Soren under the auspices of the Blomidon Naturalists Society. Members and others are invited to contribute to a database she has prepared. In addition to this work, Hilary has prepared another document: “The Hemlock Woolly Adelgid: a threat to our ecosystems.” BNS has been fortunate to have hired such a capable student to work for us this summer.

As fires ravage much of British Columbia and parts of Ontario we are reminded of the fact that we have all played a part in these disasters. Over 53 years ago a 1965 report to President Lyndon Johnson, “Restoring the quality our environment,” included this statement: “By the year 2000 the increase in CO<sub>2</sub> will be close to 25%. This may be sufficient to produce measurable and perhaps marked changes in climate. The climate changes that may be produced by the increased CO<sub>2</sub> content could be deleterious from the point of view of human beings.” In 1968, Garrett Hardin, in writing about the Tragedy of the Commons, used an 1833 mathematical analysis of grazing by William Lloyd. In this case, it is our use of carbon, not cattle grazing, that is addictive. Our influence on atmospheric CO<sub>2</sub> and methane concentrations is no longer disputable; the gases

promote temperature rise, whereas in the geological past the reverse was generally the case. We have to wean ourselves off this convenience.

Have I tried to make a difference? Not significantly. I recycle, I drive at or below the speed limit, I try to use as little electricity as possible. Do you? Even if you do, it probably won't be enough. No Canadian government since that of Brian Mulroney's has really made strides to reduce carbon use. Ontario tried, but their timing relative to the 2008 economic downturn and their political baggage was against them. Nowadays, it seems voters are not motivated by science that has been consistent in its warnings of impending climate disaster since 1965. Until voters are motivated by shock and personal loss to vote for carbon reduction, I suspect no real progress will be made. In that sense only, the many fires this year in Canada and elsewhere may be viewed as a good thing, to waken up not only decision makers, but ourselves. As Joseph de Maistre said in 1811, "In a democracy people get the leaders they deserve" [usually attributed to Tocqueville and Lincoln]. Our addictive habits don't deserve good leaders, yet.

So, when are we all going to wake up and smell the smoky new normal? Is your house surrounded by trees? Is your house resistant to wildfire? Do you use dry bark or chip mulch in your garden? If you answered yes to any of these, are you prepared? Remember, we are part of the solution to carbon-induced climate change.

## From the President

*by Soren Bondrup-Nielsen*

☞ We are well into September now, and no one should be commenting on the heat anymore. I have already had a fire in the cookstove, and it felt wonderful.

I hope everyone had a great summer. I managed to do lots of sailing along the South Shore, mooring at some of my favourite coves and enjoying the beauty and the solitude. (On one occasion I met Ed Sulis, who was on his sailboat, and we rafted together for the night and celebrated his birthday.) I led a few forest ecology walks, and I supervised three students over the summer: two were continuing the study of black bears I initiated a few years ago, and the other was hired to work for BNS.

On my forest ecology walks I invariably talk about how we now know that trees “talk” to each other and share nutrients through vast networks of fungal mycelia—not just among individuals of a species but also among species. In other words, trees cooperate. This leads me to suggest that maybe we humans should learn from trees. You can learn more in my article “The nature of humans and humans in nature.”

Hiring a student to work for BNS was a delightful experience. In late winter the BNS board applied to Canadian Summer Jobs, a funding program sponsored by the federal government, for a summer student. We were successful, and in late May we interviewed Hilary Roberts for the position. She is from Port Williams and had just graduated from Mount Allison University with a major in chemistry and a minor in biology. Of three potential candidates, the other two had taken other jobs. But we were very fortunate. Hilary turned out to

interview exceptionally well and to be an absolutely excellent employee for us.

Hilary worked on two projects: compiling an annotated list of natural history research conducted in Kings County, and producing educational material on the Hemlock Woolly Adelgid (first detected in Nova Scotia in 2017). Hilary did an exemplary job. The annotated list of natural history studies will be available to everyone through a link on the BNS website. You will be able to search for articles, read the abstracts, and in many cases download the studies. See her article “An overview of natural history studies in Kings County” in this issue of the Newsletter.

Hilary’s work on the Hemlock Woolly Adelgid was exemplary. Not only did she write an informative article on this pest (“The Hemlock Woolly Adelgid: A threat to our ecosystems” in this issue of the Newsletter), she also produced an informative documentary (search YouTube for “Hemlock woolly adelgid Nova Scotia”). Hilary also produced maps of all hemlock stands in Kings County so that anyone interested can take part in a citizen science initiative and survey for this pest. Information will be linked to the BNS website, and we will have practice sessions on how to conduct surveys.

We had two BNS board meetings (June and September) since we last reported. Shelley Porter will be back as editor of the Newsletter, and I would like to formally thank Howard Williams for having stepped in as interim editor while Shelley was otherwise occupied. Howard did an excellent job and got the Newsletter back on schedule. We wrote a letter to the town council in Bridgetown protesting the potential demolition of a chimney occupied by Chimney Swifts and suggested that having such a chimney used by swifts can be an essential conservation initiative and tourist attraction.

We look forward to the fall meetings and field trips and wish everyone a beautiful fall as the birds migrate and the leaves turn their vibrant colours.

# Upcoming Events

## Meetings

✦ *Unless otherwise noted, all meetings are held at 7:30 p.m., usually on the third Monday of each month, in Room BAC241 of the Beveridge Arts Centre of Acadia University, on the corner of Main Street and Highland Avenue, Wolfville. Parking is available off Highland Avenue, on Acadia Street, and at the parking area around the Robie Tufts Nature Centre. Everyone is welcome. For more information on any events, contact us at [info@blomidonnaturalists.ca](mailto:info@blomidonnaturalists.ca).*

MONDAY, SEPTEMBER 17—*Sable Island*. Presenter Dan Kehler, a native Wolfvillian, is currently the park ecologist for Sable Island National Park Reserve. He will introduce us to the mysterious and magical Sable Island, a place that has captured the imagination of Nova Scotians and the world for centuries. Dan will give us an overview of everything related to Sable Island, from its glacial origins to its history of human settlement, to its current management as a national park reserve, and then focus on its unique ecological features, including the largest breeding colony of Grey Seals, and the Sable Island ponies.

MONDAY, OCTOBER 15, 2018—*Water and Wildlife in the Backyard*. This is a joint meeting with the Valley Gardeners. The speaker will be announced. The presentation will provide an overview of the creation of the water features in the garden and different water “zones” in the garden (open water, marsh, etc.); it will look at water from different perspectives and forms and how it impacts the garden and wildlife (e.g., ice and freeze/thaw can be quite a problem for the garden, but snow is won-

derful for tracking animals); and it will consider the wildlife that is attracted to the garden.

### Field trips and other nature events

*Visit the BNS website for upcoming events and for field trip maps and directions. If you do not receive e-mail alerts for events and would like to, please let Pat Kelly know and he'll make sure you're on the list (info@blomidonnaturalists.ca).*

SATURDAY, OCTOBER 13—*Mushroom Walk* 9:00 am–12:00 pm. Leaders will be Ken Harrison and Bill Shaw. This event is open to everyone. It will be an informal, family-friendly event starting from the picnic shelter at the Kentville Research Centre. The mushroom walk will conclude by lunch time. The trail into the Kentville Ravine is steep, and we will be looking for mushrooms off the trail and across the slope. The footing is uneven and slippery in places, so a walking stick is very helpful. This walk depends on there being sufficient rain, so watch for announcements. [For those who like to hunt mushrooms, this has been a frustrating summer. The threads of the mushroom plant (called hyphae) continued to survive in the soil and the leaf litter all year round, but the dry conditions didn't allow the hyphae to form fruiting bodies for most of this summer.]

SATURDAY, DECEMBER 15—*Wolfville Christmas Bird Count*. Watch for further information. If you wish to participate as a field observer, contact Alison Bogan (alison@bogan.ca). You can also participate as a feeder watcher; contact information will be updated closer to the event. The tally pot luck will be hosted, as in past years, at the home of Richard and Liz Stern, 317 Middle Dyke Road. Bird Studies Canada (BSC) is also inviting photos, not only of birds, but of participants in action and scenery on count day. Photos can be submitted to CBC@birdscanada.org. The rare-bird form and other

info can be obtained from the BSC site: [www.birdscanada.org](http://www.birdscanada.org). Report forms for the count and information on the areas of the Wolfville count circle are at <https://tinyurl.com/wolfvilleCBC>. If you live or visit within the count circle, keep your eyes open for unusual birds observed the count week period, Dec. 12–14 and Dec. 16–18.

SUNDAY, DECEMBER 30, 2018—*West Hants Christmas Bird Count*. Patrick Kelly (902-472-2322, [patrick.kelly@dal.ca](mailto:patrick.kelly@dal.ca)) will be compiling the count again this year. All are welcome to participate, but please contact the compiler as soon as possible so that you can be included in the planning. Following the count, around 5 p.m., all participants are invited to a tally count and potluck supper. Location details will be available closer to the date of the event. If you live or visit within the count circle, keep your eyes open for unusual birds observed the count week period, Dec. 27–29 and Dec. 31–Jan. 2.

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FIELD TRIP

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## Geocaching & Natural History Field Trip

*by Larry Bogan*

☘ JULY 14, 2018—It was a beautiful sunny morning for a walk up the Gaspereau Valley. I was joined as co-leader by Hugh Chipman, who had placed many of the geocaches along this hiking trail. One other BNS member joined us as we followed our GPS to find geocache locations and stopped from time to time to observe plants and birds.

The section of the Gaspereau River from the White Rock bridge west has a nice 3 kilometre trail beside it. The river

resides in a deep gorge with heavily wooded sides. The flats near the river are rich botanically. Many naturalists find it a favourite place to walk. Geocachers love it also; there have been 13 caches hidden along the trail and up the sides of the gorge. Geocachers hide their caches in places to take you to new and unique areas. We only walked up the trail for a kilometre and found several of the caches along the way. Hugh explained how and why the caches were designed and placed as they were.

For more information on geocaching here and everywhere, go to <http://geocaching.com>. And for local activity, search for Valley Geocachers on Facebook.

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FIELD TRIP

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## Monarch Open House

*by Alison and Larry Bogan*

☞ AUGUST 6, 2018—About 40 naturalists, including 10 young people, visited our field, indoor holding areas, and butterfly garden. It was a very hot day, but comfortable in the shade. Outside, we had a display of eggs and all five instar stages of the Monarch caterpillar, a pupa, and a caterpillar attached to a milkweed plant. That attached Monarch caterpillar demonstrated the transformation into a pupa in front of the crowd (good timing). We had hoped that a Monarch would eclose from its chrysalis, but that occurred before everyone arrived. There were many Monarchs flying and caterpillars to find in the field, and visitors walked the mowed paths around the field to explore and find Monarchs. Some visitors used flags we provided and marked the locations of the caterpillars and chrysalises.

We have a 2 hectare field filled with Common Milkweed (*Asclepias syriaca*), and for over 12 years have managed it as a



Tagging  
newly hatched  
Monarch



Monarch  
caterpillar  
on milkweed



Alison and  
Larry Bogan

breeding place for Monarch butterflies. We help protect some of them from predators by harbouring them indoors from egg to adult, and we tag many of the released Monarchs so they can be identified if found along their migration route south.

This is a great year for Monarchs here in the Annapolis Valley. (See our Summary article later in this issue.)

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NATURAL HISTORY

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## Nova Scotia

### Celebration of Nature 2018

*by Doug Linzey*

☞ MAY 27–29, 2018—This year, Nature Nova Scotia (NNS) ventured into new territory for its annual general meeting and conference. The Debert Hospitality Centre, which comprises the old Canadian Air Force base living facilities, was our home for the weekend. The airport is still active, mostly with small planes and a flight school. And, of course, this is the site of the infamous Diefenbunker, one of the Cold War underground shelters built by the Canadian government in the early 1960s capable of surviving a near hit by an atomic bomb and able to support, as a fallout shelter, 350 people for 90 days.

The hospitality centre accommodations are essentially barracks, which housed flight crews and base personnel for nearly three decades. Rooms are grouped in areas named for the aircraft that flew out of the base (Joanne and I were in the Twin Otter group, which was a reminder of the days when we lived in the North and regularly flew in various de Havilland planes). The public areas are pleasant and commodious, including the cafeteria with its quite-acceptable food.

Friday evening, we had the opportunity to schmooze with

fellow naturalists over wine & snacks. This year we numbered about 50 adults and fewer than 10 kids, down somewhat from previous years, which might reflect the relative isolation of the site and distance from most of our members' homes.

## Saturday

It wouldn't be a proper meeting of naturalists if the keenest birders didn't rise with the dawn, looking to enhance the summer's lists. Saturday morning, though, was cold—cold enough for frost on the lawns—and generally uninviting to warblers and such, and disappointing to sleep-starved birders. Sunday morning, though, was much improved, and the birders wandered in for breakfast much happier than the day before.

After breakfast, NNS president Bob Bancroft welcomed the gathering to the 2018 Nova Scotia Celebration of Nature. The theme this year was “Species at risk in Nova Scotia.” Meanwhile, the kids were busy with their own young naturalists program.

For the morning presentations, Bethsheila Kent, our board representative from the Cape Breton Naturalists, was emcee. Bob was the first presenter, with the topic “Acadian forests and their inhabitants at risk.” This title can be read in more than one way, and Bob soon made it clear enough that it's the forest itself that is at risk, following decades of unrelenting bad management on the part of the provincial government. It's no wonder that forest-dwelling birds and animals are at risk, as their habitat continues to erode despite well-meaning legislation and regulations to the contrary. All in all, very illuminating, and Bob's well-honed sense of humour helped season a more or less depressing topic.

After a “nutrition” break (to use the modern & somewhat misleading vernacular), we had a presentation from Dr Cindy Staicer, professor of biology at Dalhousie University whose research topics concentrate on bird behaviour and ecology. For

her talk, “Nova Scotia landbird species at risk,” Cindy concentrated on three species at risk that depend on forested wetland breeding habitat: Olive-sided Flycatcher, Canada Warbler, and Rusty Blackbird. Keeping track of these elusive birds and contributing to the research is a good example of citizen science. After describing each species, its habits, and its history in Nova Scotia, Cindy spent some time encouraging her audience to learn how to submit endangered species observations, using the online database *eBird*, and what information to collect. Cindy is a compelling speaker, and I think many of us came away from her talk ready to participate.

Following lunch, the gathered masses (well, some 50 of us anyway) took off in various directions on field trips. I joined a small group that drove over into the Wentworth Valley for an exploration of the North Nova Forestry Demo Woodlot. Our guides were the forestry manager, Greg Watson, and a young keen and knowledgeable forestry student. This was a really good tour. We covered a lot of territory, including a wide variety of different forest and soil types. There was much fruitful discussion about what constitutes responsible forestry practices (as opposed to much of what goes on in reality). The mosquitoes were industrious, a Blackburnian Warbler showed itself, and the rain turned to sun. All in all, a very satisfying afternoon.

Others reported a successful visit to some waterfalls in another part of the Valley, and a third group concentrated on plants and birds in yet another location.

Saturday evening we traditionally have a social hour, then a banquet and some form of entertainment to follow. This year was no exception.

The after-dinner show was particularly interesting. Out on the patio as it got dark, we built a campfire, gathered chairs and benches around, and settled in for “In search of the 13th Mi’kmaq moon: a two-eyed seeing project.” This is a story of a meeting of cultures that evolves into a mutual understanding that natural phenomena can be viewed and understood in more

than one way. In this case, Dave Chapman, an amateur astronomer, and Kathy LeBlanc, an Acadia First Nation member, tell the story of the moons of the year. The Mi'kmaq have names for 12 “moontimes” throughout the year—they correspond to what is happening in nature at any given time. But because of the 29.5-day lunar cycle, an extra moon shows up now and then within a calendar year and the names have to shift moons to continue to correspond with nature. Kathy and Dave are on a quest to learn what significance the “13th moon” has in Mi'kmaq lore. Kathy is a mesmerizing storyteller, and between the two of them they put on an entertaining and thought-provoking show.

As it happens, that Saturday night was just three days before the Frog Croaking Moon, which was climbing the sky as we listened to its story. The only downside was that by the end of the presentation it might as well have been the “people freezing moon”—it was cold! There were no frogs croaking.

For more information on Kathy and Dave's project, see

<https://www.facebook.com/www.MikmawMoons/>  
<http://outsiderdiaries.ca/blog/2016/9/16/a-walk-with-grandmother-moon>

Larry and Pat did set up a telescope to do a little stargazing despite the cold and managed to attract a few hardy souls. They reported having an excellent view of the moons of Jupiter.

## Sunday

On Sunday morning after breakfast, Larry Bogan gave a presentation on raising Monarch butterflies. Rather than delve into his fascinating talk, I'll just direct you to his report in this issue of the Newsletter. Larry and Alison have been raising Monarchs for a few years now, with proven success. (If you've been following their progress in the BNS Newsletter, you'll

know that the Bogans have become true experts in the field. They are actively encouraging others to get involved, and they are positively influencing the breeding knowledge base in the province.)

For the last half of the morning, some 30 NNS members attended our annual general meeting, at which member clubs reported on the year's activities, officers were elected, and members vigorously discussed potential actions to draw attention to the discouraging state of the forest in Nova Scotia.

Following lunch, we vacated our rooms and departed Debert, some to head directly home, others of us to one of the offered field trips. Those who went north to the Wallace River explored a piece of old Acadian Forest on a ravine with ash trees, bloodroot, fields of unfurling ostrich ferns, nodding trilliums, trout lilies, and more. They report a very satisfying trip.

Meanwhile, Joanne and I, along with six or seven others, opted for the geological exploration of Victoria Park in Truro before heading back to the Valley. It's one thing to enjoy this wonderful park for its playgrounds, hiking trails, and natural features. It's entirely another to see it with the geologist's eye, when every exposed piece of rock or stratum in a crumbling hillside or course of a waterfall tells an origin story as well as a time-travelling story covering tens of millions of years. Such insights strain the senses to imagine the nearly unimaginable: the rise and fall of seas and the collision and separation of continents, and the rise of mountains and the folding of solid rock, and the ice and the heat, and the erosion of rock into sand and clay and the subsequent reincarnation of solid rock.



As always, our annual Celebration of Nature was a success. But it only happens with the considerable efforts of a dedicated group of organizers. Special thanks go to the perennially dedicated Jean Gibson Collins and Robin Musselman, and this year

Betty Hodgson and Bethsheila Kent gave a lot of time to the project. Thanks also to Pat Kelly, our three speakers, the field trip leaders, and of course our indomitable leader, Bob Bancroft.

I only wish that more of Nova Scotia's naturalist community could, or would, participate. The camaraderie and opportunity to experience the natural world with similar-minded people are more than worth the effort and minimal cost of the trip.

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NATURAL HISTORY

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## Nature Notes from a Recent Arrival—Year 2

*by Howard Williams*

✂ Fortunately, we had too much material to include in the last Newsletter issue so my spring notes have been delayed until this issue. The following relates to both spring and summer notes.

Watching spring develop this year was a delight, especially noting the first occurrences of warblers, Ruby-throated Hummingbirds, and flycatchers. I am constantly amazed by how quickly spring develops here when compared to the less-extreme climates in the UK and New Zealand. Despite the rather cold April, several landowners had remarked on how their grass paddocks were able to support cattle earlier than normal this year and fruit trees were ahead of normal flowering times.

I was pleased to note that *eBird* data provided by the general population have been confirmed by federal bird counts in the United States. One hopes that Canadian data, too, are similarly accurate. I admit to have been contacted a number of times by *eBird* reviewers and asked for more details, or to make corrections. As Bram Stoker said, "We learn from failure, not

from success.” Making mistakes is a normal part of the learning process. The eBird platform is a really useful tool, not only for birders to keep their lists and guide their activities, but for those who plan projects and want baseline information.

Breakfasting while lying in bed one morning in May, I looked out at the remains of the Stirling orchards, now a wild-flower meadow reverting to various grasses, roses, and other accidental plants. There I saw a Coyote, feverishly pawing at the ground. My photographs were not good because the day before I put in my fly screens (arrgh). Later, I went to the location and saw nothing but a hole—no feathers, no skin, no fur, no signs of a struggle. My question is this: Was the Coyote digging along an existing hole to catch a small animal? If so, there is no trace of the original hole, nor of anything caught. Why else would a Coyote dig a hole in flat ground, certainly not as a den. Suggestions please. There have been several close encounters with and sightings of Coyote in the Wolfville area this spring, many by dog walkers; I admit to a certain frisson of pleasure and concern when I know they are close; I enjoy it when they wake me at night.

The tick season is now with us. My partner found a deer tick on her knee in January! Fortunately, it had not been feeding long enough to require her to be medicated. In April and May, we seem to pick up one every few days, especially after walking in long grass. As the heat of summer comes, the occurrence of ticks seems to decline. Ticks fall off the dog because he has been rendered both resistant to Lyme disease and unattractive to ticks through his medication. As a result, displaced ticks find more attractive hosts—us—one of the joys of living in Canada, and let’s hope the development of a Lyme disease inoculation is fast-tracked.

With spring and summer, of course, comes the almost incessant buzzing of lawnmowers and trimmers. I find it hard to understand why householders commit so much time, effort, chemicals, drinking-quality water, and associated expense to

this practice. Indeed, the local town council put out a Municipal Policy Statement (MPS) last year, in which section 16 and sub-sections 16.1.2 & 16.1.9 encourage the use of drought-tolerant native plants to improve water and energy efficiency. The use of grass for landscaping has in this section of the MPS been clearly, if not explicitly, discouraged. One developer, at least, still uses a covenant requiring the use of grass, and I found that it is onerous and costly for householders to remove this condition. Instead of grass, I use gravel and wood chips for mulch and plant as many native species of perennials as my partner can find. Consequently, this spring and summer we can sit back and relax beside flowering shrubs instead of having to cut grass. If you must have green space that your children can play on, why not plant dwarf white clover; good for the soil, needs no watering, and does not need mowing.

Concern about declining bee populations has been in the news recently, in large part because of the use of neonicotinoid-based insecticides. Homeowners have been encouraged to provide bee habitat in their gardens by planting hardy, flowering perennials. Researchers from the University of Massachusetts and the US Forest Service found that taking a “lazy lawn mower” approach and mowing every two weeks rather than weekly can help encourage bee habitat in suburban lawns by allowing flowers to bloom. Longer intervals between mowing lets the lawn flowers bloom (but not seed), which helps bees. Mowing less frequently is a practical, economical, and time-saving alternative to replacing lawns or even planting pollinator gardens.” I find flowering dandelions, daisies, buttercups attractive, and they do not need watering to keep them thriving. Better still, don’t plant or maintain grass. Plant trees, shrubs, and dwarf white clover instead. My bee nesting box has been active this summer.

The use of potable water to keep grass green is one of many environmentally insensitive actions perhaps unwittingly taken by householders, though one upside is that it does subsidize the

sewerage disposal costs for the rest of us. In this regard I still do not understand why in Wolfville the price of water use goes down with increasing use. This policy seems to be counterproductive to prudent groundwater management and conservation, especially in view of the expected population increases in Wolfville. I checked the price of potable water per cubic metre in a few places in North America: Toronto was the most expensive at \$3.80; New York city was less expensive at \$1.50; HRM and Wolfville came in at \$0.97 and \$0.72, respectively. Wolfville may be cheap, but is the supply sustainable, bearing in mind the growing demand?

Given that fall bird migration is upon us you might enjoy this audio link: <https://www.bbc.co.uk/programmes/bo8wmk5j>. A video with no annoying chatter may be found here: <https://m.youtube.com/watch?v=l2qeBmem3jg>.

This late summer, we have been enjoying the sight of Ruby-throated Hummingbirds (hummers) fighting over ownership of our two nectar feeders, the flowering French beans, and many other red-flowering plants that we grow in our garden. We have had up to four hummers, both males and females. Two males constantly re-enact the Battle of Britain around the garden. Bearing in mind Soren's article in this issue of co-operation versus competition in nature, I can safely say that when it comes to food, hummers do not know the meaning of the word co-operation. I contrast this behaviour with that of the robins, flickers, and Song Sparrows that seem to feed happily together, stripping our dogwoods of berries. As I write this I am eagerly anticipating the migrating fall warblers in our garden. The Alder Flycatchers in our area have departed already, and soon it will be the hummers. Can winter be far behind?

Last but not least, I came across this provoking comment by Frank Zappa: "A mind is like a parachute. It doesn't work if it is not open."

# The Nature of Humans & Humans in Nature: Not Seeing the Forest for the Trees

by Soren Bondrup-Nielsen

✂ The saying “not seeing the forest for the trees” implies focusing on the details and not seeing the whole picture. This literally can be applied to a forest—we see the trees as separate individuals but fail to comprehend the interactions that create the whole forest. We are beginning to understand that trees within a forest are interconnected through vast networks of fungal mycelia whereby nutrients are shared among trees, not just with the same species but also among species. Could it be that for the forest ecosystem to persist the trees need to co-operate? Could this line of reasoning also be applied to humans?

Human societies have become divided and fragmented. There has never been as great a gap between rich and developing countries or between the few super-rich and the multitude of poor people. Our economic system, in part, lies behind this division; it sees nature as our exclusive store of resources and exalts competition rather than co-operation as if this is the natural order of things. The way we see ourselves depends on the perspective we take. We can see ourselves as either being a part of nature co-operating for the betterment of all or being separate from nature where survival of the fittest reigns supreme and only a few prosper.

The species that is us, *Homo sapiens*, came about through the process of evolution—just like all other organisms, whether

bacteria, plants, or animals. Evolution, as expounded by Charles Darwin through the process of natural selection, is what has shaped all organisms. Those organisms with characteristics that have a genetic basis that allows them to survive and reproduce are the winners under current conditions, and they pass on these characteristics. Should conditions change, those organisms whose characteristics through random genetic change are best suited for the new conditions will survive and reproduce, and the make-up of the population will change.

We classify groups of more or less identical individuals into species, following a system developed by Carl von Linnæus, the Swedish botanist. This system applies formal names to groups of organisms as if they were cast in stone. However, evolution is a continuous fluid process where, over time, there is modification to some of the characteristics through random genetic change. Thus, many species in the past exist no more, but it would be inaccurate to say that they have all gone extinct since they may exist as two or more distinct species today. Humans and chimpanzees, for example, shared a common ancestor, a single unique species, some 6 million years ago. Along the evolutionary route culminating in us, there were several unique species, but they exist no more. Some of them certainly did go extinct, but there is a continuous line of evolution between our common ancestor with chimpanzees and us. And there is also a continuous line for all present-day species and the original life that emerged from the primordial soup on Earth some three billion years ago. Thus, we share characteristics with other organisms, most with our closest relatives, the chimpanzees, and least with our most distant relatives, the bacteria. For example, we share 99 percent genetic similarity with chimpanzees, 90 percent with cats, and more than 50 percent with bananas. Despite the uniqueness of all species we are made of the same building blocks with just minor differences.

We like to think that it is our brain that separates us from our chimpanzee cousin, but brain size is not what set us off

on our branch of evolution. The ability to walk on two legs is what made life away from trees a surviving strategy. Walking upright freed the forelimbs so that dexterity with the hands could be selected, which allowed for advanced tool making to become refined, and then a larger brain became advantageous. About 170,000 years ago *Homo sapiens* evolved, and we have not changed genetically since then. Take a human from back then, and they could achieve any of our abilities today.

We were born from nature, and we live within nature, but our ability to make and use sophisticated tools—technology—has meant that we can to a certain degree control nature—our environment—to make life more comfortable and safer. We have learned how to avoid or indeed postpone the negative feedbacks from nature when we approach the limit of food or energy availability or when we become endangered due to predators or disease. We develop new sources of energy from burning wood to burning fossil fuels or harnessing nuclear fission. We increase the food supply by husbanding animals and applying fertilizer and pesticides in agriculture. We fight disease by developing antibiotics and a myriad of drugs. The shelters we live in have changed from simple huts to “intelligent” houses with running water, indoor toilets, heating and cooling functions, robot vacuum cleaners, remote surveillance, and more, potentially controlled through our smartphones. These technologies are unique to humans. It gives us a sense that nature is no longer necessary. We can control nature, and as such we think we have stepped out of nature. There is a danger in doing this: we begin to believe that we are unassailable. However, all this technology has developed with a growing economy, not to mention the ever-increasing volume of humankind. This growth requires massive inputs of energy and natural resources, with resulting impact on the environment.

Much has been written about human effects on the environment. A popular way to express a person’s impact is called “ecological footprint.” The top 10 percent of 188 countries in

the world have an ecological footprint 10 times greater than the bottom 10 percent. A study published by the *Globe and Mail* shows that the wealthiest 10 percent of Canadians have a footprint two-and-a-half times greater than the poorest 10 percent. Arguments have been made that if all the world's people had the living standards of people in the so-called west, we would need several more Earths. This is not an option, but neither is the ever-growing inequality among humans acceptable.

Until the 17th century, people were largely fatalists; they tended to accept their lot in life. However, starting with thinkers like Descartes, Bacon, Locke, and Adam Smith and others, this began to change. Bacon wrote about liberating humanity from the natural world and about the importance of objective knowledge. Locke wrote that the social role of the state was to promote the subjugation of nature, while Adam Smith wrote about the invisible hand of economics. There slowly emerged a new relationship between humans and the environment. Darwin's theory of evolution, popularly envisioned as survival of the fittest, resonated with the idea of the emerging economic system. But the term *survival of the fittest* was not Darwin's original phrase; Herbert Spencer, the English liberal political theorist, philosopher, anthropologist, biologist, and more, proposed this term to expound parallels between the human economy and the evolution of species.

The model that has evolved to be exceedingly successful is the notion of the market and the investor-owned corporation. What is exalted is the concept of survival of the fittest achieved through competition. Andrew Carnegie, the Pittsburgh steel tycoon, spoke in the late 1800s about the survival of the fittest as the all-powerful driver of the economy. Corporations merge or outcompete each other, thus growing bigger and gaining more control. Largely, their aim is to make as much money as possible for the investors, often with little regard of the human and environmental cost. This system has caused a dramatic rise in inequality among humans. The world's wealthiest 1 percent

now owns about 50 percent of the world's wealth. This has come about through massive environmental destruction, including species extinction, forest loss, erosion, pollution, and now global climate change as well as human suffering. However, the linkage between the growing economy and the degradation of the environment is not universally accepted.

Our early *Homo sapiens* ancestors evolved to exist within small social groups. Our survival depended on co-operation within these groups. We hunted and gathered in small groups, we shared food, and when someone was sick we looked after them. For the Inuit and the Senegalese, two very distinct cultures living in dramatically different environments, one of the most important guiding principles is reciprocity. By assisting someone, that person was forever bound to help you. By helping someone, you became part of their "family" regardless of genetic relatedness. Co-operation ensured that all had the basic needs, and the group, the society, survived. The interconnections among individuals enhanced group survival.

No doubt our current economic system has brought us to where we are today. Proponents will have all kinds of arguments for the status quo. In the late 1800s, when horses powered transportation, there were predictions that by 1950 London would be buried nine feet deep in horse manure. However, cars replaced horse-drawn carts, and now we are "buried" by carbon dioxide. It will not be long into the future that electric cars will have replaced gasoline cars, but what will we be buried in then? Similarly, we will no doubt find new materials for manufacturing that are less of a burden on the environment, but the real problem is an economy driven by a belief in infinite growth, minimally accounting for environmental externalities: an economy based on wants rather than needs, and the extreme human inequality across the globe, not to mention the burgeoning humankind.

It is time to recognize that the concept of "survival of the fittest" will be our demise. Let's learn from the trees and adopt

the notion of co-operation, share the wealth among all humans, and accept that we are a part of nature and that our use of what nature provides is not sustainable, neither are we. We must learn that wealth cannot be measured only in terms of money. Happiness and well-being require some money but, more importantly, require social cohesion and equality.

We can apply the saying “not seeing the forest for the trees” to how we see humanity. In economic terms, we see individual humans as mere consumers who are enticed to buy things they do not need with money that they do not have because it’s good for the economy, good for corporations. However, we need to see humanity as a cohesive, co-operative collective of humans living within nature, sharing resources equitably and sustainably.

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CONSERVATION

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## Celebrating 20 Years of Studying Sea Turtles

*by the Canadian Sea Turtle Network*

✎ The Canadian Sea Turtle Network is a Halifax-based environmental charity that works to study and conserve endangered sea turtles in Canadian waters and beyond. It was out of collaboration between scientists and Atlantic Canadian fishers and coastal community members that the Canadian Sea Turtle Network was born in 1998.

Initially, we launched a citizen science project encouraging fishers and other mariners to call in sea turtle sightings. Thousands of confirmed sightings later, it is clear that Atlantic Canada is an important part of the Leatherback sea turtle’s habitat. In fact, during the summer months, we host more foraging



CANADIAN SEA TURTLE NETWORK

Leatherback sea turtle surfaces to breathe off Nova Scotia

Leatherbacks than almost anywhere else on Earth. It turns out that in addition to being the world's largest turtles, Leatherbacks are also the most wide-ranging reptile. They travel tens of thousands of kilometres between northern foraging areas in Atlantic Canada, which host large seasonal aggregations of jellyfish (their favourite food), and tropical nesting beaches throughout Latin America and the Caribbean, where they lay their eggs.

By taking the time to write down a few observations and take a few photos for us, regular citizens in Atlantic Canada changed the global understanding of these gentle giants. Local fishers continue to be our most important research partners, and we've combined our scientific know-how with their practical skills working at sea to do ground-breaking work capturing and tagging Leatherbacks, allowing us to document their jellyfish feeding and long-distance migrations in real time.

Although our research program has now expanded considerably, we continue to accept sightings from citizen scientists, which helps us to keep track of when the turtles arrive in, and depart from, our waters. Most Leatherbacks enter the coastal



CANADIAN SEA TURTLE NETWORK

A juvenile Kemp's Ridley turtle found stranded due to hypothermia on the Bay of Fundy shore

waters of Atlantic Canada in late June to early July, making their way into the Gulf of St. Lawrence and then to Newfoundland and Labrador later in the summer. We encourage everyone on the water in summer to keep their eyes peeled for a shiny turtle head popping up or the splash of water streaming off of the ridges of its carapace as it surfaces to breathe.

As it turns out, the Leatherback is not the only sea turtle to spend time in Canadian waters. While it is the most common species in our coastal waters due to its tolerance of colder water, we have juvenile Loggerhead sea turtles, which come up to forage in the warm, offshore waters associated with the Gulf Stream. Even the occasional juvenile Atlantic Ridley or Green Turtle makes its way this far north. Unfortunately, we most commonly interact with Ridley and Green sea turtles in the late fall when an occasional tiny juvenile washes up on a local beach, stunned by the cold. Usually they have succumbed to hypothermia by the time we find them, but occasionally they are still alive and candidates for rehabilitation.

We are interested in putting more effort into searching for, and documenting, stranded turtles, including these juvenile

Green and Ridley Turtles. We have turned to the public once again for their help. It is amazing what we can discover if we take the time to look. We can't monitor every beach in Atlantic Canada all year by ourselves. But we know there are many nature-loving citizens who live on the coast and can keep an eye out for us. More than a dozen such volunteers participated in our Sea Turtle Beach Patrol program last fall, monitoring local beaches around Nova Scotia and New Brunswick for stranded turtles. We were thrilled to have so many boots on the ground, and our volunteers seemed to enjoy the excuse to spend more time in nature. We are planning to run this volunteer opportunity as an annual program and are looking forward to collaborating with our friends in coastal communities around the region again this year.

To learn more, or for more information on how to get involved, please visit [seaturtle.ca](http://seaturtle.ca) or e-mail [info@seaturtle.ca](mailto:info@seaturtle.ca).

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NATURAL HISTORY

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## An Overview of Natural History Studies in Kings County

*by Hilary Roberts, Research Assistant,  
Blomidon Naturalists Society*

✂ A collection of the natural history studies completed in Kings County, Nova Scotia, has been created and is now available for public access. The collected papers were gathered electronically, using the online referencing program Zotero, in which a group library was created that can be accessed by anyone over the Internet [https://www.zotero.org/groups/2195641/natural\\_history\\_kings\\_county\\_ns/items/collectionKey/3GRZ9K4I](https://www.zotero.org/groups/2195641/natural_history_kings_county_ns/items/collectionKey/3GRZ9K4I). The studies were organized systematically:

- (A) *reference type* (Dissertation, Peer Reviewed Publication, or Popular Article)
- (B) *research type* (Experimental or Observational)
- (C) *study type* (Field Study, Laboratory Study, or Theoretical Study)
- (D) *environment* (Fresh Water Aquatic, Terrestrial, Marine, Saltmarsh, or Agriculture)
- (E) *kingdom* (Animal, Plant, Fungi, Bacteria, or Protist)
- (F) *level* (Species, Community, Ecology, Geological).

A large amount of natural history research in Kings County originates from Acadia University. This is evidenced by the 205 Acadia dissertations that have been completed in relation to natural history in Kings County since about 1960. In addition, 82 peer-reviewed publications pertaining to Kings County natural history were collected, many of which were authored by Acadia faculty. A small number of informal publications were found relating to natural history, with three articles filed in the Popular Article category. Of the collected studies, 258 were observational studies, as compared to only 46 experimental studies, with some overlap in large studies that contained components of each. As expected, most of these research projects took place in the field (245), with fewer being carried out in a laboratory setting (47), and six completed as theoretical studies.

Kings County contains a diverse assortment of environments, allowing research to be conducted on a number of distinct ecosystems. The Bay of Fundy, known for its record-breaking tides, is a unique environment. Therefore, it is not surprising that the Minas Basin, the area of the Bay of Fundy located off the coast of Kings County and surrounding counties, is heavily studied by researchers. Studies carried out in a marine environment constitute 120 of the studies collected. The next-most-studied environment is terrestrial, with 91 studies collected. Freshwater aquatic, saltmarsh, and agriculture constitute the environmental topics of 52, 20, and 11 of the articles, respectively. Within

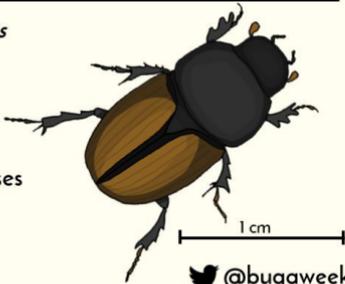
these environments, a large variety of organisms are present and available for study. The majority of the studies in this collection focus on animals (208), followed by fungi and plants, 24 and 21 articles, respectively. The remaining articles focused on a more-micro scale, investigating protists (6) and bacteria (5). As for the level at which these organisms were studied, most were investigated at ecological level (139), meaning that the researchers considered interactions among the surrounding environment, other organisms, and the organism of interest. Community refers to the interactions between different species within a specified area; of the collected studies, 26 were at this level. A large proportion (100) of the studies conducted research at the Species level, and just four were investigated at the Genetic level. Finally, 21 studies focused on the geology of the environment, rather than the organisms inhabiting it.

It is evident that extensive natural history research has been conducted in Kings County. This collection is meant to be a resource for those interested in exploring the broad array of scientific research that has been conducted in their backyards, as well as for the academic community who can use this resource to determine what has been done and what still needs to be investigated. The hope is that this collection will be a working document, to which anyone can contribute.

## BUG OF THE WEEK: APHODIUS ERRATICUS

Like most described insects, *Aphodius erraticus* doesn't have a common name. This species is a burrowing (paracoprid) dung beetle. It feeds on dung both as a larvae and an adult.

It lays its eggs in sculpted dung masses buried in the soil beneath a dung source. This species is widespread in Europe, Asia, and North America.



# The Hemlock Woolly Adelgid: a Threat to Our Ecosystems

*by Hilary Roberts, Research Assistant,  
Blomidon Naturalists Society*

✚ The Eastern Hemlock is a foundational species to many forest habitats throughout Nova Scotia. The ecological importance of hemlocks in forest stands arises from their ability to moderate local environmental conditions and to provide habitat for various wildlife species. These ecologically valuable hemlock stands in Nova Scotia are now under threat from a newly introduced pest known as the Hemlock Woolly Adelgid (HWA).

As a foundational species, hemlock trees contribute significantly to habitat structure and function. This essential role includes providing shade to brooks and consequently allowing species to thrive in cooler aquatic environments. Their extensive canopy provides a microclimate that is cool and moist in summer and less harsh in winter, which benefits a variety of wildlife. Additionally, we now know that large hemlock trees, through their extensive mycorrhizal networks, share nutrients with other hemlocks and other species of trees. Thus, trees in a forest stand are more than separate individuals; they form a co-operative community. Although these examples are far from the only contributions of hemlock trees to their surrounding environments, they provide a glimpse into the devastating ecological impacts that would arise from the loss of Eastern Hemlock.

The Hemlock Woolly Adelgid is an aphid-like insect that targets hemlock trees, obtaining nutrients from storage cells

at the base of the needles. This ultimately kills the needles and eventually the tree.

In its native range in Asia, HWA undergoes both sexual and asexual reproduction. To reproduce sexually it must find a suitable species of host tree that is not present in North America and thus is limited to asexual reproduction in North America, where only female adelgids are present. The first of two HWA generations per year hatches in late spring and are known as crawlers. This is the most mobile stage of HWA and although the crawlers are wingless, they may be dispersed by other means such as wind and birds until they settle at the base of a healthy hemlock needle. Once settled, they remain at that location for the summer and winter and will, indeed, feed throughout the winter. In early spring, this generation gives rise to the second, and shorter, generation, which consists of both wingless and winged offspring. It is the winged offspring that are known to be capable of sexual reproduction; however, in North America this stage is not completed.

Although this pest is new to Nova Scotia, it has a long history throughout North America and Asia. As a native to Asia, HWA made its way to eastern North America in the 1950s, where it was first found in Virginia, likely originating on nursery stock from Japan. HWA has also been established in western North America for a significant period of time but is not considered a threat there or in Asia because its populations are kept in control by natural predators. The potential for devastation at the hands of HWA in the east is due to both the lack of natural predators and the speed at which it can spread and establish a population. Severe damage has recently been inflicted on hemlock populations throughout the eastern US, and the establishment of HWA in Nova Scotia suggests a similar impending fate in the northernmost range of the Eastern Hemlock.

HWA targets all ages and sizes of hemlock and eventually causes a significant loss of needles and impairs the tree from producing new growth. Within as little as four to ten years

following HWA infestation, hemlock trees often become discoloured and slowly die. Contributing factors such as drought can accelerate decline in affected trees. Since HWA undergoes asexual reproduction, the transfer of just one individual to an unaffected hemlock stand can establish a pest population. Although the Nova Scotian winter can sometimes feel endless and inhospitable to those of us living through it, HWA is resilient and feeds on hemlock throughout this cold season. One factor that may limit, or at least slow down, the spread of HWA northward in Nova Scotia are temperatures colder than the insect has encountered previously.

Within Nova Scotia, HWA is currently contained in the southwestern region. The first appearance of this pest in Atlantic Canada was confirmed in July 2017 in Digby County, Nova Scotia. As of now, HWA has been confirmed in four additional regions of Nova Scotia: Queens, Shelburne, Yarmouth, and Annapolis counties. Neighbouring counties, which include Kings County, should be prepared for the possible invasion by HWA of their own hemlock stands. The spread of HWA is mediated by several factors, including birds, mammals, storms, and human transport. Within the infected counties, priority is currently placed on containment of the pest, while organizations such as the Canadian Food Inspection Agency (CFIA), the Canadian Forest Service, and the Nova Scotia Department of Lands and Forestry work to determine the most effective strategy to eradicate or control pest populations.

Many efforts have been explored in the eastern US to control HWA using an Integrated Pest Management (IPM) approach, which involves a combination of both chemical and biological controls. This approach focuses on treating a subset of trees within an infected hemlock stand with a systemic insecticide to provide those trees with immunity. Older hemlock trees are more susceptible to HWA attack and are therefore often the ones selected for chemical treatment. The second aspect of this

approach involves releasing predatory insects as a biological control onto the remaining untreated trees within the hemlock stand. A variety of insects that are known natural predators of HWA have been identified and tested as candidates for controlling HWA populations in the east, where no native predators exist. Most of these insects are native to western North America and are responsible for controlling the population size of HWA in these regions so that they can coexist on hemlock trees without posing a serious risk. To apply a biological control, insects must be reared to significant numbers in a laboratory before being released into the wild. This can be a costly process, and there is no guarantee that the predator population will be able to establish a sustainable population once released. IPM trials are ongoing in the US and are being considered for implementation in Nova Scotia.

For residents of Kings County, and on a greater scale, Nova Scotia, there are many ways we can be proactive in preventing the spread of HWA. For example, invasive insects are commonly spread through the movement of nursery products and contaminated firewood from infected to uninfected regions. Simply avoiding these practices can go a long way in ensuring that this pest and others remain contained until effective control strategies can be carried out. Additionally, it is important to monitor the health of hemlock stands near you—look out for evidence of HWA infestation, and report any signs to CFIA for further investigation.

Hemlock trees play a fundamental ecological role in Nova Scotia forests, and protecting them from invasive species such as HWA can become much more manageable when it is approached as a community effort.

Specifically, as members of the Blomidon Naturalists Society you will have the opportunity to become directly involved through monitoring the Eastern Hemlock stands near you. Training will be implemented to ensure that everyone inter-

ested can accurately search for and identify HWA. A surveying protocol and maps indicating the locations of Eastern Hemlock stands in Kings County will be provided. As well, a system will be made available to efficiently record any observations, including both absences and detections. These results will then be passed along to CFIA to contribute to the ongoing monitoring of HWA throughout the province, with a view to eradicating or minimizing this pest.

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NATURAL HISTORY

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## Nova Scotia Ambrosia

by Doug Linzey

☞ I have a habit. Fortunately, it's not a bad one. Every year I make some maple syrup.

Not much—just enough for the family, a few litres. This means tapping 6–8 Sugar Maple (*Acer saccharum*) trees near the house and collecting sap whenever the trees deign to release it. I've been doing this for a while, but never gave much thought to how the trees produce this remarkable liquid—and furthermore, why they only do it when the temperature is cycling between freezing and not freezing.

### The syrup

I did know that it takes a lot of sap to make a little syrup, on average about 40 litres of sap for 1 L of syrup. The sugar content of Sugar Maple sap can vary quite a bit, so this ratio can range from 20:1 to over 50:1, depending on factors well beyond human control.

Another thing I know is that it's easy to burn a batch of syrup if you're not paying attention, and if you've ever burnt sugar

in a pot you'll know there are two results: 1. You can't just add water to the mess and hope to restore it—nope, it's burnt and will always taste and smell bad no matter how much you try to reconstitute it. 2. Your pot is a mess. The stuff on the bottom is stuck there. Yeah, you can get it off eventually, but it takes hours and your pot is never quite the same.

One other thing I know is that it's not a good idea to boil your sap indoors. There's always a bit of the sugar in the steam, the water you're boiling off, and that stuff will eventually coat your walls and ceiling. So it's basically an outdoor job, and I do mine on the deck off the dining room on an induction burner, which works quite well. The trick is to stop boiling when you get close but not quite to the final concentration of syrup and then finish the job on the kitchen stove, where quality control is easier.

This prompts the ultimate question: How do you know when the job is done?

What you're looking for is a sugar concentration of about 67 percent. Less can result in formation of mould; more can result in crystallization of the sugar. Neither situation is insurmountable, but it's nice to be able to store your syrup at room temperature (in a sterile container, of course) without having to worry about it. The more sugar in a water/sugar solution, the higher the density, so the density you're looking for can be measured with a hydrometer or equivalent device. But for us deck boilers, it's easiest just to measure the temperature. Maple syrup boils at about 7.5°F (4.1–4.2°C) above the boiling point of water. So you take the temperature of boiling water (it varies according to elevation and the weather) and when your syrup reaches 7.5° above that, you're done.

## The sap

You can do all that without knowing anything about the raw ingredient: the sap. This year it occurred to me to wonder about

sap—why does it have sugar in it in the first place, and what’s the mechanism whereby it winds up in my bucket?

Creating sugar before photosynthesis stops for the winter is a tree’s way of storing energy for kickstarting new growth in the following spring. The sugars are converted to starch for winter storage in tree stems and reconverted to sugars in the spring, but it’s the delivery system that’s the interesting thing. It turns out that until very recently no-one really understood how the *Acer* genus (and it’s almost unique among trees in this respect) stores and uses the sugar it creates.

One of my original preconceptions was that sap moves up the tree in the sapwood and other live layers (phloem and cambium) of the tree, and hence I didn’t understand why you had to drill a hole 2 inches deep into the tree to collect sap. Well, that was wrong. In fact, if you cut a tree down in the spring, you’ll notice that it’s not long before the whole stump cut is full of moisture and attracting flies; there’s moisture flowing from the roots all over the place.

But what is extraordinary is that if the tree you fell is a maple, the stump doesn’t bleed; it’s the tree, the part that’s lying on the ground, that bleeds. Clearly, how sap moves in a maple is different from in other trees. While researchers are still puzzling out the precise mechanisms, we do now understand the basics of what happens.

The non-living woody part of a tree, the xylem, consists of fibres and vessels. While the vessels are gas-filled, the fibres conduct water, driven by root pressure, up the tree, and in turn nutrients generated for growth flow down the phloem to feed the cambium. But in the maple it’s the vessels that conduct fluids and the fibres that are gas-filled, and under specific conditions, sugars flow down through the xylem. A February 2018 article describes the process in relatively simplified form:

Carbon dioxide and other gases in those fibers are critical to generating flow because they dissolve in sap. The geyser that

results when we open a seltzer bottle (especially a warm one) too fast is a reminder that plenty of carbon dioxide can dissolve in water. If that bottle is icy cold, the risk of a gusher is low because cold water holds more dissolved gas.

During the night, gases in fibers shrink as they cool, eventually dissolving into sap in the vessels. This contraction of gases causes the tree's internal pressure to drop, creating a suction that draws sap up from the roots. As the temperature warms in the morning, gases bubble out of solution and expand, increasing the tree's internal pressure and forcing sap out the tap hole . . .

Rather than flowing up from the roots and out the tap during the day as was once commonly thought, sap actually flows down from the crown (in addition to some lateral flow) toward the tap hole.

(<https://www.hudsonvalley360.com/article/science-behind-why-maple-sap-flows>)

For the sap to run in a Sugar Maple, then, the freeze-thaw cycle is essential for moving water from the ground (during the freezing process) and allowing sugar-laden sap to flow down the tree (during the thaw). And to access that sap, we have to penetrate the xylem with our tap.

This is highly simplified, but you get the idea (I hope). If you want to pursue the science further, there are good sources on the Internet. Try searching for “how maple sap flows”—there's plenty of material to keep you occupied for hours.

### And a bit more

You're probably aware that syrup can also be made from the sap of *Betula* (birch) and *Juglans* (butternut and walnut) species. But they don't share the *Acer's* unique sap-transport system. Nor do they, in my humble opinion, produce a taste nearly as good as maple, and with a lower sugar/water ratio, the sap takes more boiling and yields less. But if you're stuck in the

woods surrounded by birch and no maple, and your pancakes are starting to get cold, well, what are you gonna do?

If you're a typical resident of Nova Scotia, you've probably visited at least one commercial sugar bush in late winter. Most of them are now bucket-free, the sap flowing from taps through a system of droplines and mainlines either directly to storage vessels at the sugar shack or into intermediate collection vessels. The larger producers have processes that often involve reverse osmosis equipment to extract more than half the water from the sap before having to apply expensive heat. The concentrated sap is then boiled down in continuous evaporators, and the syrup is taken off the heat at the right concentration, filtered, and packaged. Happily, for the aesthetics and for economy, many evaporators are still wood-fired, the firewood having been harvested from the sugar bush itself.

This year marks a personal turning point in my small maple syrup venture. For the first time, I didn't burn any syrup. I didn't wreck a pot or waste a single batch of sap. Bon appetit.

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CONSERVATION

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## Summary of Monarch Butterfly Rearing, Annapolis Valley

*by Alison and Larry Bogan*

✿ 2018 has been a great year for the Monarch population in Nova Scotia, especially the Annapolis Valley.

As of mid-September, we have released over 370 Monarch butterflies. Almost 140 are what we consider "wild" because they spent all but the last few days of their development in our milkweed field fending for themselves. The other 230 we raised inside, protected from predators, from egg or small caterpil-

lars. The final totals will not be known until as late as October, when we usually see the last of the Monarchs disappear from our field. The graph of releases below shows that we have been releasing one to 18 Monarchs every day since the start in early August. Most released in August were from the first eggs laid in July, but the numbers depend on how many we collect. By mid-August there were so many eggs in the field, we stopped actively collecting and let the larvae fend for themselves.

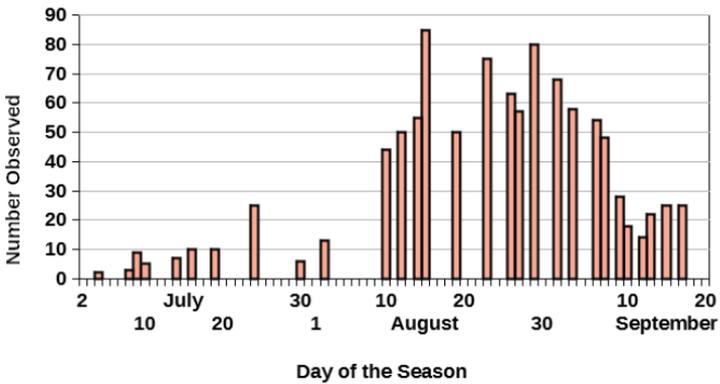
We started collecting eggs the first week of July when four, then ten Monarchs settled in our field. The egg laying continued after we released our first raised Monarch on August 1 and has gradually come to an end, but there are still many caterpillars eating, growing, and pupating. Since the first of August we have been flagging the chrysalises we find in the field. At the peak there were as many as 70 flagged. We bring in wild chrysalises when the Monarchs are ready to eclose so we can monitor their health and size, and tag some of them.

This year we have tagged 150 Monarchs with tags purchased from Monarch Watch (<http://monarchwatch.org>). Larger Monarchs have better success in migration to Mexico, so this year we have been measuring the length of the fore-wing of all our Monarchs (46 to 56 mm, averaging 52.5 mm) and tag the larger ones.

We think the early August generation stayed in the area and were sexually active. They have contributed to the large number of eggs and caterpillars present. The later August Monarchs have moved on.

During July, as we circumnavigated the field we would count 10 Monarchs with an increase to over 20 on the 24th. In mid-July, we saw Monarchs frolicking over the butterfly garden almost every sunny early evening. It was a fascinating sight to watch. On the 10th of August, 44 Monarchs were counted, then on the 15th of August we had 85 Monarchs flying in the field. That was an experience, as you walked past, not just one but several Monarchs would fly up and around you. In the

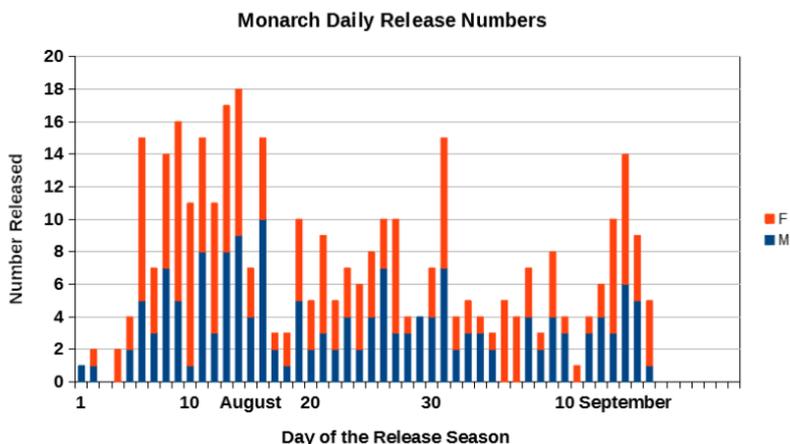
### Monarch Butterflies Observed in the Field July, August, and September 2018



last weeks of August the Monarch count has been around 50 to 80 butterflies. These numbers mean that there are many Monarch butterflies maturing in the field. As a guess I would think that we have to add about 200 Monarchs that eclosed in the field to the total being sheltered inside. In early September the Monarchs started leave and the numbers counted dropped to about 20.

#### Managing a Field of Milkweed for Monarch Rearing.

Common Milkweed sprouts from its underground roots in early May and is in flower by the beginning of July, about when the Monarchs arrive. For the past several years we have mowed sections of our milkweed in late June to induce it to re-sprout and provide the young tender plants on which the female Monarch preferentially lays eggs. Most of the caterpillars and chrysalises we find are in the mowed areas. Recently, with the help of students from the Nova Scotia Community College in Lunenburg, we surveyed four identically sized patches of milkweed in different areas of the field. Two were in June-mowed areas and two in undisturbed milkweed. The two in managed



areas had 48 caterpillars, 4 chrysalises, and 9 adult Monarchs, while the two undisturbed areas had 21 caterpillars, no chrysalises, and 3 adults. These data support our observations.

Another aspect of management involves nearby trees. Our field is surrounded on three sides by poplar, fir, pine, and oak. The Monarchs use these trees for roosting, and this is particularly noticeable when we survey for Monarchs. As we walk by the trees, many Monarchs fly out. Areas of the field that have been managed and are close to the woods seem to be particularly productive of Monarchs; most caterpillars and flagged chrysalises were found there.

### Mission Monarch

During the Mission Monarch blitz, almost every milkweed patch surveyed in the Valley showed evidence of Monarchs—as eggs, caterpillars, or adults. Also, during August we have had contact with many people who have found caterpillars on the milkweed plants in their gardens.

During the week of July 28 to August 5, Mission Monarch urged observers to survey milkweed patches for all live stages of

the Monarch butterfly and to report the results on the website. This blitz was more successful this year, as more naturalists became aware of the effort.

Between July 1 and August 28, ten observers spent 18.5 hours performing 40 surveys (27 in the Annapolis Valley, 7 in Halifax, 5 on the South shore). They examined approximately 1800 milkweed stems and found 214 eggs, 151 caterpillars, 7 chrysalises, and 52 adult butterflies.

This is not the final tally for Monarchs in 2018. We still have many more caterpillars that have to mature and will likely have new Monarchs right into early October. A final summary will be posted here or on <http://valleynature.ca>.



*Lilium canadense*

TWILA ROBAR-DECOSTE

# Summer Weather 2018, Eastern Annapolis Valley

by Larry Bogan, Cambridge Station

	TEMPERATURE			PRECIPITATION
	Max (°C)	Min (°C)	Mean (°C)	Total (mm)
June 2018 (30 yr. average)	20.1 (21.5)	7.6 (10.4)	13.9 (16.0)	118 (82)
July 2018 (30 yr. average)	27.6 (24.9)	15.3 (14.0)	21.4 (19.5)	47 (84)
August 2018 (30 yr. average)	26.8 (24.3)	15.3 (13.6)	21.0 (19.0)	147 (77)
Season (30 yr. average)	24.9 (23.6)	12.8 (12.7)	18.9 (18.2)	312 (243)

SOURCE: *Environment Canada data for Kentville, NS (<http://weatheroffice.gc.ca>).  
30-yr. averages: 1981–2010.*

After experiencing the hot weather of July and August, it is easy to forget that June was a cool month. Overall, the summer weather was not extreme.

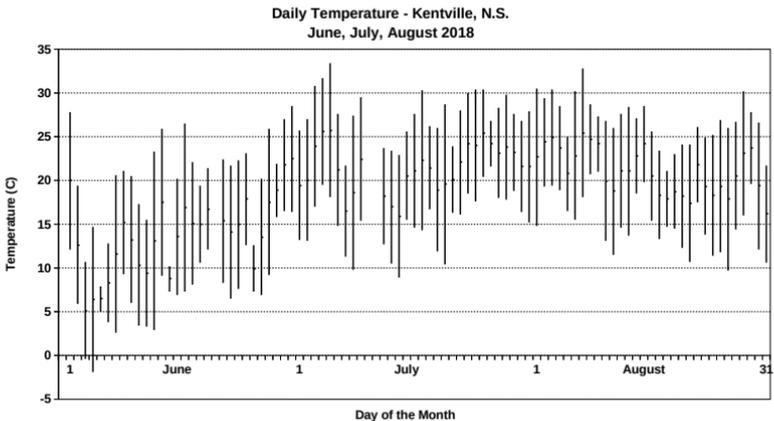
## Temperatures

June was the most extreme because its mean temperature was farthest from normal, at 2.1°C below the 30-yr average. The minimum temperatures for June averaged 2.8° lower and the

maximums averaged  $1.4^{\circ}$  lower than the average. This means that the swing in temperature in June was  $1.4^{\circ}$  more than we normally experience. The night of June 3 illustrated this when many areas of the Valley had a freeze that was very damaging to crops. Kentville registered  $-2^{\circ}\text{C}$  that night, but more low-lying locations had lower temperatures. What made the damage more severe was that during the previous month the temperatures were warm with no below-zero temperatures. The previous heavy frost had been in mid-April. Many crops were in full bud when the freeze occurred.

July and August reversed the weather of June. The average maximum temperatures were higher than the 30-year average (July by  $2.7^{\circ}$  and August by  $2.5^{\circ}$ ). The minimums were higher than the long-term average by  $1.3^{\circ}$  and  $1.7^{\circ}$  for July and August, respectively.

The departure from the long-term average of mean temperatures was  $-2.1^{\circ}$ ,  $+1.6^{\circ}$ , and  $+2.0^{\circ}$  for June, July, and August, respectively. The season averaged only  $0.7^{\circ}$  above the normal for the season, mostly due to long periods of unusually high temperatures in July and August. During the 92 days of the summer months there were 48 days with maximum temperatures above

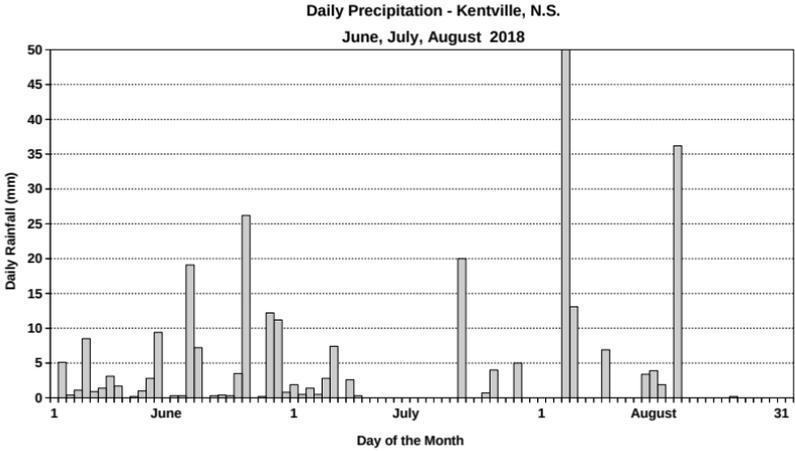


25°C. There were 11 days of 30° or above in the same period. Normally, we would expect only four days over 30° during the summer season.

### Precipitation

As I write this (at the end of August) the Valley is dry, and we need rain, but rainfall for the summer was above the long-term average by 28 percent. June and August were well above average, while July received only 56 percent of the normal precipitation. The rain was quite uneven throughout Nova Scotia because much of it came in the form of thundershowers that are quite localized. Kentville was fortunate to have an 81 mm dousing on August 3 and 36 mm on the 18th. Those two days provided 80 percent of the rain for the month. Greenwood had 83 mm, 73 mm, and 19 mm of rain in the three summer months (175 mm total), only 56 percent as much as Kentville. In August Greenwood received one-eighth as much rain as Kentville.

Humidity is not reported in the daily weather reports, but it is an important component of the comfort and enjoyment of the summer. This summer had a lot of humid days because



Nova Scotia was the target of a persistent flow of warm tropical air up along the Atlantic coast from the Caribbean.

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ASTRONOMY

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## What's in the Sky?

*by Patrick Kelly*

Highlights for October 2018 to January 2019

OCTOBER 9: New Moon

OCTOBER 23–24: Full Moon (*Note:* The Moon is full near mid-day, so you will see an almost-full Moon on both evenings.)

NOVEMBER 4: Daylight Silly Time ends

NOVEMBER 7: New Moon

NOVEMBER 15: Moon and Mars 2° apart at moonset (p.m.)

NOVEMBER 22: Full Moon (*Note:* The date shown is the date at which one will get the best view. Full Moon officially occurs on November 23 at 5:39 Universal Time, which would be on November 23 at 1:52 a.m. AST.)

DECEMBER 2: Venus at greatest illuminated extent (a.m.)

DECEMBER 7: New Moon

DECEMBER 13–14: Geminid meteor shower

DECEMBER 15: Mercury at greatest elongation west (a.m.)

DECEMBER 21: Aldebaran 1° from Moon (4 a.m.)

DECEMBER 21: Solstice (first day of winter) (6:23 p.m.)

DECEMBER 21–22: Full Moon (*Note:* The date shown is the date at which one will get the best view.)

JANUARY 6: New Moon

JANUARY 6: Venus at greatest elongation west (a.m.)

JANUARY 20: Full Moon (*Note:* The date shown is the date at which one will get the best view.)

JANUARY 21: Total lunar eclipse (1:12 a.m.)

JANUARY 22–23: Large tides (Moon at perigee Jan. 21)

## Planets and the Moon

MERCURY: Mercury's orbit is tilted by  $7^\circ$  to the ecliptic, the plane defined by Earth's orbit around the Sun. The angle that the ecliptic makes with the eastern and western horizons, as viewed from Nova Scotia, changes over the course of the year. The visibility of Mercury when it reaches an elongation (the point in its orbit where it appears to be the farthest from the Sun as viewed from Earth) depends greatly on these factors. To see Mercury at its best at mid-latitudes in the Northern Hemisphere it needs to be at greatest elongation east (in the evening sky) in March, or at greatest elongation west (in the morning sky) in October. The December appearance of Mercury will thus be not that spectacular. Luckily, you will have two guides to help you find Mercury on the morning of December 15: Venus and Jupiter. Make sure you have a good eastern horizon and face east before sunrise (6:30 a.m.). You should have no problem finding Venus—it will be the brightest object in the eastern sky (at least until the Sun rises). Look below and to the left of Venus at a  $45^\circ$  angle. Around 6:45 a.m. another bright star should appear above the horizon along that line. That will be Jupiter. Now you are set to look for Mercury. It will be one-fifth of the way along the line from Jupiter going toward Venus, and just "above" the line.

VENUS: For those of you who have been accustomed to seeing Venus in the evening sky all summer, it is about to vanish ... but not for long. While it will not reach its brightest until late September, Venus will then quickly drop closer to the horizon and vanish from the evening sky as it passes between Earth

and the Sun. It does this quickly and becomes visible in the morning sky by the middle of November, reaching its greatest illuminated extent (and its brightest) by early December and greatest apparent angle from the Sun in early January. (See the summer 2018 issue for a discussion of greatest illuminated extent.)

**EARTH:** Take several long, deep breaths. Are you still alive to read this? If so, you are on Earth, the only planet in the solar system with large amounts of oxygen in its atmosphere.

**MARS:** All summer, the Red Planet has been a prominent feature of the evening sky. As September begins, Earth starts to leave Mars behind and Mars passes the “brightest planet after Venus” crown back to Jupiter. The planet continues to fade, becoming dimmer than distant Saturn by the end of January although it will still be easy to spot due to its distinctive red colour. On November 15, look for Mars next to the Moon as the Moon sets. It should make for a pretty scene.

**JUPITER:** Jupiter has also been prominent all summer, staying between Venus and Mars in the evening sky. Earth is also moving away from Jupiter, so its brightness is slowly fading as well. Being much farther from Earth than both Mars and Venus, Jupiter’s changes in brightness are not as extreme as those of the two planets closer to Earth. Jupiter drops closer to the Sun and disappears from the evening sky by the end of October. Unlike Venus, it moves slowly in its orbit and is not near Earth, so its position relative to the Sun, as seen from Earth, is due almost entirely to Earth’s motion around the Sun. It will not immediately pop up into the morning sky. Wait until early January before looking for it in the morning sky.

**SATURN:** Saturn has followed Jupiter’s pattern all summer, although staying between Jupiter and Mars. Like Jupiter it is

slowly dimming, like Jupiter it will disappear from the evening sky by the end of November, and like Jupiter it will not be easy to see in the morning sky until about two months later . . . in this case, early February.

THE MOON: The Moon is involved in two eclipses in January. The first is a partial solar eclipse that is not visible from Nova Scotia. The second eclipse is a total lunar eclipse, and this time we get a ring-side seat, if by ring-side you mean at 1:00 a.m. on a January morning! The time when the Moon is totally in Earth's shadow is of most interest. That starts at 12:41 a.m. the Moon reaches greatest eclipse at 1:12 a.m. and begins to leave the deepest part of Earth's shadow at 1:43 a.m. Let's hope that it is a mild night.



There are two things that  
interest me: the relation of  
people to each other, and the  
relation of people to land.

ALDO LEOPOLD

from "Wherefore Wildlife Ecology" an unpublished  
manuscript quoted in *Aldo Leopold: His Life and Work*.



## SOURCES OF LOCAL NATURAL HISTORY

Amphibians & Reptiles	Sherman Bleakney	H: 902-542-3604
	Jim Wolford	H: 902-542-9204
Astronomy	Roy Bishop	H: 902-542-3992
	Sherman Williams	H: 902-542-5104
	Larry Bogan	H: 902-678-0446
Birds—General	Bernard Forsythe	H: 902-542-2427
	Richard Stern	902-679-9247 sternrichard@gmail.com
	Jean Timpa	H: 902-542-5678
	Gordon & Judy Tufts	H: 902-542-7800
	Jim Wolford	H: 902-542-9204
Butterflies & Moths	Jean Timpa	H: 902-542-5678
	Devin Johnstone	H: 902-679-3611
Fish & Wildlife	NS Department of Natural Resources	O: 902-679-6091
Flora	Ruth Newell	H: 902-542-2095
	Acadia Herbarium	O: 902-585-1355
Fungi	Nancy Nickerson	H: 902-542-9332
Hawks & Owls	Bernard Forsythe	H: 902-542-2427
Indian Prehistory & Archeology	James Legge	H: 902-542-3530
Mosses & Ferns	Ruth Newell	H: 902-542-2095
	Acadia Herbarium	O: 902-585-1355
Mammals	TBA	
Rocks & Fossils	Geology Dept., Acadia University	O: 902-585-2201
Seashore & Marine Life	Sherman Bleakney	H: 902-542-3604
	Jim Wolford	H: 902-542-9204

# BLOMIDON NATURALISTS SOCIETY

## 2018 Membership Fees & Order Form

Members receive four issues of the BNS newsletter annually.  
As a registered charity, BNS issues receipts for all donations.  
Members may also join Nature Nova Scotia through BNS.  
(Neither BNS nor NNS membership is tax deductible.)

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In signing this membership application, I/we hereby waive & release the Blomidon Naturalists Society, its executive committee and members, from all claims for injury and/or damage suffered at any function or field trip organized by the Blomidon Naturalists Society.

SIGNATURE

DATE

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No.	Description	Price	Total
_____	Individual/ Family Membership	\$30.00	\$ _____
_____	Junior (under 16 years) Membership	FREE	\$ _____
_____	Nature Nova Scotia Membership	\$5.00	\$ _____
_____	2018 BNS Calendar	\$15.00	\$ _____
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_____	Blomidon Naturalist hat	\$15.00	\$ _____
	Postage: (calendar \$2) (parcel \$6)		\$ _____
	Tax-deductible Donation		\$ _____
	(Registration number: 118811686RROO1)		
		TOTAL	\$ _____

Address cheques or money orders to BLOMIDON NATURALISTS SOCIETY for membership and other purchases to: Ed Sulis, 107 Canaan Avenue, Kentville, NS B4N 2A7. Due date is January 1 of current year.





ANDREW STEEVES

Hackmatack, Mud Lake