THE HALIFAX FIELD NATURALIST



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



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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 first Thursday of every month at 7:30 p.m. in the auditorium of the Nova Scotia Museum of Natural History, 1747 Summer Street, Halifax; they are open to the public. Field Trips are held at least once a month; it is appreciated if those travelling in someone else's car share the cost of the gas. Participants in HFN activities are responsible for their own safety. Everyone, member or not, is welcome to take part in field trips. 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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GRAPHICS All uncredited illustrations are by H. Derbyshire or from copyright-free sources. Front - Silver-bordered Fritillary on Daisy Fleabane, Bob McDonald; p. 3 - duck with young, John Dick; Back - Gaspereau Valley Acadian Forest Trip; foreground left Pat Leader, foreground right Gillian Webster, Keith Vaughan; Tide Table - Canadian Hydrographic Service, Fisheries & Oceans Canada.

HFN NEWS AND ANNOUNCEMENTS

HFN BOOK CLUB

🥰 – Gillian Webster

The current size of our group fluctuates – sometimes we are five, sometimes ten, members and we vote by consensus on the titles to read. There were three meetings over the past year discussing non-fiction works on the natural world. Members at the most recent meeting, May 11th, focused on <u>The Once and Future World. Nature As It Was, As It Is, As It Could Be</u>, J.B. MacKinnon, 2014, Vintage Canada, Random House, Toronto.

In February, we discussed <u>A Sound Like Dripping</u> <u>Water: In Search of the Boreal Owl</u>, by Soren Bondrup-Nielsen, Gaspereau Press, 2009. Last November, we read <u>The Road is How: A Prairie Pilgrimage Through</u> <u>Nature, Desire and Soul</u> by Trevor Herriot.

The meetings start at 7:00 p.m. and last two hours; the venue is usually announced near the date. If you are interested in joining, please register so important details can be emailed to you. Contact Gillian Webster, 453-9244, gillian.webster@eastlink.ca.



NSNT 2016 DINNER/AUCTION

Join the Nova Scotia Nature Trust at 5:30 p.m., November 3rd, for their 19th Annual Dinner and Auction at the Cunard Centre, 961 Marginal Road, Halifax. This year's guest speaker is farmer Peter Forbes, an educator in the fields of conservation, leadership development, and philanthropy. There will be tables set aside for HFN attendees, and – free parking!



THE SCOTS' MAGAZINE

– Arthur Morris

I would like to strongly recommend this magazine for all to read. It is a very, very interesting magazine, and – the oldest continuously published magazine in the world, first published in 1739!

It can be ordered online and is delivered on the first week of each month. You can also just view the many archived, previous editions on Google. John Muir, the famous Scots/American conservationist who had so much influence on the preservation and creation of national parks in the United states, wrote many articles in this magazine. Of particular interest to HFN members are the excellent articles written by Tom Weir over the past 60 years, another naturalist of note. His articles are as current and interesting today as when they were first written! For those interested in visiting Scotland, this magazine has a myriad of interesting articles on nature (including, nature walks, wildlife, birds, fauna etc,), historical articles, current affairs, entertainment, and in general, interesting articles all about about Scotland.

One final item – Scotland has less than 0.5% of the world's population, yet Scots have been awarded 11% of the Nobel Prizes!



PAPER STRAWS

- Grace Beazley

Remember old-fashioned waxed paper straws? I recently read Tamsyn Burgmann's article, "Vancouver Island town's anti-waste campaign starts with straws", 7th April. 2016. Apparently, businesses in Tofino, BC have been asked to stop using plastic straws and to provide biodegradable options on request. Straws are one of the top ten pieces of garbage found in beach cleanups world-wide, but single-use plastics, which include straws, accumulate in much greater volumes. "At least 20 million tonnes of plastic litter enters the ocean every year, disintegrating as a result of sand and sun". (Source: Pacific Rim Chapter of the Surfrider Foundation). An example – Long Beach Lodge Resort has stopped using 12,000 straws each year. "It's one of those things where you don't know what you don't know.", said the its executive chef Ian Riddick. "We were serving straws and plastic picks and doing what we were doing for decades." "The decision was a no-brainer...". It is "... expensive and uses energy to transport straws to the resort by truck with all the other products." "Our guests really do get it.", he said. "It was really simple. And change isn't always simple in business." The resort offers cornstarch straws to diners on request, while some other businesses in Tofino use biodegradable paper and bamboo straws. The next target in Tofino's campaign is single-use plastics; the first of these is plastic bags; the second, plastic water bottles; the third, plastic coffee cups.

To read the complete article, go to http://www.theglobeandmail.com/news/british-columbia/vancouver-island-towns-anti-waste-campaign-starts-with-straws/ article29563706/#.



NEW AND RETURNING

Returning - Sylvia Fullerton New - Lynne Kovan New - Cheryl J. Leyten New - Heather and Bernie McKenna Returning - Terrence Paris New - Sandy Yorke

SPECIAL ARTICLES

A FRESHLY CANVASSED CANOE ... – Gareth Harding & Mildred Harding-Lyons May 1st, 2016



... on a beautiful spring day! The morning after having picked up my freshly canvassed canoe from Kip Mc-Curdy at St. Croix Cove, I awoke and realised that Nova Scotia lakes were calling strongly, and the sky was clear with a slight frost on the neighbouring roof tops.

After mulling over in my mind several possible places to put into the water, I decided to do some desperately needed trail work on one of my favourite lake chains. Admiral (or Baker) Lake has been one of our most successful and scenic fishing destinations after Bob Conover discovered it in the early 70s*. Last year Renée Lyons and I, along with our young Jack Russell, Millie, went into Admiral Lake for the day and found the portage between Otter Pond and Admiral so thickly overgrown with young spruce and fir that it was impossible to see your legs! The glacial landscape there is so littered with granite boulders and cavities that portaging can be very hazardous. A number of years ago, shortly after the havoc wrought by Juan**, Renée and I had gone through with a chain saw cutting a path through the deadfalls; someone had previously started to remove fallen trees and had given up a third of the way over, so we had decided to complete the task.

To resume my story, the day started by picking up my canoe from my friend Anja Pearre's back garden bright and early. I was invited in for tea but Renée and I had both just had coffee so I conceded that another time would be more appropriate. After all, I had a mission, and Millie was 'wired to go' as usual at this time of day. We arrived at the beach boat launch on Eel Pond, just in from the Fire Department's filling station off Highway 7. Millie was running in circles and fit to be tied, while I was attempting to concentrate on getting all my gear, plus Millie, into the canoe. We were just about to push off when I noticed my life preserver wasn't aboard. (I now bring it for a knee rest in case of the most improbable event of meeting a fisheries' officer in the woods). As I stared back towards the shore I was certain that the life jacket had been with the rest of the gear on the ground by the car. Millie must have attacked it and dragged it off somewhere. I told her to stay, *firmly*, and headed back to find the bright orange jacket; Millie caught up to me. When we returned with it, the canoe was serenely drifting offshore with an ever-so-gentle breeze. I had to make a quick decision, which came down to one option - I'd better go for a swim, and guickly! I frantically stripped to my underwear and socks and dove in. Wow! It felt like ice water, which it very nearly was! I did a vigorous free-style towards my immaculate canoe as it drifted ethereally out towards the unpopulated side of the lake. I came back with the canoe in tow, splashing and numb, to find Millie dry and looking baffled by

the whole show. I left my underwear on a huckleberry bush to dry, redressed, and headed out across the lake shaking my head. I suspect that Millie, jumping out of the canoe, had been enough to set her afloat, but that is covering up my own shortcoming in not pulling it securely to the shore.

I soon warmed up again with all my paddling down to Squint's Brook, and in passing I bade a good morning to the man at the lone cabin near the portage. Very community-minded, he keeps both Squint's Lake and East Lake portages immaculately whipper-snipped. His efforts are not only welcomed by canoeists but are also ideal for Mayflowers as they proliferate in sunny openings; the sun was warm now and the Mayflowers were in bloom. I always forget the steepness of this portage, which reflects on my memory, which always emphasises the more recent less strenuous return downhill aspect with a lighter pack. There is only one rowboat at this lake now; all the fishermen 'ride on their bottoms' with ATVs over Bear Hill to Admiral Lake.

Squint's Lake was magically calm and a lone trout was jumping amongst the maze of boulders between the launch-cleft in the bank and the open water; this brought back memories of Bob urgently trying to get his fishing rod operational. Cassandra (or Leather-leaf), Chamaedaphne calyculata, the bush which surrounds the launch, was about to bloom, while its leaves were still showing the strain of the past winter. Woodpeckers were drumming from the hills on both sides as I paddled across the lake; most likely Hairys. The short haul over to Otter Pond was unkempt but readily passable. The trouble with canoeing solo is that the canoe is always pointing in the wrong direction when you either approach or leave a portage and this can be a challenge in tight guarters! Millie crossed over to the pond ahead of me and surprised into flight a loudly guacking duck that must have been feeding close to the Cassandra. It splashed down half way up the pond and to my delight, on examination, it turned out to be a male Wood Duck, one of the most colourful waterfowl, with strikingly brilliant white head markings and a rusty chest. Hopefully, there was a female nearby who was looking for, or had found, a crevice to build a nest.

The Mayfly was out in numbers in this shallow little pond, with many already spent and floating on the surface, their purpose accomplished. Come to think of it, the Wood Duck was probably eating dead and dying Mayfly. Millie, also, chased and ate quite a few of them in the canoe as I paddled across the pond. Some canoeing organisation or other had marked these portages with white plastic squares, but my hat is off to the uninitiated to find their way across this one.

We left the canoe (well-secured this time) and headed up the trail with my heavy-duty bush clippers and pack. The little blue butterflies, which are synonymous with trout fishing, were flitting precariously close to my big feet in the moist, mucky areas of the trail. I had to assemble my saw to remove a couple of windfalls, but mainly, I clipped brush. (You would think saw assem-

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bly would be easy after decades of use but somehow it ends up as a trial-and-error mental challenge each spring.)

Once we reached the valley we got into more serious brushwork. The firs and spruce, which had sprouted up where Juan had flattened the forest, were so thick you would have to be familiar with the trail to know that a trail indeed existed. It was slow progress but very gratifying to glance back at a familiar old trail emerging with all its distinctive boulders. A couple of curious Ravens flew over several times to see what we were up to, and I know exactly where they nest; they have occupied a ledge under an overhang high up on the bluff, half way up the lake to Camp Island for quite awhile.

Suddenly, I felt guite thirsty, hungry, and tired, and Millie had stopped disappearing and reappearing from the groundcover of fir/spruce and had taken to basking in the sun on mossy patches; it's a major accomplishment in life to exhaust a young Jack Russell! It was already 3:00 p.m. so I decided to fast forward to Admiral Lake to make a cup of tea and eat a late lunch. One of the most beautiful sights here is when you reach the notch in the hills at the top of the valley and gaze out along the length of the lake with its islands and steep hills. Not a fisherman to be seen. It was very dry, so a pot of water was soon in a rolling boil over a stick fire laid on top of soaking bog moss! Nothing beats tea for thirst-killing in the woods. Millie and I shared pre-prepared lunches while a Myrtle Warbler flitted along the lake edge. A pair of fishermen, one old and one young (or a woman), came out of the outfall stream to Salmon River Lake but didn't notice us. I smiled at the thought of them being frustrated, as I have been, trying to catch a fish in Poison Ivy Pond. This pond is boiling with trout at this time of the year when the Mayflies are out, but they are hard to fool. A green Canadian Tire canoe came down the lake towards us, but it turned west around the islands. After dowsing the fire we headed back and on our way clipped the branches of the older conifers. This is the previously-noted area where a clear-cut had been carried out before Juan, thus this part of the trail had been previously reclaimed once before from dense forest regeneration.** We finally reached my just-freshly-cleared section of the path by 5:00 p.m., then headed home. On the trail back, I managed to locate with difficulty, under a tangle of deadfalls, the large mossy boulder which conceals trickling ground water. This spring is within arm's reach through a gap under the boulder, and is refreshingly pure and cool even in the heat of summer. There used to be a thick, restaurant waterglass stained green with algae left upside down in the moss, just waiting for the thirsty traveller!

As I paddled back over Otter Pond, I noticed large, tennis-ball sized amphibian egg masses (?) floating just above the mud bottom. On Squint's Lake we came across a pair of ducks which I had trouble viewing because the wind had swung the canoe towards the shore as soon as I had stopped paddling. They flew to the far end of the lake and stayed near the bushy shoreline. I didn't get a great view of them, but it was enough to identify a pair of our favourite little Hooded Mergansers; the male's crest was not erect but the white patch and shape was distinctive. The male is dressed formally enough to be one of the Queen's guards at Buckingham Palace! Two of the most exotic and colourful ducks in Nova Scotia seen in one day!

The trip across Eel Pond was a hard paddle against a stiff breeze; it seems that there is always a sea breeze to greet me on my return. My friend Anja surprised me when I returned to Halifax, just before dusk, with a very welcome rack-of-lamb, mashed potatoes, and green peas which she had saved from her supper.

*Bob Conover had located the lakes on the east side of the Musquodoboit River while leisurely investigating topographic maps at his kitchen table in Waverley. He had taken his then young family on a canoeing trip, but had missed the jog in the age-old portage just past the brook emptying into Eel Pond. They'd followed the little brook straight up the hill through primeval bush to Squint's Lake, which must have been a superhuman effort with a 16 ft cedar Old Town canoe and packs bursting with his garden produce.

**A landowner had clear-cut the top of the pass, formerly owned by a previous director of BIO, Lloyd Dickie, which made the entire valley more vulnerable to windfall; then – along came Juan!



OUR UNFORTUNATE BATS

– Stephanie Robertson

At Horseshoe Island on the Northest Arm, my daughter recently saw what was most probably a migrant tree bat, a Hoary Bat *(Lasiurus cinereus).* This sighting inspired me to do a bit of research. The 1976 Spring Issue, #4, reported a second annual Hayes Cave Bat Count, by then Newsletter Editor Debby Burleson; it came to 4,500 ±250! The bats in Hayes Cave were mainly the Little Brown Bat, *(Myotis lucifugus)*, the Northern Long-eared Bat, *(M. septentrionalis)*, and the Tri-coloured Bat (previously named the Eastern Pipistrelle), *(Pipistrellus subflavus).* I, too, have been privileged to have taken part in a Haye's Cave bat count (where, in a February I believe, I fell into the cave's small lake, and had to keep running all the way back to the car so that my pant legs would not turn to ice!).

Unfortunate, the conditions our bats need for hibernation – cold temperatures and 100% humidity – are also ideal for the now endemic White-nose Fungus. Sadly, the latest news from the NSMNH's Andrew Hebda (16/06/2016) is that approximately 95% of our bats have been decimated by this scourge. Only much smaller groups are seen now, and in Cape Breton, where population levels are still acceptable, it is expected to eventually spread there as well. Let's hope there are at least a few bats left which are, or have become, immune to White Nose Fungus, and are right now replenishing Nova Scotia's bat populations. Only time will tell.



HFN TALKS

BUTTERFLY ATLAS



Our April speaker was Maritime Butterfly Atlas (MBA) director John Klymko – a citizen science project than ran from 2010 to 2015. The goals of the MBA project were to better assess the conservation status of our butterfly species for three Maritime Provinces, as well as produce a robust baseline dataset for butterfly distribution in the Maritimes. Requiring only photos or specimens for the project allowed everyone with an interest to participate, one didn't have to be a butterfly expert to contribute.

John grew up in Kitchener Ontario and did his undergraduate science degree in Biology at the University of Guelph. He enjoyed his time there so much he remained and did his BSc, his major being Fly Taxonomy.

He has worked with the Sackville NB Atlantic Canada Conservation Data Centre for six years. Among other things, he has conducted studies on bees, dragonflies, and birds; assessed the conservation status of all animal species; and assembled data on rare species and species' communities.

Results: There were two 'first evers' recorded for the the Maritimes – the Crossline Skipper and the Ocola Skipper. The Ocola Skipper is a vagrant and is similar to the Louisiana Water Thrush (the bird noted in the 'Nature Notes' before this presentation), in that it, too, was most likely off-course. The Crossline Skipper, being a resident species, was found for the first time in New Brunswick, with seven new provincial records.

The Northern Crescent was the most frequently recorded species, and the Two-Spotted Skipper was noted in two records for Nova Scotia, being the first two records ever for this species in that province.

A noted departure from New Brunswick was the Greenish Blue, while the Eastern Tailed Blue showed an opposite trend during the Atlas period, with four records in 2013 for the first time ever in Nova Scotia. It seems likely that this is a genuine new arrival.

A mass movement was seen with the huge migration of butterflies noted in 2012. The most well-known amongst them is the Monarch, a species recognised for its amazing Southern migration to Mexico every year. Also found were the Red Admiral, Painted Lady, American Lady, and one unrecognised species; these all migrate North into the Maritimes every year. 2012 also brought a number of vagrants. Nova Scotia had its second ever American Snout which has a very elongated palpate or mouthpart, and the second ever Nova Scotia record for the Fiery Skipper. There was also a first ever record of the Fiery Skipper for St. John, New Brunswick; also, the Giant Swallowtail, a species that hadn't been seen in the Maritimes for almost a century, was recorded five times in New Brunswick in 2012.

One of the goals of the Atlas was to improve on the conservation ranks assigned to butterfly species. S1 indicates a rarer species, whereas an S5 indicates a very abundant species. Overall there was a general 'lifting' of ranks for a lot of species, showing they were not as

rare as previously thought. For instance – the Common Roadside Skipper was previously an S2 and has now been bumped up to an S3/S4 category. Also noted was the Mustard White, which had declined in the 1950's and has now somehow grown in numbers. The Eastern Pine Elfin is also now being ranked as an S4 where previously its numbers were quite low. The Silvery Checkerspot however went from an S2 to an S1? rank for Nova Scotia, (the question mark indicating it may not be present at all).

Worth mentioning is the Salt Marsh Copper – a species endemic to the southern Gulf of St. Lawrence and the Gaspé Peninsula regions, as well as the Maritime Ringlet – found only in the Bay of Chaleur area. Both species are found nowhere else on Earth! They need saltwater marsh habitats and are susceptible to sea level rise, ergo, if we lose these habitats we will be saying goodbye to these butterflies as a result. A sad outlook indeed.

John is currently working to finalise the 2015 dataset, hopefully by mid-May. This will be posted online along with all the maps. As well, he is working on a book, in collaboration with a group of researchers from Maine who have done a very similar project, which will showcase the results of the two projects side by side.

It is hoped that the Butterfly Altas will be repeated again in 20 years or so, as surely there will be noticeable differences due to climate change.

EASTER ISLAND

– Stephanie Robertson

Barbara O'Shea, founding Director of Dalhousie's School of Occupational Therapy from 1981 to 1998, has been a world traveller for most of her life. Her many teaching and research trips have taken her to 55 countries, including Kenya, Iceland, Japan, Finland, Sweden, Denmark; to all countries which touch the Arctic Ocean; and to all seven continents, including Antarctica.

Last Easter, Barbara took a Road Scholar tour to Rapa Nui. Europeans had first landed there on Easter Day, 1722, thus its former name of Easter Island. A Chilean island in the southeastern Pacific Ocean, at the southeasternmost point of the Polynesian Triangle, it is the most isolated and remote island in the world, being 2,080 km from the nearest inhabited island – Pitcairn (with a population of about 50) – and approximately 3,500 km west of mainland Chile. In 1995, UNESCO named Easter Island a World Heritage Site, with much of the island protected within Rapa Nui National Park.

Rapa Nui is one of the most mysterious of civilizations. Thoughout the presentation we were shown many photos of some of those approximately 900 iconic, colossal monolithic heads, or 'moai', which were created by the early Rapa Nui people. There was one picture

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of four of these giant heads lined up along a stone 'ahu' (a horizontal, long stone shelf), and one of these was sporting a kind of topknot called a 'pukao' (it resembles a thick, flat hat).

We were then oriented with a map of the island. The western town of Hanga Ro is adjacent to Rapa Nui's Mataveri International Airport with its four km long runway, and is a six-hour flight from Chile. Barbara's hotel sported several beautiful gardens with many plants and flowers, and a pool. We also viewed a local 'lookout' amidst lovely, rolling hills. The island had been formed in the past by three erupting volcanos, and there were images of many ancient lava chunks on the grassy swards.

Barbara's Rapa Nui guide was related to the first governor of the island when Chile annexed it in 1888. There are many different sites where the tremendous, mysterious moai can be seen, some upright, and some knocked down. With no written history, the reason for this can only be conjectured; fighting among clans could be one reason. One area we saw sported only heads and one separate pukao.

Because of all the mystery surrounding the moai, the island is the most studied on earth. In the past, with a lack of modern scientific techniques and technology, many faulty theories as to the moais' origins had been conjectured over the years. But recently, with carbontesting, their ages have been determined. Interestingly, most moai face inland. We saw pictures of more akus (the stone shelves previously mentioned), and the Ran Roraku quarry of volcanic tuff, a light volcanic rock, where almost all of the statues' carving took place. The general technique was to dig a trench near a rock face, carve the moai, and then cut the whole out of the mountain. We saw one unfinished, still in situ, which had been in the process of being carved. Some moai are as tall as 11 metres high and weigh tonnes. Another had an unusual roundness to the head, and the face was pockmocked. It was the only 'kneeling' moai, and its arms were well-carved but also unusual in that they were depicted as being held behind its back.

The Puna Pau quarry yields red scoria, another light, porous volcanic rock, used for the moais' topknots, or pukao. Basalt, a harder, dense stone, was used for 'toki' (the hand-held stone carving tools); obsidian, a volcanic glass with sharp edges, was used for sharper implements such as mataa (spearpoints) and for those moai which had inlaid eyes (for the black pupils). A very large top-knotted moai, one of the largest at 15.5 feet and weighing 20 tons, sported traces of these inlays, one of the very few to retain this decorative feature; its irises had been inlaid with white coral. Some of the eyes are now painted in to show what they would have looked like when originally made. Some moai had not been finished, and some were mostly buried. With carbontesting, it is known that the carving was carried out at different times between 1250 and 1500. Some had incised figures on their surfaces (we saw one of a boat). Those with retained traces of incising had been buried, therefore their easily erodable 'tuff' still retained their surface decorations. Interestingly, all moais' faces are different.

There are many caves on the island which were formed during the cooling and hardening of volcanic lava, and there are many stories about how the people used them. Some have ancient cave paintings. Something I found very interesting – we were shown a stone seawall which had been constructed very much like the tightly fitted-together stones of Machu Pichu in South America.

In 1960, a tsunami caused by an earthquake in southern Chile toppled 15 moai; we saw them as they had been restored, upright, and on a 149-metre long aku. Only one of them had a remaining pukao, but all the heads were flat so probably they all originally had them. Seven more moai in line near a sandy beach boasted more incised carvings on their backs, one in the shape of a knot.

Now restored, Orongo was a ceremonial centre on a very high volcanic crater lip where initiation rites had been practiced. It increased in importance in the 1700/1800s along with a Tangata Manu (Bird Man) cult associated with a Make-Make god, because of tribal crises which caused a decline in faith in the moais, chiefs, and priests. The warrior class, or Matato'a, took power, creating a new religion based on a Bird Man Competition in which power was determined by physical prowess rather than rank or status. The competitors' goal was to obtain the first Manutara (an Easter Island gull) egg and with it the power to govern the island for a year. This ceremony was performed until 1862.

There were two very influential men connected with Rapa Nui – American anthropologist William Mulloy (1917-1978), and Father Sebastian Englert (1888-1969) - a resident Bavarian Roman Catholic priest who compiled systematic field notes on the island's archaeology, ethnology, and language which he shared with Mulloy. Englert spoke Rapa Nui fluently, and conducted mass in it as well. The island's museum is named after him – the Father Sebastian Englert Anthropological Mueum of Rapa Nui. William Mulloy was responsible for a lot of the moai being restored to their original upright positions, and for bringing Rapa Nui to the attention of the rest of the world through a series of famous radio broadcasts. Both men are revered by the Rapa Nui people, and are buried on the island. We also saw an interior of a Catholic Church with some recent Rapa Nui installations (they were previously disallowed) - for instance, we saw a Bird Man perched on top of a statue of the Virgin Mary.

The island used to have lots of trees such as giant palms, but along with the influx of people came Polynesian rats which ate the young trees and their fruits and seeds as well. Grazing sheep have ruined further chances for reforestation.

Having known of Easter Island for many years, I was appreciative of Barbara's presentation which revealed a more accurate history of this famous sit, and some facts I had not previously known. Thank you, Barbara.





2 JUNE – Burkhard Plache

"Not All Rocks are Granite": At our June meeting, HFN member Dr. Barrie Clarke gave a presentation on granite. He has studied geology and petrology in Canada and abroad. During his tenure at Dalhousie University, he researched the volcanic rocks of Baffin Island and southern Africa, and especially the granites of Nova Scotia, which were the focus of his presentation.

Barrie began the talk with a seemingly simple, but deep, question - what is a granite? The answer can be found by noting that all rocks are composed of one or more minerals. Minerals are inorganic chemical compounds naturally occurring in the environment. There are a total of some 5,000 known minerals. Chemically and structurally simple minerals are diamond (which is composed solely of carbon); halite (commonly called table salt, composed of sodium and chlorine); and guartz, which is silicon oxide. Other minerals are made up of a higher number of elements, e.g., feldspars contain sodium and/or potassium, aluminium, silicon, and oxygen. Only a small fraction, some 20-25 of the 5,000 known minerals, form the bulk of the rocks on earth. Granites, in particular, are composed predominantly of guartz and two types of feldspar: orthoclase feldspar and plagioclase feldspar. The terms orthoclase and plagioclase describe properties of the crystal structure of the two feldspars. In orthoclase feldspars, there are two cleavage planes at right angles to each other. In plagioclase feldspars, the two cleavage planes are at oblique angles. Other minerals (e.g., mica, which is typical for granites in Nova Scotia) may or may not be part of a particular granite. The mineral composition, however, is not the only factor in determining a type of rock. The texture of aggregation of the minerals comes in two types, which reflect the origin of the rock. Sedimentary rocks are also called clastic (from the Greek κλάω [kláo] meaning fragmented), in which the mineral grains are cemented to form the matrix of the rock. Igneous rocks are formed when a liquid magma cools underground; the minerals crystallise into an interlocking network of grains which are typically harder than sedimentary rocks.

Having put this terminology into place, Barrie then which formed from cooling magma under the surface, i.e., without erupting, which is composed of quartz and the two above mentioned types of feldspar, plus some optional minor minerals. The relative amounts of the quartz and feldspars may vary somewhat; the amount of quartz may range from 20% to 60%, with the remainder being feldspars.

After defining his terms, Barrie proceeded to illustrate the properties of granites using interesting facts.

Variable Appearance: Granites vary both in colour and in texture. They range from whitish-grey over pink and red to whitish-grey over darker grey or black. Here, the composition of the feldspars determines the strength of the red hue, and the gray and black is due to the amount of biotite or hornblende. Besides the colour, the grain size varies. Large crystals in the granite rock indicate that the magma cooled more slowly, allowing more time to assemble the atoms into a regular lattice; small crystals, conversely, occured when the magma cooled more rapidly.

Formation During Continental Collisions: The granite of southwestern Nova Scotia originated in the collision of the North American and the African continental plates, some 380 million years ago. Over a period of some million years, one plate was pushed under the other, and then the material of the lower plate was heated in the depths and started to melt. Being less dense than the material above it, it began to well upward.

Granite Emplacement: In Nova Scotia, a massive body of magma (estimated to be 100,000 cubic kilometres, i.e., some $100 \times 100 \times 10 \text{ km}$) moved upward. In that process the rock ceiling above it started to partially melt and break into blocks which sank into the body of the magma. Some blocks were melted completely, dissolving into the magma. Some pieces stayed intact until the magma solidified, and are now visible as non-crystalline inclusions in the granite, called xenoliths (foreign stones).

Abundance: Granites make up large parts of older and deeper parts of the earth crust. One example is the Canadian Shield, which covers more than half of Canada. Originally formed deep under the surface, the overlaying rocks were eroded away over billions of years.

Resistance to Erosion: Southwestern Nova Scotia owes its existence to the hardness of its granites. During the ice ages, softer rocks would have been scraped away; the tough granite remained, with the whalebacks a witness to the power of these glaciers.

A Host to Valuable Ores: Granites elsewhere (e.g., in the Canadian Shield) and locally in Nova Scotia have places with high concentrations of economically important minerals containing metals such as Uranium, Manganese, Tin, Tungsten, Molybdenum, Copper, or Gold. These areas of minerals form by a process called fractional crystallisation. The original magma contains trace amounts of many metals. The atoms of these metals are large, and do not fit into the lattice structure of quartz and feldspar. Hence, during the cooling process, these metals stay in the molten magma to the very end, and get concentrated. At the very end of the cooling process, these metals also crystallise, forming their own minerals.

Use as Dimension Stones: In Halifax, many historic buildings utilised granite from the Purcell's Cove area. Even today, granite finds its use, for example at the rebuilt seawall at the Dingle Tower, or as irregular stones to stabilise slopes which have been disturbed during construction.

Curling Stones: The best curling stones are made from a granite found in Ailsa Craig, Scotland. It is an extremely fine grained granite which is very tough and does not fracture easily.

Source of Kaolin: The clay used to produce fine china is kaolin, which originates when water percolates through the still hot, but no longer molten granite. A chemical reaction with the heated water converts the feldspar into kaolin.

Granite Rock Music: Barrie finished his presentation with two examples where granite was used to make music. The first featured artist was Klaus Fessmann. He uses blocks of granite which he saws into a series of slices which are all still joined at the bottom. He makes the rocks vibrate by rubbing the slices, and this generates a humming sound. The second design was created by the Meissen China Copany. It is a working organ using pipes made from porcelain (a very fine china made from kaolin).

The presentation was concluded by a lively question and answer period. I would like to take the opportunity to thank Barrie for an insightful presentation, illuminating many aspects of a common, often little appreciated type of rock.

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HFN FIELD TRIPS

PROVINCE HOUSE

- Avery Bain and Nancy Covington

Date: Wednesday, March 30th Place: Province House, Barrington Street Weather: A bit of misty rain, cool, then sunny Leader: Dr. Howard Donahoe Participants: 31



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On the evening of March 30th, 31 participants were given a geological, architectural, and historical tour of Province House by retired Department of Natural Resources (DNR) geologist Dr. Howard Donohoe. This house has been described as "one of the most beautiful houses in Nova Scotia, which you own through your tax dollar." This recognition made for an extra special occasion for many of the participants, especially those who were first-time visitors. The cornerstone for Province House was laid on August 12th, 1811, and eight years passed before it was completed at a cost of £52,000.

Our tour began in the grand entrance hall where we were instructed to examine the black and white stone tiles underfoot. Upon close inspection it was observed that many of the black limestone tiles contained fossils (gastropods and cephalopods), whereas the white marble tiles had none. Dr. Donohoe suggested that the limestone was likely quarried in the United Kingdom and the tiles were transported as ballast in a ship from England. He explained that the white marble was also most likely from the UK but was lacking in fossils because after forming, the rock was subjected to intense heat, pressure, and folding, which would have destroyed them.

Descending from the main floor, it was noted that the renovated basement floor was finished with black and white ceramic tiles laid on the diagonal to be in visual synchronicity with the black and white stone tiles on the first floor. Proceeding to the unfinished mechanical room, we were able to observe the three-feet-thick walls which supported the structure of Province House. Howard explained that in the absence of stud-wall framing, these stone walls carried on up to the roof line, gradually diminishing in thickness as they got higher. This same architectural design was used in constructing the Saint Mary's Cathedral Basilica and the Art Gallery of Nova Scotia. The stone for the lower floor walls is a very hard metamorphic rock called ironstone; its source was the Dalhousie guarry near Purcell's Cove. The upper storey walls are made with the more finely dressed masonry of lighter sandstone blocks quarried in Wallace, N.S., allowing for a more finished appearance.

Ascending from the basement, our attention was directed to the grey granite steps containing whitish, mottled inclusions in the stone with the geological name 'xenoliths'. Dr. Donohoe referred to them as 'fingerprints in stone' because they can be used to trace the origin of a particular granite. Our 'solid-as-a-rock' perspective was somewhat shattered when we discovered that the railings, staircases, and great white columns in the entrance hall were all made of iron and ordered from a catalogue.

Perhaps austerity trumped elegance in this phase of construction in order that resources would be available to opulently embellish the Red Chamber. Upon entering this Chamber – with its high ceilings, two fireplaces, molded plaster of Paris decorations on walls and ceilings (made from gypsum sourced from the Rawdon mines in Hants County), and touches of marble dispersed throughout - 'awestruck' was our general consensus. Some might conclude that the room is an acknowledgment that Nova Scotians can squander resources with the best of them, while others would maintain the room signifies dignity and commands respect from those who enter. Apparently, between Governor Wentworth and the elected Legislature this same argument was hotly debated during the construction phase of the Red Chamber. Originally, the Chamber was where the appointed Legislative Council met, but when this body was dissolved in 1928, the room came into general use for legislative committee meetings and special events a function that it satisfies today. The ship's table at the front of this room is made of English oak, and it was used by Edward Cornwallis to conduct his first Nova Scotia Council meeting on the ship Beaufort.

Dr. Donohoe concluded the tour outside, where we learned that the exterior walls of Province House were built from large blocks of sandstone from the Wallace quarry. The use of this porous sandstone from ground level upward has allowed water to infiltrate, and this stone's porosity in our freeze-thaw climate has led to huge maintenance issues, especially at the base where water collects. In contrast – the Art Gallery of Nova Scotia (built later in 1866), the Government Building, and the Bank of Nova Scotia – have a first course of granite at base level to prevent this problem. It was also noted that the adjacent Government Building, though similarly sandstone-clad, was of steel frame construction and had thinner walls.

It is outside the gates, looking at Province House from Hollis Street, that the symmetrical and uniform nature of the building's design can best be appreciated, and it reminded us of the early influences of British tradition in architecture and in governance.

Much appreciation is extended to Dr. Donohoe on behalf of the participants. It was indeed a privilege to be able to see the 'rocks' in our Province House.





PIGGY MOUNTAIN HIKE

– Ingrid Plache

Date: Saturday, April 16th Place: Piggy Mountain, Purcell's/Herring Cove Backlands Weather: Overcast, windy, 6°C Leader: David Patriquin Participants: 25

On this cool spring day, 25 of us met at York Redoubt for this hike to Piggy Mountain. We made our way across Purcell's Cove Road and then down Aaron's Way, where a private side lane (used with permission) led to the start of the trail.

Piggy Mountain is a large granite outcrop, located in the Purcell's Cove/Herring Cove backlands which stretch

roughly from Williams Lake to the north, to Power's Pond near Herring Cove to the south; they are flanked by Purcell's Cove Road to the east and Herring Cove Road to the west. These backlands include some special features, such as the Jack Pine/Broom Crowberry Barrens, a nationally unique ecosystem which we were going to see.

Early on along the trail, Sheep Laurel (*Kalmia angustifo-lia*), a small shrub with last year's leaves still attached, was plentiful. Additionally, Wild Raisin, or Witherod, (*Viburnum nudum*), a larger shrub, and Red Maple (*Acer rubrum*) occurred frequently; these were only just showing their buds. Further up the slope, David pointed out burnt Sedge (*Carex adusta*), a rare plant which was growing at the roots of a toppled Red Maple.

Walking the trail loop counter-clockwise, we encountered blackened tree trunks, remnants of the 2009 fire that had burned through the whole area. In the years since, new growth in the form of low shrubs and tree saplings have sprung up and covered the ground. In addition to the above mentioned trees, we saw Big-tooth Aspen (*Populus grandidentata*), Grey Birch (*Betula populifolia*), Serviceberry (*Amelanchier* sp.), and Mountain Ash (*Sorbus* sp.). Soon we reached our first stop with a good view over the backlands – to the south the ocean and Herring Cove – to the west whale-back shaped granite outcrops which had lost their tree cover after the fire, and, close by to the north – a stand of Jack Pines (*Pinus banksiana*). These had been all burned and blackened, but there were scattered young trees already coming up.

Here on the south slope the vegetation changed slightly. We saw less Sheep Laurel, and more Huckleberry (*Gay-lussacia baccata*). Teaberry, or Wintergreen, (*Gaulthe-ria procumbens*) grew abundantly and a few Mayflower (*Epigaea repeN.S.*) were in bloom. British Soldier Lichen (*Cladonia cristatella*), a species seen more often after fires, covered the rocks.

On a granite outcrop at the edge of the Jack Pine stand, we made a second stop. Jack Pine is a northern species which reaches its southern limit in Nova Scotia. Some of those which had germinated since the fire were already bearing cones. This is due to its fast life cycle in its southern limit, where cones are already formed on four- to fiveyear old trees. Jack Pine grow well in areas that are prone to frequent fires and is naturally adapted to such occurrences. Their cones remain closed and on the tree until they are heated to temperatures of some 50°C, as happens in a forest fire. Only then do the cones open to release their seeds, to be scattered over the now barren ground which offers ideal conditions for germination. Such open ground is important for Jack Pine seedlings, which need a lot of light. Noting that some of the seedlings had cones which were already open even without a fire, David explained that different cone types occur in Jack Pine in adaptation to the local growing conditions; Jack Pines in less fire-prone areas may have cones that open at lower temperatures, and there is always some variation in this trait across individual trees.

Two other plants associated with fire were also present on the outcrop – Golden Heather (*Hudsonia ericoides*), and Broom Crowberry (*Corema conradii*). Both are low shrubs with small, needle-like leaves. Golden Heather is a rare plant in Canada. But in addition to this area, it also occurs in other places in the backlands. As the common name implies, the plant resembles Scotch Heather, but it has bright yellow flowers which come out later in June – an enticement for us to return later in the season. Broom Crowberry, the other plant, can produce mats up to 10 to15 feet in diameter when mature. It has fruits with a fatty tissue (elaiosomes) attached which ants like to eat. The ants bury the remaining seeds, and thus the plants can survive fires in an underground seed-bank even when the above ground parts burn away. Broom Crowberry generally occurs in more southern regions and here in Nova Scotia it reaches the northern limit of its range. While not rare here, it is considered rare in the rest of Canada.

The barrens in the Purcell's Cove backlands with their joined occurrence of Broom Crowberry and Jack Pine form a unique ecosystem. These fire-dependent Jack Pine/ Broom Crowberry barrens are found only on scattered rocky outcrops near the Atlantic coast, and thus worthy of protection. It has been estimated that before human use, the fire frequency was lower than that of today. Now, there are small fires every few years, and larger fires some 40-50 years apart.

When looking around, the effects of the latest fire were clearly visible; most of the ridges were burned over, with wide swaths of pale tree-skeletons bearing witness to the destructive potential of this force of nature. Conflicts arise when homes are built adjacent to or inside such a fireprone landscape; to reduce the risk to their homes, owners are compelled to create a zone without trees, replacing the natural beauty with artificial landscaping.

Continuing along the trail, we soon reached the top of Piggy Mountain. Here we took some time to admire the view and to explore. The top is dominated by undulating ridges of bare granite, interspersed with the bleached remains of tall Jack Pines and small saplings coming up again. The dominant shrubs were Blueberry (mostly *Vaccinium angustifolium*) and Huckleberry. In the fall, these shrubs offer a tasty harvest, and the stunning red leaves create an opportunity for spectacular photos. A local painter has been working in the backlands to depict the natural beauty of this area. Another little treasure was a small water-filled depression at the top of Piggy Mountain. It had Cranberry (*Vaccinium macrocarpon*) growing throughout, and was bordered by sedges and rushes.

Finally, we headed back down, with a new appreciation for a gem so close to the city. Situated in the larger backlands, and offering a fine view over most of it, we got a sense of how large and fairly undeveloped this area is. It is easy to believe that the mainland Moose that are spotted sporadically near Halifax use this area for foraging and as a corridor from and to the wider Chebucto Peninsula.

I would like to thank David for leading the hike and for sharing his knowledge of and love for this area with us. We all learned a lot about the natural history of this wilderness at the edge of the city.





WATERFALL TRIP

– Richard Beazley with colour commentary by Susan Moxon, geological notes by Barrie Clarke

Dates: Saturday and Sunday, April 23rd and 24th Place: Pictou County, NS Weather: Sat. sun/cloud, 10-24°; Sun. showers/cloudy, 1-3° Leader: Richard Beazley Participants: 18 HFN members On a glorious spring morning an eager group of Halifax Field Naturalists set off on highways, trunk roads, various routes, and numerous gravel roads for a weekend outing to see waterfalls and to learn more about the fauna, flora, and geology of Pictou County.

After gathering at 10:00 a.m. near Mt. Thom, we headed for Bezanson's Lake Brook Falls and soon entered a gravel road with Coltsfoot popping up here and there, snow in some ditches, and a stand of Sugar Maple on the left, where one can imagine sap dripping into buckets on such a spring morning. On the right, clearly visible from the road, was the waterfall, but we were eager to get closer. Sadly, on our descent into this tree-surrounded ravine, we passed through a rural garbage dump of bygone days, now somewhat covered by natural debris and living plants. The waterfall was a 9-m-high beauty with water tumbling down well-worn channels on both sides of the defiant, convex-shaped rock face. Here we made our first geology and flora observations. (see 'Geological Notes' and 'Waterfall Trip Species', p.12).

It was the perfect time to be at a waterfall! Nearly all of the snow was gone, there was an ample flow of water; the few black flies were not yet biting; trees were beginning to bud in subtle colours; and mosses, ferns, and lichens were abundant.

Snaking through back roads, we stirred up lots of dust and enjoyed rural panoramic views on our way to Mill Brook Falls. From the roadside, we got a partial view of a massive rock face with water sliding into a 25-mdeep ravine. Slowly and cautiously descending, hearing the waterfall's roar, we dared not take our eyes from the steep and narrow rocky footpath. At the bottom we turned and gazed at the multi-channeled cascade of water, and in the brook we saw foam bubbles float past and Common Water Striders skimming the surface. The ravine's sides were covered with stately Eastern Hemlocks, which were arched at the base before growing skyward. The cathedral-like setting was shaded and cool, so we sat alone, in pairs, or in small groups, and enjoyed lunch in this beautiful natural place.

After climbing up to the road and our cars, we drove to Concord Falls, just upstream from a steel bridge that crossed the Middle River of Pictou. This waterfall, in a shallow and 20-m-wide ravine, looked like a naturemade dam. Its smooth and grey-coloured bedrock stretched across the river and had one open channel through which the water raced. Forty metres upstream was a second 1-m-high waterfall with wrinkled bedrock of two colours – rusty-red over pale green. Between the two waterfalls a family of five enjoyed an afternoon of fishing for trout. The mixed surrounding forest consisted of small trees, and near the bridge White Birch bent over the river with their limbs dangling lady-like above the water to create an artistic portrait.

Moving in convoy, once more along a dusty road, we passed some local folks burning grass, and nearby was a frolicking goat and a bull with a scarlet collar. The West Branch of the East River runs through Hopewell and presents the community with an impressive 40-mwide by 1- to 4-m-high waterfall. We walked out onto the flat, smooth bedrock beside the flowing water and gazed at the expanse of the falls that cut diagonally across river to a long line of majestic White Pines. There is not enough water to cover the entire width of Hopewell Falls, but four breaks in the rock face channelled the water downstream. We climbed to the bottom of the falls and strolled along the river's now-dry flood plain for full-width views of the falls. Amazingly, two small White Pines grew in a crack on the rock face.

After a walk in Trenton Park and dinner at Pictou's Lobster Bar, we settled for the night at Willow House Inn (circa 1840). Our second day began with a breakfast of wonderful homemade scones, jams, eggs Benedict, cereal, toast, juice, tea, and coffee. An hour later, on a cold and rainy morning, our car convoy climbed up, up, and up to a parking area in the woods and among large snow patches. Need I mention the wind? Br-r-r...! Wearing rubber boots, we walked along a muddy logging road and then down a lane being encroached upon by Balsam Fir and Hay-scented Fern. The Bear Brook Falls was superb – three levels, about 17-m-high and narrow in width - nestled into the side of a hill covered by deciduous trees. Everyone scrambled to get photos. Such a lovely setting in the middle of a secluded woods! Even though cold, we lingered.

Next we cut across the province towards the Eastern Shore. Just past Lochaber Lake we drove a wet gravel road to Route 347 and west to Black Brook Road. All in all, a delightful rural scenic drive, highlighted by a Bald Eagle perched atop a roadside pole. Soon we stopped to the sound of rushing water. With enthusiasm, we headed into the deepest ravine yet. With the aid of an already-installed yellow rope, we reached the bottom of the magnificent 'bridal veil' Black Brook Falls. It is extraordinarily beautiful at 18-m-high and 24-m-wide with its volcanic rock face completely covered by foaming white water. We all took a front-view seat as we ate our lunches, in awe of the spectacle before us. Not wanting to leave, but urged to do so, we climbed up the steep bank, stood for a group photo, and then celebrated with champagne this 10th waterfall trip initiated by Richard and Grace Beazley. Cheers!

Before long we were at Sutherland's River Falls, which is located beside a private home! We were momentarily distracted by this luxurious residence, making sure the Rottweilers were not patrolling, then we sought out the waterfall. Again, Eastern Hemlock dominated the mixed surrounding forest. Soon we saw and heard water thundering down two side-by-side 14-m-high breaches in a natural dam, both directing water into a turbulent plunge pool, from which the river did a 90 degree turn before continuing on its merry way. Such a demonstration of nature's power, which was made available by generous property owners; we were grateful!

We approached the final waterfall of the trip and Park Falls certainly does not disappoint. It is a four-tiered waterfall that twists and turns in a dramatic setting of rocky cliffs and a coniferous forest. Its total height reaches upward to 20-m as it descends 80-m along Sutherland's River. We walked clearly defined trails, which were steep and slippery in places, to look-off points and finally

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to a gravel beach beside a large pool. Several of us agreed that a visit in warm weather for a swim would be wonderful. This has been an unsupervised gathering place for generations, which, unfortunately, means there was some garbage and unsightly graffiti on rocks, but it hardly detracted from the beauty of this natural gem.

This field trip was a marvelous experience - imagine eight waterfalls in two days! Hooray!

WATERFALL TRIP SPECIES

Funai

Turkey Tail Fungus Lichens British Soldier Lichen Lungwort Lichen Smooth Beard Lichen Pink Earth Lichen **Pixie Cup Lichen**

Vascular Plants

Hay-scented Fern New York Fern Christmas Fern Polypody Fern Balsam Fir White Spruce **Red Spruce** Eastern Hemlock White Pine Goldthread American Beech Yellow Birch White Birch **Pussy Willow** Wintergreen/Teaberry Mayflower Wild Strawberry Red Dogwood Bunchberry

Sugar Maple

Red Maple

White Ash

Viburnum

Coltsfoot

Dandelion

Black Fly

Ladybug

Mosquitos

Common Water Strider

Insects

Ants



Trametes versicolor

Cladonia cristatella Lobaria pulmonaria Usnea trichodea Dibæis bæomyces Cladonia pyxidata

DenN.S.tædtia punctilobula Thelypteris noveboraceN.S.is Polystichum acrostichoides Polypodium vulgare Abies balsamea Picea glauca Picea rubeN.S. Tsuga canadeN.S.is Pinus strobus Coptis trifolia Fagus sylvatica B. alleghanieN.S.is Betula papyrifera Alder (Speckled-incana OR Hazel-serrulata) Alnus sp. Salix discolor Gaultheria procumbeN.S. Epigæa repeN.S. Fragaria vesca Cornus sericea Cornus canadeN.S.is Acer saccharum Acer rubrum Fraxinus americana Viburnum sp.

> Family Formicidae Family Simuliidae Family Gerridae Family Coccinellidae Family Culicidae

Tussilago farfara

Taraxacum officinale

Birds

American Black Duck American Robin Bald Eagle Blue Jay Canada Goose Common Loon Common Raven Herring Gull Mallard Duck Pileated Woodpecker **Ruffed Grouse** Spruce Grouse Yellow-bellied Sapsucker Mammals

Anas rubripes Turdus migratorius Haliæetus leucocephalus Cvanocitta cristata Branta canadensis Gavia immer Corvus corax Larus argentatus Anas platyrhynchos Dryocopus pileatus Bonasa umbellus Falcipennis canadeN.S.is Sphyrapicus varius

Groundhog

GEOLOGICAL NOTES

- Barrie Clarke

Marmota monax

Rivers carry rainwater and meltwater downward under the influence of gravity. The flowing water slowly erodes the soils and rocks over which it passes. If the entire length of the riverbed were of uniform hardness and strength, the downward slope of the riverbed should be uniform. Waterfalls represent an abrupt increase in hardness of the riverbed, and a consequent abrupt change in its slope, from gentle to steep (or even vertical). At every locality we visited, we saw resistant, hard bedrock holding up the waterfall. In some cases the contrast appeared to have been between soft glacial soils and hard bedrock, and in other cases the contrast was between relatively soft bedrock and much harder bedrock, but the effect was the same: a waterfall developed over the more resistant material. In some places, the bedrocks were gently inclined and the water flowed over ledges (e.g., Concord, Hopewell), and in other places they were steeply inclined and the water flowed guasi-parallel to the 'bedding' (e.g., Sutherland's, Park).

The following table summarises observations made without the benefit of essential geological tools such as a hammer or hand lens. In many cases, it was not logistically possible to directly observe the rock holding up the waterfall; instead, inferences could be made from broken rocks lying in the riverbed downstream from the falls. (The ages in the table are in 'my' - 'millions of years'.)



WATERFALL GEOLOGICAL TABLE

DAY	WATERFALL	NAME	AGE (MY)	GEOL. FORM.	RESISTANT ROCK
1	1	Bezanson	500 - 1,000	Mt. Thom complex	granite(?)
1	2	Mill Brook	300 - 360	Canso Group	quartzite
1	3	Concord	300 - 360	Canso Group	quartzite
1	4	Hopewell	325	Windsor Group	quartzite
2	1	Bear Brook	420 - 450	Arisaig Group	not observed
2	2	Black Brook	500 - 1,000	Jeffers/Georgeville Gr.	rhyolite, basalt
2	3	Sutherland's	500 - 1,000	Jeffers/Beorgeville Gr.	not observed
2	4	Park	500 - 1,000	Jeffers/Georgeville Gr.	not observed

BELCHER'S MARSH

- Bob McDonald

Dates: Thursday, May 12th, 6:00 p.m. Place: Belcher's Marsh, Clayton Park West Weather: Cloudy Leader: Bob McDonald Participants: 24, including one child



Surprisingly, for us at least, very few of the participants had ever visited Belcher's Marsh previously so this was a voyage of discovery for many. Although our field trip was a bit early in the season for a good show of flowering plants, this visit served as an introduction to this interesting urban wetland habitat.

Belcher's Marsh is located in Clayton Park West in suburban Halifax along Parkland Drive between Langbrae and Farnham Gate Road. The 2.5 km of trail was built by the two developers responsible for the surrounding subdivisions built in the mid-1990's. I know that Prof. Nick Hill used this site as a field trip location for his ecology students while it was still wild land. Nick described this site to me as a fen, a wetland with a welldefined inflow and outflow, both of which we observed. We entered the Park near the corner of Parkland and Langbrae and immediately crossed the bridge over the main inflow into the marsh. Unfortunately, the inflow is mainly storm water these days and so carries with it considerable silt, road salt, and chemicals from lawn fertilizers. We noticed the considerable green algae due to the too-high phosphate level in the water. Nevertheless, we also noted few alien species but many native plants associated with the woodland and wetland habitat.

As we walked along the woodland trail, we spotted our provincial flower, the Mayflower, in bloom as well as one of our earliest blooming shrubs, Hobblebush. This plant consists of an outer ring of large white sterile flowers surrounding the fertile flowers in the centre. We emerged from the woods and looked over the marsh with the musical accompaniment of many Red-winged Blackbirds and Common Grackles. The dominant wetland species in bloom around the marsh was Leatherleaf with its rows of small, white, bell-shaped flowers. We also noted Sweet Gale and the ubiquitous Coltsfoot, already gone to seed. Red Maples were also in flower. Bob pointed out a small island in the marsh which, in season, has healthy populations of Butterwort (yellow) and at least two species of tiny, pink bog orchids including Dragon's Mouth. In late June the woodlands will have Pink Lady's Slipper in bloom.

For many, the highlight of our visit to the Marsh was the observation of two Beavers checking us out from the middle of it. Bob mentioned that a few years ago, beavers had built a dam at the main outflow from the Marsh, under highway 102, and caused much of the trail to flood. City staff could do nothing to help since highways are a Provincial matter!! However, staff from NS Department of Natural Resources intervened and trapped the beavers and re-located them. In all, 11 animals were moved and none had been seen since. So, our observation is the first in several years. In other words, "They're back!!"

panels designed with input from members of Halifax North West Trails, the local trails' group which stewards the parkland. One panel describes the cultural history of the Marsh and surrounding area while the other deals with the natural history. Bob mentioned that over 140 species of trees, shrubs, and flowering plants are found within the Park. We then walked along the stream which connects Belcher's Marsh with Little Belcher's Pond found across Parkland Dr. Again, in season, odonates (dragonflies and damselflies) are abundant here. Bob described one of his 'favourites', a large damselfly called Ebony Jewelwing, the male of which has a metallic bluegreen abdomen, and black wings. A very striking insect, indeed!

For those who would like to visit or re-visit the Park, a large map is posted at two of the key entrances on Parkland Dr. In addition, a brochure describing many of the trails in the area, including Belcher's Marsh, can be found at the kiosk in the Canada Games Centre (CGC) parking lot, or in the brochure rack at the Keshen Goodman public Library across from the CGC.

BELCHER'S MARSH SPECIES BIRDS

American Black Duck 2 Mallard 16 (included at least 2 broods; 1 with 4; 1 with 8 young ones) Rock Pigeon (Feral Pigeon) 2 Mourning Dove 2 Blue Jay 3 American Crow 4 Tree Swallow 2 Black-capped Chickadee 2 American Robin 4 European Starling 4 Yellow-rumped Warbler 6 Dark-eyed Junco 4 Song Sparrow 6 Red-winged Blackbird 20 Common Grackle 12 American Goldfinch 5

PLANTS

British Soldier Lichen Horsetail Interrupted Fern Evergreen Woodfern Rock Polypody Balsam Fir Spruce Eastern Larch White Pine Sweet Gale Grey Birch Alder Willow Sheep Laurel Leatherleaf Blueberry Serviceberry Meadow-sweet Canada Holly Red Maple Hobble Bush Red-berried Elder Coltsfoot Pussytoes

Anas rubripes A. platyrhynchos Columba livia Zenaida macroura Cvanocitta cristata Corvus brachyrhynchos Tachycineta bicolor Poecile atricpillus Turdus migratorius Sturnus vulgaris Setophaga coronata Junco hyemalis Melospiza melodia Agelaius phœniceus Quiscalus quiscula Carduelis tristus





Cladonia cristatella Equisetum arvense Osmunda claytoniana Dryopteris intermedia Polypodium virginianum Abies balsamea Picea sp. Larix laricina Pinus strobus Myrica gale Betula populifolia Alnus sp. Salix sp. Kalmia angustifolia Chamædaphne calyculata Vaccinium sp. Amelanchier sp. Spiraea alba llex verticillata Acer rubrum Viburnum alnifolium Sambucus racemosa Tussilago farfara

Near the lookoff over the Marsh are two interpretive

Antennaria neglecta

GASPEREAU RIVER VALLEY

- Brian Bartlett





Date: Saturday, May 28th Place: Gaspereau River Valley, Kings County Weather: Cool; grey skies Leader: Soren Bondrup-Nielsen Participants: 15

Just after 10:00 a.m. we travelled from the Wolfville waterfront to a stretch of the Gaspereau River about a fiveminute drive out of town. Before we headed into the forest (at its edge a wild apple tree was in full bloom), trip leader Soren Bondrup-Nielsen opened the back of his truck to show us a cross-section of a 250-year-old Eastern Hemlock. When Europeans reached what would have become Kings County, Soren informed us, many trees would've been 300-400 years old. The rings in that Hemlock crosssection offered clues about the tree's history: the rings' thickening after twenty or so years suggested a decrease in forest density and an increase of sunlight reaching the tree. Viewing that bit of the tree (after all, it was only 'a bit' in relation to the entire gigantic hemlock) was a handy way to feel contact with the great Acadian Forest, of which experts say only 1% remains.

Soon after we started into the woods, Soren explained that when uncertain about a species of tree he'll "look at the ground rather than up at the tree." Leaves scattered nearby across the forest floor can be key for ID'ing. Among the first conifers Soren paused by to comment on and celebrate was one of the two 'signature trees' of the Acadian forest, Eastern Hemlock. Soren emphasized the need for trees in such dense woods to be shade-tolerant. With an example picked from a branch, he showed how a Hemlock needle is short and flat, with white stripes on its underside and a tiny peduncle (stem) attaching it to its twig. Later, he would do the same for a Balsam Fir needle, longer than the hemlock needle and without the peduncle. (Around this time, a distant power-saw made its ripping, high-pitched sounda reminder we were hardly in a wilderness.) At the point along the trail where we encountered Balsam Fir, the forest was more open and less shady, which made sense in that the species is what Soren called a 'light-lover'. Balsam Fir would've been uncommon in Nova Scotia before Europeans arrived and began centuries of deforestation.

During the three hours of the field trip, we lingered by and appreciated many other sorts of trees: a White Birch with pale green fungi, and another with much looser bark; Yellow Birch, another shade-okaying species characteristic of dense, old forests; Grey Birch, with its non-peeling bark and its triangular bark markings where branch meets trunk; a species of Cherry (the shaggy bark "feels like Corn Flakes"-a simile that didn't work when Soren once used it in front of children who had never eaten Corn Flakes); many Ash and Beech trees, including some of the latter suffering from Beech-bark disease; Ironwood, well-named, with wood so hard that saws have difficulty going through it, and it's often chosen to make axe-handles; Red Oak (oak leaves being one of the commonest sorts on the around): young Large-toothed Aspens, whose small leaves will greatly increase in size; Red Maple, with V-shaped

indentations in the leaves, in contrast with Sugar Maples and their U-shaped indentations; young Mountain Maples, their leaves already generously-sized; hairy-stemmed Red Spruce (the other 'signature tree' of the Acadian Forest), with sweetness-wafting needles: and White Spruce, with needles smelling like cat pee (one member of the group laughingly recalled having once brought home a White Spruce for a Christmas tree, and living to regret the choice).

Leaves and bark, Soren pointed out, are packed with nitrogen, and wood "is mostly carbon", so treating leaves and bark as refuse to be carted away makes no sense if we want healthy conditions for life and growth. Deadfall is also in fact very living. "The tree might be dead," Soren said, "but the life in it is far more extensive than it's ever been."

Smaller green plants we observed during the hike included Club Moss, Stair-step Moss, Christmas Fern, and Beech Fern. White flowers seen were Starflower, Solomon's Seal, and Wild Lily-of-the-Valley. The expanse of the spectrum of colours also included the orange of Spotted-touch-me-not (Jewelweed), the blue/purple of a species of Violet, the pale yellow of Clintonia (Bluebead Lily, many not yet in bloom), and the pink of Pink Lady's Slipper (Moccasin Flower).

There was little talk of birds, and few species seen, but species whose voices carried through the forest included a Bald Eagle (making a variety of cries and calls), Common Grackle, Blue Jay, American Crow, American Robin (those 'Americans' very much also Canadian birds, needless to say - or birds of no nationality), and Purple Finch, tossing out bunches of clear warbled notes. Two or three Parula Warblers also called, likely from high in the forest canopy, with their distinctive tseeeeeeeeetsup! call ending in its final clipped-off higher note. A Black-throated Green Warbler added its characteristic zee-zee-zee-zoo-zee to the morning's music. Other small birds' voices included those of an American Redstart (tseetsa tseetsa tseetsa tseet). a Black and White Warbler (weesa weesa weesa weesa weesa), and - repetitious, halting, caught in its asking-andanswering mode - a Red-Eyed Vireo. As if to remind us of domesticity and nearby agricultural labours, a barnyard rooster crowed in the distance. Several participants in the walk commented on the loudness and persistence of a least a couple of Ovenbirds, the TEAcher-TEAcher-TEAcher call so loud that it might've been broadcast from tiny microphones hung around the birds' necks.

Soren discovered a White-tailed Deer skull, its age of two years evident from an inspection of its teeth. As he held the skull in the air for display, he talked of how Caribou were more common in Nova Scotia than Deer before the 1600s. Near the end of the leisurely hike, three Common Ravens emerged from an opening in the forest. Soren noticed that the smallest of the three seemed to be landing awkwardly in the treetops, and speculated that the two others were the young one's parents coaching it to improve its in-flight skills. In imparting so much interesting information with such enthusiasm during the previous three hours, Soren himself had served as a sort of parent raven to the rest of us, filling in gaps in our knowledge of the living things along that attractive stretch of the Gaspereau River valley.

Before the field trip, Soren—author as well as scientist and Acadia University professor of ecology and conservation biology—had been asked to bring along copies of his books. Before the group dispersed, several members were glad to purchase copies of <u>Merging: Contemplations on</u> <u>Farming & Ecology from Horseback, A Sound Like Water</u> Dripping: In Search of the Boreal Owl, Winter on Diamond: An Encounter with the Temagami Wilderness, and (co-written with Merritt Gibson) <u>Winter Nature: Common Mammals,</u> <u>Birds, Tress and Shrubs of the Maritimes</u>.

A few months earlier, in mid-February, I'd been fortunate enough to be part of a "Winter on Snowshoes" field trip along the same Gaspereau Valley trail, led by Soren and sponsored by the Blomidon Naturalists Society. Exploring that area in winter and shortly afterward in spring was an enlightening experience for witnessing and walking past, over, and through remarkable (and too often taken-forgranted) features of seasonal change.



PEGGY'S COVE GRANITES

- Michael Bradfield

Date: Saturday, June 4th Places: Clayton Park, Peggy's Cove Weather: Misty and cool; then sunny/no wind at Peggy's Leader: Dr. Barrie Clarke Participants: 25

Barrie obtained his BSc and MA in geology from the University of Toronto; his PhD in petrology from the University of Edinburgh; and in 1970 became an Assistant Professor at Dalhousie, teaching and doing research there for 37 years. Now retired, he holds a current adjunct position in Dalhousie's Department of Earth Sciences.

His also researched volcanic rocks in Baffin Island and West Greenland, then expanded into kimberlites (diamondbearing rocks) in the Arctic and southern Africa, finally concentrating on the granites of Nova Scotia.

We visited three sites on this trip.

The first stop was at Regency Park Drive at the first bus stop from Thomas Raddall Drive, heading toward Bayer's Lake Mall (GPS location 44.655205oN 63.665619oW) where we viewed the 500 million year-old metasedimentary rocks (sedimentary rocks changed by intense heat and pressure) there, called turbidites. This type of rock is formed when an earthquake or other disturbance shifts sand and mud on the edge of a continental shelf down onto a deeper ocean floor. The heaviest sediments settle first; next – the lighter, finer materials. Over time, these gradually compress to form turbiditic rocks with gradations in the coarseness reflecting their settling pattern.

At this particular site, the metasedimentary beds we viewed are not horizontal but instead nearly vertical, having been later on 'folded' upward by the collision between the African and American tectonic plates. It is estimated that if the rocks were 'unfolded' they would stretch from Halifax to Montreal! The mountains created by this collision doubled the thickness of the Earth's crust to about 50-60 km, and resulted in a topographic relief similar to today's Himalayas. But now, the old mountains here have long been eroded away and washed back into the ocean; the Himalayas are being eroded too, but the India tectonic plate's northward movement is still pushing them up, with a tiny net increase in their height every year. At this Bayer's Lake site, with about 11 km of rock having been eroded away, we were actually standing in what was formerly the interior of those old mountain. These metasedimentary rocks served as 'hosts' to the intruding, upwelling of granite-forming magma (hot, liquid rock) which makes up Nova Scotia's South Mountain batholith (a deep rock, i.e., granite magma, which had cooled very, very slowly underground).

Our second stop was at the Halifax-bound ramp from Lacewood Drive, at the back of Costco (44.657817oN 63.675050oW). There is a granite rock face by the Costco's entrance there - the site of contact of the sedimentary rocks and the granite batholith. The rocks along this ramp are now metasedimentary, thermally metamorphosed by their contact with the hot, molten granite magma which baked the sedimentary rocks to become what is called a hornfels. As you walk from the ramp along Lacewood Drive (toward the Business Park), granite begins to appear (between the third and fourth light standards from the ramp). There the hot and mobile magma caused 'stoping' – the rocks which formed the roof of the magma chamber were pulled into the magma as it surged upwards. These stoped rocks became xenoliths (foreign rocks) in the granite. The rock face at the entrance to Costco is a clean granite part of the batholith (which is mushroom-shaped, having a 'stalk' about 20 km deep, with a much thinner cap, or margin). In this granite, there are low (parts-per-million) concentrations of most chemical elements.

Our third and last stop was Peggy's Cove to look at the iconic, undulating granites there (44.703139oN 63.876063oW). Here, the weather was much better, and we did more walking – leaping around on the rocks!

People also asked more questions, mainly because we were able to find our own examples of the features Barrie was explaining. Here we examined several things:

The effect of strong fractional crystallisation, resulting in the formation of boron-rich tourmaline (a gemstone) in a late-crystallising pegmatite (a coarsely crystalline granite or other igneous rock with crystals several centimetres to several metres in length);

Some magmatic features such as the parallel alignment (called flow foliation) of xenoliths (those 'foreign rocks'), and the gradual elimination of those xenoliths by their reacting chemically with the granite magma;

Then three sets of joints, or fractures, caused by the cooling and contracting of the solid batholith;

And finally some geomorphological artifacts of the relatively recent glacial erosion of the batholith, including the formation of 'whalebacks' or 'roches moutonées' (sheeps' backs). These rocks developed gentle slopes when they faced the source of ice sheet and steep slopes when they faced the direction in which the ice sheet was travelling.

We also observed the well-developed glacial striations or deep scratches on the granite outcrops. These scratches had been scoured out by any boulders which had been embedded in the base of the glacier.



NATURE NOTES

OCTOBER

By email, Michael Goodfellow reported that he saw **a** female Red-bellied Woodpecker on the fence outside his window, in the north end of Halifax. It stayed for a couple of minutes before flying west.



APRIL

– Allan Robertson

Christine Wysmyk saw **a Bald Eagle** on Highway 103 on her way to tonight's meeting. Arthur Morris reported sighting **a male Osprey** on his driveway at Belnan, near Elmsdale – about 20 inches high, with white underwings. It was stationary for at least two minutes before flying off! Keith Vaughn saw **a Sharp-shinned Hawk** late last month. It was no doubt checking out the nearby bird feeders. Shelley Pohl's father, in Annapolis Royal, reported **a group of nine Turkey Vultures** in the area.

Wild flora sightings – many people recalled seeing **Mayflowers in bud** in different areas of the Province, and 29 saw **Coltsfoot**. Leslie Jane Butters found some **open Coltsfoot** in Point Pleasant Park at the end of February. She also saw **a rare Ribbon Snake** (an endangered species) at Kejimkujik Park early in March near the Grafton Lake trail on a rare warm and sunny day, as well as **an ant** on the kitchen counter in her unheated cottage, and **four geese** at Peggy's Cove.

A number of members reported hearing **Spring Peepers**. While Wood Frogs are usually heard a bit before the Peepers (they sound a bit like quacking ducks), no one reported hearing them when asked. Members were reminded to keep their eyes open for Yellow-spotted Salamanders in the coming week, as all the signs are present for them to become active soon.

Clarence Stevens Sr. reported seeing **n off-course Louisiana Waterthrush** at the Crystal Crescent's third beach on the previous Saturday. It was Number 409 on his life list! He also saw some **American Pippits**. Ingrid Plache saw **a male Wood Duck** on the Frog Pond off the Purcell's Cove Road.

Pat Leader reported seeing **Cedar Waxwings** on the Bedford waterfront. At her house on Edward Street, Halifax, Bernice Moores had an early morning visit by **a yearling Deer** on March 28th. It had been very quiet – the only signs of its stopover being tulip leaves with browsed tips, and the inevitable droppings (identified by the Nova Scotia Museum's Andrew Hebda).

MAY



Clarence Stevens noticed the season's **first black flies**. Bob McDonald spotted **a Pileated Woodpecker** in mainland common Clayton Park. Based on the vocalisations, he thought at first it might be a Northern Flicker, as the two birds sound similar.

Burkhard Plache watched **a Northern Flicker** excavate a hole in an old dead birch, and it is now sitting in it. Ingrid Plache also noticed **a pair of Hairy Woodpeckers** in another dead birch (they had been every day for the last two weeks), but hadn't seen them in the last two days. She wondered if they were nesting, or if they had moved on. Nancy Covington saw **a Great-horned Owl pair and nest** in River John.

Edith Ward spotted **a Red Fox** wandering through Shubie Park, along with **a Northern Flicker** (which was the first she'd seen). Sharon Russel watched **a Black-capped Chickadee** dig a nest in the top of a dead tree (about 30 feet off the ground), but hadn't seen it for a few days afterward. She wondered if she(?) was sitting, or did she go? Chickadees lay an average of eight eggs per nesting season (the size of a dime!).

Stephanie Robertson noticed that the **seals** are back on the rocks in Point Pleasant Park (three of them according to David Patriquin). Nina Patriquin saw **a Bald Eagle** and **two Deer** in Prospect Bay on April 25th. Stephanie Robertson saw **American Goldfinches** at her Halifax south-end bird feeder. Matt Salsbury saw **Cardinals** in Bedford (he hadn't seen them in years); there also was **a Sharp-shinned hawk** sitting on top of the a feeder. Pat Leader saw **five Red-breasted Mergansers** at Bedford Basin, along with **an open Mayflower** and **a Bloodroot** (in her garden!).

Grace Beazley was at the NS Nature Trust Meander River property on Saturday April 30th and saw a Daphnis bush. Suzanne Gauthier saw a ruffed grouse doing it's mating display (puffed up), and thought it was a little bit late in the season. Pat Leader saw a Viburnum in bloom along with a Northern Fly Honeysuckle on the waterfall hike. Bob McDonald thought it could have been a Hobblebush. Clarence Stevens Senior was at the Brookfield Marsh and saw a Great Egret. In two hours he saw 23 species! He also witnessed a lot of fighting going on, with species looking to nest (geese, mallards, etc.). Mike Bradfield saw a Baltimore Oriole in Conrose Field, and Clarence Stevens mentioned that a Black-throated Sparrow (quite rare) had been spotted along the border of N.S. and N.B. He advised everyone to keep their eyes open, because one never knows where it might end up!

JUNE



- Judy Keating

Regine was happy to see at least 30 new buds on her garden's **Purple Clematis** which she received from HFN last year. She also discovered **a wild geranium** with a lovely pinkish flower at the Frog Pond recently.

Stephanie Robertson saw **two Deer** mating on Pine Hill Drive, on CN's side of the railway fence.

Bobbie Wilson offered an update on Hope For Wildlife's new arrivals, which include **a baby Beaver, baby Deer** and cute **baby Weasels**.

Janet Dalton observed more than the usual number of **Hummingbirds** at her feeder. Group discussion ensued regarding food for Hummingbirds. The proper ratio to make feeder food is one part cane sugar to four parts water. Hummingbirds also like black currants and tube flowers.

Bob MacDonald discovered **blooming Northern Fly Honeysuckle**, *Lonacera velosa*, on his recent Crystal Crescent Beach walk.

Wendy MacDonald saw **several Chimney Swifts** at sunset in Wolfville. She heard there were approximately 200 more in Middleton,

Clarence Stevens observed **Ram's-Head Lady's Slippers** blooming in Gypsum Mines (Exit 5, Hwy 101). He also noted **Yellow Lady's Slippers in bloom**. Stephanie Robertson noted that there were many **Pink Lady's Slippers** on the recent HFN Gaspereau Valley trip.



This almanac is for the dates of events which are not found in our HFN programme: for field trips or lectures which members might like to attend, or natural happenings to watch for, such as eclipses, comets, average migration dates, expected blooming seasons, etc. Please suggest other suitable items.

"The alders had their own powerful, swampy odor – a scent that, for me, contains the essence of all the summer afternoons of my faroff childhood, and can instantly abolish space and time in the explosion of an inner resurrection."

- Harold Horwood, in The foxes of Beachy Cove, (1967)

NATURAL EVENTS

- 14 Jun. -16 Jun. The earliest mornings of the year: Sunrise at 5:28 ADT.
- **20 Jun.** Summer Solstice at 19:34 ADT. Summer begins in the Northern hemisphere. The longest day of the year, with 15 hours and 34 minutes of daylight at Halifax.
- 20 Jun. Full Moon. Moonrise at 21:01 ADT.
- 22 Jun. -29 Jun. The latest evenings of the year: Sunset at 21:04 ADT.
- 16 Jul. Canada's "Parks Day" look for events at local parks.
- 19 Jul. Full Moon. Moonrise at 20:30 ADT.
- 5 Aug. -12 Aug. Average dates of the hottest days of summer (average daily maximum is 22.5° C.)
- 12 Aug. -13 Aug. Perseid Meteor showers peak.
- **13 Aug.** Average date for temperatures to start decreasing.
- 18 Aug. Full Moon. Moonrise at 20:24 ADT.
- 16 Sept. Full Moon. Moonrise at 19:29 ADT.
- 22 Sept. Autumnal Equinox at 14:21 ADT. Fall begins in the Northern Hemisphere.
- 23 Sept. Thirteenth anniversary of Hurricane Juan.
- **30 Sept.** Average date for first frost in Halifax (Env. Can. says there is a 1:10 chance we will have frost before this date.) Look forward to 210 days of frosty weather.
 - Sources: Atmospheric Environment Service, Climate Normals 1951-80 Halifax (Shearwater A) N.S.;
 Blomidon Naturalists Society 2016 Calendar; United States Naval Observatory Data Services.

SUNRISE AND SUNSET ON SUMMER AND EARLY FALL SATURDAYS FOR HALIFAX: 44 39 N, 063 36 W

	4 Ju	ı n. 05:31	20:55	2	Jul. (05:34	21:03
	11 Ju	i n. 05:29	21:00	9	Jul. (05:39	21:00
. MAA.	18 Ju	i n. 05:29	21:03	16	Jul. (05:45	20:56
The	25 Ju	n. 05:30	21:04	23	Jul. (05:52	20:50
Xaz B				30	Jul. (05:59	20:42
	6 Αι	Ig. 06:07	20:33	3	Sept.	06:40	19:47
MUN	13 Au	Ig. 06:15	20:22	10	Sept. (06:48	19:34
	20 Au		20:11	17	Sept.	06:56	19:20
	27 Αι	Ig. 06:32	19:59	24	Sept. (07:04	19:07

ORGANISATIONAL EVENTS

Blomidon Naturalists Society: Indoor meetings are held on the 3rd Monday of the month, in Room BAC241 of the Beveridge Arts Centre, Acadia University, 7:30 p.m. Field trips usually depart from the Wolfville Waterfront, Front Street, Wolfville. For more information, go to http://www.blomidonnaturalists.ca/.

Mid-Jun. "Tree Swallow Banding Demonstration", at Miner's Marsh, Kentville.

20 Jun. "Monarch Butterflies", with speaker Phil Schappert.

Jul. "National Moth Week", 'mothing' in the valley, Time and date to be announced.



Burke-Gaffney Observatory: Free Public Open Houses are scheduled on the 2nd and 4th Friday of each month, except from June through September when they are usually scheduled every Friday. They generally begin at 7:00 p.m. between November 1st and March 30th, and at 8:00 p.m. or later (depending on when it gets dark enough) between April 1st and October 31st. This astronomical observatory is primarily used for teaching observational astronomy, public education in astronomy, and modest research projects. It is located on the roof of the 22-storey Loyola residence tower of St. Mary's University, and was made possible by an anonymous benefactor who wished to honour Fr. Burke-Gaffney, St. Mary's University's well-loved astronomer. It was originally installed in 1972 with a 0.4-metre Ealing Cassegrain telescope, but was extensively upgraded and renovated in 2013 and now contains a Planewave 0.6-metre CDK24 telescope. For more information phone 496-8257, or go to http://www.ap.smu.ca/pr/bgo-visit.

Nova Scotia Bird Society: Indoor meetings usually take place on the 4th Thursday of the month, September to April, at the Nova Scotia Museum of Natural History, 7:30 p.m. For more information phone Kate Steele, 476-2883, or email **field-tripcoordinator@nsbirdsociety.ca**. This email address is being protected from spambots. You need JavaScript enabled to view it. You may also email the trip leader, or go to **http://www.nsbirdsociety.ca**/.

- **19 Jun.** "Abraham's Lake Bird Walk", with leader Jim Cameron, 1-902-885-2970, **jim.cameron@ns.sympatico.ca**
- **09 Jul.** "Beginning Birders, Taylor Head", with leader Peter Oickle, 1-902-499-4114.
- **17 Jul.** "Slow and Easy Birding, Taylor Head", with leader Jim Cameron, 1-902-885-2970.

06 Aug. "Mid-summer Bird Walk, Taylor Head", with leader Jim Cameron, 1-902-885-2970.

24 Sept. "Early Fall Migrants, Taylor Head", with leader Jim Cameron, 1-902-885-2970.

Nova Scotia Department of Natural Resources: Many outings which will take place in Provincial Parks are listed in the "Parks are for People" Programme, available at museums, parks, and tourist bureaus, and on the web at http://www.novascotiaparks.ca/.

Nova Scotia Museum of Natural History: For more information phone 424-6099 , 424-7353, or go to http://naturalhistory.novascotia.ca/

1 Jun. - 5 Sept. "Nocturnal Life: Animals at Night", with Little Ray's Reptile Zoo.

Nova Scotia Wild Flora Society: Meets the 4th Monday of the month, September to May, at the Nova Scotia Museum of Natural History, 7:30 p.m. For more information, nswildflora@yahoo.ca, or go to http://www.nswildflora.ca/.
28 Mar. Speakers Jennie Graham and Tony Bowron, St. Mary's University.

Nova Scotia Nature Trust: For more information, 425-5263, or go to http://www.nsnt.ca.

- **19 Jun**. "100 Wild Islands Paddle and Hike at Shelter Cove", with Coastal Adventures.
- **24 Jul.** "Explore Fire Ecology at Purcell's Cove", with leader David Patriquin.
- 24 Aug. "Conservation Celebration Announcement and Hike in the Parrsboro Area".
- 27 Aug. "Rare Flower Paddling Expedition on the Tusket River".
- 17 Sept. "Rogue's Roost Boat Trip and Paddle".

Royal Astronomical Society of Canada (Halifax Chapter): Meets the 3rd Friday of each month (except July and August) in Room AT101 of the Atrium Building at Saint Mary's University, 7:30 p.m. For more information go to http://halifax. rasc.ca/.

26 -28 Aug. "Nova East 2016", Atlantic Canada's longest-running star party, Smiley's Provincial Park.

Young Naturalists' Club: A fun, free nature club for children seven to 12 years. Meetings take place every 3rd Saturday of the month (excepting July and August), at the Museum of Natural History, 1747 Summer St., from 10:30 - 11:30 a.m. Field trips take place every fourth Sunday, at 1:00 p.m. For more information, Karen McKendry, 404-9902, **ynchalifax@yahoo.ca**, or, go to http://nature1st.net/ync.

– compiled by Patricia L. Chalmers



HALIFAX TIDE TABLE



July-juillet									August-août									September-septembre						
Da	y Time	Metres	Feet	jour	heure	mètres	pieds	Day	Time	Metres	Feet	jour	heure	mètres	pieds	Day	Time	Metres	Feet	jour	heure	mètres	pieds	
1 FF VE	0446 1114 1703	1.6 0.4 1.9	5.2 1.3 6.2	16 SA SA	0527 1129 1728	1.5 0.6 1.6	4.9 2.0 5.2	1 MO LU	0044 0636 1304 1845	0.2 1.7 0.4 1.9	0.7 5.6 1.3 6.2	16 TU MA	0017 0628 1228 1828	0.3 1.6 0.5 1.8	1.0 5.2 1.6 5.9	1 TH JE	0203 0752 1425 2003	0.2 1.8 0.4 1.9	0.7 5.9 1.3 6.2	16 FR VE	0115 0718 1339 1932	0.1 1.8 0.2 1.9	0.3 5.9 0.7 6.2	
2 SA SA	0001 0550 1216 1801	0.1 1.7 0.3 1.9	0.3 5.6 1.0 6.2	17 SU DI	0007 0615 1215 1812	0.4 1.5 0.6 1.7	1.3 4.9 2.0 5.6	2 TU MA	0136 0727 1357 1935	0.1 1.8 0.4 1.9	0.3 5.9 1.3 6.2	17 WE ME	0104 0710 1314 1912	0.2 1.7 0.4 1.9	0.7 5.6 1.3 6.2	2 FR VE	0244 0831 1505 2044	0.2 1.8 0.4 1.8	0.7 5.9 1.3 5.9	17 SA SA	0201 0801 1429 2019	0.0 1.9 0.1 1.9	$\begin{array}{c} 0.0 \\ 6.2 \\ 0.3 \\ 6.2 \end{array}$	
SL D	0058 0647 1314 1856	0.1 1.8 0.3 2.0	0.3 5.9 1.0 6.6	18 MO LU	0051 0658 1258 1854	0.3 1.6 0.6 1.8	1.0 5.2 2.0 5.9	3 WE ME	0224 0814 1446 2022	0.1 1.8 0.4 1.9	0.3 5.9 1.3 6.2	18 TH JE	0148 0750 1401 1956	0.1 1.7 0.3 1.9	$ \begin{array}{r} 0.3 \\ 5.6 \\ 1.0 \\ 6.2 \end{array} $	3 SA SA	0319 0909 1541 2125	0.3 1.8 0.4 1.8	1.0 5.9 1.3 5.9	18 SU DI	0247 0846 1520 2107	0.0 2.0 0.1 1.9	$0.0 \\ 6.6 \\ 0.3 \\ 6.2$	
4 MC LU	0151 0741 1410 1948	0.0 1.8 0.3 2.0	0.0 5.9 1.0 6.6	19 TU MA	0133 0739 1340 1936	0.2 1.6 0.5 1.8	0.7 5.2 1.6 5.9	4 TH JE	0308 0858 1531 2106	0.2 1.9 0.4 1.9	0.7 6.2 1.3 6.2	19 FR VE	0231 0832 1448 2040	0.1 1.8 0.3 1.9	0.3 5.9 1.0 6.2	4 SU DI	0351 0946 1617 2204	0.4 1.8 0.4 1.7	1.3 5.9 1.3 5.6	19 мо LU	0336 0931 1614 2155	0.0 2.0 0.1 1.9	$0.0 \\ 6.6 \\ 0.3 \\ 6.2$	
TU MA	0242 0832 1504 2038	0.0 1.9 0.4 2.0	0.0 6.2 1.3 6.6	20 WE ME	0215 0819 1423 2018	0.2 1.7 0.4 1.9	0.7 5.6 1.3 6.2	5 FR VE	0350 0939 1615 2149	0.2 1.9 0.5 1.8	0.7 6.2 1.6 5.9	20 SA SA	0314 0913 1538 2125	0.0 1.9 0.2 1.9	0.0 6.2 0.7 6.2	5 MO LU	0420 1022 1653 2242	0.4 1.8 0.5 1.7	1.3 5.9 1.6 5.6	20 TU MA	0430 1017 1712 2245	0.1 2.0 0.1 1.8	0.3 6.6 0.3 5.9	
6 WE ME	0331 0920 1556 2126	0.1 1.9 0.4 1.9	0.3 6.2 1.3 6.2	21 TH JE	0257 0859 1508 2059	0.1 1.7 0.4 1.9	0.3 5.6 1.3 6.2	6 SA SA	0428 1019 1658 2231	0.3 1.8 0.5 1.8	1.0 5.9 1.6 5.9	21 SU DI	0359 0956 1631 2211	0.0 1.9 0.2 1.8	0.0 6.2 0.7 5.9	6 TU MA	0450 1059 1733 2321	0.5 1.7 0.5 1.6	1.6 5.6 1.6 5.2	21 WE ME	0530 1105 1812 2336	0.2 1.9 0.1 1.7	0.7 6.2 0.3 5.6	
7 TH JE	0418 1006 1647 2212	0.2 1.9 0.5 1.9	0.7 6.2 1.6 6.2	22 FR VE	0340 0939 1556 2143	0.1 1.8 0.4 1.9	0.3 5.9 1.3 6.2	7 SU DI	0504 1058 1741 2312	0.4 1.8 0.5 1.7	1.3 5.9 1.6 5.6	22 MO LU	0450 1040 1728 2259	0.1 1.9 0.2 1.8	0.3 6.2 0.7 5.9	7 WE ME	0528 1137 1818	0.6 1.7 0.6	2.0 5.6 2.0	22 TH JE	0635 1155 1914	0.3 1.8 0.2	1.0 5.9 0.7	
FF VE	0503 1049 1738 2257	0.3 1.8 0.5 1.8	1.0 5.9 1.6 5.9	23 SA SA	0424 1020 1649 2227	0.1 1.8 0.4 1.8	0.3 5.9 1.3 5.9	8 MO LU	0540 1137 1827 2354	0.5 1.8 0.6 1.6	1.6 5.9 2.0 5.2	23 TU MA	0545 1126 1829 2349	0.2 1.8 0.2 1.7	0.7 5.9 0.7 5.6	8 TH JE	0002 0617 1217 1909	1.5 0.7 1.6 0.6	4.9 2.3 5.2 2.0	23 FR VE	0031 0741 1250 2016	1.6 0.4 1.7 0.3	5.2 1.3 5.6 1.0	
9 SA SA	0548 1131 1830 2343	0.4 1.8 0.6 1.7	1.3 5.9 2.0 5.6	24 SU DI	0512 1103 1746 2313	0.2 1.8 0.4 1.8	0.7 5.9 1.3 5.9	9 TU MA	0620 1219 1915	0.6 1.7 0.6	2.0 5.6 2.0	24 WE ME	0646 1214 1930	0.3 1.8 0.3	1.0 5.9 1.0	9 FR VE	0047 0716 1302 2003	1.5 0.7 1.6 0.6	4.9 2.3 5.2 2.0	24 SA SA	0133 0846 1353 2118	1.5 0.5 1.6 0.3	4.9 1.6 5.2 1.0	
10 SL D	0632 1215 1921	0.5 1.7 0.6	1.6 5.6 2.0	25 MO LU	0604 1147 1845	0.2 1.8 0.4	0.7 5.9 1.3	10 WE ME	0039 0707 1304 2004	1.5 0.6 1.6 0.6	4.9 2.0 5.2 2.0	25 TH JE	0043 0750 1308 2032	1.6 0.4 1.7 0.3	5.2 1.3 5.6 1.0	10 SA SA	0141 0817 1357 2058	1.5 0.8 1.5 0.6	4.9 2.6 4.9 2.0	25 SU DI	0250 0948 1510 2217	1.5 0.5 1.6 0.3	4.9 1.6 5.2 1.0	
11 мс LU	0030 0718 1302 12012	1.6 0.5 1.7 0.6	5.2 1.6 5.6 2.0	26 TU MA	0003 0700 1235 1946	1.7 0.3 1.8 0.4	5.6 1.0 5.9 1.3	11 TH JE	0130 0801 1355 2055	1.4 0.7 1.6 0.6	4.6 2.3 5.2 2.0	26 FR VE	0145 0854 1411 2134	1.5 0.4 1.7 0.3	4.9 1.3 5.6 1.0	11 SU DI	0250 0916 1502 2153	1.4 0.7 1.6 0.5	4.6 2.3 5.2 1.6	26 мо LU	0413 1048 1628 2314	1.6 0.5 1.6 0.3	5.2 1.6 5.2 1.0	
12 ті ма	0121 0805 1354 2102	1.5 0.6 1.6 0.6	4.9 2.0 5.2 2.0	27 WE ME	0058 0759 1329 2047	1.6 0.4 1.7 0.3	5.2 1.3 5.6 1.0	12 FR VE	0231 0858 1453 2146	1.4 0.7 1.5 0.6	4.6 2.3 4.9 2.0	27 SA SA	0301 0957 1525 2235	1.5 0.5 1.7 0.3	4.9 1.6 5.6 1.0	12 MO LU	0405 1013 1610 2248	1.5 0.7 1.6 0.4	4.9 2.3 5.2 1.3	27 TU MA	0516 1145 1728	1.6 0.4 1.7	5.2 1.3 5.6	
13 WE ME	0220 0854 1450 2150	1.4 0.6 1.6 0.6	4.6 2.0 5.2 2.0	28 TH JE	0201 0901 1431 2148	1.6 0.4 1.7 0.3	5.2 1.3 5.6 1.0	13 SA SA	0343 0954 1555 2237	1.4 0.7 1.6 0.5	4.6 2.3 5.2 1.6	28 SU DI	0424 1059 1639 2334	1.5 0.5 1.7 0.3	4.9 1.6 5.6 1.0	13 TU MA	0505 1107 1708 2340	1.5 0.6 1.7 0.3	4.9 2.0 5.6 1.0	28 WE ME	0008 0604 1236 1817	0.3 1.7 0.4 1.7	1.0 5.6 1.3 5.6	
14 TH JH	0326 0946 1548 2237	1.4 0.6 1.6 0.5	4.6 2.0 5.2 1.6	29 FR VE	0315 1004 1540 2249	1.5 0.4 1.7 0.2	4.9 1.3 5.6 0.7	14 SU DI	0449 1049 1652 2328	1.5 0.7 1.6 0.4	4.9 2.3 5.2 1.3	29 MO LU	0531 1158 1741	1.6 0.4 1.8	5.2 1.3 5.9	14 WE ME	0553 1158 1758	1.6 0.5 1.8	5.2 1.6 5.9	29 TH JE	0056 0645 1322 1901	0.3 1.8 0.4 1.8	1.0 5.9 1.3 5.9	
15 FF VE	0431 1039 1641 2323	1.4 0.6 1.6 0.4	4.6 2.0 5.2 1.3	30 SA SA	0432 1106 1648 2348	1.6 0.4 1.8 0.2	5.2 1.3 5.9 0.7	15 MO LU	0543 1140 1742	1.5 0.6 1.7	4.9 2.0 5.6	30 TU MA	0029 0624 1252 1833	0.2 1.7 0.4 1.8	0.7 5.6 1.3 5.9	15 TH JE	0029 0636 1249 1846	0.2 1.7 0.3 1.8	0.7 5.6 1.0 5.9	30 FR VE	0139 0724 1402 1942	0.3 1.8 0.3 1.8	1.0 5.9 1.0 5.9	
[ALL 1 ARE	TIMES AST	6	31 SU DI	0539 1207 1750	1.6 0.4 1.8	5.2 1.3 5.9		ŐK.	THE		31 WE ME	0119 0709 1341 1919	0.2 1.8 0.4 1.8	0.7 5.9 1.3 5.9	-	S.	*					•	

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