THE HALIFAX FIELD NATURALIST



No. 168 September to November, 2017



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HFN NEWS AND ANNOUNCEMENTS

TIMELY READING

Grace Beazley discovered two items in the May/June 2017 'Special Urban Issue' of <u>Canadian Geographic</u> which she would like to share with us. (For non-sub-scribers, it may be available at the Central Library).

One is "Trash Nation" by Charles Wilkins, (pp. 49 - 54), subtitled "Canada leads the developed world in per capita production of garbage. An exclusive investigation into the nation's dirtiest secret."

The other is "Rise of the Synanthropes" by Kerry Banks (pp. 57 - 61), subtitled "Synanthropes: wild animals that live near and benefit from humans. An exploration of why species thrive among us, and how urban

SPECIAL ARTICLES

MORAR TALES

BANK SWALLOWS AND CLIMATE CHANGE – Gareth Harding & Millie Harding/Lyon

June 10th - a sunny day with a light breeze, the dogs eager for some excitement. A perfect day to walk down the shore to check out the Bank Swallow colony, an hour's walk just past Morar Brook, but well before Livingstone Cove. The previous week I'd made a similar pilgrimage only to find that almost all the swallow tunnels had been obliterated by winter storms. This happened once a couple of years ago when the Gulf of St. Lawrence had also failed to freeze over. I've been watching the shore since 1981, and always the Gulf froze solid - up to a few years ago. Whenever open water occurs, the mud/sand banks are worn back several feet by winter storms, if there is no intervening bedrock. According to Robie Tufts, Bank Swallows excavate tunnels two to three feet deep, which means a considerable amount of bank was undercut and washed away again last winter. Ice cover normally dampens both wave height and the erosive force of winter storms. Last year there was not even enough shore-bound ice to protect the mud/sand banks left by the glaciers.

Today there appeared to be one pair of Swallows making infrequent visits to a hole just under the overhanging sod. I leisurely ate an apple on a basaltic outcrop worn in the shape of a couch while Millie and Jacque Jr. ate their cookies. I eventually became aware of a tight cloud of some 20+ swallows circling high over my head. It was one of those bright, hazy-blue days which is hard on the eyes. Suddenly a Merlin alighted and perched on a spruce root projecting out from the bank less than 30 feet from us. (The top of this bank was littered with the roots of former spruce woods that had been cleared by the cottagers for a view.) Suddenly, the swallow cloud was down and fluttering at the wall of the bank. In a flash the male Merlin grasped one as easily as a flycatcher grabs an insect and was off down the shore to its nest with its prey. The Swallow colony was in a precarious situation; each time Swallows came to rebuild

planners are managing their increasing numbers." Grace feels these two articles are a 'must-read' for HFN'ers.

THANK YOU

An appreciative thank you goes out to Diane Birch for providing our monthly meetings with the addition of truly declicious homemade cookies. Thank you Diane.

NEW AND RETURNING



Cathy Bethune Laura Ferguson Selina Mu Karen Robinson and Bruce Sarty Helene Ryding

their tunnels, the Merlin could deplete their numbers by one. With this efficiency, it wouldn't take long to wipe the colony out.

I returned the next day, forsaking my garden, armed with saw and bush shears, determined to assist the swallows. My intent was to remove the perches that this very efficient swallow catcher was using in its ambush tactics. I was somewhat relieved to find the bank deserted. (The Merlin couldn't have caught them all in such a short time.) Preservation instinct must have taken priority and the swallows had gone in search of a new site. Nevertheless, I proceeded to clip all the spruce roots that could serve as a possible Merlin perch all along the length of the bank. The swallows prefer a bank backed by low heath or field and there are many suitable dry soil banks, some of considerable height, all along this coast. However, these banks are all topped with a white spruce wall. This avoidance of treed shorelines now began to make sense to me.

The next week I returned to the same site and found a solitary Bank Swallow pair at what had been a teeming colony the previous year. Once they have their nesting tunnel they are safe from this aerial predator. Hopefully, the entire colony hadn't been lost, but had gone to some other location beyond my range.

Alternate Explanation for Tree Swallow Behaviour

This experience got me thinking of the curious behaviour of my Tree Swallows. They have never been as endearing as the Barn Swallows which used to spend the entire summer with me. Tree Swallows arrive at middle to late May, disappear for weeks, and reappear to build their nests, then disappear again. It is not until late June that you know for sure whether you have a nesting pair or not. I had always thought better insect foraging elsewhere explained this disappearance. But in the light of what I'd witnessed at the Bank Swallow colony, the best survival behaviour for any cavity-nesting swallow must be to make yourself as scarce as possible near your selected nest site. My Tree Swallows suddenly appeared again this weekend and the female is now in their box each night, the male occasionally resting on the power wires over the meadow near our house. I know the young will hopefully fledge in a couple of weeks and then be gone.

(Addendum - two fledged Tree Swallows were suc-



COLD CRITTERS

7 SEPT. – Stephanie Robertson

Laura Ferguson grew up on the south shore of Nova Scotia in St. Margaret's Bay and attended Acadia University for both her BSc and MSc, where she worked with Dr.'s Kirk Hillier and Todd Smith. There she studied everyone's favourite mosquito species, *Culex territans* (they only feed on frogs and snakes), and how their behavior and reproduction changes when they take a blood meal full of parasites.

In London, Ontario, she completed her PhD at Western University with Dr. Brent Sinclair. There she continued to follow her passion for insects and their relationship with pathogens and parasites by studying how insect immune systems and their ability to fight disease are affected by our cold Canadian winters.

Now she is back in Nova Scotia and working as a Post Doctoral researcher at Acadia University. For this HFN presentation, she described both her own research and that of her colleagues, which is all centered around discovering how insects can possibly survive our long and frigid winters.



Some insects die before they freeze; some die at freezing point (freeze-avoiding); and some survive freezing (freeze-tolerant). How do certain thresholds of cold threaten insects? Body cells are filled with fluids. When the cells' fluids freeze they expand and can no longer function. The cells' walls burst open, and the insect dies.

Insects are for the most part ectotherms, that is, their body temperature varies along with any changing environmental temperature in which they find themselves. With warm-blooded (endothermic) creatures such as mammals, their metabolism works to keep them warm to a species-specific DNA-dictated 'normal' temperature (sometimes help is needed, such as clothing). How have insects adapted to survive ectothermy in the bitter cold of winter?

Insects take cues from the seasonal changes of daylight length and changing temperatures. To survive the most extreme of these changes, they have developed successful (for the most part) behavioural, physiological, and chemical responses.

1) They can avoid life-threatening changing temperatures by leaving them (migration), such as the Monarch Butterfly does, travelling 4,800 kilometres to Mexico from Canada, taking up to two months to complete this cessfully flying over Dusty's Meadow with their parents on July 19th and all Swallows had gone on July 23rd leaving an empty nest box).



arduous journey. Insects can also migrate more locally, to a warm home or barn for instance. 2) They can get behaviourly creative. For instance bees can mimic the advantages of endothermia by 'shivering' in the hive. This mass shivering raises the hive's temperature and ensures survival during any bad cold spells. (This is rare for insects.) 3) Insects have evolved chemically adaptive behaviours for the cold which allow them to survive in otherwise hostile invironments. The Woolly Bear caterpillar of the Isabella Tiger Moth, Pyrrharctia isabella, can be found in many cold regions, including the Arctic. Their larvae emerge from their eggs in the fall, and they overwinter in their hairy caterpillar form after freezing solid. The evolutionary chemical change of having developed an internal antifreeze allows them to remain in a kind of dormancy until they thaw out in the spring, when they crawl away seemingly none the worse for the experience! These antifreezes are for the most part polyols (a kind of sugar-alcohol), and other sugars. 4) They are able to remain in cold environments by overwintering with successfully adapted life stages - as an egg, a pupa, or a larva which have developed different chemistries that, like the Woolly Bear caterpillar, enable survival. The Goldenrod Gall Fly Eurosta solidaginis does this. It is best known for the characteristic galls it forms on several Solidago (goldenrod) species. The fly's eggs are inserted near the developing buds. After hatching, the larvae migrate to an area below those the hardened, bulbous chamber referred to as a gall. Its tolerance of freezing temperatures has inspired many studies into the antifreeze properties of its biochemistry. 5) Some insects have successfully evolved to overwinter as adults; i.e. some grasshoppers have this ability.



The larvae of the Emerald Ash Borer, *Agrilus planipennis*, is freeze-tolerant to certain temperatures and also to only so many days of freezing temperatures. They lay their eggs in ash bark crevices which hatch and feed under the bark through a few larvae stages. This protects them a bit from the cold, but only if the temperature doesn't dip too low, or the periods of cold do not last too long. The Emerald Ash Borer's cells will only stay liquid and functional until -25°, freezing at -30°. A colleague of Laura's wanted to experience the taste of a freeze-tolerant insect so took a small bite of an Emerald Ash Borer. The polyols and sugaars did indeed make it taste sweet! The Emerald Ash Borer is one of Laura's favourite insects.

The science of freezing liquids is interesting in itself.

For instance, If water is made absolutely pure, with no small particles, it can stay liquid for a very long time as compared with ordinary tap water or fresh water, which will freeze quickly at the right temperature. This is because water requires a 'nucleator', or particle, to start the freezing process. Even bacteria can act as nucleators. Some insects actually void their intestines to get rid of their ordinary bacteria. They then make antifreeze proteins which will attach themselves to any new intestinal bacteria, making the insect less susceptible to cell death under colder circumstances.

This nucleation of water to ice can be used for pest control. The Rusty Grain Beetle, *Cryptolestes ferrugineus* (Stephens), which, like bees, is freeze-avoidant, can be killed by spraying ice nucleators on the grain they are infesting. This lowers the grain's temperature and the beetles then die. Exotic invaders such as the Spotted Wing Drosophila, *Drosphila suzukii* (a fruit fly), which love blueberries, grapes, cherries, etc., can overwinter in houses for ten years, but, they *are* chill-susciptible.

Whether or not insects overwinter above or below the snow cover makes a difference as well. Woolly Bears overwinter under snow and leaves and thus are protected from chilling winds and predators. Weevils bury themselves about 10 cm under the earth, but don't

HFN FIELD TRIPS

BUTTERFLIES

Date: Sunday, July 9th Place: McCormack's Beach Weather: Cloudy then sunny Leaders: Clarence Stevens Participants: 7 plus Clarence



– Susan Moxon

"Butterflies at McCormack's Beach" This would be my first butterfly walk and I would learn about and see many different butterflies. Firstly I learned that butterflies do not fly in the rain, they like to stay dry just as we do. Therefore the butterfly walk was rescheduled from the rainy Saturday of July 8th to Sunday, July 9th.

The best butterfly viewing time is from 10:00 a.m. to 2:00 p.m., so we met at noon. The seven participants met Clarence Stevens near a profusion of wild roses by the boardwalk. It would not be long before we would see a fluttering Cabbage White. I was amazed at how small it was. I erroneously thought that all butterflies were about the size of the Monarch. I had a lot to learn and Clarence was an excellent teacher. The Cabbage White is given this name as it feeds on cabbage-like plants. We would see several Cabbage Whites throughout our walk.

Ninety species of butterflies can be spotted in Nova ⁵⁵ Scotia. When butterflies land their wings are closed, therefore often it is necessary to know the appearance of survive freezing at that depth.

Climate change is also a stress in different ways. Not only does it change conditions such as average temperatures, rainfall amounts, winds, lack of ice cover, and northward species migration – warmer temperatures will raise the body temperature of ectothermic insects. This increases their metabolism and can cause starvation because nutrients are burned up more quickly.

Cold and winter are complicated! Different winter conditions affect insects' energy stores. Chilling increases predation success when prey can't move. Freeze/thaw cycles can be variable and are therefore harder to deal with. Freeze/thaw cycles negatively affect the immune systems of insects as well (bats are similarly affected).

Laura is now working on moths and their pheronomes. The session ended with many interesting questions arising from this very interesting and informative talk. Thank you so much to Laura, who is now a wonderful addition to HFN's programme committee.



the undersides of their wings in order to ID them. Clarence prefers to use the Kaufman Field Guide for butterfly identification. It also shows butterflies' silhouettes as well as the view with the wings open. Sadly, a butterfly's life is short. A species peaks for a week or two and then shortly dies. If we were to have repeated this walk in two weeks time, we would have seen different species.

We walked along the boardwalk where Beach Pea was in abundance. We then saw a Silvery Blue (there are five species of blue butterflies in Nova Scotia). We continued along as we looked very carefully, and we spotted a Common Ringlet; Maritime Ringlet butterflies are most usually found in New Brunswick and Quebec.

Clarence informed us that McCormack's Beach to Hartlen Point, as well as Spectacle Lake and Birch Cove in Dartmouth, were good butterfly viewing areas. Mount Uniake Park was another good spot. Most urban butterflies are orange or blue or dark brown.

Next, we spied a Mustard White. This butterfly is also found at Oakfield Park, Truro, and the valley.

We also traversed the inside of the boardwalk where there was an abundance of tall grasses; here we saw a European Skipper. There are 13 species of Skipper butterflies. Before returning to our cars we also saw a Northern Crescent.

Next we drove for about a kilometre along Shore Road to a second grassland with wildflowers. Some of the

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wildflowers included Beach Pea, Daisies, Wild Mustard, and Purple Vetch. Almost immediately, we were rewarded with a sighting of a Red Admiral; there were also a Painted Lady, a Silvery Blue, and a Northern Blue. Apparently, another good spot for the Northern Blue is Chebucto Head. This is an open grassy area near the ocean and Clarence explained how this kind of habitat attracts butterflies. He also spoke of the different 'eyes' on the wings as a way of identifying butterflies; these prominant wing markings which resemble' eyes' are there for the purpose of discouraging predators.

The third stop was at the end of Shore Road before the golf course. Again there were grasses with Daisies, Red Clover, Buttercups, Purple Vetch, Cranberries, and Sedge. Here we saw an Arctic Skipper and a faded Painted Lady; the Painted Lady had probably had some of its scales washed off from the previous day's rain. A Long Dash Skipper and a Northern Crescent were also spotted here. Clarence found some Pheasant feathers and explained how the female pheasant sheds its feathers while the baby Pheasants are flightless. We also saw a Short-tailed Weasel run across the path. Before we headed back to our cars, we saw a Northern Crescent, a Red Admiral, a Tiger Swallowtail, and a Common Ringlet.

Our final viewing spot was on a path near Oceanview school off Caldwell Road. Here we saw several Hobomok Skippers. These butterflies have colonies and are territorial. We also saw an Arctic Skipper.

When we had started, the day was cloudy. Now - the sun shone brightly. We all parted feeling very content with all our sightings. The field trip so interested one participant that she said she would be joining HFN. Clarence Stevens was an excellent guide and ambassador for the club. It was a very good introduction to butterflies for me as well.

Thank you, Clarence!



PARRSBORO ADVENTURE

- Lesley-Jane Butters

Date: July 11th to 16th Place: Parrsboro, Nova Scotia Weather: Sunshine; a few clouds; very warm Leader: John Brownlie and canine assistant Bosco Participants: 20

fascinating places which we visited.



With great anticipation, one could hardly wait for the HFN weekend field trip to Parrsboro Nova Scotia in mid-July, led by John Brownlie and his dog, Bosco. The programme was filled up each day with interesting

natural history subjects which would be observed in the

Leaving Halifax under sunny, very humid conditions, my passengers and I began our beautiful weekend adventure (mind you - Hwy 102 was distinctly un-interesting). For a well-needed break, we stopped at Masstown market; guite the adventure there! We treated ourselves to peach frozen-yogurt cups - I highly recommend them!

Once in the town of Parrsboro, we settled in at 'The Mad Hatter Hostel' which was extremely clean, spacious, and super friendly; we felt very much at home and could come and go as we pleased.

On Friday evening, John invited us naturalists into his home for the evening's 'meet and greet; and for an orientation outline of the weekend's field trips. Unfortunately, a few of the events had had to be cancelled from the programme, due to lack of time.

The Saturday morning meet-up was in front of the Fundy Geological Museum. From there we convoyed to Partridge Island to meet local fishermen tending their fishing weir. It was close to low tide, the ebb tide, when we arrived at the beach, though just enough water was left in the weir for us to see several species of fish splashing madly about in the remaining receding waters. Clad in gumboots/waders we were invited into the weir. We seemed dwarfed next to this towering, netted structure, which was built on the flat ledge of the stony beach at the low waterline, on the north side of Partridge Island.

The nets are built very high, two metres above the highest of Partridge Island's tides. It takes approximately 60 tides to assemble the weir in early spring, which, in late summer, is then dismantled and taken out. If left in place, winter's ice floes would rip the netting and poles to shreds. There were approximately 700 Black Spruce poles supporting the weir's netting, positioned in place by steel footings pounded deep into the stony beach. These footings usually survive the harshness of winter weather and are often left in place. The nets are mended by hand and are re-used as often as possible over the years, sometimes lasting for over 20. Before being stored away for the winter, the netting has to be cleaned thouroughly of algae, periwinkles, and other living marine matter.

The weir works as follows – with a long extension net the fish are guided into entering the weir through a narrow gate and are then are corralled into a semi-circular netting from which they cannot escape (we had an animated, theatrical demonstration by John!).

The flow of incoming fish was rather interesting to watch. But it was a bit disturbing to see them being scooped up by hand nets and then tossed unceremoniously into white plastic fish boxes as they frantically flapped about. The species normally caught are Halibut, Herring, Mackerel, Flounder, Bass, and sometimes, Sturgeon and Skate. These two latter species are thrown back into The Bay of Fundy along with any other stray marine species. A Sea Raven, a dinosaur-like looking spiny creature (Hemitripteridae family) was caught. A peculiar looking fish, it too was tossed back into the bay. As the muddy waters were quickly subsiding, a few more interesting species managed to float in, one being an aqua-green Lumpfish, sometimes named Lumpsucker (Cyclopteridea family). It was actually a rather cute marine species after looking at the Sea Raven! There were also a few purple jellyfish, Green Crabs, and a very small and transparent Sea Gooseberry, also known as a Comb Jelly (Pleurobrachidae family).

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This beautiful marine invertebrate is in a group of its own and is unrelated to jellyfish. A single squid managed to sneak in before the ebbing tide was completely out of the weir. We examined its spotted pink tubular body and its fascinating and piercing beady, greenish eyes. Then it was time to listen to the fishermen's concerns about the Tidal Energy Development Project and the effects this project has on the fishing industry in the Minas Basin.

Our next adventure took us to the visitor centre of the Fundy Ocean Research Centre for Energy (FORCE) which overlooks its technology test site in the Minas Passage of The Bay of Fundy. Force is Canada's leading test centre for in-stream tidal energy technology. It works with researchers, developers, and regulators to study the potential for tidal turbines to operate within The Bay of Fundy. If they can prove that their turbines work successfully near Parrsboro, they can then place them into any other bodies of water worldwide. The turbines ('big fish grinders' say the fishermen) weigh 1,000 tonnes, are five stories high, and are sixteen metres in \Rightarrow diameter. They produce two megawatts of power and are located off Cape Sharp, approximately one and half kilometres offshore. The first tidal turbine-produced energy was connected to the grid in Parrsboro in November, 2016.

After a most informative session at FORCE, it was lunchtime. A few naturalists remained outside the visitor centre to lunch under a partially sunny light blue sky, with tranquil beautiful scenery and Cape Split and the calming serenity of The Minas Basin as a backdrop. We were periodically bothered by a few hungry passing deerfly and numerous pesky mosquitoes. It was then time to leave and join the others for our afternoon field outing.

This field trip was to the Kettle Bog Ponds which are now surrounded by encroaching blueberry fields – 15 minutes outside Parrsboro and minutes from Port Greville. 'Kettle holes' are bowl-shaped depressions created when blocks of ice from retreating glaciers become lodged in glacial deposits. When they later melts, they leave depressions, creating ponds or small lakes. The ponds are extremely deep - about 20 metres, and there are no inlets or outlets. Waterlogged, spongy vegetation comprise various hues of mosses, sphagnum, sedges, heaths, and small conifers (mainly Black Spruce). Over time this vegetation forms into a floating, dense mass around the kettle hole, known as a floating bog. We walked slowly on a trail in the bog so as not to step into a mushy spongy suction hole which might have been difficult to get out of easily. Biting insects are often associated with wetland areas, but on our field trip we were more bothered by the stillness of a muggy air mass and the intense heat from the sun, rather than that of ferocious hungry mosquitoes or deerflies. Observations in the bog were the bog butterflies Bronze Copper, Atlantis Fritillary, and Northern Blue; and baby Green Frogs, caterpillars, and bog moths. Black Spruce dominate the area in and around the bogs. These bog spruces can be decades old but only a few metres in height. Also, we observed one pink Bog Orchid, blooming Sheep Laurel,

Huckleberry, white-tufted Cotton Grass, Pitcher Plants with mosquito larvae inside their tubular leaves, and Round Leaf Sundew (John gave us a detailed description of how these plants catch and devour their prey), colourful red and green mosses, and damselflies and dragonflie (hence the relative lack of biting creatures). Towards the end of the field trip, one of us noticed a small group of yellow water lilies which seemed to be growing above the waterline in the bog, rather than floating. Their large and deep-green firm leaves and yellow globed flowers protruded above the bog, resembling a small, oval bush; upon closer observation we saw they were in the water but had grown up through the bog mass. After supper most naturalists went to see "Pugwash" at the Ship's Company Theatre, an excellent play!

Afterwards, I joined John and Bosco for an evening outing. The town of Parrsboro was built on a very large glacial outwash delta which formed 14,000 years ago at the glacier's base. Powerful, glacial meltwater streams cut into the delta, forming four distinctive terraces easily visible today due to the blueberry industry having removed the forest cover which normally hides these features. These terraces are at different elevations because they were formed as the land was rebounding upwards over time when the glacier was melting.

John and Bosco and I visited a gravel pit where it was easy to see sand and gravel till deposits about five metres thick. The Parrsboro area has some spectacular glacial scenery including dry kettle holes, kettle lakes, hummocky kames, eskers, and terminal moraines (parallel ridges of debris deposited along the sides of a glacier). A kame is a glacial landform, an irregularly shaped hill or mound composed of sand, gravel, and till that accumulates in a depression on a retreating glacier, and is then deposited on the land surface with its further melting. Kames are often associated with kettles, and this is referred to as 'kame and kettle' topography.

Sunday morning was overcast and mild with no fog visible. This meant that our group of seven could take our excursion on the Minas Basin aboard the Zodiac "Explorer 1", with Captain Randy Corcoran (while other HFNers learned about Newville Lake's shore ecology). We met early in the morning at East Bay next to the fish weir on an out-going tide. The Minas Basin is generally calmest in the early morning before the noonday winds develop, and then the Basin can become quite ferocious and frightening, especially in a tiny boat. We rolled our pant legs up and walked knee-deep out into the chilly waters and clambered aboard the Zodiac. Every second counts on a receding tide in the Bay so there was no time for dilly-dallying! Once aboard, we were each issued a full, red flotation safety garment.

We were absolutely thrilled to be boating in the Minas Channel, (for one passenger it was their first time ever to be in a boat on the water) and it seemed a rather magical experience as we normally only see the Minas Basin from various shorelines of the Basin or Bay. As Randy pushed the throttle forward, we picked up speed and were met with a warmish sea breeze plastering our faces – to our joy.

The shoreline of Cape Sharp, West Bay, was our first

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point of interest. We passed over the Tidal Turbine project though there was nothing to see to mark the site, then we motored on to observe the cliffs and jagged coast line near Cape Sharp. Cape Sharp lighthouse (built in 1886) was one of the outstanding attractions seen from the water, as was the majestic beauty of Cape Split in the distance, approximately three and one half kms away on the opposite shore across the narrowest section of The Minas Basin.



As we slowly cruised across the channel, adrenaline kicking in, we crossed the invisible Cumberland/King's County boundary line, and made our way around a huge swath of floating seaweed, a semi-submerged log, and other lurking marine debris. Randy, timing the tide, piloted his Zodiac carefully as we approached the middle section of the channel where tidal ebb and flood create the most turbulence. We were fortunate to cross this section while the ebbing was guite tame, though we could still observe the force of the current by the swirling and churning waters creating whirlpools (thank goodness - not large enough to suck us under). This experience was most gratifying, but at the same time a bit frightening, for every second the waters around the Zodiac were changing in patterns and strength, (fantastic to watch but when might the tide turn into a ferocious turbulence?), and this can been seen and heard from as far away as anyone hiking out to Cape Split. The churning, powerful swells can reach ten metres plus, even too dangerous for the largest of marine crafts. Imagine over 100 billion tonnes of water rushes in and out twice a day!

Across the Minas Channel, we toured around the 60-metre high, dramatic, (charcoal grey with orange lichen), towering basalt cliffs of Cape Split and Blomidon. 'Awe and enthusiasm' struck us all! Cameras clicking frantically, how could we not record such magnificent beauty as seen at such a different perspective than that which we see from land. Far above the Split, tiny figures could be seen - people! Tucking into Broad Cove, a couple of seals popped their heads up to observe us. Coursing down the back side of Blomidon Peninsula, we passed by the Amethyst Cove/Big Eddy rock-hounding sites. Unfortunately, we could not stop here, as the tide was lowering fast and the sunshine brought with it strong northwest winds creating larger swells. Back at the beach, we had to disembark as guickly as we had embarked, so as not to let the Zodiac and its motor

Upon our return I took a couple of us from the Zodiac tour out to the popular Hidden Falls where we saw, in a field before the path to them, a large stand of very tall, domed clusters of the white tiny flowers of the Garden Heliotrope (*Valeriana Officinalis*). Many Great Spangled Fritillary butterflies were flitting from flower to flower. Beautiful! At the falls, the surrounding rock faces were covered in mosses and liverworts, with clusters of Polyploidy ferns. Whirligigs and water striders were numerous in the pools below.

At Newville Lake, we noted the lakeshore's ecology and were quite impressed with the bullfrogs that sat at the edge of the lake snatching whatever moves in front



of them. Fortunately, the Green Frogs have learnt to stay clear of the lak; they reside on the other side of the highway, in ponds. I picked up a Red Sucker leach from the lake and demonstrated how harmless these creatures are, though locals will not swim in the lake due the abundance of leaches there. We saw many schools of small minnows, a leach's delight! Mussel beds are abundant in this lake, and evidence of a Raccoon's feast were observed in piles of shucked shells along the shore. We also observed a green, freshwater sponge. Along the edge of the lake at the beach where we were, was a mysterious strip of wetness about two feet wide from the lake's edge, most peculiar as there was neither tide nor wave action; the lake was calm. What was the reason for fairly wet pebbly strips of beach? Where was the moisture coming from? The best reason we came up with was that the lake waters must flow underground at this point, wetting the gravelly shore above. The numerous aguatic plant species around the lake are of great interest to botanists, a subject for perhaps another enlightening field trip.

With great appreciation, many heartfelt thanks to John Brownlie (and Bosco) for successfully planning and taking the Halifax Field Naturalists on a two-day, fabulously informative field trip in and around the Parrsboro area of Nova Scotia. We had a fantastic outing, one well worth repeating!

Thank you to Grace Beazley, Regine Maass, Gillian Webster, Nick Mattison, John Brownlie, Keith Vaughan, Susan Moxon, and Denyse Contrasty for helping me remember details about this wonderful HFN field trip.

HALIFAX PUBLIC GARDENS – Sheldon Harper and Carol Klar



Date: Tuesday, August 1st Place: Halifax Public Gardens, Spring Garden Road Weather: Sunny; 25°C Leader: Sheldon Harper Participants: 16

On a hot and sunny summer evening 16 of us gathered at the main entrance of the Halifax Public Gardens (HPG) with seasoned HPG gardener Sheldon Harper for a most informative tour and talk on most everything that grows there. We had a little four year old participating with her Mum, the youngest among the many lifetime gardeners in our midst, all of whom had many questions for Sheldon along the way.

Sheldon began by informing us that this year was the 150th anniversary of the HPG, and the section where we were standing was once a former NS Lt. Governor's garden. Two older gardens, the NS Horticultural Society and the then adjacent Public Gardens, amalgamated

ground in the mud.

and in 1872 Richard Power was hired as the park's superintendent. He introduced an axially symmetrical plan which governs the overall design of the site.

One of the garden beds near the entrance holds a plant worthy of note – the deep purple Heliotrope – an old garden heirloom annual (in our Zone 6) from way back. Its distinctive, delicious smell is like vanilla or maybe cherry pie. It is one of those which can be 'pinched' when young in order to promote more blooms.

As we continued on the path he pointed out a Snow Fountain Weeping Cherry, Prunus x snowfazam. In spring it is covered in white blooms which turn into red ornamental fruits in summer; it is known to be diseaseand insect-resistant - a real plus for any gardener.

Next we looked at a giant, Blue-leaf Hosta known as 'Drinking Gourd' since, after rain, water collects and sparkles in its deeply cupped leaves. This one is shadeand tree-root tolerant. (What I needed to know was - is it deer proof? Maybe not.)

Across from the stream near the entrance is a most noteworthy Magnolia with enormous leaves, unlike any other Magnolia tree I've ever seen - a Magnolia tripetala. It's nickname is the 'Umbrella Tree' and is native to the mid-eastern US in the Appalachians, the Ozarks, and the Oachita Mountains.

In the extensive perennial bed across from the geese enclosure, Sheldon pointed out my favorite perennial, Crocosmia, and he lets me name it since I've been growing it in my garden for the past two years (although it is nothing compared to the HPG specimen). This Crocosmia is known as 'Lucifer' and grows to a size of three ft by three ft, with stems covered with Freesia-looking red flowers. It is absolutely stunning, appearing in midsummer and attracting many hummingbirds!

We now approached the bandstand which is surrounded by one of the most glorious displays of colour in the Gardens. The benches surrounding the bandstand allow one to feel as though they are seated at a banqueting table of mainly annuals (in our Zone 6) arranged in a kaleidoscope of lush colours and textures. The Coleus provide a great variety of foliage mixes and are fast and easy to grow but they do not like the cold so don't plant them too early in spring. They can also be kept indoors as a houseplant. Our eyes turn to a most striking plant, the purple Angelonia (also in red and white) which grows from 12 to 18 inches and is a summer favourite. They are herbaceous plants occurring mainly in arid and semi-arid habitats and are fast spreading. Then there was Salvia with its blue-purple flowers (Victoria blue) growing on tall stalks and strikingly contrasting against some grey-green foliage. Questions came forward about a bright, lime-green, low-growing plant which Sheldon informed us is Helichrysum. He tells us this one is a favourite in mixed plantings and grows easily and fast in planters. My favourite was the 'Mystic Illusion' Dahlia, a real stunner of gorgeous, bright yellow daisy-like blooms which really pop out against their rich, dark purple, nearly-black foliage. These are annuals and will be composted at the end of the season.

We moved away from the bandstand and approached the hanging baskets which line the Grand Allée on its

south side, nearest the Horticultural Building. The hanging baskets grow in 18 in. wire round baskets lined with a plastic liner containing Pro-Mix soil. These are created by Sheldon himself and are magnificent. I wanted to know his secret in bringing this creation about. Each one is made up of 15 baby-pink Begonias with one yellow Thumbergia and are planted in three layers. Each of the three layers of plants – top, middle, and bottom - contain a reservoir of the slow-release fertilizer 'Nutricote 14-13-13' which lasts the summer. The water schedule is three times per week and includes a once-aweek water soluble fertilizer of 20-20-20 NPK (nitrogen, phosphorus, and potassium).

Similar to the 'Mystic Illusion' is the 'Mystic Dreamer', a tall hybrid Dahlia with large, bright pink daisy-like flowers and a contrasting rich dark foliage. They are located in the round bed across from the Flora statue.

Sheldon then asked us what we would like to know about next but when one is standing in the midst of one of ten of Canada's most beautiful gardens where should we head now? Of course - to the other glorious display of dazzling Dahlias a few of which were just coming into bloom. The Dahlia is a genus of bushy, tuberous, herbaceous perennial plants native to Mexico. Dahlias belong to the Aster family along with daisies and sunflowers. They need to be over-wintered in an unheated indoor space in a dry medium such as wood shavings. Propagation begins in March with the cleaning and division of tubers. Young plants are planted out in May with an organic fertilizer of either manure or anything of an organic nature. Plants grow very large and require regular watering throughout the season.

This concluded the stroll with Sheldon although he stayed around to answer more questions. With many thanks for a splendid evening and a final farewell, we headed back to our cars not long before closing time. Thank you, Sheldon, for a most enjoyable and informative evenina.

Mentioned in this article are only a few of the many plants, shrubs, and trees Sheldon spoke of, as well as a wealth of information on how to improve our own gardens.

As a member of the Friends of the Halifax Public Gardens. I am now aware of a most celebrated Dahlia Festival that takes place in the Gardens in late August/ early September, when the Dahlias are at their peak. For as little as \$10.00 for a yearly membership it is well worth knowing about all the special events and activities that take place here each year.





WILDLIFE AT SUNSET

- Denyse Contrasty

Date: Saturday, September 22nd Place: Subenacadie Provincial Wildlife Park Weather: Warm; no wind Leader: Nick Baker & Rebecca Blank Participants: 23

Eighteen adults and five children gathered at the Shubenacadie Wildlife Park Visitors' Centre to look at the indoor displays before leaving for a two-hour night tour of the Park's animals. Guides Rebecca Blank and Nick Baker asked that no one climb onto or over the rail fences, and that we not shine flashlights directly onto the animals (camera flashes were fine however). There was an outhouse stop planned mid-tour, and these tours are offered once a month to the public, and two to three times a month to private groups such as HFN. The park is relatively free of deer ticks as the paths are well groomed and gravelled.

The participants were led through a gated entrance which was locked at night to keep out predators of any kind, including humans. Animals are kept at the park if they have been permanently injured or if they have imprinted onto humans. Either condition means they would not survive in the wild very long if released.

The first enclosure had a Red-tailed Hawk which had a wing injury (usually caused by their dropping down into wires). Birds' bones are hollow and therefore do not fuse well if broken. Consequently, the wing is usually partially removed or amputated. This hawk's cry is used as a film voice-over for other hawks which do not have the same distinct sound as the Red-tailed Hawk.

The next two enclosures contained a Barn Owl, distinguished by the horizontal lines on his head, and a Great Horned Owl. The Barn Owl mates for life and is rarely seen, as they live mostly south of Nova Scotia; they like vacant buildings such as barns. The Great Horned Owl is the third largest population of owls in NS, and they will prey on animals up to twice their weight. This Owl is territorial and will steal other birds' nests for their own use. They can see in both the day and the night and can also see in the ultraviolet range. The latter means that their prey (mostly rodents) which urinate as they move about, leave a trail the owl can easily detect. Owl's wing feathers are like fingers pointing downwards, and are linked to one another. This means the wings make no sound when they swoop down on their prey. Owls prefer old trees, and our guide asked us that before cutting any old tree down, we should first check that it is not being used by an owl.

The bears have a very large enclosure but had been locked into their den for the night for security reasons. Many asked throughout the walk if we could see the bears. However they were not available for viewing.

The Bald Eagle surprised many with its very highpitched screechy call. The guide was pleased to say that these eagles were making a comeback ever since the insecticide DDT had been banned. Farmers who had in the past sprayed their fields with DDT caused a bio-accumulation effect on the food chain of eagles. Too much DDT in their diet made their eggs soft and when the eagle would sit on them, they would break. These eagles can be found in river areas and they pick the easiest food sources. Their heads turn white in three to four years time and they mate for life. They will use the same nest from year to year if their hatching of eggs was successful the year before. They will prey on animals up to three to four times their size – roughly the size of a small VW car! The Park has shipped Bald Eagles to the US to aid in their repopulation there.

The guides then asked us to be very quiet. In the distance we could hear the howls of wolves and coyotes.

The Otters in the next enclosure were sisters as well as playmates. They are very territorial and in spite of their playful nature, they don't like other species – including humans. These particular two have actually bitten the person who feeds them. Otters have oil glands which waterproof their fur. **They remain in the enclosure in the winter and they keep a hole in the ice open so that** they are able to swim even in freezing temperatures.

One Racoon in the next enclosure put on a good show by climbing wooden staging and crossing an aerial bridge before lying down in the middle of it. The guide stated that people either love or hate Racoons. Many are kept as pets but released when they mature into cranky adults, but by then they have lost their ability to adapt to the wild. They have fingers, like ours, which permit them to wash their food before eating it, and they climb trees quickly. Like many wild animals, they are safe to approach as long as they have an escape route. They are found everywhere, even in the tropics, and are known as 'trashcan pandas' in southern cities. Their main drawback is that their diseases, such as worms, can be transferred to humans.

It was easy to see the Snowshoe Hares in the next enclosure as they are quite big. While currently their fur is brown, it turns white in the winter. They have a very large heart which assists them in outrunning their predators; they can run up to 17km/h. They have three to four litters annually and are the main food source for Bobcats, Owls, and Coyotes. They live about two to four years.

A pair of Skunks had been locked up in a small cage which was constructed to mimic the size of their dens in the wild. These skunks had been de-scented and would therefore make an easy snack for coyotes at night. As they are slow moving, skunks will do a dance and then lift their tail to warn approaching animals that they will get sprayed if they get too close. Owls have no smelling organs and therefore will prey on skunks. Skunks love to eat ground insects and that accounts for the many holes found in your lawn in the morning.

The Beavers were a big hit and were swimming about in their small pool filled with tree branches as they do most of their work at night time. It is a hard job for the caretakers as they must clean the pool out every three days and then pressu-wash it before filling it again with water and new branches. The beaver is the largest rodent in North America. As their teeth constantly grow, they must constantly knaw to keep their teeth worn



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down to a useable length. Beavers have lips that close behind their teeth to keep water out when they are carrying sticks; nictitating, transparent eyelids which keep their eyes dry when swimming; and oil glands which keep their fur relatively dry. This oil, called castor oil (not to be confused with the plant source castor oil), is very smelly, and is used to make perfumes. Their broad tail is used as a rudder and to warn other beavers of danger. Beavers have recovered their numbers to about the same as when the Europeans first arrived in Canada.

A River Mink was scooting about in the next enclosure. Minks appear little and cute, but kill for sport and are fearless. Foxes get the most blame for killing chickens, but it is usually Mink which are the culprits. Mink fæces is very smelly. Ranched Minks are three times the size of wild Minks, as they are farmed for their pelts.



One enclosure had a mated pair of Porcupines and their year-old offspring. A porcupine has 30,000 quills which are soft at birth. However, in only two to three hours they become protectively hard. Porcupines are often found on roadsides, as they like easy walking. Christmas tree farmers don't like them because they eat their trees. Porcupines have enzymes and antibodies to protect them against others' quills. Quills are hollow and barbed like a fish hook at the end of each quill. Before 'standing its quills up' (just like the Skunk before it 'sprays'), the Porcupine also does a warning dance.



Red foxes were patrolling the next enclosure. There are three populations in NS – Cross Fox which are dark black with a brown cross on their back (a partially melanistic colour variant of the Red Fox, *Vulpes vulpes*); Silver Fox which are black with white at the tips of each hair; and the Red Fox.

The white fur of the Arctic Wolves in the next enclosure made them stand out in the darkness of the night. They have a longer nose and legs and flatter feet than other wolves. Once, they were native to NS, being a subspecies of the Grey Wolf. But, it was always a small population, and they were extirpated, that is, died out, in the late 1960s. Once the apex predator, they have been replaced by the Eastern Coyote, which is a cross between wolves and the smaller Western Coyote. This Eastern Coyote first appeared in Algonquin Park and then started moving eastward to NS.

The next enclosure housed the Grey Wolves which prey on large animals such as deer, Caribou, Elk, and Moose. They have been reintroduced into western areas, and there they are in conflict with ranchers who claim they are eating their sheep or cattle. They have a distinctive pecking order – the alpha animal of the wolf pack decides when to hunt and to reproduce; they wander both in family groups and alone.

We did not see any Lynx or Bobcats as they had been moved to temporary facilities when their regular enclosures underwent maintenance. Bobcats do not range any further north than NS.

Halfway through our tour we were shown the 'Peacock tree' where several all-white hens plus one brightly coloured male were roosting for the night. We were surprised to see how high they roosted in this giant White Pine, and were even more surprised when a 'bomb' of peacock droppings landed very near to Rebecca, who had warned us against standing under their tree!

Before we knew it we were approaching the Moose enclosure, and some participants were startled by a strange noise which grew louder and louder. A fine bull Moose was standing by the fence with a magnificent set of antlers which probably weighed about 40 pounds! There are two populations of Moose in NS - one on the mainland, which is endangered, and the other in Cape Breton, which is not. The Cape Breton Moose had been sent from Alberta to repopulate the island, while the ones on the mainland have a 'love corridor' between NB and NS which will increase the genetic diversity in the mainland NS population. Moose need large tracts of undisturbed land to thrive, such as is found in Guyborough county. In the summer they eat aquatic plants and in the winter move to forested areas for shelter and to eat bark. They are the largest species of the deer family and they sport a large fat deposit called a dewlap or bell. Each cow produces one or two calves yearly.

An animal which usually lives in the Yukon or BC is the Dall Sheep, which was housed in the next enclosure. To escape predators in its natural habitat, it goes up the sides of mountains on hooves that have adapted to stand on toeholds which are no bigger than two inches! On one side, their fence was leaning into a corridor which separated them from the Big Horn Sheep which also had their fence leaning into the corridor. Males will battle for territory and these sheep have charged their respective fences multiple times. Both types of sheep have a 'second skull' layer to cushion blows. As there are many blood vessels at the base of their horns, a badly damaged horn can cause a bleed-out and the animal will die. Consequently, most fights will eventually lead to one male walking away before significant damage is done.

We were surprised to see a pair of Sable Island Horses in the next enclosure. The origin of these horses on Sable Island cannot be determined, and Sable Island is a harsh environment of sand, wind, and little fresh water; it is a wonder that the horses have survived for so long. Sable horses are now protected and cannot be removed. The two Shubenacadie horses are descendents of some which were removed before protection was put in place.

A Caribou stood in the next enclosure. There are two populations in Canada, one in Newfoundland/Labrador and the other in the North West Territories where there are great migrations of these every year. Both males and females grow antlers, and we found out that the tendon from their leg to their hoof makes a clicking sound when they walk.

We were surprised to see Emus in the next enclosure. These are flightless birds and not as aggressive as are Ostriches or Cassowaries; consequently, they are sometimes farmed for their eggs, oil, and meat.

The next two pens contained a Black Vulture and a Turkey Vulture. The Black Vulture is a well known scavenger in NS while the Turkey Vulture started appearing in NS in the Yarmouth and Digby areas. The latter have a strange habit of defecating onto their feet to get them warm!

We stopped by an enclosure holding Wild Turkeys. They can be found where there is much undergrowth, as they like to make their nests low to the ground. However, they prefer to roost in the trees as they mature. Nick said the Wild Turkey was once considered for the US's national bird because it was so prevalent and also a such a good food source.

We then passed the enclosure of Shubenacadie Sam (Groundhog) who had been removed due to work on his pen. Nick said Sam should not be blamed if he predicted the wrong date for the end of winter, as the Groundhog is not using scientific methods!

The Cougar was walking about its enclosure. While not found in NS, there have been sightings in the last few years. Nick thought they might have been escapees from private collections. (Later, the author asked Nick and Rebecca if these private collections were registered with DNR, he said most are not.) Cougars are known by 60 different names such as Puma, Mountain Lion, and Wildcat. While large, they have small hearts and lungs., consequently, they stalk their prey and then pounce to kill them rather than run them down. Nick pointed out that they could go very high or very far in one jump.

We came to the enclosure that housed Red Deer which are found only in the UK and were a gift from Her Majesty Queen Elizabeth. They are Elk-sized and are renowned for eating all vegetation in sight, turning an area of woodland into a swamp.

The final enclosure was that of the White-tailed Deer which shed their antlers every year in December and January. They flip their tails up to show the white to signal danger. They can also be heard blowing or snorting as they smell the air for other animal scents. Nick reminded us not to touch any fawn if we ever come across one lying in the grass ; it is customary for does to leave their fawns to go and graze and then to return several hours later to nurse them. If the doe smells the scent of a human on her fawn, she will abandon it.

We returned to the Visitors' Centre where we thanked both guides. It had been a long day for them as they had started work at 8:30 a.m. and it was now nearly 10:00 p.m.!



NATURE NOTES

– Stephanie Robertson

SEPTEMBER

On Monday, September 3rd, at Melmerby Beach, Pictou County, Stephanie Robertson observed two Pileated Woodpeckers, most probably an adult and its 'begging' youngster on a tall conifer. After observing over many seasons the behaviours of various adult bird who bring their fledged young to their suet feeder in Halifax in order to show them acceptable local food sources, she came to the conclusion that this is what she was witnessing. The parent Pileated kept pecking at various places on the tree trunk, and the youngster kept following, but not imitating, its parent's food foraging. It kept up its hopeful wing fluttering and open-beak presenting without result, and finally, the adult flew off with the young one close behind.

At Gaspereau Lake, Blomidon Naturalists David and Sheila, friends of Lesley-Jane Butters, saw a Loon sitting on an egg for about one full month. Sheila, a keen birder, took the egg off nest hoping the mother Loon would look after herself (no other loons seemed to be anywhere nearby to perhaps bring food to her). When the egg was finally able to be retrieved (the Loon had left the nest permanently), it was found to be dead.

One month ago Grace Beazley was canoeing on Keji's Mersey River and twice spotted an American Bittern amongst the tall water reeds there.

On a trip to Keji when it was very windy, Gareth Harding reported seeing 14 Loons (including six young ones) behind some islands.



Carol Klar reported a Ring-necked Snake on her property. Although having had a regular individual which she has spotted for five years, this snake's colouring told Carol it was a different one. She lives on Remington Court near Belcher's Marsh in Clayton Park.



Barry Clarke was star-gazing at Sherbrooke Lake when along with two other people, he spotted a bat. He let the audience know that there exists a website where you can report sightings of Nova Scotia bats.

Speaking of bats, Mike Bradfield reported one which had alighted to hang from his finger(!) at Hirtle's Beach in 2001. There was a skate/ray on the sand there also, 20 inches wide and about 24 inches long. It was tan in colour with grey markings and sported a cross-shape on its back near its head.



On Sunday, September 2nd, Wendy McDonald observed a Kentville entomologist releasing 80 Monarch butterflies at Hartlen Point, after he had collected and stored the eggs for hatching.



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 melancholy days are come, the saddest of the year, Of wailing winds and naked woods and meadows brown and sear."

- William Cullen Bryant, from Outdoor rambles, by Stuart L. Thompson, 1958

NATURAL EVENTS

- 6 Sept. Full Moon. Moonrise at 20:08 ADT.
- 22 Sept. Autumnal Equinox at 17:02 ADT: Fall begins in the Northern Hemisphere.
- 28 Sept. & 29 Sept. Fourteenth anniversary of Hurricane Juan.
- **30 Sept.** Average date for first frost in Halifax (Env. Canada says that there is a 1:10 ten chance of frost before this date.) Look forward to 210 days of frosty weather.
- 5 Oct. Full Moon. Moonrise at 19:08 ADT.
- 4 Nov. Full Moon. Moonrise at 18:48 ADT.
- 5 Nov. Daylight Saving Time ends (set back clocks one hour), and Atlantic Standard Time begins at 2:00 a.m.
- **22 Nov.** Daily minimum temperature goes below 0°C.
- 3 Dec. Full Moon. Moonrise at 17:06 AST.
- 4 Dec. -5 Dec. Moon at close perigee; high tides follow.
- 5 Dec. -14 Dec. Earliest Sunset of the year at 16:34 AST.
- 7 Dec. Daily average temperature goes below 0°C.
- 13 Dec. & 14 Dec. Geminid Meteor Shower.
- 14 Dec. to 5 Jan. Audubon Christmas Bird Count period.
- **21 Dec.** Winter Solstice at 12:28 AST; the shortest day. Winter begins in the N. Hemisphere; the temperature drops, but days begin to lengthen.
- 27Dec. to 31 Dec. Latest Sunrise of the year at 07:51 AST.

Sources: Atmospheric Environment Service, Climate Normals 1951-80 Halifax (Shearwater A) N.S.;
 Blomidon Naturalists Society's 2017 Calendar; United States Naval Observatory Data Services.

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



ORGANISATIONAL EVENTS

Blomidon Naturalists Society: Indoor meetings are held on the 3rd Monday of the month, in Room BAC241 in 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/.

16 Oct. Joint meeting with the Valley Gardeners.

Burke-Gaffney Observatory: Public shows at the Burke-Gaffney Observatory at Saint Mary's University are held on the 2nd and 4th Friday of each month, except from June through September when they are held every Friday. Tours begin at 7:00 p.m. between November 1st and March 30th, and at either 9:00 p.m. or 10:00 p.m. (depending on when it gets dark), between April 1st and October 31st. For more information, 496-8257, or go to http://www.smu.ca/academics/depart-ments/astronomy-physics-burke-gaffney-observatory.html#tours.

Friends of McNab's Island: Contact Faye Power, 443-1749, or go to http://www.mcnabsisland.ca/. 15 Oct. Rain date: 22 Oct. "Fall Foliage Tour".

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 is a protected email address. You need JavaScript enabled to view it. Or, email the trip leader, or **http://www.nsbirdsociety.ca**/.

- 28 Sept. "Robie Tufts, His Life and Legacy", with speaker Mark Elderkin, DNR.
- **30 Sept.** to 1 Oct. "Brier Island Weekend", with leader James Hirtle 1-902-693-2174, jrhbirder@hotmail.com.
- 26 Oct. "A is for Adventure", with speakers Chris Surette and Jan LaPierre.
- 25 Nov. "Annual General Meeting and Wine and Cheese" in the NSMNH Main Floor Gallery.

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.novas-cotiaparks.ca/.

Nova Scotia Museum of Natural History: For more information, 424-6099, 424-7353, http://naturalhistory.novascotia.ca/. 21 June -5 Nov. "First Peoples, First Meetings: The French in Seventeenth Century Mi'kma'ki."

Nova Scotia Nature Trust: For more information, 425-5263, or go to http://www.nsnt.ca. **26 Oct.** "20th Annual Dinner and Auction", with speaker Brian Keating, www.goingwild.org.

Nova Scotia Wild Flora Society: Meets the fourth Monday of the month, September to May, at the Nova Scotia Museum of Natural History, 7:30 p.m. For more information email **nswildflora@yahoo.ca**, or go to **http://www.nswildflora.ca**/.

- 25 Sept. "Building a functional mini-meadow without shocking the neighbours (too much)..", with speaker Mary Macaulay.
- 14 Oct. Rain date 15 Oct. "Acadian Forest Walk", with leader David Patriquin.
- 23 Oct. "Looking for Stuff. Terrestrial Ecology for Fun and Profit", with speaker Mike Crowell.
- 27 Nov. "Seagrasses and Seaweeds of the Southern Caribbean", with speaker David Patriquin.

Nova Scotian Institute of Science: Meets the first Monday of the month, September to April, usually at the Nova Scotia Museum of Natural History, 7:30 p.m. For more information, go to **http://nsis.chebucto.org/**.

- **2 Oct.** "A Proud History of the Geological Survey of Canada: On the 175th Anniversary", with speaker Dr. Steven Locke, GSC.
- **6 Nov.** "In Pursuit of 'the other' Greenhouse Gas: Mapping Methane Emissions Across the Canadian Energy Sector", with speaker Dave Risk, St.FX.
- **4 Dec.** "A "clear cut" Perspective About "science-based" Forest Management in NS", with Dr. Donna Crosland. This lecture takes place at the K.C. Irving Centre, Acadia University.
- **8 Jan.** "150 Years of Canadian Dinosaurs and Other Major Fossil Discoveries", with Dr. Tim Fedak, Fundy Geological Museum. This lecture takes place at the Halifax Central Library, 7:00 p.m.

Royal Astronomical Society of Canada (Halifax Chapter): Meets the third Friday of each month (except July and August) in Room AT101 of the Atrium Building at Saint Mary's University, 8:00 p.m. For more info, http://halifax.rasc.ca/.

Young Naturalists' Club: A fun, free nature club for children seven to 12 years. Meetings take place every third 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 info, Karen McKendry, 404-9902, **ynchalifax@yahoo.ca**, or, **http://nature1st.net/ync**.



HALIFAX TIDE TABLE



	October-octobre						November-novembre								December-décembre								
Day	Time	Metres	Feet	jour	heure	mètres	pieds	Day	Time	Metres	Feet	jour	heure	mètres j	pieds	Day	Time	Metres	Feet	jour	heure	mètres	pieds
1 SU DI	0437 1041 1641 2303	1.5 0.7 1.6 0.5	4.9 2.3 5.2 1.6	16 MO LU	0510 1143 1727	1.7 0.4 1.7	5.6 1.3 5.6	1 WE ME	0523 1143 1742 2354	1.7 0.4 1.7 0.3	5.6 1.3 5.6 1.0	16 TH JE	0031 0613 1302 1844	0.4 1.8 0.3 1.7	1.3 5.9 1.0 5.6	1 FR VE	0523 1205 1759	1.9 0.2 1.7	6.2 0.7 5.6	16 SA SA	0052 0626 1319 1907	0.5 1.7 0.3 1.6	1.6 5.6 1.0 5.2
2 MO LU	0526 1129 1731 2351	1.6 0.6 1.6 0.4	5.2 2.0 5.2 1.3	17 TU MA	0003 0559 1236 1818	0.3 1.8 0.3 1.7	1.0 5.9 1.0 5.6	2 TH JE	0604 1232 1829	1.8 0.2 1.7	5.9 0.7 5.6	17 FR VE	0116 0653 1344 1927	0.4 1.8 0.2 1.7	1.3 5.9 0.7 5.6	2 SA SA	0010 0611 1258 1852	0.3 2.0 0.1 1.7	1.0 6.6 0.3 5.6	17 SU DI	0134 0707 1356 1950	0.5 1.7 0.3 1.7	1.6 5.6 1.0 5.6
3 TU MA	0607 1215 1816	1.7 0.5 1.7	5.6 1.6 5.6	18 WE ME	0054 0642 1324 1904	0.3 1.8 0.3 1.8	1.0 5.9 1.0 5.9	3 FR VE	0042 0645 1321 1915	0.3 1.9 0.1 1.8	1.0 6.2 0.3 5.9	18 SA SA	0157 0732 1421 2009	0.4 1.8 0.2 1.7	1.3 5.9 0.7 5.6	3 SU DI	0104 0701 1351 1943	0.3 2.0 0.0 1.8	1.0 6.6 0.0 5.9	18 MO LU	0210 0746 1431 2030	0.6 1.8 0.3 1.7	2.0 5.9 1.0 5.6
4 WE ME	0035 0645 1259 1858	0.3 1.7 0.3 1.8	1.0 5.6 1.0 5.9	19 TH JE	0139 0722 1407 1947	0.3 1.9 0.2 1.8	1.0 6.2 0.7 5.9	4 SA SA	0129 0728 1410 2002	0.2 2.0 0.0 1.8	0.7 6.6 0.0 5.9	19 SU DI	0233 0810 1455 2050	0.5 1.8 0.2 1.7	1.6 5.9 0.7 5.6	4 MO LU	0159 0752 1444 2036	0.2 2.1 -0.1 1.8	0.7 6.9 -0.3 5.9	19 TU MA	0241 0825 1504 2109	0.6 1.8 0.3 1.7	2.0 5.9 1.0 5.6
5 TH JE	0118 0722 1345 1940	0.2 1.8 0.2 1.8	0.7 5.9 0.7 5.9	20 FR VE	0220 0801 1446 2029	0.3 1.9 0.2 1.8	1.0 6.2 0.7 5.9	5 SU DI	0218 0814 1500 2051	0.2 2.0 0.0 1.8	0.7 6.6 0.0 5.9	20 MO LU	0305 0848 1528 2129	0.6 1.8 0.3 1.7	2.0 5.9 1.0 5.6	5 TU MA	0257 0844 1539 2129	0.3 2.1 -0.1 1.9	1.0 6.9 -0.3 6.2	20 WE ME	0312 0903 1537 2146	0.6 1.8 0.3 1.7	2.0 5.9 1.0 5.6
6 FR VE	0159 0801 1430 2024	0.1 1.9 0.1 1.8	0.3 6.2 0.3 5.9	21 SA SA	0257 0839 1523 2110	0.4 1.8 0.3 1.7	1.3 5.9 1.0 5.6	6 MO LU	0310 0901 1553 2141	0.2 2.0 0.0 1.8	0.7 6.6 0.0 5.9	21 TU MA	0336 0926 1601 2208	0.6 1.8 0.4 1.7	2.0 5.9 1.3 5.6	6 WE ME	0359 0937 1635 2222	0.3 2.0 0.0 1.9	$1.0 \\ 6.6 \\ 0.0 \\ 6.2$	21 TH JE	0345 0941 1612 2222	0.7 1.8 0.4 1.7	2.3 5.9 1.3 5.6
7 SA SA	0242 0841 1517 2108	0.1 1.9 0.1 1.8	0.3 6.2 0.3 5.9	22 SU DI	0331 0917 1558 2151	0.5 1.8 0.3 1.7	1.6 5.9 1.0 5.6	7 TU MA	0408 0951 1650 2232	0.3 2.0 0.0 1.8	1.0 6.6 0.0 5.9	22 WE ME	0409 1005 1638 2246	0.7 1.7 0.4 1.7	2.3 5.6 1.3 5.6	7 TH JE	0503 1029 1734 2315	0.4 1.9 0.1 1.8	1.3 6.2 0.3 5.9	22 FR VE	0425 1019 1650 2259	0.7 1.7 0.4 1.7	2.3 5.6 1.3 5.6
8 SU DI	0328 0924 1608 2154	0.2 1.9 0.1 1.8	0.7 6.2 0.3 5.9	23 MO LU	0402 0955 1633 2230	0.6 1.8 0.4 1.7	2.0 5.9 1.3 5.6	8 WE ME	0513 1041 1750 2324	0.4 1.9 0.1 1.8	1.3 6.2 0.3 5.9	23 TH JE	0451 1043 1718 2325	0.8 1.7 0.5 1.7	2.6 5.6 1.6 5.6	8 FR VE	0609 1122 1833	0.4 1.8 0.1	1.3 5.9 0.3	23 SA SA	0511 1057 1733 2337	0.7 1.7 0.4 1.7	2.3 5.6 1.3 5.6
9 MO LU	0420 1009 1703 2242	0.2 1.9 0.1 1.8	0.7 6.2 0.3 5.9	24 TU MA	0437 1033 1712 2310	0.7 1.7 0.5 1.6	2.3 5.6 1.6 5.2	9 TH JE	0621 1134 1851	0.4 1.8 0.2	1.3 5.9 0.7	24 FR VE	0542 1123 1805	0.8 1.7 0.5	2.6 5.6 1.6	9 SA SA	0008 0713 1218 1931	1.8 0.5 1.7 0.2	5.9 1.6 5.6 0.7	24 SU DI	0604 1137 1820	0.7 1.6 0.5	2.3 5.2 1.6
10 TU MA	0520 1056 1803 2332	0.3 1.9 0.2 1.7	1.0 6.2 0.7 5.6	25 WE ME	0521 1113 1756 2351	0.7 1.7 0.5 1.6	2.3 5.6 1.6 5.2	10 FR VE	0020 0728 1231 1953	1.7 0.5 1.7 0.2	5.6 1.6 5.6 0.7	25 SA SA	0006 0639 1206 1855	1.6 0.8 1.6 0.6	5.2 2.6 5.2 2.0	10 SU DI	0104 0814 1317 2029	1.7 0.5 1.6 0.3	5.6 1.6 5.2 1.0	25 MO LU	0019 0659 1221 1910	1.7 0.7 1.6 0.5	5.6 2.3 5.2 1.6
11 WE ME	0628 1146 1906	0.4 1.8 0.2	1.3 5.9 0.7	26 TH JE	0616 1155 1845	0.8 1.6 0.6	2.6 5.2 2.0	11 SA SA	0123 0832 1336 2052	1.6 0.5 1.6 0.3	5.2 1.6 5.2 1.0	26 SU DI	0053 0736 1255 1947	1.6 0.8 1.6 0.5	5.2 2.6 5.2 1.6	11 MO LU	0205 0913 1424 2125	1.7 0.4 1.5 0.4	5.6 1.3 4.9 1.3	26 TU MA	0104 0755 1313 2001	1.7 0.7 1.6 0.5	5.6 2.3 5.2 1.6
12 TH JE	0027 0735 1242 2008	1.6 0.5 1.7 0.3	5.2 1.6 5.6 1.0	27 FR VE	0037 0717 1242 1937	1.6 0.8 1.6 0.6	5.2 2.6 5.2 2.0	12 SU DI	0234 0933 1451 2150	1.6 0.5 1.6 0.3	5.2 1.6 5.2 1.0	27 MO LU	0148 0831 1353 2040	1.6 0.7 1.5 0.5	5.2 2.3 4.9 1.6	12 TU MA	0309 1009 1536 2220	1.7 0.4 1.5 0.4	5.6 1.3 4.9 1.3	27 WE ME	0155 0850 1414 2054	1.7 0.6 1.5 0.5	5.6 2.0 4.9 1.6
13 FR VE	0131 0841 1347 2110	1.6 0.5 1.6 0.3	5.2 1.6 5.2 1.0	28 SA SA	0132 0815 1338 2030	1.5 0.8 1.5 0.6	4.9 2.6 4.9 2.0	13 MO LU	0346 1031 1607 2247	1.7 0.4 1.6 0.4	5.6 1.3 5.2 1.3	28 TU MA	0247 0925 1500 2132	1.6 0.6 1.5 0.5	5.2 2.0 4.9 1.6	13 WE ME	0408 1102 1640 2314	1.7 0.4 1.5 0.4	5.6 1.3 4.9 1.3	28 TH JE	0251 0946 1524 2149	1.7 0.4 1.5 0.5	5.6 1.3 4.9 1.6
14 SA SA	0249 0944 1506 2210	1.6 0.5 1.6 0.3	5.2 1.6 5.2 1.0	29 SU DI	0239 0909 1445 2123	1.5 0.8 1.5 0.5	4.9 2.6 4.9 1.6	14 TU MA	0444 1126 1708 2340	1.7 0.4 1.6 0.4	5.6 1.3 5.2 1.3	29 WE ME	0344 1018 1607 2224	1.7 0.5 1.5 0.4	5.6 1.6 4.9 1.3	14 TH JE	0459 1152 1734	1.7 0.3 1.5	5.6 1.0 4.9	29 FR VE	0350 1044 1632 2247	1.8 0.3 1.6 0.4	5.9 1.0 5.2 1.3
15 SU DI	0409 1045 1625 2309	1.6 0.5 1.6 0.3	5.2 1.6 5.2 1.0	30 MO LU	0346 1002 1554 2215	1.6 0.7 1.5 0.5	5.2 2.3 4.9 1.6	15 WE ME	0531 1217 1759	1.7 0.3 1.6	5.6 1.0 5.2	30 TH JE	0435 1112 1706 2316	1.8 0.3 1.6 0.4	5.9 1.0 5.2 1.3	15 FR VE	0005 0544 1238 1823	0.5 1.7 0.3 1.6	1.6 5.6 1.0 5.2	30 SA SA	0448 1141 1734 2347	1.9 0.2 1.6 0.4	6.2 0.7 5.2 1.3
	LL I ARE	TIMI S AST	Ξ S Γ	31 TU MA	0439 1053 1652 2306	1.6 0.6 1.6 0.4	5.2 2.0 5.2 1.3				Ś	K	S					ķ		31 SU DI	0544 1238 1831	2.0 0.1 1.7	6.6 0.3 5.6

