



Since 1923

TORONTO FIELD NATURALIST

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High Park, Autumn 2020. Photo: Charlotte Broome

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PRESIDENT'S REPORT

Running rapidly upwards in mid-air, the tiny spider and its shining thread of silk floated a few feet before my astonished eyes. We both were far out on a bay in northern Ontario, early fall. My kayak would take me safely to shore, but the spiderling was drifting perilously over dark waters. An image to reflect upon.

How often have we seen that spider's admirable trait demonstrated in our own species and in our own communities! Especially over recent months, pandemic constraints have induced creative minds to spin out threads for new ideas and test them bravely in the changing breezes. Some ideas inevitably take a dunking; some float away; but some manage to land on good terrain and thrive. Consider these samplings of creativity within our own TFN community:

Sandra Iskandar, art educator and architect, has piloted a mindful drawing course for TFN members via Zoom. Over three sessions, participants are guided in sketching birds. They learn to relish "being in the moment" and they get their creative juices flowing.

Joanne Doucette, author, artist, historian and a seasoned TFN walk leader, has begun offering Zoom chats a few days before her walks. These chats let participants share deeper understanding of science and history themes. They also open the communal walk experience to members who may not be able to join the actual walk.

Jim Eckenwalder now offers a series for our newsletter on Biodiversity Patterns in Ontario in addition to his Tree of the Month, and Nancy Dengler is explaining Why Plant Names Change. Jennifer Smith has launched a new series about bird behaviour. Each article is an investment of time, our most valuable resource, and a willingness to experiment. Will the story come across? Will readers' synapses crackle with new insights? Will someone respond? Similarly, every personal nature experience and

photo contributed to the newsletter acts like a thread spun out for the breeze to catch, a hope for connection and confirmation.

Zunaid Khan, our Vice-President, tried out a TFN photography group last spring, in part to help foster ethical nature photography. Already the group has 25 members participating in both virtual and in-person events.

Jason Ramsay-Brown and Corinne McDonald, our webmaster and membership coordinator respectively, have switched our membership database to a cloud-based format, no longer bound to an office computer. To be clear, this move was not a blind leap into the unknown. Rather, the plans were carefully spun over the course of a year or more. Among other benefits, it spares Corinne a monthly trip to Toronto to sync up membership files, and empowers her to better serve member needs.

More TFN creativity and enterprising spirit were on display at our virtual Annual General Meeting on October 14. The AGM allowed us to thank retiring board members Mark Stewart and Alex Wellington for their dedication on behalf of nature. We also welcomed Jessica Iraci to the TFN board. Jessica works for the City of Toronto as a Natural Environment Specialist on projects involving naturalization, restoration and use of regeneration techniques. With a Master of Forest Science and Bachelor of Biology and Environmental Science from the University of Toronto, she will clearly add expertise and insight to board discussions. If you missed the AGM, the recording will be available here: <https://tfngo.to/agm2021>.

As autumn ripens, be sure to explore, enjoy and help promote TFN's many creative experiments to connect people with nature.

Ellen Schwartzel
president@torontofieldnaturalists.org

WHAT'S NEW ON TFN'S WEBSITE

Visit today and discover:

- . October's Zoom Lecture
- . Highlights of our 2021 AGM
- . A Shot in the Dark

Discover all this and more at <https://tfngo.to/for-members/>

TFN OUTINGS

Due to COVID-19 we continue our practice of offering “members only” outings posted on our website. To ensure that groups do not exceed allowed maximums and to facilitate contact tracing should the need arise, members who wish to attend a particular walk must pre-register. This facility opens on the website, at a random time of day, five days before the date of each walk. Walk leaders will have a list of who registered, and only people on the list will be allowed to participate. Before registering, please review all guidelines on the webpage and carefully review walk descriptions for any additional guidelines specific to that walk.

Visit the “Members Only” section of our website to access our Walks List

As we are unable to list walks in the newsletter at present, an Archive of Past Walks is being maintained for your enjoyment: <https://tfngo.to/pastwalks>

TO ACCESS THE "MEMBERS ONLY" SECTION OF TFN'S WEBSITE, VISIT:

<https://tfngo.to/private>

The password was delivered in the email notifying you that the newsletter is available online.
If you have misplaced the password you can request it by emailing
membership@torontofieldnaturalists.org.

TFN LECTURES

The TFN Lecture Series is now being conducted through Zoom technology. On the scheduled date of each lecture, members will be welcomed into the virtual space at 2:30 pm. The host will introduce the speaker. To provide an engaging and interactive experience, the 45-minute lecture with accompanying visual materials will be presented live, after which the speaker will answer questions from the audience.

The presentation and follow-up question period will subsequently be posted on our website for viewing by all TFN members.

See information about this month's lecture on the back page. To join the November Zoom meeting, click here: <https://us06web.zoom.us/j/87340810626?pwd=bINjVDhrWUhPNDN0ei81VTZONIN6QT09> or

visit the “Members Only” section of our website to access this link.

If you prefer, you may dial in to the November lecture by phone as follows:
+1 204 272 7920 Canada
Meeting ID: 873 4081 0626
Passcode: 722096

FOR READING

***Under a White Sky: The Nature of the Future* by Elizabeth Kolbert, 2021**

The Pulitzer Prize-winning author of *The Sixth Extinction* takes a hard look in this new book at efforts to manage nature in the Anthropocene. She meets scientists who are trying to preserve the world's rarest fish in a single, tiny pool in the Mojave Desert. She visits a lava field in Iceland where engineers are turning carbon emissions to stone, an aquarium in Australia where researchers are trying to develop "super coral" that can survive on a hotter globe, and a lab at Harvard where physicists are contemplating shooting tiny diamonds into the stratosphere in order to reflect sunlight back to space to mitigate the climate crisis. In *The Sixth Extinction*, Kolbert explored how our capacity for destruction has reshaped the natural world. Now she examines how the sorts of interventions that have imperiled our planet are increasingly seen as the only hope for its salvation. Inspiring, worrying and darkly comic, *Under a White Sky* is an original examination of some of the challenges we face.

Link to Toronto Public Library: <https://tfngo.to/whitesky>

Bob Kortright

***Field Study – Meditations on a Year at the Herbarium* by Helen Humphries, 2021**

This Canadian author of so many wonderful books lives near Kingston, Ontario and walks the same route daily through all seasons. I have recently been absorbed in her new beautifully illustrated book. It is one of a kind – a fascinating journey over the course of a year. One passage in the 'Summer' section kept me thinking while I was

rambling at the shore watching monarchs slowly drift west on migration. She writes of milkweed, without which there would be no monarchs. It highlights some lovely insights that I had not noticed and will now observe whenever I see milkweed in future.

Link to Toronto Public Library: <https://tfngo.to/fieldstudy>

Lynn Pady

***The Genius of Birds* by Jennifer Ackerman, 2020**

This book will enable you to see why no one should say birdbrain in a disparaging sense ever again. Some birds can outdo you in memory and navigation, not to mention song. Some can invent tools, hold intelligent conversations, remember human faces they have not seen for years, etc. Could you find your way back to a particular tree in Canada from South America without navigation aids and arrive in the middle of the second week in May every year, even if you could fly? How about from Alaska to Venezuela via Nova Scotia and a three-day flight over the Atlantic, or a seven-day flight from Alaska to New Zealand, in both cases when landing in the water would mean death? Well, a 20 gram Blackpoll Warbler and a 12 ounce Bar-tailed Godwit respectively can. But will any of this capability save you and your kind in the face of relentless change in the environment from deforestation, pesticides, road construction and a gauntlet of glass buildings and outdoor cats? Perhaps the most adaptable, like sparrows, starlings, grackles and crows, will make it. Wouldn't it be nice if all the other bird geniuses could too?

Link to Toronto Public Library: <https://tfngo.to/geniusbirds>

Bob Kortright

WEATHER (THIS TIME LAST YEAR)

November 2020

November continued the changeable character of this fall, with record warmth followed by unusually heavy snow. The month began with a bit of measurable snow, but quickly gave way to a relative heat wave that was remarkable for its duration. For the period from the 4th to 11th, temperatures rose above 20° for four or five of the eight days (depending on location) and the other days were in the high teens. The warmth peaked on the 10th with a high of 24.3° at Pearson Airport. This was second to November 1, 1950's record of 25.0° and the warmest ever so late in the year. The warm spell was similar to the one experienced in 1975 that ushered in the Edmund Fitzgerald storm.

Conditions became more seasonable after the 11th, which set the stage for the other remarkable feature of the month:

the heavy snowfall of the 22nd. Wet snow accumulated in all areas of the city and lasted a few days. Pearson had 19.4 cm, with a monthly total of 23.4 cm – the most for November since 2002. The Environment Canada office in North York had a total for the month of 32.8 cm. Amounts were somewhat less downtown, although snowfall is no longer measured there.

As a whole, November had a much-above-average mean temperature due to the intensity of the early warm spell, though it was slightly cooler than 2001 and tied with 2016. Pearson had a mean of 6.8° and downtown a mean of 7.6°. Total precipitation was 66 mm both downtown and at Pearson Airport, almost exactly normal.

Gavin Miller

LECTURE REPORT

New Discoveries in Bird Migration

October 3, 2021

Bridget Stutchbury, PhD, Professor, Dept of Biology, York University

Bridget Stutchbury got hooked on field biology as an undergraduate at Queen's and took a summer job in ecology working with Tree Swallows. "At the time I had no bird identification skills at all – I could recognize a Canada Goose." During our question period she admitted "I would have been just as happy working on bluegill or sunfish." We are lucky she directed her love for field biology into a deep and energetic commitment to songbirds and their migration.

Dr. Stutchbury finds songbird migration fascinating. There is no start-to-finish mapping of individual birds during this unprecedented natural phenomenon, and only half the birds survive. The effects on the songbirds during these trips are not fully documented or understood, but the numbers of songbirds are decreasing.

It's only since 2009 that we have been able to track songbirds. As more sophisticated tracking systems developed, use of these technologies mushroomed. New migration maps were generated and studied with maps of human habitation, vegetation, etc.

2009	2014	2015
Geolocator Tracking	Radio Tracking and Tower Networks	Archival Global Positioning System (GPS)
Latitude/longitude calculated based on day length from light sensitive tracker. Can only use if bird returns.	Mainly tracked through small <i>Motus</i> Wildlife Tracking System.	Miniaturization of GPS trackers for larger songbirds. Exact location.

For Dr. Stutchbury this raised more questions about the epic journeys and the fate of our songbirds. She took us on a tour of four studies she has been involved with: the technologies used, the questions raised, and some conclusions that impact our response to the decrease in songbirds.

*What role has tropical deforestation played in the population decline of the **Wood Thrush**?* Geolocator tags showed the main migration south was over urban and agricultural land on the east coast of North America. Fifty percent of Wood Thrushes passed through Florida in the fall and 70% returned through the Mississippi Delta in the

spring. These bottlenecks are often used as stopovers for the Gulf crossing and are important to preserve for migration. Later, GPS tags were used to give "snapshots" of exact locations of stopovers. Although they preferred forest, Wood Thrush were often forced into suboptimal habitats. Wintering grounds are in a small region in Central America, much of it in Nicaragua which has one of the highest levels of deforestation in the world. The bird population in the most deforested area has been hammered.

*Why is the **Northern Purple Martin** population declining?*

One map from Breeding Birds Survey indicated that this was true of the Northern Purple Martin, but the Southern Purple Martin population was increasing! The migration bottlenecks were the Yucatan and Panama (important areas to protect). On the wintering grounds in the Central Amazon all Purple Martin breeding groups mixed in the same area. About half those in the Amazon later relocated to a second site in the east where deforestation rates are higher. Dr. Stutchbury states the Purple Martin is a "tropical forest-dependent bird" and habitats need to be saved in both locations. Purple Martins roost in large groups of up to 100,000 birds. GPS tracking showed roosts on small islands in the Amazon. She asks, "Why are these special and what happens if we lose them?" Questions remain. We still can't explain why Northern Purple Martins are declining while Southern Purple Martins are increasing.

Do pesticides impair songbird migration? The fact that pesticides hurt more than pests is not news. Selected **White-crowned Sparrows** were dosed with three **Neonicotinoid**-treated canola seeds and tagged along with a control group. When the canola seeds were ingested, the sparrows lost weight. They had to delay migration to recover because energy from body fat fuels migration. Radio tracking towers at Long Point tell exactly when a bird leaves. As it flies by other Motus towers in Ontario, you can tell the direction the bird is going. Once migration resumed all birds in the test left in the same direction, but the canola-fed birds were delayed. How much will delay impact their successful migration and breeding in the short Arctic summer? One ingestion of Neonicotinoids at a stopover site may be surmountable, but two or three more times? The next step is to follow one bird.

***Red-eyed Vireos** leave Canada over a two-month period with some arriving in the Amazon early and some late.* They all stay approximately five months. The early arrivals leave early, and the late arrivals leave late. Why is this? Geolocation studies seem to indicate this may be a genetic trait. Does this make a difference to their survival? Motus will help us answer this question as it will be easier to find the winners and losers in this migration game.

continued on next page

EXTRACTS FROM OUTINGS LEADERS' REPORTS

Newtonbrook Creek, Sept 6. Leader: Ellen Schwartzel.

Thunderstorms the previous night had cleared the air, so we met under a perfectly blue sky, cooled by breezes. Leaving the busy traffic of Finch and Bayview, we entered quiet, leafy Bayview Village and took a steep but paved route down to Newtonbrook Creek. Deep, shady creek meanders had us hoping for herons, but we did see a vireo and heard nuthatches. Bumble bees gathered pollen from goldenrod patches. Generous stands of jewelweed were in full bloom and offered ripe seed pods to pop. A wet meadow of horsetails had us imagining how their ancient gigantic ancestors might have grown in the carboniferous period, 350 million years ago. The meadow also featured boneset (native) and elecampane (introduced). We strolled as far as Forest Grove, then doubled back, enjoying the chance to catch up with friends.

Thomson Memorial Park and Meadoway, Sept 8.

Leader: Charles Bruce-Thompson. We had a very engaged group, asking interesting questions and suggesting useful answers, which made the leader's job so much more pleasurable. Several thunderstorms the previous night had broken a long summer drought; the torrential rain came close to breaching the banks of West Highland Creek. The Meadoway was resplendent with the yellows of sunflowers, coreopsis and goldenrods. What a great success this restoration project has been – a boon to wildlife and naturalists alike! After reference to James Eckenwalder's excellent article in the newsletter we carefully identified the eastern cottonwood, as well as two other poplars (Lombardy and balsam), butternut, dawn redwood, Ohio buckeye and paperbark maple. We saw small birds in hot pursuit of a group of crows, which in turn were harassing a persistent Cooper's hawk. The crows were making a most un-crow-like liquid burbling call. As far as I know, Thomson Memorial Park is the only place in Toronto where you can find Hercules' club (AKA devil's walking stick or prickly ash).



Group at Don Jail. Photo: Jane Cluver

Riverdale loop (Broadview TTC – Don Jail – Broadview Ave), Sept 11. Leader: Richard Longley.

We followed the route of the Jane's Walk at: <https://www.janeswalkfestivalto.com/walk-list> There was "wild" nature only in the northwest corner of Riverdale Park, with stumps of trees showing how huge they were in the original forest. Three additions to the self-guided Jane's walk were: flying saucer parasols of Riverdale Hospital, Chinese Pailou gate, and Sun Yat Sen statue. Walkers were advised to read *Recovering the Don* by Jennifer Bonnell, UT Press, an environmental history of the Don Valley as it was and how it became what it is. Fascinating, often macabre, at times hilarious. It was also recommended that walkers take a self-guided tour of the Don Jail (now Bridgepoint Health administration building) when it re-opens post-pandemic.

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LECTURE REPORT *continued*

Dr. Stutchbury has many questions about how climate change will affect songbird migration. How flexible are individual birds in migrating early or late? What happens if they are not flexible? Will climate change affect the location or quality of stopovers and bottlenecks? How will innate migration routes shift with habitat and climate change?

I, for one, am happy to have Dr. Stutchbury working on these questions for our songbirds, and not on sunfish.

Nicola Lawrence

You can access the recorded lecture at: <https://tfngo.to/oct2021lecture>

More information:

Dr. Bridget Stutchbury. *Silence of the Songbirds* (2007), *The Bird Detective* (2010). Available for purchase or can be borrowed through your local library.

The Messenger (2015) stream on Kanopy at Toronto Public Library

Stutchbury Lab: yorku.ca/bstutch

Motus Wildlife Tracking Systems: motus.org

WHY DO PLANT NAMES CHANGE?

Field naturalists often make the complaint: “Why do they keep changing all the plant names? As soon as I learn them, they change them, and the new names are always longer and less pronounceable.” Examples of these name changes abound amongst our fall-blooming flora: New England aster (formerly *Aster novae-angliae*) is now *Symphyotrichum novae-angliae*, large-leaved aster (formerly *Aster macrophyllus*) is now *Eurybia macrophylla*, and tall flat-topped white aster (formerly *Aster umbellatus*) is now *Doellingeria umbellata*.

Who are the ‘they’ behind these name changes and why are they doing it? “They” are plant systematists whose primary aim is to understand and delimit natural groupings of plants so that each group reflects a plant’s evolutionary past and relationships. Their overarching goal is to recognize natural plant groups that are **monophyletic**; that is, each group should consist of plants that share a recent common ancestor. Plants that are not descended from that common ancestor should be excluded from the group. Figuring out these ancestor/descendant relationships results in a well-documented **phylogeny** or family tree. Using new characters, such as DNA sequences, and carrying out analyses using computers have made it possible to infer phylogenetic relationships of large numbers of species in the same study. These approaches have resulted in greater precision in determining plant relationships than was possible even 20 years ago. So, these inconvenient-to-us name changes actually reflect new scientific insights about plant relationships and evolution.

How are the new names chosen? The rules for naming plants follow the International Code of Nomenclature for algae, fungi and plants (updated most recently in 2018). Every plant has a scientific binomial consisting of genus and species names, a system established by the Swedish botanist Carl Linnaeus in 1753. One fundamental principle of plant nomenclature is that the oldest published name

takes precedence when a plant must be renamed. For example, the genus name *Symphyotrichum* was first used in 1833 by the German botanist Christian Nees who thought that specimens of New York aster (*Aster novibelgii*) were sufficiently different from Eurasian asters to warrant a new generic name. Nees’s new generic name didn’t stick at first, but was resurrected in 1994 by American botanist Guy Nesom who found that North American species of the genus *Aster* grouped together more closely and did not appear to share a recent common ancestor with Eurasian aster species. Therefore, according to the rules of nomenclature, a new genus name had to be found for North American asters and it had to be the first-published name used for this group, *Symphyotrichum*.

Why aren’t all North American asters now in the genus *Symphyotrichum*? More recent work by Canadian botanists Luc Brouillet and John Semple, using DNA sequences of multiple genes along with other characters such as chromosome number, provided compelling evidence that evolutionary relationships among the former aster species are even more complex than previously thought. In order to meet the criterion of recognizing monophyletic groups that share a recent common ancestor, it was necessary to establish more than ten new genera, including *Symphyotrichum*, *Eurybia* and *Doellingeria* (names that had been published much earlier, but fell into disuse).

For naturalists, keeping up with these changes will always be a challenge! We can look up the most up-to-date name for any plant, however, by checking under the old name in the World Flora Online (www.worldfloraonline.org).

Nancy Dengler

To read more about plant names, see Peter Money’s articles, *Figworts No More*, in the December 2011 and February 2012 issues of the TFN Newsletter.



New England aster
(*Symphyotrichum novae-angliae*)
Photo: Wendy Rothwell



Large-leaved aster
(*Eurybia macrophylla*)
Photo: Wendy Rothwell



Tall flat-topped white aster
(*Doellingeria umbellata*)
Photo: Ken Sproule

MALLARDS ON TORONTO LAKESHORE AFFECTED BY BOTULISM

This summer, from the end of July onwards, Toronto Island residents and others observed far fewer mallards than usual and, sadly, were also reporting both dead and dying ones in the Island lagoons. Subsequently, Toronto and Region Conservation Authority (TRCA) collected duck carcasses for analysis and, after some time, reported that type C botulism was the suspected cause. (Apparently botulism isn't tested for directly. Rather, other causes of death are ruled out.)

Two types of botulism, type C and type E, exist in Lake Ontario, and the toxins move up the food chain causing bird mortality annually. In some years massive die-offs of birds occur, especially with warm temperatures and anaerobic conditions. Invasive introduced species, including zebra mussels and round goby fish, have greatly exacerbated the problem. Diving ducks, loons, gulls, terns and raptors have been impacted. Toxin-laced maggots in carcasses are also consumed by shorebirds, dabbling ducks such as mallards, and even by opportunistic passerines and owls. An article in Toronto Ornithological Club's newsletter (November 2011) stated that turkey vultures' stomach acid destroys the toxin, so they are not affected by botulism, but that it had been reported that consuming a single toxic maggot can prove fatal to a mallard.

References:

Breederland, M. 2014. Avian botulism and the Great Lakes. Michigan State University Extension
<https://tfngo.to/msubotulism>

Hoar, Tyler L. 2011. Great Lake Birds Succumb to Botulism Type E Outbreak. *TOC Newsletter* #219, November 2011.

New York Sea Grant. Great Lakes: Botulism in Lakes Erie and Ontario, Frequently Asked Questions: Q&A
https://tfngo.to/seagrant_botulism

Toronto Wildlife Centre (TWC) reported on their Instagram feed this summer that "Botulism is treatable with emergency medical care if caught early enough. Early detection can be the difference between life and death... Birds affected by this terrible disease are most often found in the water as they're unable to get themselves onto land." In one 24-hour period, TWC's

Rescue Team captured over 25 birds and brought them in for emergency care. Apparently "most of the affected birds have been concentrated around the Toronto Islands and Lakeshore waterfront."

As one of the few bird species not in decline, the mallard population is likely to bounce back quickly. By the end of September, with cooler weather, groups of healthy-looking mallards were evident again in Island waters, though with a patchy distribution that

eerily included long stretches of lagoon with no ducks in sight. The Christmas Bird Count and the Winter Waterfowl Count may reveal the effects of this year's outbreak on mallards. Let us know if you have observed a decline in mallards this summer and if so, when and where.

Jenny Bull and Marilyn Murphy



Mallards, Toronto Islands, October 2011
 Photo: Ken Sproule

Rich autumn colours –

Nature's final fling before

cold whites of winter

Haiku by Charlotte Broome

TREE OF THE MONTH: SHAGBARK HICKORY (*CARYA OVATA*)

Looking at a shagbark hickory, you cannot miss how it got its most common name. Few other trees anywhere so extravagantly discard great vertical sheets and strips of bark, sometimes acquiring a wide skirt of shed bark around the base of its trunk. Contrasting this with the remarkable smoothness of a large beech tree's bark or the permanent high ridges and deep furrows of a large cottonwood, you have to ask yourself why and how. "Why" you might ask, but beyond speculating on its obvious protective function, little research has been done on the topic. The "how" question is easier and largely boils down to the way that bark is formed by a series of cork cambiums. Unlike the vascular cambium, which lasts throughout the whole life of the tree, producing wood and secondary phloem (living inner bark), a tree generally continues to produce new, short-lived cork cambiums within the oldest layers of the inner bark. These seal off everything outside them from the "lifeblood" flowing within, ensuring that the outer bark is just dead tissue. The size and positions of the cork cambiums and the characteristics of the units of outer bark (called rhytiderms) that they produce determine the external appearance and inner structure of the bark. For shagbark hickory, the cork cambiums produce large patches of weak cells at intervals that cause the layer of bark outside them to separate, under their own weight and with the aid of wind, heavy precipitation, the slight expansion and contraction of the trunk with changes in air temperature, and the degree of hydration of the living tissues inside.

The five leaflets typical for shagbark hickory (a few leaves may have either three or seven) is lower than the number found in most of our trees with pinnately compound leaves. While not decisive, it is one feature that helps to distinguish shagbark from other local hickory species. If you enter a forest in the fall, however, how can you tell how many leaflets a compound leaf has, considering that leaflets typically fall separately from each other before the rachis is shed? There is a neat trick you can apply. If you look at an intact shagbark leaf, note that the terminal leaflet is symmetrical while the lateral leaflets are asymmetrical. Go through a pile of leaflets and tally the number of asymmetrical leaflets versus symmetrical ones. The ratio of the two gives you roughly the number of lateral leaflets per terminal one. The sum of these two numbers gives you your estimate of the number of leaflets. This trick could potentially be used to help decide whether the fossil hickory leaflets in the Pleistocene interglacial Don Valley beds here belonged to shagbarks or mockernuts (which more often have seven leaflets).

A stroll into the autumn woods might also uncover fallen hickory nuts, should any have survived the sharply focused attentions of squirrels. As perusal of the forest floor clearly demonstrates, even the thick, bony inner stone surrounding the nutritious seed provides scant protection against a squirrel's chiseling teeth. And, rather than additional protection against squirrels, the husks of shagbark and other hickories are built for quick release from the smooth-surfaced nut. Hickory husks have lines of dehiscence (splitting) that are perfectly obvious, not only on the mature fruit while still attached to the tree, but already on the ovary of the female flowers, even before pollination. These female flowers are clustered in threes (a dichasial cyme) at the tips of the newly emerging shoots. At the same time, the male flowers emerge at the base of the same shoots just above the conspicuous, broad inner bud scales. The male flowers are arranged in dangling catkins (as are those of so many of our wind-pollinated hardwoods), which, in turn, are grouped in dichasia, just like the female flowers. Thus, while the male and female flowers are different in almost every aspect of their appearance and function, they share a common branch structure at their very base.



From top: Shaggy bark; catkins and female flower; hickory nuts and leaves; Hickory nuts and husks.
Photos: Ron Dengler

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BIRD BEHAVIOUR: CACHING FOR WINTER

As daylight decreases and temperatures fall, many animals begin to store food in order to survive the long winter months.



White-breasted Nuthatch. Marie Curtis Park, February 2007. Photo: Ken Sproule

Nuthatches cache food behind loose bark or in crevices in tree trunks or branches, often covering the item with a fragment of bark, moss or lichen. They may hoard hundreds of seeds around their territory, thus decreasing the likelihood that their entire stash would be stolen by a competitor. Blue Jays cache acorns in the ground. Any acorns not retrieved may germinate in the spring, making jays important tree dispersers. However, the Canada Jay is a corvid that caches in trees. It uses saliva to form a bundle containing multiple food items and sticks it to arboreal surfaces. The saliva also helps prevent the food from spoiling. Of course, the birds need to remember where they store all these food sources for the cold months. Studies have shown that the hippocampus in birds

that cache food grows larger in the autumn to allow for this increased need for memory.

While many winter residents cache food, some also adapt their diet to food sources available throughout winter. Some eat fruits left on trees; others find seeds on flowers; others may find dormant spiders and insects in hollow stems. This suggests one more reason why NOT to clean up the garden in the autumn: there may well be food present for our avian friends!

Jennifer Smith



Female Northern Cardinal eating wild grapes, Don Mills, November 2014. Photo: Ken Sproule

Sources:

- *Secret lives of common birds: enjoying bird behaviour through the seasons* by Marie Read c. 2005
- The Cornell Lab of Ornithology, April 13, 2016
- <https://corvidresearch.blog/2018/10/19/you-need-to-know-more-about-jay-spit/>

SHAGBARK HICKORY *continued from page 9*

If you look around now at the winter buds of trees, you will find a surprisingly wide range of appearances, though the scales that clothe them are all modifications of some form of leaf or leaf part. Among our trees, few have bud scales so obviously connected to leaf bases as the outer scales of some shagbark hickory terminal buds. The example shown here displays a wonderful transition from ordinary foliage leaves, through scales with progressive shrinking of the petiole, to full-blown protective bud scales. Further emphasizing the morphological and developmental fluidity embraced by the yearly sequence of bud scales, the ribbon-like innermost ones seen later beneath newly emerged flowering shoots highlight additional and largely unexplored roles of different scales, even within the same bud. Maintaining our dialogue with trees through the winter and early spring provides a perfect opportunity to focus more attention on their buds and other twig features, as well as their bark. While all trees merit contemplation and thoughtful analysis during their annual slow-down, shagbark hickory is a good one to start with.

James Eckenwalder



Terminal bud showing relationship of scales to leaf bases. Photo: Ron Dengler

JUNIOR NATURALISTS

PREPARING FOR WINTER

As the summer days start to shorten and the temperatures start to cool, the first signs of autumn can be seen in changes of behaviour in many of the animals with whom we share our city. In order to survive the colder temperatures, or prepare for their long migration, animals, including birds and insects, increase their efforts to find food (forage). Chipmunks and eastern gray squirrels use this time to gather seeds and other food items to store for use during the winter months.

With that in mind, on September 9, the first in-person session of the Junior Field Naturalists held several activities in an east end pollinator garden where children participated in a seed treasure hunt, finding seeds based on plant characteristics found in the garden.

The pollinator garden had been planted with native flowers, in addition to edible plants, in an effort to help promote habitat for native bee species including bumble bees. Male bumble bees and future queens emerge and mate during the late summer, and the young queens forage for enough pollen and nectar to hibernate in their burrows throughout the winter.



Photo by Ken Purvis



Children gently collected bees in clear jars. They were able to collect sweat bees, common eastern bumblebees, a brown-belted bee, leaf-cutter bees and a Virginia carpenter bee, afterwards releasing them to continue their foraging.

Article by Vanessa McMain

Photo by Vanessa McMain

UPCOMING JUNIOR FIELD NATURALISTS PROGRAMS

Saturdays from 10 am to 12 noon

November 13: Solitary and Social Wasps by Zoom with Andrew Interisano and Sandra Iskandar

December 4: Arctic Ducks at Ontario Place

To pre-register, and to learn about COVID precautions for in-person programs, email Anne Purvis at juniortfn@torontofieldnaturalists.org

EXTRACTS FROM OUTINGS LEADERS' REPORTS *continued from page 6*

Betty Sutherland Trail Park, Sept 16. Leader: Zunaid Khan. A beautiful morning. We walked along the Don River through forested areas and wildflower meadows. Bird sightings included Belted Kingfisher, American Robins, American Goldfinches and European Starlings. Lots of Canada goldenrod, some zigzag goldenrod and several types of aster including New England. Invasives sighted: dog-strangling vine, garlic mustard and European buckthorn. We visited an area of new tree plantings close to Hwy 401, part of a joint effort between the Highway of Heroes project and the federal government tree planting program. Lots of trees had been planted, all quite close together in straight rows. Interesting that they chose not to do anything about the DSV in the area.

Centennial Park and Etobicoke Creek, Sept 19. Leader: Lillian Natalizio. A beautiful sunny morning for a walk along some of the natural(ized) areas of Centennial Park and a section of the Etobicoke Creek ravine. Gray Catbirds and Blue Jays made their presence known throughout the walk. Early on, we watched a Great Blue Heron take flight over Joe Benesh pond while a Double-crested Cormorant was perched in a dead ash tree nearby. A keen eye spotted two green frogs in the pond and a toad along the Etobicoke Creek trail. We were treated to the spectacle of three Broad-winged Hawks soaring overhead. There were a few pale touch-me-not and boneset plants in seed along the creek, while zig-zag goldenrod was in full bloom in the woods along with some blue-stemmed goldenrod and large-leaved aster.

James Gardens and Humber River Trail, Sept 24. Leaders: Anne Heber and Kayoko Smith. James Gardens is a 21-acre botanical garden situated west of the Humber in Etobicoke. Named after the James family who formerly owned the property, it is now managed by the Toronto Parks Department. There are numerous flower gardens, specimen plantings, rock gardens, trails, terraced stone pathways, spring-fed pools and streams, a bowling green, a scenic look-out, bridges, a gazebo, and a memorial to Fred and Margaret James. Their former home is now the Edgehill House Community Centre (currently closed for renovations) that offers specialized preschool, arts and fitness programs and a summer camp.

Due to recent heavy rain, the river was running high, putting under water the sunning spots normally used by ducks and cormorants. We hiked the trail along the west bank of the Humber to the GO train railway bridge where we took a break while one of the walkers read the story of Joshua Glover, an escaped American slave who arrived in the area almost 170 years ago. Crossing a convenient new bridge, we noticed that eroded areas in Lambton Woods are being restored. It was a stellar afternoon to observe migratory birds. We spotted Northern Flickers, Red-bellied

and Hairy Woodpeckers, Red-winged Blackbirds, White-breasted Nuthatches, Northern Cardinals, American Robins, Blue Jays, House Sparrows, Mallards, Double-crested Cormorants and Great Egrets. Plants we saw included New England and heath asters, rattlesnake root, white snakeroot, European euonymus, mountain ash and maple leaf viburnum with lots of berries. We found four species of goldenrod, including Canada goldenrod in full bloom. Invasive species including European buckthorn, garlic mustard, dog-strangling vines, and phragmites were also observed.

Ward's Island, Sept 30. Leaders: Ellen Schwartzel and Jenny Bull. Life sends us happy moments, and this was one – a cloudless late September morning at Ward's Island. Birders were kept busy with flurries of Yellow-rumped Warblers and loose flocks of Blue Jays heading west around the lake. Also seen: American Goldfinch, Nashville Warbler, Gray Catbird, Golden-crowned and Ruby-crowned Kinglets, Brown Creeper, Eastern Phoebe, Swainson's Thrush, Black-capped Chickadees, Yellow-bellied Sapsuckers, Downy Woodpeckers and several Blue-headed Vireos.

Jenny explained how progressively deeper sections of wetlands support distinct fauna: toad tadpoles in the shallowest sections; leopard frogs in deeper waters, and green frog tadpoles in the deepest parts. She also introduced us to meadow plants hanging on in the Environmentally Significant Areas of Ward's Island, including fringed gentian, and the delicate marsh bellflower. We learned how marram grass holds sand dunes together, flowering only when its clumps are being covered by shifting sands.

With so much to experience, we never left Ward's Island in three and a half hours and barely found time to eat our sandwiches.



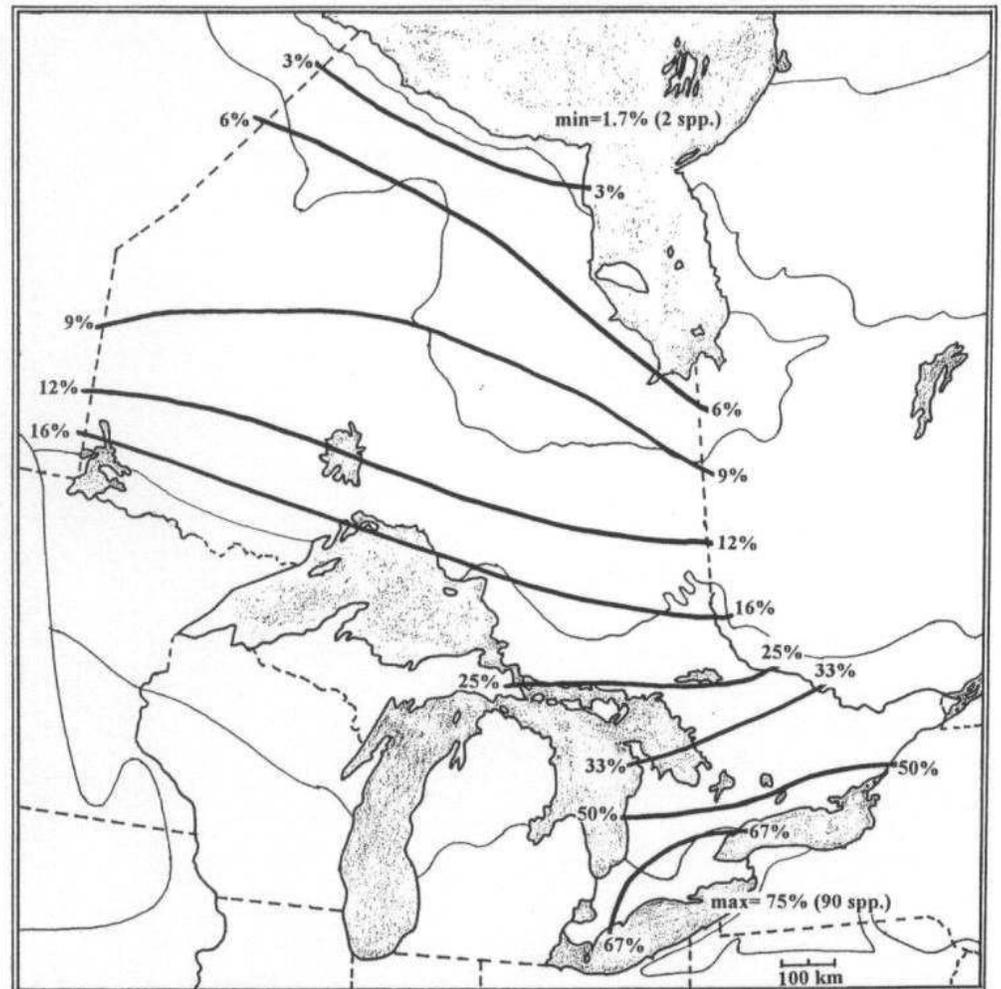
Fringed gentian (right) and
marsh bellflower.
Photos: Jenny Bull

BIODIVERSITY GRADIENTS IN ONTARIO. PART 2, TREES

The geographical pattern of diversity for any group of plants or animals emerges from the individual distributions of all the species within that group. Each species' distribution, in turn, depends on the biological characteristics of the individuals in that species. These characteristics include tolerances and requirements related to the physical environment (temperature, water, gases, mineral nutrients, and sources of support and shelter), types of food and how they are acquired, interactions with other organisms (competitors, predators and prey), and modes of reproduction and means of dispersal.

Each map in this series summarizes my count of the number of species in one group of organisms found in the cells of a 100 X 150 km rectangular grid laid over a base map of the province. After some hand-waving to smooth out irregularities, I've represented the cell counts as isolines of percentage occurrence out of the total number of species of that group in Ontario. The numerical values used for the isolines vary from map to map to reflect differences in the total number of species in a group, inevitable "noise" in the counts between nearby cells, and the coarseness of the original data. The tallies were based on published maps of species distributions, with all the uncertainties in geographical and taxonomic sampling that this entails, so "caveat emptor."

Of course, "tree" is not a taxonomic category but an ecological one. Trees, marked by their trunks, are distributed across many plant families and orders that also contain species with different growth forms, all of which basically feed the same way, absorbing carbon dioxide from the air and water from the soil, while bathing in the sunlight that powers the chemical bonding of the two into sugars. What distinguishes trees from other plant life forms is obviously their size, both above and below ground, which means that, wherever they occur, they dominate access to carbon dioxide and water. In effect,



Diversity of Trees in Ontario (120 species total)

Raw data from Farrar 1995, Little 1976 & 1981, Phipps & Muniyamma 1980.

with the sheer bulk of their biomass (more than 90% of the total in forests), they are the landscape for all other organisms under and within their canopies.

The 120 species of trees mapped here fall into the general global pattern remarkably well, with a smooth diminution in species numbers northward under the influence of an increasingly short growing season and colder winter. A similar map for British Columbia would look quite different, with the mountains and their additional effect on the climate also adding a strong but inconsistent east to west component to the pattern. Since trees are fixed in place and their trunks are fully exposed to everything winter can throw at them, and since our east to west gradient of decreasing precipitation is fairly weak, temperature is the dominant factor determining overall tree species distributions here.

continued on next page

KEEPING IN TOUCH

Remembering Mary Cumming

I was sorry to read in the October newsletter of Mary Cumming's passing. When I joined TFN in 1988, the Nature Arts group sold Mary's and Diana Banville's beautiful work, in the form of notecards, at the monthly meetings, and one of these cards was always included with receipts for membership renewals. When I researched past copies of the newsletter for *From the Archives*, I was able once again to delight in their work.

Elisabeth Gladstone



During a recent walk by Grenadier Pond in High Park, a friend and I were intrigued to see this juvenile Wood Duck repeatedly leaping up to eat wild grapes from an overhanging vine. I never thought of ducks as fruit-eaters.

Wendy Rothwell

Rarely am I well and truly dumbfounded, as I ramble about wondering what might show up. Recently though, while walking at Ashbridge's Bay, I did a double-take when I glanced down at a shrub by the path and saw an incredible caterpillar. It was bright orange with five big white 'spots of joy!' I was awe-struck. We all know what happened to Alice when she fell down the rabbit hole. I immediately thought of her speaking to the very wise hookah-smoking caterpillar. This 'cat' could have been that 'cat' in a heartbeat! Once I recovered from the shock, I took endless photos of this sloth-like creature as it very very slowly chewed on a leaf, moving its head to and fro, and not doing much of anything except thrill me to bits!



Why, sometimes I've believed as many as six impossible things before breakfast!

It is a Pandora Sphinx moth caterpillar. The moth is huge (45 to 60 mm), pale green with complex patterns of darker green patches and pink veins. Its host plants are grape and Virginia creeper. Not rare. The 'cats' can also be a brilliant green with white spots, rather than orange. I doubt I would have seen it had it been green.

Lynn Pady

In August my friend Jill Witherspoon was lucky enough to photograph this hummingbird moth at Wicklow Beach near Cobourg. Enjoy!

Rita Bijons



Monarch butterflies and bees love the two butterfly bushes in my backyard and feed throughout the season. Although buddleia are not native to North America, but hail from Asia, our pollinators love them and benefit from their long blooming season.

Jennifer Smith



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TFN LECTURE

Sunday, November 7 at 2:30 pm

See page 3 for information about lectures via Zoom

The unique nature of Toronto Islands

Bob Kortright, who has learned about Toronto's nature primarily through his involvement as a TFN walk leader and 15 years serving on the TFN board, will speak about the unique nature of Toronto Islands which he has enjoyed all his life, most intensely while conducting the annual butterfly count for many years.



Photo: Jenny Bull

Upcoming lectures:

- Dec 5 *Piping Plovers in Ontario*, Andrea Gress, Ontario Piping Plover Program Coordinator, Birds Canada/Oiseaux Canada
- Feb 6 *Ontario's Caribou*, Dr. James Schaefer, Dept of Biology, Trent University