

ON nature



Summer 2019
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summer melody become a
distant memory?



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Humanity's Legacy

By Caroline Schultz

“We are at a fork in the road for where we stand as a species.” —Al Gore

Earth is in the midst of the Anthropocene epoch. Human activities are changing the planet at an unprecedented rate in ways that affect every sector of society. We have gone from being one of many thriving species to an increasingly dominant and destructive one. But our health, our moods and our survival remain inextricably linked to the health of our world.

Despite the broad awareness of the impact we are having on our environment, on May 2, the Government of Ontario tabled an omnibus bill that, under the guise of increasing housing supply, would eliminate crucial protections for the province's most vulnerable species and their habitats. Schedule 5 of the bill proposes, among other things, to remove the science-based assessment of species at risk currently in place, and to allow industries engaging in harmful activities to pay into a fund instead of completing on-the-ground work that would provide an overall benefit to the species being harmed.

At a time when the government should be doing more, it is proposing to do less. If enacted, these changes would spell disaster for Ontario's at-risk plants and animals. One such animal is the eastern whip-poor-will. In this issue's cover story, “The sing-song of summer” (page 18), author Brian Banks examines the decline of this once-ubiquitous bird and identifies some of the possible causes. Gone are the days when cottagers and campers were kept awake by the nocturnal serenade of male whip-poor-wills laying claim to a territory or mate.

Gone, too, are the bug-splattered windshields that were once a staple of summer road trips (“Where are all the bugs?”, page 24). It is easy to overlook the declines of less charismatic insect species—particularly given their collective reputation as a nuisance—but their decline could cause the loss of other wildlife, forever altering nature as we know it today. Surely we can find a place in our hearts for all creatures.

The consequences of the changes proposed in Schedule 5 would reach beyond species and their habitats. The healthcare community now recognizes what conservationists and others who spend significant time in nature have long known: a healthy environment contributes to a healthy citizenry. With regular access to natural areas, people of all ages, abilities and backgrounds are better able to keep fit, reduce their stress and prevent illness. These benefits translate into long-term economic gains, as healthy nature lovers are less reliant on traditional healthcare services and government support.

We will continue fighting to protect the survival of Ontario's species and the well-being of Ontarians. It is essential that we look further into the future than the remaining three years of our current provincial government's mandate to ensure that the choices we make benefit all.

Humanity is, indeed, at a fork in the road. The path we choose to follow will determine the fate of our natural world and, ultimately, the fate of our descendants. 🐦

Carshi

LUIS TINOCO; (OPPOSITE PAGE) ROBERT MCCAW

Earth Watch



Did you know? The horned lark is North America's only native lark species. Adult birds return to their birthplace after each migration, which has led different horned lark populations to adapt physically to the colour of their local habitat.

OJIBWAY SHORES



Species oasis: Ojibway Shores is scheduled to become part of the Ojibway Prairie Complex.

Windsor to Permanently Protect Ojibway Shores

By Lisa Richardson

An ecological hot spot in Windsor is one step closer to permanent protection. Last summer, the City of Windsor announced the plan to take ownership of Ojibway Shores, a 13-hectare property currently controlled by the Windsor Port Authority, and add it to the Ojibway Prairie Complex, a collection of five species-rich natural areas near downtown Windsor. In exchange, the city will expropriate 3.6 hectares of private land along the Detroit River and give some of it to the Port Authority.

The details of the arrangement are still

being finalized, but naturalists are heralding it as an important move in protecting species at risk within a corner of the province that has lost much of its nature. "This is an incredibly species-rich property surrounded by development, so it is crucial that it be permanently protected," says Steve Marks, vice-president of the Essex County Field Naturalists' Club (ECFNC).

Ojibway Shores, the only remaining habitat corridor linking the Detroit River to the Ojibway Prairie Complex, is habitat for 293 animal species and 261 plant species. Twenty-eight of the species, including spiny softshell turtles and barn swallows,

are already provincially or federally protected. By taking charge of the property, the city government wants to secure this important property's long-term protection.

Marks and ECFNC members are relieved the area has eluded the threat of destruction. In 2013, the Port Authority had announced plans to clear-cut Ojibway Shores and dump rubble from Windsor's Herb Gray Parkway project on it. Public outcry halted that plan, but the property remained available for development.

More information about Ojibway Shores is available on the ECFNC website at essex-countynature.com/ojibwayshores.

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Cormorants in the Crosshairs

By **Samantha Cava**

The double-crested cormorant, which a few decades ago experienced alarming population declines, may soon be the subject of widespread hunting. In response to concerns about declining fish stocks and property damage that fishing operators and property owners have blamed on the birds, the Ontario Ministry of Natural Resources and Forestry (MNR) proposed last December to classify the species as a

game bird. If the proposal is passed, anyone licensed to hunt small game will be able to kill up to 50 cormorants a day from March 15 until December 31.

Scientific and conservation communities are concerned that this proposal is not based on sound justifications. The birds are efficient fish predators, but they feed primarily on non-commercial species such as the invasive alewife. Damage to

shorelines and island forests caused by cormorants' acidic guano and tree nests can be a nuisance to landowners, but the Fish and Wildlife Conservation Act (FWCA) already permits property owners to kill the birds if they are causing damage.

"There is no information about the current population size, no population management target, and no plan to monitor and assess impact," says Anne Bell,



director of conservation and education at Ontario Nature. She notes that in the 1970s cormorant numbers sank to historic lows in the Great Lakes area due to environmental contaminants. A subsequent rebound was widely hailed as a conservation success story—an outcome that may now be in danger.

Although cormorants are not currently threatened, the proposed hunt would

stretch throughout the birds' breeding season, potentially leading to nest failure and chick starvation. It could also harm other birds that cormorants often nest with, including great egrets and black-crowned night herons. There are also public safety concerns. Hunters will be permitted to shoot cormorants from stationary boats throughout the open-water season—a time when cottagers and

Open season: *The proposed hunt would last for 9.5 months annually.*

other outdoor enthusiasts are out on lakes.

Since cormorants are inedible to humans, MNRF is proposing to amend the FWCA so that the birds killed can be allowed to spoil. The provincial government's decision on the proposed hunt is expected later this summer.

Invasive Species Running Hog Wild

By **Tanya Pulfer**

What would the perfect invasive wildlife species be like? It would be able to live anywhere and eat anything. It would thrive in any climate. It would have a high reproductive rate and few predators.

In Ontario, the wild boar is the perfect invader.

Native to large portions of Eurasia and North Africa, the wild boar was brought to Canada in the 1980s and 1990s for the purpose of raising the animals for their meat. “Unfortunately, they have tusks and are hard to contain, and as a result escapes are a problem,” says Keith Munro, wildlife biologist with the Ontario Federation of Anglers and Hunters (OFAH).

Now the boars are raising growing concerns. “They are often referred to as an ecological train wreck,” says Ryan Brook, an associate professor of animal and poultry science at the University of Saskatchewan. “They use their snouts and tusks to rip up the ground, destroying and contaminating wetlands, uplands and forested areas. On top of this, they can carry

diseases that can infect humans, pets, wildlife and livestock.” That wild boars reproduce at an extremely high rate makes the problem even more serious.

To develop an eradication plan, researchers need to know where the boars live and how best to remove them. Last year, OFAH asked people to report boar sightings and received reports from across southern and eastern Ontario. “Getting an immediate picture of where and how many wild boar there are in Ontario will allow us to coordinate our efforts to eradicate them before too much harm is done,” says Erin Koen, Research Scientist

—Wildlife Landscape Ecology at the Ontario Ministry of Natural Resources and Forestry (MNRF), who has been trying to find those answers.

Public monitoring and reporting will go a long way to giving scientists that picture, says Brook. “If experts and the public work together to detect and report sightings, the wild pigs can be removed by experienced control personnel before [the animals] become permanently established.”

Sightings of wild

boars can be reported to iNaturalist’s Ontario Wild Boar Reporting project or local MNRF offices.



WILD BOAR

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Highest honour: Dr. Francis Cook is a renowned herpetologist.

Francis Cook Receives Order of Canada

By Emma Horrigan

Renowned herpetologist Dr. Francis Cook was recently admitted to the Order of Canada for his contributions to science and conservation. Cook's five-decade career studying reptiles and amphibians began in the late 1950s at the Canadian Museum of Nature in Ottawa and continues to this day.

Cook's impact is far-reaching and his list of accomplishments lengthy. Over the years, he has acted as both a contributor to and editor of the scientific journal *The Canadian Field Naturalist*. His 1984 book *Introduction to Canadian Reptiles and Amphibians* remains a significant text. Furthermore, he has been an invaluable contributor to the Ontario Reptile and Amphibian Atlas, an Ontario Nature-led citizen science project that tracks the species' distribution trends in the province, through his involvement in the steering committee.

Cook became interested in reptiles and amphibians as a young boy. When he was just 10 years old, he set up a meeting with the late E.B. Shelley Logier, then a scientist at the Royal Ontario Museum, to discuss his fascination with snakes and frogs. Logier became one of several mentors, along with J. Sherman Bleakney, who later supervised Cook's master's thesis at Acadia University, and Ken Stewart, his PhD advisor at the University of Manitoba.

Cook humbly attributes his success to these mentors and other colleagues. "This award is not just for me, it is for the broader herpetology community in Canada," he says. "It is my hope that it will encourage more people to become involved in studying reptiles and amphibians."

Over the years, Cook has provided encouragement to both expert and amateur herpetologists alike. Michael Oldham, Provincial Botanist at the Ontario Natural Heritage Information Centre, recalls writing, as a Grade 11 student, a letter to Cook requesting reprints of some of his articles. The letter began a decades-long correspondence that now numbers more than 80 exchanges. "Francis patiently and generously answered each and every one of my letters with detailed and helpful responses," says Oldham.

David Seburn, a fellow herpetologist and long-time friend of Cook, describes him as having an infectious enthusiasm for the creatures he studies. "I have always loved hearing his stories of conducting surveys across Canada before smartphones, GPSs, or even most field guides existed," he says. "He has inspired a generation—or two—of herpetologists." As an Order of Canada recipient, Cook will continue to inspire generations to come.


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Earth Watch

Summer Species Watch



Red Admiral

The familiar red admiral butterfly lives throughout North America. Though migratory, the species occasionally remains in Canada during mild winters. Spring 2012 marked a record butterfly migration in eastern Canada, when an unprecedented 300 million red admirals were observed from Windsor to New Brunswick.



Eastern Prickly-Pear Cactus

The eastern prickly-pear cactus is a perennial succulent that produces waxy yellow or bright gold flowers and juicy, edible fruit. Extremely rare in Canada, this cactus is found in only two locations in southwestern Ontario: Point Pelee National Park and Fish Point Provincial Nature Reserve on Pelee Island.

Restoring Sudbury's Junction Creek

By **Lisa Richardson**

The Junction Creek Stewardship Committee (JCSC) in Sudbury knows that healthy waterways beget healthy communities. "Junction Creek provides a unique natural asset," says Miranda Virtanen, JCSC's executive director. "It's essential we keep it clean."

Last October, the group partnered with Plastic-Free Greater Sudbury – a coalition of residents campaigning to ban single-use plastics from the city – and 30 local nature lovers to remove waste from a 300-metre stretch bordering Junction Creek. After collecting the garbage, participants inventoried the items to help determine possible sources of the pollution. "If we know where the garbage is coming from, we can more effectively target our efforts at reducing it," says Virtanen.

The 52-kilometre Junction Creek has long been polluted by urban and industrial activities. Decades of mining and logging in the Sudbury area and improper waste disposal by residents have degraded the habitats around the waterway and harmed animals that drank the contaminated water or got tangled up in

plastic debris. The group will use the garbage inventory to raise public awareness about how refuse can endanger wildlife and pollute habitats, and to make recommendations to local governments on ways to reduce garbage.

During the October event, the team collected 400 kilograms of trash, a substantial part of the 2,560 kilograms of garbage JCSC and its partners removed from creek shores in 2018. Plastic food wrappers were the most numerous item found during the cleanup: participants collected nearly 2,000 of them in two hours. The debris tally also included 500 disposable coffee cups, 370 clothing items and more than 1,300 plastic bags, bottles and straws.

JCSC will continue bolstering the waterway's health by hosting public shoreline cleanups throughout 2019 and monitoring the garbage its volunteers collect. More information on the restoration of Junction Creek and how members of the public can get involved is available on the JCSC website, junctioncreek.com.

Toxic tally: *Volunteers inventoried the debris they collected from along Junction Creek.*



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Bill McDonald

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Eight years ago, after retiring from a career in the industrial sector, Bill McDonald refocused on his passion for wildlife photography. Based in Kitchener, McDonald has developed a reputation for inspiring images of birds, animals and landscapes.



ALUS Expands

By **Emma Horrigan**

The Alternative Land Use Services (ALUS) program, which works with farmers to maintain thriving ecosystems on agricultural lands, has been expanding across Ontario. Since 2016, eight communities—including Chatham-Kent, Lambton, Middlesex and Peterborough counties—have launched pilot ALUS projects on local farms.

In Chatham-Kent, where ALUS launched in 2018, the program has received “unbelievable” support from the community, says Amanda Blain, ALUS coordinator for the area, noting that farmers have told her “it’s a program they can really get behind.” A total of 15 confirmed projects are currently underway on farms in the region, and another 14 people are on a waitlist. Projects range from tree plantings to wetland creation to delayed hay harvests aimed at protecting nesting birds, and Blain expects more to start later this year.

The ALUS program, which is now active in six Canadian provinces, works directly with farmers to help them turn low-productivity farmland into valuable wildlife habitat. ALUS supports stewardship and restoration efforts through the creation of wetlands, tallgrass prairie and tree planting among other projects.

With the help of funding from the Ontario Trillium Foundation, farmers in the new Ontario ALUS communities will be able to help mitigate environmental concerns such as declining water quality in the Great Lakes, flooding and biodiversity loss, says Casey Whitelock, Eastern Hub manager for ALUS Canada. Furthermore, she adds, participants in each community are “targeting high-priority concerns in the region and implementing projects that will have impacts in their communities, and collectively across the province.”

(TOP) LISA RICHARDSON

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Earth Watch

Delayed Hay Harvests Reward Farmers and Birds

By Ron Corkum

The Jackson family, who have been farming in Peel Region for five generations, love to watch birds flitter about their hayfields in the summer. So when they heard about the Bird-Friendly Certified Hay Program, which provides incentives to landowners and hay growers to delay harvest until after chicks have left their nests, it seemed a no-brainer—they had already been deferring cutting their 40-hectare hayfield until mid-July to avoid disturbing nesting birds.

That move earned them a small grant from the federal Species at Risk Partnerships on Agricultural Lands program. The certification also enables them to market their farm produce as bird-friendly. "To me, it was an obvious thing to do," says Pam Jackson. "If we can help the population of ground-nesting birds with a simple change in practice, why not?"

Many species of North American grassland birds have been declining over the past few decades as development and farming put pressure on their habitats. In Ontario, bobolink and eastern meadowlark populations are down by more than 60 percent since 1960, and these species are now considered at risk.

Farmers play a key role in the lives of grassland birds. Bobolinks and eastern meadowlarks nest in June, concealing their nests in the tall grass of pastures and hayfields. When farmers harvest hay during that time, their

mechanical equipment can destroy the nests and the exposed fields make the young vulnerable to predators.

Farmers who participate in the certification program agree to delay their hay cutting until mid-July so the nestlings of these threatened birds survive. "[We] wanted to develop a program that was economically efficient and useful to participants, and produced measurable results in grassland bird habitat improvement," says Mark Eastman, senior coordinator of Agricultural Outreach at Credit Valley Conservation, which launched the certification initiative in 2014. Last year, the program had 41 participants in Ontario and certified 157 hectares as bird-friendly. "These farmers and rural landowners are providing an amazing public service by intentionally creating a space for species at risk on their property," says Eastman.

The Jacksons are now planning to go even further than delaying hay harvest by developing a rotational grazing management plan for cattle that will help protect nesting birds. "I feel like our farm is a safe haven for them," says Jackson.

More information is available on Credit Valley Conservation's Bird-Friendly Certified Hay website, cvc.ca/your-land-water/grassland-bird-recovery-program/bird-friendly-certified-hay.



EASTERN MEADOWLARK

KEN NEWCOMBE



Wilderness class: Year-round logging would harm Black Bay's pristine forest.

Logging Threatens Black Bay Peninsula Species

By **Jaklynn Nimec**

This article is part of a series on natural areas in Ontario that call out for protection, in the process helping Canada meet its international commitment to protect at least 17 percent of land and inland waters by 2020.

Several large, provincially significant wetlands stretching along a peninsula on the north shore of Lake Superior may fall victim to logging unless the provincial government acts to protect them.

The Black Bay Peninsula, an area 55 kilometres long and 25 kilometres wide that is primarily Crown land today, serves as a refuge for many rare species of orchids, dragonflies and butterflies. It is one of the largest remaining roadless expanses south of the provincial road network, making it a prime candidate for protection.

Currently, the peninsula is largely untouched except for logging that occurs on parts of the land during winter months.



A large wetland located at the base of the peninsula prevents logging trucks from being able to access much of the area most of the year. In the winter, however, an ice road allows vehicles to travel across the wetland to log the forest.

Over the years climate change has been shortening the interval during which the ice road remains frozen, increasing pressure on the forestry company to build an all-season road. Such a road would not only enable logging to occur year-round, but also potentially encourage more development on the peninsula.

Thunder Bay Field Naturalists is advocating for Black Bay Peninsula to be designated a Wilderness Class Park, which would halt any current and future logging operations on the land. Group members worry that such activity would negatively affect the wildlife and plant life, as well as the water around the peninsula. 🦋

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The Sing-Song of Summer

In the decade since designating the whip-poor-will a threatened species, the Ontario government has done little to halt its decline. Yet, without the bird's call, Ontario outdoors would not be the same.

By **Brian Banks**



Dusk creeps in late once mid-June arrives in Ontario. It's not quite full summer, but, when taking a slow turn down any secondary highway or backroad in the diminishing light, a person is inundated with smells, sights and sounds.

In the right location, and with a bit of luck, a shrill, repetitive call might punch through the rest: "WHIP-poor-WEEA, WHIP-poor-WEEA, WHIP-poor-WEEA."

That sound—the loud, unmistakable song of the eastern whip-poor-will—is what a team of about 30 volunteers with the Orillia-based Couchiching Conservancy will be listening for this season across Carden and Ramara townships east of Lake Simcoe. "It should be done as close to the full moon as possible," says Dorthea Hangaard, the organization's citizen science project manager. That is when the whip-poor-will, a member of the nightjar family, is most active.

The volunteers will adhere to a protocol Bird Studies Canada (BSC) developed: start at sunset, follow a planned route, stop every kilometre, and listen for at least three minutes. The goal is to record as many locations of whip-poor-will activity as possible. The conservancy is currently updating the focus of its conservation efforts on the basis of the location of provincially endangered species and critical habitats, Hangaard explains. The data will be coupled with observations gathered last year west of Lake Simcoe to eventually map known locations of all endangered species in the six municipalities around Lake Couchiching and Orillia where the conservancy does its work.



Moonlight serenade: Whip-poor-wills are most active during a full moon.

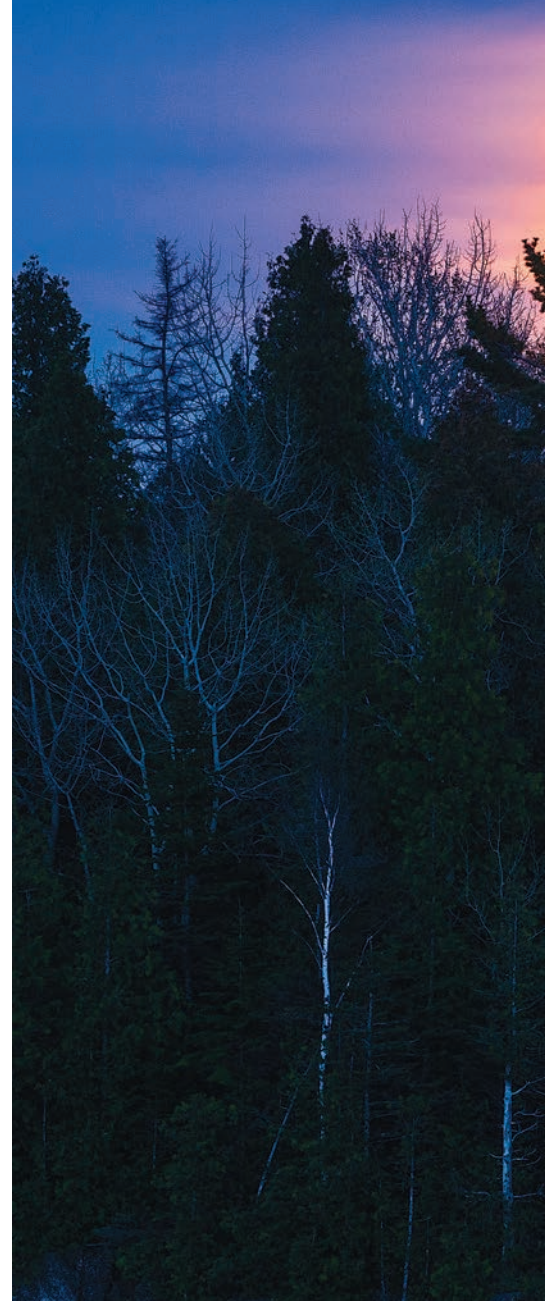
Not so long ago, the idea that volunteers would have to be recruited to listen for whip-poor-wills—or that this species would be listed, both provincially and federally, as a threatened one—would have seemed laughable. Though infrequently seen due to their nocturnal habits and mottled grey, brown and black camouflage, these medium-sized birds were once common from May to September across southern and central Ontario through Sudbury, Sault Ste. Marie and northwest of Lake Superior. (*Too* common for some campers and cottagers kept awake at night by male whip-poor-wills singing relentlessly to ward off intruders into their territory during the breeding season.)

But since the 1960s, the whip-poor-will population has declined by about 3 percent a year. Two Ontario surveys conducted 20 years apart for the Breeding Bird Atlas—the first from 1981 to 1985 and the second from 2001 to 2005—showed a 51 percent drop in whip-poor-will numbers. In 2009, the species was officially listed as threatened in the province. Yet in the decade since that designation, little action has taken place in terms of meeting legislative requirements to reverse the decline, and the development of a plan to help the bird may now be further delayed. Can summer's iconic singer hold out?

The cause of the whip-poor-will's decline remains unknown, but the main threat, according to a provincial government fact sheet, "is likely habitat loss and degradation." Because the bird requires a mix of both forested areas (for nesting) and open areas (where it feeds on moths, beetles and other flying insects), that "loss" can mean either the regrowth of forests in fields historically cleared for agriculture or growing incursions on the species' habitat by farms and new development.

The 2009 Committee on the Status of Endangered Wildlife in Canada (COSEWIC) report that declared the bird threatened nationally lists several other factors. Foremost, according to the report's author, Alex Mills, an associate professor in the department of biology at York University, are hazards that migrating whip-poor-wills encounter en route to and in overwintering areas in Mexico and Central America. Others include changes in the food supply, collisions with automobiles, and nest predators such as raccoons and feral cats.

Despite these threats, to date the Ontario



government has done little to address the bird's plight, as required under the Endangered Species Act, 2007 (ESA). When a species is listed as threatened, it is protected under the law, as is its habitat. (The latter applies only to existing habitat, however, not to areas where the species once lived.) Listing also starts the clock ticking on a process that requires a draft recovery strategy within two years, followed by the publication of a government response statement nine months after that. The first document essentially lays out ways to reverse a species' decline; the second indicates the steps the government intends to take.

In the whip-poor-will's case, the recovery strategy remains pending. Over the past 10 years, the Ministry of Natural Resources and Forestry has done some population surveys



and recently collaborated with Mills and University of Manitoba assistant professor of biology Kevin Fraser to study whip-poor-will



Ontario is vitally important to the whip-poor-will's long-term survival. That is underscored in a section of the federal strategy that covers known areas of critical nesting and foraging habitat.

habitat use and migration—capturing birds, fitting them with GPS devices that track their movements, and then recapturing them later

to see where they have been. The ministry's rationale for the long delay on the recovery strategy is that it was waiting for the federal government—which listed the bird as threatened in 2011—to produce one first, as the Canadian Wildlife Service has the “jurisdictional lead” for migratory birds. That federal document was finally published last year. Since then, the Ministry of Environment, Conservation and Parks, which now oversees the ESA, announced it would adopt that strategy

and, according to a timetable on its website, post it by the end of 2019. That does not mean that the bird is on

the cusp of a turnaround. Uncertainty about why whip-poor-will numbers are dropping means more research is required, particularly to clarify whether there are specific levels of habitat loss or insect prey decline beyond which recovery would be jeopardized, the federal strategy advises. Between now and 2028, the strategy presents the best-case objective as keeping further declines nationally to no more than 10 percent of the current population.

Conservationists also worry about the prospect of further delays and the potential loss of more habitat if the provincial government carries through with proposed

Sound of summer: Cottagers are sometimes able to hear whip-poor-wills at night.

Conservationists also worry about the prospect of further delays and the potential loss of more habitat if the provincial government carries through with proposed

revisions to the ESA. In making the case for the review, this spring the government noted improving protection for species at risk and seeking efficiencies for businesses. However, Anne Bell, director of conservation and education at Ontario Nature, argues that the solution lies not in revamping the ESA but in making sure the existing provisions are properly applied—something the Environmental Commissioner of Ontario’s office strongly argued for in its 2017 annual report. “Even with the law and the current requirements, we see that the problem for this species is implementation,” Bell says.

Bell notes that the government’s proposed revisions would do little to improve species protection. Instead, they focus on making it easier and quicker for development proponents to proceed with potentially harmful activities. “‘Increase efficiencies,’ ‘streamline approvals’—that’s all about making it easier for business to go ahead in the habitats of species at risk,” she says.

Ontario is vitally important to the whip-poor-will’s long-term survival. That is underscored in a section of the federal strategy that covers known areas of critical nesting and foraging habitat. As of September 2014, there were 198 across the country—110 of those in Ontario.

Credit for at least some of that provincial data lies with citizen scientists. The genesis of the protocols that Couchiching Conservancy volunteers use, for example, is a three-year, province-wide monitoring program—appropriately called the Ontario Whip-poor-will

Ideal habitat: Whip-poor-wills prefer open areas with scattered shrubs and trees.

Project—that BSC ran from 2011 to 2013. That work was spurred by the 2009 COSEWIC report and the bird’s subsequent listing as threatened in Ontario. While report author Mills drew on the best available survey information, he acknowledges that because the bulk of non-species-specific data collection is done from dawn to dusk, it is not as effective at capturing whip-poor-will activity as it is for other birds.

To help fill in those gaps, BSC mounted its whip-poor-will project with financing from the provincial government’s Species at Risk Stewardship Fund. Legions of volunteers across the whip-poor-will’s traditional range conducted roadside surveys in late spring and early summer, tracking the moon and listening for the bird’s sing-song. “The goal was to provide a better picture of the distribution of the species and the centres of its abundance,” says Audrey Heagy, BSC’s project coordinator at the time. By and large, Heagy says, the surveys confirmed the known distribution pattern while also identifying “some real hot spots” for the species. Now a consulting biologist based in St. Williams, near Lake Erie, Heagy recalls one around Torrance Barrens, northwest of Gravenhurst that stood out. “It’s kind of ideal habitat for them,” she says. “Open rock, shrubby scattered trees and lowland areas.”

Heagy had no personal connection with whip-poor-wills before the work began. As

she travelled around the province, she was struck by how many people wanted to tell her about their affinity for the bird. “It was mostly either camping or at cottages and hearing the birds calling,” she says. “They always associated it with summer. But then, with the decline of the species, they suddenly weren’t hearing it anymore and they wanted to know where the birds had gone, what had happened.”

It’s a sentiment that Couchiching’s Hangaard is hearing a lot lately as well. So it was heartening that the handful of volunteers—her “whip-poor-willians”—who did the monitoring last year identified 20 new locations not flagged in the provincial database where at least one whip-poor-will was heard, and she is optimistic volunteers will find a few more this year. “[The locations] were concentrated around the Oro Moraine and the Severn woodlands, areas already under consideration [for protection or restoration] in our natural heritage strategy,” she says, “so that just solidified that we’re on the right track.”

It does not mean, however, that the bigger story of population decline has changed, but it does offer hope that there are still enough birds and remaining habitat to build a recovery strategy that leads to an increase in whip-poor-will numbers and keeps their song alive. 🐦

Brian Banks is a Cobourg-area writer and editor, and a long-time contributor to ON Nature.



EASTERN WHIP-POOR-WILL

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DOG-DAY CICADA

Where Are All the Bugs?

The dramatic declines in insect populations are leading scientists to warn of cataclysmic consequences. But even as evidence mounts, the causes remain poorly understood.

By Patricia Hluchy



A year and a half ago, at a meeting of hoverfly researchers in Brazil, entomologist Axel Ssymank presented the results of a groundbreaking, nearly three-decade-long study on flying insects in German nature reserves. The research team had found a staggering 76 percent drop in the overall population and an even deeper plunge during summer peak times. “There was an audible gasp in the room,” recalls Jeff Skevington, an Ottawa entomologist who attended the conference. “I don’t think people had anticipated just how severe the losses were.”

This 2017 study followed earlier shocking findings, reported in *Science* magazine in 2014. After synthesizing existing research on invertebrate species, most of which are insects, the authors discovered a 45 percent decline in abundance among two-thirds of the populations. The latest dire warning came this past April, when an article in the journal *Biological Conservation* reporting the results of the first global review of insect declines declared that if the crash in insect numbers is not halted, nature’s ecosystems would collapse before the end of this century. The international research team concluded that more than 40 percent of insect species are threatened with extinction. Putting the blame primarily on intensive agriculture and the heavy use of pesticides, they warned of “catastrophic consequences for both the planet’s ecosystems and for the survival of mankind.”



FROSTED ELFIN

Gone but not forgotten: Three butterfly species have been eradicated from Ontario.

Skevington, who works as a research scientist with Agriculture and Agri-Foods Canada, does not find such assessments overly alarmist. “Insect declines are profound,” he says. “Anybody with any kind of ecological background knows that as soon as you start removing species from food webs, there’s going to be a cascade of consequences.”

Renowned U.S. biologist Edward O. Wilson once said, “If all mankind were to disappear, the world would regenerate back to the rich

state of equilibrium that existed 10,000 years ago. If insects were to vanish, the environment would collapse into chaos.” The conclusion is a reasonable one, given that insects are the most diverse group of organisms on Earth, accounting for eight out of 10 species. There are 900,000 known insect species (80,000 or so of them in Canada), but some experts estimate the number may be as high as 30 million.

While most of the evidence for insect declines is based on observation rather than statistical data, that anecdotal evidence is hard to deny. Consider the so-called windshield phenomenon. People who are of a certain age have probably noticed that the bug splatter that used to coat windows during long car trips, requiring the driver to stop and wipe them down, does not occur anymore. Sixteen Ontario insect species are designated as endangered or threatened, and four—the American burying beetle and three butterflies: the eastern persius duskywing, the frosted elfin and the Karner blue—are no longer present in the province. Meanwhile, populations of barn swallows and other aerial insect-eating birds are declining sharply, harbingers of potentially much larger changes. “There could be massive loss of vertebrate diversity, mammals as well as birds, and changes in forest composition because of the loss of specialist

Butterfly effect: Insect declines may be contributing to declines of insectivorous birds.



BARN SWALLOW



pollinators,” Skevington says. “A single species removed can have far-reaching consequences, and we’re talking about removing thousands of insect species.”

While the general public tends to view insects as slimy, biting, stinging pests, scientists know that the creatures perform vital work in ecosystems. Pollinators, which include numerous fly species, bees, wasps, beetles and butterflies, help wild and agricultural plants reproduce, thus ensuring animals that feed on those plants have sufficient food. Flying insects are also essential parts of the diet for birds, reptiles, amphibians and other

“**If all mankind were to disappear, the world would regenerate back to the rich state of equilibrium that existed 10,000 years ago. If insects were to vanish, the environment would collapse into chaos.**

insects. Preying and parasitic bugs, such as ground beetles and wasps, help control the levels of plant- and crop-eating pests. And insects are great decomposers. “When an animal dies somewhere in the woods or cattle poop in the field, there’s a whole suite of insects that consume it, bury it and recycle it,” explains Robert Anderson, an entomologist at the Canadian Museum of Nature in Ottawa. Insects help break down the leaves shed

by deciduous trees into smaller pieces so that earthworms and fungi can further decompose them. Insects also aerate the soil and create channels that allow water to reach plant roots.

For some time, scientists have been linking declining insect populations to the dwindling numbers of other species. Several insectivorous birds, including the once-ubiquitous barn swallow, are now threatened in Ontario. “Fifty years ago, nobody would ever have expected the barn swallow would end up on the list of species at risk,” says biologist Joe Nocera, an associate professor at the University of New Brunswick. The chimney swift, another aerial insectivore, has declined by

95 percent in the past four decades in Canada, and bird experts suspect fewer insects are at least part of the reason. Other species that rely heavily on insects for nutrition, including bats, may also be affected.

The big question, of course, is what is causing the declines. The evidence to date mainly implicates pesticides and herbicides,

habitat degradation or loss, invasive species and climate change. Nocera, for one, found compelling evidence of the harmful impact of the now-banned pesticide DDT. In 2012, he was part of an Ontario team that studied a two-metre-deep deposit of bird feces in a Kingston chimney. Some 4,000 chimney swifts roosted there over 85 years until the structure was sealed off, and the researchers found a dramatic change in the chimney

Nuisance nostalgia: Bug-splattered windshields are a rarity today.

swift diet around the 1950s and 1960s, which correlates with widespread use of DDT in Ontario. The birds switched from eating beetles to other bugs such as aphids, cicadas and stink bugs. “Most beetles tend to be bigger than true bugs, so it’s more bang for your buck if you’re an insectivore,” says Nocera. “So there was a decline in nutritional quality when they made that switch.” The number of beetles in the guano increased somewhat after the DDT ban but never returned to historic levels, he adds.

Nocera cautions, however, that “correlation does not equal causation.” In the case of barn swallow declines, insect availability may be a factor, but so is the disappearance of old wooden barns, the birds’ favoured roosting sites. “How do you separate out what’s driving their population down when both things are happening at the same time?”

Henri Goulet, who has been studying insects for Agriculture Canada for 40 years, also believes he has strong evidence for the harm wrought by herbicides. In a 2017 paper, he and collaborator Lubomir Masner reported on three insect groups they had long studied in the Ottawa and Montreal regions: ground beetles, sawflies and parasitic wasps. They detected a “massive collapse” of the populations of all three groups in the 1980s—after corn, and later soybeans, became prominent as agricultural crops around Ottawa and Montreal, and springtime spraying with herbicides became

common. Goulet notes that ground beetles would have been directly affected by spraying, while the other two groups prey on or are parasites of other insects that prevailing winds would have blown over from sprayed farms. “If you go west from Ottawa for an hour or two,” he says, “insects reappear that I haven’t seen near Ottawa in years.”

Despite the mounting evidence of dramatic crashes in insect numbers, experts agree that more research is needed to understand the causes and severity of the declines. Stephen Marshall, a professor of entomology at the University of Guelph, argues that a baseline urgently needs to be established. Marshall, the long-time director of the university’s insect collection, the oldest in Canada, notes that such collections give some indication of decreases by documenting apparent disappearances of species or highlighting how many specimens of a species were collected at different times. But that is not the same as having a standardized set of data, as was available for the 2017 German study, that can be used to rigorously compare diversity and abundance over time. “I’ve been pushing for 35 years to get support for surveys of parks and protected areas,” says Marshall. “If we don’t know what we’ve got, we’re not going to know what we’re losing.” But, as decades of futile proposals to agencies



CORN FIELD

and foundations attest, scientists struggle to get such labour-intensive surveys launched, because publishable findings do not emerge for 10 to 20 years.

One group of insects for which researchers have relatively strong baseline data is wild bumblebees, of which there are 20 species in southern Ontario. Sheila Colla, an ecologist and assistant professor at York University, discovered in the early 2000s that the rusty-patched bumblebee, one of the most common wild bees in Ontario until the 1980s, had virtually disappeared. She is the last person on record to have seen one in Canada, in Pinery Provincial Park on Lake Huron in 2009. Now found almost exclusively in the American Midwest, the species is designated as endangered in Ontario, as is the gypsy cuckoo bumblebee.

The rapid decline of the rusty-patched bumblebee suggests a disease outbreak, says

Colla, probably from managed bumblebees. The wild bees “probably got exposed to some disease that they haven’t evolved with, and that completely wiped them out in Canada and most of their range in the U.S.,” she theorizes. She adds that some researchers think climate change might also be a factor, as bumblebees are “cold-weather animals.”

But as worries mount about an insect Armageddon, definitive answers remain elusive. To rally research and protection, respect and appreciation for the creepy crawlies so essential to our environment need to be increased among the public. “Think about how many millions of dollars have gone into tracking of the large vertebrates when the little things aren’t a priority for research or conservation,” says Colla. “We need to understand the role of invertebrates in our ecosystems and to value them as much as we would value something much prettier, like a bluebird.” 🐝



RUSTY-PATCHED BUMBLEBEE

Historic sighting: *The rusty-patched bumblebee was last seen in Canada in 2009.*

Patricia Hluchy’s ON Nature feature about wild American ginseng is a finalist in the 2018 National Magazine Awards.



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Urban Planet

The growth of cities is driving evolutionary changes in plants and animals at an unprecedented pace. What will this mean for the environment—and for us?

By **Conor Mihell**



A few years ago, Mississauga-based ecologist Marc Johnson conducted a study exploring how urbanization affects white clover. It was a side project for the director of the Centre for Urban Environments at the University of Toronto Mississauga, whose research had been focusing on how urban “heat islands”—the phenomenon in which cities are markedly warmer than rural areas—influence the evolution of plants and insects. But what Johnson thought would be a mundane study delivered stunning results, providing a compelling glimpse of how the urbanization of our planet is affecting the evolution of life forms.

Some populations of white clover, an invasive species ubiquitous in urban lawns, carry an inherited chemical trait that offers them protection from herbivores such

as slugs. The presence of this cyanogenic chemical, however, also makes those white clover communities less tolerant to cold temperatures. Johnson surveyed thousands of plants in Toronto, Montreal, New York and Boston, and compared them to control plots in neighbouring rural areas. In three out of four cities, Johnson found rural clover twice as likely to produce chemical defences.

That is because urban cores of Toronto, New York and Boston have less snow than countrysides (relatively snowy Montreal was the exception), and without the insulation that snow provides, winter soil temperatures are colder there than in snow-covered outlying areas. That made cold intolerance a dangerous trait for urban clover plants. But here is the kicker: white clover colonized Toronto barely a century ago—a blink of an

eye in evolutionary terms. In essence, the study demonstrated an example of evolution—a process once believed to occur over thousands or millions of years—playing out at warp speed and in parallel across multiple cities.

It is well known that some animals adapt their behaviour to thrive in human-dominated environments. But that urbanization is playing a role in evolution, at the genetic level, is a recent revelation. The first studies in what is now called urban evolutionary ecology date back to the mid-1990s; since 2010, dozens of scientific articles have been published on the subject. For researchers like Johnson, the goal is not just to document the phenomenon, but also to highlight the important role this knowledge will play in urban planning and the conservation of biological diversity.

Urban areas cover only 3 percent of the planet, but more than half of all humans, including 83 percent of Canadians, live in them. Warmer air temperatures, vast concrete and asphalt cover, abundant invasive species, and air, water and light pollution are the hallmarks of this rapidly growing ecosystem—and all of these variables have an impact on the evolution of many species. In a 2017 article in the journal *Science*, Johnson and a colleague highlighted dozens of examples of evolution in urban populations of salamanders, bobcats, bedbugs and finches, among others, around the world. “The study of urban evolution has rapidly become an important frontier in biology, with implications for healthy and sustainable human populations in ecosystems,” Johnson wrote.

To Johnson, cities represent complex scientific models for the study of how humans are altering the environment and changing the planet’s evolutionary patterns. “The range of variables that are changing and how much they’re changing is unlike any other ecosystem on earth,” he says. “What species will adapt? That question becomes more important as the world becomes more urbanized.”

It is no surprise that people exert a powerful force in nature. House mice, black rats, lice, cockroaches, pigeons and countless bacteria are just a few organisms whose behaviour and genetics have evolved over millennia to become completely dependent on humans. Johnson says raccoons, coyotes and birds such as American robins and chimney swifts may be on the same path, but scientists have not yet performed enough

WHITE-FOOTED MOUSE



The Shrinking Gene Pool

A 2017 article in the journal *Science* documented numerous studies in urban evolutionary ecology from around the world, most of them analyzing how urban populations of species in small, fragmented habitats respond to limited gene flow. Researchers in New York City detected rapid genetic changes in **white-footed mice** in urban parks compared with rural populations. The growth of areas with more than 50 percent impervious surfaces (pavement, for example) was shown to reduce the dispersal of **song sparrows**, diminishing genetic diversity. In Los Angeles, scientists observed declining genetic diversity in urban **bobcats** due to restricted habitat and high pesticide levels in their rodent prey. Similar patterns appear in **German cockroaches** and **bedbugs**; these and other pests often evolve rapidly to better tolerate pesticides.

One study of **humans** showed evidence of greater resistance to diseases like tuberculosis and leprosy in older cities, possibly because of lengthier histories of exposure to these diseases and therefore adaptation. Similarly, populations of **killifish** in urban waters have evolved to be more tolerant of toxic PCBs. While very little of the research dealt with plants, one study of five North American cities demonstrated faster growth, larger size and earlier flowering of urban populations of **Virginia pepperweed**, giving them distinct advantages over their rural cousins.

—Conor Mihell

experiments to detect distinct responses at a genetic level.

A knowledge gap exists largely because ecologists have always favoured wild places like the Galapagos Islands or Algonquin Provincial Park as sites for data collection. “Until recently, most researchers thought of cities as being anti-life,” notes Johnson. “They are areas we have sterilized and homogenized with development.” But a new generation of researchers is realizing that in cities “we have this amazing experiment, replicated all over the world,” he says.

A textbook case of urban evolution dates back to the Industrial Revolution in England, when dark-coloured peppered moths were better camouflaged on sooty surfaces. As pollution levels decreased in the mid-1900s, more light-coloured moths were observed. This is an example of Charles Darwin’s concept of natural selection, whereby possessing specific characteristics makes certain individuals more likely to reproduce, in turn helping the species survive over time. More recently, in a study of house finch populations in various cities, researchers in Arizona demonstrated that the beak size of the finches was changing in response to backyard birdfeeders, which favour birds with wider beaks that can crack sunflower seeds.

In contrast to natural selection, non-adaptive evolution occurs when populations of species are isolated from one another, diminishing the gene pool over time and leading to what is known as “genetic divergence.” The smaller the population, the greater the likelihood of certain genes becoming common to every individual over time—along with reduced reproductive success due to inbreeding.

One result of prolonged isolation is the origin of new species. This is the case with an insect pest first observed in England when Londoners took shelter underground during World War II. In the 1990s, a PhD student described *Culex pipiens molestus*, a new type of subterranean mosquito that does not



WHITE CLOVER

hibernate, has a special affinity for mammalian blood and cannot interbreed with its aboveground counterparts. Amazingly, the identical *molestus* subspecies also appears to have emerged in the subway systems of Chicago, Los Angeles and New York, in a pattern known as parallel evolution. (Johnson says it would be exciting to study Toronto’s subway to see if the subspecies has emerged in Canada.)

Of course, the other possible outcome of isolation is extinction, to which countless endangered species around the globe are vulnerable. Researchers in Montreal tracked

isolated populations of red-backed salamanders in urban green spaces like Mont Royal and other parks, which have become islands in a sea of development over the past four centuries. They found that these salamander populations—even those that were geographically close to one

another, separated by narrow roads—were genetically diverged, with each isolated population displaying its own unique genetic signature. In contrast, rural populations showed far more genetic diversity. That is because salamanders have no lungs and so have difficulty crossing even small barriers. Isolated from their brethren, these salamanders are more susceptible to dying out.

Winter hardy: Urban white clover has adapted to colder soil temperatures.

Similarly, a study in southwestern Ontario’s Wellington County demonstrated that Highway 401 had created a barrier between populations of wood frogs. Moose populations in Alaska may diverge genetically due to barriers installed to protect motorists on highways. Genetic changes multiply over time, says Johnson. What’s more, small, isolated populations tend to have higher expressions of deleterious mutations, affecting species’ survival.

The relationship between isolation and extinction is well known to conservation biologists; the phenomenon explains why larger, better-connected natural areas have greater species diversity than small, fragmented parcels of habitat for many native species with limited dispersal capabilities. As the world becomes more urbanized, researchers like Johnson are applying this fundamental concept to reinforce the need to preserve existing natural landscapes, restore degraded ecosystems and connect natural spaces with corridors within cities. Such connectivity is the key principle behind Ontario Nature’s Greenway Program, which aims to link areas of core habitat across southern and eastern Ontario.

However, these long-term strategies are often overshadowed by lucrative development projects and political whims. “The recent discoveries [made by researchers like Johnson] are so simple, yet so amazing,” says Tanya Pulfer, Ontario Nature’s conservation science



HOUSE FINCH



RED-BACKED SALAMANDER

manager, and reinforce the necessity of ensuring that species have what they need to survive. “We can’t look at every open space simply in terms of its potential for a road or building. It’s not just about how it will work for humans, but how it will impact animals and plants.”

One of the greatest benefits of urban evolutionary ecology is its ability to make ordinary people see their effect on nature; revelatory experiments are taking place in front of the eyes of millions, often aided by the contributions of citizen scientists. Carly

Restricted movement: Barriers along highways may cause genetic divergence in some moose populations.

Isolating urbanization: Salamander populations in Montreal are less diverse than rural populations.

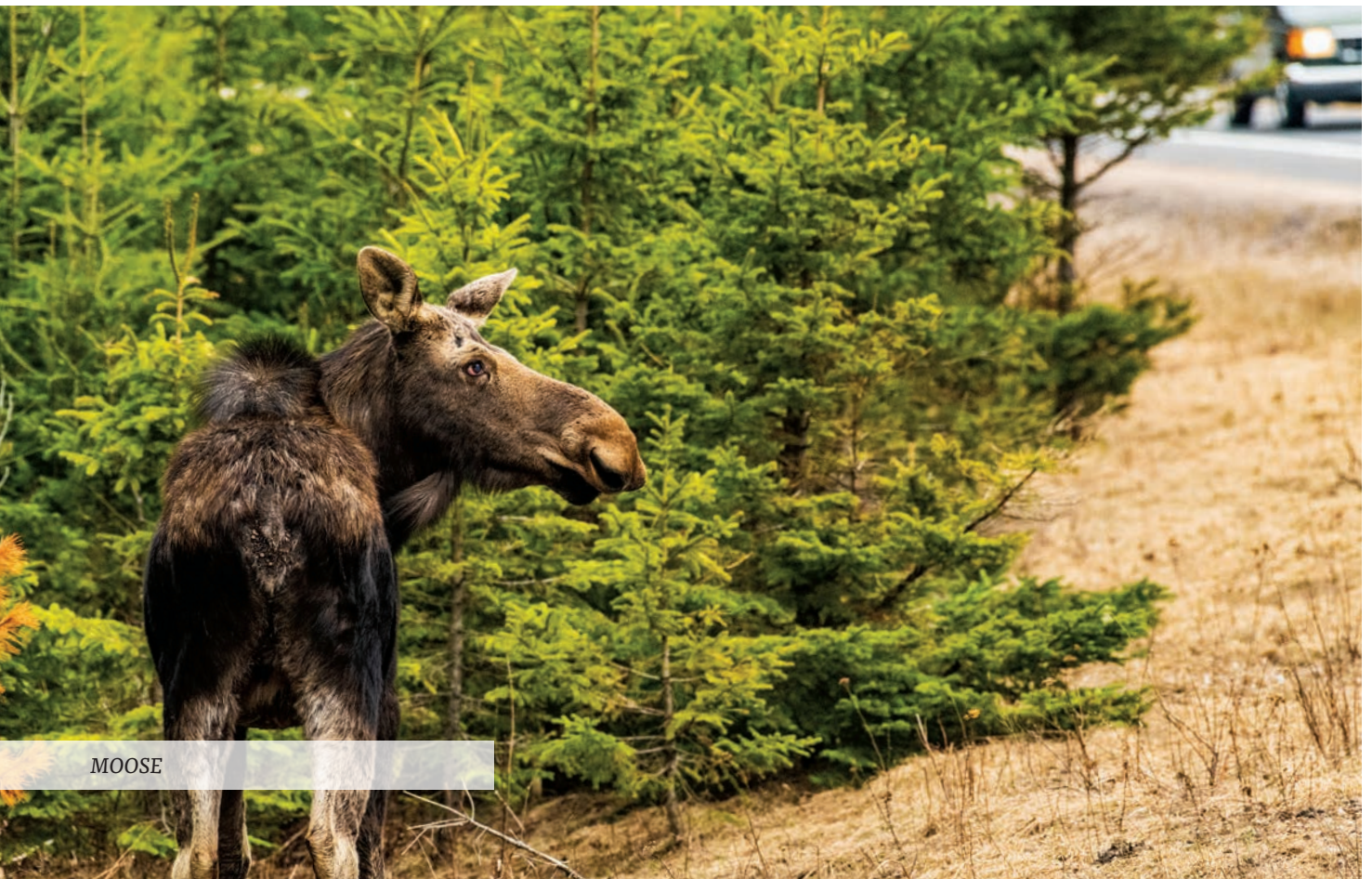
Ziter, an assistant professor of biology at Montreal’s Concordia University whose research focuses on urban and landscape ecology, studied the potential for urban green spaces to provide benefits to people. During her PhD studies at the University of Wisconsin-Madison, while her colleagues ventured into the wilds of Yellowstone National Park, Ziter knocked on doors and collected soil samples from suburban backyards. Her work showed how conservation gains can be made in the typically disregarded vestiges of green space, such as residential

lots, which form an interconnected constellation of habitat throughout cities, providing plants and animals with a way to avoid isolation within the urban ecosystem. “Suburbs and sprawl are really difficult places for biodiversity to thrive,” Ziter admits. “But they can provide quite a bit of habitat. If you start adding it all up, there’s potential for a lot more resiliency.”

Urban evolutionary ecology also provides compelling evidence of how urbanization is threatening the survival of many species. Southern Ontario, where more endangered species live than anywhere else in Canada, is the epicentre of a biodiversity crisis. As the population of the Greater Toronto Area continues to swell, remaining natural pockets are constantly under siege: only a public outcry from conservationists, farmers and municipalities convinced the provincial government recently to scrap proposed exemptions to environmental regulations aimed at facilitating urban sprawl.

Johnson says the ultimate goal of his research is making cities more sustainable. “How can we increase resiliency, adapt to a changing climate and address changes in technology and demography?” he asks. “It’s all about making cities healthier for all forms of life.”

Conor Mihell wrote about plastics in the Great Lakes in the spring 2019 issue of ON Nature.



MOOSE



Photo credit: Smera Sukumar, Sydenham River Nature Reserve

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Our Member Groups



Raising environmentalists: *The foundations for caring for nature are established early.*

Outdoor Learning in Norfolk

By Lisa Richardson

Nature-loving children in Norfolk County will have plenty of outdoor activities to enjoy this summer, thanks to the latest roster of camps from Nature's Calling Environmental Education (NCEE). The Simcoe-based group will host nine week-long day camps in July and August that will introduce children aged four to 10 to local species and help them develop outdoor skills.

Each day camp offers participants learning experiences focused on different facets of nature and nature exploration. For example, the Nature's Palette camp, scheduled for the third week of July, shows campers how to create wind chimes, picture frames, ornaments and other art using only natural materials. The Zombie Apocalypse Survival camp later that month will use the spectre of a zombie invasion to teach participants outdoor survival skills.

NCEE grew out of the Long Point World Biosphere Reserve Foundation's Kids for Turtles initiative, which was created in 2009 to provide nature-focused programs for children and their families. In 2012, the initiative became a separate organization and adopted its current name.

A core tenet of NCEE's mission is the importance of teaching kids about nature in an outdoor setting. In September 2017, the group launched a forest school that conducts outdoor lessons for students aged three to six during all seasons. It covers the same subjects as a traditional school but helps students learn by giving them regular access to natural spaces, including woodlands and meadows.

In October 2018, NCEE built on the success of the school by introducing a forest school for home-schooled children aged six to 12. One day a week, students learn about wildlife, orienteering, wilderness survival and other nature-related topics through hands-on outdoor activities.

NCEE's founder and executive director Bernie Solymar attributes the group's success to the contributions of local nature lovers. "We have a great board of directors," he says. "Most are educators and naturalists in our community with a strong commitment to environmental education."

More information about NCEE's 2019 summer camps and other programs is available on the group's website at naturescalling.ca/day-camps. 🐦

Friend of Nature Passes on Her Passion

By **Portia Mohlmann**



FRED MOHLMANN

Irene Lefebvre has fond memories of growing up in Cornwall in the 1950s, where she swam and fished along the St. Lawrence River. Throughout her life, she made sure that water was always close by. “Red-winged blackbirds, pussy willows and bulrushes in local marshes are always signs that spring is on the way!” she says with enthusiasm.

This love of water and the species in and around it inspired a life-long fascination with nature. In the 1990s, Lefebvre travelled extensively through Ontario and other parts of Canada, seeking out any opportunity to explore the great outdoors. She discovered Ontario Nature when she participated in a day trip to an old-growth forest near Wawa, and soon after she became a Friend of Nature monthly donor.

Lefebvre is eager to help preserve nature. Over the years she has watched forests, meadows and wetlands be replaced with housing and commercial development. “It’s about quality of life,” she says, “from the air you breathe and the water you drink to the food you eat. I’m not against modernization, but I believe there needs to be a balance between nature and urbanization.”

Retired now, Lefebvre lives in Carleton Place close to her family, where she enjoys taking her grandchildren and great-grandchildren to swim in the meandering Mississippi River, passing her love of nature on to younger generations. Since injuring her knees, she cannot get outdoors as much as she once did. Signing advocacy emails, reading *ON Nature* magazine, and supporting programs that protect wild species and spaces with her monthly Ontario Nature donations—these simple actions connect her to nature and allow her voice to be heard, she says.

Readers can join dedicated members like Irene Lefebvre as a Friend of Nature monthly donor by calling 1-800-440-2366 ext. 233 or by visiting the Become a Friend of Nature webpage at ontarionature.org/monthly. 🐦

Passing the torch: Irene Lefebvre is instilling a love of nature in her descendants.



The Undervalued Life of Plants

By Joanna Pachner

Last year, a dear neighbour passed away. He had been part of my life since I moved into my midtown Toronto house—a quiet, patient, soothing presence whose company made my stresses drift away. He was an old, towering maple, and I anthropomorphized him from the start.

Partly, that is because he, along with his even bigger brother, practically grew out of my home's foundation, his trunk often serving as my foot or back rest when I sat on the deck. The previous owners had built the deck around his trunk, so I know I was not the first to cherish his presence. And when he collapsed—considerately, causing no damage except for a slightly dented fence—I felt genuine grief.

With sun now pouring onto the lawn, my kids and friends pronounced the tree's absence an improvement. "Manitoba maples are weed trees," one neighbour said disdainfully, which in my bereaved state felt like a species-ist slur.

Why do we put so little value on

botanical life? Trees and other plants have none of the emotional hold on most people that animals do (or at least the animals to which humans can relate). We view plant life as disposable. You do not like that overgrown dogwood or the pine that rains needles on your car? Yank it out. When I invited a landscaper to help me bring some order to my chaotic backyard, she blithely suggested widespread ripping, digging out and demolition to put in younger, prettier and more obedient plants.

Imagine if veterinarians put down pets the moment they showed signs of illness or strain. I think of this double standard as rootism—discrimination, even by nature lovers, against life forms that do not move. Trees show signs of experiencing pain, use senses of smell and taste, and communicate with and support each other in social networks. "The distinction between plant and animal is arbitrary and depends on the way an organism feeds itself," writes German forester Peter Wohlleben in his bestseller *The Hidden Life of Trees*. "The

only other big difference is in the amount of time it takes to process information and translate it into action. Does that mean beings that live life in the slow lane are automatically worth less than ones on the fast track?"

My appreciation of trees—their seasonal procreation cycles, their tough but sensitive skin that bleeds sap, how they filter light—has adjusted my attitude to other plants as well. Now, I cannot bring myself to remove overgrown bushes, but focus instead on helping them thrive in their old age.

Today, when I sit on my porch with my feet resting on the maple that remains, I know that this neighbour is old and frail and will be gone soon, too. But I will nurse and protect him for as long as I can. When he dies, his trunk will become an outdoor table: a permanent commemoration of a beloved friend. 🐦

Joanna Pachner is a Toronto-based writer and editor, and a contributing editor with ON Nature.

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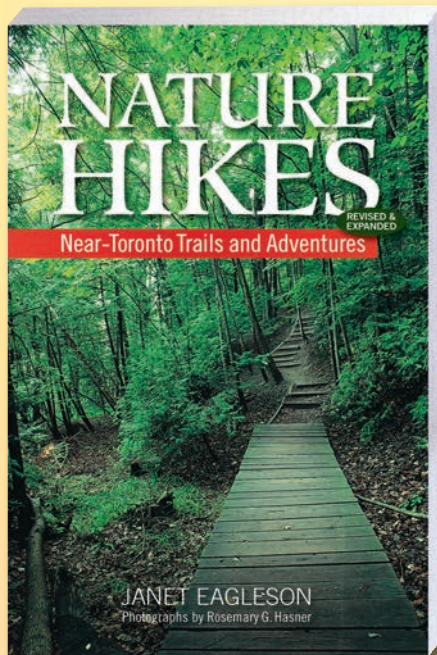
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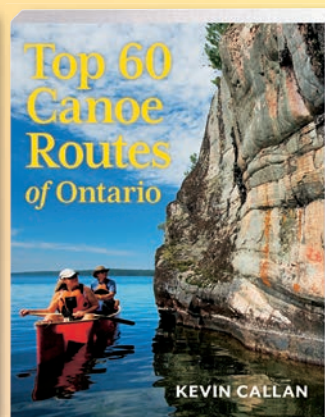
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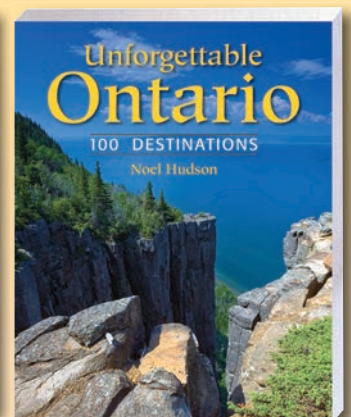
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