

# NATURE ALBERTA

MAGAZINE

FALL 2022  
VOLUME 52 | NUMBER 3



A COMMUNITY  
CONNECTED BY A  
LOVE OF NATURE

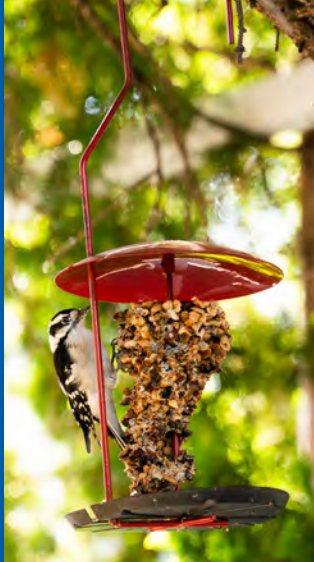
## Wood Lilies and Swallowtails

A Colourful Relationship

Hiking the  
Trans Canada  
Trail

The  
Hidden Life  
of Fungi

The Dire State  
of Grassland  
Birds



# Growing together.



With funding from the Edmonton Community Foundation, Nature Alberta launched the Urban Nature Initiative in 2019, providing homeowners with tools and techniques to enhance biodiversity in their yards. By sharing their stories and results, they inspired others to undertake their own urban nature journeys.

ECF's support of Nature Alberta continues with their donation-matching program for the Nature Alberta Endowment Fund. Until the end of 2022, ECF will match Endowment Fund donations dollar for dollar, doubling the impact of every contribution towards Nature Alberta's sustainable financial future.

Nature Alberta is proud to partner with ECF and grateful for their ongoing support.



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To see the Urban Nature Initiative in action, visit [naturealberta.ca/support-urban-nature](https://naturealberta.ca/support-urban-nature)

*Ad creative courtesy of Nature Alberta.*

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# NATURE ALBERTA MAGAZINE

VOLUME 52 | NUMBER 3 | FALL 2022

ISSN 1713-8639

**Publisher** Nature Alberta

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**Managing Editor** Jason Switner

**Creative** Susan May, intrinsic design

**Cover Image** Lawrence Harder

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Nature Alberta magazine is published four times per year by:

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Edmonton, AB T5M 3K6

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Nature Alberta Magazine (electronic) is made available free of charge at naturealberta.ca. Print copies of Nature Alberta Magazine are available by annual subscription for \$32 (Canadian funds + GST), which covers four issues per year, plus postage and handling, within Canada. Publications Mail Agreement No. 40015475

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## About Nature Alberta

Alberta is home to incredible natural spaces comprised of beautiful and varied landscapes, and rich biodiversity reflected in our abundant and diverse flora and fauna. Across the province, natural history clubs and their members are engaging Albertans in the conservation and appreciation of this natural heritage. Nature Alberta represents a network of these natural history organizations in Alberta.



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## SHARING OUR SPACE

### It's Nesting Audit Season

Fall is an ideal time to do a bird nest audit of your property, checking for unwanted nests and cleaning out nest boxes.

House sparrows nest in all kinds of places. I once rescued a nest of house sparrows out of a hood fan. The unsuspecting homeowner turned on her stove fan after returning from vacation, and the nestlings slid down the vent and began chirping loudly from inside her kitchen fan! Luckily, I was able to pull the nestlings out safely. You can prevent sparrows from nesting in your kitchen and dryer vents by inspecting the vent cover outside. If your vent does not have an appropriate cover, you can purchase one from your local hardware store. Have a look inside the vent and remove any nesting material before installing the new cap.

Take some time to inspect and clean out your nest boxes. Most bird houses have a side wall or bottom that opens for ease of cleaning. Before opening the nest box, stand to the side and knock first, to see if anyone is home. I once opened a nest box to find a sleepy flying squirrel inside. Startled, I screamed before regaining my composure to snap a photo, and then carefully shut the door to let the squirrel carry on snoozing.



"Knock on the door" before opening a nest box. You may discover a nocturnal occupant, such as this northern flying squirrel, living inside. STEPH WEIZENBACH

Once you've determined your nest box is not occupied, open it to remove the old nesting material and clean the next box with mild soap. Let it dry and set it back up. Resident birds, such as chickadees, may use nest boxes during the winter as roosts. Having the box already set up also ensures it is ready for returning migrants who begin searching for nest sites early in the spring.

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# Nature Alberta News

## Family Nature Nights: Inspiring a Love of Nature

This summer was alive with the sound of laughter and learning at our Family Nature Nights! We had a very ambitious plan to run seven events across three different cities in two months, and it went spectacularly.

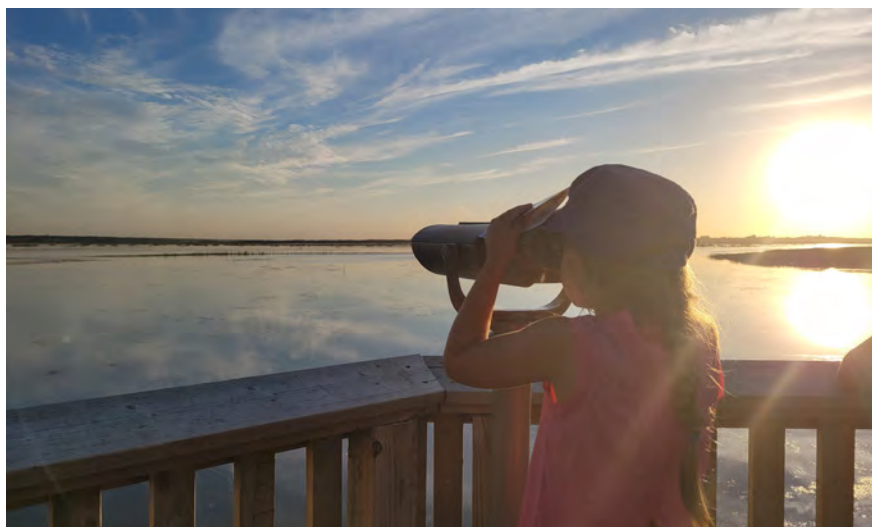
We couldn't have done it without the support of our member clubs and wonderful volunteers. Special thanks to the clubs who helped us expand Family Nature Nights outside of Edmonton. The Red Deer River Naturalists were central to running our Incredible Ecosystems event at Gaetz Lake Sanctuary. Nature Calgary and Weaselhead/Glenmore Park Preservation Society were instrumental in bringing Brilliant Birds to Calgary. By the end of the summer, we connected with 816 people and raised \$1,055 (all events were free to attend, but donations were appreciated). These funds will help support Nature Alberta's outreach programs and keep us connecting people to nature for many years to come.

While these achievements are cause for celebration, Family Nature Nights are so much more than just numbers.



MacEwan University Assistant Professor Dr. Jessica Haines teaches families about antlers and their ecological significance during our Fur and Feathers Family Nature Night in Edmonton's Whitemud Park. STEPH WEIZENBACH

They're about seeing a child's eyes light up during pond dipping as they realize the water is "alive," or when a family new to Canada sees a beaver for the first time, or a thousand other moments like these that create lifelong memories and inspire a love of nature. We are truly grateful to everyone who made this season possible and can't wait for next year!



Families looked to the sky as they learned about the birds of Big Lake during our Wetland Champions event at Lois Hole Centennial Provincial Park ABIGAL STOSKY-RAHMAN

**Thank you to all our community partners involved in bringing Family Nature Nights together:**

Alberta Amphibians and Reptile Conservancy  
Alberta Biodiversity Monitoring Institute  
Alberta Environment and Parks - Water Projects Management  
Alberta Fish and Wildlife  
Alberta Lake Management Society  
Alberta Lepidopterists' Guild  
Alberta Science Network  
Big Lake Environmental Support Society  
Cold Lake Fish Hatchery  
Edmonton Nature Club  
Edmonton Native Plant Society  
Grant MacEwan Expert: Jessica Haines  
Kerry Wood Nature Centre  
Medicine River Wildlife Centre  
Nature Alberta Presenters: Steph Weizenbach and Nick Carter  
Nature Calgary  
Nature Central  
North Saskatchewan Watershed Alliance  
Red Deer River Naturalists  
Root for Trees  
University of Alberta Experts: Ilan Dornich, Ronald Batallas, Valerie Miller, and Anya Batycky  
Wagner Natural Area Society  
Weaselhead/Glenmore Park Preservation Society

**And thank you to our funding partners whose contributions made these events possible:**

Alberta Conservation Association  
Environment and Climate Change Canada  
Nature Canada  
TD Friends of the Environment Foundation

# Wild Boars on the March

If you were to design a species with maximal potential for invasive spread, which features might you include? A rapid rate of reproduction would certainly be high on the list, as would the ability to eat most anything and the ability to survive under a wide range of climatic conditions. For good measure, you might throw in high intelligence, stealthy behaviour, and the absence of effective predation. As it turns out, this creature already exists. It's known as the pig.

Not just any pig, mind you. We are talking about Eurasian wild boars hybridized with domestic pigs. The origin of these animals dates back to the 1980s, when agricultural producers across Canada became enamored with raising exotic species for big profit. This craze brought elk farms, ostrich farms, and more to Alberta, including wild boars. Of course, warnings were issued by the environmental community and others about things that might go wrong. And of course, these warnings were ignored.

Over the years, some of the farmed wild boars escaped into the wild and hybridized with escaped domestic pigs. As highly adaptable omnivores, they have no trouble finding enough to eat. Plants, including tubers and roots, stems and leaves, and seeds and berries, are the main part of their diet. They also eat mushrooms, invertebrates, bird eggs, and small animals. Surviving our harsh winters does not pose a problem either

because they are well protected by a woolly undercoat and are smart enough to create cattail shelters for riding out the worst weather.

Initially, wild boar numbers were low and they went largely unnoticed. However, females become sexually mature at around ten months of age and thereafter can produce two litters of five to seven piglets each year. That's a recipe for exponential growth, which is exactly what has happened.



Females can give birth to two litters per year of five to seven piglets each. TOMBAKO

Today, wild boars are found throughout much of Canada, with the largest populations occurring in Saskatchewan and Alberta (see map). They prefer areas that provide a combination of forest cover and access to crops for feeding; therefore, densities are highest in the Parkland region of the Prairie Provinces. Wild boars are also found across much of the U.S.

## Causes for Concern

Ironically, it is the agriculture industry, where the debacle began, that is suffering most from wild boars. The

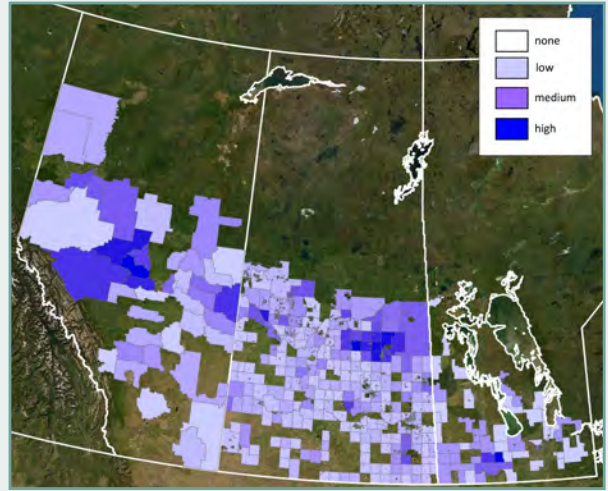
animals love to eat grain crops and they also damage crops through trampling. (This 45-second video is a real eye-opener: [bit.ly/feralpigfield](https://bit.ly/feralpigfield)). Rooting behaviour causes extensive damage as well, especially in pastures. And hog farmers are extremely concerned about the potential for diseases to spread from wild pigs to their domestic herds.

Wild boars can also take up residence in urban areas, which they have done in many European cities with associated safety concerns. If you think that urban coyotes are a concern, imagine coming face to face with a 150-kg boar sporting two sharp tusks. Wild boars have already been sighted in Lamont, and the experts believe it is just a matter of time until they make their way into Edmonton and other cities.

What about their ecological impact? In media reports, wild boars are often cast as porcine equivalents of the Terminator, devastating everything in their path. However, in ecological systems, disturbance is not necessarily a bad thing. In days past, millions of bison ate and trampled vegetation and tore up the ground through wallowing. Beavers and ground squirrels are also expert land disturbers. Yet we laud these species as ecosystem engineers, helping to create habitat diversity. As for eating bird eggs, innocuous squirrels do this too, as do crows and coyotes, and many other species.



Mature wild boars can weigh over 150 kg and have thick coats that allow them to survive Alberta's harsh winters. CLOUDTAIL



Map of the distribution of wild boars across the Prairie Provinces. RYAN BROOK

So, are wild boars then a positive ecological force, replacing some of the natural disturbances that are no longer active (such as bison grazing and prairie fires)? Not necessarily. Alberta's native species have evolved together over millennia and have the adaptations needed to survive in each other's company. As a newcomer to the scene, wild boars may present challenges that some species are ill-equipped to handle. This is particularly the case for

species already struggling to remain viable because of human impacts on the landscape.

A related problem is the potential for ecological imbalance. Because few medium- to large-sized predators remain in the settled parts of Alberta, predation is unlikely to keep boar populations in check. Nor is food supply much of a constraint, given their ability to eat just about anything and the ready availability of agricultural crops. Therefore, the potential exists for overpopulation. While ecosystems do require disturbance, there are limits beyond which ecosystem integrity cannot be maintained.

### What to Do?

Hunting may seem like an obvious solution to the problem; however, experience has shown that it is ineffective for controlling populations. Boars are intelligent and quickly adapt to being hunted by becoming nocturnal and more evasive. Moreover, hunting can cause sounders (pig groups) to fracture and disperse. It also makes the boars more difficult to trap.

Trapping does work, but it is a complex, labour-intensive process because the entire group needs to be captured at

once to be effective. Bait is set inside a fenced enclosure, which is then monitored by video camera. Once it is visually confirmed that all pigs are inside (which can take weeks), the door to the enclosure is closed via remote control.

The Alberta government has initiated a trapping program, along with a surveillance program to locate the boars. The public is asked to help by reporting sightings to [af.wildboar@gov.ab.ca](mailto:af.wildboar@gov.ab.ca) or by phoning **310-3276** (no area code needed). More information is available on the Alberta Invasive Species Council website: [abinvasives.ca/fact-sheet/wild-boar-at-large](https://www.abinvasives.ca/fact-sheet/wild-boar-at-large)

Given the wild boar's invasive characteristics and widespread distribution, total eradication no longer seems feasible. But through ongoing surveillance and trapping, boar numbers can hopefully be kept low enough to avoid serious environmental damage. ■



Wild boars use their snouts to root for food, which results in extensive soil and vegetation disturbance. RYAN BROOK



# Alberta Red-necks — Grebes, That Is

BY NICK CARTER

It's an early May evening along a boreal forest lake. A campfire crackles at my feet and the setting sun glitters on the still, dark water. Suddenly, wild, braying calls in the distance pierce the cool evening air. It's the call of duetting red-necked grebes, an announcement of warmer days ahead. The thought awakens the spirit and inspires me to go out and explore again.

Although the courtship of red-necked grebes is one of nature's great shows, it often goes unappreciated. The same goes for other grebe species. These birds generally do not inspire the same sense of northern majesty that loons do. Nor are they synonymous with Alberta wetlands the way ducks and geese are. But grebes are just as much a part of our lakes and ponds as all those other birds, and the red-necked grebe is one of my favourites. It's bigger and more outgoing than horned, eared, or pied-billed grebes, and easier to find than the

larger western and Clark's grebes. Just right for budding naturalists to watch and enjoy.

The red-necked grebe is a handsome bird. During the breeding season, when it's most likely to be seen in Alberta, it has distinctive gray cheeks, a chestnut throat, and a black head cap. These colours, along with its dagger-shaped yellow bill, are handy field marks that make red-necked grebes easy to identify even at a distance. Nonbreeding birds lack the characteristic red neck. The chicks have a cute black-and-white colour pattern, like little zebras, which can still be seen in the faces of juveniles just acquiring their adult plumage.

Red-necked grebes winter mostly on the west coast of B.C. and Alaska. During migration they stop to rest on large, deep lakes before settling down on smaller water bodies across Western Canada to breed. They arrive in Alberta in late April, though how they do so is a mystery since I've never seen a flying

grebe. They seem to simply emerge from wetlands once the ice is gone. Ducks and geese make little secret of their migration habits, but red-necked grebes stealthily fly overland at night.

Red-necked grebes are found across most of the province except the dry grassland region in Alberta's southeast corner. During the breeding season, any decent-sized water body where fish can be caught may support a pair of grebes. I've frequently seen them on the glacially carved pothole lakes in and around Elk Island National Park, as well as Crystal Lake in the suburbs of Grande Prairie and even on Pyramid Lake in Jasper National Park.

The spear-shaped bills of red-necked grebes hint at their preferred source of food, which is mostly fish and freshwater crustaceans. They hunt visually by dipping their heads below the surface and scanning underwater for prey. While nesting, however, the grebes become less picky and will take



just about any food source they can catch, including leeches, amphibians, and aquatic insects. Once a potential food item is spotted, the bird quickly dives below to make the catch. Red-necked grebes also have a strange habit of swallowing their own feathers, which clump up into ball-shaped masses in the gizzard (the avian equivalent of the stomach). This behaviour, which other grebes have as well, is still poorly understood by scientists. It might be a way of preventing sharp, indigestible objects like fish bones from damaging the gizzard.

Like all grebes, red-necked grebes are renowned swimmers and divers. I've spent many spring evenings watching grebes hunt and trying to guess where the bird will pop up again after it suddenly dips below the water's surface. Most of our swimming birds, like waterfowl, loons, and gulls, have palmate feet, meaning the outer three toes are joined by webbing. Grebes evolved a different approach called the lobate condition, where each toe has separate, fleshy lobes used as paddles.



Preceding page: Red-necked grebes build floating nests from aquatic vegetation that are usually anchored to marsh vegetation in shallow water. NICK CARTER

Top: Red-necked grebe chicks have curious zebra-like markings and are often seen riding on a parent's back. NICK CARTER

Above: A juvenile red-necked grebe displaying markings that are transitional between chick and adult. NICK CARTER

Coots and phalaropes have this feature too, though it evolved independently in each. Lobed toes are great for swimming because the fleshy lobes passively spread out as the bird paddles and then compress during the foreword stroke, reducing drag.

When it comes to springtime courtship rituals, the red-necked grebe is theatrical. Mating pairs posture and vocalize to each other in a hoarse, braying cry. In some areas these grebes are quite territorial, but on big lakes with plentiful food they're happy to share their space. This year, I counted no less than three nesting pairs in the vicinity of the Astotin Lake boardwalk at Elk Island National Park. The grebes' nest is a mound of vegetation built near the water's edge, with a depression in the middle where up to nine eggs are laid. After hatching, the small downy chicks hitch a ride on their parent's backs for a couple of weeks until they can swim for themselves.

While red-necked grebe populations are secure in Alberta, and the birds are relatively human-tolerant, they're still reliant on wetland habitats for feeding, reproducing, and just about everything else they do. The best way to make sure they stay common here is to protect Alberta wetlands from disturbances and destruction. Red-necked grebes have been hollering it up every summer on Alberta lakes since long before we came on the scene, and if we keep our wetlands healthy, they'll continue to do so. ■



With their black head cap, white face patch, and chestnut throat, red-necked grebes are easy to identify. RICHARD SCHNEIDER

Nick Carter is a writer, photographer, and naturalist from Edmonton. From birds and bugs to flowers and fossils, Nick is always seeking out the natural wonders of this province and sharing his enthusiasm with others.

# YOUR SHOT

Images of Alberta's  
Natural Heritage



## RUFFED GROUSE

*"I took this photo in Fish Creek Provincial Park in early December. The sun filtering through the trees made for some interesting lighting. I just got lucky that she turned and "smiled" when she did. I wasn't so lucky with her boyfriend, who was only a few steps behind but standing in unflattering direct sunlight."*

— Tony LePrieur



## MISTY MORNING AT BOW LAKE

*"My husband arranged a surprise weekend for me at Bow Lake for our 40th anniversary. It was the perfect getaway. He slept in and I got up at 5 a.m. and took about 50 early morning shots. The misty mood at that hour was amazing!"*

— Lee Lachance

**Your Shot** celebrates the amazing work of Alberta photographers and the special places and species they encounter. Photos are selected from submissions to the Nature Alberta image library, which we draw on to create the magazine and other outreach materials. If you have a special photo you would like to contribute to the image library, and possibly have published in the magazine, please send it as an email attachment, at full resolution, to [images@naturealberta.ca](mailto:images@naturealberta.ca). Photos of all native species and natural landscapes within Alberta are welcome.



A Canadian tiger swallowtail butterfly drinking nectar from a wood lily flower. LAWRENCE HARDER

# Pollination on a Wing and a Prayer

## Wood Lilies and Swallowtails

BY LAWRENCE HARDER AND TIM SCHOWALTER

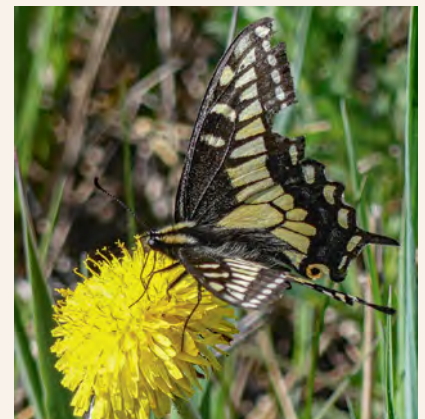
**W**ood lilies command attention. Their distinctive, large orange flowers flash like survey flags in a meadow. Wood lily flowers are such iconic prairie species that they are featured on the flags of the Province of Saskatchewan and the Métis Nation-Saskatchewan. However, the beauty of wood lily flowers is not intended merely for appreciation by humans (which, indeed, can be detrimental if we pick, rather than just admire). Instead, the flamboyance of wood lily flowers is a key feature of their rare and specialized system of insect-based pollination. The story involves a somewhat one-sided relationship, including plant sex, some specialized anatomy, a surprising role for wings, and success against long odds.

### Specialization for Butterfly Pollination

Butterflies visit the flowers of many Alberta plants for nectar. But compared to other insects, especially bees and flies, they are minor pollinators for most plant species. The wood lily is an important exception in that it depends completely on butterflies for pollination. And not any butterfly will do. The wood lily is pollinated effectively by only large butterflies, and across most of its Alberta range this includes just three species: the Canadian tiger swallowtail (*Papilio canadensis*), the old world swallowtail (*P. machaon*), and the anise swallowtail (*P. zelicaon*). Such extreme



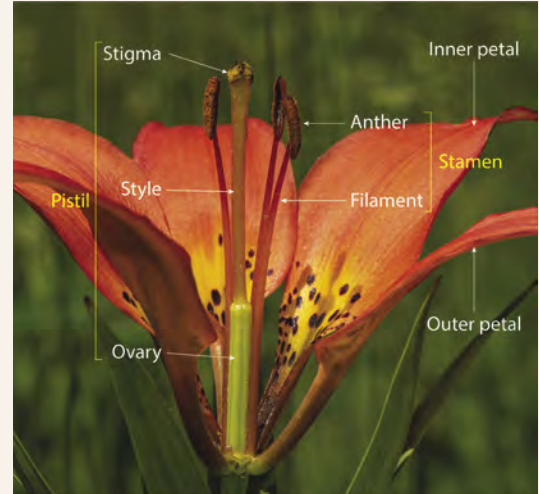
The old world swallowtail butterfly. Note the brick-red lily pollen along the front margins of the forewing. TIM SCHOWALTER



The anise swallowtail butterfly. TIM SCHOWALTER



Left: The iconic large orange flowers of western wood lily measure 70-110 mm across. RICHARD SCHNEIDER



Right: Close-up of a wood lily flower with relevant components labelled (one petal and two stamens are removed). LAWRENCE HARDER

specialization requires that wood lily flowers encourage visits by the “right” insects but deter visits by unsuitable ones that use precious nectar and pollen without supporting successful pollination. Given that its large, cup-shaped flowers seem open to visits by any insect, how does the lily achieve this exclusivity?

At least two wood lily characteristics favour swallowtail pollination while discouraging visits by other animals. The first is the striking orange colour of the flowers, which advertises their location to hummingbirds and most butterflies. These two groups have eyes that are sensitive to red, whereas the eyes of pollinating bees and hawk moths are not. Among the 21 North American lily species, 11 have orange flowers and are butterfly-pollinated, whereas the others have different coloured flowers and rely on different pollinators. Although the orange wood lily flowers attract visits by a variety of butterflies, only large species act as pollinators for reasons described below.

A second wood lily characteristic controls which animals can access nectar from the flowers. Butterflies visit flowers for sugar-rich nectar to obtain the energy they need to mate and lay eggs. The accessibility of nectar depends on how deeply it is hidden within a flower and the length of a visitor’s proboscis. In a wood lily flower, nectar is produced at the base of three long (about 17 mm), narrow tubes, created by the outer “petals” where they attach to the stem. (Strictly speaking, as monocots lily flowers have “tepals” rather than “petals.”) These tubes are longer than the proboscises of all Alberta flies and bumble bees, and this limitation is likely also true for most Alberta butterflies. We are unaware of proboscis measurements for the Canadian tiger swallowtail, but the tongue of its closest relative, the eastern tiger swallowtail, is 18 mm long.

Similarly, the old world swallowtail had the longest proboscis (17 mm) in a survey of 71 European butterfly species. Therefore, although many animals visit flowers for nectar in Alberta, swallowtails have almost exclusive access to wood lily nectar because of their long proboscises.

### Pollination on the Wing

Not all animals that visit flowers are necessarily pollinators. Besides visiting a flower, a pollinator must also disperse pollen between different plants of the same species. More specifically, pollen needs to transfer from a plant’s (male) anthers onto the pollinator, remain on the pollinator as it moves between plants, and then transfer onto a receiving plant’s (female) stigma(s) (see the accompanying photo with labelled flower parts). Typically, only a fraction of the pollen carried on a pollinator is deposited on a recipient plant’s



A Canadian tiger swallowtail probing a nectar tube with its proboscis. Note how pollen has rubbed off the anthers onto the forewing. LAWRENCE HARDER

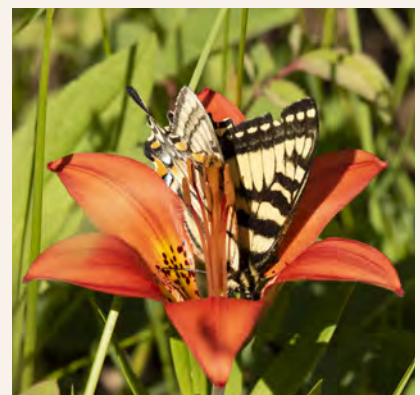
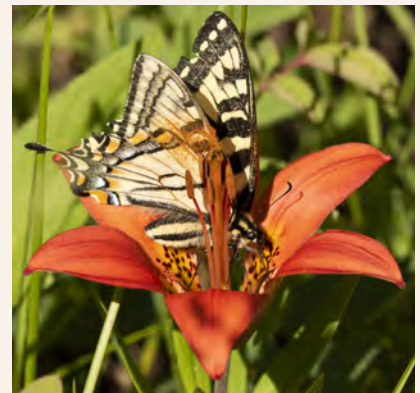
stigmas. The remaining pollen can be transported to the stigmas of additional recipient plants, as long as it remains on the pollinator. Because of such pollen “carryover,” animal-pollinated plants typically mate with multiple partners, and so are promiscuous.

Although the steps of pollen dispersal are easily stated, relatively few pollen grains complete them all. For most animal-pollinated plants, about 99% of the pollen removed from flowers does not reach stigmas of other plants and is lost from the pollination process. This is because animals do not act intentionally to help immobile plants mate with each other. Instead, animal pollination occurs incidentally as animals visit flowers out of self-interest, usually to find food. How then can plants increase the chance that their pollen will disperse successfully?

Pollination success depends, in part, on where pollen is carried on a pollinator’s body. The best sites are those where pollen has a relatively high chance of remaining on a

pollinator and of contacting stigmas when the pollinator visits new flowers. Wood lily pollination is very unusual, even among species specialized for butterfly pollination, because pollen is transported on the pollinator’s wings, rather on its body or proboscis. The lower surfaces of swallowtail wings, especially along the front margins of the forewings, appear to be ideally suited for transporting wood lily pollen. This being the case, a lily flower’s anatomy is optimized to ensure that both donor anthers and recipient stigmas contact the same area on the wing. They do this by encouraging pollinators to adopt the same position during each flower visit — in effect, lily flowers provide a custom “fit” for swallowtails.

Other than being large, how does a cup-shaped wood lily flower fit a swallowtail? The answer becomes apparent when you observe a swallowtail visit a wood lily flower. On arrival, the butterfly usually lands on the horizontal surface of one petal facing the flower’s centre and raises its wings. To reach the nectar, the butterfly must turn sideways and descend into the flower’s cup, entering the narrow alley between the inside of the cup and the central stamens and pistil. Wood lily stamens and pistils are very long, so when a swallowtail is in the alley both the anthers and stigma are level with the butterfly’s inward-facing forewing. The alley is just wide enough to fit a swallowtail’s body, increasing the chance of wing contact with the stigma and anthers.

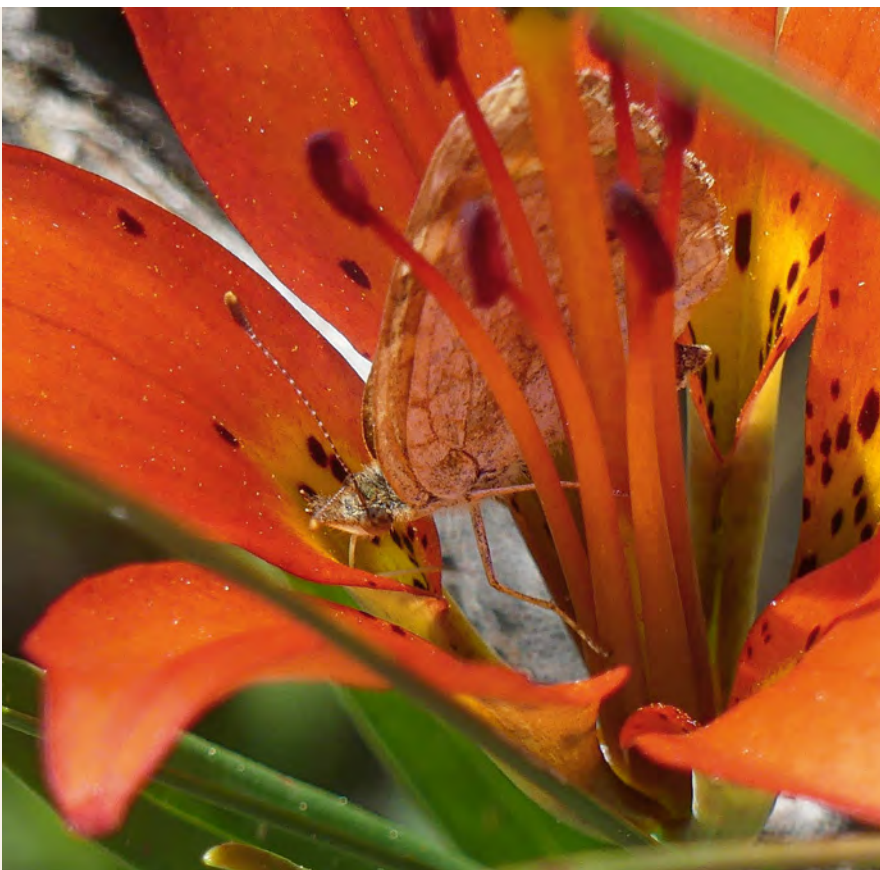


A Canadian tiger swallowtail circling within a wood lily flower to drink nectar from the three petal tubes. The butterfly just fits between the petal cup and the stamens and pistil. In the bottom photograph, note the butterfly’s tilted posture as it probes for nectar, which strokes the front margin of its forewing against the stigma and anthers. LAWRENCE HARDER

After drinking nectar from the first nectar tube, the butterfly usually walks around the circular alley to probe the other tubes, further improving the opportunity for pollen exchange. Each time a swallowtail pushes its proboscis into a nectar tube, its head and thorax tilt down, stroking the front margin of the forewing against the stigma and anthers. This provides an opportunity for cross-pollination, assuming the swallowtail carries pollen from another wood lily. Because the stigma is slightly higher than the anthers, it should receive donor pollen during a wing stroke before that pollen can be covered by the flower's own pollen. This is important because self-pollen does not produce seeds in wood lilies.

What about smaller butterflies, such as fritillaries, which occasionally visit wood lily flowers? These butterflies seldom pollinate effectively because their wings are too short to contact anthers and stigmas if they enter the alley to drink nectar. Instead, such visitors act as nectar thieves, perhaps reducing the nectar available for swallowtails that visit later.

In summary, wood lily flowers use nectar to entice swallowtails to visit while making the nectar difficult for other insects to access. Then they manipulate swallowtails to adopt positions that increase the chance of successful cross-pollination through several anatomical features: the size and shape of the petal cup, the length and position of the pistil and stamens,



A northern crescent (*Phyciodes cocyta*) stealing wood lily nectar. This butterfly's wings are too short to contact the stigma and anthers. TIM SCHOWALTER

and the locations and depth of the nectar tubes.

Together, these features highlight the close association between wood lilies and swallowtails. The wood lily produces seeds only if it is cross-pollinated and that cross-pollination requires visits by large butterflies. Therefore, persistence of wood lily populations requires survival of both the plants themselves (no picking, please!) and of the butterflies on which their reproduction depends. ■

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Lawrence Harder is a Faculty and Emeritus Professor of Biological Sciences at the University of Calgary. Although formally educated as a zoologist, Lawrence's research across more than three decades has focused on the ecology and evolution of plant reproduction and pollinator behaviour. Lawrence's natural history and research fascination with flowers is motivated by the search for deeper beauty that is revealed by understanding their pollination function.

Tim Schowalter is a retired biologist and college instructor whose early work focused on bats and skunks in Alberta, and more recently on examining the distribution of small mammals through identification of prey remains in owl pellets. He has also worked on birds of prey on the Canadian prairies and Yukon and grasslands conservation in Alberta. In retirement, Tim's interests have expanded to include butterflies and local history.

# What Lies Beneath: The Hidden Life of Fungi

BY HEATHER ADDY

When you think about nature in Alberta, what organisms come to mind? Birds are likely top of the list for many people, along with other animals, particularly large, “charismatic” animals such as bears, elk, and moose. Trees, colourful wildflowers, fruit-bearing shrubs and other native plants would also be on most people’s lists. What would often be missed from the list, at least for most of the year, are fungi. Fungi are often overlooked because many of them spend much of their lives hidden from us, and out of sight means out of mind. While all fungi share certain features, these organisms display remarkable diversity. Here, we’ll focus on fungi that form mushrooms and other large, complex fruiting bodies.

In late summer and fall, mushrooms and other fungal fruiting bodies are most noticeable, appearing seemingly from nowhere. This proliferation sparks people’s interest in and curiosity about fungi: why do mushrooms appear so suddenly, often in circles, and more



Mushrooms growing in forest understory in autumn. BERNARD SPRAGG

often at certain times of year? In the past, supernatural forces were invoked to answer these questions; for example, “fairy rings” of mushrooms marked places where fairies or witches danced, and people believed it was dangerous to walk through these rings — you might get spirited away! While we no longer believe these myths, misconceptions and mysteries about fungi persist.

One common misconception is that a mushroom is the entire fungus. In

reality, a mushroom is just one part of a larger organism. The relationship between mushrooms and a fungus is like that of apples and a tree; just as apples are the fruit of a tree, mushrooms are the fruiting bodies of a fungus. Both structures produce, protect, and help disperse offspring — seeds in the case of apples and spores for mushrooms. (Spores are usually a single cell and thus are smaller and simpler than seeds).

One reason why we might think that a mushroom is the whole fungus is that, unlike an apple tree that we can see grow and develop, the fungus is hidden from us, growing inside soil, trees, or some other substrate. We only become aware of this hidden fungus when its mushrooms pop out of the ground. Imagine if the apple tree grew underground in your yard and you only became aware of it when apples suddenly emerged from the soil!



Many fungi only make their presence known when their fruiting bodies, such as these mica cap mushrooms, emerge from the substrate in which the fungus is growing. HOLGER KRISP



Mushrooms often form a “fairy ring,” having developed in a specific region of a roughly circular mycelium. These rings certainly grab our attention when they grow in our lawns. M. SKIPPY

What does this hidden fungus look like? Most fungi grow as a highly organized network of fine tubes called hyphae. This network, known as a mycelium, forms when a spore lands on a suitable substrate. The spore breaks open as the first hyphae emerge, extending at their tips, like long fingers reaching through the substrate. The hyphal tips release digestive enzymes that break down the substrate into small molecules that the hyphae can absorb. These nutrients fuel further extension and branching of hyphae to form a dense, circular mycelium. Hyphae at the outer margins of this mycelium invade new areas of the substrate, searching for food, while hyphae further back in the mycelium branch extensively to feed on the food sources that have already been discovered.

As the mycelium develops, its hyphae push their way into and through the substrate, even wood and other tough, resistant materials. How do these fine



The body of most fungi is made up of fine, branching filaments known as hyphae.  
BOB BLAYLOCK



Hyphae form a highly organized, radial network known as a mycelium that grows outward in search of new food sources.  
TOBI KELLNER

tubes exert enough pressure to do this? Each hypha is a long, tubular cell surrounded by a cell wall. The fungus produces sugars that draw water into the hyphae by osmosis. As this water flows into the hyphae, it “inflates” the tubular cell, just like when you pump air into the inner tube of a bike tire. The wall at the very tip of a hypha is softer and more elastic than the rest of the wall and so the water pressure gets exerted at the tip, pushing it into and through its substrate. In this way, the fungus can grow through soil, wood, and even rock walls.



Mushrooms can exert enough pressure to force their way through walls and even asphalt! TANGOPASO

As a fungus grows through its substrate, its mycelium does not blindly grow out in all directions. Just as animals and plants do, fungi sense and respond to environmental cues by changing their foraging behaviour. For example, hyphae within a mycelium sense each other’s presence and avoid growing too close to each other, reducing competition for resources. As well, when exploratory hyphae on one margin of a mycelium locate a nutrient-rich patch, the mycelium grows preferentially towards and into the new food source, cutting back on growth in less-rewarding patches. In effect, a mycelium is a “living, growing, opportunistic investigation”<sup>1</sup>

that makes and remembers decisions about growth.

Thanks to their invasive growth and opportunistic foraging, the mycelia of some fungi can grow for a very long time and become very large. The mycelium of a mushroom-forming fungus in the Malheur National Forest of Oregon is one of the largest organisms on Earth: it is currently about 10 km<sup>2</sup> in size and about 2,400 years old.<sup>2</sup>

At some point, when a mycelium has accumulated enough resources and has the right combination of light, temperature, and moisture, sexual reproduction occurs, culminating in the production of fruiting bodies such as mushrooms. For many fungi, the mycelium formed by a single spore cannot produce mushrooms by itself but instead must encounter a mate, a compatible mycelium that is genetically similar but not identical. Mushroom-producing fungi are not “male” or “female”; instead, they can have hundreds or even thousands of mating types. When two mycelia of compatible mating types fuse, they form a new mycelium containing genetic material from both parents. In specific regions of this mycelium, under the right environmental conditions, hyphae respond to signals directing them to grow towards each other, intertwining to form small “knots,” the first stage of mushrooms.



An early stage in mushroom development in a mycelium. PRADEJONIENSIS

As the young mushrooms mature and enlarge, they push up through their substrate, often overnight. Why do they appear so suddenly? Remember that each individual tube in a mycelium uses water pressure to extend at the tip. The tips of thousands of filaments that make up a mushroom can, in concert, exert a lot of pressure, allowing them to burst through soil, wood or even asphalt. But attaining this pressure requires lots of moisture to inflate all the hyphae, and that is one reason why mushrooms form at times of year when there is abundant rain. The buttons have been developing on the underground mycelium and emerge suddenly and simultaneously when they are the right stage and there is sufficient moisture to support their emergence. Because the buttons have developed in a specific region of the roughly circular mycelium, the mushrooms (or other fruiting bodies) may be arranged in a ring. When fully mature, these fruiting bodies produce and disperse millions or even billions of spores.

Fuelling the production of these large, complex fruiting bodies and their billions of spores, as well as growth of the mycelium itself, requires a lot of nutrients. What are these fungi feeding on? Like animals, fungi require organic molecules produced by other organisms.

Some fungi obtain these organic molecules by feeding on non-living sources such as wood or soil organic matter. These decomposer (saprotrophic) fungi play a crucial ecological role by releasing the nutrients



Fruiting bodies formed by a decomposer (saprotrophic) fungus feeding on a log. ERICA TO

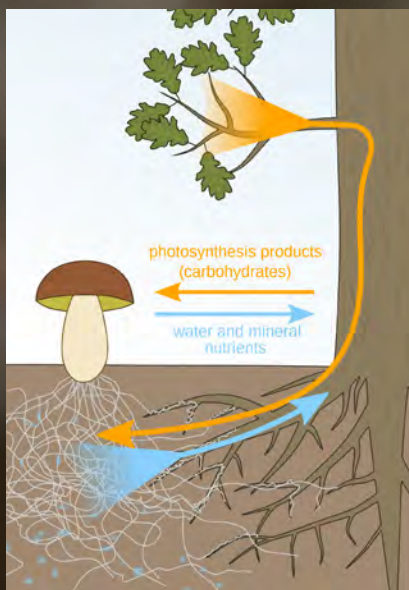


Mushrooms and other fruiting bodies, such as this puffball, produce and disperse millions or even billions of spores. CARLOS ANDRÉS REYES

locked up in organic matter and making them available to other organisms. Although these fungi can be destructive when they decide our houses, decks, and fences are their food supply, they can also be beneficial. We are learning how to use the digestive abilities and mycelial growth of these fungi to our advantage. For example, mycelia of decomposer fungi are now grown to produce building materials, shoes, leather, and clothing. And rather than adding to waste in landfills, these fungal products can be composted when worn out.

Other fungi are symbionts, obtaining organic molecules from living organisms. Some symbiotic fungi are pathogens that cause disease, but others, such as mycorrhizal fungi, are mutualists that provide some benefit to their partners in exchange for organic molecules. Most plants form some type of mycorrhizal association during their life, in which fungal hyphae grow around and/or into their roots as well as into the soil around the roots. Sugars made by the plant flow into the fungus, and in return the fungus delivers nitrogen and other soil nutrients. It is worth noting that this division of fungi into saprotrophs or symbionts is not always tidy: for example, some fungi change feeding strategy over their lives.

Both the plant and the fungus can have many partners. The hyphae that grow into the roots of one plant are typically part of an extensive mycelium that also grows into the roots of other plants. The resulting mycorrhizal networks interconnect plants of the same and different species, allowing nutrients and “information” (such as chemical signals that warn about insect pests) to move from one plant to another. For example, Suzanne Simard’s research at the University of British Columbia shows that in forests, these interconnected



A mycorrhizal fungus grows into plant roots, providing the plant with nutrients that the mycelium obtains from the soil. In return, the plant provides the fungus with carbohydrates produced by photosynthesis. WIKIMEDIA COMMONS NEFRONUS



Not all mushrooms are small. Western giant puffballs can grow to over 50 cm in diameter (this one is approximately 25 cm wide — that's three times the size shown in this photograph!). RICHARD SCHNEIDER

networks allow large, mature “mother trees” to provide sugars to developing seedlings or smaller shaded plants.<sup>3</sup>

It is important not to oversimplify these mycorrhizal networks by thinking of them as passive pipelines connecting plants. The fungi are opportunistic and make decisions about how to allocate resources to their own benefit. For example, in laboratory studies, mycorrhizal fungi preferentially reward “better” partners by providing more nutrients to plants that give them more organic molecules.<sup>4</sup> We do not yet have a full picture of how these mycorrhizal networks work, with many fundamental questions still to answer. How large can a network get? How do the partners communicate with each other? And how do they regulate the flow of nutrients?

Even without knowing the full significance of these hidden mycorrhizal networks, knowing that they and the other fungal mycelia are there as we

walk through a forest or grassland adds a fascinating dimension to a nature walk. Next time you are out for a walk, think about how, beneath your feet, mycelia are busy recycling nutrients, promoting new growth, and weaving individual plants together into interconnected networks. In the case of fungi, out of sight should not be out of mind! ■

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Heather Addy is a Teaching Professor Emerita in the Biological Sciences Department at the University of Calgary. She earned a PhD in plant-fungal interactions at the University of Guelph. Over her 24 years at the University of Calgary, she particularly enjoyed exploring the fascinating world of fungi with her mycology students.

# Across the Country on the Trans Canada Trail

## A 28,000-km Hike for Birds and Youth Engagement

BY SONYA RICHMOND AND SEAN MORTON

After the third straight day of rain, we paused under the shelter of a stand of trees at the side of the Trans Canada Trail. Our bodies were stiff and sore from carrying our packs and pulling the hiking carts with our camping gear and extra water through the thick prairie mud. With another 25 km of trail to cover before nightfall, and no end to the rain in sight, we couldn't help wondering how we'd gotten ourselves into this mess. After all, what type of person steps away from everything to hike the longest trail on Earth? The strange thing is, we wouldn't trade it for the world.

Three years ago, I (Sonya) was a scientific researcher for Bird Studies Canada, working as a Geographic Information Systems (GIS) Analyst on the award-winning Breeding Bird Atlases for British Columbia, Manitoba, and Quebec, and Sean was an award-winning photographer. In 2019, we sold our house and donated most of our possessions to charity to self-fund a hike across Canada on the 28,000-km-long Trans Canada Trail, visiting more than 15,000 communities along the way. We set out from Cape Spear, Newfoundland on June 1, 2019, and after 475 days on the trail, we've hiked over 11,500 km across nine provinces to reach Calgary. Our plan is to reach Victoria, B.C. by fall 2022 and then to walk north from Fort Saskatchewan, Alberta to Tuktoyaktuk, NWT in 2023.

Dr. Sonya Richmond, Royal Canadian Geographical Society Expedition Leader, and Sean Morton, RCGS Expedition Photographer.

All photos by Sean Morton.





28,000 km of the Trans Canada Trail. COMEWALKWITHUS.ONLINE

### Time to Recharge

We didn't make the decision to undertake this hike lightly. The trail is so vast, stretching from the Atlantic, to the Pacific, to the Arctic, that fewer people have com-

*During the pandemic, many people have realized that digital landscapes are no replacement for natural ones. In the process, they have rediscovered the value of connecting with the outdoors.*

pleted it on foot than have gone to the moon. Part of our motivation came from a feeling that the digital world was taking over our lives. We were spending more time in digital landscapes than natural ones and this left us feeling disconnected from ourselves, each other, and the natural world. We were also helping to raise a younger family member



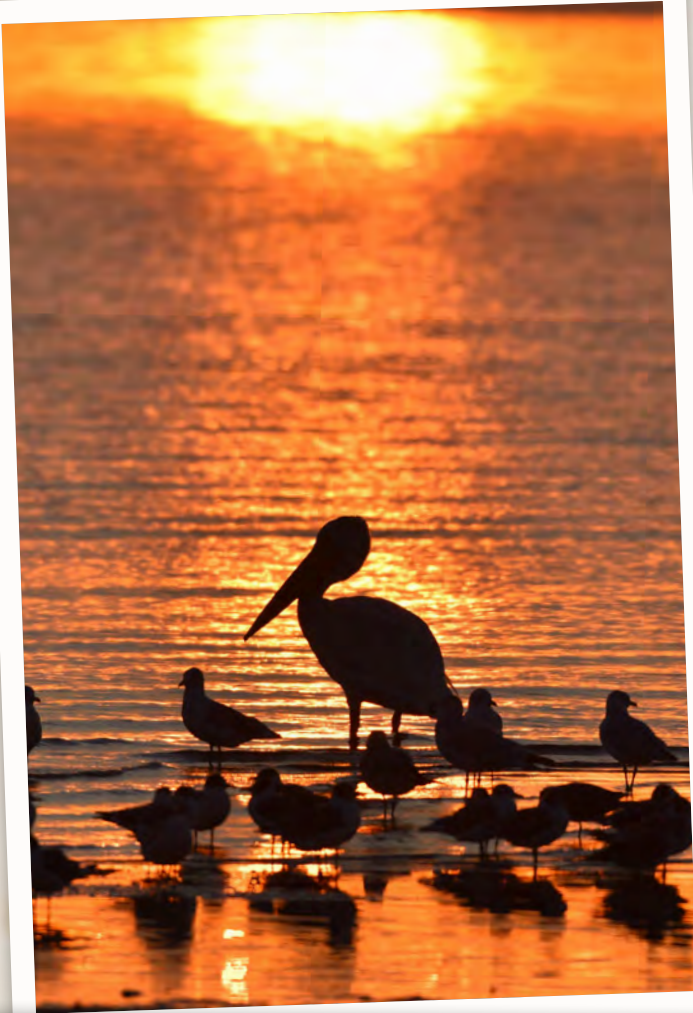
Tree swallow

who was struggling with a video game addiction. As we searched for ways to help him graduate high school, we learned first hand how immersion in nature can be used to restore balance. We realized it was time to recharge ourselves, not just our devices.

Looking for ways to slow down and reconnect with nature, we took up long-distance hiking in 2016, first in Ontario on the 900-km Bruce Trail. Next, we walked the 235-km East Coast Trail in Newfoundland, and eventually we trekked across Spain, France, and Portugal. The idea to hike across Canada was first suggested to us by the international community of long-distance hikers we met on the Camino de Santiago in Spain. Upon learning we were Canadian, people often asked why we weren't walking across our own country, since, as this international community kept insisting, "Canada is one of the most beautiful places on Earth." The idea had been planted, and when the trail was officially connected for Canada's 150th birthday, we decided to make it a reality.

Driven by our passion for birds, nature, and outdoor recreation, we set out with the goal of inspiring people of all ages, physical abilities, cultural backgrounds, and orientations to reconnect with nature through birdwatching and citizen science. We hope to encourage Canadians to discover more of Canada's stunning natural beauty for themselves. Over the past four years we have shared over

*American white pelican*



30,000 photos in 750 blog entries, released thousands of Facebook and Instagram posts, given over 100 free presentations, and written articles for *Canada Travel*. Our story has been shared in over two dozen radio and TV interviews and in more than 150 written articles in local, national, and international media.

#### **Contributing to Conservation**

One of the first questions people ask us is why we are focusing on birds as a way to encourage a connection with nature. Well, simply put, they are free and fun to watch, and they are accessible to everyone. In Alberta's vast countryside you might find an elegant American avocet wading in a small pond at the edge of a gravel range road,

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*Birdwatching... empowers  
individuals to make a positive  
contribution to conservation  
in Canada through  
citizen science).*

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*American redstart*

spot the black and white tuxedo of a bobolink perched on a pasture fence, or hear the rusty-gate call of a yellow-headed blackbird in the cattails. Even in large cities like Edmonton and Calgary, it is possible to spot American white pelicans swimming in the river or listen to the varied songs of a gray catbird in one of the many urban parks.

Birdwatching is a great way to experience the many mental and physical benefits of spending time in nature. Not only that, it also empowers individuals to make a positive contribution to conservation in Canada through citizen science. With the help of several free phone apps,

it is now fun and easy to learn to identify local birds and other wildlife, while at the same time turning your observations into valuable data that help scientists monitor the health of wildlife populations. This makes birdwatching the perfect tool to help people of all ages, but especially youth, turn some of their screen time into green time.

While many avid birders favour eBird, as we hike across the country we are encouraging people new to citizen science to use a free app called iNaturalist. Users simply take a photo of something in the natural world and upload it to the app. You are then presented with a series of photos to compare with your own to help you identify your subject. Super easy! Using iNaturalist also allows you to participate in special events like the annual City Nature Challenge, in which cities around the world compete to see which one will submit the most records or have the greatest number of participants.

The free Seek app, which is a version of iNaturalist specially designed for kids, makes learning about nature a fun-filled treasure hunt. Users can choose to enter various challenges, and then they can earn achievements for completing them. For example, the Backyard Challenge requires users to find and identify five plants, two insects, one arachnid, and two birds. Using Seek can feel a lot like playing a video game, which is something many kids enjoy doing, but it also teaches youth how to use their mobile devices as a tool to help them build a connection with the natural world — and at the same time empowers them to make a positive contribution to conservation. As a result, it provides the perfect bridge between the digital world and the natural one for anyone to enjoy.

### **Dispatches from the Alberta Trail**

On Day 475 on the Trans Canada Trail, we were in Alberta's ranch country. It had been tough going. The rain had been pelting down, dripping down the backs of our necks, filling up our shoes, and turning the trail to thick



mud. It's easy to be discouraged, but when we looked up, we saw the lush, green, rolling hills and pastures. Nearby a herd of horses was grazing beside a small wooden outbuilding that evoked memories of the past. Just below them was a huge cattail marsh where we could hear the loud calls of a sora. We watched the graceful forms of black terns sweeping through the sky, and spotted the quiet movements of a great blue heron stalking prey in the shallow waters.

Hiking across Alberta has been a naturalist's dream. We began on the Iron Horse Trail, in northeast Alberta, which took us through boreal forest and aspen parkland, along the banks of the North Saskatchewan River, and through many small historic towns. The scenery has been stunning, and the diversity of habitats provided opportunities to see

*Baltimore oriole*



*Great horned owl fledgling*



*Grey catbird*

a wide variety of birds, including fluffy great horned owl fledglings, colourful Baltimore orioles, and comical ruddy ducks. Many mornings the iconic “Oh sweet Canada, Canada, Canada” song of a white-throated sparrow

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*Regardless of one's  
political views, many  
Canadians are in fact  
“closet conservationists”  
open to finding individual  
ways to improve their  
local environment.*

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welcomed the sunrise.

Within a few days of leaving Alberta's Iron Horse Trail we found ourselves following the River Valley Trail through Edmonton. This system of paved cycling pathways winds along beside the banks of the North Saskatchewan River, through the longest stretch of connected urban parkland

in North America. Immersed in this peaceful corridor of greenery, we wouldn't have known that we were crossing Canada's fifth-largest city. Yellow warblers, red-eyed vireos, and American redstarts were among the birding highlights we enjoyed in this section. The trail systems of cities like Fort Saskatchewan, Edmonton, Lacombe, Blackfalds, Red Deer, and Calgary serve as terrific examples of how easy it is, even in large urban centres, to enjoy and connect with nature close to home.

As we've hiked across Alberta, we've been deeply impressed and inspired by countless examples of individual engagement, local leadership, and community involvement in conservation. Our conversations with local farmers, ranchers, and Albertans across the province have revealed a widespread concern for the decline in environmental sustainability and shown that regardless of one's political views, many Canadians are in fact “closet conservationists” open to finding individual ways to improve their local environment.

We've walked hundreds of kilometres on gravel range roads lined with fences that are topped with bird houses providing habitat for tree swallows, mountain bluebirds, house wrens, and other species. Many ranches have purple martin houses. Sites like the Ellis Bird Farm near Lacombe and the Kerry Woods Nature Centre in Red Deer remind us of the power each one of us has to effect a huge positive



*Mountain bluebird*

*Yellow warbler*



change to protect our environment by simply taking it one step at a time. We are excited to discover what other hidden gems Alberta has to offer as we continue our journey west towards the Rocky Mountains.

During the pandemic, many people have realized that digital landscapes are no replacement for natural ones. In the process, they have rediscovered the value of connecting with the outdoors. Now that life is returning to normal, our sincere hope is that this reinvigorated interest in nature will continue.

We invite you to “Come Walk With Us” by checking out our website: [comewalkwithus.online](https://comewalkwithus.online). Join us for a literal “boots on the ground” view of Canada’s incredible natural beauty and learn how you can help support migratory birds in your own community. ■

Dr. Sonya Richmond was named Canadian Outdoors Person of the Year 2022 by the Canadian Wildlife Federation and received a Certificate of Appreciation from the Ontario Federation of Ornithologists in recognition of her dedication to connecting people to nature and promoting stewardship for birds and their habitats. Sean Morton is an award-winning professional landscape and architecture photographer. In 2021, their Trans Canada Trail hike was officially designated a Royal Canadian Geographical Society Expedition.



*Bald eagle*

# Remembering David Schindler

BY ERIN MCCLOSKEY

Every time you use your phosphate-free laundry detergent, you can be reminded of Dr. David Schindler. For many, myself included, he will be a person difficult to forget for countless reasons. Schindler was a force of and for nature, renowned in Alberta and around the world as a limnologist, ecologist, and activist. He scientifically scrutinized and collected data on various freshwater pollution and shortage issues and presented his findings to the public and to governments to demand action. He was an instigator of policy and legislation improvements not only in Alberta, but throughout Canada and the world.

His research publications are numerous and in the most prestigious scientific journals and magazines in the world. His very first academic paper was published in none other than *Science* in 1963: “Calorific values of microcrustacea.” He was accepted on a Rhodes Scholarship at Oxford University in England where he completed his PhD.

In 1968, he joined the International Institute for Sustainable Development (IISD) and became the founding director of the Experimental Lakes Area in Ontario. His team’s findings garnered worldwide attention, resulting in our phosphate-free detergents and ultimately stricter water pollution regulation. They conducted revolutionary whole-lake experimentation, instead of examining samples in bottles in a lab. Their studies demonstrated that excess phosphorus (and nitrogen) cause large algal blooms that starve freshwater lakes of oxygen. By using a massive impermeable curtain to divide the lake, Schindler’s team was able to manipulate half the lake with high



Dr. David Schindler. JOHN ULAN

inputs of phosphorus while the other half remained phosphorus-free. The resultant algal bloom gave indisputable

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*Schindler stated that scientists were obliged to bring their research findings to public attention and to challenge government and industry to uphold stringent regulation.*

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proof in vivid colour. A photo of the lake spoke volumes and convinced policy-makers around the world to remove

phosphates from household detergents. Removing agricultural phosphates from fertilizers was a subsequent and ongoing target.

Freshwater acidification was another whole-lake experiment using sulfuric and nitric acids. Schindler’s team demonstrated that at pH values below 6 (neutral pH is 7), important aquatic invertebrates and small fish species were unable to reproduce, which resulted in starvation in larger fish. Specimens of starving fish gained public attention and persuaded policy-makers to enact air-quality regulations to reduce pollutants contributing to acid rain.

From 1989 until his retirement in 2013, Schindler took the role of Killam Memorial Chair and professor of ecology at the University of Alberta. There, he continued to research freshwater

issues such as the ecological impacts of pesticides and other chlorinated compounds, the release of previously widespread chemicals such as DDT and PCBs from melting glaciers, clean-water shortages, and polycyclic aromatic hydrocarbons leaching into water systems from oilsands projects. His harsh criticism of the lack of stringent water quality monitoring and his defiance of the oilsands industry's claims of responsible self-monitoring led to investigations by provincial and federal government scientific review panels composed of independent and high-ranking scientists. These panels concluded that the monitoring standards were insufficient and Environment Canada subsequently designed a new monitoring plan. Schindler did not relent and continued to demonstrate the ongoing inadequacies of these plans and took his concerns to the Canadian Senate. Throughout his career, Schindler remained an advocate for the ecosystems and people living downstream from the ongoing damage from the oilsands.

A man of brilliance and accomplishment, his accolades are lengthy and include Officer of the Order of Canada, Fellow of the Royal Society of London, and countless national and international awards, prizes and medals. Schindler was never arrogant and shared his knowledge and wisdom with his students and the public in ways that engaged and empowered. Critical of the ivory towers of academia, Schindler stated that scientists were obliged to bring their research findings to public attention and to challenge government and industry to uphold stringent regulation. With a career overflowing with scientific

breakthroughs, rigorous research results, and a legion of undergrad and graduate students, he was always available and accessible in his university office. I am grateful and honoured to have had him



David Schindler's bigger-than-life demonstration of algal blooms caused by excess phosphorus captured the attention of policy-makers worldwide and led to the removal of phosphates from household detergents and improved water pollution regulations. IISD EXPERIMENTAL LAKES AREA

as a professor. One of Schindler's three children followed in his footsteps to become a professor of limnology at the University of Washington.

Despite an endless roster of conferences, hearings, and speaking engagements, he still prioritized his home life. Choosing to drive 100 km to and from work every day from Wildwood, Alberta, where he and his wife, Suzanne Bayley (U of A professor of wetland science), enjoyed river

activities in summer and racing dog sleds in winter. At the peak of their dog-sledding days, they cared for 85 sled dogs.

Schindler left a legacy in his children, his students, in freshwater policy in Canada and abroad, and in each of us whenever we choose to continue to advocate for freshwater protection in Alberta, and whenever we choose to pick up phosphate-free detergent off the grocery shelf. He was a mentor who strengthened my sense of responsibility to advocate for the environment. Of all his great accomplishments, perhaps his greatest are his examples of perseverance and making a difference through science. In these times when we feel most overwhelmed, we can remember these truths. Thank you, David Schindler, for all you did to make our world better than it would have been without you. ■

Erin McCloskey graduated from the University of Alberta with an MSc in Environmental and Conservation Sciences in 1998. David Schindler was one of her most admired, favoured, and influential professors. Erin has worked with conservation organizations around the world, has authored several natural history books, and is a professional editor. She is currently serving on the Board of Nature Alberta as Secretary.

# Diminished Chorus

## The Decline of Grassland Birds

BY NANCY MAHONY

**F**ew people are lucky enough to experience the dawn chorus on Alberta's native grasslands — a bewildering concert of ringing trills, melodious gurgles, and jumbled songs. I've had the good fortune to do so on many May and June mornings, as a biologist researching grassland songbirds at one of Canada's largest remaining native prairies, the Suffield National Wildlife Area near Medicine Hat.

What struck me when I first started working on the prairies was the unique and impressive aerial displays used by many grassland birds. Unlike other habitats in which I had worked, where birds sang from shrubs and trees to defend territories and attract mates, there is not much vertical structure in native prairie. So grassland birds must take to the wing to get their message across.

Male Sprague's pipits are the true masters of this behaviour, flying up to 100 m above the ground while singing — a mere speck against the sky when seen from below — before diving to the ground at dizzying speeds. Horned larks, while not going nearly as high, do a similar fluttering aerial display while singing their tinkling, bell-like song. Thick-billed longspur males fly dozens of metres above the ground, hold their wings outstretched to display white wing linings, and then spread their tails and float downward while singing. The agile chestnut-collared longspurs chase



The Baird's sparrow population across the Canadian prairies has declined by more than 50% since 1970. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessed this species as Special Concern. CONNOR CHARCHUK

each other in looping mid-air aerobatics. And large shorebirds, such as long-billed curlews and marbled godwits, take to the sky to circle and loudly scold unwary predators — and biologists — who happen to encroach on their territories.

Not all grassland species are acrobatic though. Species such as vesper and grasshopper sparrows use small shrubs or stout patches of grass or flowers as singing perches. Elusive Baird's sparrows sing from patches of thicker vegetation, making them hard to spot.

In contrast to the highly visible males, female grassland birds have more camouflaged plumage and stay closer to the ground, the better to hide them and their nests from predators. These adaptations to the wide-open, windswept prairies evolved over thousands of years and have allowed birds to take advantage of all types of grasslands and the many micro-habitats within them, resulting in a rich and varied bird community.

When I'm counting birds or searching for hidden nests out on the prairie, without a road, power line, fence, or crop field in sight, it is easy to imagine the vast unbroken native grasslands that once stretched from the edge of the Canadian Shield in Manitoba to the foothills of the Rocky Mountains. Unfortunately, this is a rare sight today. Approximately 75% of Canada's native grasslands have been plowed up for crop production or converted to tame pasture since the beginning of European settlement of the west.<sup>1</sup>

Temperate grasslands rank among the most imperiled and least protected ecosystems on Earth. In 2008, the International Union for the Conservation of Nature declared them the world's most endangered ecosystem. To make matters worse, the conversion of native grassland to crop production is still ongoing. From 2018–2019 alone, an estimated 1.1 million hectares of grassland were plowed up in Canada and the U.S., primarily for row crop agriculture.<sup>2</sup> Agricultural practices

Preceding page: Canada has lost 75% of its native grasslands, and their destruction continues. In 2018–2019, over 1 million hectares of grassland were plowed up in Canada and the U.S. to make way for row crop agriculture. CONNOR CHARCHUK

have also become more intensive over the years, with less and less natural structure left on the land.

It is worth noting that native grasslands dedicated to cattle grazing, rather than growing crops, can support grassland bird populations as long as appropriate management practices are used (e.g., livestock rotation, water source management, and stocking rates). Properly managed rangelands also serve as carbon sinks, storing carbon underground in thick, deep root systems. There is currently an increase in research exploring how sustainable livestock grazing may have beneficial effects on biodiversity, including birds, and carbon sequestration.

Agricultural pesticides are an additional concern. There is evidence that pesticides cause direct mortality and alter food availability for birds.

Recent reports have found equally negative impacts of habitat loss and pesticide use on population trends of North American grassland birds.<sup>3</sup>

With such overwhelming agricultural impacts, it is not surprising that North American grassland bird populations continue to decline, despite decades of conservation concern. In Canada, grassland bird abundance has declined by 57% since 1970, with species dependent on native grassland being particularly hard hit, with declines of 87%. Even those that are more tolerant of agriculture have declined by 39%.<sup>4</sup> Our grasslands have lost 300 million birds in the last 50 years.

It is within this somewhat dire context that I do research on grassland songbird conservation for Environment and Climate Change Canada. Many grassland birds have been designated as Species at

Risk in Canada, including the chestnut-collared longspur (endangered), thick-billed longspur (threatened), Sprague's pipit (threatened), Baird's sparrow (special concern), and the horned lark, which is currently being assessed. My work is focused on understanding how landscape change is driving population declines in these species throughout their full life-cycle, including the breeding season here in Canada as well as migration and wintering in the U.S. and Mexico, where similar agricultural conversion is happening.

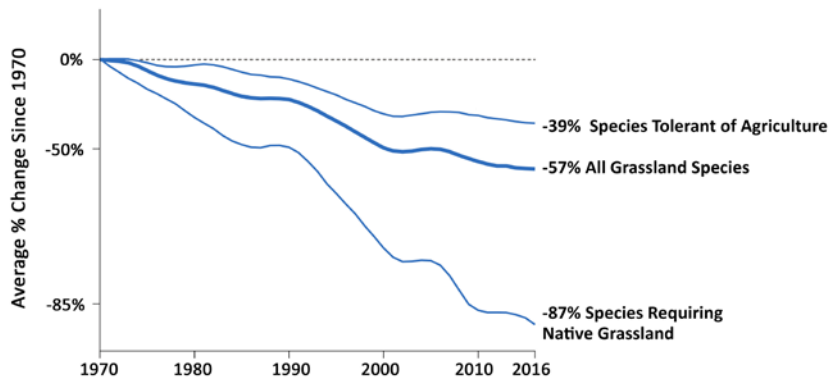
My work at the Suffield National Wildlife Area has confirmed the importance of large, intact grassland areas. Breeding Bird Surveys show that, across the prairie potholes region of North America, ten of the 16 grassland bird species I studied declined between 1994–2016. However, within the largely



Left: This chestnut-collared longspur pair has individual colour-band combinations. Monitoring how many colour-banded birds return in the years following banding is a measure of the population's apparent over-winter survival. Their population in Canada has declined steeply since 1970 at a rate of more than 5% per year and they are listed as Endangered by COSEWIC. DAVID BELL

Right: Small, lightweight VHF nano-tags are attached to birds using leg-loop harnesses in an ongoing collaborative study on grassland bird migration. When this chestnut-collared longspur heads south on fall migration, we hope that it will fly near a growing array of receiver stations across North America to provide detailed information on migration routes and wintering locations. LIAM SINGH





Grassland bird populations in Canada have declined by 57% since 1970. Native grassland specialists have been particularly hard hit, with declines of 87%, but even those somewhat tolerant of agriculture continue to decline. (Modified from the State of Canada's Birds 2019.) NABCI CANADA

intact Suffield region, only one of these 16 species — the horned lark — declined over the same period.

Much of my research has focused on nesting success and over-winter survival of horned larks and chestnut-collared longspurs. To determine nest success, my team spends a good portion of May to July at Suffield looking for nests. Each species manages to find ways to hide their nests on the ground, employing different strategies to keep them hidden from predators.

Horned larks choose sites with bare ground or with very sparse vegetation next to a clump of grass, pasture sage, or a cow patty. The nests seem dangerously open to the elements and the prying eyes of predators, but once a female sits on the nest, her light brown plumage provides excellent camouflage. The birds are also extremely wary of approaching their nests and giving away the location — annoyingly so, as I have spent far too many fruitless hours watching horned larks do anything but go back to their nests.

Chestnut-collared longspurs hide their nests in much denser vegetation, making them difficult to see until the female explodes off the nest when someone approaches within one or two metres.

Even then it requires sharp eyes to find a nest so well hidden under dense grass.

Once a nest is found, we check it every two to four days until it either fledges or fails. We count the number of eggs laid, the number of those that hatch, and the number of chicks that fledge. When the chicks are seven days old we weigh and measure them to assess their quality. Nest success has varied between years, with 50% of horned lark and 45% of chestnut-collared longspur nests successfully fledging chicks on average. While this may not seem very successful, both species make multiple breeding attempts in a season, building a new nest and laying a new clutch after one fledges or is discovered by a predator.

We also attempt to band the adults with unique colour-band combinations. These bands allow us to calculate the percentage of breeding birds that return in subsequent years. One of the great unknowns until recently is where different breeding populations spend their migration and wintering periods. Although we know the general winter range of each species, different breeding populations may take different routes or winter in different areas. Understanding this migratory connectivity may help us understand how land-use or climate



Top: Horned lark nests are quite open to the elements, but an incubating female provides good camouflage. DAVID BELL

Middle: At approximately five days old, these horned lark chicks are losing their early downy feathers. LIAM SINGH

Bottom: Juvenile horned larks fledge the nest ten days after hatching. Their spotty, light brown juvenile plumage helps camouflage them during this dangerous life stage when they are learning to fly, forage, and evade predators. DAVID BELL



Nat Hontar (right) weighs a horned lark, Emma Sherwood prepares bands, and David Bell records data as part of ongoing research of grassland birds at Suffield National Wildlife Area.  
NANCY MAHONY

change throughout the life-cycle may be related to population declines.

Tracking has gotten easier in the last several years as the size and weight of tags for birds has grown increasingly smaller. There is now a geolocator tag that can be attached to the back of a bird using a leg-loop harness. This tag uses a light sensor to record sunrise and sunset each day, and from that the bird's approximate location can be calculated. Unfortunately, the tag must be retrieved from the bird to download this information, and horned larks are very wary of being re-trapped. Of the tags we have retrieved so far, two birds spent most of the winter in northern Colorado and southern Wyoming, migrating in the fall through Montana and the spring through the Dakotas. But a third bird appeared to spend most of the winter near Suffield.

This past summer I was able to expand this migratory connectivity work with collaborators from Saskatchewan and Montana through a wide and growing network called the Motus Wildlife Tracking System ([motus.org](http://motus.org)). Motus uses individually coded radio-tags attached to the birds and radio-receiver stations that pick up the pings from

the tags when birds fly by within approximately 30 km. The network of receiver towers is growing rapidly across the grasslands of Canada, the U.S., and Mexico. These tags do not need to be retrieved from the birds, so I hope to be able to get much more data on migration of grassland songbirds in the future.

Between Suffield and sites in Saskatchewan, in 2022 we deployed tags on horned larks, chestnut-collared longspurs, Baird's sparrows, Sprague's pipits and thick-billed longspurs. We have high hopes that the tags will begin pinging off towers as birds start their fall migrations! This work will continue to give us a fuller picture of how these species use habitat and are affected by agriculture and climate throughout their annual cycles across North America.

While the situation for grassland birds in Alberta and beyond seems dire, there are actions people can take to help. First, we need to conserve remaining native grassland wherever it occurs. This can be accomplished by donating to organizations that conserve and

protect native prairie, as well as by letting your elected officials know about your concern for grassland protection. You can also support grassland conservation by buying grass-fed, grass-finished beef. By supporting ranchers using sustainable methods, you support operations that keep those grasslands from being plowed up. And finally, you can watch, appreciate, and spread the word about the unique and wonderful grassland bird community and the struggles it faces. For more information, please visit [3billionbirds.org](http://3billionbirds.org) and [birdscanada.org/bird-science/grassland-birds-at-risk](http://birdscanada.org/bird-science/grassland-birds-at-risk). ■

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Dr. Nancy Mahony is a research biologist with the Wildlife Research Division of Environment and Climate Change Canada, based in Edmonton. Her research program is focused on exploring the causes of population declines of grassland and aerial insectivore birds in western Canada and strategies for their conservation.



# Painting the Prairie The Dotted Blazing Star

BY LORNE FITCH

**I**n late summer, across a drab and desiccated expanse of grassland, one can sometimes make out a tiny flame — not of a fire, but of the lavender blossoms of blazing star.

This is unusual. For native grassland plants, it's basic survival — don't waste resources, especially moisture. Consequently, most plants flower and set seed soon after the snow melts and spring rains have provided a surplus of moisture. From early moss phlox and prairie crocus to the later asters and blue grama grass, the show is short and quickly over. By late summer, most have called it quits, gone to bed, and retreated to their roots.

But not blazing star. It blooms late, providing a welcome splash of color to a landscape of browns and yellows. While other plants wilt from the heat and dryness, it literally “blazes” in the dog days of late summer and into the autumn.

Blazing star is a forb in the aster family and some of its relatives are also late bloomers. The plant has speckled leaves, earning it the Latin name of *Liatris punctata*, the latter word meaning “dotted.” From this comes the common name, dotted blazing star.

Why it blooms late, outside of the period of ample moisture, seems a mystery. Are we witnessing a plant inferiority complex? Does it not wish to compete with the subtle purple shades of the crocus, the wedding dress white of the saskatoon blossoms, or the gaudy, highlighter yellow of the balsam root?

That it does bloom late is probably much appreciated by native bumble bees, butterflies, and moths, since the lavender spike of flowers provides a late-season buffet in the absence of the other prairie plants that have long since abandoned their pollinators.

Blazing star likely doesn't tug many human heartstrings. Not only is it a prairie plant, living in a landscape that is shunned by many, but it blooms past the time when native plant aficionados are keen to visit the flowers of the grassland.

Blazing star provides an important late-season resource for pollinating insects, such as this regal fritillary butterfly. USFWS



The lavender blossoms of a blazing star stand provide a welcome splash of color in grasslands that have turned yellow in the summer heat. MATT LAVIN

Like most prairie plants, blazing star goes about its business quietly, largely out of sight, and unheralded. However, early plant ecologists provide some insights on the plants of the native prairie environment, to which it would be worthwhile to pay attention.

Two of these, R. Coupland and R. Johnson from Saskatchewan, investigated how prairie plants make a living in dry conditions. Since moisture is the key to survival, they looked at root systems and rooting depths. They painstakingly excavated trenches in prairie soils and then disentangled the root systems of individual plants from the dirt. For anyone who has ever dug a hole by hand, or tried to plant a fencepost in these soils, the effort required for this work would have to be acknowledged as herculean.

For blazing star, they found that it drove its roots down almost two metres into the soil. Another earlier researcher in Nebraska, John Weaver, found rooting depths for the plant to be nearly five metres! This means the rooting depth exceeds the above-ground portion of the plant by 13 to 33 times.

Most other prairie plants do not have roots as long as those of the blazing star, and this likely explains why it has the luxury of blooming late, when there is little or no surface moisture available. It taps deeper, subterranean sources of water. This is not to say that other native grassland plants have shallow roots, like introduced species do. All native species are admirably adapted to the semi-arid conditions of the prairies. To say these native plants are “drought-tolerant” seems like stereotypical understatement, obvious and trite.

In another paper Weaver pointed out: “Dotted blazing star develops slowly and is long lived. Ring counts in root crowns showed plant ages greater than 35 years.” That requires a pause for reflection — 35 years! This is old-growth prairie, akin to old-growth forest.



Dotted blazing star is one of the few prairie plants that blooms in late summer. MATT LAVIN

Weaver and other plant ecologists have provided valuable information on the elegant role, value, and adaptability of prairie plants. But there was a time when this was not understood. Thinking that grasslands could be “improved,” much of the native prairie went under the plow. We are at a point now where it cannot be said we lack an understanding of the virtues and values of leaving these landscapes alone. Yet even as we are better informed, we avoid using that information to make appropriate choices, and continue to plow up more grassland.

Imagine what blazing star could teach us — if we had a mind to listen — about patience and persistence, of living successfully in a semi-arid environment, particularly under the additional crisis of climate change. We prairie people should strive to be similarly deeply rooted, parsimonious in water use, and part of a community that thrives on natural diversity. ■

Lorne Fitch is a Professional Biologist, a retired Fish and Wildlife Biologist, and a former Adjunct Professor with the University of Calgary.

# Nature Kids



## My BIG Alberta Backyard

BY STEPH WEIZENBACH, PROGRAM DIRECTOR

**A**lberta is a great place to live. It's a big, beautiful province full of all kinds of natural wonders. In My Big Alberta Backyard, we introduce you to the unique and interesting wild spaces, and the diversity of wildlife that live there, that you can find in your province. This time, let's explore your "NatureHood!"

### What Is My NatureHood?

As defined by our partner, Nature Canada:

*Your NatureHood is any green space in your neighbourhood — from the biggest cities to the smallest towns. It's*

*nearby nature, whether it be the park at the end of your street, your backyard, a community garden plot, an overlooked urban forest, or a special green space in your community.*

*Your NatureHood is any place you go to "connect" with the Earth's natural wonders — from watching a bee pollinate a flower, to feeding wild birds, to witnessing the trees change with the passing of the seasons.*

Many people travel 15 minutes, half an hour, or even several hours to their favourite park or natural area to connect with nature. But exploring your own NatureHood can give you a

wonderful new feeling of connection to — and appreciation for — nature in your own community.

### Find Some Bugs

Get down on your hands and knees in your NatureHood. Stay in one spot for a while and look closely. Suddenly, you will see the bugs scuttling and crawling all around you. You can take pictures of the bugs and post them on **iNaturalist** to find out what species they are! Follow the instructions at [naturealberta.ca/inaturalist](https://naturealberta.ca/inaturalist) to find out how to get started.

Have a look in corners and crannies and you might find a cat-faced spider (also known as an orb-weaver) with an egg sac that looks like a fuzzy, spider-sized pillow. Look for ladybugs and count the spots on their elytra (protective wing cases). Spot a small clump of leaves that haven't fallen from the branch and you may have discovered a moth cocoon!

### Secrets Revealed by Fallen Leaves

The leaves have all turned yellow, orange, or red, and are crunching underfoot. Raking up the leaves into a pile, throwing them up into the air, and running and jumping in the leaves is a long-held tradition for many generations of Albertans. If you are new to Alberta, I promise that no one will look at you funny if you bring your rake for a walk in your local



An orb-weaver spider on a leaf, on top of its recently laid, pink, fluffy egg sac.  
STEPH WEIZENBACH



A clump of leaves that appears to be stuck on the branch could be hiding something like this polyphemus moth cocoon! STEPH WEIZENBACH

NatureHood to make a pile of leaves to play in!

When you are done crunching and playing in the leaves, take some time to look up into the trees where the leaves have fallen from. The leaves' absence reveals many secrets from the past summer. Songbird nests stick out like a sore thumb, now that they aren't hidden by a bunch of green leaves. See one? The nestlings who hatched here last summer have already grown feathers and learned to fly. The nests are empty. It's the perfect time to get up close to take a peek.

### What is the nest made of?

Birds build nests using a variety of materials, including small twigs, moss, pieces of long grass, fluff from last year's cattails, and possibly even a tuft of fur that your dog rubbed off on

a fence. Have a close look, but please leave the nest intact and undisturbed. Many birds return to the same spot year after year, and some will rebuild on top of a previous nest. The most exciting thing about this revelation is that you have discovered where to search — carefully and quietly — next summer to find a nesting bird. You and nature share your very own secret!

Have you spotted any large clumps of twigs and grass high up in the tree branches? It might look like a giant bird nest, but it is actually a drey. What is a drey, you ask? Turn the page to "Ask Stuart" to find out! ■

Empty bird nests are easy to spot once all of the leaves have fallen. Have a peek to find out what they are made of.  
STEPH WEIZENBACH



# Out and About

BY STEPH WEIZENBACH, PROGRAM DIRECTOR

## What you need:

- ✓ Recycled cardboard and paper
- ✓ Something heavy like textbooks
- ✓ Clear, self-adhesive plastic (like Mactac, contact paper, or clear shelf liner)
- ✓ Assorted leaves
- ✓ Scissors

## Unbe-leaf-able Fall Placemat!

Playing with colourful leaves is a fun way to connect with nature in autumn. You can crunch leaves underfoot, rake them into a pile to jump into, and collect them for a craft! This placemat craft is an annual fall favourite in our household.

### What to do:

- 1 Go for a nature walk somewhere there are trees and shrubs with colourful leaves. Look for leaves on the ground, and find leaves about to fall off of trees, shrubs, and smaller plants to get a wide variety of colours, sizes, and shapes for your craft. Select leaves that are still soft enough to bend without breaking.
- 2 Press the leaves. Cover a flat surface with recycled cardboard and then a layer of paper on top. Lay your leaves out flat. Cover the leaves with another piece of paper and then another layer of cardboard. Place something heavy on top, like your copy of *The Atlas of Breeding Birds of Alberta*. For best results, allow the leaves to remain like this for a few days.
- 3 Cut two pieces of clear, self-adhesive plastic approximately 30 by 45 cm.
- 4 Peel off the backing of one piece of plastic and place it on the table, sticky side up.
- 5 Picking from your pressed collection, select a variety of leaves with different sizes, shapes, and colours and place them on the sticky plastic, in any arrangement you like. Try to maintain at least 1 cm of space between your leaves and the edge of your placemat. This will help create a sealed border for your finished craft.
- 6 Peel the backing off of your second piece of plastic. Turn it sticky side down, carefully line it up, and place it on top of your first piece of plastic, with your leaves in the middle. Seal the edges and smooth out any air bubbles by sliding your hands firmly from side to side over the placemat.
- 7 For the finishing touch, cut a small amount of the plastic off, all the way around the border of your placemat. ■



STEPH WEIZENBACH

# Ask Stuart

BY DR. JESSICA HAINES



Welcome to Ask Stuart, a regular feature in which Stuart, our Nature Kids mascot (who just happens to be a swift fox) responds to questions asked by kids across Alberta. From time to time Stuart will also ask local experts to help him answer these questions. If you have a question you would like to ask Stuart, send it along to our Nature Network Assistant at [naturekids@naturealberta.ca](mailto:naturekids@naturealberta.ca) and it may be featured in a future issue. Since Stuart sometimes eats squirrels for lunch, today's questions are answered by our friend Dr. Jessica Haines, Assistant Professor at MacEwan University, who specializes in wildlife biology.



Squirrels spend a lot of time sleeping in the winter. JACK WALLER

## Q What is a drey?

A drey is the name for a squirrel's nest. You may have come across one without realizing it. A drey is usually a circular or oval-shaped clump of grasses and other soft materials, high up in the branches of a tree. Squirrels will even steal human-made materials (such as lost clothing) and weave them into their dreys. Squirrels usually build their dreys in trees, though they sometimes also tuck their drey into a hole in a tree or underground.

Female squirrels have their babies in their dreys, where they are kept safe from predators and bad weather. But it isn't just females who have dreys — male squirrels also build them. Just like people enjoy having a safe, cozy place to relax and sleep, squirrels also use their dreys for resting and sleeping. ■

## Q Do red squirrels hibernate?

In the middle of winter, when the temperature is freezing and there is lots of snow, it can seem like red squirrels have disappeared. Because of this, when I was growing up I thought red squirrels hibernated. But they actually don't! They just spend more time sleeping in their drey so they can stay warm and cozy.

Squirrels only venture out from their warm dreys to eat. During the summer and fall, squirrels will spend lots of their time storing away food for the winter into a midden, like you store food in your fridge or pantry. In winter, this midden helps squirrels survive because they can go outside for a quick snack, then hurry back to their drey to warm up again. This is why it can seem like they disappear in winter. But they haven't actually gone into the deep sleep of hibernation. If you happen upon their home and disturb them, they may come out and yell at you as a reminder that they're still around! But please don't disturb them on purpose! ■



Above: A red Squirrel enjoying a quick snack before returning to its drey to warm up. DR. JESSICA HAINES

Below: A red Squirrel packing spruce cones. DEBBIE GODKIN

# Preparing for Fall

BY MARGOT HERVIEUX

RICHARD SCHNEIDER

The first fall frosts remind many of us to start winterizing our yards, homes, and vehicles — but we aren't the only ones. Outdoors, a variety of creatures are actively storing food, finding weatherproof shelters, and even making their own antifreeze!

Red squirrels are one of the most visible food collectors. Wherever there are spruce trees you will see squirrels cutting cones from the branches and then picking them up from the ground to carry off for storage. Squirrels also love mushrooms, so don't be surprised if you find a mushroom tucked on a branch to dry.

Chipmunks also put food away, filling underground chambers with tidbits that will help them survive six months of hibernation. Watch for them filling their cheeks with seeds and other delights and then darting off into the underbrush.

The blue jays at my feeder are also preparing for the coming cold. Instead of opening individual sunflower seeds, they stuff over a dozen in their throat pouch before heading to the woods to stash their treasure for later.

On any creek or pond with beavers, you may spot a pile of branches sticking out of the water. Even after the water freezes, the animals will be able to visit these underwater brush piles and bring food back to the lodge.

It's not just animals preparing for the changing season. Have you ever noticed that garden carrots taste sweeter after the first frost? That's because plants store food over the winter by moving sugars into their roots. Plants with bulbs or tubers get a jump on spring by storing the food energy they need for early growth.



RICHARD SCHNEIDER

The ultimate recyclers, plants also store and reuse their green chlorophyll. The chlorophyll is broken down into its component molecules and reabsorbed into the plant, revealing the yellow and red pigments that brighten up the season

before the leaves drop. When the weather warms up, the plant can use those stored molecules to start making chlorophyll again rather than having to make it from scratch.

For some cold-blooded creatures, fall means actually winterizing their bodies. Wood frogs increase the amount of sugar in their cells so they can freeze solid without doing damage. Butterflies like the orange and brown Milbert's tortoiseshell and the larger brown and yellow-edged mourning cloak also use natural internal antifreeze to protect themselves while frozen in the leaf litter.

The hunt for a warm winter shelter also brings animals into our houses. I am starting to find two-spotted ladybeetles on my windowsills and tiny plume moths on my walls. A search of my basement will likely also turn up spiders and flies that have worked their way in through cracks.

Winter is a reality for any creature living in Alberta, and wherever you look you will find preparations underway. I rather expect that we aren't the only ones who wouldn't mind just a few more weeks to get ready! ■

Margot Hervieux is a founding member of the Peace Parkland Naturalists, an honorary member of Nature Alberta, and a longtime Nature Alberta board member. A version of this article originally appeared in her "Naturally Yours" column in the *Peace Country Sun*, which she has been writing for 15 years. You can read more of her archived columns at [peacecountrysun.com](http://peacecountrysun.com).



## MEET A MEMBER CLUB

JANICE HURLBURT

BY BRIAN STEPHENS

### Edmonton Nature Club

**T**he **Edmonton Nature Club** (a.k.a. ENC or Nature Edmonton) was formed in 2004 by the merger of the Edmonton Natural History Club (founded 1959) and the Edmonton Bird Club (founded 1949).

We offer programs covering birds, bugs and spiders, butterflies, and plants. Historically, our activities have ranged quite far around the Edmonton area with driving trips. More recently we have focused on local walks that make use of the extensive habitats of the

North Saskatchewan River valley and the adjacent ravines. We host weekly walks along trails such as Strathcona Riverside Trail, Hermitage Park, Rundle Park, Gold Bar Park, Kinsmen-Emily Murphy Park, Hawrelak Park, and Whitemud Nature Reserve. These are open to anyone. The club hopes to soon get back to driving trips to more distant locations.

Even in the city, these locations serve as ideal places to introduce people to nature because of their accessibility, the excellent trail systems, and the flexibility of distance and time. For example, in Hawrelak Park, the lake provides good views of a diversity of waterfowl, a variety of adjacent forest habitats, and views of the river itself. This offers opportunities for learning about waterfowl identification and the habitat relationships between different species of forest birds. In 2022, members were able to access Nature Calgary's Birding 101 presentations, which were followed with four outings with new birders.

The river valley also provides excellent sites to catch the spring and fall bird migrations into and out of the boreal forest to the north. Depending on weather conditions in the spring, river valley habitats provide feeding and resting areas for migrating birds, with

several locations becoming real birding "hotspots" through the season.

Our ongoing commitment to the study of the natural environment is reflected in the activities of members who, for example, have recently identified plant species previously unknown in the area. A survey of birds in Whitemud Ravine at the time the Whitemud Nature Reserve was created listed 128 species with 60 breeding in the ravine. By 2020, ENC members had increased the total to over 170 observed species and 82 breeding.

ENC participated in the Bird Friendly Cities initiative that saw Edmonton receive entry-level certification. The club successfully conducted its first May Species Count this year using an 80-km-radius circle. We sponsor the annual Edmonton Christmas Bird Count. ENC maintains a local forum — ENC Nature Talk ([groups.io/g/ENCnaturetalk](https://groups.io/g/ENCnaturetalk)) — for discussion and reports. You can become a member and join in any of our activities by visiting our website: [edmontonnatureclub.org](https://edmontonnatureclub.org). ■

Brian Stephens is the President of the Edmonton Nature Club and the lead Edmonton Bird Friendly City Team Member.



JANICE HURLBURT



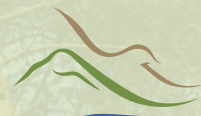
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