NATURE ALBERTA MAGAZINE

SPRING 2024
VOLUME 54 | NUMBER 1

A COMMUNITY CONNECTED BY A LOVE OF NATURE

Spring Homecoming

Neotropical Migrators Return to Alberta

Abuzz About Native Bees

Creating Safe Spaces for Urban Birds

Exploring Plant Communites in Sand Dunes

PM40015475

photo: ACA, Charmaine Brunes

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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.

Nature Alberta acknowledges that the land we know as Alberta resides within Treaties 6, 7, and 8, as well as portions of Treaties 4 and 10, and is the ancestral and traditional territory of First Nations, Inuit, and Métis Peoples. We have a responsibility to care for these lands and waters, and to honour the history and culture of those who have been here for generations.

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NATUREALBERTA.CA

SHARING OUR SPACE

Nesting Season

If you're planning on pruning or removing trees this spring, we encourage you to be certain they are not home to any nests (cavity or open). Monitor trees in early spring for signs of activity. Birds typically nest between May and August; arboreal mammals, such as squirrels, can start nesting as early as February. Remember to keep a respectful distance; close inspection may cause nest abandonment and repeated visits increase the risk of disturbance. Observe nesting behaviors — wildlife entering and leaving a nest, nest hole, or nest box — from a distance to avoid disturbance.


American three-toed woodpecker. RICHARD SCHNEIDER

If there is any evidence of migratory bird nesting, the tree must not be disturbed. Disturbing or harming a nesting migratory bird or relocating, damaging, or destroying an active nest or (viable) egg are prohibited under federal *Migratory Bird Regulations, 2022* (Part 1 – General: Prohibitions 5(1)). Birds may abandon nests if there is any perceived threat to their nest, eggs, or young. Pruning companies may claim that they mitigate disturbance, but there is no way to mitigate a disturbed bird nest and companies who attempt to work around active nests of migratory birds are in regulatory violation.

Squirrels and non-migratory birds, including cavity nesters such as some species of woodpecker and owl, are protected under provincial jurisdiction (Alberta Environment and Protected Areas). The provincial *Wildlife Act* states that a person cannot "wilfully molest, disturb or destroy a house, nest or den" (Section 3:36).

If a nest of any animal has been inadvertently disturbed, leave the area immediately, monitor from a safe distance, and contact an expert such as your local wildlife rehabilitation centre (**alberta.ca/orphaned-or-injured-wildlife**) or Fish and Wildlife office (**alberta.ca/fish-wildlife-area-office-contacts**).

—ERIN MCCLOSKEY, ASSISTANT EDITOR

Nature Alberta News

Alberta Migratory Bird Sanctuaries iNaturalist Project

Alberta Migratory Bird Sanctuaries is a Nature Alberta project to encourage nature appreciation, wildlife observations, and participation in citizen science using the iNaturalist app at three Alberta protected migratory bird sanctuaries: Saskatoon Lake (west of Grand Prairie), Gaetz Lakes (Red Deer), and Inglewood (Calgary). Join the project at **inaturalist.ca/projects/alberta-migratory-bird-sanctuaries**.

Birding for Nature

This is the second year of our Birding for Nature fundraiser — increase awareness for bird conservation while sharing your passion for birding with loved ones. Your contributions will raise crucial funds to support Nature Alberta's important mission to be a strong voice and active champion for nature in Alberta. Participation is easy — visit **naturealberta.ca/birding-for-nature** to register your birding adventure and begin collecting donations!

10 Years of Family Nature Nights!

Nature Alberta's Nature Kids program is celebrating 10 full years of providing high-quality nature programming through the Family Nature Night event series. Since beginning in the Edmonton region, popularity and support have grown so we're now able to host events in Red Deer and Calgary too. Family Nature Nights provide positive, guided experiences in nature for families and kids, empowering them to observe, investigate, and explore nature and inspiring the next generation of nature-lovers.

To help celebrate this 10-year milestone and support the next decade of Family Nature Nights, you can set up a $10 monthly donation. $10 a month pays for eight children to attend Family Nature Nights and experience unforgettable, up-close-and-personal activities like planting their first tree, handling a slippery fish, or discovering how much life there is in a scoop of pond water! Set up your $10 monthly donation at **naturealberta.ca/donate**.

Contribute to Citizen Science

Visit **naturealberta.ca/citizen-science** to find out how to participate in these upcoming bio blitzes!

City Nature Challenge
April 26–29

Nature Alberta's May Species Count
Late May

Alberta Biodiversity Challenge
June 13–16

Upcoming Events

Nature Alberta is leading events across the province through spring and summer. Find all the details at **naturealberta.ca/events**.

Migratory Bird Day
Lois Hole Centennial Provincial Park, Sturgeon County
May 11, 10 a.m.–3 p.m.

Fish Fin-atics
Hermitage Park, Edmonton
June 3, 6:30 p.m.

Tree Planting for Biodiversity
Rundle Park, Edmonton
June 13, 6 p.m.

Family Nature Nights
July 10 in Red Deer
July 17 in Calgary
July 24 through August 21 in the Edmonton region

Correction: A photo caption in Lorne Fitch's Winter 2024 article "The Currency of Angler Citizen Science" incorrectly referred to a population crash of bull trout in Gold Creek following a coal spoil pile failure in 2015. The species involved was actually westslope cutthroat trout. The image and caption on page 10 of the online edition have been changed to correct this, and other minor edits have been made to the article to improve clarity. The corrected version of the article can be read online at **bit.ly/namag_anglerscience**.

Caribou Update:
Rhetoric Meets Reality

BY RICHARD SCHNEIDER

Six years ago, faced with progressive declines in caribou populations and the threat of federal intervention under the *Species at Risk Act*, the Alberta government released a comprehensive plan for caribou recovery.[1] This plan marked a turning point. For the first time, the restoration of caribou habitat was front and centre, replacing the usual proposals for industrial "best practices," which had been tried for decades without success.

According to the federal caribou recovery strategy, at least 65% of each caribou range must be in an undisturbed state to ensure caribou persistence. Under Alberta's 2017 caribou plan, this target would be achieved through an integrated system of land management that included habitat protection and restoration, the development of an optimized road network, and aggregated forest harvesting. These restoration efforts were expected to take decades, given the slow rate of tree growth, so the plan also called for temporary wolf control to reduce predation pressure while the forest was being restored.

In January 2024, the government finally released an update report on its caribou recovery efforts, providing an initial glimpse into progress since the release of the 2017 plan.[2] You have to feel a bit sorry for the hapless soul who was tasked with writing this report. The discrepancy between rhetoric and reality could not be more extreme.

Let's begin with habitat protection. The 2017 plan included three large areas in northwestern Alberta to be formally protected as caribou reserves. However, the local municipality opposed the protection of these sites, despite their low resource potential, and it appears this was all it took for the government to abandon the sites. No further planning has been done and the update report makes no mention of protecting habitat at all.

Moving on to habitat restoration, the report states that Alberta's caribou ranges are crisscrossed by over 250,000 km of old seismic lines. Access roads, well sites, pipelines, and utility corridors add thousands of additional square kilometres of disturbance. So how are we doing in terms of restoration? The report only provides data for one year, 2021, and in that year, less than 1,000 km of seismic were reclaimed or in progress. At that pace, it would take 250 years to restore all of the lines. Moreover, there is no mention of the reclamation of well sites or other disturbances. Nor does the report make any mention of progress in creating the optimized road network called for in the 2017 plan.

It gets worse. The *Species at Risk Act* prohibits the destruction of critical habitat, yet new resource extraction permits continue to be approved in Alberta caribou ranges. In fact, the forestry minister has been promoting an across-the-board increase in the rate of forest harvest. Meanwhile, new oil and gas wells and associated access roads continue to appear in critical range. According to the update report, "Over the period 2010 to 2021 the percentage of caribou range covered by [industrial] footprint increased in all ranges, except for Yates, and the A la Peche summer range."[2] The report provides a detailed breakdown of developments that were approved in 2020 and 2021, and the total area of caribou range impacted was 67,955 ha.

The prospects for the future are not promising, either. The update report talks about sub-regional planning that

will "balance social, environmental and economic interests." Yet only two of the 15 range plans due by 2025 have been completed. Since 2022, caribou range planning has ground to a halt — it appears the process has joined the *Alberta Land-Use Framework* in planning limbo. In any case, the first two plans fell short of what would be required to meaningfully implement the 2017 plan at the regional scale.

The only thing that is actually proceeding according to plan is the killing of wolves. Currently, wolves are being shot, trapped, and poisoned in seven caribou ranges across the province. These efforts have been successful in reducing predation pressure on caribou, and most caribou populations are now stable, after decades of decline. It appears the Faustian bargain we made to save caribou is working, though it is the wolf who has to pay the devil, not us.

What should we make of all this? The scale is vast and the trade-offs are difficult, so we should not expect to see immediate results. Nevertheless, the update report could not be more disappointing: we are being served a "nothingburger." It is inconceivable that a government truly intent on recovering caribou would only deliver a token amount of seismic line restoration after more than six years of effort. Granted, planning takes time. But the planning clock started ticking in 2012, when the federal caribou recovery strategy, with the 65% undisturbed habitat target, was released. So we are really 12 years in, with virtually nothing to show for it except a nice plan. Check that — with continued resource development within caribou range, we are actually in worse shape than when we started in 2012.

When you combine the lack of progress on caribou recovery with what has been happening on other environmental issues in recent years, a pattern begins to emerge. We've had a proposal to rescind the Coal Policy, which provided vital protection to the Eastern Slopes. We've had a proposal to delist parks from the provincial protected areas system. We've had a proposal to increase forest harvesting by 30%, well over sustainable limits. And we've had a proposal to massively expand irrigation in the province, threatening the health of southern rivers. Put it all together and it's clear that the UCP government has a strong anti-environment orientation — worse than anything we've seen since the 1980s.

When it comes to saving Alberta's caribou, our best hope lies with the federal *Species at Risk Act*, which compels the provinces to act when it comes to the recovery of listed species. Not that this will be easy. Danielle Smith would love nothing better than a bare-knuckled brawl with the federal government, since diversions like this are central to her playbook. This is not a fight the feds want; however, the *Species at Risk Act* will force their hand at some point.

You can help by writing to Steven Guilbeault, federal Minister of Environment and Climate Change, urging him to call the Alberta government to task for its failure to implement the 2017 caribou plan (**steven.guilbeault@parl.gc.ca**). While you're at it, be sure to CC Rebecca Schulz, Alberta Minister of Environment and Protected Areas (**aep.minister@gov.ab.ca**), so that she knows Albertans care about caribou and want to see meaningful recovery action. ■

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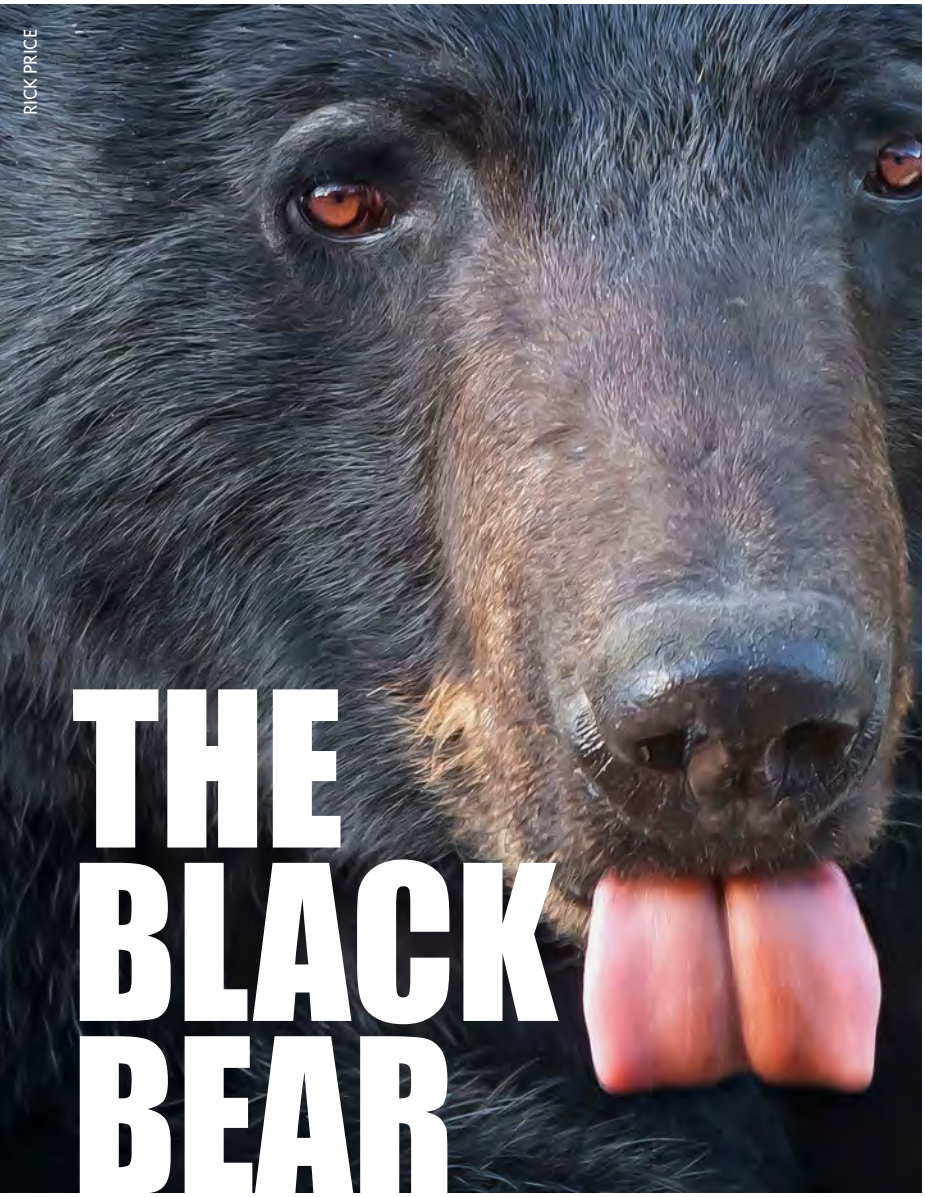
2. Government of Alberta (2024). First Report on The Implementation of the Section 11 Agreement for the Conservation and Recovery of the Woodland Caribou in Alberta. Government of Alberta, Edmonton, AB.

Richard Schneider is a conservation biologist who has worked on species at risk and land-use planning in Alberta for the past 30 years. He is the editor-in-chief of *Nature Alberta Magazine*.



RICK PRICE

THE BLACK BEAR

BY NICK CARTER

The American black bear represents different things to people. Visitors to the Rockies all hope to spot a bear, unless that means encountering it on the trail or finding it breaking into the camp cooler. The black bear is also an important figure in the spirituality of Indigenous peoples. But aside from the mix of love and fear we have for this species, the black bear is a fixture of the Alberta wilderness and worthy of our understanding and respect.

The black bear is the smallest of North America's three bear species (black, grizzly, and polar bears). In Alberta, adult males get up to around 200 kg and 1.8 metres long. Females are about two-thirds that size. American black bears are widespread across North America, from Alaska to northern Mexico. Its closest living relative is the Asiatic black bear, which is found throughout central and southern Asia.

While many black bears are indeed black over most of the body, there's a lot of colour variation between and within populations, from chocolate brown to blonde to nearly white. In Alberta, black seems to be the most common colour, followed by cinnamon brown, and both colour phases have brown muzzles and occasionally a white chest patch.

Despite belonging to the order Carnivora, the black bear is omnivorous. Plants comprise most of its diet, especially plants with lots of sugar and protein and little cellulose, such as sprouts, buds, flowers, fruits, and nuts. Unlike hoofed mammals, bears can't digest cellulose, though their digestive system is good at extracting nutritious liquids from plant fibres. Far from being a picky eater, the black bear will exploit any available food source it comes across, including carrion, small mammals, fish, and insects, as well as human food and garbage. Deer, usually fawns, are also taken as prey from time to time.

In winter, black bears go into a dormancy period during which they do not eat, drink, urinate, or defecate. A dormant black bear can slow its metabolism to 25% of normal levels and its heart rate may be reduced to as few as nine beats per minute. But unlike many hibernating species, which can drop their body temperature to near freezing, bears only experience a small drop in body temperature while dormant.[1] For this reason, some scientists do not consider bears to be true hibernators, though this remains a point of contention.

The den is a simple dirt hole that the bear digs out, often under a fallen tree, large rock, or overhanging bank. A spot likely to get covered by snow is optimal, as snow helps to insulate the den from the frigid air outside.

To prepare for its time of dormancy, the black bear eats ravenously in late summer and early fall, consuming about 20,000 calories per day. The fat reserves that are built up keep the bear alive through winter. Black bears in Alberta are typically in their dens by the start of November. Depending on the spring weather, the bear will emerge from the den in either April or May. Females with cubs tend to go down for the winter early and emerge late, while for males it's the opposite.

Right: Black bears are omnivorous, though most of their diet is plant based. This bear is feeding on aspen buds. LEO DE GROOT

Bottom right: When danger threatens, black bears will often scamper up a tree, as these three cubs have done. RICK PRICE

Below: Black bear cubs are born in February while the mother is still in the den. RICK PRICE

Females mate in mid-summer, but the fertilized eggs don't implant on the uterine wall and start developing until late fall. Females give birth while in the den, typically in early February, to two to three cubs on average. The mother will care for her cubs until their second summer, when they become independent, after which she'll breed again.

In Alberta, the black bear lives in the shadow of the iconic grizzly. The grizzly bear is generally larger, but this isn't always reliable, as a male black bear can be larger than a small female grizzly. Both species have small, round ears, but the face of a black bear is longer and more dog-like than the short snout and wide head of the grizzly bear. A grizzly has a prominent shoulder hump, which the black bear lacks, and fur colour is far less variable between individual grizzlies. Grizzly claws are long and straight for digging, while black bear claws are hook-shaped for climbing, which the black bear does readily to either access food or seek shelter from predators. Grizzly bears have been known to prey on black bears.

The black bear is a forest-dwelling species, though it can sometimes be spotted in open fields adjacent to wooded areas. Like grizzlies, black bears will make scratch marks on tree trunks to communicate with other bears. In Alberta, the black bear can be found just about anywhere except the grasslands, though it is most common in the more remote parts of the

Black bears typically give birth to multiple young, and triplets are not uncommon. RICK PRICE

boreal forest, foothills, and mountains. Keep an eye out for it along wooded roads and trails where good forage is available. Black bears are more tolerant of humans than grizzlies, and will approach campsites, cabins, and towns if there's food to be had.

Agricultural development has made the black bear somewhat scarce in the Central Parkland Subregion, but it seems to be relatively abundant in the Peace River Parkland of the northwest. In places where towns and farmland dominate the landscape, black bears often use wooded river valleys as natural highways to move from one suitable location to the next. Occasionally, this includes the bustling North Saskatchewan River valley of Edmonton.

The relationship between humans and black bears has been a tense one since the early days of European settlement. Nevertheless, it has been reasonably successful in adapting to human development and is currently listed as "Secure" in Alberta. Non-habituated black bears are generally afraid of people, avoiding us when they can and running away at the sign of our approach. Consequently, attacks on humans are very rare. Conflict between people and black bears is most often centred around food. Guided by their sharp sense of smell, intelligence, and curiosity, black bears are attracted to garbage dumps and unsecured food items. Worse still, sometimes people deliberately feed bears.

Preventing conflict between bears and humans before it happens is in the best interest of both species. Securing food and waste out of reach and practising appropriate agricultural methods in bear country is now widespread in Alberta. This, combined with better education on the dangers of feeding wildlife, is helping to reduce conflict between bears and humans. If we keep the black bear wild and give it plenty of wilderness to exist in, we can coexist peacefully well into the future. ■

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1. Tøien, Øivind et al. (2011). Hibernation in black bears: independence of metabolic suppression from body temperature. Science: 331.

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

FEEDING TIME!

Young barn swallows have voracious appetites, enabling them to reach nearly adult size in only a few weeks.

Photo by Tony LePrieur

LITTLE BIGHORN

Bighorn sheep ewes usually give birth to a single lamb between late April and mid-June, when grass and wildflowers are plentiful.

Photo by Rick Price

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 **communications@naturealberta.ca.** Photos of all native species and natural landscapes within Alberta are welcome.

Four Ways to Help Your Backyard Birds

BY STEPHANIE WEIZENBACH

Birds are negatively affected by many human activities, and as a result, one in eight bird species is now threatened with extinction. The main threats include habitat loss from agriculture and forestry, the introduction of invasive species (including cats), overexploitation, and climate change. Residential and commercial development are also a concern as they result in habitat loss, pollution, disturbance, and collisions with buildings. Because there are so many threats facing our feathered friends, we need to do everything we can to stop the decline in populations. Here are four simple ways you can reduce threats to birds in your own backyard.

1. Share Your Space

Chirp, chirp, chirp. The bird songs in my urban yard blend in with the noises of a bustling city. On one particular day, however, one frantic bird's chirps caught my attention. I could tell something was wrong and went to my backyard to investigate. I found a sparrow perched on the fence, continuing to chirp loudly, despite my presence. I followed the

Create a backyard bird oasis by planting native species such as jewelweed to feed the birds. JACK WALLER

An American robin in its vulnerable fledgling stage, in which it spends two to three weeks on the ground building up muscles to fly. RICHARD SCHNEIDER

adult bird's gaze down to its fledgling in my basement window well. This little fledgling was strong enough to fly small distances, and must have felt on top of the world as it flew the distance down into that window well. But it was not strong enough to fly out. I grabbed a pillow case to gently scoop it out and back onto the grass to set it free.

We share our urban spaces with wildlife, in the patches of green dotted among the residential and commercial developments. There are many things you can do in your own yard to make it safer and more productive for the birds that share our space. You can create a bird oasis by landscaping for biodiversity; eliminate pesticides; plant native plants that attract pollinators; provide food, water, and shelter for birds; leave leaf litter for bugs; cover hazards such as window wells and dryer vents; and more. Nature Alberta has published a checklist of beneficial practices for homeowners called *Supporting Nature and Biodiversity in Urban Yards*. You can download a free copy at **naturealberta.ca/support-urban-nature**.

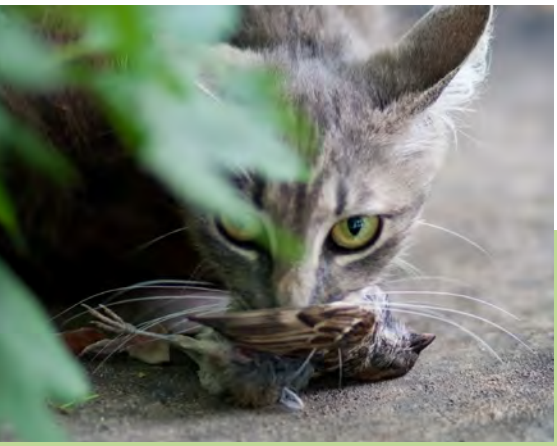
Further action is needed to conserve nature and halt the decline in bird populations. The *State of the World's Birds 2022* report urges the protection of Important Bird and Biodiversity Areas (IBAs). Nature Alberta is the regional coordinator for IBAs in Alberta and many of our member clubs are IBA Caretakers, conserving, stewarding, and monitoring these areas. We also recruit and support volunteers to survey birds on the land and report conservation issues to appropriate authorities. If you frequent an IBA and want to contribute to its conservation, please consider volunteering. Visit **naturealberta.ca/iba** for more info.

Supporting Nature and Biodiversity in Urban Yards is a comprehensive guide to help you protect nature. Download your copy at naturealberta.ca/support-urban-nature.

2. Keep Cats and Birds Safe

Have you ever seen a baby pigeon? They are awkward, prehistoric-looking creatures with gawky limbs, bulging eyes, and stubby feathers poking out in every direction. I happened across one of these adorable fledglings a few days in a row outside a building I frequented. I started looking for it daily, anticipating a more pigeon-like appearance with each visit. Until one day, when I opened the door and a black and white cat bolted off with its ears pinned back, as if I had caught it doing something bad. When it dawned on me what must have happened, I ran around the side of the building to find my awkward little feathered friend lying lifeless on the ground.

Predation by our beloved feline pets is a major threat to wild birds. The numbers are astonishing: in Canada, estimates range between 100 and 350 million birds killed annually by cats.[1]



Cats kill as many as 350 million birds annually in Canada.

Placing bird feeders less than 1 m or more than 10 m away from windows reduces the chance of a window strike. STEVE PIERPOINT

Cats have a strong hunting instinct and will kill birds even when well fed. Even if your cat doesn't bring home birds, it is likely still hunting and killing birds while roaming the neighbourhood. Fledgling birds that are learning to fly in the middle of summer are most vulnerable. And even if the bird is lucky enough to escape a cat's jaws, the bird can die from an infection left by the cat's saliva in the puncture wounds.

Keeping your cats indoors is safest for birds and for cats. Cats that are free to roam outside are at risk of bringing home parasites; becoming prey to coyotes, foxes, owls, and hawks; getting hit by a vehicle; and sustaining injuries from fights with other animals. They also increase feral cat populations when not spayed or neutered. The estimated lifespan of an outdoor cat is only 3–5 years, whereas an indoor cat can live to be 12–15 years old.

Many people use catios: fenced-in outdoor enclosures where cats can spend time outdoors without being able to leave the yard. You can also help replace the cat's instinctive hunting activities with stimulating toys and food puzzles. Keeping your cats living happily indoors and relaxing in catios will reduce their threat to our backyard birds while extending the cat's life expectancy!

3. Make Windows Visible to Birds

One day, as I opened the curtains of a large office window, I heard a loud *thump* as a juvenile robin hit the window. Fortunately, I was at work at a wildlife rehabilitation centre. I placed the stunned bird in a box lined with paper towel and kept it in a dark, quiet place for a couple of hours to recover. I later took the box back outside and opened it up and the bird flew away. Luckily, the robin hit the window at a slow speed and only stunned itself. In many other cases, songbirds brought to the centre have had broken bones or ruptured air sacs after hitting windows, requiring six weeks to recover.

An estimated 25 million birds are killed in Canada annually by colliding with windows.[2] There are many variables that contribute to window strikes, including the reflection of trees and sky, clear flight paths in or through a building, cleanliness of the windows, angle of the light, and even the placement of food and water sources in our backyards. When we turn our backyard into a bird oasis with native plants, bird feeders, houses, and baths, we provide habitat that was previously lost through development. But now there is habitat with large picture windows in the birds' backyard.

Bohemian waxwings are infamous for flying into windows after eating fermented berries. LEO DE GROOT

Studies have shown that placing your bird feeders or baths between 1 and 10 metres from your windows can increase the threat of a bird hitting the window. The ideal placement of these resources is within 1 metre of windows so that if a bird does fly into the window, they are less likely to be injured. Alternatively, placing bird feeders and baths more than 10 metres from windows reduces the occurrence of birds hitting the structure's windows.

You can reduce collisions with windows by making them more visible to birds. You can hang string or ribbon in front of the window, or draw designs on the window with washable tempera paint or even a bar of soap! You can also apply decorative or frosted window films to protect the birds in style. Bird stores carry many products such as decals, window markers, tape, and a relatively new product that applies rows of white dots on the window. If you have a backyard bird oasis and birds are regularly hitting your windows, follow FLAP Canada's recommendations to install high-contrast, dense patterns to the outside of the window, leaving gaps no larger than 5 cm by 5 cm.

There are even affordable ways to build new buildings to reduce the risk of collisions for birds, using a national CSA standard for bird-friendly building design. Write to your city council to urge your municipal government to adopt and implement the standard to make all new buildings bird friendly!

4. Reduce Your Light Pollution

Light pollution — the alteration of outdoor light levels — diminishes the dark sky with an orange glow above our cities. A light pollution map created in 2018 placed Calgary and Edmonton as the world's fifth and sixth brightest cities (compared to the global urban average), respectively, leading the world in light pollution. Light pollution has numerous harmful effects on wild species, including birds. Many animals and plants rely on the natural cycle of light and dark to cue critical behaviours, such as feeding, sleep, reproduction, and predator avoidance. Migrating birds use the moon, stars, and setting sun to navigate. Unfortunately, these birds are drawn toward light-polluted areas, veering off course to enter large cities during migration. This increases the flock's chance of colliding with buildings.

You can help reduce light pollution around your own home. Efficient use of lighting increases visibility on the ground, reduces power consumption, and produces less greenhouse gas emissions. To reduce your light levels, completely shield outdoor lights to direct all light towards the ground, where it is needed most. Directing all of the light towards the ground allows you to select a lower-wattage bulb for lighting, which saves energy as well. Installing timers or motion sensors also reduces light pollution by only using the light when needed. Information on a wide variety of efficient, dark sky-approved lighting products is available at **darksky.org**.

Interested in advancing bird conservation in urban areas? Bird Friendly teams are popping up all over the province! Get involved with a team near you at **birdfriendlyedmonton.org** and **birdfriendlycalgary.ca**. ■

Shielding outdoor lights makes the ground brighter and the sky darker, benefiting migrating birds. STEPH WEIZENBACH

The Milky Way is not visible in urban centres where light pollution creates a glow over the city. TERESA MUTH

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Stephanie Weizenbach studied environmental and conservation sciences at the University of Alberta with a major in conservation biology. She currently serves as Nature Alberta's Executive Director and contributes to bird conservation on the Bird Friendly Edmonton Team.

Open sand dunes can be found in the Wainwright Dunes Ecological Reserve. RICHARD SCHNEIDER

Sand Dune Plant Communities of Northern Alberta

BY PATSY COTTERILL

Sand dunes in Alberta? Yes, indeed. The eastern side of our province contains many examples of these sandhill landforms. Admittedly, only the dunes of Lake Athabasca in the far northeast are "active," with desert-like areas of blowing sand that are moving slowly southward. The rest have been subdued into immobility by a cover of vegetation, which varies by region: grass in the southern prairie, aspen stands and shrubby meadows in central parkland, and jack pine-dominated forests in the boreal region. There are also isolated spots of bare sand eroded by wind, water, drought, and human agency within otherwise vegetated dunes. Sand dune sites provide a wide variety of microhabitats, significant for the welfare of the plants and animals that inhabit them.

Many sand dune landforms are protected as reserves, providing islands of natural vegetation in a sea of settlement. Some do have human uses: grazing in the south, the Suffield military base in the Middle Sandhills, and oil and gas installations in various locations. Many are accessible to the public as provincial and wildland parks, ecological reserves, and natural areas, or as land trust reserves. Some have been targeted for scientific research, and citizen scientists can monitor rare species and ecological health.

Sand Dune Formation

Sand is created by the breaking down of rocks, such as granite, over time. The sand grains — usually hard crystals of quartz and feldspar — are carried away by rainwater and streams and, being chemically inert and insoluble, accumulate as deposits in low-lying areas. Strong winds blow the exposed deposits into dune ridges and hollows.

Most of our Alberta dunes began forming at the end of the last Ice Age, some 11,000 years ago, when wind blowing across treeless, postglacial landscapes sculpted sand into the rolling topography we have today. Dunes tend to become vegetated during moist climatic

Most of Alberta's sand dunes are covered by various forms of vegetation, such as this dune field in the Wainwright Dunes Ecological Reserve. RICHARD SCHNEIDER

Above left: An open jack pine stand in Halfmoon Lake Natural Area, with reindeer lichen and spreading dogbane in the foreground and a green carpet of common bearberry in the background. PATSY COTTERILL

Above right: Jack pine branch showing cones of different ages characteristically pointing towards the tip of the branch. MANNA PARSEYAN

periods, whereas periods of drought can result in the loss of vegetation cover and more open, blown sand.

An integral feature of sand dune landforms is the existence of low-lying areas between the dune hills, sometimes referred to as dune slacks. Because they receive runoff and are closer to the water table, they generally support a completely different suite of plants than uplands and feature silty or organic soils. Wetlands vary within and between sites; indeed, the larger valleys may even contain lakes. These are important areas for wildlife, and in their variety contribute to the uniqueness of sandhill communities.

Sandhill Communities of Northern Alberta

In this article, I explore the upland vegetation of sand dunes, rather than the interdunal lowlands, with an emphasis on northern Alberta. In contrast to the south, where floras representative of the grassland or parkland regions prevail, sandhills in northern Alberta are typically vegetated by jack pine forests and their associates. Aspen forests are also commonly present, with understory species characteristic of woodland on dry soil. The plant composition in any given location depends on the site, stage of succession, and microhabitat. I will focus here on some of the more common vegetation types, beginning with the main tree species, jack pine.

Jack pine is well-adapted to growing in sandy, acidic soils and it is typically the dominant tree found in sandy upland sites throughout the boreal region. It has long taproots that reach down to the water table and hard, narrow leaves that transpire less water than the soft, flat leaves of deciduous trees. Like most forest trees, it is supported by a network of soil fungi that facilitate water, nitrogen, and phosphorus uptake in exchange for the sugars produced by the pine's green leaves. Jack pine's hard, woody cones point towards the tips of the branches, a feature that helps distinguish it from its western cousin, the lodgepole pine of the mountains, in areas where their ranges overlap.

Dry conifer forests with a lot of needle litter are prone to fire, and jack pine has evolved adaptations to deal with it. It reaches maturity quickly and its cones are tough and sealed with a resinous glue that keeps the seeds viable for many years. When exposed to high heat, the seal melts and the seeds become exposed. As a result, it is common to have a massive release of seeds following fire, creating Lilliputian forests of pine seedlings of the same age.

As pine forests get older, they assume a parkland appearance: the trees have spreading branches and are well-spaced, with an expansive groundcover between them. Carpets of grey reindeer lichen and prostrate shrubs develop, with tufted, thin-leaved, drought-tolerant grasses such as northern ricegrass and flowering plants elbowing in.

Patches of sand heather colonizing sand along with jack pine at Opal Natural Area. PATSY COTTERILL

Fruits developing on female flowers of American dwarf mistletoe at Halfmoon Lake Natural Area. PATSY COTTERILL

The older trees often bear dense masses of twigs known as witches' brooms. These signal an infestation with American dwarf mistletoe, a semi-parasitic plant that penetrates the bark of the host pine, tapping into its food- and water-conducting systems. It produces single-seeded berries that burst explosively when ripe, shooting the sticky seed out with a chance to find a new branch on which to germinate. Witches' brooms provide shelter and nesting habitat for red squirrels and birds.

Jack pine forests are associated with a variety of understory plants depending on stage of succession and various microhabitat factors. In sandy areas free from erosion, it is common to find a crust of non-flowering plants, mosses, spikemoss, and lichens. Between rains, the crust is dry and crunchy to walk on and the mosses and lichens are dormant — an adaptation to drought. When wet, they turn green and soft, the leaves of the mosses unfurl, and photosynthesis kicks into gear. Lichens are an amalgam of fungi and photosynthesizing algae or cyanobacteria that allows these amazing organisms to grow in unfavourable habitats. (For an "enlichening" introduction to lichens, see Diane Haughland's article in the Winter 2024 issue of *Nature Alberta Magazine*.)

Low shrubs of the heath family are also abundant inhabitants of jack pine forests; they too have characteristics that allow them to tolerate dry, sandy soils. Common bearberry (also known as kinnikinnick) has small, hard, evergreen leaves with shiny cuticles, which reduce water loss. It has well-developed taproots and spreads by trailing stems to form extensive patches, which also conserve moisture. Bearberry leaves are food for caterpillars of a rare moth and rare species of butterflies.

Another heath, velvet-leaved blueberry, occurs on dune uplands but flourishes best in the lower-lying areas or in aspen stands. It is unusual among heaths

Above left: British soldier club lichen can be found in Bellis North Natural Area. MIKE LEWINSKI

Above right: Common bearberry at Bellis North Natural Area; senescing leaves of velvet-leaved blueberry can be seen in the upper left. PATSY COTTERILL

Sand heather in flower at Opal Natural Area. MANNA PARSEYAN

Long-leaved bluets in flower at Opal Natural Area. PATSY COTTERILL

in being deciduous, losing its softly hairy leaves at the onset of winter. Its pink, bell-like flowers are too small for most bees to enter; instead, it is "buzz-pollinated" by bumblebees and andrenid bees, which vibrate their thorax muscles to shake out the pollen through the anther pores. The sweet, blue fruits are relished by a variety of mammals and birds.

Sand heather has a restricted distribution in the sandhills north of Edmonton and the far northeast, although it can occur in large numbers colonizing ground after fire. A heath-like, cushion-forming shrub with small, crowded leaves covered in hairs (all features that reduce water loss), it has attractive yellow flowers reminiscent of small roses. Research has unearthed another adaptation: nitrogen is scarce in sandy soils, but cyanobacteria live in "green sand" in the plant's root zone and "fix" atmospheric nitrogen in the soil, making it available to the plant.

Rare and Uncommon Species

A number of rare and uncommon species grow in Alberta's sandhills and, while they contribute little to vegetation cover, they are of interest in their rarity. Examples from the south include western spiderwort, sand flatsedge, and small-flowered sand-verbena. In the far north, Tyrrell's willow, an Arctic species, is restricted to the Athabasca Sand Dunes. Long-leaved bluets is found only in the sandhill sites north of Edmonton. Like most of the rare sandhill plants, it requires periodic sand disturbance to thrive; perhaps because of its small stature, it gets crowded out by tall, dense vegetation.

Like plants, insects have their various preferences for loose, open sand versus consolidated vegetation. Indeed, the fortunes of many species may depend upon a balance of environmental factors such as fire, drought, and climate warming that alter vegetation cover in the dunes.

Further Exploration

Alberta's sandhills are worth exploring and protecting. They are the legacy of the last glaciation: infertile soils and varied topography that spur nature's adaptability and diversity, a boon for the natural environment. Sandhill communities are also dynamic; no futures are assured in a changing climate or with changing land use. ■

SELECTED SANDHILL LOCATIONS OF ALBERTA

NORTH

Athabasca Dunes Ecological Reserve (and Maybelle River Wildland Park)

Richardson Wildland Provincial Park

Fort Assiniboine Sandhills Wildland Provincial Park

Holmes Crossing Sandhills Ecological Reserve

Various Natural Areas, including: Bellis Lake, Bellis North, Bridge Lake, Clyde Fen, Halfmoon Lake, Nestow, Northwest of Bruderheim, Opal, Redwater

Edmonton Region: Bunchberry Meadows Conservation Area, Clifford E. Lee Nature Sanctuary, University of Alberta Botanic Garden

CENTRAL PARKLAND

Dillberry Lake Provincial Park

Wainwright Dunes Ecological Reserve (including David Lake)

SOUTH – MIXED GRASSLAND

Middle Sandhills including Prairie Coulees Natural Area

Pakowki Lake

For more information contact Stewards of Alberta's Protected Areas Association at sapaastewards.com

Patsy Cotterill is a retired botanist who lives in Edmonton. She is a board member of the non-profit Stewards of Alberta's Protected Areas Association and a keen advocate for Alberta's natural environment.

the Amazing Migration of Neotropical Birds

BY JIM BUTLER

Bird migration is among the most amazing natural phenomena on the North American continent, and the neotropical migrants are the most impressive. Bird migrants from Canada and the U.S. are divided into two groups: the Nearctic and the neotropical. The Nearctic group winters in the warmer parts of the U.S., particularly southern Florida and southern Texas. The neotropical migrants spend the winter in Central and South America, especially the Central American rainforest region, the drainage of the Orinoco River in Venezuela, the extensive Amazon rainforest, and the foothills of the Andes in Ecuador and Peru.

An important South American winter birding location for me has been in the Amazon forest of Ecuador, where I have seen many familiar bird friends from Canada, including several warblers (blackburnian, blackpoll, bay-breasted, and Canada) as well as redstarts and western tanagers. Another of my favorite birding destinations in the neotropics is the Calakmul Biosphere Reserve in the Yucatan Peninsula, home to 385 species of birds and 400 species of butterflies. It is one of Mexico's largest protected areas, where one meets a variety of resident birds, such as the eastern thicket tinamou, blue-diademed motmot, and black-headed trogon, perched alongside our northern bird visitors.

Canada warblers nest in Alberta's boreal region (and to the east) and winter mainly in Peru, Ecuador, and Colombia. BOB BOWHAY

My favorite group of neotropical migrants is the wood warblers. Many people consider these colorful warblers "candy for the eyes." They are mostly arboreal insect gleaners with a preference for woodland forests, often in the highest canopies of the tallest trees. Migratory warblers from North America differ from the resident non-migratory warblers of the tropics in several ways. Compared with resident warblers, migratory warblers have shorter breeding cycles, have shorter lifespans, and lay larger clutches of eggs (four to seven). They also show marked differences between the sexes and take a different mate each year. And of course, they undertake long-distance migrations.

Adaptations for Migration

Before departing the southern hemisphere, migrating birds prepare for their journey north by doubling their body mass through increased feeding, called hyperphagia. Stored fat provides 90% of the energy utilized by birds during long-distance flight, with the remainder from protein and a bit from stored carbohydrates. High-fat fruits and seeds provide all the essential fatty acids the birds need.

Much has been learned about bird migration over the years. Over land, they typically fly for half the night, travelling 150 to 300 km. They orient themselves using stars and the Earth's

magnetic field. One of the most interesting findings is that birds can sleep in flight, perhaps with one eye open for predators, in the manner of dolphins and whales. This fascinating phenomenon is called unihemispheric sleep. It is short and fragmentary, yet sometimes whole, with both brain hemispheres asleep in flight. Despite being asleep, the birds are still able to sustain aerodynamic control. (I suspected a segment of my students demonstrated something similar during my lengthy, low-light slide lectures.)

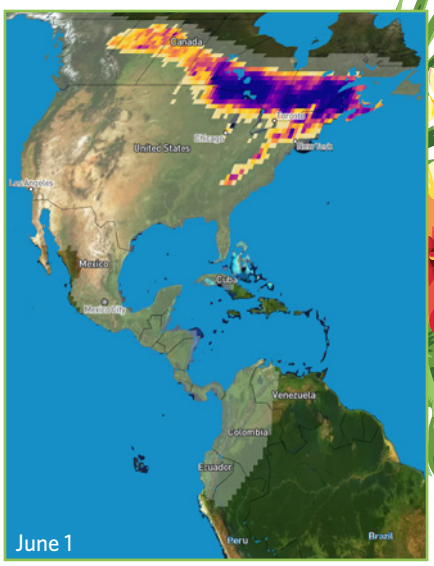
Researchers have proven that monitored frigatebirds sleep for periods during their long, gliding flights, which last for days. Old World alpine swifts, known for their rapid wing beats, have also been proven to sleep when aloft for days, using their unihemispheric capability. Research on sleep has not yet been applied to our North American wood warblers. Some research in England has referenced warblers, but these are from an unrelated family of warblers represented in North America by kinglets and gnatcatchers, all of which are moderate migrators, never travelling farther than Guatemala. I suspect that North American wood warblers might well have unihemispheric capabilities as well, which would explain much in the redoubtable ways of this accomplished group.

The Journey Begins

In late March, more than 150 species of North American birds suddenly and silently alight, up and out of the South American jungles, forests, and savannahs, as if summoned by sirens. Five billion birds launch into the air, seemingly on the same evening. How these birds manage to take flight nearly simultaneously, well out of each other's view, is an intriguing mystery. In the neotropical jungles, the resident birds, such as toucans, parrots, and motmots, must be relieved that tourist season is over and the treetops are quieter. Perhaps only the stealthy arboreal snakes that have been feeding upon the migrants are sad to see them go.

Migrating songbirds typically fly solo at first, but eventually they find themselves travelling and foraging in mixed flocks to improve foraging efficiency and provide greater security in detecting hawk predators who are also migrating. For example, Harris's hawks organize in groups to prey upon the growing numbers of gathering songbirds. Small songbirds, such as warblers, share the mixed cloud groups with a range of larger birds, but as the migration continues toward their nesting areas, the bird species increasingly cluster around their own kind.

Neotropical migrants initially travel northward through Central America into Mexico. There they face a decision: keep flying mostly over land, or take the shorter route across the



The distribution of Canada warblers at three time periods. eBird has proven to be an amazing tool for tracking bird migration. It is now possible to view where a species is located each week of the year based on eBird data: **science.ebird.org/en/canada/status-and-trends/abundance-animations**.

Gulf of Mexico — the largest island-free gulf of water in the world. Many birds choose the presumably safer land route, even though it adds hundreds of kilometres to their trip. Some continue straight north through Mexico and into the western U.S. Others head east from Mexico's Yucatan Peninsula to Cuba, a 300-km journey across water. From there it is only a short hop to the Florida Keys, where they are joined by migrants from the West Indies.

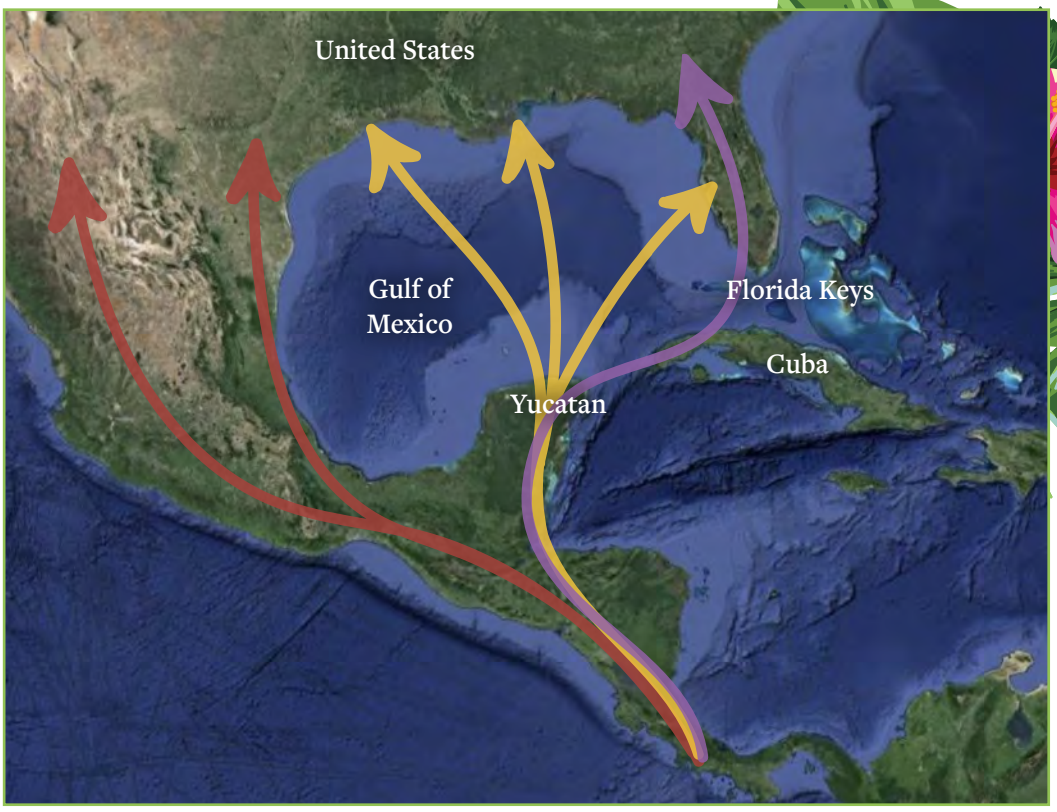
Despite the hazards, most neotropical migrants choose to cross the Gulf of Mexico. The primary staging area for this crossing is the Yucatan Peninsula, which juts northward into the Gulf and serves as a launching platform 300 km closer to the other side. Billions of birds make the crossing, making it the largest open-water crossing of land birds in the world, confirmed by radar readings. More than 30 species of wood warblers cross the Gulf each year, along with sandpipers, orioles, grosbeaks, indigo buntings, and many other species.

Crossing the Gulf of Mexico entails a non-stop 1,000-km journey. The birds wait up in the treetops till dark and finally, as nightfall approaches, they embark. The birds fly beneath the stars in loose groups, at about 50 km/h and at an altitude ranging from 300 to 1,500 m. The crossing can be as short as 12 hours with a good tailwind or a frightening 30 hours in a strong headwind. Fortunately, winds customarily blow northeast, aiding the migrants. But foul weather can be deadly, evidenced by drowned birds washed up on the U.S. shore. For those that make it, the U.S. shoreline and forest welcome the migratory birds and provide a welcome opportunity to rest and feed.

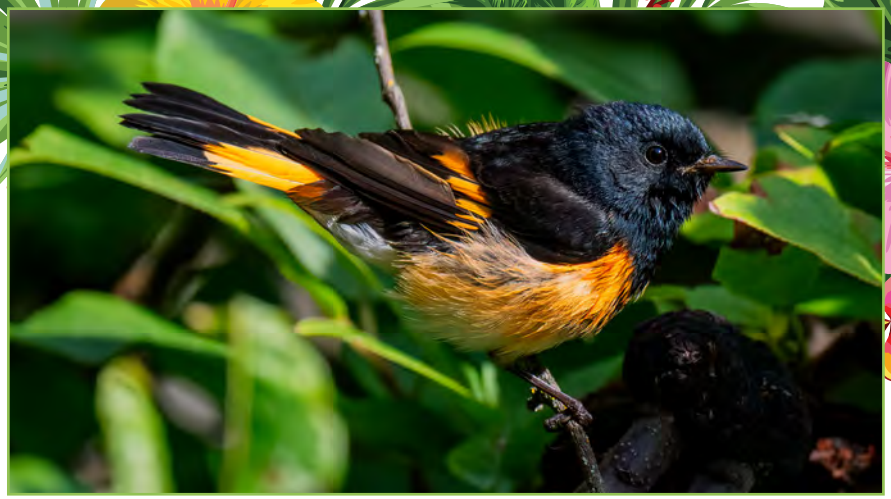
Blackburnian warblers nest in northeast Alberta (and to the east) and winter from Costa Rica south to Peru. BOB BOWHAY

On to Canada

I enjoy attending the spring Featherfest in Galveston, Texas to view shorebirds en route to the Canadian far north. Most of these shorebirds use the Atlantic Flyway on their northward



Returning neotropical migrants travel north through Central America, and after reaching Mexico they take one of several routes into the U.S. The water crossing over the Gulf of Mexico is the shortest, most popular route.



American redstarts nest throughout central and northern Alberta and winter in Central America, the Caribbean, Columbia, and Venezuela. BOB BOWHAY

Rose-breasted grosbeaks nest throughout central and northern Alberta and winter from southern Mexico down to Colombia and Venezuela. RICHARD SCHNEIDER

journey, making a pit stop along the shores of Delaware Bay, Maryland. Every year, hundreds of thousands of horseshoe crabs converge on the shores of Delaware Bay and Chesapeake Bay to breed and lay their eggs in the sand. The crabs spawn many times throughout May and early June, and it is estimated that each female lays around 88,000 eggs every year, depositing up to 4,000 eggs in each nest. During this time, shorebirds wisely lay over in Delaware Bay to feast on the freely available crab eggs. Some have been known to eat so much that they were almost too heavy to be able to take off. Many of these shorebirds will never be seen here in Alberta. Fully refuelled, they will head directly for the northern Arctic with limited pauses.

Once in the U.S., Canadian songbirds require roughly 14 days before they reach the Canadian border, typically in the Great Lakes Region, where they divide into western-bound and eastern-bound groups. Along the way they are greeted by bird-watchers in the thousands. Many migrating songbirds build up in large numbers along the southern shore of Lake Erie, waiting for the proper weather and favorable winds for crossing the lake, which is both large and known for frequent dangerous storms. A key destination is Point Pelee National Park, which is on a long peninsula that extends southward from the north shore of Lake Erie (it's the southernmost point of land in Canada). Although the Lake Erie crossing is much shorter than the Gulf crossing, it can still be treacherous. Under pressure to reach their breeding territories, the birds are sometimes tempted to embark at the wrong time, right into one of these storms. Some major fallouts have been observed in the park when birds have flown through storms and fog to reach the north shore, cold and exhausted.

Songbirds reach Alberta throughout May. By June, they have dispersed throughout the province to their individual nesting

Rufous hummingbirds nest along Alberta's foothills (and to the west) and winter in southern Mexico. TONY LEPRIEUR

Magnolia warblers nest throughout central and northern Alberta and winter mainly in Central America. BOB BOWHAY

Yellow warblers nest throughout most of Alberta and winter from southern Mexico down to Colombia and Venezuela. RICK PRICE

Neotropical migrants are greeting by thousands of birdwatchers all along their journey. JIM BUTLER

territories and are busy singing, mating, and eventually rearing young. Most songbirds seem to exhibit breeding site fidelity. An example is the familiar purple martin, a neotropical migrating bird that winters in large flocks in the jungle of southern Brazil and northern Argentina. These birds return to the same purple martin "hotels" year after year. Many other northern songbirds do the same, establishing their territory within yards of previous nesting sites.

My home in Edmonton is a notable annual migration layover, serving as a bird-friendly, forested space with flowing water. My yard list exceeds 100 species, and I often recognize the manners of familiar return visitors. It's humbling to know that these birds have survived aerial predators, storms, drowning, and exhaustion. And then there are the human-based hazards on land, like windmill towers, electric towers, and windows in homes and skyscrapers. I hope you can enjoy these delights this spring in your own backyard and nearby green spaces. We should all do what we can to aid their journey and to support their conservation. ■

Jim Butler is a Professor Emeritus of Forest Ecology and Wildlife from the University of Alberta. Founder of the Conservation Biology program, he is a highly respected naturalist and scientist worldwide.

Kleskun Hills
Alberta's Newest Provincial Park

BY MARGOT HERVIEUX

The eastern edge of the Kleskun Hills features badland formations similar to those found along the Red Deer River in southern Alberta. DRAGOMIR VUJINOVIC

Rising out of the farmland east of Grande Prairie is a height of land called the Kleskun Hills. The Hills contain the largest remaining tract of upland Peace River Parkland, a natural subregion found only in northwestern Alberta. This mosaic of native grasslands, aspen woods, eroded badlands, ponds, and tame pasture has now been officially designated as Kleskun Hills Provincial Park.

Ever since the area was resettled after the last Ice Age, the Kleskun Hills have been important to the local people. The Beaver and later the Cree First Nations hunted and collected berries and herbs in and around the Hills. When the first wave of European homesteaders arrived on the Edson Trail in 1911, their wagons skirted the Hills, leaving ruts that are still visible in the Park.

The Kleskun Hills, rising up over the surrounding plains, are the largest remaining tract of upland Peace River Parkland. REG ARBUCKLE

Geological History

The geologic history of the Kleskun Hills is told in the eroded badland formations along the eastern end of the Hills. These deeply eroded gullies and slopes expose layers of rock laid down over millions of years. Alternating layers of sand, clay, decaying plants from ancient river deltas, and volcanic ash were compressed over time to become the sandstone, shale, coal, and bentonite clay of the Wapiti Formation.

At the end of the last Ice Age, over 11,000 years ago, glacial Lake Peace flooded much of the current Peace River basin, including the land around the Kleskun Hills. When ice dams forming the lake broke, vast amounts of rushing water carved off the hills and started the erosion process that shapes them to this day.

Plants normally found in southern Alberta, such as prickly pear cactus, can be found in the Kleskun Hills. MARGOT HERVIEUX

The rocks of the Wapiti Formation are similar in age to those found in the Drumheller region of southern Alberta. Teeth and bone fragments of dinosaurs have been found in the Hills, as well as significant fossil remnants of early fish, mammals, and reptiles, including a new species of lizard.[1] Since eroding hillsides are great places to look for fossils, staff from the nearby Philip J. Currie Dinosaur Museum prospect at Kleskun each year.

A Unique Landscape

Today, the Peace River Parkland comprises a unique assemblage of habitats dominated by open areas of grassland. Here northern species of flora and fauna mix with those more commonly found in both the foothills and the grasslands of central and southern Alberta. The largest area of Peace River Parkland lies around Grande Prairie and gave the city its name. Two smaller areas of parkland occur near the town of Spirit River and along the north side of the Peace River between the towns of Fairview and Peace River. Most of this landscape has been developed.

Kleskun Hills Provincial Park is a significant addition to the province's protected area system. Not only does it protect a large area of threatened Peace River Parkland, but the stunning landscape is home to a unique assemblage of plants and animals.

The Kleskun Hills are one of the few intact remnants of Peace River Parkland and they provide an excellent spot to view an interesting mix of plants and animals. The palette of wildflowers is spectacular and changes every few weeks. The prairie crocuses of April are followed by three-flowered avens and prairie parsley in May, and carpets of shining arnica and slender blue penstemon in June. July brings harebells, common yarrow, and prairie rose. Meadows fill with wood lilies while the blossoms of fragile prickly pear cactus decorate the most eroded slopes. By mid-summer, the colours of ripening grasses and sage cloak the Hills. In addition to the cactus, mountain goldenrod and tufted white prairie aster are among the wildflower species that have disjunct populations in the Peace River Parkland.

The Peace River Parkland is also home to eight species of disjunct butterfly, including three found in Kleskun: the plains skipper, Uhler's Arctic, and Alberta Arctic.[2] Grassland birds also nest at Kleskun, including upland sandpiper, western meadowlark,

and vesper sparrow. Sharp-tailed grouse have at least one dancing ground, or lek, in the Hills. Mule deer are common and moose and elk also occasionally visit the area.

The Road to Protection

Intact parcels of Peace River Parkland are extremely rare. A 2005 survey report found that less than half of one percent remained, and most of that land was located along the breaks of the Peace River.[3] At the time of that survey, the largest area of upland habitat under some form of protection was the Kleskun Hill Natural Area — just 62 ha in size.

Unlike the adjacent flatlands, the Kleskun Hills were never cultivated. In the 1930s and '40s, the Hills were a popular picnic and berry picking spot, and the site was even recommended as a provincial geological park in 1947. Beginning in 1960, the County of Grande Prairie established a small campground and day-use area under a recreation lease. Kleskun Hill Natural Area, designated in 1979, was the first parcel to be formally protected. Additional pieces of land were acquired, with some assistance from the County of Grande Prairie, in the 1990s and 2000s with the hopes of adding to the Natural Area. The big breakthrough came in 2018 when the Government of Alberta was able to acquire a large private bison ranch with the goal of creating a park. In January 2024, the new Kleskun Hills Provincial Park, totalling 1,087 ha, was officially announced.

The Kleskun Hills are home to several grassland birds, such as this upland sandpiper. RICKEY SCOTTA

Kleskun Hills Provincial Park is a significant addition to the province's protected area system. Not only does it protect a large area of threatened Peace River Parkland, but the stunning landscape is home to a unique assemblage of plants and animals. Kleskun is a very special place long worthy of protection. ■

Margot Hervieux is a founding member of the Peace Parkland Naturalists and an honorary member of Nature Alberta.

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Many raptors, such as this red-tailed hawk, were infected with AIV from eating infected waterfowl. SYLVAIN BOURDAGES

Avian Influenza: A New Chapter in an Old Book

BY MARGO PYBUS

Avian influenza is an ancient virus. It coevolved naturally in wild waterfowl over millennia — perhaps ever since dinosaurs started developing feathers. But our view of avian influenza as a disease agent shifted dramatically in spring 2022, as Mother Nature provided something never seen before in North America. There was a dramatic change in the ancient relationship between avian influenza virus (AIV) and the birds in which it lives, and the final outcome has yet to be revealed.

As we saw with COVID-19, viruses can change a lot! But some do so more than others. Influenza viruses are among the most changeable, and the strains of this virus in wild birds are constantly mixing and reassorting in a genetic melting pot around the world. Given the virus' lengthy existence, genetic variation in AIV is extensive and can change rapidly. The predominant form of AIV can differ at continental, flyway, regional, and local levels. Data collected by the Canadian Wildlife Service from waterfowl across the prairies in the 1970s and 1980s revealed differences in the virus from year to year, month to month, species to species, week to week, and pond to pond. For example, the predominant form in mallards on one pond in one time period could differ from that in mallards on a different pond in the same time period, or differ from that in blue-winged teal on the same pond.

What Changed in 2022?

Normally the relationship between AIV and wild waterfowl is benign: the virus gains a place to live and reproduce but does not harm infected birds. However, in 2022 a novel strain of AIV — a specific form of H5N1 — was detected in dead wild geese and ducks during spring migration on all four North American flyways. Mortality was widespread across Canada and the U.S., from Atlantic to Pacific, from the Gulf of Mexico to the boreal forest.

The H5N1 AIV wave hit Alberta in early April 2022. Within a few days, Fish and Wildlife office phone lines lit up with sick and dead bird reports, largely snow geese in southern Alberta. But very quickly, most of central and east-central Alberta was awash with sick and dead snow geese and a few Canada geese. Infected geese were a bonanza for avian predators and scavengers, but the free food came with a high price. We received reports of significant numbers of sick or dead red-tailed hawks, great horned owls, crows, magpies, and a few peregrine falcons. Many, many owl and hawk nests were empty in 2022. At the same time, striped skunks displayed strange neurologic behaviour. In April and May

For more information about AIV in Alberta, visit **alberta.ca/avian-influenza-in-wild-birds.aspx** and for Canada-wide data go to **cwhc-rcsf.ca/avian_influenza.php**

Geese were one of the main groups affected by avian flu. This Canada goose is infected and exhibits a weak neck and clouded eye. CLIVE SHAUPMEYER

2022, more than 80 sick or dead skunks were reported from the same area where dead snow geese littered the landscape in central Alberta. We confirmed H5N1 in a sample of these skunks.

Infected birds and mammals displayed severe neurologic signs, including head tremors, weak necks, incoordination, and clouded eyes. Many raptors and corvids fell out of trees and died. Many skunks had severe seizures and convulsions before they died.

Through June and July of 2022, it was relatively quiet, although the virus showed up in a few cormorant and grebe colonies, with devastating effects on juveniles in some locations. During fall migration, a few individual ducks and geese tested positive for H5N1 but there was no widespread mortality. However, the outbreak continued through the winter in pockets of Canada geese that used open water in parts of southern Alberta, along with a few scavengers that ate the dead geese.

Overall, in 2022 we detected AIV (specifically North American HPAI H5N1) in a wide range of wild bird species, plus skunks and a few young foxes. Mortality was greatest in snow geese, great horned owls (adults and juveniles), red-tailed hawks, and crows. The same virus was detected in commercial and backyard poultry flocks involving approximately 1.4 million domestic birds across Alberta. It was a widespread and very "hot" form of AIV.

What Happened in 2023?

In an avian influenza context, spring migration and summer 2023 came and went with no detected mortality associated with the new AIV in wild birds or mammals (or poultry) in Alberta, nor anywhere across western regions of Canada and the U.S. There was a minor flurry of dead Canada geese with H5N1 during fall migration and among geese that spent early winter on open waters in southern Alberta, but not nearly the level of mortality seen in the previous year. Six infected skunks were also found in areas with dead Canada geese.

What Comes Next?

Spread of the deadly form of AIV fully reflects the interconnected nature of wild bird populations around the world. It initially began as a form of H5N1 that killed wild birds in Asia in 2006, which then spread to Europe and Africa. Eventually, it crossed over to North America, where it became a unique North American H5N1 against which wild birds here had no innate immunity to control the virus. As western hemisphere bird populations overlap, the virulent form of AIV systematically continued south through Mexico, Central America, South America and eventually, in October 2023, to bird colonies in isolated islands in the Antarctic region.

An H5N1 form of AIV still exists in wild waterfowl, mainly in mallards, but following the initial outbreak event, the mortality rate has declined. The genetics of the virus may be changing to something less pathogenic (after all, AIV is designed to live in harmony with wild ecosystems). And no doubt the protective immunity in wild ducks and geese also responds to limit the virulent form of H5N1. However, we can anticipate that the genetics of AIV will continue to percolate in its melting pot of wild bird populations.

Where things go from here will depend on what Mother Nature comes up with next. ■

Margo Pybus is the Provincial Wildlife Disease Specialist with Alberta Fish and Wildlife. She holds a PhD in Wildlife Parasitology from the University of Alberta and is an adjunct professor in the Department of Biological Sciences at the University of Alberta.

Beneath the Buzz: Alberta's Native Bees as Nature's Unsung Heroes

BY MEGAN EVANS

A bumble bee (*Bombus ternarius*) inspects dogbane. RICHARD SCHNEIDER

While honey bees often steal the spotlight, it is our native bee species that quietly work as the unsung heroes of pollination across Alberta's diverse landscapes. With 370 bee species native to our province, these small yet mighty insects play a vital role in the reproduction of flowering plants, including many of our agricultural crops and wildflowers.

Bee Diversity: Social and Solitary

You're likely familiar with bumble bees — big, fuzzy, loud attention-grabbers! The life cycle of a bumble bee begins in early spring when a mated queen emerges from hibernation. She searches for a suitable nest site, often in underground burrows or abandoned rodent nests (or sometimes in your home's insulation or under a step!). The queen then begins laying eggs, which emerge as adults in a few weeks. The newly emerged worker bumble bees take on various roles within the nest, such as foraging for nectar and pollen, constructing and expanding the nest, and caring for the brood. The queen continues to lay eggs, and the colony grows, ranging from a few dozen to several hundred individuals. Toward the end of the summer, the queen produces males and new queens, which leave the nest to mate with bees from other colonies. After mating, the males die, as do the founding queen and workers, and the newly mated queen finds a hibernation site to overwinter.

Despite their high profile, bumble bees aren't the most common type of bee. There are only about 30 bumble bee species in Alberta and they account for less than 10% of Alberta's total bee diversity. The other bees (340 species from six families and 38 genera) come in all shapes, sizes, and colours of the rainbow! We often refer to these bees as "solitary bees," because the majority are truly solitary. But mixed in are some species that are social and live like bumble bees, with a queen and workers and so on, and others that nest in aggregations.

The life cycle of a typical solitary bee begins with the female bee finding a suitable nesting site. This can be a hollow plant stem, a hole in wood, or a tunnel she has excavated

Centre: Sweat bee (*Halictus ligatus*). ALEXIS ROBERTS

in the ground. Once the nesting site is chosen, the female bee collects pollen and nectar and creates a small provision mass. She lays a single egg on top of the provision mass and then seals it off with a partition made of mud, leaves, or other materials. This process is then repeated, with each provisioned cell containing a single egg. The female bee may construct several cells within her chosen nesting site. Each egg transitions from larvae to pupa within its nesting cell and the adult bee typically emerges the following year by chewing through the cell partition and exiting the nest. Adult females search for suitable nesting sites to continue the life cycle, while males focus on finding mates.

How Are Our Bees Doing?

We often hear about bee declines in the news, so you might wonder how our native bees are doing. In Alberta, about 30% of our native bees are secure or apparently secure, 10% are rare or declining, and, alarmingly, a whopping 60% are unrankable because we simply don't have enough information to assess their status. Two species, the yellow-banded bumble bee (*Bombus terricola*) and gypsy cuckoo bumble bee (*Bombus bohemicus*), have been formally listed under the federal *Species at Risk Act* as Special Concern and Endangered, respectively.

The decline of native bees is attributed to several factors acting in combination, including habitat loss, pesticide exposure, climate change, and disease. As natural landscapes are converted into farmlands, cities, roads, and other modified habitats, native bee nesting sites and food resources are destroyed or become limited. Pesticides, even at low levels of exposure, can impair bee foraging abilities, navigation skills, and overall health. Neonicotinoids are a particular concern because they are typically applied as a seed coating prior to planting, which has led to widespread overuse. A more appropriate means of using these pesticides would be to monitor crops for signs of pests and apply them when early signs are detected. Climate-associated risks include rising temperatures, altered precipitation patterns, forest fires, and other extreme weather events. Such events impact bees directly and can also result in a mismatch between the emergence of bees and the availability of flowers for foraging. Existing and novel diseases (including those transmitted by honey bees) contribute to bee decline as well.

The decline of bees is part of a larger problem of insect declines, which are occurring across the world. Conservation efforts are crucial to halt and reverse these declines. Key measures include preserving and restoring habitats, reducing pesticide usage, promoting climate resilience, developing more stringent regulations pertaining to managed bees, and raising awareness about the importance of native bees.

Clockwise from top right:
Male *Agapostemon* on gumweed. SYDNEY WORTHY
Plasterer bee (*Colletes*) on alumroot leaf. MEGAN EVANS
Mining bee (*Andrena lupinorum*). MEGAN EVANS

Honey bee (*Apis mellifera*) on wild rose.
RICHARD SCHNEIDER

Long-horned bee (*Melissodes*) male on gumweed.
SYDNEY WORTHY

Honey Bees

Honey bees are not native to North America. They were introduced to the continent by beekeepers, essentially as a managed livestock species. In addition to producing honey (and who doesn't love honey!), they also play a crucial role in pollinating agricultural crops, and farmers rent hives for this purpose. Overwintering losses can be high — an estimated 50% loss was reported in 2022. However, the number of commercial honey bee colonies in Alberta has remained relatively stable (at over 300,000) despite these losses. In fact, through the import of expansion colonies, the number of honey bee hives in Alberta has doubled since the 1980s.

Unfortunately, the relationship between honey bees and native bees is not a positive one. Honey bees can compete for limited food resources and spread diseases. More research needs to be done to better understand these impacts and to implement mitigation measures, develop best practices, and limit the placement of honey bee colonies, particularly in areas where at-risk native bee species are present.

Bee Conservation

The Alberta Native Bee Council (ANBC) was established in 2017 to address gaps in native bee conservation. We work to achieve healthy and resilient native bees and their habitats in Alberta. An initial step was to launch a collaborative, provincewide program to monitor native bees to better understand which species are present and how they're doing. We've also developed some identification resources, created a citizen science bumble bee box monitoring program (read on for details on how to participate), developed best management practices to help protect our native bees, contributed to research on the status of native bees in Alberta, and contributed to recovery strategies for bees of concern in Alberta.

You can help make important contributions in conserving native bees. Here are some steps you can take:

- The best thing you can do for native bees is plant native flowers. Visit the ANBC website, **albertanativebeecouncil.ca**, for a list of native flower species that support native bees. If you can't plant native flowers, plant ornamental varieties.
- Reduce or eliminate the use of pesticides and herbicides in your garden or property to protect bees from potentially harmful exposure.
- Incorporate diversity in your landscaping and gardening. Native bees can nest in decaying stumps, under piles of branches, in sandy spots, and in hollow stems. Providing nesting habitat for native bees is just as important as providing food!
- Build a bumble bee box and participate in our citizen science bumble bee box monitoring program. You'll find instructions for building a bumble bee box on our website.

You can also build a solitary bee hotel, but be sure to check out ANBC's online guide before deciding on a design.

- Take up bee watching! You can watch bees right in your own backyard. If you're keen, you can send pictures of bees to iNaturalist or **bumblebeewatch.org**.
- Raise awareness about the importance of native bees by sharing information with friends, family, and community members through social media and conversations.
- Get kids excited about bees and encourage learning by using ANBC's downloadable resources for children.
- Understand that keeping honey bees does not support native bee conservation and may even harm native bees.
- Support the Alberta Native Bee Council, the Alberta Native Plant Council, or other grassroots non-profit organizations doing great work in Alberta by becoming a member or purchasing merchandise!

Identifying Bees

Bees come in all colours of the rainbow and vary from large, fuzzy bumble bees to teeny, relatively hairless sweat bees (see photos). It can sometimes be challenging to differentiate bees from other insects, but everyone can learn. A good first step is to learn to differentiate bees from flies, which can be tricky, especially when it comes to bee mimics. The key characteristics to look for are the eyes — fly eyes are much larger than bee eyes — and antennae — bees have long, jointed antennae whereas flies usually have short, stubby antennae. Also, all bees (and sometimes wasps and ants) have two sets of wings (four total). One set of wings are large forewings, and the other is a smaller set of hind wings. Flies only have a single set of wings.

In addition to physical differences, you can use behaviour to determine what kind of critter you're looking at. Female bees will almost always be observed actively foraging for pollen and/or nectar on flowers. Some flies mimic bee colour patterns and are often confused with bees, but they exhibit very different behaviours. For example, robber flies won't be found foraging for pollen and nectar, and hoverflies have a distinct hovering flight pattern.

You can learn more about bees on the Alberta Native Bee Council website, **albertanativebeecouncil.ca**. Start your journey into the world of native bees today by planning a bee safari anywhere that flowers are blooming! ■

Leaf cutter bee (*Megachile*) in flight. MATHIAS FENTON

Bee mimic hoverfly. Note the enormous eyes covering most of the head, lack of long antennae, and the single pair of wings, which indicate that this is not a bee. GAIL HAMPSHIRE

Megan Evans is a terrestrial ecologist with over ten years in the field. She is passionate about protecting biodiversity, especially our native plants and pollinators. She contributes to those efforts through her work as the Executive Director of the Alberta Invasive Species Council and President of the Alberta Native Bee Council.

Nature Kids

MY BIG ALBERTA BACKYARD

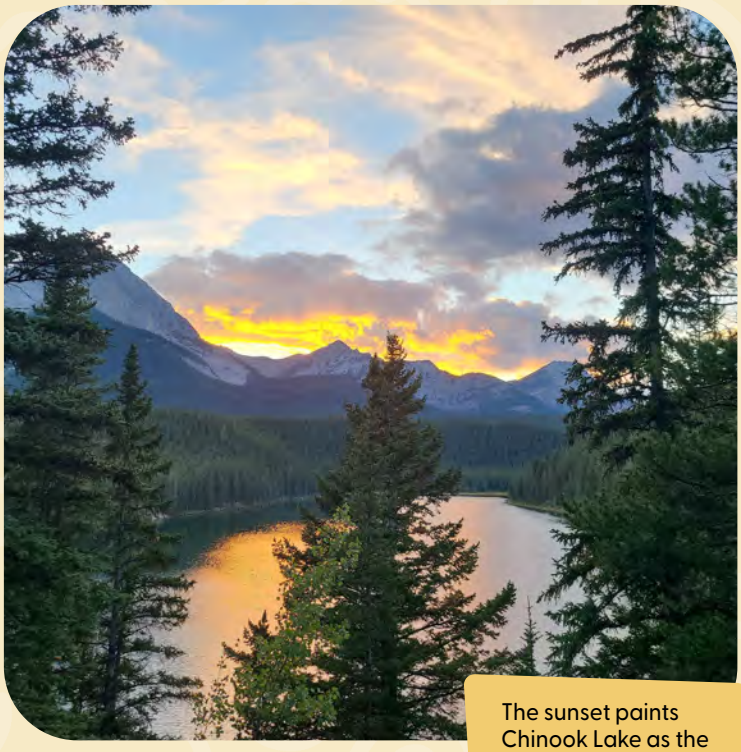
BY SARA LORENZ

Alberta 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 that you can find in your province, and the diverse wildlife that live there. This time, let's explore the beautiful scenery of **Chinook Provincial Recreation Area!**

What is a Provincial Recreation Area?

A Provincial Recreation Area (PRA) is a section of land that is designated (which means saved specifically) for recreational activities in nature. It is a smaller area than a national or provincial park but is conveniently located near campgrounds or day-use areas like picnic spots, so you can camp, fish, hike, bike, and much more!

Chinook PRA is a special spot located in southern Alberta, right next to the British Columbia border. Unlike some of the big parks in Alberta, like Jasper National Park or Banff National Park, Chinook PRA does not have a range of mountains. Instead, its unique landscape boasts just a few towering peaks that poke up from the thick forests here and there. Lots of lakes and waterfalls dot the landscape too. Mule deer and white-tailed deer roam the area, and if you have a keen eye you might even spot a grouse!

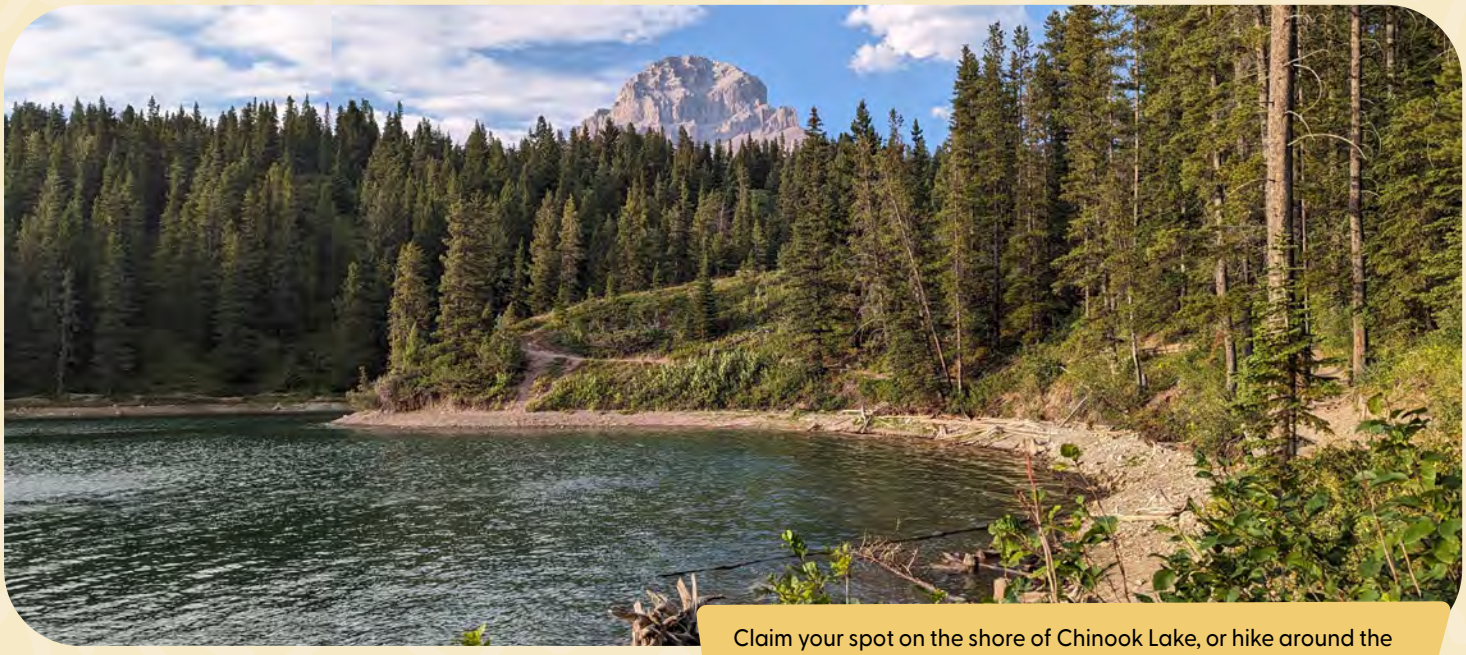


The sunset paints Chinook Lake as the day draws to a close.

Crowsnest Mountain is an iconic landmark in Chinook PRA. Take in the view from any angle at one of the many benches around Chinook Lake!

Chinook Lake

Chinook Lake is a piece of paradise where you can camp, swim, canoe, hike, bike, and cross-country ski. No matter which season you're visiting this stunning spot, you're sure to create unforgettable memories in nature. My favourite time of year to bask in the beautiful views of Chinook Lake is summer, and my favourite way to take in all it has to offer is camping and hiking. Campsites are a stone's throw from the water, with towering trees all around so you feel like you've truly escaped into the wild. One major benefit to camping at the lake is that you can experience sunrises and sunsets reflected on the water. There's no better



Claim your spot on the shore of Chinook Lake, or hike around the lake and towards Crowsnest Mountain to find Allison Creek Falls!

way to start and end the day! You can while away the hours in between splashing in the crystal-clear waters or hiking all the way around the lake. It's only a 2.25-km loop, and although there are a few short climbs, most of the path is packed-dirt pathways and boardwalks. At every turn, you can experience a new view of the majestic Crowsnest Mountain as it towers over the lush forest and is mirrored in the calm waters.

Allison Creek Falls

If that's not a long enough hike and you're craving further adventures, you can turn off partway around the lake and make your way through beautiful woods along a newly renovated and well-marked path to visit Allison Creek Falls. The hike is a pleasant 2.57 km one way and is easy to navigate. You'll cross the creek back and forth on brand new bridges to follow it to its source at the Falls, which cascade like a staircase. Natural land formations create small pools the water gently falls into – the perfect place to soak your feet and beat the summer heat! Layers of rocks and shallow pools make a natural playground.

Chinook Provincial Recreation Area is a small sample of Alberta's vast and varied landscape, but it has huge potential for awesome adventures in every season. This peaceful landscape is the ultimate spot to relax and connect with nature. ■

Sara Lorenz is an editor who loves to explore Alberta's natural landscapes. She feels most at peace in Alberta's wild places and has been passionate about camping and hiking in our parks since childhood.

The gently cascading Allison Creek Falls await at the end of an easy and fun hike.

Nature Kids OUT AND ABOUT

BY DR. JESSICA HAINES

How well do you know Alberta's waterfowl? Test your identification skills on a few of our species by matching the photos with the descriptions of these wonderful waterfowl below.

Fill in the blanks... Which photo matches my description?

Snow goose (white morph)

I am a white bird with black wing tips. My bill and legs are pink, though you may mistake it for orange from a distance. You can find me in giant flocks numbering in the thousands!

Snow goose (blue morph)

I am a white and blue-grey bird with black wing tips. Like the white morph, my bill and legs are pink, though you may mistake it for orange from a distance. You can find me among the same huge flocks as the white morph.

Canada goose

My head is mainly black except for a white patch in the shape of a chin strap. My beak and legs are black. I have a white belly with a brown and grey back. I am good at living with humans – so some people love me and some people think I'm a pest!

Greater white-fronted goose

I am brown across much of my body, but I have a white patch around the base of my tail and at the base of my beak. My legs are orange and my bill is orange-pink. I have black spots on my belly, which has earned me the nickname "specklebelly."

Sandhill crane

My body is grey with some rusty-coloured feathers. I have a long neck, long black legs, and a long black beak. I have a red forehead and a white chin. My young are called "colts" – they can gallop on long legs soon after they are born.

Trumpeter swan

I am a striking bird! All my feathers are white, which distinguishes me from snow geese. I have a black bill and black legs. I am the largest of all the waterfowl with a wingspan of over six feet!

Answers: 4, 6, 1, 3, 2, 5

Nature Kids ASK STUART

WITH HELP FROM DR. JESSICA HAINES

Welcome to **Ask Stuart**, in which our Nature Kids mascot, Stuart the 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 to **naturekids@naturealberta.ca** and it may be featured in a future issue. This time, our friend Dr. Jessica Haines, an Assistant Professor at MacEwan University who specializes in wildlife biology, is helping out with a couple of good goose questions.

A huge flock of snow geese gather on a pond in Alberta, getting ready for their trip to the Arctic tundra. LEO DE GROOT

Q Why are there so many snow geese around in the spring?

While other goose species gather in small to large flocks, snow geese gather in massive flocks that can have thousands of individuals! Snow geese spend their winters in the southern U.S.A., where they live primarily on agricultural lands. There, they form huge flocks which then migrate north in spring. These huge flocks use many places in Alberta as rest stops, where they refuel after their long flight from the south. They especially love the eastern and central parts of Alberta, where abundant wetlands and lakes give them safe spaces to stay during their migration. You can often find them feeding on agricultural fields in Alberta in such large numbers that they blanket the ground. When they take off the sound can be deafening, as thousands of these white birds swirl into the air. Eventually they leave Alberta to continue their journey north to breed on the Arctic tundra. The annual Snow Goose Festival, held in late April in Tofield, is a wonderful opportunity to witness this amazing migration event! ■

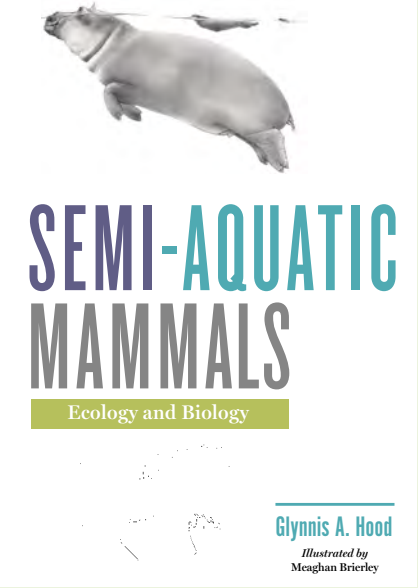
Fluffy Canada goose goslings cuddle together in the Alberta summertime. RICK SCHNEIDER

Q How do geese spend their year?

Geese spend their summers in Alberta, raising their newly hatched offspring (called goslings) with their mates. In the fall, they spend a lot of time eating to bulk up in preparation for winter – they have a long trip coming up! When not eating, you can often find them roosting on water, especially on large lakes where they can stay safe from land predators. When the weather turns cold and the lakes freeze, they migrate south to warmer climates for the winter. As temperatures warm in the spring, geese start their migration north again, ready to spend their summer enjoying the long, warm, Alberta summer days. ■

Book Review

REVIEW BY LU CARBYN



Semi-aquatic Mammals: Ecology and Biology

By Glynnis Hood. Illustrated by Meaghan Brierley.

Johns Hopkins University Press, 2020, 469 pp.

Available at press.jhu.edu

Semi-aquatic Mammals: Ecology and Biology is a remarkable book written by a remarkable wildlife biologist. Glynnis Hood spent her early life near a marsh in south-central British Columbia. She became enthralled by the diversity of life in that setting, which eventually led to a career in biology, first with studies in British Columbia, then a 19-year career with Parks Canada's warden service. That eventually led her to study the fascinating ecology of beavers in western Canada.

In 2007, Hood joined the staff of the University of Alberta, Augustana Campus, where her research has focused on the interface of freshwater ecology systems and wildlife ecology. She has spent many years studying beavers in western Canada and continues to do so today. But in this book, she has tackled a broader dimension: the biology and conservation status of 140 species of semi-aquatic mammals from around the world. These are animals that divide their existence between hostile terrestrial environments and the relative security of an aquatic setting.

Hood illustrates how various semi-aquatic species have evolved different traits to accommodate survival under a variety of ecological systems. She cleverly deals with a range of topics, including morphological and physiological adaptations, feeding ecology, reproduction, mating systems, sociality, parental care, predator detection and avoidance, conservation, reintroductions, and many more subjects. The book is highly informative.

I tested its usefulness by selecting four well-known species — beaver, muskrat, American mink, and American water shrew — that I had become familiar with in the years I worked as a professional biologist. Checking the book's well-organized index to find what Hood had written about these species, I was amazed to learn much more about these common species I have encountered many times.

The book is well written with simple prose yet also filled with technical details and informative tables that would serve well in a university text for an undergraduate course. Incredible amounts of data are presented that give the reader an instant overview on specific topics. For example, ask any biologist or naturalist about dive duration of semi-aquatic species, and you will likely not get accurate and detailed responses. Hood provides the answers: beaver, 15 minutes; muskrats, 12 minutes; American water shrew, 38 seconds!

The book is brimming with other information that is fascinating for the scientific community and for lay people interested in natural history. For example, the African hippopotamus lacks sweat glands but produces a unique equivalent from subdermal glands, which oozes over the entire body to protect the skin from sunburn, regulate temperature, and aid in healing wounds.

In the final chapter, there is an excellent overview of the conservation problems impacting our biodiversity, and its disappearance going into the 21st century.

Hood has presented a wonderful blend of scientific facts and natural history about mammals that are specially adapted to aquatic environments. I highly recommend this book to all nature enthusiasts. ■

Lu Carbyn is an adjunct professor at the University of Alberta, a retired Canadian Wildlife Service biologist, and a Provincial Director of Nature Alberta.

MEET A MEMBER CLUB

BY GLEN HVENEGAARD

Camrose Wildlife Stewardship Society

The **Camrose Wildlife Stewardship Society (CWSS)** began in 2002 to address greenspace loss and fragmentation, and the lack of sufficient consideration of greenspace and wildlife issues in planning efforts. Thus, CWSS seeks to raise awareness, knowledge, and support for the abundant wildlife and greenspaces in Camrose, and to emphasize the importance of these features as contributors to quality of life in the community. To this end, CWSS builds on collaborative projects among partners representing several environmental, service, municipal, and educational organizations.

CWSS has undertaken many projects to support its goals. First, an early survey found a high level of support for wildlife in Camrose; 93% of households enjoyed wildlife from their home, 76% attracted wildlife to their property, 93% supported wildlife stewardship projects, and 33% would volunteer. We also conducted bird surveys around the city to determine species-rich habitats. CWSS lobbied for the development of a Green Space Master Plan, which was approved in 2014. We have supported other groups in their stewardship efforts, such as tree planting for the city of Camrose, nest boxes for purple martins, and gardens for hummingbirds and butterflies.

CWSS adopted the purple martin as its flagship species because of significant engagement from local "martin landlords." The purple martin is a large swallow that depends almost completely on human-provided cavity nesting structures. It is a

species of concern in Canada because of its reliance on these structures. We raised funds to construct several "condominium-style" nesting boxes, and now support landlords throughout the city and area. We have also supported research on martin migration, dispersal, nest box preferences, and effectiveness of landlord activities. Our annual survey shows the martin population has fluctuated, but has generally increased over the past two decades. We also learned about landlord motivations and citizen science associated with martins. This information demonstrated that martin landlords wanted social activities, mentoring, and resources to support their stewardship efforts. As a result, in 2010 we began hosting an annual Purple Martin Festival to celebrate martins and other local wildlife.

At present, CWSS and the City of Camrose hire a summer coordinator to facilitate weekly summer educational events for the public, develop educational materials, analyze policies, and support stewardship activities. We have had many fascinating presentations, hikes, and workshops on topics related to natural history, sustainability, food, and more. Please join us on Thursday evenings at 7 from late May to early July at the Stoney Creek Centre in Camrose.

CWSS won an Emerald Award in 2015 for environmental excellence in the Community Group or Nonprofit Association category.

You can find us on Facebook (search Camrose Wildlife Stewardship Society - CWSS or Camrose Purple Martin Festival) or email us at **gth@ualberta.ca**. ■

Glen Hvenegaard is the Chair of the Camrose Wildlife Stewardship Society.

NATURE ALBERTA

Nature Kids

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We've connected families and kids with hands-on nature experiences for 10 full years! **Family Nature Nights** encourage kids to explore the natural world in their own communities.

Celebrate with us and inspire the next generation of nature-lovers!

Attend a Family Nature Night

with your little critters, Wednesdays in July and August. Details on our social media and at **naturealberta.ca/nature-kids**.

Set up a $10 monthly donation.

$10 a month pays for eight children to attend Family Nature Nights and experience unforgettable moments of connection with nature. Make memories happen at **naturealberta.ca/donate**.

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