

# NATURE ALBERTA

MAGAZINE

WINTER 2023  
VOLUME 52 | NUMBER 4



A COMMUNITY  
CONNECTED BY A  
LOVE OF NATURE



## Caribou Conservation

The Time for Action is Now

Waking Up With  
the Wolves of  
Wood Buffalo

Alberta's  
Amazing  
Ants

Citizen Scientists  
Unearth Data on  
Ground Squirrels





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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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## SHARING OUR SPACE

### Wildlife-Friendly Fences

The Alberta countryside is lined with barbed-wire fences. Fences serve many purposes on private property including confining livestock, marking boundaries, and discouraging trespassing. Sadly, wild birds can become entangled in barbed wire in poor-visibility areas such as strands running over open water or through tall grass in open meadows. I have personally witnessed a deceased duck, pelican, and long-eared owl hanging from barbed wire.

Fortunately, there is an easy trick that can help make your own barbed-wire fence more visible to wildlife in low-visibility areas. Winter is the perfect time to fix this problem; barbed-wire strings above water are accessible in areas that are completely frozen over. Whenever possible, it is best to completely remove unnecessary barbed wire. Otherwise, you can make the fence more visible to birds in flight by attaching flagging tape, old plastic jugs, or



Homemade reflector installed on barbed wire over a frozen wetland in the Ministik Bird Sanctuary beside the remnants of an entangled duck. STEPH WEIZENBACH

homemade reflectors to the strands of wire. You can make your own reflectors using sections of undersill siding cut to approximately 8-cm pieces and adding reflective automotive tape. This snaps onto the string of barbed wire with ease and is secure for many years.

I can't think of a more meaningful winter excursion than the time I snowshoed to access a remote wetland in the Ministik Bird Sanctuary to install reflectors along a stretch of wire straddling a frozen wetland. For more info on creating safe habitat for wildlife, visit [ealt.ca/safe-habitats-for-wildlife](http://ealt.ca/safe-habitats-for-wildlife).

— STEPH WEIZENBACH, NATURE ALBERTA PROGRAM DIRECTOR

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# Nature Alberta News

## 50th Anniversary Celebration and Fundraiser

After a two-year delay, we were at last able to gather to celebrate Nature Alberta's 50th Anniversary on September 10, 2022 at the Edmonton Community Foundation's (ECF) Hilltop House. Attendees donated \$7,000 to the Nature Alberta Endowment Fund to help us launch the next 50 years of success! This total was matched by Nature Alberta Vice-President Dr. Lu Carbyn and Joanne McDonald (in honour of the birth of her first grandchild). That amount was matched by Nature Alberta's reserves. And then that total was matched by ECF, meaning every donation was matched eight times, for a total contribution of **\$56,000!**

Thank you to ECF for providing the venue and catering, and of course

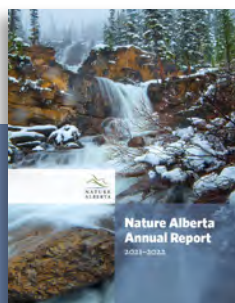
for the donation matching. Thanks to our keynote speakers, Nature Alberta Patron John Acorn and his son Benny, who contemplated the importance of passing on our love of nature. Thanks to those who donated nature experiences for our exciting live auction: Beaverhill Bird Observatory (BBO), Alina Schneider of Design by Nature Pottery, paddling expert Mark Lund, and Raquel Feroe of Edmonton River Valley Conservation Coalition. Thanks to Butterfly Wings n' Wishes for the door prizes. And thanks to Jana from BBO for bringing Remy the American kestrel to meet us. Most of all, thanks to everyone who came out to look back on 50 years of success and look forward to our future!



Nature Alberta Patron John Acorn and his son, Benny Acorn, shared the podium for their keynote address at Nature Alberta's 50th Anniversary Celebration. SUSAN MAY

## Nature Alberta Magazine School Initiative

Thanks to a printing overage and a generous donation by Bob Morgan, Nature Alberta was able to send a free sample of the Fall 2022 *Nature Alberta Magazine* to 218 Edmonton Public Schools! Each magazine came with a letter for school staff about accessing the free digital version and subscribing to the print version to provide students with this important resource on an ongoing basis.



Nature Alberta has accomplished a great deal in the past year. Read about all the exciting achievements in our 2021-2022 Annual Report at [naturealberta.ca/annual-reports](https://naturealberta.ca/annual-reports)

## Honouring Don Stiles

We are saddened by the passing of Honorary Lifetime Member Don Stiles. Don was a longtime Nature Alberta Board member and served as Nature Alberta President in 1990 and 1991. He oversaw the completion of *The Atlas of Breeding Birds of Alberta*, Nature Alberta's first completely self-published book, which would become the most successful atlas project ever published in North America. Don was the founder of the Calgary Area Nest Box Monitors and won the very first Blue Feather Award from Ellis Bird Farm. He was a dedicated member of our Nature Network who made a positive, lasting difference for nature in Alberta. He will be dearly missed.

# The High Cost of “Freedom”

BY RICHARD SCHNEIDER

**F**reedom. It’s a word we hear a lot these days. It’s what the people of eastern Ukraine are slowly regaining. It’s what the Uyghurs in China have been denied. And apparently, some would have it that freedom is under threat right here in Alberta.

If the idea that Albertans are horribly oppressed does not ring true to you, you are not alone. The strident voices demanding “freedom from government tyranny” are a small, but loud, minority. The rest of us are left scratching our heads wondering what all the fuss is about. “Should I be concerned? Maybe they’re on to something.” Rest assured, they’re not.

One can certainly understand the intrinsic appeal of freedom. Who wants to be told what to do? But let’s take a minute to think this through. What is the nature of the oppression we are under? The issue that has garnered the most attention recently has been the loss of personal freedoms related to COVID control measures. But that’s yesterday’s news. Most control measures have now been lifted, outside of specific sites such as hospitals.

Longer term, the main grievance relates to the perceived unfair treatment of Alberta within Canadian Confederation. Rather than applauding the benefits our resource economy provides to the rest of Canada, we get barbs and barriers to progress. No wonder bashing Ottawa has long been a

favourite pastime of Albertans, up there with hockey and curling.

But with Premier Danielle Smith’s new sovereignty legislation, Alberta’s fight with Ottawa has moved into a new and troubling phase. This legislation has nothing to do with reducing COVID control measures (which were mostly provincial anyway). It has nothing to do with getting pipelines built. And it has nothing to do with establishing Alberta’s “rightful” place in Confederation. It is simply a unilateral decision to ignore federal rules the premier doesn’t like. “Freedom.” Of a sort.

The flaw in Premier Smith’s reasoning is that the rules she is proposing to ignore are not Ottawa’s rules. They are Canadian rules. They concern values that transcend provincial boundaries and need to be addressed at the national scale.

A case in point is the protection of species at risk. The development of the federal *Species at Risk Act* was not something cooked up in the basement of 24 Sussex Drive. It was the result of a decade of difficult debate involving stakeholders from across the country. The constraints the Act imposes on resource development reflect the trade-offs that Canadians, including Albertans, believe are necessary to safeguard our natural heritage. The article on woodland caribou in this issue (page 18) provides a good example of the *Species at Risk Act* in action. This Act

has been instrumental in motivating meaningful caribou conservation action in Alberta after decades of provincial neglect.

The *Impact Assessment Act* is another piece of federal legislation vital for safeguarding Alberta’s environment. For example, a recent assessment made under the Act determined that the Grassy Mountain Coal project in southern Alberta would cause significant harm to the environment and the project was disallowed. This decision aligned well with the values of most Albertans, who view the protection of the Eastern Slopes as a priority. In stark contrast, the UCP government’s pro-development agenda for this region is remarkably out of step with public opinion. A 2021 government survey on coal development generated 25,000 responses, and a full two-thirds of respondents felt that the economic benefits of coal development are “not important at all.” Environmental protection was an overriding concern. It is very revealing that 85% indicated they were “not at all confident that coal exploration and development in Alberta is regulated to ensure it is safe, efficient, orderly, and environmentally responsible.”<sup>1</sup>

Let’s not forget climate change. Federal policies to reduce carbon emissions are a key point of angst among Alberta’s “freedom fighters.”



These policies are not seen as steps needed to limit the amount of future warming. They are seen as an unwarranted attack on Alberta's prosperity. The thing is, these attitudes are again seriously out of sync with the opinions of most Albertans. A recent poll found that 62% of Albertans feel that more should be done to address climate change, not less.<sup>2</sup>

It is no accident that these examples all involve environmental protection. Premier Smith is simply doubling down on the "development at all costs" agenda that Jason Kenney initiated. Recall Kenney's *Red Tape Reduction Implementation Act*, another piece of legislation designed to remove "unnecessary" rules that were getting in the way of industrial development. And don't forget UCP plans to increase forest harvesting by 30% — well above sustainable limits. As well as plans to expand irrigation well beyond the ecological capacity of southern rivers. You get the picture.

In summary, the "freedom" the UCP government is pitching mainly means "freedom from rules that constrain industrial development." But these rules, at both the federal and provincial level, were enacted for a reason. They are the mechanism by which resource development objectives are balanced against environmental protection objectives, as demanded by Albertans. Previous Conservative governments

understood this. Consider the following quote:

"There are more and more people doing more and more activities on the same piece of land. The competition between user groups creates conflict, and often puts stress on the finite capacity of our land, air, water and habitat. What worked for us when our population was only one or two million will not get the job done with four, and soon five million. We have reached a tipping point, where sticking with the old rules will not produce the quality of life we have come to expect. If we want our children to enjoy the same quality of life that current generations have, we need a new land-use system."

This passage from the *Land-Use Framework* was written just 15 years ago and reflected the views of Ed Stelmach's government. Unfortunately, the balanced approach to land use that Stelmach championed was never implemented. The Wildrose Party came into existence at that time and, sensing a political vulnerability, launched a disinformation campaign to convince rural landowners that the *Land-Use Framework* was a ploy to take away their land rights (which it was not). The architect of that campaign was none other than our freedom-fighter-in-chief, Danielle Smith. Needless to say, the *Land-Use Framework* quickly went

from a major planning achievement to a political liability, and faded into oblivion.

The upcoming election provides an opportunity to hold the government to account. We need a government that is willing to govern in the broad public interest and to defend, rather than ignore, rules to safeguard the environment. This election will be closely contested, so every vote will be important. ■

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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 currently serves as the Executive Director of Nature Alberta.



# The Recovery of Trumpeter Swans in Alberta

BY NICK CARTER

The musical, horn-like call of the trumpeter swan is a beautiful feature of Alberta's wilderness. There was, however, a time when the trumpeter swan had very nearly disappeared from our wetlands and pastures. What caused this magnificent bird's decline, and what does its future as a species look like in our province?

## Natural History

The trumpeter swan is the largest and heaviest bird native to North America, measuring up to two metres from bill to tail and weighing an average of 11 kg. This is a massive bird — no other Alberta waterfowl species comes even close.

Adults are entirely white, with a long neck, black beak and face patch, and black legs. Juveniles are mostly pale grey in colour and sport a pink blotch on the top of the bill. They obtain their fresh, crisp white, adult plumage as they enter their second year.

Trumpeter swans can easily be confused with tundra swans, which also occur in Alberta. Tundra swans are also pure white with black bills, but they are only about half the size of trumpeter swans. A small yellow patch in front of the eye is another distinguishing feature. In addition, tundra swans nest in the Arctic, so they are generally only seen during migration, whereas trumpeter swans can be seen in Alberta all summer long.

Trumpeter swans winter in the northern United States and return to Alberta in early April. Returning flocks feed on prairie croplands as they move north and then break off into pairs to nest in small wetlands across the Parkland, Boreal, and Foothills regions. They build their nests with aquatic vegetation, often on top of a muskrat den or beaver lodge, and monogamous pairs often return to the same nest site year after year. Four to six off-white



Trumpeter swans are massive birds, the largest native to North America, much larger than other waterfowl species. LEO DE GROOT





A distinguishing feature of the tundra swan, shown here, is a yellow patch on the beak just below the eye. TONY LEPRIEUR

eggs are laid in early May and the fuzzy grey cygnets hatch about a month later. Cygnets spend the summer with their parents before being driven off to fend for themselves at the end of the year.

During the summer, trumpeter swans feed mainly on aquatic plants found in shallow, quiet ponds, marshes, and small lakes. They forage either by skimming the surface of the water like a dabbling duck or by using their long necks to reach the muddy bottom and pry food items up by the roots. They also paddle their feet in place to stir up water currents to dislodge firmly rooted plants. Smaller waterfowl, like dabbling ducks, will take advantage of this behaviour, following in the wake of foraging swans and feeding on the vegetation they stir up. On the wintering grounds, their diet is mostly tubers and waste grain from agricultural crops.

Swans congregate in flocks on and around large water bodies during the fall in preparation for migration. Late bloomers are sometimes left behind. I once observed a lone juvenile trumpeter being harassed by a fox just outside of Wembley in late November, about a month after all other swans had left.

Alberta is an important region for trumpeter swans, and within the province there are several well-established breeding locations. The heart of their Alberta range is in the Peace Country, most notably in an area immediately north and west of Grande Prairie. This region is designated as an Important Bird Area, and trumpeter swans have been observed nesting in at least 28 lakes here. A well-known pair has occupied Crystal Lake in a suburb of Grande Prairie on a regular basis. The trumpeter swan has fondly become the official symbol of Grande Prairie, which is often referred to as the “Swan City.”

Additional nesting areas are scattered throughout northwestern Alberta, the southwest corner of the province around Pincher Creek, Elk Island National Park, and the foothills from Edson to Whitecourt. Look for them on reedy ponds and lakes, grazing in pastures, or flying overhead in these areas.



Because they are so heavy, trumpeter swans require a long runway to build up speed to get airborne. RICK PRICE

### Population Decline and Conservation Efforts

Historically, trumpeter swans were found throughout Alberta, but by the early 1900s the species was near extinction, mainly because of overhunting.<sup>1</sup> The bird’s white plumage was a popular fashion accessory and collector’s item. Swans were also

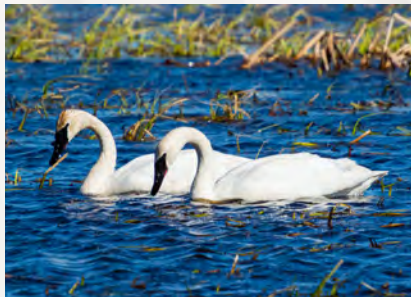
hunted for their meat, skins, and quills, which were used as writing pens. In later years, the drainage of wetlands for agriculture deprived the swans of important nesting habitat. By the early 20th century, the species was reduced to a few remnant populations scattered across North America, including one in the Grande Prairie region.

Early government protection measures and local efforts were instrumental in saving the trumpeter swan from extinction. The 1917 Migratory Birds Convention Act made it illegal to hunt trumpeter swans in Canada and the United States followed suit the following year. More locally, Saskatoon Island Provincial Park was established in 1932 just west of Grande Prairie as a critical refuge for swans and other migratory birds. This site was later designated as a federal migratory bird sanctuary. Another important step was the translocation of trumpeter swans from the Grande Prairie area

to Elk Island National Park in 1987, re-establishing a breeding population in the Central Parkland region. To support management efforts, formal surveys of swan populations began in the Grande Prairie area in 1953 and were extended to all of Alberta in 1985.<sup>2</sup>

More recently, the provincial government developed two comprehensive five-year recovery plans, released in





During the summer, trumpeter swans are usually found in shallow, quiet ponds, marshes, and small lakes where they feed on aquatic plants. NICK CARTER

2006 and in 2013.<sup>2</sup> The stated recovery goals of the 2013 plan were to maintain or increase the breeding population of trumpeter swans in already occupied regions and to expand the breeding range of the species into regions it had historically occupied, including the establishment of ten breeding pairs in the Beaver Hills. There have been no further updates to the recovery plan since 2013.

The recovery plans recognized that, even though hunting has been curtailed, trumpeter swans still face a variety of threats. Swans are sensitive to human disturbances, such as removal of shoreline vegetation, boating, swimming, and other forms of development and recreation in wetlands. Fluctuating water levels can drown nests during floods or cause habitat loss during droughts. Trumpeters also avoid sensory disturbances, such as nearby traffic and similar intrusions, and will abandon their breeding sites if they feel disturbed. Power lines are another hazard, causing injuries and death.

In terms of conservation actions, the 2013 recovery plan focused on preventing the loss of critical breeding and staging habitat through cooperation between government, industry, and private landowners. Additional steps included information and outreach efforts, research and monitoring of swan populations, developing partnerships among government and non-government agencies, and subsequent assessment of trumpeter swan conservation efforts.

### A Conservation Success Story

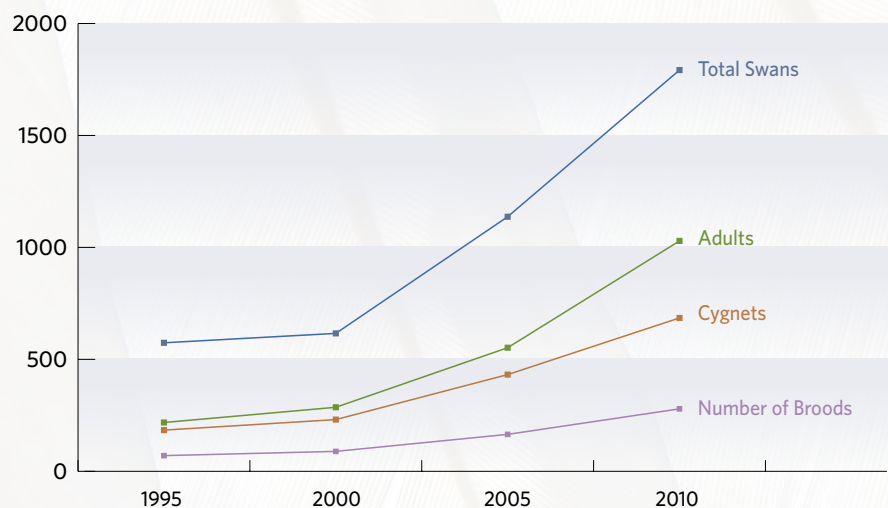
By 1995, Alberta's trumpeter swan population had increased to 792 individuals, with 67% of the total found in the Grande Prairie-Valleyview area.<sup>2</sup> Because of this positive trend, trumpeter swans were upgraded from "Endangered" to "Threatened" in 1997. With continued population growth, the species was further upgraded to "At Risk" in 2000.<sup>3</sup>

By 2010, Alberta's trumpeter swan population had increased to 2,821 individuals.<sup>2</sup> The Grande Prairie-Valleyview area was still home to most swans, accounting for 61% of the total (1,717 individuals). The second-highest

population was further north, between Peace River and Peerless Lake (863 individuals). And the Beaver Hills population, centred on Elk Island National Park, numbered 54 individuals (up from 11 in 1995).

A survey in 2015 showed even better results, with 7,734 individuals counted according to Provincial Wildlife Specialist Mark Heckbert, who leads the trumpeter swan recovery effort in Alberta. As a result, the species status in Alberta was upgraded to "Sensitive," where it remains today.<sup>3</sup> The Alberta government still considers the trumpeter swan to be a species of special concern, but because of the excellent population growth seen in the 2015 survey, it did not conduct a follow-up survey in 2020.

Given this impressive population growth, trumpeter swan recovery in Alberta can be considered a resounding success. But certain regions have seen better population growth than others, so there are still areas for improvement. For example, the Waterton-Pincher Creek region showed no growth from 1995 to 2010, and Lac La Biche went from nine individuals in 2000 to zero in 2010.<sup>2</sup>



Trumpeter swan population size by type, 1995–2010. A follow-up survey in 2015 found that the total population was 7,734. DATA SOURCE: ALBERTA ENVIRONMENT AND SUSTAINABLE RESOURCE DEVELOPMENT



Though the trumpeter swan is not fully secure in Alberta, the prospects for continued population growth and breeding range expansion are good. According to Heckbert, factors leading to continued recovery of trumpeter swans include better water quality in wetlands that are free from disturbance, as well as improvement in winter feeding conditions in the United States. Well-fed swans returning to Alberta in the spring are continuing to produce high numbers of cygnets.

Outside of northwestern Alberta, however, challenges persist. Trumpeter swans continue to breed in the Pincher Creek area, but the limited amount of suitable habitat is preventing population increase in the region. Moreover, while the reintroduction program to Elk Island National Park helped establish trumpeter swans east of Edmonton, they have not become as numerous in the general area as had been expected, and the goal of establishing ten breeding pairs in the surrounding Beaver Hills has not yet been realized. This, according to Heckbert, is puzzling, as the region should provide excellent trumpeter swan breeding habitat. The species has also failed to gain a footing in northeastern Alberta, possibly because of the colder and deeper lakes there.

Trumpeter swans remain sensitive to human disturbances from both industrial and individual activities, so now is not the time for us to ease up on protective measures. There are many ways that members of the public can help trumpeter swans in their recovery. The swans do best in the absence of



Trumpeter swans usually mate for life, producing four to six cygnets each year. NICK CARTER

human activity. We should give them space when we are in their habitat, avoid approaching them on foot or in boats, instead admiring them from a distance while leaving their wetland homes unpolluted. Be a respectful neighbour and refrain from loud, high-energy activities like power boating or shooting near swan breeding areas. Hunters should know their targets well and not mistake protected swans for geese or other waterfowl. Lastly, supporting causes and campaigns aimed at protecting wetlands from development and destruction will ensure that these majestic swans will always have a summer home in Alberta. ■

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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.





# Delta Dawn With the Wolves of Wood Buffalo National Park

BY ERIN McCLOSKEY

I waited five days and 50 years to see a wild wolf. Despite being a lifelong advocate for sound, humane wolf management and conservation in Canada and even having written a book about wolves,<sup>1</sup> I had never seen one in the wild. I have had fleeting glimpses of unidentified large canids in the Rockies, but no real confirmed wild wolf sighting. But as I sat crouched in the early hours of a June morning in a remote meadow within Wood Buffalo National Park (WBNP), the moment had come. And after five nights of waiting for this moment, it had come to me so generously that I was unsure if I was not still asleep in my tent, dreaming.

My arrival to this meadow came by invitation from Lu Carbyn, whose research of wolf-bison dynamics in WBNP began in 1979 and spanned 30 years. He has written countless research papers as well as *Buffalo Wolf*, for which he was awarded the Canadian Geographic Society's Best Wildlife Book of the Year. Still actively writing about the park, Lu organized a revisit of his research area this past spring with his colleague, Doug Smith, the senior biologist who headed the reintroduction of wolves to Yellowstone National Park, and two WBNP bison researchers. When he invited me to tag along, with a promise to see a wolf, I could not decline!

## A Unique Predator-Prey Dynamic

WBNP was established in 1922 to protect what remained of Canada's wood bison after overhunting reduced the species almost to extinction. With the myriad sedge meadows and lowlands associated with the Peace-Athabasca Delta, the park was an ideal refuge. Today, exactly 100 years later, the park supports a population of approximately 3,000 bison, which coexist alongside their natural predator, the wolf. The core range of WBNP is quite

RICK PRICE





Upper right: Wood Buffalo National Park is surrounded by an interconnected system of provincial parks, collectively forming the world's largest boreal protected area, encompassing almost 70,000 km<sup>2</sup>.

Above: The Peace-Athabasca Delta is a distinctive feature of WBNP. Within the delta, minor differences in elevation create a mosaic of lakes, marshes, wet meadows, shrublands, and islands of forest. ROBERT BELANGER

possibly the only place where bison are wolves' primary prey.<sup>2</sup> It is a rare and uninterrupted interrelationship between North America's largest predator and largest prey species.

Yellowstone National Park provides an interesting contrast.<sup>3</sup> Plains bison were re-established in Yellowstone in 1872 from a herd of 23 and they number several thousand today. Wolves were reintroduced in 1995. The wolves primarily prey on elk, followed by mule and white-tailed deer, and only occasionally bison (though bison calves are taken in summer). In WBNP, elk are absent, deer populations are relatively low, and moose are present but widely scattered throughout the forest. Therefore, the large bison herds in the park present the most reliable and easy-to-find source of food for wolves. By necessity, WBNP wolves have developed the hunting skills and the pack coordination needed to successfully take down mature bison, which is no mean feat given these animals can weigh over 1,000 kg.

In most places where bison exist today, wolves are hunted, trapped, actively culled with poisons, or have been exterminated. In WBNP, wolves are killed by Indigenous trappers. Bison

harvest is not permitted but co-management could introduce bison hunting, potentially even ranching. Hopefully, some area of the park will be preserved as the one place in Canada where the wolf-bison system can be unmolested by human harvest.

### **Treasured Refuge**

In addition to the unique bison-wolf dynamics, WBNP has a variety of other valuable ecological attributes. It is Canada's largest national park — read intact ecosystem — with an area of 44,807 km<sup>2</sup> (by comparison, Jasper is 10,878 km<sup>2</sup> and Banff is 6,641 km<sup>2</sup>). Its vast size and remoteness make this park an invaluable conservation area. Moreover, in recent decades conservation groups, local Indigenous communities, and local industrial players have led efforts to establish new provincial wildland parks adjacent to WBNP. Today, WBNP serves as the ecological heart of the world's largest boreal protected area, encompassing almost 70,000 km<sup>2</sup> — more than twice the size of Vancouver Island.

The park is a nesting and staging area for great concentrations of migratory waterfowl from all four North American flyways. When whooping cranes were pushed to the brink of extinction in



Erin McCloskey and Lu Carbyn in Wood Buffalo National Park. DOUG SMITH



In June, most bison cows are with young calves and form large matriarchal herds. LU CARBYN

the early 20th century, WBNP served as the nesting ground for the last remaining birds. Fortunately, through intensive ongoing conservation efforts, whooping cranes have slowly recovered. This is one of the world's most celebrated conservation accomplishments. WBNP still serves as the nesting grounds for the main whooping crane population, which now numbers over 500 individuals.<sup>4</sup> Moreover, surplus eggs from WBNP birds have been used to start a new flock that nests in Wisconsin and winters in the southeast United States, as well as a couple of non-migratory flocks.

A key feature of WBNP is the Peace-Athabasca Delta, most of which lies within the park. At 3,900 km<sup>2</sup>, this is the largest freshwater inland river delta in North America, and one of the world's largest. In 1982 it was designated a Ramsar site (Wetland of International Significance). The park also features extensive (370 km<sup>2</sup>) salt flats, the remnants of a sea that once covered this land hundreds of millions of years ago.

The distinctive karst topography within the park creates karst caves that are used as hibernacula by snakes and bats. WBNP hosts the northernmost hibernaculum of red-sided garter snakes on the continent, as well as an underground karst cave hibernaculum of endangered little brown myotis, northern myotis, and big brown bats. WBNP is also summer habitat for three species of tree bats: the silver-haired bat, hoary bat, and eastern red bat. All these bats benefit from night skies unpolluted by human light sources; in 2013 the Royal Astronomical Society of Canada named the park as the largest Dark Sky Preserve in Canada.

### A Park Under Threat

In 1983, WBNP was declared a UNESCO World Heritage Site. But despite the many things to celebrate in WBNP, there are seemingly just as many threats. In 2020, UNESCO assessed the park's State and Trend to be "high concern and deteriorating."<sup>5</sup> The drying of the delta because of climate change is a major problem. In addition, there are ever-expanding upstream developments, including the W.A.C. Bennett and Site C dams in B.C. and contamination of ground and surface water from nearby oilsands mines. UNESCO has currently designated this site "significant concern" with risk of being downgraded to "in danger"; if so, it would be one of only two sites in a G7 country to be given this designation. The other current 52 sites on this list are there due to war or civil unrest.

We must do all we can to mitigate and remove the threats to this incredible part of our province. For now, allow me to bring you back into the park with my story. To access this remote national park, which receives only a few hundred tourists per year on the Alberta side, we flew in a small commuter charter plane from Fort McMurray to Fort Chipewyan. This community is only accessible by vehicle in winter when a temporary ice road traverses the myriad waterways in the region.

### Exploring the Sweetgrass Meadows

We hired a local guide to speedboat us for three hours up the Peace River and drop us at Sweetgrass Landing. From there we made our way along an overgrown path leading to the warden station at the shore of Lake Claire. This was one of Lu's base camps when he was conducting his early field research, and the



historic bison corrals still stand here from when nearly 7,000 plains bison were shipped in from Wainwright in the 1920s.

We arrived to find a herd of bison resting, grazing, and wallowing in the meadow surrounding the station. It was a large herd, over 50 by rough estimate, with lots of cows and calves. The meadow was extensively flooded, with the shores of Lake Claire reaching almost to the cabin. Where Lu once observed bison and wolves running across the fields, we found ourselves paddling canoes. The shoreline's abundant waterfowl, including avocets and sandhill cranes, looked like they were at an overcrowded beach party.

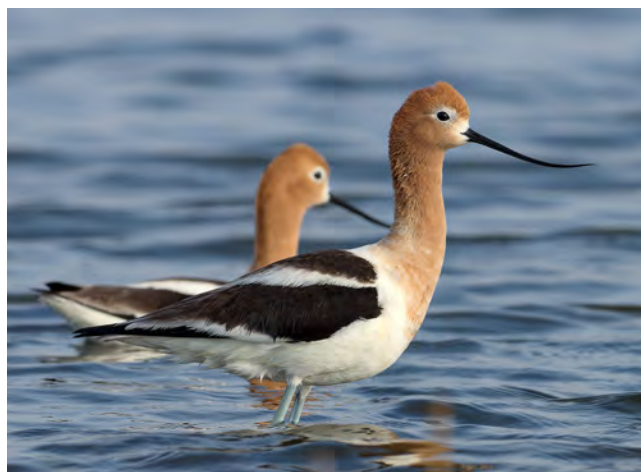
After nearly a week of hiking and canoeing throughout the area, we had seen bison daily, a bear on day one that kept us vigilant for his return all week, and what I would call "countless" birds (the birders in the group counted 82 species including nine warblers). Wolves, however, we had neither seen nor heard, even though we had found plenty of signs of their presence — fur, scat, tracks.

I retired to my tent on the fifth evening and managed to doze off to sleep despite the light of the northern June evening, the hoofing and snorting of passing bison, the continuous singing of forest and shorebirds whose dusk and dawn chorus merge in the brief interval of nighttime, and the subconscious concern about a potential return visit from our campsite bear. In my semi-lucid state, I became aware of a heightened pounding of bison hooves. Then I heard Doug call out to me from his neighbouring tent. I was worried we were about to be stampeded by a herd of bison! Instead, Doug said: "Wolves!"

### Sunrise Stare-down

My head shot out of my tent, but my sleepy eyes were taking their time to focus in the dim 3 a.m. light. Within the hoof-beaten dust clouds I could make out the silhouettes of seven wolves milling around a defensively poised herd of about a dozen bison. Doug called me over, offering his binoculars while he went to the cabin to get Lu. There he left me, crouched in this meadow, peering through the binoculars of one of the world's top wolf researchers. Surely, these have viewed more wolves than most any other binoculars on the planet!

My eyes were graced with a moment of clarity as I watched the action of this wildlife saga slow to a pause. The wolves had stopped their pursuit and were laying low, watching the bison for the next opportunity to resume the hunt. My breath also slowed as all went quiet and a single large, pale grey wolf rose while looking directly at me. And then she began walking calmly



An array of remarkable WBNP residents:

Above: Already a striking bird in black-and-white plumage, come breeding season the blush head and blue legs of both the male and female American avocet make this bird even more beautiful.

RICHARD SCHNEIDER

Left: Standing up to 1.5 m tall, the whooping crane is the tallest bird in North America.

Below: Swarms of midges at this time of year do not seem to bother this bison, who stands stoically unperturbed.

LU CARBYN





Most wolves in the park are grey or white in colour, owing to the proximity with arctic wolves, whereas wolves in the Alberta Rockies are more frequently black. RICK PRICE

and intently towards me. When she didn't stop walking, I began counting her paces: ten, eleven, twelve... I reminded myself that wolves do not attack people as I continued counting: eighteen, nineteen, twenty paces. Then she stopped. She must have been only another twenty paces from potentially reaching me, but stood still to stare at me while I stared back.

As the just-risen sun cast golden morning light, I could see her shaggy fur, her winter coat shedding in clumps. I could see the mist of her breath. I watched her shake her head to scatter the bugs biting her ear. And I could see her eyes looking at me. The world disappeared, but for this wolf, until our staring at each other was interrupted by the other pack members rising to their feet and resuming their pursuit of the bison. The pale wolf glanced over her shoulder to see her pack back in action, then she glanced back at me for one last look, spun around and ran back with the other wolves as they chased the bison herd away from our camp and behind a grove of trees.

I turned my attention back to the cabin, wondering if Lu and Doug had seen any of this. They were behind the cabin window, jumping up and down and waving their arms in the air cheering! Lu's face lit up with the expression of somebody reunited with an old friend; these wolves were the descendants of his research wolves, still chasing the descendants of the bison of yesteryear. This will undoubtedly be one of my ultimate lifetime experiences.

Euphoric the entire next day, I didn't think things could get any better. But they did. That evening I lay in my tent and fell

asleep listening to that pack of wolves howling their primordial harmonies. It is my sincerest wish that we do right by the bison and wolves of WBNP and ensure that they will always find refuge in this unique and spectacular wilderness. ■

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Erin McCloskey graduated from the University of Alberta with an MSc in Environmental and Conservation Sciences in 1998. She has worked with conservation organizations around the world, has authored several natural history books, and is a professional editor. She currently serves on the Board of Nature Alberta as Secretary.





### WHITE ON WHITE

*"Winter wildlife doesn't take snow days. Although this long-tailed weasel wasn't successful in finding prey during this session, it did provide some excellent photo opportunities. Posing is always a bonus!"*

—Susan Ingham



### TINY BUT TOUGH

*"Chickadees are remarkable. Nothing more than a little ball of fluff, yet they are able to take whatever winter throws at them."*

—Jack Waller

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

# Exploring the Amazing World of Ants

BY JAMES GLASIER



The Hercules carpenter ant (*Camponotus herculeanus*) is a common species that has large colonies under rotten bark and in rotten logs and stumps.

JASON HEADLEY

Ants are an integral and ever-present part of Alberta landscapes. Most people accept ants in their backyards, though some, like my neighbours, are at constant war with them, drowning them with the hose, pouring gas on them, or applying insecticides. Despite these efforts, I'm pretty sure their lawns have just as many ant mounds from one year to the next. Besides being resilient, ants are diverse, numerous, and ecologically important. A recent peer-reviewed study estimated that there are 20 quadrillion ants on our planet (that's 20 with 15 zeros behind it).<sup>1</sup> A number of such unimaginable magnitude emphasizes how impactful they are to our world.

## The Basics

Before I delve into Albertan ants, there are a few general things everyone should know about ants. The study of ants is called myrmecology. Ants evolved about 100 million years ago (the age of the dinosaurs) and share a common ancestor with wasps and bees. Because of this evolutionary connection, all three groups are placed in the order Hymenoptera; each is in its own family, ants being in the family *Formicidae*. Scientists estimate there are currently about 25,000 species of ants worldwide, most of which are found in the tropics.

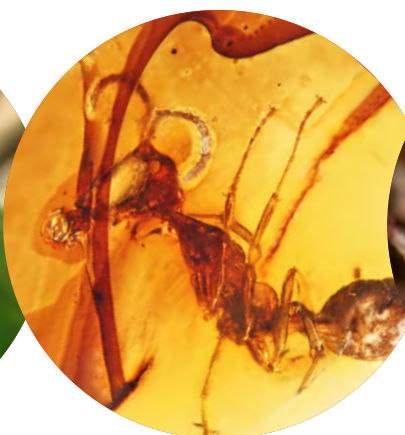
Ants are eusocial insects, living in colonies that have nonreproductive and reproductive castes. Most of the ants you will encounter are wingless workers. These are all sisters and all are sterile. Winged ants are the reproductive caste. Queen ants remove their wings after they mate, while male drones die after mating.

## Ants in Alberta

The story of ants in Alberta goes back at least 74 million years.<sup>2</sup> Fossilized amber from Alberta has preserved several ant species, including the strange-looking hell ant (*Haidoterminus cippus*), which has elongated mandibles that moved up and down instead of side to side like most ants. The more modern-looking *Chronomyrmex medicinehatensis* looks like an ant you might see living today. Both ants lived in a tropical coastal environment very different from Alberta's present climate.

In modern Alberta, there are many remarkable ants, though only limited research has been done on them. Janet Sharplin laid the groundwork with her excellent 1966 report, *The Annotated list of the Formicidae (Hymenoptera) of Central and Southern Alberta*. This report documented 40 ant species from Alberta, including notes on nest shapes, natural history, and even reports of frogs hibernating in ant nests.

Sharplin's work and ant collection, stored in the E.H. Strickland Museum at the University of Alberta, provided an excellent starting point for my own research, beginning in 2008. By collecting additional ants from across Alberta, exploring museum collections, and reviewing newly published literature, I was able to publish a key to the ant species of Alberta in 2013.<sup>3</sup> In this report, my co-authors and I added 54 species to Sharplin's list, bringing the number of known ant species in Alberta to 94. Fast-forward to 2022, and the list now sits at 117 species. This dramatic increase suggests there is much more we have to learn about ants in our province.



Left: Any winged ants you see are part of the reproductive caste composed of queens and drones. KATJA SCHULZ.

Middle: A hell ant (*Haidoterminus cippus*) from the Cretaceous Period, preserved in amber.

RYAN MCKELLAR

Right: Western thatching ants (*Formica obscuripes*) build large thatched mounds housing huge colonies with tens or hundreds of thousands of workers.

JASON HEADLEY





Left: Ant larva are an important food source for many animals. RYAN HODNETT

Middle: Turfgrass ants (*Lasius neoniger*) are found in farm fields and other early successional habitats, beaches, and sand dunes. JASON HEADLEY

Right: Myrmica ants on a dead worm. Ants play a critical role in recycling nutrients. JASON HEADLEY

Given that there are only 117 ant species in Alberta (a far cry from the ant diversity of the tropics), why are they considered to be ecologically important? By comparison, there are thousands of species of beetles in Alberta. Even birds number over 300 species. The answer lies in ant abundance. Though there may not be many species, there are many individual ants. And they play several important ecological roles.

### Ecological Importance

In Alberta, many vertebrates rely on ants for food. During July, some bears will eat ant larva almost exclusively and some birds, such as woodpeckers, feed on ants year round. Ants are important for nutrient cycling, bringing nutrients into the ground and turning over soil by excavating their nests. Ants are major predators of other insects, even pest insects such as spruce budworm. A single colony of ants can consume tens of thousands of insects a year.<sup>4</sup> Lastly, ants create habitat for smaller organisms; their colonies provide protection, food, and a temperature-controlled home.

Organisms that require ants to survive are called myrmecophiles, and they include beetles, collembola, mites, spiders, leafhoppers, aphids, and butterfly larva. For example, the caterpillar of the endangered half-moon hairstreak butterfly (*Satyrrium semiluna*) relies on ants for protection from predators and parasites, and in return it provides a sugary excrement for the ants to eat. In contrast, Ulke's sap beetle (*Amphotis ulkei*) relies predominantly on ants for food. It tricks ants into feeding it by using its antennae to beg, as if it were another ant. The ant, believing it has met a hungry sister, regurgitates food for the beetle to eat. There are many other invertebrates that rely on ants for survival, making the presence of ants integral to invertebrate biodiversity.

The study of ants is not for the faint of heart because some ants are notoriously difficult to identify. Separating species can come down to the number or shape of teeth on the mandible or how many setae (hairs) are on the head — using a microscope is sometimes the only way to get a positive identification. Of the 22 genera of ants in Alberta, *Formica* has the most species (45 recorded). At a glance, *Formica* take the form of a typical

ant, but the range of variation is extraordinary. Individual species can be shiny or dull and coloured black, light amber, dark brown, or both red and black. They can range from large, 7-mm thatch ants to small, 2.5-mm field ants. *Formica* are one of most ecologically important ants because they can live in large colonies (up to 100,000 individuals), are major predators, and can be found provincewide.

Even though *Formica* ants are the most common, there is much we do not understand about their life history, habitat preferences, and potential conservation issues. The same holds for many ant species found in our province. More work is needed to better understand ants, their ecological impacts, and the impacts of land use, climate change, and invasive species in our province. We have a lot of work to do to understand how our changing world will impact these species.

Ants are awesome, and in Alberta they can be found almost everywhere. The next time you find an ant mound, in your lawn or elsewhere, I hope you will pause, take a closer look, and appreciate ants just a little bit more. ■

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James Glasier did his undergrad studies at the University of Alberta and then travelled to Australia to complete his PhD at the University of New South Wales studying ants and insect ecology. He then returned to Canada and has focused his studies on biodiversity, conservation, and biological interactions. He currently works at the Wilder Institute - Calgary Zoo leading the Half-Moon Hairstreak Conservation Project.

Alberta's caribou are found in small groups in forested landscapes. PEUPLELOUP

# ACTION FOR AN ICON

## *Why Do Alberta's Caribou Keep Declining, and What Can We Do About It?*

BY RICHARD SCHNEIDER



**T**he caribou is one of Canada's most iconic species; its image is still featured on Canadian quarters. But across the country, the species is not doing well. Despite its high profile and the millions of dollars we've poured into research, the caribou's story is one of progressive decline. As a conservation biologist beginning my career in the early 1990s, I've had a front-row seat to the unfolding drama. Here I will explore the key challenges that make caribou conservation so difficult and provide an unvarnished perspective on what needs to change.

### **Caribou, Wolves, and Moose**

The caribou that reside in Alberta are a subspecies referred to as woodland caribou. Unlike the barren-ground caribou of the far north, known for their large migratory herds, woodland caribou only form small groups and do not undertake long-distance migrations. Historically, they were distributed throughout the forested parts of Alberta, but over the last century their range has contracted and become fragmented.

The main limiting factor affecting caribou populations is wolf predation.

Woodland caribou were once distributed throughout Alberta's forested lands, but today they are restricted to 14 core ranges.

Caribou are not much larger than deer and are relatively easily killed by wolves. Their strategy is one of avoidance — woodland caribou reside in habitats that wolves generally ignore. To understand how this works, we need to look at the system from the wolf's perspective.

In boreal forests, moose are ubiquitous, elk are generally absent, and deer are uncommon (at least historically). Therefore, moose form the main prey base for wolves in boreal systems. In the past, wood bison would have been important as well, in localized areas. Wolves also eat rodents, hares, and other animals, but these species cannot support a wolf pack over the





Moose form the main prey base for wolves in boreal systems. RICK TALLAS

Wolf predation is the main limiting factor on caribou populations.  
KELTIE MASTERS

Caribou use peatlands to spatially separate themselves from  
moose and wolves, which prefer upland forests.  
RICHARD SCHNEIDER

course of the year; it's moose that wolves ultimately depend upon.

Moose are browsers, mainly eating the leaves and twigs of shrubs and young trees. This means moose are usually found in upland forests, especially young forests regenerating after fire. The north's vast peatlands, comprising more than a third of Alberta's boreal region, offer little of interest to moose. Most peatlands are either open, with a ground cover of moss and lichen, or covered with scraggly, lichen-covered black spruce and tamarack. Either way, there is not much to eat if you are a moose and so these areas are generally avoided. And without moose, there is little to attract wolves either.

It follows that, if you are a caribou trying to avoid being eaten, peatlands are the place to be. The trouble is, you still need to eat, and peatlands are challenging habitats for most herbivores.

But caribou are not like most herbivores. They do just fine on a diet of lichens, mosses, and conifer needles — exactly what's on the menu within peatlands.

Spatial isolation together with a low natural rate of reproduction provide a winning strategy for caribou survival.<sup>1</sup> There are simply not enough caribou present to make it worthwhile for wolves to spend time hunting in peatlands, which are otherwise devoid of prey. The occasional caribou is taken through chance encounters, but wolves spend most of their time in upland areas, where the moose are. This is how caribou have been able to persist in Alberta's boreal region for thousands of years, despite their inherent vulnerability to wolf predation.

The same basic pattern applies in the mountains. But instead of peatlands, mountain caribou inhabit large areas of old-growth forest. Older

coniferous forests offer little in the way of browse for moose, but plenty of arboreal and ground lichen for caribou.

### A Forest Transformed

Like many large herbivores, caribou were subject to overhunting in the 19th and early 20th centuries. However, the declines were much less extreme than for many other game species, mainly because caribou were difficult to access. There had been some range contraction by the 1950s, but caribou were still widely distributed across Alberta's forested lands and individual populations remained viable.

Over the past 70 years, the overriding threat to caribou has been habitat transformation resulting from the industrialization of Alberta's forests.<sup>1</sup> First came large-scale logging operations in the foothills, beginning in the 1950s. Then oil and gas extraction expanded from the prairies into the foothills



and boreal region. This brought roads, seismic lines, and utility corridors into forested lands and facilitated further expansion of forestry into the north. By the 1980s, there was virtually no part of the province that had not been accessed, other than the far northeast corner.

The effects of these transformations on woodland caribou were understood early on. Biologist Jan Edmonds summarized the process in a paper in 1988, and the basic thesis she put forward has been verified by dozens of research studies since then.<sup>2</sup> In a nutshell, forestry cut-blocks, oil and gas wells, seismic lines, and access corridors all entail cutting mature forest and resetting the successional clock. At the regional scale, this means more food for moose, leading to growing moose populations. This in turn means more

wolf packs and more chance encounters between wolves and caribou. Increased forest access also results in increased poaching and vehicle collisions. The net effect has been a steady decline in caribou populations across the province.<sup>3</sup>

### Initial Conservation Efforts

Initial caribou conservation efforts were led by provincial wildlife managers. They began by curtailing sport hunting of caribou in 1981, and then designating the species as provincially threatened in 1985. They also recommended habitat protection; however, they had little authority over the decisions that mattered. While wildlife managers were recommending the retention of intact forest for caribou, other branches of government were allocating vast tracks of caribou habitat for new industrial developments.

The 1990s were a period of heightened environmental salience,

and all across the country there were high-profile public protests over unsustainable forestry practices.<sup>4</sup> Thereafter, stakeholders began to be included in resource decision-making. In Alberta, caribou committees and working groups were established at the provincial, regional, and range levels. The stakeholders within these groups were roughly divided into two camps: those who sought substantive protective measures for caribou (government wildlife managers, conservation groups, and Indigenous communities) and those who favoured the status quo (most resource companies and local communities). Unsurprisingly, these two camps could not find common ground. Elected officials, for their part, remained on the sidelines and made no attempt to resolve the impasse.

The ensuing decades were characterized by relative stasis. Every few years a new strategy or set of management guidelines would be released, but meaningful on-the-ground protection of caribou was not forthcoming. The only area of substantive progress was in research. The resource sector was unwilling to entertain constraints on development, but it was willing to provide funding for caribou field studies. There was a hope that such research would lead to win-win solutions that permitted resource extraction while also maintaining caribou. Research efforts could also be cited as evidence of conservation effort, offsetting the lack of demonstrable change on the ground.

From the perspective of caribou, this period was disastrous. Industrial development continued to expand



■ Access Routes ■ Protected Areas

Access routes, shown in red, are extensive in Alberta, mainly because of oil and gas development and forestry operations. Protected areas are shown in green. DATA FROM GLOBAL FOREST WATCH CANADA



Understory vegetation flourishes after forest harvesting, providing plenty of browse for moose. ELI SAGOR

and intensify, forests continued to be transformed, and caribou populations continued to decline.<sup>4</sup> By the late 2000s, Alberta's caribou were acknowledged to be among the most threatened in Canada. All the while, poll after poll showed that Albertans placed a high priority on the conservation of biodiversity, including the recovery of caribou, even if it came at the expense of resource jobs. Why the disconnect?

The root of the problem is that caribou conservation demands politically challenging choices between environmental protection and economic development. There are no win-win solutions here: caribou and industry simply don't mix. Furthermore, caribou are distributed across much of Alberta's forested lands, which means that substantive efforts to protect caribou will impact the resource sector and rural communities broadly. This has been viewed as politically dangerous ground by successive Conservative governments, whose core voting base resides in rural Alberta. As a result, elected officials have been keen to offload these tough decisions to stakeholder working groups rather than tackle them directly. The trouble is, these working groups were never given the mandate or the authority to resolve broad land-use conflicts. The result was decision by indecision.

### The Feds Step in

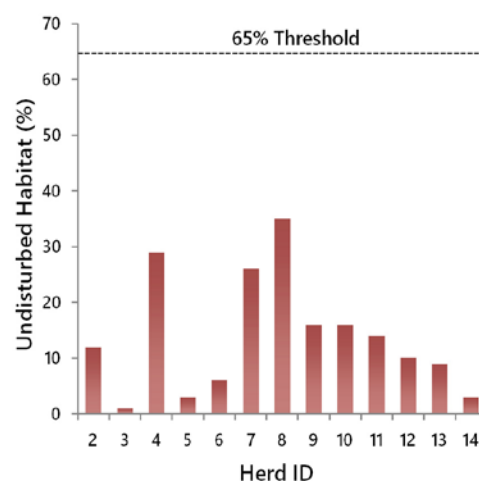
Canada's *Species at Risk Act* was passed in 2002 and the boreal population of woodland caribou was listed as "Threatened" the following year. This prompted the development of a federal caribou recovery strategy in 2012, which marked a turning point in caribou conservation in Alberta.<sup>5</sup> Not only was the bar raised for recovery actions, but also, for the first time, these actions were non-discretionary.

What differentiated the new federal strategy from earlier provincial efforts was the hard line it took concerning the identification and management of critical habitat. The federal recovery team defined critical habitat in functional terms: within each range, a minimum of 65% of the area would have to be maintained in an undisturbed state. The provinces were given until 2017 to develop range plans that would describe how the 65% target would be achieved for each herd.

Alberta failed to complete individual range plans by the 2017 deadline. However, it did release a provincial range plan in 2017, which was meant to serve as a template for future herd-level planning.<sup>6</sup> The provincial range plan described how 65% of each range would be maintained in an undisturbed state through an integrated landscape management system. The centrepiece of the proposed system was a multi-use access network that would be developed for each range. According to the plan, it would be possible, using spatial optimization techniques, to design a network that provided access to virtually all resources while still achieving the 65% intact habitat target. The plan also included measures to reduce habitat fragmentation from forestry operations by aggregating harvest blocks.

The provincial range plan acknowledged that achieving the 65% undisturbed target would require substantial restoration efforts because existing levels of disturbance were very high in

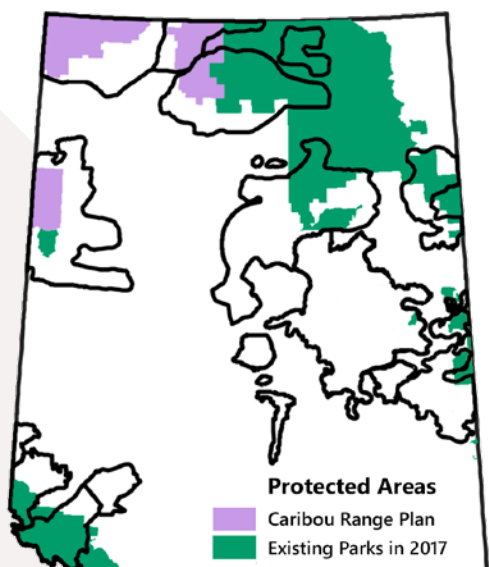
all ranges. Under the plan, restoration would be applied to industrial features that were no longer in use, particularly seismic lines and well sites. In addition, access routes would gradually be transitioned to the new optimized network. Given the extent of the existing footprint, it was estimated that it could take 50 to 100 years to achieve the 65% undisturbed target in all ranges. The range plan prescribed the use of wolf control



In all Alberta caribou ranges, the current amount of undisturbed habitat is far below what is needed for caribou viability (range numbers correspond to the range map on page 18; data unavailable for Herd 1). DATA FROM THE ALBERTA CARIBOU RANGE PLAN<sup>6</sup>

to maintain the viability of caribou herds during the extended restoration period.

Significantly, the range plan also included protected areas as a recovery measure. Three large sites in northwest Alberta were identified as proposed caribou reserves. These three sites provided the best opportunity for full protection because the level of resource conflict was minimal, in contrast to most other caribou ranges.



The Alberta Caribou Range Plan proposed several new protected areas in northwest Alberta.<sup>6</sup> Caribou ranges are outlined in black.

Though the 2017 range plan had serious deficiencies — chief among them the long period required for restoration and the need for prolonged, widespread wolf control — this was the first caribou management plan with a meaningful chance of success. Moreover, the plan amounted to a cumulative effects management strategy that would benefit many species besides caribou. Such a strategy had been promised under the *Alberta Land-Use Framework* but was never implemented. The caribou range plan provided a working model for how it could be done.

### What Does the Future Hold?

It's been more than five years since the 2017 range plan was released, providing enough time for us to gauge progress. An optimist would point to several positive developments. First and foremost, most provincial caribou herds have stopped declining (for the first time in decades). Second, range plans are now being developed for individual herds and two have been completed as of this writing. The completed plans reconfirm Alberta's intention to achieve the objectives and targets in the federal recovery strategy and they incorporate the core strategies outlined in the 2017 provincial range plan. Third, several seismic reclamation projects are now underway.

Unfortunately, there are also reasons for pessimism. To begin, the three large protected areas identified in the 2017 plan were abandoned after the local municipality pushed back. Giving up full protection in exchange for a regional management plan which allows for further industrial development is a serious blow. It's even more troubling when you consider that the four affected caribou herds had the highest potential for long-term viability of all provincial herds and that the level of resource conflict here was lower than anywhere else.

Another reason for pessimism is that, in the five years since the provincial range plan was released, not a single road has been reclaimed. Yet all the while, new forestry cutblocks, new oil and gas wells, and new roads were added to the already excessive levels of disturbance within caribou habitat. And while some seismic lines have been reclaimed, on an ad hoc basis, new lines are still being cut. Add everything up and we are today farther from the target of 65% intact habitat than when the plan was released five years ago. This is hardly encouraging progress.

It gets worse. In late 2021, then-Forestry Minister Devin Dreeshen announced that the government planned to increase the rate of forest harvesting by 30%. This is directly contrary to the needs of caribou and indicates that, at the highest levels, the UCP government has no real commitment to caribou recovery or to sustainable land-use in general. Instead, the government seems intent on turning the clock back to the 1980s, when industrial development trumped all other land uses. Under these circumstances, the prospects for the 2017 range plan are bleak. A plan is like a hot-air balloon; without a flame to provide lift, it isn't going anywhere. In a planning context, political will is the flame needed for implementation.

Finally, the only reason that caribou populations have stabilized is because we are now killing wolves on a massive scale. Wolves are being shot, trapped, and poisoned in seven caribou ranges across the province. The ecological disruption arising from the removal of an apex predator is a serious concern, as are ethics of wolf control. Most (though not all) conservationists have reluctantly accepted wolf control as a temporary measure needed to keep caribou viable until their habitat has been restored. However, it is increasingly apparent that wolf control is being used as an alternative to meaningful and timely restoration. Support for wolf control is likely to vanish under these circumstances.

In summary, caribou present an extremely challenging case because they are widely distributed and require large areas of intact habitat to survive. This pits caribou against the resource sector and the rural communities that depend on this sector for their livelihood. As such, this is a political problem that will not be resolved through the development of range plans. These plans are a necessary component of



caribou recovery, but without a change in political will there is little hope of meaningful implementation.

Presented with competing values and societal divisions, we face a difficult question: who gets to decide how public lands are managed? Roughly three-quarters of Albertans reside in urban centres and most of these individuals would protect caribou in a heartbeat, even if it meant some job losses. But would it be fair to allow urbanites to unilaterally force through land-use decisions that could disrupt the lives of rural Albertans? Arguably not. On the other hand, should individuals who live in remote areas have a veto over decisions concerning public lands? Even if it means that species such as caribou would disappear? This doesn't seem right either. Yet this is exactly what happened in northwest Alberta in 2018. Even though there are over 4.5 million people in Alberta, a petition led by County of Mackenzie, with a population of around 11,000 people, was enough to squash the proposed creation of caribou reserves in that area.<sup>4</sup>

Clearly, an approach is needed that balances the values and needs of rural Albertans with those of broader society. This presents a political challenge for Alberta's Conservatives, whose core supporters are mostly rural. But it's not an impossible challenge. A decade ago, the Stelmach government managed to find a way forward through the *Land-Use Framework*. Unfortunately, Stelmach's balanced approach was abandoned by the Kenney government, which instead emphasized industrial development over other values. The policy agenda being advanced by Premier Smith is even more extreme and disconnected from broad public concerns and priorities. The future for caribou is exceedingly bleak if Danielle Smith is elected Premier in the spring of 2023.

Other than a change in government, the main hope for caribou is the *Species at Risk Act*. Alberta has until 2024 to complete its range planning for all herds. If these plans are deemed inadequate for caribou recovery, the province may be compelled to do better through the "safety net" provisions of the *Species at Risk Act*. However, it is unclear whether the federal government will choose to get into a fight with Alberta over this issue. Moreover, we are moving into a legal gray area, so it is very hard to predict how things will play out.

If you can't bear to stand by while Alberta's caribou slowly disappear and you can't tolerate the idea of killing wolves indefinitely, I urge you to take action. We have an election coming up, providing all of us an opportunity to hold our government to account and to ensure that environmental values are not disregarded. Over the past four years, in addition to the neglect of species at risk, we have seen proposals to delist provincial parks, proposals to expand coal mining in the Eastern Slopes, and proposals to increase forestry beyond sustainable limits. It's time for a change in direction, and your vote can make it happen. ■

Richard Schneider is a conservation biologist who has worked on species at risk and land management in Alberta for the past 30 years. His recent book, *Biodiversity Conservation in Canada: From Theory to Practice*, includes a detailed case study on Alberta's caribou. Richard currently serves as the Executive Director of Nature Alberta.



Woodland caribou require large areas of intact habitat to survive.  
THARTMANN

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# ***AERIAL SUPREMACY***

## *Which Is the Superior Predator: The Peregrine Falcon or the Golden Eagle?*

BY JIM BROHMAN

**F**ew people can say they were once neighbours with two of the fastest birds in the world. But when a pair of peregrine falcons nested atop the Clinical Sciences Building at the University of Alberta, across from where I worked, I had a front-row seat to their comings and goings. I watched as the peregrines dive-bombed smaller birds out of the sky, sped past my window with prey clutched in their talons, and dropped the remains after feeding.

I was certain the peregrine was the most formidable of all the sky's predators. That is, until I had a chance

a few years ago to go on a boat tour into the Khuzamateen Valley off the coast of Prince Rupert. Near the end of the tour, numerous eagles dove from great heights to feed on bait tossed overboard by the boat staff. As I photographed this wildlife spectacle I was amazed by the speed, agility, and size of these birds.

More recently, I was able to watch and photograph a spectacular golden eagle in southeastern Alberta as well, which made me wonder how the hunting adaptations of the agile peregrine stacked up against the huge and powerful golden eagle.

Before launching into a comparison of these two birds, it is useful to review the behavioral and physical characteristics shared by all birds of prey, which include falcons, eagles, ospreys, and hawks:<sup>1</sup>

- Diurnal (daytime) hunting.
- Strong, hooked bills.
- Powerful, curved talons that are both long and sharp.
- Large retinas and high visual acuity providing excellent long-distance vision.
- Superb flying skills.
- Reversed sexual dimorphism, meaning that females are larger



Left: Peregrine falcons typically nest high on steep cliffs. GORDON COURT



Right: Golden eagles typically prey on small mammals. This one was hunting Columbian ground squirrels in the Bob Creek Wildland Park in southwest Alberta. RICHARD SCHNEIDER

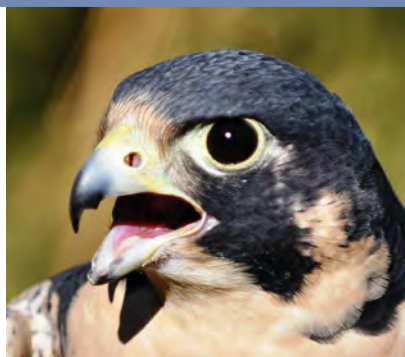


than males (the opposite of the typical pattern).

We'll begin our comparison by looking at the distinctive features of the peregrine. This is one of the most widespread birds in the world, nesting on every continent except Antarctica.<sup>1,2</sup> It nests on cliff ledges along mountain ranges, river valleys, and coastlines, and in recent decades it has begun nesting in tall buildings in urban centres. This has turned out to be a successful strategy, given the abundance of pigeons and other prey species present within cities.

The peregrine falcon has a roughly one-metre wingspan and weighs around 1 kg. It feeds mainly on birds, including a wide variety of species. Over the years, I have identified sora rails, black-headed gulls, grebes, coots, teals, ring-billed gulls, and pigeons below the peregrine nest I've been watching. The peregrine falcon captures its prey in flight, either by a rapid pursuit or a head-first dive called a stoop. During these dives, often from great heights, it can attain speeds over 300 km/h, making it the fastest species on Earth.<sup>3</sup> The peregrine's top horizontal pursuit speed while chasing prey is 112 km/h.

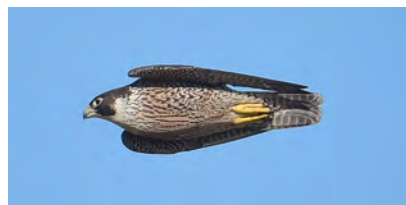
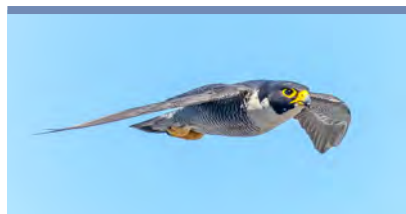
The falcon strikes its prey with a clenched foot, stunning or sometimes killing it with the impact, then turns to catch it in mid-air. It instinctively bites through the cervical vertebrae of the captured bird to kill it. A specialized triangular structure on the upper beak, called a "tomial tooth," assists with the killing process. Perhaps this explains why I found so many severed heads and headless carcasses of prey species



A male peregrine falcon; note the tomial tooth near the front of the beak. JIM BROHAM

below the nesting box on the Clinical Sciences Building (especially sora rail heads)!

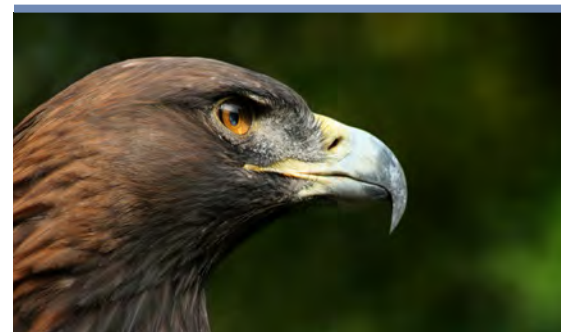
Peregrines are built for speed, with a teardrop shape, long stiff wings, and contour feathers made to withstand high-speed dives and manoeuvres. The wings are pointed and swept back and there are no wing slots. This shape minimizes drag forces and maximizes speed at the expense of lift. The falcon has to compensate with a rapid, powerful wing beat to remain airborne. This is not a bird designed for soaring.



The wings of a peregrine falcon are designed for speed and maneuverability rather than soaring. PAUL BALFE

Like a bullet! Peregrines bring their wings in close to their body during high-speed flight. DAVID JENKINS

Now turning to the golden eagle, it is a larger bird with a wingspan of approximately two metres and weighing up to 6 kg (six times as heavy as a peregrine).<sup>1</sup> It is the most widely distributed species of eagle, found throughout the Northern Hemisphere. In Alberta, the golden eagle nests mainly in the southern third of the province, in both mountainous areas and native grasslands.<sup>4</sup> It builds an enormous nest, usually on a cliff ledge or in a tall tree, and reuses the nest for several years.



Golden eagles have a powerful hooked beak. They lack the tomial tooth of peregrines. RICHARD BARTZ

The golden eagle feeds primarily on small mammals, including ground squirrels, prairie dogs, hares, marmots, grouse, carrion, and occasionally the young of mountain ungulates. It employs a variety of hunting techniques, tailored to the prey and terrain. Sometimes it will scan for prey while sitting motionless on an elevated perch. In other cases, it will search for prey while soaring high in the sky. When prey is spotted, the eagle will dive down to capture it with outstretched talons. It also commonly performs "contour cruising hunting," in which it flies low to the ground to surprise and capture prey.





Golden eagles often search for prey while soaring high overhead. Note the prominent gaps in the primary wing feathers. IMRAN SHAH

The golden eagle subdues and kills its prey with its talons, which are reported to be able to generate an astounding 400- to 800-PSI closing pressure. For comparison, the closing pressure of red-tailed hawks is approximately 200 PSI, and that of adult humans is about 50 PSI.

Like the peregrine falcon, the golden eagle is designed for speed and can perform spectacular high-speed dives. However, in contrast to the peregrine, the eagle's wing is also designed to enable extended periods of soaring while searching for prey. In particular, the wing area is quite large relative to body weight, which is referred to as low wing loading. This wing design allows the eagle to remain airborne at slow speeds without stalling and to use thermal updrafts to remain airborne without any wing flapping at all.

A second characteristic of the eagle wing that affects flight style is the presence of slotted wing tip primary feathers. The first five or six primary feathers have conspicuous gaps, which act as individual airfoils, enhancing lift. These specialized wing tips also help reduce wind vortices, which are circular patterns of rotating air that come off the tip of the wing during flapping, causing drag and reduced lift.<sup>5</sup> Slotted wings are analogous to the semi-vertical winglets present on the wing tips of most modern passenger jets, which are likewise



Modern airliners often feature upturned wing tips, analogous to a soaring bird's wing. BERNAL SABORIO

designed to break up wind vortices and increase efficiency.

So, what should we conclude? Is the superior predator the swift peregrine falcon or the mighty golden eagle? The honest answer is that this is a false dichotomy, because a direct comparison cannot be made. Each bird is the master of its own domain, having evolved specialized anatomy and skills that make it superbly effective at what it does. For their chosen habitat and preferred prey, these are equally formidable birds. ■

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Jim Brohman is a University of Alberta Zoology graduate and a retired physiotherapist. As a keen nature photographer, he has spent countless hours observing wildlife in natural habitats.



# Book Review

REVIEW BY LORNA ALLEN

Published by the Alberta Native Plant Council in early 2022, the back cover of *Rare Vascular Plants of Alberta* states that this second edition was “long awaited” and that is certainly true. The first edition, published in 2001, has been out of print for several years. In the interests of full disclosure, I will let you know up front that I have been involved in a small way with both editions. Both relied on many volunteers putting in thousands of hours needed to research and write the detailed descriptions for hundreds of species, backed by the information on rarity and distribution found in the Alberta Conservation Information Management System (ACIMS) database.

Organized by main plant groups, the write-ups start with lycophytes, then move through ferns, trees and shrubs, aquatic plants, non-graminoid monocots, graminoid monocots, and finally to eudicots. All the species are illustrated, at least with drawings and most with photographs. This is no small task, given that these are all rare species, not easily found or often photographed. Each species write-up includes a description of the plant itself, then details about the leaves, flower clusters, fruits, and habitat, with emphasis on features important to correctly identify the species. A discussion on similar species is often included. Most species have a map of the distribution within Alberta documented in the ACIMS database and a second map showing the range in the U.S.A. and Canada from the Biota of North America Program (BONAP).

The first edition helped to increase the knowledge of and interest in Alberta’s rare and uncommon plants. Data reported to ACIMS on distribution and population of species (in part assisted by this increased knowledge) are used to periodically update rarity assessments. Since the first edition was written, some species have been shown to be more common, some less common, and some new species have been found. Thus, there are significant differences in the species documented in the two editions. Some are so newly reported in Alberta that these were not yet mapped in ACIMS when the second edition went to print. It would be preferable to have maps for all, but I suppose that at some point, a cut-off had to be made so that the book could go to print. In the first edition, write-ups for some similar species were combined, but in the new edition, each rare species gets its own treatment.

*Rare Vascular Plants of Alberta, Second Edition* is a comprehensive, technical reference, not a portable wildflower guide. Lycophytes? Eudicots? Significant effort has been made to produce a guide that is as user-friendly as possible, but in the end, this is a reference documenting rare species. Sometimes the differences between a rare and a common species are a matter of small, often technical, details. If the terms are too much and if trying to tell apart the 19 rare but similar-looking cinquefoils is not really of interest, well, this book is not for everyone. If, however, you are interested in our province’s rare vascular plants, then this book is the authoritative and beautiful reference that you need. ■

## RARE VASCULAR PLANTS OF ALBERTA

— SECOND EDITION —



GINA FRYER, JANE LANCASTER, KIMBERLY OTTENBREIT,  
CHRISTINA METKE, DONNA CHERNIAWSKY, AMY GRIFFITHS,  
KRISTEN FOREMAN, AND JENALEE MISCHKOLZ

### *Rare Vascular Plants of Alberta, Second Edition*

By Gina Fryer et al.

Alberta Native Plant Council,  
2022, 664 pages.

Available at [ubcpress.ca](http://ubcpress.ca)

Lorna Allen is a retired biologist. She spent more than 35 years working in Alberta’s protected areas, including working as the Coordinator for Alberta’s Conservation Data Centre, the Alberta Conservation Information Management System (ACIMS).

# Emerging from “Data Limbo”

## Citizen Scientists Come To the Aid of the Tenacious Franklin’s Ground Squirrel

BY GILLIAN CHOW-FRASER AND RICHARD SCHNEIDER

Did you know Alberta is home to five ground squirrel species? Ground squirrel roll call! In the prairies and parkland we have the ubiquitous Richardson’s ground squirrel and the less common thirteen-lined ground squirrel. The Rocky Mountains and foothills are home to the Columbian ground squirrel and the uniquely marked golden-mantled ground squirrel. And finally, there is Franklin’s ground squirrel — lesser known, but nevertheless an important member of the parkland ecosystems of central Alberta.

### “Bush Gopher” Background

The Franklin’s ground squirrel has the typical shape of a ground squirrel but differs from its cousins in several ways (see the accompanying photographs). Its most distinctive feature is a long, bushy tail, which is about a third of its overall length. Its head and tail are gray and its back has a reddish colour, to a variable degree. Its underside is yellowish white. Franklin’s ground squirrels are a bit larger than the more common Richardson’s ground squirrel. It can also be differentiated by its habitat preferences.<sup>1</sup> Rather than favouring open prairie, it is usually found in semi-open shrublands and aspen forest, which is how it earned its moniker of “bush gopher.” These squirrels are often seen along forested grassland edges and the tall grasses bordering croplands or marshlands.



Top: Franklin’s ground squirrels have a gray head, a gray bushy tail, and reddish fur on the back. DAVID SCOTT

Left: Richardson’s ground squirrels are mostly tan in colour with a darker back. They lack the gray head and tail that distinguishes Franklin’s ground squirrels. ELRON

Right: Red squirrels are easily distinguished from Franklin’s ground squirrels by the long, bushy tail and pointed ears. TONY LEPRIEUR

Franklin’s ground squirrels are surprisingly tenacious. They feed mostly on vegetation, but also eat insects, small mammals, frogs, birds, and bird eggs.

Small as it is, this rodent has even been known to kill prey the size of chickens and ducks! They are the only ground squirrels known to also climb trees, and



are skilled enough to pillage songbird nests. Surprisingly vicious for such cuddly-looking critters!

Living in small, loosely knit colonies, Franklin's ground squirrels are the least social of the ground squirrels. Their prairie cousins are more aggressive, but fighting does occur, especially during mating season. They have been described as one of the more vocal ground squirrels. When interacting with other squirrels, they can growl or unleash what has been described as a "bubbly trill" or musical whistles.

Franklin's ground squirrels escape harsh winters by hibernating underground in extensive tunnel systems. Adult males emerge from hibernation first, in early April to mid-May. Females emerge later. After mating, females bear their litters in underground dens. Litter sizes average about seven to nine pups but can vary from two to 13. Adults first retreat underground in mid-August or September for hibernation, while young-of-the-year pups spend another six weeks above ground to continue to fatten up in preparation for six to eight months of underground hibernation.

### Conservation Concerns

Franklin's ground squirrels are found across the prairie provinces and in Ontario.<sup>1</sup> They are considered "Secure" in Saskatchewan and Manitoba but have been designated as "Imperiled" in Ontario. In the United States, Franklin's



Franklin's ground squirrels are most often seen in the central Alberta parkland region, either on the ground or in trees. SUSAN ELLIOTT

ground squirrels have declined throughout their eastern range and are listed as a species at risk in several jurisdictions.<sup>2</sup> In all parts of their range, habitat fragmentation and loss from agricultural expansion along with pest control have been the main causes of the squirrel's decline.

In Alberta, the status of Franklin's ground squirrel has still not been determined. The provincial government maintains that there is not enough information to say whether the population is stable or imperiled. Talk to experienced naturalists, though, and you will hear stories of serious concern about the fate of this squirrel. For example, individuals who used to see them regularly in the Clifford E. Lee Nature Sanctuary near Edmonton have noted their absence in recent years. Though such observations are anecdotal, they provide a compelling reason for concern and conservation action.

Leaving the squirrels in "data limbo" is dangerous. Since it has no official status as a species of concern, no

conservation action is taken. This means the monitoring needed to determine the squirrel's status is not being done either. It's a catch-22. In the meantime, squirrel populations may be declining year by year.

### Citizen Scientists Fill the Gap

In the spring of 2022, Nature Alberta initiated a citizen science project to help fill some of the data gaps with respect to Franklin's ground squirrels in Alberta. Citizen science projects use volunteers to gather data on wildlife and ecological processes. Many citizen science programs have run for decades and have a proven track record of contributing to biodiversity conservation. With the advent of citizen science apps for smartphones, the number of participants has skyrocketed in recent years. Having many "eyes on the ground" makes citizen science especially useful for collecting observations of rare and endangered species, which are difficult to monitor with conventional research programs.

Nature Alberta's citizen science project had two components. First, we created a Franklin's ground squirrel project on iNaturalist and asked the Alberta naturalist community and the general public to participate ([inaturalist.ca/projects/franklin-s-ground-squirrels](https://inaturalist.ca/projects/franklin-s-ground-squirrels)). iNaturalist is the world's largest citizen science platform devoted to general biodiversity. Worldwide, there are now more than two million iNaturalist users who have collectively contributed close to 100 million observations. Behind the scenes, a community of volunteer naturalists works to help identify the species submitted to the database. All of the information gathered is made available to the public at no charge through the iNaturalist website, which can be searched by species, location, date, or by specific project.

To help participants know what to look for, Nature Alberta provided identification tips and photographs of Franklin's ground squirrels on our website ([naturealberta.ca/ground-squirrel](https://naturealberta.ca/ground-squirrel)). Participants were asked to take a photo of any Franklin's ground squirrels they encountered in the field using the iNaturalist app. The app automatically adds the time and GPS location of the observation and submits everything to the iNaturalist database. Once submitted, the identity of the species is verified by the online naturalist community.

The second component of Nature Alberta's project was to ask the naturalist community to submit information on past sightings. Participants submitted these past observations through a form on our website. Lastly, we requested a download of Franklin's ground squirrel observations from the government's Fisheries and Wildlife Management

Information System (FWMIS). The FWMIS database is a repository of fish and wildlife observations submitted to the government by various organizations (though not including iNaturalist).

By the fall of 2022, we had 136 observations to work with: 43 from iNaturalist, 14 sent by naturalists via the website, and 79 from the FWMIS database. The majority of the FWMIS observations (56 of 79) were labelled as legacy data, from museum collecting in the 20th century. The data we assembled could not be used to assess changes in population size over time because the amount of effort varied considerably from year to year. However, it was possible to draw insights about the squirrel's spatial distribution.

We can confirm that the range of Franklin's ground squirrels in Alberta is centered on the Central Parkland and adjacent Dry Mixedwood natural regions. Based on this pattern, one would expect to find the squirrels in the Peace Country as well, especially around Grande Prairie, but there were no sightings in this area. This may indicate range contraction, though without better historical data there is no way to be sure. One would also expect to find the squirrels along the Eastern Slopes, where the foothills transition to prairie. Indeed, there were two historical sightings here, but none in the last decade. So again, this may indicate range contraction, but we cannot be sure.

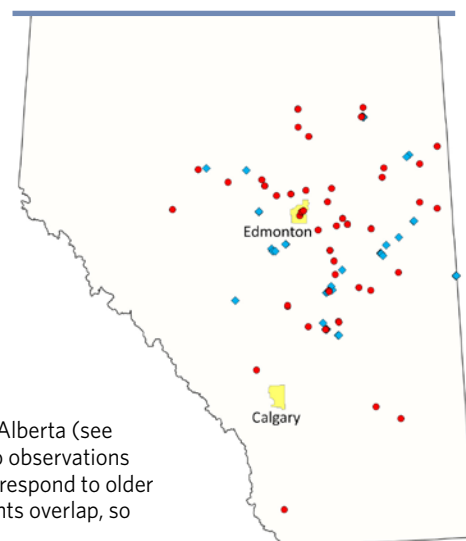
Another noteworthy finding is that, historically, the Edmonton region and lands north of Edmonton formed the

heart of the squirrel's range. However, over the past 10 years, there were no sightings at all in this region. The fact that there were many iNaturalist sightings further west, south, and east of Edmonton suggests that there has been a localized decline in the squirrel population in the Edmonton region rather than a lack of observer effort.

Lastly, a large proportion of the observations made in the last decade occurred within parks and protected areas. This could, in part, be because iNaturalist users tend to visit parks on their outings. However, it seems unlikely that this pattern is simply coincidence. Instead, it's likely that the squirrels, like people, prefer to hang out in areas that are relatively intact (rather than in canola fields).

### Next Steps

Though uncertainties about the Franklin's ground squirrel remain, there is sufficient evidence of range contraction to place the squirrel in the category of "Sensitive." This would motivate further study, including systematic surveys to assess population trends.



Sightings of Franklin's ground squirrels across Alberta (see text for sources). Blue diamonds correspond to observations made over the past decade, and red circles correspond to older observations. At this resolution some data points overlap, so not all 136 observations are visible.



Moreover, it would provide baseline protection for the squirrels. For example, in 2017, a research study on duck predation led to the killing of nine squirrels near Buffalo Lake, whereas badgers were excluded from trapping due to their status as a “Sensitive” species.<sup>3</sup> Protection from pest control is also needed.

More generally, funding for species at risk research and management needs to be restored. Alberta’s strategy for the management of species at risk was written in 2008 and expired eight years ago.<sup>4</sup> It has never been updated. Progressive funding cuts have seriously diminished what government biologists can accomplish, even as the threats facing our species at risk continue to increase. This is completely at odds with public values and expectations.

We thank everyone who contributed to the Franklin’s ground squirrel citizen science project so far. As this project demonstrates, citizen science observations can make a meaningful contribution to conservation of sensitive species. It’s a great way for anyone who cares about nature to make a difference. Our plan is to keep the project running to further improve our understanding of this squirrel. So please keep the observations coming — visit [naturealberta.ca/citizen-science](https://naturealberta.ca/citizen-science) for more information. We will also keep advocating for the squirrel’s protection.

Fortunately, Franklin’s ground squirrel is not at immediate risk of disappearing from Alberta. It’s more a matter of halting further range contraction and long-term population decline. With appropriate proactive management, it should be possible to ensure that these tenacious squirrels remain with us indefinitely. ■



If you see a Franklin’s ground squirrel, be sure to take a photo and submit it to iNaturalist.  
MATT REINBOLD

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Gillian Chow-Fraser is the Boreal Program Manager at the Canadian Parks and Wilderness Society (CPAWS) Northern Alberta, where she leads on conservation work in the boreal forests of Alberta to protect their wilderness and the wildlife that depend on it.

Richard Schneider is a conservation biologist who has worked on species at risk and land management in Alberta for the past 30 years. He currently serves as the Executive Director of Nature Alberta.

# Nature Kids MY BIG ALBERTA BACKYARD

BY DR. JESSICA HAINES



In the summer, it would have been hard to tell who lives in this brushy patch of forest. But the snow reveals that a grouse (vertical tracks) and a snowshoe hare (horizontal tracks at the bottom of the photo) live here in the same forest community!

DR. JESSICA HAINES

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

One of my favourite parts of winter is looking for animal tracks in the snow. In the summer, animals leave little evidence of their travels as they move through their wild spaces. But in winter, animals leave tracks in the snow everywhere they go. Their tracks leave lots of hints. Was it a deer or a coyote that walked through the forest? Were they in a group or alone? Were they walking or running? You can learn lots of information by being a nature detective and examining wildlife tracks.

The best time to find tracks is soon after a fresh snowfall when the weather is cold. You can find tracks anywhere. It might surprise you what walks through your backyard when you aren't around! Check out your backyard after it snows – you might discover that you have a jackrabbit hanging out in your neighbourhood. Go for a walk in a city park – you might spot red squirrel tracks as they run to their stores to collect food. Go to a national park such as Elk Island National Park or Banff National Park – you might find moose tracks where they crossed a walking trail.

If you want to learn to identify the animals that left the tracks behind, count how many toe impressions you see in the snow. Animals in the deer and moose family have two pointy toes. Carnivores, like lynx or coyotes, leave a track with four toes. The mustelid family, which includes weasels and wolverines, leave a track with five toes. If you want to identify the species, there are field guides that can help you – check out your local library!







An antler lies covered in fresh snow after it was shed by a moose. Moose and deer shed their antlers in the winter, and when you're a nature detective following tracks in the snow, sometimes you will find beautiful treasures like this one! Make sure you leave it where you find it, though; lots of animals eat shed antlers as a source of calcium! DR. JESSICA HAINES



Moose and deer cross paths in the snow. Their hooves leave two pointy toe impressions, making it easy to tell them apart from other animals. The smaller prints on the left are deer and the larger prints on the right are moose. The two circular imprints at the back of the moose tracks are their dewclaws; these usually only touch the ground when the moose needs extra traction, like in icy conditions. DR. JESSICA HAINES

Follow your nature detective instincts to investigate further. You could follow the tracks to learn even more about the animals who left them behind. You might discover what bushes a rabbit was snacking on – they can reach really high when the snow is deep. Or you might find mouse tracks that abruptly stop – an owl might have swooped down and snatched it up! You could find a spot where a deer made a bed in the snow. You might even find a treasure like an antler that a moose shed as he was walking through the forest.

Now, examine your own tracks. Notice how the shape of your boot shows which direction you were walking. Try walking a few steps and then running a few more. Circle back and see if you can tell by your tracks where you started running. Your tracks tell your story, too!

Tracking in the winter is a great way to learn more about the world around you. I hope you make lots of fun discoveries this winter! ■



A snowshoe hare hopped across an open area in the forest, leaving these tracks behind in fresh snow! DR. JESSICA HAINES



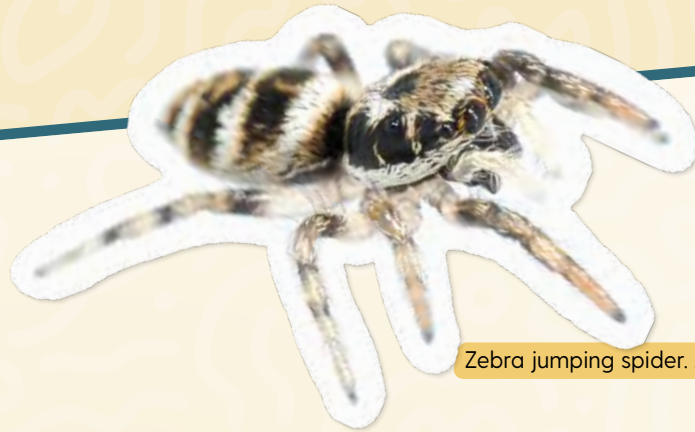
The oval impressions in the snow show us that a couple of deer laid down in this cozy spot under a spruce tree where they were sheltered from the elements and could watch their surroundings for danger. You can see a fresh set of tracks leading away from the beds towards the top of the photo. DR. JESSICA HAINES

*Dr. Jessica Haines is a wildlife biologist and an assistant professor at MacEwan University. She loves to get outside and explore Alberta's wild spaces, especially if she can take her dogs with her for the adventure.*



# Nature Kids OUT AND ABOUT

BY STEPH WEIZENBACH, PROGRAM DIRECTOR



Zebra jumping spider. JOHN ACORN

**T**he annual Winter Bug Count documents arthropods – insects, spiders, and crustaceans such as sow bugs – in Alberta and Saskatchewan through December, January, and February. Accepted species include any free-living arthropod indoors or outdoors, excluding pets, specimens, or pet food. You can contribute observations to this year's Winter Bug Count by sharing your observations on iNaturalist. Not sure what that creepy crawler in your basement is? Experts will help identify your find!

## What to do:

- 1 Install the iNaturalist app on your device or visit [inaturalist.org](https://www.inaturalist.org) on your computer.
- 2 Create an account.
- 3 Head outside to explore snowbanks and sheltered areas or head down into your basement to find a creepy crawler skittering across the floor. Try moving boxes or items that have not been disturbed in a while. Some bugs will just sit there, allowing an easy photograph to be taken. Other times, you'll have to be fast to take a picture, or catch the arthropod in a bug viewing container to get a clear photograph.
- 4 Tap "Observe" to take a photo of your little critter. Review your photo and hit "Next" if it looks good.
- 5 Optional: Identify the species by clicking on "What did you see?" Options will populate based on species that look like your photo. You can select one of these or look up a species name, if you know what it is.
- 6 Optional: You can add more photos, or a note, and review other set options.
- 7 Hit "Share."

It's that easy! Your observation will automatically be included in the Winter Bug Count results. Now search iNaturalist's "Projects" for the Winter Bug Count to see what other small species are active in our part of the country at this time of year. ■



Ant. JOHN ACORN

Giant predaceous diving beetle. JOHN ACORN



# Nature Kids ASK STUART

BY BENNY ACORN



**W**elcome to **Ask Stuart**, a regular feature in which Stuart, our Nature Kids mascot (who just happens to be a swift fox) responds to questions asked by kids across Alberta. From time to time Stuart will also ask local experts to help him answer these questions. If you have a question you would like to ask Stuart, send it to [naturekids@naturealberta.ca](mailto:naturekids@naturealberta.ca) and it may be featured in a future issue. Today's questions are answered by our friend Benny Acorn, one of the directors of the Alberta Lepidopterists' Guild and a lifelong lover of insects.

## Q Are there bugs that live in the snow?

Most people might assume that bugs aren't active outside during the winter because we rarely see them, but the truth is much cooler! While many bugs will sleep through the winter (often as eggs), others remain active during most of the season in an unexpected place: below the snow! Although very cold, snow forms a cozy blanket that creates a space right near the soil that is actually warmer than the air above. This warm space gives insects a place to live during the cold winter days, and many of them will climb up onto the tops of the snowbank to look for food if the weather is warm enough. One group of insects that does

this is particularly neat, and they are known as ice crawlers! These are flightless and sometimes even eyeless bugs that are as distinct a group as butterflies and beetles. They live high up on mountain snowfields, and they love nothing more than the chilly weather very close to the freezing point that is common in October and April or May. This group was actually discovered here in Alberta, making them a point of great pride for us Alberta bug lovers! ■



An ice crawler... on ice! ALEX WILD



Jumping spiders like this handsome individual are one type of spider that spend part of the winter on the hunt underneath the blanket of snow.  
A. HILLMAN

## Q What happens to spiders in the winter?

Just like many bugs, a lot of spiders will spend the winter in a deep sleep, or will wait as eggs for the warmer months to arrive. The spiders that do this are mostly the kinds that spin webs. Despite this, winter can still be a great time to be a spider lover! Many of us are aware that some spiders will enter our homes to keep warm during the winter, but others choose to live in the warm space underneath the snow and close to the soil in deep snowbanks. Here these spiders will frolic and hunt, forming an exciting and complex ecosystem with the other bugs and mammals that make their home under the snow during the coldest days of the year! ■

# Bohemian Waxwings

## On the Move

BY MARGOT HERVIEUX

RICK PRICE

At this time of year, it often feels as if all the songbirds have abandoned us for warmer climes, but some birds actually consider Alberta to be south enough for their needs. Bohemian waxwings have been on the move since late October, taking advantage of all the berries in and around our towns, cities, and farms.

Bohemian waxwings are beautiful gray birds with black masks, distinctive crests, and a yellow band on their tails. The name waxwing comes from the spots of red on their wing feathers. Bohemians are slightly larger than the cedar waxwings we see in the summer and have rust under the tail instead of pale yellow.

The life of a waxwing revolves around fruit. During the summer, bohemian waxwings move around in the northern boreal forest and mountains, taking advantage of each new berry crop. In September they continue their travels, heading as far south as necessary to find food. Fruit makes up the majority of the waxwing diet, particularly in winter, but they also eat insects, which they often

catch on the wing. Berries are also shared during courtship, and the birds nest later than most so their fledglings can feed on summer fruit.



LEO DE GROOT

The only time waxwings settle down is during the nesting season, and even then they nest in loose colonies near a food supply rather than setting up territories. Without a territory to defend, the males don't need a song, but the birds do communicate using their high-pitched whistle.

Male waxwings play an active role in raising their four to six chicks. They help the females build a nest in a coniferous tree, usually near a lake or stream, and then feed her during incubation. Both parents feed the chicks for two weeks after hatching. As soon as the streaky youngsters take wing they join the local flock as it moves on to new feeding areas.

The berry-eating habits of waxwings actually affect the distribution of fruit trees. In any city with large winter waxwing populations, wooded areas and ravines are full of non-native fruit trees that grew from seeds passed by waxwings.

Because of their nomadic lifestyle, most people only see waxwings in their yards on the day a flock descends to strip a mountain ash or crab apple tree. It's exciting to watch a large, trilling flock, sometimes numbering hundreds of birds, moving in unison back and forth through the trees. Enjoy the spectacle while you can — they will soon be moving on. ■



LEO DE GROOT

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





## MEET A MEMBER CLUB

MEGAN EVANS

BY MEGAN EVANS

### Alberta Native Bee Council

**T**he **Alberta Native Bee Council (ANBC)** is a non-profit organization established in 2017 to promote the conservation of native pollinators through research, monitoring, advocacy, education, and community collaboration. ANBC was the first organization of its kind in Canada: focused solely on native bee conservation and established in response to a lack of research, monitoring, and resources on native bees.

There are 321 native bee species on record in Alberta, almost twice as many species as all of the fish, amphibian, reptile, and mammal species combined. However, far more efforts focus on the monitoring and conservation of the latter species, to the extent that the provincial government's Wild Species Status Report no longer reports on the status of invertebrates as of 2015. The federal government provides species status reports that include bees and other invertebrates, but these reports are not the result of any coordinated or strategic monitoring; instead, they are informed by the best estimates of researchers and experts in the field.

How are our native bees doing? A little more than half of our native

bee species are secure or apparently secure, approximately a quarter are data deficient, and another quarter are rare or declining. It's not clear why some species are declining while others are not, but factors that can negatively impact all bees include habitat loss, pesticides, diseases, and climate change.

ANBC also promotes awareness of the differences between native bees and managed bees, like the European honey bee. Did you know that honey bees are not native to North America? Honey bees were brought to Canada by European settlers. Currently, Alberta is home to 40% of Canada's honey bees, which are used for crop pollination and honey production. Honey bees are managed under the Alberta Bee Act, which requires beekeepers to report annually on the status of their hives. An important distinction is that honey bees, an introduced species, are managed by beekeepers and are categorized as livestock, while native bees are wildlife and are therefore of conservation concern.

ANBC has been busy during our first five years of operations. To address the deficiencies mentioned above, we implemented a provincewide

monitoring program in 2018 to inform a comprehensive inventory and baseline of native bees in Alberta. Additionally, ANBC has created a citizen science bumble bee box monitoring program, developed a module for best practices for conservation of native bees for the Environmental Farm Plan, continued and completed research assessing the density and abundance of bumble bees in Waterton Lakes National Park, and given almost 100 presentations reaching thousands of people across Alberta.

How can you support native bee conservation? Create bee habitat by planting native flowers and incorporating diversity into your landscaping by leaving small patches of bare soil, old logs and stumps, piles of branches, and hollow stems. Reduce or eliminate pesticide use. Visit [albertanativebeecouncil.ca](http://albertanativebeecouncil.ca), become an ANBC member, support the ANBC by purchasing merchandise from our online store, and follow us on social media to be notified of ANBC events near you! ■

Megan Evans is a co-founder and President of the Alberta Native Bee Council.

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