MORNING HAS BROKEN...
Sunrise over the Frenchman River Valley in Grasslands National Park in southern Saskatchewan

AMAZING GRASS

More than 70 per cent of Canada's native prairie grasslands has been lost to agriculture and development, endangering this precious ecosystem and the many species it encompasses. It will take everyone — ranchers, Indigenous people, conservationists and three levels of government — to conserve this precious natural heritage. Time is running out

By Niki Wilson

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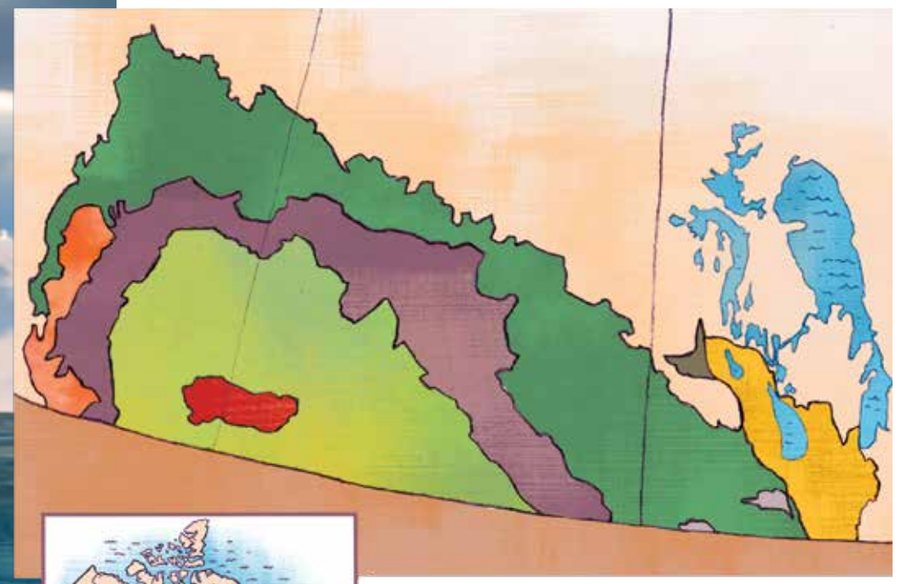

GRASSLANDS AT RISK

- *Southwest Manitoba Uplands*
- *Cypress Upland*
- *Fescue Grassland*
- *Lake Manitoba Plain*
- *Aspen Parkland*
- *Mixed Grassland*
- *Moist Mixed Grassland*
- *Aspen Parkland*

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ONE OF TREVOR HERRIOT'S EARLIEST MEMORIES IS OF

walking through tall grass, hand in hand with his father. It was late summer, and they were headed to local fairgrounds in the eastern part of the Qu'Appelle Valley near the village of Tantallon, Saskatchewan. The grass stretched above his head, but as it moved, it allowed him to steal glances of the distant hills he says lay like sleeping animals. "It's the type of grassland I really imprinted on," says Herriot, now an acclaimed author, naturalist and activist in prairie grassland conservation. "I had a strong sense of the world being benign and safe."

In his memory, he and his father emerged from the grass to a vibrant fair. Pies, tomatoes, petunias and marigolds were carefully arranged before him with "a sense of pride in produce that comes when you've grown it with your own hands."

That was around 1962, and by then hardworking immigrants had established the ranches and farms that formed the base of the bread belt of Canada. But this came at the cost of most native grassland prairie, lost to the plow in an effort to feed a growing nation. By the time Herriot walked to the fair, roughly two-thirds of these grasslands had been turned over in Alberta, Saskatchewan and Manitoba. Many of the species that were considered incompatible with agriculture, like the swift fox and black-footed ferret, were either eradicated or close to it.

What remains of these grasslands is now scattered in fragments across the Prairie provinces and is slowly being converted to crops or other human uses. Exceptions can be found in a few protected areas, on private ranch lands and on community pastures. Community pastures hold some of the greatest conservation potential, but that may change if the Prairie provinces, having newly acquired responsibility for their management in 2012, don't support a strong conservation mandate.

JACQUI OAKLEY

At stake are the already dwindling numbers of grassland birds, pronghorn, small mammals, insects and reptiles that evolved to live only in this northern reach of North America's once vast temperate grassland. Saving what remains of these endangered species and landscapes may rely on the ability of Canadians to support the ranchers, communities and conservationists struggling to hold on to what is left.

Before European settlement, the great temperate grasslands of North America stretched unimpeded from northern Mexico to the Prairie provinces of Canada. Grasses dominated, filling a niche where it was neither wet enough for trees nor dry enough for desert. Plains bison roamed in herds millions strong, their thunderous presence carving habitat in the landscape for a multitude of species including badgers, pronghorn and prairie dogs. Great Plains wolves and the prairie population of grizzly bears dominated the top of the food chain, along with the bison-hunting people who used fire to help maintain the ecosystem. The calls of Sprague's pipits and chestnut-collared longspurs signalled the start of spring, while great migrants like snow geese stopped in droves to rest and refuel at abundant wetlands and prairie potholes on their way to their Arctic breeding grounds.

By the mid to late 1800s, the bison were all but gone, removing one of the most critical forces that shaped the Prairies. The first people who hunted them were beaten back, and many were forced onto reservations. Conversely, the promised freedom and land ownership lured European immigrants to the Prairies, where they tilled the soil to grow crops. As agriculture took hold and towns and cities grew, there was less room for the swift fox, black-footed ferret, Great Plains wolf and the prairie population of grizzly bears that were eventually hunted, poisoned or pushed out. More than two-thirds of what was once a contiguous stretch of the Prairie Ecozone that spanned over 465,000 square kilometres of the Prairie provinces — almost 5 per cent of Canada's landmass — was lost forever.

"Wild prairie is now one of the most endangered terrestrial ecosystems," says Carolyn Callaghan, conservation biologist for the Canadian Wildlife Federation. "A broken prairie is never the same." She likens the prairie to an iceberg. "Much of the living system is below the surface — the grass is only a small portion of what is really there." When it is turned over, the lichens, microbes, plants and other members of the soil community are irrevocably altered, which is why she says "Every scrap of native prairie grassland left is precious. We need to keep what we have."

COLOURS OF THE LAND
*(Left) A lichen-covered rock, 70 Mile Butte in the distance. (Right) Pronghorn (*Antilocapra americana*) which are related to giraffe*

WHEN CANADIANS THINK ABOUT GLOBALLY RARE ECOSYSTEMS, THEY THINK ABOUT RAINFORESTS AND CORAL REEFS. BUT IN THE HEARTLAND OF CANADA IS AN ECOSYSTEM THAT IS AS IMPORTANT, RARE AND ENDANGERED AS ANY ON THE PLANET

Prairie ecosystems are not just homes for animals; they also provide important services for the people who live there, says Dan Kraus, conservation biologist with Nature Conservancy of Canada. The underground root systems of grasslands retain moisture in the land and help hold back floodwaters in a way tilled soil cannot. They also release moisture during drought. Native prairies store more carbon than they produce, and Kraus points out they may prove to be more resistant to future drought and the subsequent erosion that will likely be exacerbated by climate change.

The Prairie Ecozone is divided up into several types of grasslands, all of which have suffered massive range contractions. In 2010, according to the *Canadian Biodiversity: Ecosystem Status and Trends Report* of the Canadian Councils of Resource Ministers, only 25 per cent (about 10,000 sq. km) of mixed and fescue prairie were left in the Prairies ecozone. Tallgrass prairie had all but disappeared, with only 100 sq. km left of its former 6,000 sq. km in Manitoba. Since then, grasslands continue to succumb to crop conversion and urban expansion, and we may be losing even more than we think.

Nicola Koper is a professor at the Natural Resources Institute at the University of Manitoba who has been studying prairie ecosystems for 18 years. A lot of her work has focused on grassland bird communities. She says it's not just the conversation of grasslands to other uses, but the additional loss to "edge effect" that is having a tremendous impact on grassland birds. "This results in a much higher loss of suitable habitat across the landscape than we as humans realize when we convert these areas." "Edge" is created any time native prairie grassland comes up against altered habitat, like human infrastructure and cropland. Edge effects are created from things like recreational activities, roads or cropland. Oil wells bring noise and roads. Sometimes, things that seem benign can have an effect, Koper says. For example, fences around croplands create perches for raptors and cowbirds where there were none before. All of these things change the landscape for grassland birds, she says "and unfortunately, in many cases it makes it a lot less suitable for them."

Complicating matters is the fact that, like all ecosystems, the prairies are not a monoculture, but a diverse patchwork of subtly different habitats. Many species are specialists in a particular type of grassland. What's good for one is not necessarily good for another.

"The species that like moderate vegetation are doing pretty well in Canada," says Koper. Moderately grazed grasses are well maintained by ranchers, who have been successful in avoiding erosion in this way, she says. "But those species that like lightly grazed or undisturbed habitat are declining." The Sprague's pipit is one of those birds, preferring to stay hidden in tall grasses. Listed as threatened under Canada's Species at Risk Act, like many grassland specialists its population has declined significantly over the past four to five decades, says Koper.

Conversely, there are also declines in species that like heavily grazed pastures, like the chestnut-collared longspur, also a threatened species. These birds evolved to take advantage of the way bison grazed, and "bison really hammered some areas," says Koper. "Birds that really adapted to that environment are now losing their habitat."

By better mimicking the way bison used the landscape, conservationists and ranchers can work together to protect native grassland prairie. It's a resilient system, Koper says. "Even if one area is really heavily grazed, once you remove the livestock, the habitat comes back pretty much the way it was before."

To that end, the biggest pastures are the best, Koper says. Cattle choose where they graze more similarly to the way bison did. Some areas are heavily grazed, while others are not grazed at all. High intensity over short durations, with long rest periods to follow, is key.

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ANIMALS AT RISK

Learn more at CanadianWildlifeFederation.ca

BURROWING OWL
Athene cunicularia

Borrowing owl is more like it: it seldom digs its own holes to nest. Instead, it usually moves into burrows vacated by ground squirrels, badgers and prairie dogs. To discourage predators, it mimics a rattlesnake's hiss. Unlike most owls, this small bird thrives in the open, hunting day and night. Canadian populations declined by 90 per cent in the 1990s, and declines continue. Extirpated from B.C. and Manitoba, it was designated endangered in 1995.

BLACK-FOOTED FERRET
Mustela nigripes

The only ferret native to North America is well adapted to its prairie grasslands habitat with its sandy colouring, periscoping neck and acute hearing and smell. Because it preys almost exclusively on prairie dogs, it suffered with that species' decline. By the 1970s, it was extirpated from Canada. In 2009, the Toronto and Calgary zoos, Parks Canada and partners released 34 into Grasslands National Park in Saskatchewan. A small but growing population lives there still.

SWIFT FOX
Vulpes velox

Small as a house cat and super-quick, the swift fox deserves its name. It uses a den year-round (rare for a fox), something that is at least partially explained by one of its quirks: it cannot abide being in windy conditions, which is odd since historically it has thrived in open, sparsely vegetated mixed-grass prairie, where its vision and agility are unimpeded. Once common across the Canadian plains, its vulnerability means swift fox are now endangered.

FERRUGINOUS HAWK
Buteo regalis

Often taken for a golden eagle, thanks to its similar behaviours and appearance, this secretive raptor is found in the grass and shrubs of western North America. In Canada, its range has been shrinking for more than a century: it now occupies only 48 per cent of its historical purview here, and much of that is compromised by farming, oil and gas exploitation, and other human encroachments. It is considered endangered.

GREATER SAGE GROUSE
Centrocercus urophasianus

The size of a big turkey, it is the largest grouse in North America. The extreme southern portion of Canada represents its northernmost reaches. It is under siege, primarily from the effects of agriculture and the oil and gas industry. Still, the population is stabilizing: the 2016 Canadian population of sage grouse was estimated at 340 birds (including 38 females imported from Montana). That was an improvement over recent years, although still down more than 50 per cent from 20 years ago, when it was already compromised.

ROBERT HARDING/ALAMY STOCK PHOTO. ISTOCK. ISTOCK.

PRECIOUS LANDS
(Left) Prairie dog on alert.
(Right) Grasslands as far as the eye can see

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PRAIRIE ECOSYSTEMS CAN PLAY AN IMPORTANT ROLE IN RESPONDING TO CLIMATE CHANGE: THE ROOT SYSTEMS OF GRASSLANDS RETAIN MOISTURE IN THE LAND, RELEASING IT DURING DROUGHT — THEY ALSO HELP HOLD BACK FLOODWATERS AND STORE MORE CARBON THAN THEY PRODUCE

For many years, the conservation community, including ranchers, looked to public pastures as a place where good opportunities existed to manage native prairie grassland both for ranching and wildlife. These pastures were created in the 1930s when, in response to severe drought and subsequent issues with soil erosion, the Canadian government created the Prairie Farm Rehabilitation Administration. Through that process, the feds took control of native prairie grasslands, rehabilitated them and leased them to ranchers for livestock grazing.

There are 89 Prairie Farm Rehabilitation Administration pastures in the Canadian Prairies, totalling 2,256,072 acres, the majority (78%) of which are in Saskatchewan. Within their fence lines are some of the biggest and best tracts of remaining native prairie grasslands, providing habitat for 31 species at risk that live there, including the burrowing owl, swift fox, black-footed ferret, Sprague's pipit and greater sage grouse. As federal lands, these pastures were subject to the rules and protections that came along with federal legislation, like the Species at Risk Act. However, the 2012 decision of the Harper government to dismantle the federal community pasture program and turn the pastures over to the provinces has changed that.

Since then, Alberta's only three pastures were transferred to management by the federally operated Suffield Military Base and remain subject to the Species at Risk Act. The Association of Manitoba Community Pastures, a producer-led non-profit, took over the management of 20 pastures with the help of transitional funding provided by the province. Though pasture management is no longer subject to the Species at Risk Act, protecting prairie ecosystems is part of its mandate.

The fate of pastures in Saskatchewan has been the most tenuous since the 2012 decision, when at first the provincial government considered selling some of them for private use. Outcry from the ranchers who leased the land convinced the government to hold off on selling the PFRA pastures. More recently, in 2017, the Saskatchewan government announced that it was terminating its Community Pasture Program and possibly selling about one third of these lands. Public response, and subsequent comments on a province-wide survey, showed the people of Saskatchewan to be overwhelmingly in favour of government ownership and continued use of the land for community pastures. As a result, members of the Community Pasture Patrons Association of Saskatchewan now lease the pastures from the provincial government, but with no support for species at risk management from either the federal or provincial government, says Callaghan. The last of the federally held pastures that Callaghan says are "some of the biggest and the best" will be turned over to Saskatchewan this year.

One option for management of pastures that supports both ranching and biodiversity conservation may be available through Pathway to Canada Target 1, a federal government program that aims to protect at least 17 per cent of terrestrial areas and inland water by 2020. This will be done through the creation of networks of protected areas and "other effective area-based conservation measures," or OECMs. The International Union for Conservation of Nature characterizes an OECM as "a geographically defined space, not recognized as a protected area, which is governed and managed over the long-term in ways that deliver the effective in-situ conservation of biodiversity, with associated ecosystem services and cultural and spiritual values." In other words, as long as core conservation values are being met, these areas can serve other purposes. Callaghan says public pastures are a perfect fit. "They could be protective for native grasslands, while also supporting beef production."

SUN SETTING ON THE GRASSLANDS
The waxing crescent moon in twilight over the sage and priairie grass

Callaghan would also like to see Canada formalize grassland protection in policies that enable conservation and guide research and action on the ground. "We don't have the tools in place to know how much native prairie we really have left," she says, though she adds that Agriculture and Agri-Food Canada is working on remote sensing capabilities toward this end.

In addition to that, she says, "We need to support the ranchers who are maintaining their prairie right now." Many private ranchers have native prairie on their lands. Callaghan suggests government subsidies or tax breaks could be provided as incentives for ranchers to continue to protect native prairie grassland. More speculatively, perhaps grasslands could be folded into the carbon market, whereby ranchers could receive payment from energy companies for maintaining grasslands, which store plenty of carbon.

While these issues are foremost in the minds and hearts of many prairie people and conservationists, it's been difficult to rally the rest of Canada to action on prairie conservation. Dan Kraus at the Nature Conservancy of Canada says, "Many Canadians, when they think about globally rare ecosystems, think about tropical rainforest or coral reefs, which are important, and we need to protect those. But I think we need to raise the awareness that here in the heartland of Canada is an ecosystem that is as rare and endangered as anything else on the planet." The Nature Conservancy of Canada is working on creating conservation easements with ranchers and farmers to offset the cost of protecting native prairie. Kraus would like to see more protected areas representing grassland ecotypes.

Formalized awareness campaigns, sustainable management of prairie pasture and some kind of formal federal protection would go a long way, but in the end, Herriot suggests a reframing of people's relationship with the prairies may be needed. Not only are prairie ecosystems intrinsically worth protecting, but they also provide opportunities for cultural and spiritual connection with nature.

To that end, he suggests we include Indigenous people — whose ancestors hunted bison across the prairie for millennia — in the conversation about protecting native prairie grasslands. "There are deep cultural values that come from Indigenous voices," he says. "If we can work with Indigenous people in Canada who are concerned about conservation and have them involved not just in the conservation about grasslands but other ecosystems too, I think we will start to see the cultural shift that all Canadians need."

Herriot, though, needs no convincing. His connection to the land is apparent when he describes the singing of the meadowlarks as they return in the spring. He's seen a burrowing owl at its burrow, and ferruginous hawks circle overhead. "Those things are immeasurably important. You can't put a dollar value on them."

Callaghan agrees. "You have to have patience for the prairie, but if you do, you'll see its wild beauty all around you. The stars are incredible. It's quiet — if you go to southwestern Saskatchewan, you won't hear human sounds except for your own. That's exceptional. All we need is a different way of looking at the prairies and of enjoying the beauty in its subtlety. Then, I think, people could become quite protective of it."

Visit **CanadianWildlifeFederation.ca** and Hinterland Who's Who (**hww.ca**) to watch videos filmed in the grasslands and learn more about this important ecosystem and how you can help with prairie conservation efforts.

ALAN DYER/VWPICS/ALAMY STOCK PHOTO