



WINTER 2021 VOLUME 79.4

BLUE JAY



FROM THE PRESIDENT



5

Orval Beland further documents the occurrence of breeding Wood Ducks outside of their reported breeding range in Saskatchewan.



6

Sightings of black coyotes have become common in Waskesiu Lake during recent years. Ken Kingdon provides evidence of reproduction, gene transfer, and a possible explanation for the presence of black coyotes in the area.



10

Vladimir Kricsfalusy details information on the rare plants in the Redberry Lake Biosphere Reserve in Saskatchewan, including taxonomy, conservation status, distribution and threats to survival.



19

In November 2020, Paule and Dale Hjertaas located two Rusty Blackbirds along small areas of open water at Regina's Wascana Marsh. While observing and photographing the birds, one captured a fish. Two days later, one of the birds was observed capturing at least two fish.



25

C. Stuart Houston, who passed away in July of 2021, achieved a degree of success in each of three distinct fields — physician/radiologist, ornithologist and historian. He was also an active and long-time member of Nature Saskatchewan, and the Saskatoon Nature Society.



34

In this issue's edition of Human Nature, Kenn Wood shares the wonder of the poplar forest on his land, including the mega-dose of "Vitamin T" that those who walk his *Esso Trail* are lucky enough to experience!

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The seasons come and go, and it seems that we are ever facing issues that we need to be concerned about as they threaten to adversely impact the natural landscapes in the province along with their flora and fauna.



ON THE FRONT COVER

Great Gray Owl perched among hoarfrost-covered trees near Smeaton, SK.
Photo credit: Nick Saunders.



ON THE BACK COVER

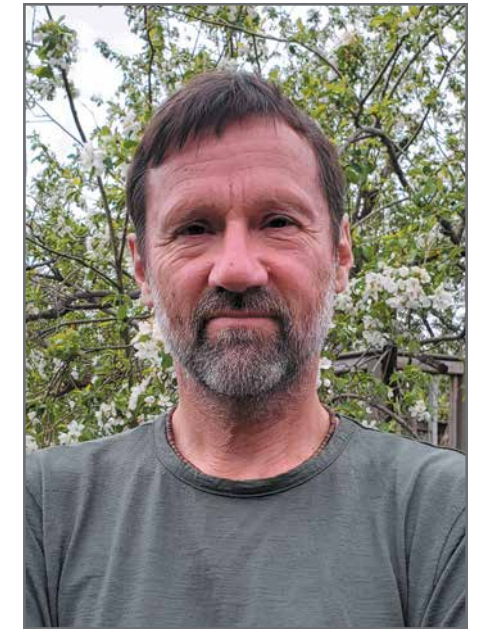
Ruffed Grouse in Prince Albert National Park, SK.
Photo credit: Annie McLeod.

On July 2, 2020, the provincial government announced the Lake Diefenbaker Irrigation Project, a major plan to significantly expand irrigation. The plan calls for a three-phase project to upgrade existing irrigation canals and build new canals over a 10-year period. The whole effort is expected to cost some \$4 billion.

This represents a major development with significant ecological impacts. The estimated 600,000 cubic decameters of water per year anticipated to be withdrawn from the lake and larger flow system is a very large proportion of the province's annual water supply, especially in dry years. The withdrawal of this much water would disrupt ecosystems as a result of the loss in water supply itself, the changes to nutrient availability and aquatic life behaviours, and the degradation of water quality.

Very significantly, the Saskatchewan River Delta, the largest inland freshwater delta on the continent, is already under stress of drying out. A reduction of the water brought downstream from Lake Diefenbaker would only aggravate the situation. This would have major consequences for the natural life of the area. For this reason, the Cumberland House Cree people living on the delta are taking legal action to challenge the initiative.

On the other side of considerations, there is not enough evidence that the enhancement to the irrigation system will add substantial value to crop production. The 500,000 acres of land proposed to be serviced by this expanded irrigation represents only an estimated two per cent



Ken Ludwig

of crop producers in the province. There was passing suggestion in the government's announcement that the enhanced irrigation may also be intended to encourage and support industrial expansion; the concern with this is that, once such infrastructure is in place, it tends to create a level of pressure to move forward with expansions without thorough assessment and prudent decision making, but with more potential pressures on the land.

The bottom line is that with potentially significant environmental impacts, a seemingly limited benefit to crop production, and a large cost, a full environmental impact assessment and inclusive cost-benefit analysis is needed so we can fully understand the implications of this plan.

Nature Saskatchewan joined other groups in calling for this assessment before the substantive project work proceeds. 🦉

WHAT'S INSIDE

- 5 Wood Ducks Breeding Near North Battleford**
Orval Beland
- 6 The Black Coyotes of Waskesiu Lake**
Ken Kingdon
- 9 The Mystery of Migration**
Brian K. Jeffery
- 10 Rare Vascular Plants of Redberry Lake Biosphere Reserve**
Vladimir Kricsfalusy
- 19 Observations of Rusty Blackbirds Capturing and Consuming Fish**
Paule Hjertaas
- 22 Second Recovery of a Calgary Area Nestbox Monitors Society (CANMS) Banded Mountain Bluebird (MOBL) from the Wintering Grounds**
Don Stiles
- 23 Book Review: Backyard Bird Feeding: A Saskatchewan Guide**
Shelley A. Leedahl
- 24 Call for Applications: Margaret Skeel Graduate Student Scholarship**
- 24 Poetry: Twins in the Near Meadow**
George Grassick
- 25 Stuart Houston: 1926 – 2021**
- 26 Nature Saskatchewan Fall Meet 2021 Re-Cap**
Rachel Ward
- 28 The Nature Notebook: A Dry and Scorching Summer**
Jared Clarke
- 30 Human Nature A Mega-Dose of "Vitamin T" on the Esso Trail**
Kenn Wood
- 31 Mystery Photo**

BLUE JAY

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WOOD DUCKS BREEDING NEAR NORTH BATTLEFORD

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An article in *Blue Jay* 78(3):34 (Fall 2020) by Dale Hjertaas details the occurrence of breeding Wood Ducks (*Aix sponsa*) significantly outside their reported breeding range for Saskatchewan, notably farther north and west. My article expands on the theme of his observations of June 2018 except predating them by two years, even farther northwest.

We live 6 km south of Denholm, just north of the North Saskatchewan River valley, not far southeast of North Battleford. I optimistically built two suitable nest boxes in earlier years and the Wood Ducks finally appeared in 2016. The boxes are located on either side of a small slough just east of our house. Box #1 is on the east side of the slough, while Box #2 is on the west side, just 20 m from our house. The slough is surrounded by aspen, willow and red osier dogwood but both boxes are visible from our kitchen window.

The first male was seen 23 April 2016; the first pair 13 May. The female was inside Box #1 for 10 minutes while the male swam nearby. The female also checked out Box #2 before the pair flew to a nearby field to feed. Presumably the same pair rechecked the boxes on both 14 and 15 May. Things looked promising! But we considered that both boxes were somewhat small for Wood Ducks, so I added a larger box (Box #3) 4 m up an aspen trunk, just 10 m from our house, on 17 May. Nevertheless, our story now focuses on Box #1.

At 05:30h 20 May, two males and one female competed for possession of the first box with a female Bufflehead (*Bucephala albeola*). Throughout the following days, the pair appeared



Wood Duck family near Denholm, Saskatchewan. Photo credit: Orval Beland.


irregularly at the box. Two female Hooded Mergansers (*Lophodytes cucullatus*) attempted, unsuccessfully, to flush the male Wood Duck from the roof of the box on 25 May. One female merganser entered the box after the male Wood Duck eventually departed. She subsequently took his place on the roof for some time, but he regained his perch by dusk.

The Wood Duck pair was recorded 17 more times in and around the box through 10 June. Then comes special day, 11 June: Female arrived and entered the box at 16:30h. Then... surprise...another female Wood Duck swam by with 10 ducklings in tow! These ducklings appeared to be about five days old. The family posed for photos taken later from our kitchen window through 10 x 60 binoculars at 35 m. These ducklings grew to flying age on the slough. Some were seen as late as 26 August when the slough had almost dried up.

Our original female was seen entering and exiting the box until at least 5 July. Did she also brood successfully? Probably, but we never saw her young. We suspect she

immediately escorted them east, across the road to a larger slough that is not practically accessible. One would require hip waders to fight through the flooded, dense willows and undergrowth from any direction to reach the relatively open water near the center. Any waterfowl would certainly flush or hide with such disturbance. One unhatched egg remained in the box. We also believe that the larger, willow and tree-bordered slough also sourced the surprise brood of 11 June since we had not seen any activity at the other boxes. Data interpolated from *Birds of Saskatchewan*¹ indicate an average clutch size of 11.6 eggs and 8.8 young. We haven't seen any Wood Duck activity since 2016 but a Common Goldeneye (*Bucephala clangula*) nested in the largest box (#3) in 2019 and 2020.

Thanks to Dale Hjertaas for his encouragement to submit this article. To use his words: "When you share stories you also learn things."

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THE BLACK COYOTES OF WASKESIU LAKE



Black coyote photographed at Waskesiu Lake on 19 April 2021. Photo credit: Curtis Matwishyn.

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In recent years, sightings of black coloured coyotes (*Canis latrans*) have become common in the community of Waskesiu Lake, which is situated in Prince Albert National Park (PANP), Saskatchewan. I provide evidence of reproduction and subsequent transfer of the gene responsible for the black colour, and a possible explanation for the presence of black coyotes in Waskesiu.

In the world of canines, black coloured dogs (*Canis lupus familiaris*) are common. It could be considered to be their default colour as most dogs of mixed breed exhibit some black in their coats. Black wolves (*Canis lupus*), though not as common, are also far from rare. Estimates of black or dark grey coloured wolves in Alberta are

estimated to represent more than 50 per cent of the population.¹ However, a coyote that is entirely black in colour is new to me. Prior to my move to Prince Albert National Park in 2019, all of the coyotes I had observed were of the “standard” coyote colouration — grey, with orangey brown colouration on the legs and ears, and a dash of black here and there. They certainly were never predominantly black.

In the summer of 2019, my wife Rae and I were bicycling along a trail in Waskesiu Lake when we startled what we assumed to be a very small black wolf. It was accompanied by an even smaller “grey wolf pup”. The animals ran off before we could make a positive identification, but we both noted something odd about them that we couldn’t precisely determine. During the same time, park staff started to hear reports of other people around town seeing a

small black wolf that didn’t actually appear to be a wolf, but seemed more coyote-like in appearance and behaviour.

Finally, on 8 July 2020, I discovered a coyote rendezvous site (the location where, once the den has been abandoned, pups are left on their own but continue to be tended by adults) on the edge of the townsite of Waskesiu Lake. On that first visit, I spotted approximately five coyote pups, with several appearing to be quite dark in colour. I regularly returned to the area over several weeks, and at 05:00 on 10 July 2020 I spotted two adult coyotes, both entirely black. They were relatively small and one was submissive to the other, including approaching in a crouched position with ears back and tail wagging. Then a grey adult coyote, very clearly larger than the two smaller black adults, came into sight.



Black coyote photographed at Waskesiu Lake on 19 April 2021. Photo credit: Curtis Matwishyn.

Having sub-adult family members assist in raising pups is not uncommon in coyotes, and my interpretation is that this was a grey adult male, a black adult female, and a black yearling or sub-adult female.² The appearance of the large adult triggered a response in the hidden pups, as he was soon surrounded by eight of them. The pups were two distinctly different colours, with five being black and the remaining three grey.

Since that time, park staff and visitors have continued to report seeing black coyotes in Waskesiu Lake, and I was able to capture an image of two black coyotes feeding on a bull elk carcass using a trail camera in the fall of 2020.

As a result of these sightings, I searched the literature for other occurrences of melanism, or an unusually large amount of black skin or hair pigmentation in coyotes.³ While generally rare, there is a relatively large population of black coyotes in the southeastern parts of the United States, sparking a research program in and around Atlanta, Georgia.⁴ Mowry and Edge (2014) theorised that coyotes in Georgia are

expanding their range into areas that they have never occupied and, as such, there are fewer opportunities to find mates. In response, the coyotes may have occasionally mated with dogs.⁴ Genetic testing indicates that the regional coyote population has dog genes in their DNA, supporting this theory.⁵ An alternate theory is that the gene for melanism came through interbreeding with red wolves (*Canis lupus baileyi*) in the past.⁴ In either case, whether the gene arrived directly from domestic dogs, or through dogs to red wolves, the presence of dog DNA is believed to explain the high prevalence of black coyotes in that area.⁴

The evolutionary history of the gene that expresses black coat colour in canids is being revealed through genetic mapping.⁶ Given that all breeds of dog originated from a common ancestor of modern grey wolves, it was originally assumed that black wolves led to black dogs.⁷ Interestingly, the opposite appears to be true. The gene that expresses black fur in wolves didn’t arise in them, but evolved in dogs. As far as geneticists can tell, the gene mutation developed in domestic

dogs about 50,000 years ago.⁶ This gene was then transferred to wolves through interbreeding events about 15,000 years ago in the vicinity of the Bering land bridge in northern Yukon/Alaska, when humans, along with their dogs, migrated from Siberia to North America.⁶ This mutation is dominant, so it required only one copy of the mutated gene to produce a black wolf. This also meant that the gene mutation spread throughout the North American wolf population.⁶

Historically, coyote/dog crosses have been considered extremely rare, if not impossible, as this requires mating between two different species.⁵ However, the genetic evidence that coyote/dog crosses have occurred in the southeastern US population demonstrates that this same dog gene for black colour could make its way into a coyote population.⁴

A similar situation may be occurring near Waskesiu Lake. While coyotes are known to have expanded into the boreal forest of Saskatchewan for more than 100 years, long-time residents recall few observations of coyotes near

Waskesiu Lake until the early 2000s (Jonathan Jansen, Parks Canada pers. comm.; Adam Pidwerbeski, Parks Canada pers. comm.; Brad Lloyd, Parks Canada pers. comm.).⁸

This lack of coyotes until recently may be due to the effects of predator cascade. It is well known that wolves suppress coyote populations, and wolves have long been known to inhabit the region immediately surrounding the townsite of Waskesiu Lake.⁹ Thus, while coyotes have been present in PANP for a long period, it is also likely that they have never been abundant, particularly in areas with relatively high wolf populations.⁸ As discussed below, there appears to be no significant change in wolf populations, but rather the current situation may be reflected in an increased tolerance of coyotes to live near humans, and thus an ability for coyotes to live in the “sweet spot” between wolves and humans that Waskesiu Lake provides. Given that black coyotes stand out from their grey relatives, it is likely that coyotes in the region have only recently cross bred with domestic dogs, and the genes for melanism were transferred to the local coyote population. It is unlikely, however, that the cross occurred in Waskesiu Lake itself.

Coyotes normally mate during the winter months.^{10,11} However, Waskesiu Lake, as a seasonal community, has a very low dog population at that time. Additionally, the likelihood of mating decreases further as the number of free ranging dogs is near zero, given the current Parks Canada policy to have all dogs on leash or confined.¹² My sense is that these regulations are generally abided by, especially during the winter.

A more likely scenario is that the mating occurred somewhere near but outside the park boundary. Beginning in the winter of 2017-18, PANP staff who travel from Waskesiu

Lake toward the City of Prince Albert first noted a black coyote at the intersection of Highway 2 and Provincial Highway 953, which leads to Anglin Lake and Great Blue Heron Provincial Park (Adam Pidwerbeski, Parks Canada pers. comm.; Brad Lloyd, Parks Canada pers. comm.). This coyote, or a similar black one, was regularly observed in the same location for several years, and as recently as the winter of 2020-21 (Brad Lloyd, Parks Canada pers. comm.). Of note, the intersection where the Anglin Lake coyote was observed is approximately 30 kilometres from Waskesiu Lake by highway, and 23.5 kilometres in direct line distance. Coyotes have been recorded to disperse up to 500 km, thus this distance could be easily navigated by dispersing coyotes.^{13,14}

These sightings precede the sightings in Waskesiu Lake by several years, and with sightings at the two different locations overlapping temporarily, it is possible there are currently two core populations of black coyotes. Furthermore, based on the proximity of the Anglin Lake coyote, and by the lack of opportunity for crossbreeding at Waskesiu Lake, it is more probable that the founding black coyote in Waskesiu Lake came from the Anglin Lake population.

Regardless of where the gene transfer occurred within the region, it would take only one pairing between a female coyote and a domestic male dog to create a black coyote (it is unlikely that the cross would occur between a domestic bitch and male coyote, as the resulting pups would be born into a domestic household). The ratio of my observed five black pups to three grey coyote pups also bears out the dominance of the genetic trait, and would explain the relatively common sightings of black coyotes in Waskesiu Lake recently.

Some coyote populations have adapted to live in close proximity to humans, even successfully living in urban city centers such as downtown Chicago.^{15,16} This increased tolerance of humans could explain how the interbreeding event, and subsequent transfer of the melanistic gene, could occur. It also may explain the recent establishment of coyotes in the Waskesiu Lake area. These coyotes may have found a buffer zone between humans and wolves, using the presence of humans to avoid interactions with the local wolves, which tend to be wary of humans. At the same time, I have observed that few humans stray from the pavement and established trails of the townsite, making the bush immediately surrounding Waskesiu Lake a safe and relatively untrammelled place for coyotes to inhabit.

An excellent example is provided by the location chosen for the coyote pair’s rendezvous site. This site was less than 150 metres from a busy cottage area, only separated by a relatively narrow band of forest, and the pups would have been constantly exposed to the noise and activity of humans. At first appearances, it would seem like a poor location to raise young, but in fact it provides a perfect spot to avoid wolves while being distant enough from the cottages to reduce the likelihood of discovery by humans.

One additional observed outcome is an anecdotal reduction of red foxes (*Vulpes vulpes*) living within the town boundaries. I have made fewer observations of foxes over my two years living in the townsite, which could be explained by the cascade effects of coyotes moving into the area and killing or displacing the resident foxes.⁹

While there is currently no plan to undertake genetic testing on Waskesiu Lake coyotes, time will tell

whether these black genes persist in the local coyote population. Stahler et al. (2012) found that black female wolves had 25 per cent fewer surviving pups when compared to grey-coloured females.¹⁷ The reason for this difference in pup survival rates was not determined, but this does suggest that if wild black canids are less fit than other individuals, then the population of melanistic coyotes near Waskesiu Lake may slowly disappear.

I thank Jonathan Jansen, Adam Pidwerbeski and Brad Lloyd for sharing their coyote sightings and knowledge of Prince Albert National Park, Curtis Matwishyn for capturing photographic evidence of the black coyote, and to Katrien, Rebecca, Abbey, and Rae Kingdon for their comments on an earlier draft of this article. Thank you also to the anonymous reviewer and Annie McLeod for their thoughtful comments and edits.

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THE MYSTERY OF MIGRATION

Brian K. Jeffery
Regina, SK

What is the inner bidding that stirs the birds to migrate?

Is it the shorter number of daylight hours? Over the summer, the number of daylight hours decreases thus signaling to the birds it is time to prepare for migration. As winter approaches, their normal prey will not survive and hence the need to migrate to the wintering grounds until Spring returns.

Just how do they navigate this migration? Some suggest that it is by landmarks such as rivers, mountain ranges, land formations and cities. Other suggest that they navigate by the moon and the stars. Still others will say that it is by the angle of the sun that helps them determine a course. And what of the birds that have migrated many times? Perhaps they already know the route and can fly directly to their wintering grounds without any hesitation. Younger birds, migrating for the first time, may learn how to migrate by following the adults.

We may never know for sure just how the birds migrate.

It might be by any one or combination of methods. Or is it by some method that we haven’t yet considered. Besides, perhaps it is the intention of the birds to keep the mystery of migration their secret. I wonder? 🐾

RARE VASCULAR PLANTS OF REDBERRY LAKE BIOSPHERE RESERVE

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Introduction

The loss of biodiversity is now considered a major global concern and some studies suggest that it could rank among the key drivers of ecosystem change in the twenty-first century.^{1,2} To help with conservation planning efforts, a greater understanding of biodiversity is needed at regional scales and for different taxonomic groups.³

Conservation efforts targeting plant diversity are often hampered by a lack of suitable data for prioritizing conservation action.⁴ The first stage of systematic conservation planning prioritizes the compilation of distribution data for rare species as they are usually underrepresented when establishing different types of protected areas.⁵

Redberry Lake Biosphere Reserve (RLBR) is the only protected area of this type in Saskatchewan. The

biosphere reserve was designated by UNESCO in 2000 with a purpose to conserve biodiversity, foster sustainable development, and capacity building through scientific research, monitoring, education, and training.⁶ The data on RLBR's biodiversity are rather limited and with a predominant focus on bird species.⁷ Thus, the overall objectives of this paper were to provide information on rare plants in the RLBR: (i) species taxonomy, (ii) conservation status, (iii) distribution, and (iv) threats to survival. These data are intended to support evidence-based conservation management in the biosphere reserve.

Methods

Study area

Redberry Lake Biosphere Reserve (recently the word 'reserve' in the name of the organization was replaced with the "region"⁸) is located about 60 km northwest of Saskatoon (Figure 1). The biosphere reserve covers 112,200 hectares and is in the Redberry Lake's watershed. It is a saline lake that provides essential habitats for almost 200 bird species, including many

threatened species (UNESCO 2018).⁹ The landscape of RLBR is composed of rolling prairie dotted with seasonal ponds and marshes along with aspen woodland and shrub groves. There are small patches of natural mixed prairie which are very rare in this highly grazed and cultivated part of the Canadian Prairies. Many wetlands were drained and transformed into cultivated croplands and pastures (UNESCO 2018).⁹

According to recent studies (Kricsfalussy 2021)¹⁰, vascular plants of RLBR include 466 taxa, representing approximately 26.3 per cent of Saskatchewan's flora. The first list of the vascular flora of the biosphere reserve, which includes 281 taxa, was compiled by local naturalist M. Finley in 1993–2008, however, it has not been published. Information on nine rare plant species of this region, which was collected by M. Finley, is diffuse and does not include the data where those species occur.

Data collection

The information on rare plants in the Redberry Lake Biosphere Reserve was compiled from different sources (literature, databases, and herbarium specimens) and field studies conducted by the author. This information includes data on the species taxonomic status, conservation rank, and distribution in Saskatchewan. Information about human land use practices in the biosphere reserve, including livestock grazing, agricultural conversion, and fire suppression was provided by J. Kindrachuk, Executive Director of RLBR.

Herbarium vouchers of rare plants deposited at the W.P. Fraser Herbarium of the University of Saskatchewan (SASK 2018)¹¹ were examined. Additional information on occurrences of rare plants was obtained through the Saskatchewan Conservation Data Centre (SKCDC 2018)¹² and the HABISask database (2020).¹³ The nomenclature of

the taxa follows the VASCAN database (2010).¹⁴ The species conservation ranks are given according to the NatureServe (2012)¹⁵ categories and listing by Saskatchewan Conservation Data Centre (SKCDC 2018).¹²

Data on rare plants in the RLBR (local distribution, population features, and threats to survival) were collected during the general floristic inventories conducted from 2011–2018. Plants were identified *in situ* and a few photos for each species observed were taken. All locations were georeferenced using a GPS unit with an accuracy of 2 m. Whenever possible, the number of individuals was either counted directly (for the rarest and least widely distributed taxa) or estimated from partial counts (for species located at discontinuous sites). To characterize the habitat for each population, the corresponding vegetation surveys were conducted. Representative sampling plots of different size were laid in grassland (1x1m), shrubland (2x2m), and woodland (10x10m) vegetation communities, and transects (2x10m) in wetlands. Daubenmire classes (1 – 0-5%, 2 – 5-25%, 3 – 25-50%, 4 – 50-75%, 5 – 75-95%, 6 – 95-100%) were used to estimate cover for each vascular plant species, as well as for all vegetation layers and soil. Disturbances (litter, trampling/trails, exotics, grazing/browsing, burrowing) were recorded in

four classes (0 – absent, 1 – light, 2 – moderate, 3 – severe). Information on slope, aspect, elevation, legal location, and geographic coordinates were also collected. Vegetation types were identified using the principles of the Ecological Land Classification (Lee et al. 1998)¹⁶, adapted by the author for Saskatchewan.

Results and Discussion

As a result of this study 18 vascular plant species were identified in the Redberry Lake Biosphere Reserve as being at risk at the global (1 taxon), national (3 taxa), and subnational (18 taxa) levels. It should be noted that the same species can be placed in all three categories simultaneously.

These rare plants are distributed within the following subnational (provincial) categories (Figure 2): S1– Critically Imperiled/Extremely rare (1 taxon), S2– Imperiled/Very rare (4 taxa), and S3– Vulnerable/Rare to uncommon (13 taxa). In terms of the rare species richness at the subnational level (S1–S3), the top five families are Orchidaceae (4 taxa) and Poaceae (3 taxa), followed by Asteraceae, Chenopodiaceae and Gentianaceae, each including 2 taxa. The rest six families include one taxon only (Figure 3). Thus, the orchid family alone contains 22 per cent of all rare plants of provincial significance in this region.

Yellow twayblade (*Liparis loeselii*) has the highest conservation status at the subnational level as Critically Imperiled (S1) species.

Concerning the rare species richness at the national level (N1–N3), there are only three taxa that belong to two families: Chenopodiaceae (2 taxa) and Ophioglossaceae (1 taxon). Prairie moonwort (*Botrychium campestre*) has the highest national rank (N2 – Imperiled) among all rare plants. It is also the only plant species with a high conservation status at the global level – G3G4 (Vulnerable/Rare, Uncommon).

Asteraceae – Aster (sunflower) family

Almutaster pauciflorus (Nutt.) Á. Löve & D. Löve (= *Aster pauciflorus* Nutt.) – alkali marsh aster, few-flowered aster (Figure 4A)

Habit: perennial herb growing a reddish-green glandular stem to heights from 30 to 120 cm. The narrow leaves are linear in shape and up to 10 cm long. The inflorescence is an open array of flower heads containing white to pale purple ray florets and a center of yellow disc florets. The head is lined with phyllaries covered in tiny white resin glands.

Range: scattered across Canada (NWT and the Prairie Provinces), the western United States, and northern and central Mexico.

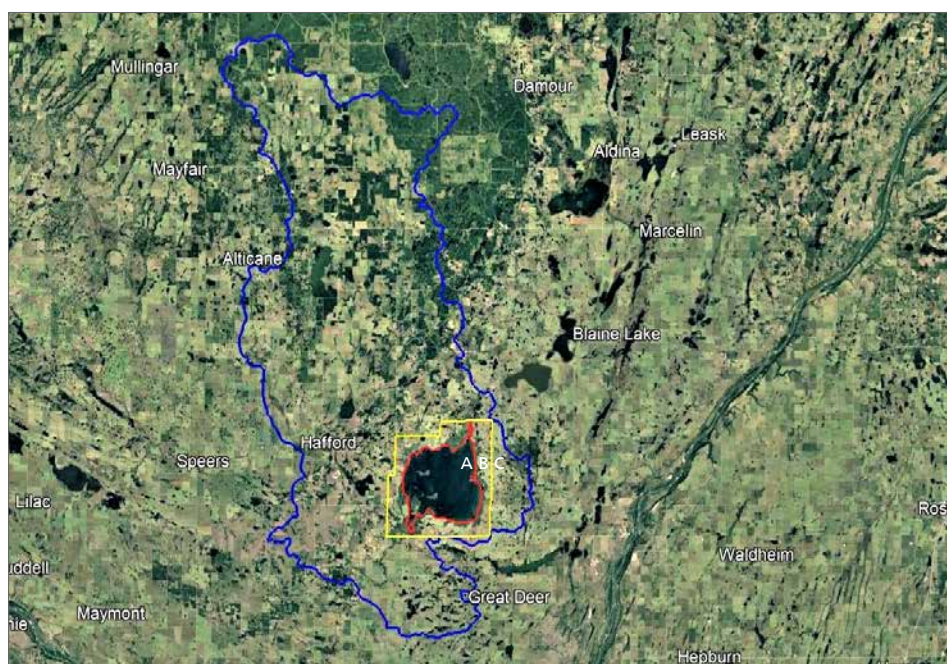


FIGURE 1: A map showing position of Redberry Lake Biosphere Reserve (RLBR) in Saskatchewan. Zoning of RLBR: A - core area, B - buffer zone, and C - transition area.

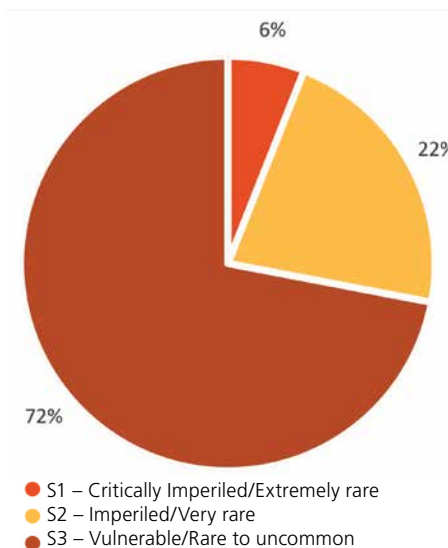


FIGURE 2: Rare plants distribution per subnational (provincial) conservation rank (S1–S3) in the Redberry Lake Biosphere Reserve.

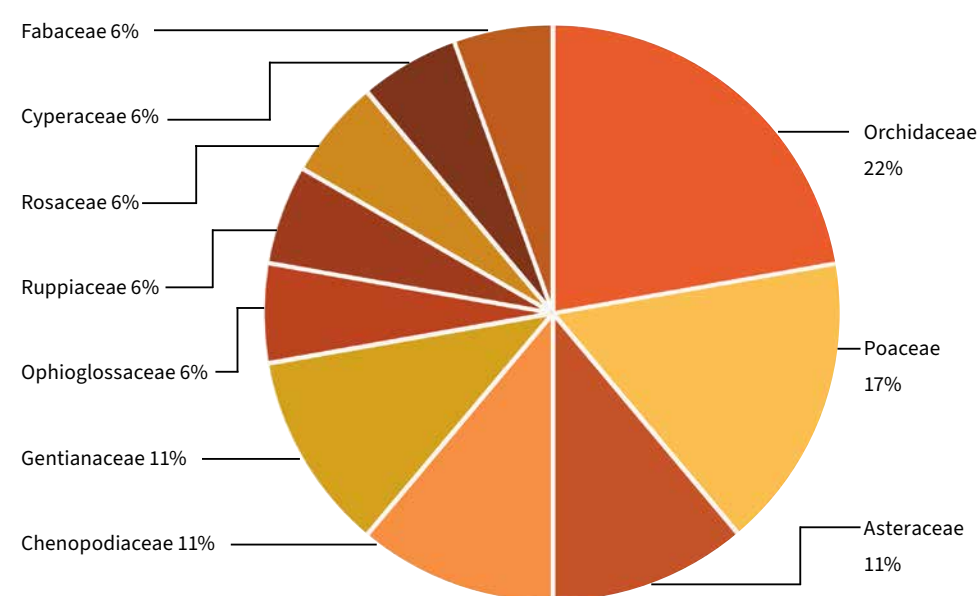


FIGURE 3: Rare plants distribution per family in the flora of Redberry Lake Biosphere Reserve.



FIGURE 4: Rare plants of Redberry Lake Biosphere Reserve (Photo V. Kricsfalusy): A – alkali marsh aster (*Almutaster pauciflorus*), B – devil's beggarticks (*Bidens frondosa*), C – American bugseed (*Corispermum americanum* var. *americanum*)

Distribution in SK: Cypress Hills, Mixed Grassland, Moist Mixed Grassland, Aspen Parkland, and Boreal Transition ecoregions. RLBR – two locations.

Habitat: inland salt marshes and saline flats.

Conservation Status: S3 N4 G4.

Bidens frondosa L. – devil's beggarticks, common beggarticks (Figure 4B)

Habit: annual herb usually about 20 to 60 cm tall, but it can reach 1.8 m at times. The stems are square in cross-section and may branch near the top. The leaves are pinnate, divided into a few toothed triangular or lance-shaped leaflets usually up to 6 or 8 cm long. The inflorescence is often a solitary flower head, but there may be pairs or arrays of several heads. The head contains many orange disc florets.

Range: widespread across much of Canada, the United States, and Mexico. It is known as an introduced species in Europe, Asia, North Africa, and New Zealand.

Distribution in SK: Mixed Grassland, Moist Mixed Grassland, Aspen Parkland, Boreal Transition, and Mid-Boreal Upland ecoregions. RLBR – three locations.

Habitat: moist woods, meadows, thickets, fields, roadsides, railroads, borders of streams, ponds, sloughs,

swamps, and ditches.

Conservation Status: S3 N5 G5.

Chenopodiaceae – Goosefoot family

Corispermum americanum (Nutt.) Nutt. var. *americanum* (= *C. hyssopifolium* var. *americanum* Nutt.) – American bugseed (Figure 4C)

The name *C. americanum* has been misapplied to the Eurasian species, hyssop-leaved bugseed (*C. hyssopifolium* L.), which differs primarily in lacking wings on fruits, and having rounder, non-spotted fruits, respectively.

Habit: short, bushy annual plant, up to 50 cm tall and nearly as wide; many leaf-tips possessing dark, non-green points; inflorescence elongate-linear and loosely-flowered; fruits obovate, spotted, extending beyond thin perianth with conspicuous, papery, 0.25 to 0.60 mm wide wings.

Range: rare across North America except the southeastern region and northern Mexico.

Distribution in SK: Mixed Grassland, Moist Mixed Grassland, Aspen Parkland, and Boreal Transition ecoregions. RLBR – one location.

Habitat: Dunes, sandy prairies and hills and dry waste places.

Conservation Status: S3 N3 N4 G5?T5?

Corispermum pallasii Steven (= *C. hyssopifolium* L. var. *leptopterum* Ascherson.) – Pallas' bugseed, Siberian bugseed

According to recent studies¹⁷, the hypothesis of the native status of *C. pallasii* in North America seems to be preferable; the secondary introduction of some populations from Europe is also not improbable.

Habit: branched, 10 to 45 cm tall annual forb of dunes and beaches; leaves less than 4.0 mm wide, tipped with a sharp, non-green tip less than 0.5 mm long; inflorescence densely flowered except at base; fruit winged, greater than 2.3 mm wide.

Range: native to Siberia but naturalized in Europe. Native to Canada, and the Great Lakes Region of the United States.

Distribution in SK: Mixed Grassland, Moist Mixed Grassland, Aspen Parkland, and Boreal Transition ecoregions. RLBR – one location; two other species locations (SKCDC 2018)¹² were not confirmed by our field surveys.

Habitat: full sun on dry, well-drained sandy soil. Found on dunes and rarely in disturbed, sandy sites.

Conservation Status: S2 N3 N4 G4?

Cyperaceae – Sedge family

Amphiscirpus nevadensis (S. Watson) Oteng-Yeboah



FIGURE 5: Rare plants of Redberry Lake Biosphere Reserve (Photo V. Kricsfalusy): A – Nevada bulrush (*Amphiscirpus nevadensis*), B – Macoun's fringed gentian (*Gentianopsis virgata* subsp. *macounii*), C – marsh felwort (*Lomatogonium rotatum*).

(= *Scirpus nevadensis* S. Watson) – Nevada bulrush (Figure 5A)

Habit: perennial herb with erect stems that are stiff, ridged, and cylindrical, not three-angled. It lacks aerenchyma, a trait that makes it different from many of its relatives. The stems are sheathed by tough long leaves. The inflorescence is a head-like cluster of a few cone-shaped spikelets accompanied by a long, stiff bract that looks like an extension of the stem.

Range: Western North America, including the western Canadian provinces and the northwestern United States, as well as southern South America.

Distribution in SK: Mixed Grassland, Moist Mixed Grassland, Aspen Parkland. RLBR – one location.

Habitat: wet and seasonally wet habitat, often on saline and alkaline soils.

Conservation Status: S3 NNR G4.

Fabaceae (Leguminosae) – Legume (pea) family

Astragalus australis (L.) Lamark var. *glabriusculus* (Hooker) Isely (= *A. richardsonii* E. Sheldon, *A. aboriginorum* Richardson) – aboriginal milk-vetch

Habit: perennial herb from a woody taproot and much-branched stem-base; stems few to several, tufted, decumbent to ascending, 10-40

cm long/tall, with short or long, unbranched hairs, or nearly glabrous.

Range: circumpolar species found in North America but also in Europe and northwest Asia. In North America occurs from Alaska through most of Canada except for the extreme east and in the US from the state of Washington to Nevada.

Distribution in SK: Cypress Hills, Moist Mixed Grassland, Aspen Parkland, Boreal Transition, and Mid-Boreal Upland ecoregions. RLBR – may occur in the area (SKCDC 2018).¹²

Habitat: mesic to dry, open bluffs, grassy or rocky slopes, streambanks, meadows, ridges, tundra and forest openings from the steppe to alpine zones.

Conservation Status: S3 N5 G5.

Gentianaceae – Gentian family

Gentianopsis virgata (Rafinesque) Holub subsp. *macounii* (Holm) J.S. Pringle (= *Gentiana macounii* (Holm) Iltis) – Macoun's fringed gentian (Figure 5B)

Habit: erect, annual/biennial, 30-70 cm tall forb, often branched near the top. Upper leaves long and narrow, less than 1 cm wide. Flowers blue, 4-parted, 3-5 cm wide, funnel-shaped, long-stalked, petals toothed at the ends and fringed at the sides, with no folds between; solitary on long stalks.

Range: scattered across North America from Yukon to Quebec, south to British Columbia, Montana, and North Dakota.

Distribution in SK: Aspen Parkland, Boreal Transition, and Athabasca Plain, and Tazin Lake Upland ecoregions. RLBR – one location.

Habitat: wet to moist meadows, shores; in limey, rocky soil.

Conservation Status: S3 N5 G5.

Lomatogonium rotatum (L.) Fries var. *fontanum* (A. Nelson) J.S. Pringle – marsh felwort (Figure 5C)

Habit: grows as tall as 35 cm from fibrous roots. Has a slender, simple or branched stem. The basal leaves are spatula-shaped and soon wither away. The stem leaves are mostly linear and are purplish-green in colour. The flowers are clustered in heads at the top of the stem or in the leaf axils. The sepals are deeply divided, and the lobes are almost equal to the petals. The petals are purple and widely spreading. Each petal lobe has a pair of scale like appendages near the base. The fruit is a capsule.

Range: has a circumboreal and alpine distribution, and in North America is found across Alaska, Canada and the Rockies, entering New England with a few populations in Maine.

Distribution in SK: Mixed Grassland, Moist Mixed Grassland, Aspen



FIGURE 6: Rare plants of Redberry Lake Biosphere Reserve (Photo V. Kricsfalusy): A – prairie moonwort (*Botrychium campestre*), B – striped coral root (*Corallorhiza striata* var. *striata*), C – small yellow lady's slipper (*Cypripedium parviflorum* var. *makasin*).

Parkland, and Sothern Boreal Forest ecoregions. RLBR – one location.
Habitat: wet to moist fens, meadows and shorelines.

Conservation Status: **S3** N5? G5.

Lemnaceae – Arum family

Lemna sp. – duckweed

Most plants collected in Saskatchewan are now recognized as common duckweed (*L. turionifera* E. Landolt) (Harms et al 2018).¹⁸ M. Finley identified the specimen collected in the RLBR in 2000 as lesser duckweed (*L. minor* L.). The poor quality of this specimen did not allow me to make a conclusive decision about its taxonomic status. As such, *L. minor* is not included in the list of rare species of RLBR.

Habitat: floating freshwater aquatic plant, with one, two or three leaves each with a single root hanging in the water; as more leaves grow, the plants divide and become separate individuals. The root is 1-2 cm long. The leaves are oval, 1-8 mm long and 0.6-5 mm broad, light green, with three (rarely five) veins, and small air spaces to assist flotation.

Range: has a subcosmopolitan distribution, native throughout most of North America, Africa, Asia, and Europe.

Distribution in SK: It is most likely that *L. turionifera* occurs in the RLBR (see my comment above).

Habitat: occurring everywhere that freshwater ponds and slow-moving streams occur, except for arctic and subarctic climates.

Conservation Status: *L. minor* – **S1** N5 G5; *L. turionifera* – G5 N5 S4.

Ophioglossaceae – Adder's-tongue family

Botrychium campestre W.H. Wagner & Farrar – prairie moonwort (Figure 6A)

Habitat: Plant has one leaf, with the sterile and fertile blades coming from the same stalk. The sterile blade is sessile to the common stalk and is only up to 4 cm long. When the plant is in the vegetative stage, the sterile blade is folded lengthwise. This blade is fleshy, with a bluish tinge and has up to five pairs of lobes. The lobes may be well-spaced. The fertile blade is 1 to 1.5 times longer than the sterile blade.

Range: Great Lakes region, Iowa, and Minnesota, ranging into Nebraska, North Dakota, Saskatchewan, and Alberta, with isolated disjunct occurrences known in New York and eastern Canada.

Distribution in SK: Mixed Grassland, Moist Mixed Grassland, and Aspen Parkland ecoregion. RLBR – one location (Kricsfalusy 2021).¹⁹

Habitat: grasslands, sand dunes, and sometimes in open woodlands.
Conservation Status: **S3** N2 G3G4.

Orchidaceae – Orchid family

Corallorhiza striata Lindl. var. *striata* – striped coral root, hooded coralroot (Figure 6B)

Habitat: lives off decaying organic matter in the soil and therefore does not need to have chlorophyll to obtain food. The stems are purplish to yellowish-brown and the leaves are reduced to small bracts. The flowers are in an unbranched cluster at the top of the stem. The sepals and petals can be spreading or touching at the tip. They are reddish-purple or yellow with three to five darker purple veins. The lip has deep red margins and a white or yellow centre striped with purple. The column is slender and yellow.

Range: widespread across much of southern Canada, the northern and western United States, and Mexico.
Distribution in SK: Cypress Hills, Aspen Parkland, Boreal Transition, and Southern Boreal Forest ecoregions. RLBR – one location.

Habitat: lives in dry, decaying plant matter on the ground in forests and woodlands, and it obtains its nutrients from fungi via mycoheterotrophy.
Conservation Status: **S3** N5 G5T5.

Cypripedium parviflorum Salisb. var. *makasin* (Farwell) Sheviak (= *C. pubescens* Willd. var. *makasin* Farwell) – small yellow lady's slipper, hairy yellow lady slipper (Figure 6C)



FIGURE 7: Rare plants of Redberry Lake Biosphere Reserve (Photo V. Kricsfalusy): A – large yellow lady's slipper (*Cypripedium parviflorum* var. *pubescens*), B – yellow twayblade (*Liparis loeselii*), C – plains rough fescue (*Festuca hallii*).

Habitat: flowers small; lip 15–29 mm; Labellum 1.5–3 (–3.5) cm long; lateral petals mostly 3–5 cm long, either densely spotted or evenly suffused with red-purple or red-brown. Uppermost sheathing bract glabrous or inconspicuously pubescent; the red-purple colour of lateral petals due to an even suffusion of pigment; floral scent intensely sweet.

Range: North American taxon that occurs from Alaska across entire Canada to adjacent northeastern and western parts of the United States.

Distribution in SK: Cypress Hills, Moist Mixed Grassland, Aspen Parkland, and Southern Boreal Forest. RLBR – one location (Kricsfalusy 2021).¹⁰

Habitat: rich, moist, semi-open woods, fringes of bogs and fens, and moist meadows.

Conservation Status: **S3** N4N5 G5T4T5.

Cypripedium parviflorum Salisb. var. *pubescens* (Willdenow) Knight (= *C. calceolus* L. var. *pubescens* (Willdenow) Correll) – large yellow lady's slipper (Figure 7A)

Habitat: flowers commonly large, lip to 54 mm, but very small in some boreal specimens. Labellum usually 3–5.4 cm long; lateral petals mostly 5–8 cm long, entirely yellow-green or sparsely to moderately spotted or streaked with red-purple; has a musty floral fragrance.

Range: Newfoundland, south to Georgia; most of Midwest, Great Lakes, and Plains states; in the southwest to Arizona and California, north to Pacific Northwest.

Distribution in SK: Aspen Parkland, and Southern Boreal Forest. RLBR – four locations.

Habitat: mesic to moist forests, shrub-thickets, meadows, clearings, and wet ditches.

Conservation Status: **S2** N5 G5T5.

Liparis loeselii (L.) Rich. – yellow twayblade, fen orchid (Figure 7B)

Habitat: grows up to 25 cm tall from a short rhizome. There is an enlargement at the base of the stem that is covered in bracts. The stem is pale or yellowish-green. There are two green, glossy leaves. The flowers are in an unbranched cluster up to 10 cm long. The sepals and petals are greenish, yellowish, or whitish. The petals are threadlike with a wedge-shaped base. The column is short and stout.

Range: has a wide distribution in North America, Europe and Asia, but is uncommon to rare in most of its range.

Distribution in SK: Moist Mixed Grassland, Aspen Parkland, and Southern Boreal Forest ecoregions. RLBR – one location.

Habitat: wet meadows, fens, sloughs, and disturbed areas.

Conservation Status: **S1** N5 G5.

Poaceae (Gramineae) – Grass family

Danthonia californica Bolander (= *D. californica* var. *americana* (Scribner) Hitchcock) – California oatgrass

Habitat: perennial grass; caespitose. Culms 30-100 cm long; disarticulating at the nodes. Leaf-sheaths glabrous on the surface. Leaf-sheath oral hairs ciliate. Ligule a fringe of hairs. Leaf-blades flat, or involute; 10-20 cm long; 1-3 mm wide.

Range: occurs from British Columbia to southern California and eastward through the Rocky Mountain States and Provinces. A portion of the species range is located in Chile.

Distribution in SK: Cypress Hills, Mixed Grassland and sometimes in Aspen Parkland. RLBR – may occur in the area (SKCDC 2018).¹²

Habitat: woodland, shrubland, grassland, and transitional wetland habitats.

Conservation Status: **S3** NNR G5TNRQ.

Festuca hallii (Vasey) Piper (= *F. altaica* Trin. var. *hallii* (Vasey) Harms) – plains rough fescue (Figure 7C)

Habitat: perennial grass; clumped densely. Culms erect; 30-90 cm long; 2-noded. Culm-internodes smooth, or scaberulous. Leaf-sheaths tight; antrorsely scabrous. Leaf-sheath auricles absent. Ligule a ciliolate membrane. Leaf-blades involute; 10-50

cm long; 1-2 mm wide; stiff. Leaf-blade surface scabrous. Leaf-blade apex acute; pungent.

Range: occurs across Great Plains in the United States and Canadian Prairie Provinces and scattered through Aspen Parkland to Ontario.

Distribution in SK: Cypress Hills, Mixed Grassland, Moist Mixed Grassland, Aspen Parkland, and Southern Boreal Forest. RLBR – nine locations.

Habitat: dry and mesic grasslands.
Conservation Status: S3 N5 G4.

Piptatheropsis canadensis (Poiret) Romaschenko, P.M. Peterson & Soreng (= *Oryzopsis canadensis* (Poiret) Torr.) – Canada ricegrass

Habit: perennial grass; caespitose. Culms erect; 30-70 cm long. Ligule an eciliate membrane; 2 mm long. Leaf-blades flat, or involute; 5-20 cm long; 1-1.5 mm wide; coriaceous; stiff. Leaf-blade surface ribbed; scabrous. Leaf-blade apex attenuate.

Range: occurs in Canada from British Columbia to Newfoundland and adjacent areas of the United States, and Great Lakes region.

Distribution in SK: Moist Mixed Grassland, Aspen Parkland, and Southern Boreal Forest. RLBR – may occur in the area (SKCDC 2018).¹²

Habitat: dry-fresh grasslands, sandy open aspen woods, rocky slopes.

Conservation Status: S2 N5 G5.

Rosaceae – Rose family

Potentilla rubricaulis Lehmann – red-stemmed cinquefoil, Rocky Mountain cinquefoil

Habit: relatively large plants with open 4–20-flowered inflorescences. Leaflet teeth (4)5–8 per side; leaflets green to grayish-green adaxially hypanthium 4–6 mm diam. Stems ascending to nearly erect, 1.5–4 dm. Basal leaves often both ternate and palmate on the same plant, rarely subpalmate, 4–10 cm; petiole 2.5–7 cm, long hairs sparse to common, loosely appressed to ascending-spreading.

Range: Subarctic Alaska and Canada to the west and central United States.

Distribution in SK: Mixed Grassland, Moist Mixed Grassland, Aspen Parkland, Boreal Transition, and Athabasca Plain. RLBR – one location.

Habitat: sandy lake shores, open sandy forests, dry grassy slopes, sandy and loamy bluffs.

Conservation Status: S3 NNR GNR.

Ruppiaceae – Ditch-grass family

Ruppia cirrhosa (Petagna) Grande (= *R. occidentalis* S. Watson) – western ditchgrass, spiral ditchgrass
Habit: it is a thread-thin, grass-like perennial herb that grows from a rhizome anchored in the wet substrate. It produces a long, narrow inflorescence tipped with two tiny flowers. As the fruit develops the peduncle of the inflorescence curls into a neat spiral.

Range: an aquatic plant native to the Americas and Europe.

Distribution in SK: Mixed Grassland, Aspen Parkland, Boreal Transition, and Mid-Boreal Upland. RLBR – one location.

Habitat: freshwater bodies, such as lakes.

Conservation Status: S3 N5 G5.

Distribution and habitat

The research undertaken for this study has substantially enlarged the number of rare plants and their locations in the Redberry Lake Biosphere Reserve. In total, 10 out of 18 taxa were identified as new for the biosphere reserve. In addition to that, distribution areas were updated with new locations for 12 rare plants, such as plains rough fescue (five locations), large yellow lady's slipper (three locations), few-flowered aster (two locations) and other species. As a result of our field surveys, six species-rich sites that possess more than one rare species were identified: 4 taxa (two sites), 3 taxa (one site), 2 taxa (three sites).

The obtained results indicate that

the habitat preferences of rare plants are as follows: wetland/riparian (8 taxa), grassland (4 taxa), woodland (4 taxa), and sand dune (2 taxa). As we can see, rare plants more likely to be found in wet and dry habitat conditions, and significantly less expected in disturbed areas. Such patterns may be explained by local natural history. This part of Saskatchewan has been subjected to intense agricultural pressure which resulted in extensive habitat alteration.²⁰ Because of the dramatic transition from natural to agricultural ecosystems, most of the prairies (which are dry open habitats) have been wiped out.

The two most severe threats estimated to face the studied rare plants are successional overgrowth (affecting a total of 11 taxa and six sites), and recreation, especially physical destruction of plants (affecting a total of 6 taxa and three sites). Both these threats are resulting from a lack of management. A less common, but also dramatic threat is habitat destruction caused by wetland desiccation due to drainage, which targets two rare species. Most of the rare plants are affected by one or two main threats, whereas large yellow lady's slipper is in the most extreme situation facing three threats.

Conservation management

It was to be expected that habitat loss and the fragmentation of populations would be two of the key mechanisms for the loss of biodiversity in the Redberry Lake Biosphere Reserve. As mentioned above, the overgrowth of woody species during natural succession is having the most negative impact on habitats of rare species and their populations. Habitats of large yellow lady's slipper, small yellow lady's slipper, prairie moonwort, and striped coral root are particularly vulnerable to the successional overgrowth.

There are a few historical records of American bugseed and Pallas' bugseed

indicating the occurrence of these species on two islands in Redberry Lake and in the shore zone around the lake (SKCDC 2018).¹² Recent survey efforts in 2017 did not confirm previously documented locations on those islands. It has been found that sand dune habitat is declining there because of vegetation succession, particularly shrub and low tree growth.

Plains rough fescue has disjunct occurrences across the biosphere reserve. The species has declined due to human land use practices, including livestock grazing, agricultural conversion, and fire suppression. Great concern exists because these habitats are being invaded by aggressive exotic species.

Thus, we can declare the higher significance of habitat conservation than individual conservation for the protection of these rare plants. The different threats faced by the populations can be averted by different means of restoration, with the most relevant being the clearing of bushes and trees, restorative mowing and control of invasive exotic species. In addition to these measures, the introduction of grazing and fire should be investigated in certain sites, as it is ultimately one of the few means to ensure the long-term persistence of the species.

Conclusions

It is a matter of concern that only two out of six species-rich sites found in the Redberry Lake Biosphere Reserve are included in the biosphere reserve's core zone. These two sites are securely protected for conserving biological diversity because of the existing zoning. In terms of species protection, only five out of 18 rare plants occur at the sites located in the core zone of the biosphere reserve. However, the majority of rare plant species are located within the buffer zone of RLBR in which human impact is less intensive than in the transition zone.

Conservation management such as grazing, clearing, and mowing is

needed in the majority of rare species habitats in the near future. Monitoring known populations of rare species would help to determine whether they are declining.

This information will serve to designate the future priorities for the conservation of rare plants in the RLBR. These conservation strategies are important for raising public awareness and prompting political action but smaller-scale actions are also needed by local conservation practitioners.

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PHOTOGRAPHY



Killdeer adult (left) and juveniles (right) photographed by Daniel Bushman in late July 2021 at Last Mountain Lake Regional Park.



A Luna Moth photographed by Janet Loran.



A Common Redpoll photographed on March 4, 2021 by Bill MacKenzie.

OBSERVATIONS OF RUSTY BLACKBIRDS CAPTURING AND CONSUMING FISH

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On 23 November 2020, Dale Hjertaas and I located two Rusty Blackbirds (*Euphagus carolinus*) where flow from two storm sewers created small areas of open water in Regina's Wascana Marsh. I spent about 17 minutes observing and photographing them and observed one capture a fish. When I returned two days later for a second observation period of about 90 minutes, I observed one bird capture at least two fish. Both observation periods ended when the birds flew away.

Rusty Blackbirds' food is described as crustaceans, aquatic insect larvae and seeds and they are often observed foraging in overgrown, swampy habitat.¹ A quantitative food analysis (stomach contents mostly from March, April, October and November) illustrates that the types of invertebrates eaten vary by month (more scarab beetles in April, more caterpillars in May, more grasshoppers in August and October, more spiders and myriapods in August), likely depending on availability.² Invertebrates, including crawfish, are eaten throughout the year.³ "Other small animals, such as crustaceans, snails, salamanders, and small fish, were found in the stomachs for nearly every month, and amount to 7% of the food of the year", with 30% in December."² Rusty Blackbirds are also known to attack, kill, and sometimes eat other birds.³ Invertebrates, especially dragonfly nymphs (97%) are the primary food during the breeding

season, though salamanders, water beetles, spiders, small fish, crustaceans, snails, and mosquitoes are also consumed.⁴

On 11 December 2012, Kim Mann photographed a Rusty Blackbird holding a fish at A.E. Wilson Park in Regina.¹ She stated: "Laurie had seen the bird around the Christmas Bird Count time I think. I felt so sorry for the bird. I think it was found dead a few days later. It was wicked cold that time." My internet search managed to locate only two other photos of a Rusty Blackbird holding or eating a fish^{5,6,12} and I found no records in past issues of *Blue Jay*.

On 25 November, only one bird was present, alternating between the two open water areas. This is the last day this or another bird was seen in this area. A third Rusty Blackbird was observed below the Broad Street bridge at the same time I was photographing by the storm sewer. This third bird was last seen on the afternoon of the 30 November (ebird S76917471). The three birds mentioned here are late migrants, as Saskatchewan's average fall departure for Rusty Blackbirds is 25 to 27 October.¹ Rusty Blackbirds have occasionally overwintered in Saskatchewan.¹

The Rusty Blackbirds spent most of their time foraging along the ice, rocks and shoreline, generally within 17 m of the storm sewer outlets (Figure 1). When a bird got that far out it returned, hopped or flew across, then foraged on the other shore. On 25 November, I observed the bird fly four times from the open water by one storm sewer to the other. I photographed it holding and eating two different fish. It may have caught a third fish as it went to

shore — for about seven seconds, I could see its head moving in a behaviour similar to handling a larger prey item. However, it was behind a rock so I cannot be sure what the prey item was. I also watched the bird apparently capture a few small unidentified objects, probably aquatic invertebrates, and eat Russian Olive (*Eleagnus angustifolia*) berries that had fallen on the ground. Twice I observed the bird preen.

Figures 2 and 3, taken on 23 November 2020, show a Rusty Blackbird holding, then preparing to fly away with a fish as the other blackbird flew toward it. On 25 November, the blackbird quickly carried one small fish up to the snowy bank before dropping it in the snow (Figure 4). Although



FIGURE 1. Rusty Blackbird foraging along the ice. Regina, Saskatchewan, 25 November 2020.



FIGURE 2. When this one caught the fish, the other came in fast in what seemed like an attempt at stealing it. 23 November 2020.

dropped a few more times, the fish was swallowed whole, headfirst, a minimum of seven seconds later.

I was able to identify the second fish as a Brook Stickleback (*Culaea inconstans*) by the five spines on the dorsal fin⁷ (visible in Figure 5). This fish was either too large, or the dorsal spines prevented the fish from being swallowed whole. The blackbird carried it to shallow water and spent four minutes and 20 seconds tearing it apart and eating it. The blackbird repeatedly picked up the fish, tried to swallow it, dropped it, and held it with one or both feet while using its bill to tear it into smaller pieces (Figures 6, 7 and 8). While the blackbird tore the fish apart, it often did not hold it in place with one foot. This resulted in the fish being picked up before being dropped again, with the bird finally positioning its foot to hold it in place. The blackbird pulled the head off and swallowed it separately, finally swallowing the remainder of the fish "head" first (Figure 9).

The observation of the Rusty Blackbird eating fallen Russian Olive berries apparently adds a species to

the list of seed/fruit known to be eaten by this species. This reflects the species' opportunistic use of available sources of food.

Common (*Quiscalus quiscula*), Great-tailed (*Q. mexicanus*) and Boat-tailed (*Q. major*) grackles have been reported capturing and eating fish^{8,9,10} and Red-winged (*Agelaius phoeniceus*) and Brewer's (*E. cyanocephalus*) blackbirds have been reported scavenging dead minnows after a fish kill.¹¹ There is a recent photo of Brewer's Blackbird feeding a fish to chicks with no



FIGURE 3. Rusty Blackbird, carrying freshly captured fish, turning to take off before being pursued by the other Rusty Blackbird. This bird flew away with the fish pursued by the other blackbird.



FIGURE 4. Rusty Blackbird eating small fish.

background information on whether the fish was captured and killed or it was already dead.¹² As Rusty Blackbirds often forage in moist habitats, and with cold November weather eliminating most sources of invertebrate food, the choice of these late migrant Rusty Blackbirds



FIGURE 5. Rusty Blackbird with freshly captured Brook Stickleback.



FIGURE 6. Rusty Blackbird dropping the stickleback.



FIGURE 7. Rusty Blackbird tearing up the stickleback.

to forage along small patches of open water where invertebrates and fish could still be obtained is not surprising. A small fish would clearly be a substantial and prized food item.



FIGURE 8. Rusty Blackbird eating a piece of the stickleback it has torn from the body.

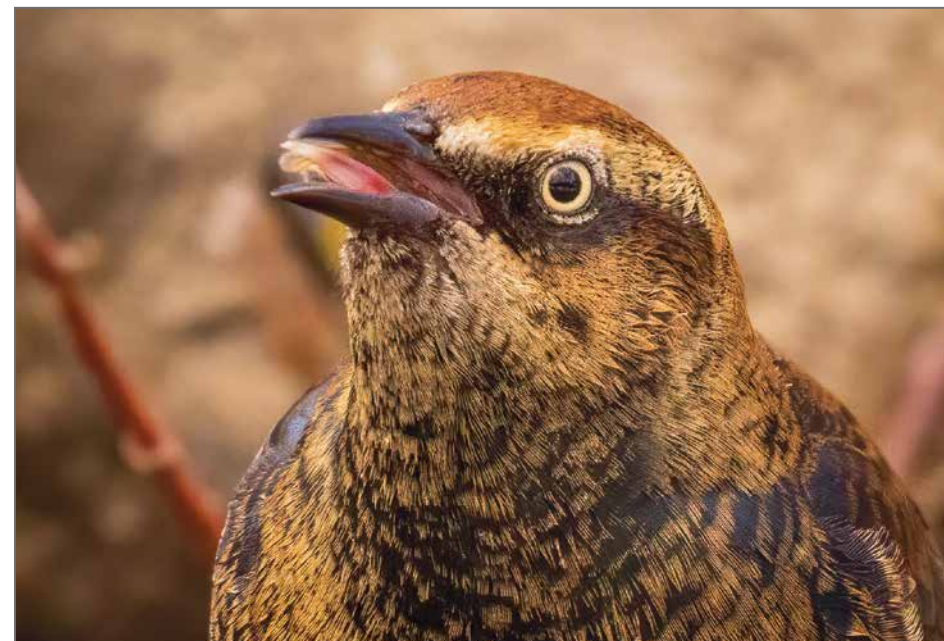


FIGURE 9. Rusty Blackbird swallowing remainder of the stickleback.

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SECOND RECOVERY OF A CALGARY AREA NESTBOX MONITORS SOCIETY (CANMS) BANDED MOUNTAIN BLUEBIRD (MOBL) FROM THE WINTERING GROUNDS

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Background

Calgary Area Bluebird Trail Monitors (CABTM) officially began in 1980 with six active trails and 743 boxes, which fledged approximately 1,000 Mountain Bluebirds (*Sialia currucoides*) and 2,189 Tree Swallows (*Tachycineta bicolor*). This has gradually increased over the years to 71 trails and 5,143 boxes in 2020, which fledged 5,488 Mountain Bluebirds and 12,595 Tree Swallows. The name was changed in 2009 to Calgary Area Nestbox Monitors to acknowledge that Mountain Bluebirds did not occur on every trail. On 12 April 2018 the name was modified to Calgary Area Nestbox Monitors Society (CANMS) when the group became a Society.

Banding began in 1981 with Don Stiles as a sub-permittee of Cam Finlay. Don acquired his own permit (no. 10488) in 1985 with one sub-permittee, Ray Woods. Banding totals up to 2018 included 81,350 Mountain Bluebirds and 74,524 Tree Swallows. Because banders concentrated on Mountain Bluebirds, proportionally more bluebirds than Tree Swallows were banded. In 2019, the permit was changed to a Station Permit no. 10925 under the supervision of Bob Cooper, with 23 active sub-permittees. In 2019 and 2020, 4,836 Mountain Bluebirds and 5,247 Tree Swallows were banded under permit no. 10925. This gives a total banded up to 2020 of 86,186 Mountain Bluebirds and 79,771 Tree Swallows.

The second recovery

MOBL 2791-67014, banded as a young on 15 June 2020 by Susanne Maidment in a nestbox in ranching country 16.5 km or 10 mi south of Cochrane, AB, Lat-Long 51° 00'N, 114° 30'W.

Notes from the finder, Jim Hanson: I found a dead male bluebird in a driveway on 02 November 2020 in Pueblo West, CO, with no obvious marks on the body. A group of them had been feeding on the berries in my Juniper tree the last week or so. Band number and species were confirmed by photos. Finding location: Lat-Long 38° 10'N, 104° 40'W. It moved approximately 1,600 km or 1,000 mi from its banding location. The bird was likely already on its wintering grounds. This bird was recovered after the 2020 season with 86,186 Mountain Bluebirds banded up to that point. Two of 86,186 birds recovered gives a recovery rate of 0.00232%.



Mountain Bluebird. Photo credit: Annie McLeod.

The first recovery

MOBL 961-61248 banded as a young by Ray Woods on 06 June 1986 near Elkton, AB, Lat-Long 51° 30'N, 114° 30'W. Found dead in a building about 50 miles north of Santa Fe, NM after 01 Jan 1987. Lat-Long: 36° 20'N, 105° 40'W, moved about 1830 km or 1135 mi.¹

This bird was recovered after the 1986 banding season. 1,417 Mountain Bluebirds had been banded up to that point.

The long time-span between the two recoveries indicates the extreme rarity in finding a banded bluebird on the wintering grounds, which is also indicated by the low recovery rate.

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Note: The latitude and longitude values are given in the southeast corner of the appropriate 10' x 10' block. 🐦

BOOK REVIEW

BACKYARD BIRD FEEDING: A SASKATCHEWAN GUIDE A COMPLETE GUIDE TO YEAR-ROUND BIRD FEEDING IN SASKATCHEWAN Trevor Herriot and Myrna Pearman, 2021. Nature Saskatchewan. 112 pp. \$19.95

Shelley A. Leedahl

It's apropos that a Blue Jay graces the cover of *Backyard Bird Feeding: A Saskatchewan Guide: A Complete Guide to Year-round Bird Feeding in Saskatchewan*. The Blue Jay is my home province's provincial bird, and *Blue Jay* is also the name of Nature Saskatchewan's quarterly publication. And did you know that these handsome birds also have such incredible memories, they hide seeds and nuts in trees or in the ground and return later to enjoy them? I can't even remember where I left my glasses a minute ago.

The seven chapters in this photograph-full softcover provide a compendium of information for those who, like bird-experts Trevor Herriot and Myrna Pearman, admire — and are inspired by — “the remarkable lives of wild birds,” and understand how it's beneficial to birds and humans when we study, support and discuss them. “To feed birds in a mid-continental temperate place like Saskatchewan is to reach out a hand toward the untamed dramas outside our windows,” the co-authors write.

This easy-to-read, school notebook-sized guide begins with a history of bird feeding, and asserts that while it's an age-old activity, its popularity rocketed with the development of conservation groups, and Roger Tory Peterson's 1934 field guide secured wide interest in our “wild-winged neighbours”. In post-WWII suburbia, both gardening and bird feeding greatly increased and nature centres sprung up. Bird feeding was forever changed in the 60s with the importation of nyger seed, and scientific research, the bird-feeding benefits of black oil seeds, and the

use of seed feeders fed the passion for bird feeding in the 70s. Today, “8.4 million Canadian households (61.5 percent) buy wild bird feed”. And why not? Aside from being fun, educational, and aiding science (ie: bird counts), evidence indicates that watching birds at feeders even lowers blood pressure.

While bird-feeding naysayers point to dependency, disease spreading, cat and predatory bird attacks, window strikes, and potential migration delays — among other issues — the writers assert that bird-feeding benefits highly outweigh potential harms, and healthy birds will always also find their own natural food sources.

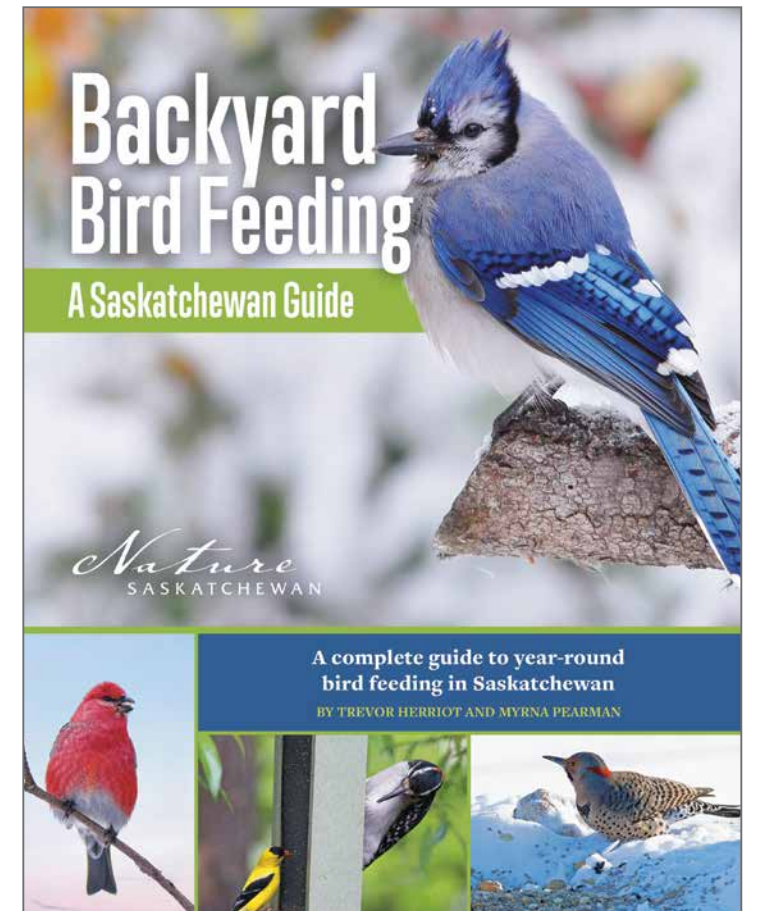
This info-packed guidebook teaches the diverse variety of *what* (seeds, fruit, corn, pet food, vermicelli ... and expect recipes for suet!), *how* (see the many feeder designs), and *where* to feed and water our feathered friends. I learned so much, ie: “photoperiodism” means hours of daylight, birds have a third eyelid called a “nictitating membrane,” and it's a myth that if you touch a baby bird its parents will abandon it. Did you know Eurasian Collared-Doves are in North America thanks to

a mid-1970s pet shop burglary in the Bahamas? That birds have dialects? What a “keystone” species is, and that sapsuckers are among them?

Birds have learned to live through Saskatchewan's harsh winters via “a variety of physical, physiological, and behavioural strategies,” including shivering, going into “nightly hypothermia by dropping their body temperature,” and huddling.

Backyard Bird Feeding: A Saskatchewan Guide is a brilliant resource for beginner and veteran bird-feeding aficionados. As such, it should fly off the shelves.

The book is available at local book stores, through Nature Saskatchewan, or from www.skbooks.com. 🐦



CALL FOR APPLICATIONS: MARGARET SKEEL GRADUATE STUDENT SCHOLARSHIP

The 2022 Nature Saskatchewan Margaret Skeel Graduate Student Scholarship in the amount of \$2,000 will be awarded to a graduate student attending a post-secondary institution in Saskatchewan in the fields of biology, ecology, wildlife management, environmental education or environmental studies, including social sciences applied to advancement of conservation and sustainable use of natural resources.

The scholarship is awarded to a student pursuing studies in a field that complements the goals of Nature Saskatchewan: to promote appreciation and understanding of our natural environment, and support research to protect and conserve natural ecosystems and their biodiversity. We work for sustainable use of Saskatchewan's natural heritage, ensuring survival of all native species and representative natural areas, as well as maintenance of

healthy and diverse wildlife populations throughout the province. We also aim to educate and to stimulate research to increase knowledge of all aspects of the natural world. Research that will contribute to resolving current conservation problems has a special priority.

The Margaret Skeel Graduate Student Scholarship must be applied to tuition and associated costs at the named institution. For more information, contact our office at info@naturesask.ca or 306-780-9273 (in Regina) or 1-800-667-4668 (Saskatchewan only).

Application Guidelines

Please include the following documents in your application:

- An updated resume and cover letter
- A full description of your present and/or proposed research
- A transcript of the undergraduate and graduate courses completed so far and those currently enrolled in
- An indication of what other source(s) of funding you hope to rely on to complete your studies
- Letters of reference are optional

Application deadline:

December 31, 2021

Winner announced:

January 31, 2022

Please submit your completed application to the Scholarship Committee:

info@naturesask.ca or
Nature Saskatchewan
206 - 1860 Lorne Street
Regina, SK S4P 2L7

POETRY

Twins In The Near Meadow

A mule doe steps into sight
with her young twins,
either side of her.
She eyes me, Patch
and Dingo, unblinkingly,
but calmly.
The deer's new winter
pelage glistens even
in the clouded morning
light filtering through
the golden leafed aspens
and olive, going to grey,
buffalo berry.

One twin is calm, still,
like their mother.
The other, less so,
picking up, then in turn,
setting down,
tiny, perfect feet.

George Grassick

Box 205
Lumsden, SK
S0G 3C0
ggrassick@sasktel.net

STUART HOUSTON

SEPTEMBER 26, 1926 – JULY 22, 2021

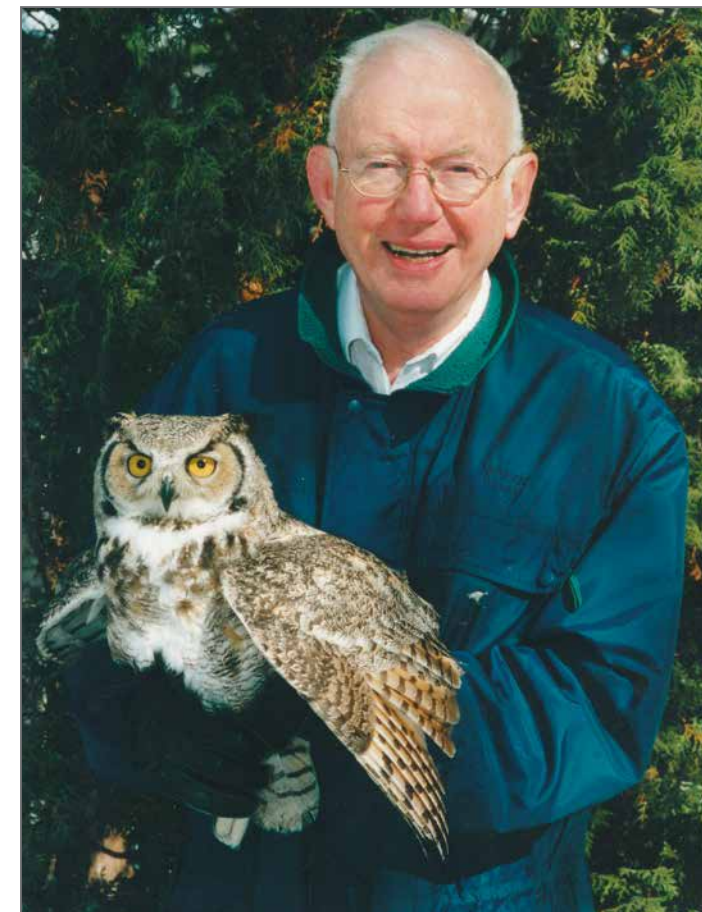
C. Stuart Houston achieved a degree of success in each of three distinct fields, that most people would have been happy to achieve in one.

Stuart was born in North Dakota where his parents, Dr. Sigga Christianson Houston and Dr. Clarence Joseph Houston practiced briefly before relocating to Yorkton, Saskatchewan. Stuart's interest in ornithology began as a boy in Yorkton, fostered by an amateur naturalist, Isabel Priestly and subsequently by his work for Ducks Unlimited.

Stuart completed his medical degree at the University of Manitoba and spent eight years in General Practice in Yorkton. Stuart then specialized in Radiology (now Medical Imaging) at the University of Saskatchewan with one year in Boston, pursuing a particular interest in pediatric radiology. He returned to a faculty position at the University of Saskatchewan where he stayed for his professional career. He served a term as chair of the department but particularly enjoyed his term as editor of the Journal of the Canadian Association of Radiologists. He served on the Council of the Royal College of Physicians and Surgeons and was the only professor in the College of Medicine to have been named honorary president of the Student Medical Society three times.

He maintained a lifelong commitment to ornithology, mainly expressed through banding birds. To 2014 he had had banded 150,283 individual birds of 211 species, with 3,945 recoveries of 84 species (the highest number of species and four subspecies recovered of any Canadian bander). Over decades he cultivated an extraordinary network of people, mostly farmers, who notified him, for example, when they found an owl nest on their land. Equally remarkable was the army of both young and old who volunteered to climb trees to bird nests or chase down smelly young pelicans to band. He was also an active member of the Saskatoon and provincial Natural History societies and participated extensively in their activities. His work in ornithology included four books on Saskatchewan natural history and 311 articles in ornithology and natural history journals, and culminated in 2020 with the publication with Frank Roy and Alan Smith of the definitive book on the Birds of Saskatchewan. He remained keenly involved in his most recent project, banding and wing-tagging turkey vultures, until his last year.

His third concurrent career was as a historian and his 13 other books all had historical subjects. Four described the observations of early Canadian explorer naturalists with the Franklin expedition, two were biographies of pioneer



Saskatchewan doctors and three, starting with Steps on the Road to Medicare, described Saskatchewan's early achievements in health care.

In large part he was able to do all this with the help of his wife, Mary Isabel nee Belcher. Stuart married Mary in Dilke, SK on December 8, 1951 and was devoted to and inseparable from her for the next 68 years. Mary kept the household running as well as making a major contribution to the banding efforts and contributing to the research for many of his publications. Looking back, however, we kids were blissfully unaware of his many commitments since he was always home for meals and available to drive us to hockey games or canoe trips.

He received many honours including D. Litt and D CnL degrees, Saskatchewan Order of Merit, Officer of the Order of Canada, and innumerable other awards, local, national and international, in all three spheres of his activities.

Stuart was predeceased by Mary in 2019. He is survived by children Stan (Venta Kabzems), Margaret (Richard Ehman), David (Kate Bell) and Donald (Marty Helgerson), nine grandchildren and two great grandchildren. 🦉

NATURE SASKATCHEWAN FALL MEET 2021 RE-CAP

Rachel Ward
Habitat Stewardship Coordinator
Nature Saskatchewan

The Fall Meet, which was held on September 18, started off with a nature walk through Wakamow Valley in Moose Jaw. The president of the Moose Jaw Nature Society, Richard Pickering, led us through the valley while pointing out places

of significance and interesting facts about different features within the park. We encountered some recently downed trees and later saw evidence of beavers by the stream. Even with our large group we managed to see a few different bird species, including a Swainson's Hawk, Double-crested Cormorant, Cedar Waxwings, and many American Robins. While passing the feeder, a birding hotspot

within the park, we were lucky enough to see a couple White-breasted Nuthatches. Many members also enjoyed identifying different plant species along the paths.

After our nature walk in Wakamow Valley, we dispersed for lunch before gathering at Nicolle Flats in Buffalo Pound Provincial Park. Many members chose to arrive at the park early, which resulted in an impromptu, socially-distanced picnic. We were lucky to have lovely, warm weather for our afternoon hike. We did a five senses hike, during which we took time to appreciate the things around us that we could hear, see, smell and touch. There were even some small samples of dried rose hips for tea that were distributed for taste! The children in the group thoroughly enjoyed doing some leaf rubbings to see the different shapes and textures for the touch exercise. Later on during the

hike, both children and many adults took part in a game of Thicket. There were many laughs as the "prey" hid from the "predators" in creative ways, and thankfully there were not too many ticks around!

The beautiful fall colours made for some stunning views on the flats. At the end of the hike, those of us willing to brave more of the hot weather walked to the homestead of Charles Nicolle. This impressive building was built from stone gathered by hand and hauled by horses to the site.

The day wrapped up with a presentation by Richard Pickering about the history of the Wakamow Valley and its trails. The presentation included several past and present comparison photos of areas we had walked through in the morning. It was wonderful to meet in-person and spend the day visiting with a group of fellow nature enthusiasts in some of the beautiful areas in Saskatchewan! 🐦



Amara & Leonora Jan-King. Photo credit: Lacey Weekes.



Photo credit: Rachel Ward.



Photo credit: Rachel Ward.



Photo credit: Rachel Ward.



Charles Nicolle's house at the Nicolle homestead site. Photo credit: Rachel Ward.

THE NATURE NOTEBOOK: A DRY AND SCORCHING SUMMER



Jared Clarke

I learned a few years ago from Dr. David Sauchyn, a researcher at the Prairie Adaptation Research Program at the University of Regina, that Saskatchewan has one of the most variable climates in the world (along with Mongolia)! Which makes sense to me: we have droughts, floods, and extreme hot and cold temperatures and that's just normal. But after this summer, it is hard to ignore the glaring truth that climate change is affecting even us here in Saskatchewan in devastating ways.

The heat and lack of precipitation this summer was extreme! Looking at the Canadian Drought Monitoring data the entire southern part of the province was classified as a Moderate to Exceptional (the highest ranking) drought from July through to September 30. In terms of water on the landscape, essentially all of the little wetlands around Regina and many other parts of the province dried up and the big bodies of water shrunk significantly. The water in the big wetland beside our house covered about 1.7 hectares a few years ago, and this year has been

reduced to 0.2 hectares of water! That's about 12 per cent of its original size from just three or four years ago.

Yellow Grass, SK lost its record of the highest temperature in Canada this summer, which it set back in 1937, clocking in at 45°C. Lytton, BC initially broke that record on June 27 with a temperature of 46.6°C, then the following day broke it again with 47.5°C, and then again the following day with 49°C. Tragically, Lytton burned to the ground a few weeks later. During that same heat wave, 34 communities in this province broke high temperature records — some set back in 1886.

Impacts on some types of wildlife were significant, while others took advantage of the drought. From one of my own research projects, a Monitoring Avian Productivity and Survivorship (MAPS) station which studies the local breeding songbirds, we captured and banded the lowest number of birds this year since we began in 2013. In total we captured 197 this summer, while the seven-year average prior to has been ~291 bird per summer. It was the wetlands birds that were essentially absent (ex. Red-winged Blackbirds, Song Sparrows, Common Yellowthroats, etc.), plus lower productivity in some species. While general atlassing for the Saskatchewan Breeding Bird Atlas this summer, many of the areas I travelled to and surveyed didn't have any water within the 10 x 10 km square! All of the species that rely on wetlands were just absent, many of which were present in the same squares two years prior. I'm very curious to see what the North American duck surveys show for duck productivity this year.

We desperately need to start

making real change in our carbon emissions if we have any hope of not locking in more of these severe droughts. The Prairie Climate Centre's models show that if we don't reduce emissions soon, we can expect 15 more days a summer with +30°C temperatures compared to 1975-2005 rates!

Dr. John Pomeroy, the Canada Research Chair in Water Resources and Climate Change at the University of Saskatchewan, said in August "This particular drought is a good wake-up call for Saskatchewan. It has the greatest spatial coverage and uniformity, and some of the greatest severity of any drought we've ever had." We need to act now.

Jared Clarke is a grade 6/7 teacher and biologist, who lives on a small farm near Edenwold, SK with his family. He has been bird watching since the age of five after a Spotted Towhee visited his yard. Follow him on Twitter @jaredthebirdguy. 🐦

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 Scholarship Fund Stewards of Saskatchewan Programs (OBO/SFS/POS/RPR)
 Nature Sanctuaries Important Bird and Biodiversity Area Program

3. I wish to become a monthly donor by joining the Nature Savings Plan:

(Income tax receipts are issued annually — please provide credit card information or void cheque)

Amount: \$ _____ / month

Fee Totals

Nature Saskatchewan Annual Membership \$ _____ + GST (5%)

Donation \$ _____

Total \$ _____

Cheque (payable to Nature Saskatchewan) Visa MasterCard Cash

Card # ____ / ____ / ____ / ____ Expiry: ____ / ____ CVC#: ____

Cardholder's Name: _____ Signature: _____

Become a member or donate online @ www.naturesask.ca/support

HUMAN NATURE

A MEGA-DOSE OF "VITAMIN T" ON THE ESSO TRAIL

Kenn Wood
Woodbird Farm
Ebenezer, SK

We have lived on our farm five miles west of Ebenezer in the heart of the parkland region for close to two decades. Across the road from our yard entrance is the western edge of a poplar forest that extends for about 15 acres to the east on the north side of the road to Ebenezer. We purchased this quarter section a few years ago.

My interest in this forest began when it became a winter "yard" for the white-tailed deer that abound here. In the late 90s we would have more than 200 deer around our home until the snow melted. A walk in this winter wonderland was facilitated by a myriad of narrow trails carved by whitetail hooves. This was the beginning of an enduring fascination with this whitetail haven.

A few years ago, I got the idea to carve a walking path through

the forest. It is unique in that it is dominated by white poplars 40 to 60 feet tall. Poplar forests propagate primarily by suckering (most new trees arise from the shallow roots — not from seeds). It is possible this forest is one organism! It only took a few hours to carve a winding trail that ends where it starts and I can mow with the riding mower. The highlight of the walk is "Toadstool Glade" in the center of the forest. The name derives from the three "toadstools" I installed in the glade. One can navigate the trail in 15 minutes, depending on how much time you spend on one of the toadstools. The Esso Trail gets its name from an ancient steel oil pail I encountered about 50 yards from the start. Needless to say I left it in place!

Our farm abounds with exhilarating nature experiences, but to my mind there is one that surpasses all others. When I become enveloped by the forest while

navigating the trail, something happens. It is hard to describe — a sense of tranquility and isolation (even though one is never more than 100 yards from a gravel road!). I have read that it is caused by pheromones released by the trees that the relatively feeble human olfactory organ cannot recognize. It happens to me every time! I call it "Vitamin T" (Tree) and everyone is welcome to experience it — no charge! 🐦



Kenn, along with his wife Nancy and daughter Sarah, at Toadstool Glade. All photos courtesy of Kenn Wood.



MYSTERY PHOTO



Photo credit: Robert Holtkamp.

Fall 2021 (top)

ANSWER: The cocoon shown in the Fall 2021 Mystery Photo was that of a Polyphemus Moth. These moths can be found from southern Canada down into Mexico and an adult's wingspan is 10 to 15 centimetres. The moth is named after Polyphemus, the giant cyclops from Greek mythology, due to the large eye spots in the middle of the hind wings.

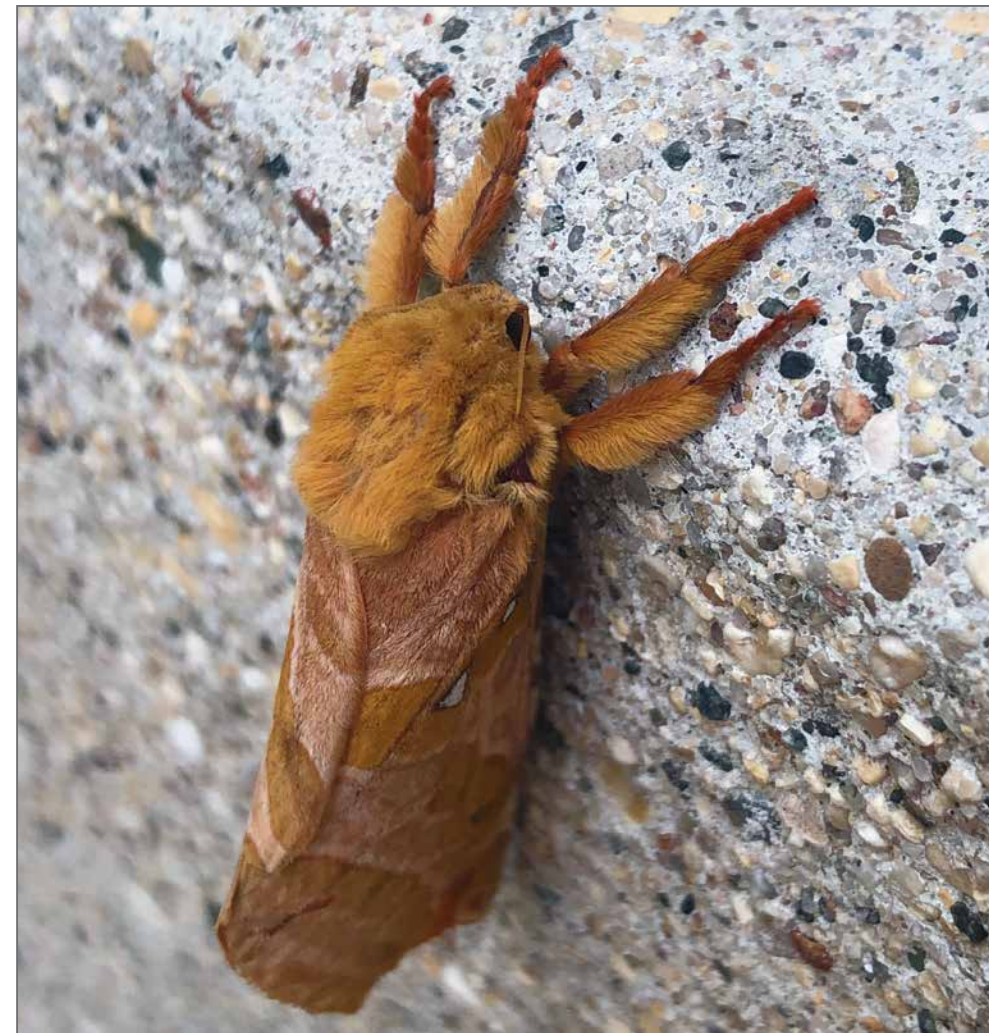


Photo credit: Christine Goytan.

WINTER 2021 (bottom)

QUESTION: This photo was taken in Winnipeg on July 17, 2021 by Christine Goytan. The insect was clinging to the concrete steps at the back door and remained there for hours. It is uncommon but regular during mid-summer in the Prairie provinces. What insect is this?

Hint: This insect flies at night, is incredibly fast, and makes people wonder what they just saw . . .

Please send your answers to the *Blue Jay* editor, Annie McLeod, by email at bluejay@naturesask.ca or by letter mail (address on page 4). Those with correct answers will be entered into a draw for a prize from Nature Saskatchewan.

Have you taken a picture that may make for a good mystery photo? Send it to the editor for possible inclusion in an upcoming issue. 🐦



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