



# PRAIRIE BREEZE

THE LIVING PRAIRIE MUSEUM NEWSLETTER

Winter 2019-2020

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## WINTER INTERPRETIVE CENTRE HOURS

by Appointment or  
Open for Special Events

## UPCOMING EVENTS

**Snowshoe Sundays  
Winter Speaker Series**

**See p. 4**

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## Restoration Underway

A north section of the prairie has been winter seeded.

Once the site of the Ducharme homestead, this area of the prairie had the usual signs of human inhabitation: soil compaction, non-native plants like smooth brome and thistle, and remnants of a midden heap. While the site still functioned as part of the prairie, the invasive species had become too aggressive, making it difficult for the native prairie to move in.

Naturalist staff worked to prepare this area for some major first aid. First, the area was burned. This thinned the thatch layer and encouraged the vegetation to regrow, good and bad species alike. Then the area was mowed to knock back the recovering weeds. Because the invasive plants were well established and firmly holding their ground, we applied a herbicide. This is something that we only do in extreme cases of habitat deterioration on our preserve. This gives an indication of just how difficult this area had become to manage.

Once the site was ready for seed, two more activities took place. The site was harrowed with small

equipment to open up more soil, followed by raking to gather up the remaining thatch. This improves potential seed to soil contact.

We hand-seeded the area with 39 wildflower and 10 grass species, all native to Winnipeg and collected by Naturalist staff. The seed was pressed into the soil using a small roller and some good clomping around in our boots.



*The prairie seed mix of 49 native species.*

It takes many years for a prairie restoration to take shape, and the definition of success can vary. Our goal is to increase the diversity of this area with native seed, hopefully assisting the naturalization of the site. This will take diligent maintenance, and some crossed-fingers. But we hope this effort will help return this space to the native prairie it once was.

## Bison Surfing on the Prairies

Zoologist Robert Paine introduced the concept of a keystone species in 1969. He described it as a species that has a disproportionately large impact on the ecosystem relative to its abundance. Ecologists have been working to understand how bison act as a keystone species on the tall grass prairie for a long time, and they have found more than enough evidence. However, yet another piece of evidence was discovered this year.

Bison were thought to “surf the green wave”, based on the Green Wave Hypothesis. The GWH states that seasonally migrating herbivores follow the progression of spring green-up because young vegetation provides the best forage, refunding the energy cost of travelling.

A study by Chris Geremia ([et al. 2019](#)) found that bison are more than just surfers, they actually make the wave. Geremia fitted bison in Yellowstone National Park with radio collars. The bison moved with spring growth but eventually slowed, allowing the green wave, and all its nutrients, to pass. When their diet was sampled via feces, they were still found to be consuming extremely high quality forage. How could this be?

The bison had created their own spring through intense grazing. By staying put and feeding, it kept the plants in a state of regeneration where they consistently produced new shoots. This enhanced the forage quality by 50-90%. The effect carried into the following year - plant growth accelerated in spring due to improved sunlight from a lack of litter cover.

It's incredible how closely prairie productivity and bison are linked. We even find their influence within the soil itself. K.A. Garrett ([et al. 2016](#)) determined that bison are microbiome engineers, influencing the soil structure in a way that translates into the structure of grassland

plant communities.



*Photo by Jennifer Hall.*

For example, they review the role of bison saliva and the transmission of fungal species. Bison can spread strains of *Fusarium* - a ubiquitous fungi of prairie soils. With their four-chambered stomachs bison can “stomach” things that more sensitive mono-gastric (one stomach) creatures cannot. The mycotoxins produced by the *Fusarium* do not sicken the bison, and the bison transfers the fungus while grazing. *Fusarium* assists plants by generating gibberellic acid, which helps the cells of plants grow and elongate. The authors suggest that the secondary metabolites produced by the microbes alter plant palatability, creating a self-reinforcing feedback pattern.

Visions of a surfing bison in a Hawaiian shirt are quite extraordinary, but the science is even more so. Understanding some of the intricate ecological networks on the tall grass prairie is just the kind of surfing that we hope will foster greater protection of this treasured habitat and its interconnected species.

*Learn more about soil microbiota during our Speaker Series - see p. 4.*

## How Big is Big Enough for a Prairie Remnant?

The Living Prairie Museum is not a large prairie. When considering the historical expanse of the tall grass prairie - Southern Manitoba to Texas - you start to get the feeling of just how small it really is.

Our prairie is ~12 hectares (1 ha = 0.01 km<sup>2</sup> or 2.5 acres), with the majority of that landscape remnant. Remnant prairie is irreplaceable, taking thousands of years to form with thousands of species reliant on its resources. But not all of the remaining fragments will contain all of the species that historically existed on prairies, as each has its own needs in terms of space and particular niches.

There isn't an easy answer to the question of optimal size. It's strongly dependant on the [conservation goals](#) for the site. A few examples:

Bison - to support a functioning herd, you might be looking at [hundreds of hectares](#), even more if you're hoping to support the natural predators that keep herds in check, or to allow movement across the landscape. To help visualize, the Lake Audy bison enclosure in RMNP holds about 30 bison, and is 500 ha in size.

Birds - entirely dependant on the species and its behavioural and nesting requirements. Ex. Chestnut-collared longspurs require disturbed (grazed or burned), short-grass prairie habitats that need to be [at least 39 ha](#) to entice a pair to nest.

Flowers - so many plant species exist on the prairies, each with their own light, soil, and modes of dispersal. Sometimes you have to select a target species of high conservation value to use as a parameter. The majority of the Canadian population of Western Prairie Fringed Orchid is found [in about 1 ha](#) of remnant prairie in southern Manitoba. Would that be viable in the long term? Would 1 ha be enough

to support a reliable population of sphinx moths required for pollination? Fortunately, this 1 ha is surrounded by almost 4000 ha of patchwork prairie in the RM of Stuartburn.

Bees - there is a shortage of consistent data for the size of prairie needed to support pollinator communities near historic levels of diversity (what are historical levels of diversity?). We can look to [foraging range](#); smaller solitary bees may only travel 100 m, while bumble bees may travel over 1 km. Native flower diversity will play a role, as some bees are [generalists](#) while others only visit one or a few to flower species to complete their development. [In agricultural areas](#), 1-2/100 ha planted as pollinator forage can support important bee species. [Studies in urban areas](#) have found that gardens can have an abundance of bees, however, the diversity of bees will be linked to available nesting and overwintering habitat, [surrounding natural habitat](#), and site characteristics. Our site provides resources for pollinators from egg to adult, even supporting the yellow-banded bumble bee, a species at risk. We've found hundreds of flower visiting species in Winnipeg's prairie fragments with non-intensive sampling, so that might be the tip of the iceberg. [A little goes a long way.](#)

Our prairie is small, but that certainly doesn't discredit its ecological and cultural value. We may never support a herd of bison, but we do have over 150 plant species, some of which are rare or have links to Indigenous culture. Savannah sparrows nest here. Ground squirrel colonies thrive. Countless prairie roots absorb meltwater and sequester carbon, while their green shoots provide oxygen for wildlife, including us. This preserve also provides opportunities for people to make invaluable connections with the natural world. The scarcity of prairie makes conserving each piece a priority. Whether large or small, the species that exist within, the heritage, and the ecological services are worth protecting.



## Thank You



Thank you for volunteering to collect native seeds! We had a really good crop despite the drought for most of the season. These seeds give us the ability to create much-needed habitat.

## MUSEUM STAFF

Sarah Semmler  
Lois Grieger



Thank you for receiving your newsletter electronically.

## UPCOMING EVENTS

### Winter Speaker Series 2020

Registration begins on January 2nd. Members may register for any session, while non-members may register two weeks before each event.

#### January 14th

Building roots to restore northern prairie ecosystems  
Dr. Rafael Otfinowski and Victory Coffey - University of Winnipeg

#### January 28th

Mommy Dear-est: A newborn's cry transcends species  
Dr. Susan Lingle - University of Winnipeg

#### February 11th

Who are the Métis?  
Dr. Fred Shore - University of Manitoba

#### February 25th

Coexisting with Coyotes  
Pauline Bloom - Government of Manitoba

#### March 10th

Poweshiek skipperling: Prairie butterfly on the brink  
Laura Burns - Assiniboine Park Zoo

Full summaries can be found on the Friends and museum websites!

### Snowshoe Sundays

Due to a lack of snow, our first date has been postponed until **January 12th, snowpack permitting.**

Events will continue on January 26th, February 2nd, and February 23rd, 10 - 4 PM. Snowshoes are available first come, first served, and no experience or registration is required. Please wear winter boots.

Check for cancellations at [winnipeg.ca/livingprairie](http://winnipeg.ca/livingprairie) before arriving. Let's hope for some snow!



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