out to pasture

exploring use, value, and meaning in Saskatchewan's former public pastures

Kathryn McCudden

A practicum submitted to the Faculty of Graduate Studies, University of Manitoba, in partial fulfillment of the requirements for a **Master's Degree in Landscape Architecture**

Department of Landscape Architecture
Faculty of Architecture
University of Mantioba
January 2022

acknowledgements

The majority of this work was completed in Regina, Saskatchewan, on Treaty Four territory, the same territory and land governing the location of the final site design. This is the land of the Cree, Saulteaux, Dakota, Lakota, and Nakoda people, and the homeland of the Métis nation, and I acknowledge their bond to the land, and our shared commitment to the treaties.

This practicum was completed with the help and support of a great number of people, to whom I am grateful.

First, I would not have completed this work in its final form without the unfailing guidance, feedback, and support of my commitee members, Karen Wilson Baptist, Leanne Muir, and Ryan Wakshinski. Their generosity with their time, energy, and expertise propelled this project. Thank you. I'd also like to thank several other professors at the University of Manitoba who offered advice and critique on this project: Brenda Brown, Kamni Gill, Jean Trottier, and Alan Tate in particular provided guiding comments.

In addition to my teachers, I am grateful for the support of my friends and peers, particularly as the bulk of this practicum was completed during the Covid-19 pandemic, and it could have been easy to become isolated inside my work. So thanks too, to Karissa, Carl, Matt, Desiree, Chris, Jiaqi, Kacie, Elise, and Maddie.

Additional thanks go to Sean Miller and Shawn Thue at the Caledonia-Elmsthorpe pasture, and Brian Cooper at Regina Beach, for their generosity in accomodating my requests to access the pastures. Thanks too, to Richard Baydack at the University of Manitoba, and Jenny Yoo with Manitoba's Parks and Protected Areas, for their patience talking me through designing with Sharp-Tailed Grouse.

I was fortunate to be able to receive feedback in the early stages of this project from the members of Public Pastures - Public Interest, and their input helped guide the direction of this work. Their passion for the prairies and for the conservation of this landscape energized my project, and I often found myself thinking of them as I was completing it. I offer them my sincere thanks.

I have done this work with the support of my family and friends, and I am not sure I could have completed it without them. In particular, thank you to Kristen Catherwood for her thoughts, insights, and conversational fervour for the prairie landscape. And thank you to my Mom, who loves the prairies in all seasons and helped me in every way she could, and my sister, Ali, who is always there with a cup of coffee and thoughtful questions. Finally, my partner Yann, who took on the lion's share of the laundry, dishes, and emotional support over the final few months of this project, thank you.

table of contents

Caledonia-Elmsthorpe, a former PFRA pasture

endings

an introduction to the public pastures

The Saskatchewan Provincial Pastures and the federal Community Pasture Program, established in 1922 and 1939, respectively, were created in response to local drought and environmental hardship that had been exacerbated by agricultural practices of the early 20th century. The pastures held land in trust for the public as both an economic and environmental support and resource, and they served this purpose until, within the span of five years between 2012 and 2017, the parallel provincial and federal programs were both discontinued. In the fall of 2019, the last public pasture in Saskatchewan finished the grazing season, ending nearly a century of a unique system that supported the ecology, economy, and culture of communities across the province.

I became aware of the pastures near the end of their story. Before 2013, I didn't have a real awareness of the public pasture system. Growing up in Regina, I was a city kid, and although my uncle, my grandparents, and their parents had farmed, I did not have any direct connection to ranching, just retold stories of the cows and horses my family kept on the farm when my mom was growing up. I may have heard of the public pastures, but their presence had never impacted my life as I made my way through elementary and high school, and later university, all in Regina.

The public pastures, and their significance to prairie birds, came into my field of awareness because I loved reading. In June of 2013, Margaret Atwood and the late Graeme Gibson were the guests of honour at a fundraising event held by PPPI – Public Pastures – Public Interest. I was a long-time Margaret Atwood fan, and was thrilled that she would be in Regina, and that I could hear her speak. It didn't matter that she wasn't going to be speaking about writing or fiction; I would have listened to whatever she wanted to talk about. My mom bought us two tickets to the dinner, and that evening we listened to Margaret Atwood, Graeme Gibson, Trevor Herriot, and a host of other birders, environmentalists, and conservationists talk about the plight of prairie birds, the importance of preserving Saskatchewan's remaining prairie, and the threat faced by the public pastures.

I was drawn in by a celebrity author, but once the public pastures were on my radar, they

stayed there. Perhaps if I hadn't joined the mailing list that evening, they would have faded from my attention, but perhaps not. The pastures leave an impression; at first, there is a little tickle of curiosity, a stinging in your eyes for the fragility of plants, birds, and other animals that are relying on these places, a constriction in your throat at the thought of how much has been lost, of how much there still is to lose. Perhaps you hear a whisper, feel some romantic nostalgia for the old west, notice with a surprise that it lives still, here in your own backyard. There is something about the pastures that invites the imagination.

In the years following that fundraiser, I was absent from home for long periods of time. I always loved the big skies and expansive horizons of my home province, had always thought them beautiful, and found something poetic and simple and true in our licence plate motto: "the Land of the Living Skies." Being away from home, from the wide views of the prairies and the regular sights of cowboy boots and barbed wire fences, I found new depths of appreciation for Saskatchewan. There are some deeply beautiful and unique landscapes in this world, but the prairies of North America have their own stark beauty, their own deep culture and history, different from anywhere else I have been. I missed it, and every time I came home from being away, the awe I felt standing under the dome of the sky, surrounded by unending horizon, was both renewed and deepened.

Living abroad, I took advantage of being in new countries to explore, but I resolved that one day when I was home again, I would take the time to explore Saskatchewan. What had always been beautiful but had also been homely and humdrum, something I was used to seeing all my life, became something new again. To have a renewed appreciation for something you thought you knew well is a revelation, and when I decided to return to school to pursue a Master's Degree in Landscape Architecture, I knew I wanted to study on the prairies. If I was going to spend long hours studying landscape, I wanted it to be the one that I loved best, and with teachers who knew how to appreciate it. It was a longing for sky that sent me to Winnipeg and the University of Manitoba.

While I was exploring other horizons and slowly turning my feet homewards, the public pastures were fighting for survival. In Saskatchewan there were two separate but parallel systems, one federal and one provincial, accessible to the same population but run through different administrations. In the late 2000s and early 2010s, both the provincial and federal governments were led by conservative parties, and both held the opinion and corresponding policies that governments should reduce public spending, at the cost of even successful social and environmental programs. Both were actively divesting themselves of responsibilities they no longer viewed as a belonging to a government, and many other programs that I grew up aware of were cut at this time.[1] Across the board, both governments were looking to cut expenses.

The government of Saskatchewan, under the leadership of Premier Brad Wall (Saskatchewan Party), was already considering the future of the Saskatchewan Provincial Pastures when in 2012, Prime Minister Stephen Harper's Conservatives announced the closure of the Agriculture and Agri-Food Canada Community Pasture Program (the AAFC's CPP), formerly and more popularly known as the Prairie Farm Rehabilitation Act (PFRA) pastures. For the purposes of this document, I will use the latter, more widely recognized name. The

crown lands of the PFRA pastures, totalling roughly 920,000 hectares across Alberta, Saskatchewan, and Manitoba, were to revert back to the control of the provinces. In Saskatchewan the government responded by announcing first that upon the reversion the PFRA land would be for sale, and soon afterwards that the SPP lands would follow the PFRA: both public pasture systems would be decommissioned.[2]

The announcements were not met with quiet acceptance from the affected population, and significant protest by the public won important concessions, which will be reviewed later in this document.[3] Ultimately, both programs were closed. The closures took six years and have finally finished their transition: the PFRA in 2018 and the SPP in 2019. They represent a loss greater than I think either government expected, or indeed realizes, even now.

What were the public pastures, and why was their closure significant to anyone other than the ranchers and farmers that used the program and land? This is a story of how we value public resources and of how we value landscapes, and because of that it is a story that involves the economy and politics, as well as aesthetic judgements, cultural learning, and social justice. It's a story about the delicate relationship that exists between the land and its inhabitants, between humans and non-humans, and amongst humans – where and how cultures meet, adapt to each other, change over time, and how this transforms the landscape that they inhabit. It's a story about learning and forgetting. It's a story about birds and grass.

a timeline of the public pastures

Saskatchewan Provincial Pastures (SPP)
315,600 ha

1922
first provincial pastures established

1920

1939
PFRA enacted, federal public pastures created

Prairie Farm Rehabilitation Administration (PFRA) Community Pasture Program
920,000 ha

2017
provincial government announces end to SPP

2019
final grazing season

2020

2012
federal government announces end to PFRA pastures

2018
final grazing season

Grasslands National Park, east block

beginnings

a statement of purpose

The anchor to this practicum is the desire to preserve remaining native prairie within Saskatchewan. While there is an ever-growing body of evidence regarding the ecological value of grasslands, and increasing concern for the protection of what remains, loss of native prairie continues.[1] The closure of the federal and Saskatchewan provincial public pastures systems is a significant example of how prairie is undervalued, but unfortunately it is not the only one. The most endangered ecosystem in the world, as declared by the International Union for the Conservation of Nature, isn't rainforests: it is temperate grasslands.[2] These grasslands, also known in North America as prairie, earned the title by scoring high on the Conservation Risk Index compared to other terrestrial ecosystems, mostly because they have comparatively few protections.[3] Every year, more native prairie is lost to agricultural, industrial, and suburban development.

The former public pastures are an example of how under-protected resources can be easily lost, but they are also an example of how public concern can help to sway government decisions. People have the power to effect change. But in order to save the prairies from further loss, we need more people to *want* to save them. One of the best ways to do this is to provide opportunities for more people to gain first-hand experience and knowledge of native prairies: this is something I will be aiming to show in this document. The recently decommissioned public pastures in Saskatchewan offer a unique opportunity to the public if we can reframe and reclaim them.

The pastures have always hosted a multitude of uses. They were ecological reserves that were deployed as sustainably managed yet productive rangeland, but they were also spaces of recreation, hunting, tourism, research (biological, ecological, archaeological), and places for the Indigenous people of Saskatchewan to collect traditional medicines.[4] As some of the largest reserves of native prairie left in the province, they also played a role in honouring the Treaty agreements. They in turn deserve to be honoured and preserved. In these spaces, I see enormous potential for the people of Saskatchewan to learn from the prairies and possibly from each other, to explore how we can support and cherish what remains of the grasslands, to enrich our

understanding of this land, and to live on it well.

This is a design practicum. As opposed to a thesis, which develops new research, a practicum is the practical application of knowledge and skill, and as such, it aims to review existing research and data and apply it to produce a speculative design based on the analysis of the research. A significant part of this document is dedicated to understanding why the pastures were created, how they functioned, and why they were ultimately lost, and the research involves a review of their history and social, economic, and ecological contexts. I have also investigated the application of environmental aesthetics as a way of supporting conservation goals within the project, and completed several case studies of sites, initiatives, and design projects that have helped me to explore the ideas and goals of this practicum. But as important as research is, and however much theory and precedent studies inform design decisions, or build a bridge through which we can understand how we might best apply the principles of design, the heart of a design practicum lies in the design itself.

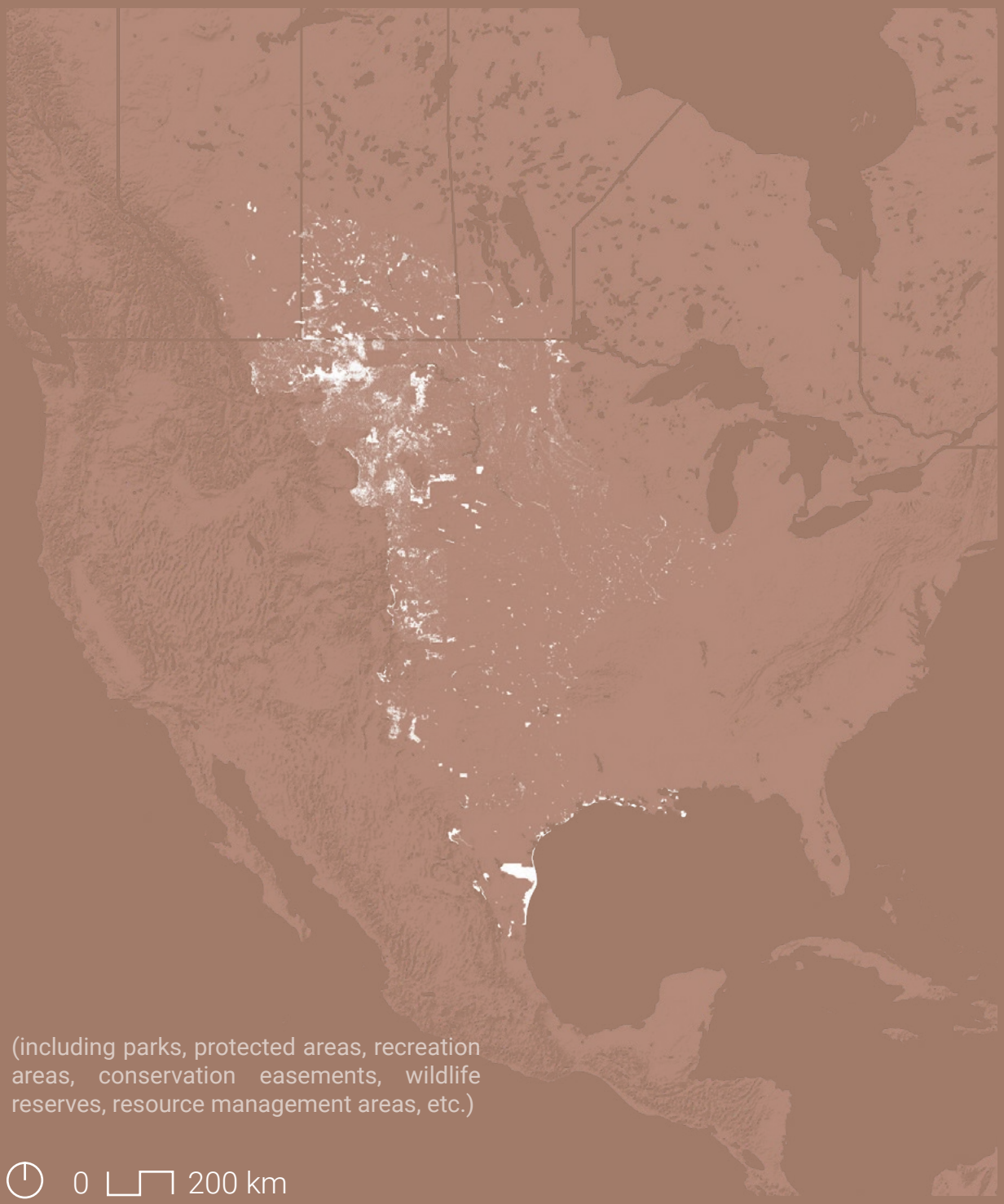
The design advanced in these pages is two-pronged: the first prong focuses on the design of a system of programming to engage and educate visitors in native prairie, and involves devising a calendar of public engagement events that could be held in different seasons and at different times of day, while functioning in different contexts. This programming could be applied at any of the former public pastures, federal or provincial.

The second prong involves the design of a staging area to support the infrastructure required by this programming – a space that is accessible and engaging. This site functions as *a gateway* to the pastures, a place from which to enter and explore the landscape, when feasible. At other times it functions as *a window*, a place to look in at the prairie, to let the experience of awe and the terror of loss find a perch in your heart. For the purpose of this practicum, the site will be located adjacent to the former Caledonia-Elmsthorpe PFRA pasture.

The aim of the design is to draw people out to the prairie and to provide opportunities for greater understanding and appreciation of their value. To be successful, it must plausibly draw people from the city and out into the prairie, exposing as many people as possible to its beauty, and its distress. The situation is serious, and often heartbreaking, but there is a role in this project for both joy and fun. I do not believe that we can face the challenges of climate change, of ecosystem devastation, or of cultural reconciliation, with only a grim and stubborn determination to try and fix the mistakes of the past. We must acknowledge them, face them, mourn them, and in our mourning look for levity, hope, and joy. Laughter is a great healer, and in recognizing how precious our remaining prairie is, we have to reintroduce enjoyment and recreation into these spaces. We must re-create them through positive and meaningful interaction.

The pastures have been spaces of stewardship, education, recreation, and industry. They have been cultural landscapes with ecological, economic, and social benefits to their communities: how can we maintain these uses and develop them further as we move deeper into the twenty-first century? What can landscape architecture contribute to and learn from the public pastures, and can we, as landscape architects, reveal and heighten the impact these spaces have on the public good? A final question: can design

protected areas within prairie ecozones in North America, 2017



(including parks, protected areas, recreation areas, conservation easements, wildlife reserves, resource management areas, etc.)

0 200 km

Caledonia-Elmsthorpe, a former PFRA pasture

help save an endangered landscape?

In order to begin, we need to understand what the public pasture system in Saskatchewan was and how it functioned. We can do this by looking at its origins, and at its successes and failures over the course of almost a century of use. We can also try to determine what led to its closure. A critical examination of the history of the public pastures in Saskatchewan will show that although the first public pastures were opened nearly a century ago, the reasons for their creation are still relevant, and despite the closure of the last public pasture with the end of the 2019 grazing season, there is still a role, perhaps an evolving one, for these spaces in the future of the province.

Grasslands National Park, west block

prairie

an introduction to the life and legacy of the grasslands

To understand the public pastures, we first need to understand the prairie, because so much of the value of the pastures lies in their physical reality, in the soil and sod, and in the health of the living landscape that is the material from which they were cut. The pastures are remnants of a once vast and vibrant grassland that covered the Great Plains of North America. The boundary of an ecozone is rarely a hard line and often shifts, but the region we identify as the Great Plains covers approximately 2.6 million square kilometers, or about 14 percent of the land mass of Canada and the mainland United States.[1]

It is the predominance of grass over other types of vegetation which loosely defines the borders of the Great Plains. While it is possible for trees and shrubs to grow in the region, as evidenced by riparian forests along riverbanks and creeks, in valleys and coulees, and by generations of shelterbelt-planting farmers and tree-loving city planners, it is grass that has evolved to respond to the particularities of the environment in the region, and it is grass that grows best.

This hasn't always been the case; the deep history of this landscape is one of great change. Dinosaurs once roamed here, and at various times the region was covered with lush tropical forests and life-filled inland seas. The current reign of grass has been relatively stable for approximately the last 10,000 years.[2]

Grass owes its dominance to the climate and soils of the region, which in turn owe their current state to the geological history of the continent. The rise of the Rocky Mountains to the west (and the accompanying rain shadow they cast across the Great Plains), the successive advance and retreat of various inland lakes and seas, and a series of progressive glaciations over the millennia, has left the topography, soil, and climate of the plains as we know it today; relatively flat (or at least appearing so), dry, sunny, windy, prone to drought, and with extreme temperatures in both summer and winter ranging seasonally from above 30 degrees Celsius to well below minus 30. [3]

Distanced as it is from any significant body of water, the temperature on the prairie can pivot from extreme cold in winter to extreme heat in summer.[4] It has been observed that

> The effect of these wild seasonal deviations is equivalent to moving up and down the continent every twelve months. Saskatoon, for example, has an average January temperature of -17°C (0°F), well below that of Anchorage, Alaska. But in July, Saskatoon's average heats up to 19°C (66°F), almost on par with that of Los Angeles.[5]

Simply by staying in place and waiting for time to pass, one experiences vastly different conditions on the plains throughout the year.

One can also experience vastly different conditions from year to year. The prairies experience cycles of drier and wetter weather; the distance from any coast means access to water is not reliable or the same from year to year, and drought is a recurring event in the Great Plains region. On average, the last 400 years have seen approximately two major droughts per century, arriving with a fair amount of regularity.[6]

Grass is adapted to both the harsh conditions of the climate and the soil. Along with other plants native to the region, including shrubs and a few tough trees, the roughly 140 remaining species of native Great Plains grasses that we know of today have evolved to suit the particular conditions in which they grow.[7] It's possible there was an even greater variety of grass species prior to European settlement, which have disappeared due to habitat loss and competition.

While several of the most successful and recognizable prairie grasses have wide ranges across the continent, the grasses that historically covered the Great Plains were not evenly nor regularly distributed across the region. There is in fact a great variety of grasslands and ecoregions that arose from the unique circumstances of their position on the Great Plains, each responding to local soils and the vagaries of local climates. Thus we have different types of "prairie", like tallgrass prairie, short-grass prairie, mixed-grass prairie, aspen parkland, and many others.

Some regions are more treed than others, some have more hills, but whatever type of grassland or savannah you find yourself in, the Great Plains is the land of prairie and sky. For beyond the predominance of grass, it is the limitless horizon that is the defining feature of the prairies; here, one has room to breathe. It is for this reason that the region is sometimes colloquially referred to as both "big sky country", and "the Big Empty."

Of course, the prairies are far from flat, and far from empty. Exploration reveals river valleys, coulees, badlands, sandhills, and any number of geographical and topographical features that belie the "flat" denomination; across the Great Plains there are many prairie places that feature hills. Yet often when viewed from a distance, the impression of flatness remains. There is so much space, and so much to see, that it achieves an almost optical illusion of emptiness.

It is a feature of the landscape that locals, at least in Saskatchewan, seem to simultaneously admire and make wry jokes about. In one episode of the Saskatchewan-made comedy *Corner Gas,* a passersby remarks to the local owner of a rural gas station "It sure is flat… nothing to see", and receives the response "There's lots to see, there's nothing to block your view."[8] It is a small joke but it touches on an important reality of the prairies that the apparent "emptiness" of the landscape tends to hide, that the prairies teem with life.

Historically, the Great Plains have been home

estimated original extent of prairie ecozones in North America

bison + the cycle of grass

without grazing

litter layer accumulates, blocking sun and warmth, new shoots die, grass cannot reproduce itself

with grazing

wallowing behaviour

bison wallows allow new seeds to take root; depressions collect water

to thousands of species. Many are gone, or their numbers greatly reduced. This includes innumerable prairie birds, as well as animals both large and small, from pronghorns to prairie dogs, and animals like the Great Plains Grizzly and the Great Plains Wolf, to name just a few.[9] Many of these animals were recorded in Lewis and Clark's notes from their famous expedition,[10] and the great numbers of birds were noted in John James Audubon's *The Birds of America.*[11] Among others, these famous 19th century publications are both frequently referred to as historic sources of how the Great Plains looked prior to European settlement.[12] The oral traditions of the plains Indigenous peoples also detail the wide variety of life that inhabited the region, and collectively are a wide-ranging and comprehensive source of knowledge. Indigenous and settler sources agree that pre-colonization, the Great Plains were home to a rich diversity of animals, the most prominent of which was the bison.

The bison were the keystone species on the Great Plains, meaning they had a pivotal role in the health and functioning of the ecosystem.[13] Bison were important to the region for a number of reasons:

> Their habit of wallowing in the dirt to evade flies [opened] up new earth for seeds to sprout and animals to create burrows. Bison [carried] hitchhiking seeds over great distances in their fur. They [left] fertilizer in the form of dung in their path.[14]

Perhaps most importantly, they ate grass, and they ate it in very specific ways.[15]

Grasses coevolved with large herbivores, and while the nature of their relationship is a subject of debate, seeming to defy categorization as either predator-prey or mutualism, the overall health of the prairie ecosystem is improved by some grazing.[16]

Research shows that bison prefer a diet of mostly grass, with a few forbs (about 5 - 10% of their diet) mixed in.[17] This is significant for two reasons. First, while grazing might remove leaf tissue, new grass leaves grow from the base of the plant, very near or even under the soil, so grazing doesn't stop the plant from growing.[18] In fact, some grasses respond positively to grazing, growing "so exuberantly that they slightly overcompensate for the tissues that have been removed."[19] This is not to say that grass cannot be overgrazed; overgrazing is a real risk to grass, and can be extremely detrimental to the health of the prairie. Yet when bison ruled the prairies, overgrazing does not appear to have been a significant risk. This is seemingly because grass always had the opportunity to recover from bison grazing in the days of the unfenced plains. Bison were constantly on the move, and they moved across incredibly wide areas. Candace Savage, in *Prairie: A Natural History*, writes that:

> If they traveled through an area quickly, snatching mouthfuls on the run, the grasses were left standing in tattered clumps. If they lingered, the prairie was reduced to a worn-out, close-cropped lawn, where whatever remained uneaten was trampled or splattered with dung. These impacts occurred haphazardly, tracking the uncertainties of rain, lightning, and fire, to say nothing of the whimsies of the bovine mind. Once a herd had passed through an area, it might return in six months or five years or never again. As a result, the Great Plains were an ever-shifting mosaic, in which a patch of tall,

Grasslands National Park, east block

> ungrazed vegetation might stand next to a mouthful that had been cropped to the quick.[20]

The above passage alludes to the second way that bison grazing supported the overall health of the prairie. Their preference for grass over forbs left forbs standing, and since forbs have a harder time recovering from grazing than grasses do, this preference gave forbs a better chance to compete with grasses. Over time, these grazing habits result in a patchier, richer, more biodiverse prairie.[22]

Along with grazing, prairie ecosystems respond well to fire. Again, this is a condition that North American grasses coevolved with; the periodic drought of the land combined with seasonal lightning storms meant that natural wildfires were a recurring event on the prairies. In fact, bison grazing and fire work best when they work together, creating "a coarse, dynamic vegetation pattern" that supports biodiversity and numerous animals.[23] Similarly to its unique resistance to grazing, grass is able to rebound from fire, and not only rebound but flourish. Unlike trees and shrubs, grasses can survive losing everything above ground, while the heat of the fire releases nutrients in the soil and allows the grass to grow back stronger and healthier, and without the competition of other plants.[24] Indigenous hunters, noticing that the grass grew back green and lush after a burn, which in turn attracted bison, also set intentional burns to draw the bison to the hunt. Fire helped replenish the earth, renew the grass, and perhaps even more importantly, it prevented the advance and encroachment of trees and forest in the prairie biome.[25]

Fire and grazing together, as part of a disturbance regime, support the health of

grasses vs. forbs

While grasses (and grass-like plants like sedges and rushes) dominate the grasslands, they are not the only type of plant that is native to the ecozone: woody shrubs and forbs are also in the mix. Woody species are easily identified: they have stems and roots which harden over time and become covered in bark, and this woody structure remains in place year-round, losing leaves in the fall and gaining new ones in the spring. In comparison, both grasses and forbs store their energy below the soil and grow from the ground again each spring. Grasses and forbs are also often intermixed in the prairie sod. So what is the difference between them?

Very simply, forbs are the plants that aren't woody shrubs and don't look like grass. They are herbaceous, meaning they have a leafy vegetative structure, and they often have an inflorescence. Most prairie wildflowers are forbs, and while grass is typically the star of the show on the prairies, come springtime it is the wildflowers that often catch the admiring eye of the observer. They also catch the eye of some of the species that rely on the grasslands, and in fact there are species that rely solely on the presence of forbs, notably the monarch butterfly, which has a special relationship to milkweed, a forb native to the prairies.[21]

native prairie.[26] It is in the bloom of the prairie as it works to recover from each successive crisis that it reaches its greatest and richest diversity and strength:

> Thus, at their most vibrant, the grasslands were a kind of living crazy quilt, with patches of vegetation of varying sizes in varying states of recovery from grazing, fire, or drought. This is the true climax condition of the Great Plains grasslands, a system that achieves stability by responding constructively to continual challenges.[27]

This relative stability, with the land always in a state of recovering its balance, allowed life to flourish on the Great Plains for thousands of years, not only the lives of plants and animals, but human life as well. Even before the grasslands had stabilized into the shape and form that they held for almost 10,000 years pre-colonization, Indigenous people were established across the region at least 11,000 years ago, and some estimates suggest much longer than that.[28]

Exactly how and when humans first lived in North America is actively debated, but on the Great Plains, humans have been present since before it settled into the prairies as we know them. Recounting an Indigenous creation story recorded by a fur trader in Northern Saskatchewan in 1823, Bill Waiser writes that:

> This creation story and others like it suggest that… [Indigenous people of North America] were not immigrants but have always been part of the New World since time immemorial.[29]

Certainly, the history of the prairies is indelibly written alongside that of its people.

To cover the rich history of human habitation on the prairies in any depth of detail requires more time than this work allows, and is addressed in several other publications.[30] Many different cultural groups have historically inhabited the Great Plains, and through trade networks they were connected to Indigenous Peoples across the continent. Within the prairies, groups had variously different customs, and sometimes found themselves in conflict with others over access to resources. It is worth remembering that contrary to some of the imagery that the earliest European visitors portrayed in their journals and letters home, North America was never a garden of Eden; living on the Great Plains required actively cultivating a relationship with the landscape, and feeding a community was a vast cooperative effort. For thousands of years, many of the people of the Great Plains were often migratory, following bison and fleeing drought, fire, or flood. In this way, they took their cues from the environment, but they were far from passive players; Indigenous people of the Great Plains were "essential partners in [the dynamic environment] and manipulated and controlled the landscape in sophisticated ways to ensure their survival and future welfare."[31] They did this with the controlled application of fire, with a wide variety of hunting techniques, and with agriculture. Through techniques and strategies refined over generations and often tied to their cultural identities, they were able to sustain themselves and thrive on the prairies without depleting the land in any way from which it could not recover.[32]

Nevertheless, life on the Great Plains was not easy. The climate is a harsh one, and even the highly adaptable prairie, capable of sustaining both human and animal residents, has not always been able to maintain its

Grasslands National Park, east block

sage brush at Grasslands National Park , west block

stability. There is evidence not only of regular droughts, but of severe and long-lasting droughts in the past, lasting decades or even centuries in some areas of the Great Plains.[33] Furthermore, the fossil record indicates that there was a significant period in the mid-Holocene during which the bison population was severely reduced.[34] This corresponded to a temporary rise in temperatures of approximately three degrees Celsius, with an accompanying reduction in moisture. As the temperature fell again, the bison population recovered.[35] Throughout it all, the grasses grew, and life on the Great Plains continued.

Clearly, whatever stability the prairie finds in its response to continuous disturbance involves a precarious balance. Like spiderweb, it is both incredibly strong and flexible, yet also somehow fragile. It is a study in contradiction, but at its roots, deep as they are, it is resilient. Throughout these great challenges of the past, the prairie persisted, as did its people, for millennia.

Grasslands National Park , east block

lost horizon

a brief history of European settlement on the northern Great Plains

Despite surviving the environmental crises of the past, it was the arrival on the Great Plains of Europeans, Americans, and eastern Canadians that has presented the greatest disruption that the region has ever faced. The advent of the fur trade, the introduction of large scale agriculture, the systematic slaughter of the bison, and the general settlement of the west resulted in irreparable changes to the landscape.

As previously noted, Indigenous peoples have inhabited the plains for thousands and thousands of years. While many groups travelled with the seasons and bison, they often returned to the same well-known sites year after year, season after season, and some groups practiced crop agriculture.[1] None of these communities were static; their political, economic, geographic and cultural history is at least as long as their tenure on these plains. They were (and still are) deeply attached to the land, each community with their own special ties and associations to places across the prairies. In this work, when I use the term settlement, I am speaking specifically of European and Euroamerican settlement. This is not to disregard or overlook Indigenous settlement of the plains that preceded the arrival of Europeans, and I would like to acknowledge the special relationship that each nation has to their homelands.

European settlement in the Great Plains started slowly, and it started at different times in different areas across the expanse of the region. In its northernmost reaches on the present-day Canadian prairies, the presence of Europeans and the technology they brought with them did not have large scale adverse effects for a long time. It is only in the last century and a half that the prairie has truly begun to suffer from the changes this settlement has wrought. Before looking at what has happened to the physical realities of the once healthy and expansive grasslands, a brief review of European settlement will be helpful.

Indigenous people were living across the northernmost reaches of the prairies for millennia before the first Europeans arrived in 1691, when a European scout of the fur trade made an expedition to the northernmost plains as a guest of Cree and Assiniboine (Nakota) groups that traded with the Hudson's Bay Company at York Factory. The

purpose of the trip was to encourage more Indigenous hunters to come trade at York Factory, and it was successful: Indigenous traders travelled to the HBC post, and the British stayed where they were for nearly a century following this sales trip.[2]

While the English waited for business in Hudson's Bay, the French had established trading posts in the region by the late 1730s.[3] In response, the Hudson's Bay Company (HBC) established its first inland post in 1774 at Cumberland House, in present-day Saskatchewan. The infamous competition between various trading companies, but particularly between the English and the French, egged on by the Indigenous traders who were poised to play them off one another to their own advantage, drove the establishment of trading forts across the region. [4]

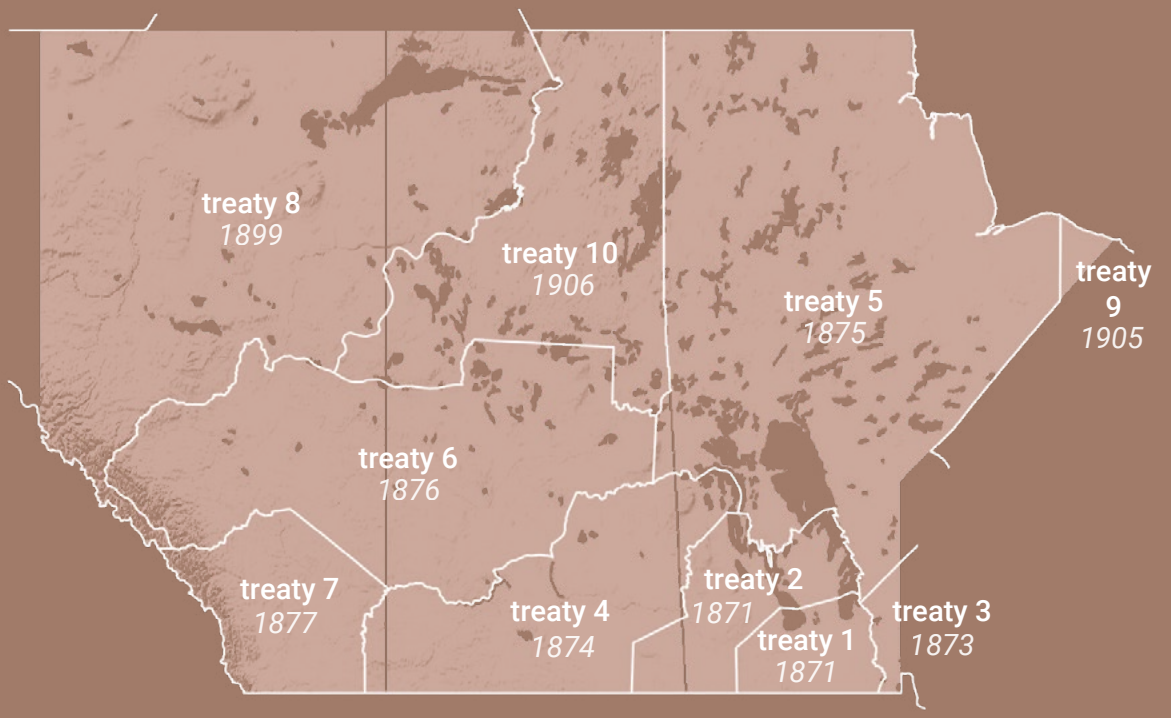
The fur trade witnessed the birth of the Métis nation, made up of those born from mixed European and Indigenous heritage. Over the centuries of the fur trade's operation and heyday, we can trace a diaspora across the plains of small settlements growing farther and farther from the heart of the Métis community in the Red River Colony (present day Winnipeg), as they worked closely with the expanding fur trade. As it spread farther into the west, so did the Métis, setting up temporary or semi-permanent settlements across the region as places to overwinter away from Red River Colony. As the 19th century progressed, some of these settlements grew more permanent. Residents drew a living not just from the hunt and the trade, but from small farms on the land, and some of the settlements survive today, including the present-day city of Prince Albert, which grew from a Métis settlement into the third largest city in 21st century Saskatchewan.[5]

The fur trade was spurred by the European economy, and particularly by the demand for beaver pelts used in highly popular felt hats. However, as the 19th century progressed, changing fashions in Europe shifted the trajectory of the fur trade, and as felt hats fell out of vogue the fur business started to slow down.[6] With an eye on the economic possibilities of the region, two expeditions were sent by the Canadian and British governments in the mid 1850s to assess the potential of larger scale agriculture in the region, scouting for new economic opportunities as the fur trade slowly died.[7] The purchase of "Rupert's Land" from the HBC by the newly formed Dominion of Canada in 1869 was hastily completed in fear of American expansionism; the U.S. purchase of Alaska from Russia in 1867 and the threat of potentially being cut off from the west coast spurred the new government of Canada to action.[8] In the eyes of eastern Canada, the purchase brought the prairies into their possession and expanded the borders of the country out to the foothills of the Rocky Mountains.

In the eyes of the Indigenous residents of the land, the transaction between two foreign powers did not bring the prairies under the control of Canada. The "purchase" was, understandably, met with alarm by the Indigenous Peoples of the Great Plains, who did not recognize that the HBC had any right to sell the land they had lived on for hundreds of generations. What they did recognize was that the bison economy was changing. The fur trade had been on the decline for years preceding the transaction between the HBC and Canada, and as active trade members, Indigenous residents of the plains were aware of the shift. They were equally aware of the sustained and continuing decline in the numbers of bison across the northern

blue grama grass at dawn

treaty boundaries in the prairie provinces



plains.

Already declining by the 1830s, the bison population was significantly reduced and under distress by the mid-century.[9] Once numbering between five and six million, the bison that inhabited the northernmost reaches of the Great Plains during the 19th century did not, of course, die out in a single year.[10] Rather, theirs was, collectively, a slow death, in part thanks to a long, drawn-out drought, but mostly due to overhunting.[11] The fur trade and the influx of newcomers to the region had created a near insatiable demand for meat and fur.[12] At the same time, the reintroduction of horses to the Great Plains (which had reached Saskatchewan by 1725) increased the success of the hunt and reduced travel times, which along with the new proximity of the trading forts meant less time travelling and more time hunting.[13] Additionally, both Canadian and American governments encouraged the extirpation of the species as a way to exert control over Indigenous people of the plains.[14]

The effect was certainly felt. Losing the bison meant losing a way of life that had sustained people of the Plains for thousands of years. This would have been devastating, and would have influenced how open the Indigenous Peoples of the plains were to treaty negotiations.

In his study of this period, *Clearing the Plains: Disease, Politics of Starvation, and the Loss of Aboriginal Life*, James Daschuk writes that:

> Shrinking herds, coupled with imminent settlement of the plains by European immigrants, forced the original inhabitants of the region into an increasingly desperate situation.[15]

Yet, writing specifically of the Cree as they faced the decline of the bison and the necessity of the treaties, Waiser notes that:

> they were not a defeated or doomed people. They not only practiced an opportunity-based economy but were also an extremely dynamic, resilient people who had faced similar challenges in the past and adapted accordingly. The Cree saw themselves as equals in their dealing with Canada and were prepared to negotiate in order to guarantee their future security and well-being in the region as an independent nation… They recognized, though, that the rapid decline of the bison forced them to convert to agriculture in order to compete with the newcomers. Indeed, they regarded an alliance with the Crown – similar to the relationship that they had enjoyed with the HBC in the past – as the best hope of restructuring their economy.[16]

The First People of the plains had to be resilient to survive all that European settlement brought to North America. Besides the widespread hunger that the loss of the bison ensured, the settlers brought new diseases with them, to which the Indigenous population had no immunity. Not one but two major epidemics of smallpox decimated the Indigenous people of the plains, in 1781-82 and 1837.[17] The HBC was also the vector through which influenza, measles, and dysentery travelled across the plains.[18] And if disease and starvation were not enough, it was also a time of increasing conflict. The decline of the bison heightened tensions between Indigenous groups across the region, making them more tightly protective of their hunting grounds.[19] As one historian noted: "No longer were the northern plains a bison commons, open to all, but increasingly

claimed by particular bands to ensure access to the depleted herd."[20]

Indigenous leaders in present-day Manitoba began requesting treaty negotiations in the late 1850s, likely in response to the declining bison herds, but also the threat of encroaching cultivation and logging on their lands.[21] The government of Canada was sluggish in response, negotiating the first of the numbered treaties in 1871, a full two years after their transaction with the HBC. Of the numbered treaties, Daschuk writes that:

> [they] were not monolithic; each took place under specific geographic and social conditions in the context of the dominion's short-term agenda for development. From the perspective of the dominion, treaties were a means to facilitate regional economic and political development… a legal imperative, an obstacle to be overcome before settlement could proceed in earnest.[22]

This pattern held more or less true for the next six numbered treaties. By the 1870s, there were many Indigenous groups that were open to negotiation, but the Canadian Government delayed responding to treaty negotiations, only negotiating as necessary to gain legal access to the lands they wanted, as they wanted them.[23] Surveyors frequently preceded any treaty negotiations, and at times these survey teams had to be physically stopped before the government would pay attention to the call for treaty negotiation.[24]

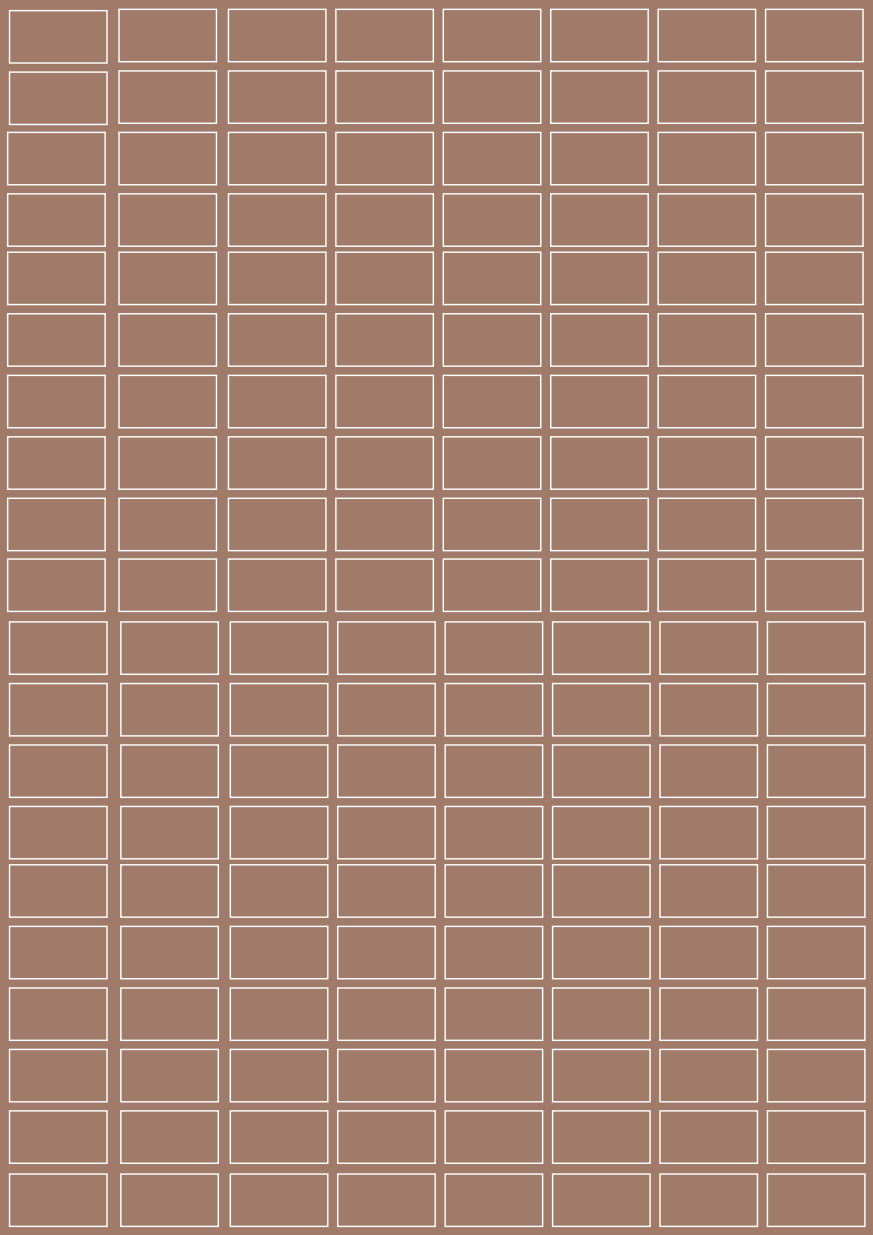
The government surveyors drew lines on the landscape – one straight down the 49th parallel, marking the new Canadian-American border, and others measuring out each half-mile by half-mile quarter section of land with the utmost care for regularity and uniformity and utter disregard for topographical features like hills, coulees, badlands, wetlands, and sloughs, not to mention disregard for prior inhabitants, including those who had previously drawn property lines.[25] It was the attempt to resurvey land into quarter sections that had long ago been parceled out and cultivated following the seigneurial system of farming (preferred by the French and Métis), that ignited existing concerns about the sale of "Rupert's Land" and sparked the Red River Rebellion in 1869.[26]

An added element in this restless time were American whisky traders and wolfers, who crossed the border as they pleased, occasionally bringing violence with them. This was the case in 1873 when, in revenge for an imagined horse theft, they killed between 20 and 50 Assiniboine in a single night near the Cypress Hills.[27] It was this massacre that finally pushed the Canadian government to create and deploy the North West Mounted Police. They arrived on the plains in the summer of 1874, a sure sign of European dominance, if we were looking for one.[28]

Perhaps an even greater mark of European settlement than an organized police force is the birth of a regional tourism industry. The region attracted its fair share of botanists, painters, writers, leisure hunters, and adventurers, many of whom visited the prairies on their way to the mountains or the west coast. They recorded their adventures, as early as the 1840s, for the enjoyment of readers back east, or in Europe.[29] Their paintings and journals may even have influenced some of the settlers who left their homes in the late 19th century to seek a new life on the Canadian prairies.

scale comparison

1 football field = roughly equivalent to 1 acre
quarter section = 160 acres



The romanticized records of early visitors cannot have had the same powers of persuasion as the promises the government of Canada made. The Dominion Lands Act of 1872 promised a quarter section in exchange for a ten dollar registration fee and a promise to reside on and cultivate the land for three years. This was a significant threat to the integrity of the grasslands, as were the amendments made in 1884, which stated that to keep the land, you must break at least 25 acres in the first two years of residence.[30]

A fate sealed in ink, the Dominion Lands Act preceded all but the first two treaties, but would be applied across the plains region of Canada. Also preceding the rest of the treaties was the progress of the railway. Perhaps we might say that the pace of settlement of the prairies followed the progress of the railway, rolling westward tie by tie until it reached Calgary in 1883.[31] It was the same year that the last free roaming bison in Canada was killed.[32] Treaties 4 and 6, covering most of southern Saskatchewan, followed in 1874 and 1876, respectively. Treaty 7, governing southern Alberta, would not be signed until 1877.

With the rail line arrived trainloads of passengers who intended to stay.[33] Stepping from the train at hundreds of stations across the region, full of optimism and without any sense of the region's history nor environmental particularities, these settlers arrived in a landscape transformed into a blank slate, an empty canvas transfigured by the twin powers of uninformed human perception and the Dominions Lands Act.[34] With the settlers came unwitting ignorance, as well as an intense and sometimes heartbreaking hope; it is worth noting that many of these immigrants and migrants were fleeing oppression, poverty, or the closure and loss of the commons in their home countries.[35]

As those thousands of newcomers peeled back the sod and broke the land, the landscape was transformed. Archaeological reminders of the millennia of human habitation preceding the newest settlers were plowed and erased from the landscape. Roots of domesticated grasses like wheat and rye reaped nutrients from the topsoil that had been built up over 10,000 years of the decomposition and regrowth of the wild native grass. The grasslands were either improved or broken, depending on your worldview (or the century). The legacy of this settlement included the loss of one of North America's greatest carbon sinks, and a cultural genocide that continued unacknowledged for almost a century. While reserves were carved out and set aside for Indigenous residents, the boundaries shifted over the years and rarely in their favour. Roads crisscrossed the prairies, connecting the towns and cities that have grown (and in some cases died), and disconnecting the prairie from itself, fragmenting it into patches of decreasing size and connectivity.

The prairies are one of the most altered ecosystems in the world.[36] In Saskatchewan, it is estimated that less than 14% of native prairie remains.[37] Yet wild places persist, unexpected and hiding, but still there. Saskatchewan's former public pastures are some of them.

railway tracks, Moose Jaw

Charolais near Regina

rangelands

remnant prairie in southern Saskatchewan

Throughout the history of colonization in North America, the activity of ranching could often be found at the edge of European settlement, a vanguard of territorial expansion, pushing ever westwards.[1] The Europeans who arrived in North America provided a ready market for the cattle industry, and early ranchers took advantage of the liminal spaces between new Euroamerican settlements and Indigenous controlled territories. As settlement moved across the continent, so did rangeland. One early twentieth-century historian of the ranch industry writes that:

> Under such circumstances grew up the idea that grazing is but a transient and temporary occupation to be carried on in any region only until the lands are needed for a more intensive form of agriculture.[2]

The prioritization of crop agriculture by public policies, even in places where it was not an appropriate strategy for the capacities of the land, can be found even now in the twenty-first century, in spite of the undeniable damage it has done to the environment and its people.[3]

In wetter regions to the east, there are many places where the land easily supports crop agriculture, and the European settlement approach could be carried out without resistance from the soil itself. But as prairie settlers discovered, there are parts of the region that are simply too dry, the environment too harsh, for the kind of agricultural practices that were transplanted by people with the forests and meadows of Europe and Eastern Canada held close in their hearts, habits, and concepts of habitat.

The question of how suitable the environment of the Great Plains is to the kind of settlement practiced by Europeans and Euroamericans is one we will return to. Less questionable is the suitability of the Great Plains as a habitat for cattle. To these grazers, the vast grasslands of the North American interior must have seemed a kind of homecoming, and if cattle could write history, surely their discovery of the Great Plains would be prodigious: a moment in time and place powerful enough to inspire a bovine Aeneid.

In the southernmost extent of the Great Plains, cattle and the accompanying ranching industry arrived in Texas with the

earliest Spanish settlers, where they have maintained a presence for roughly the last three centuries.[4] In the northern reaches of the Great Plains, the first cattle arrived (from England via Hudson's Bay) at the Red River colony in 1813, and were established in present-day Saskatchewan and Alberta by the late 1870s.[5]

It is not a coincidence that cattle appear on the scene as the bison disappear, though there were times and places where the two herbivores coexisted on the Great Plains. The coordinated ascent and decline of their respective populations is not because of an intolerance of one species to the other, but rather because of the social history of the people living alongside them.[6]

Of the many impacts that people had on the bison, the introduction of barbed wire, invented in Illinois in the 1870s, was a significant blow. With the advent of barbed wire, the plains were fenced and the movements of the bison severely hampered.[7]

It was not solely the invention of barbed wire or the absence of bison on the Great Plains that allowed commercial ranching to expand: it was the sequestration of the people of the bison onto reserves and tribal lands, and what that meant for the expansionist dreams of the Canadian and American governments.

Writing in 1930, one historian noted that:

> the rapid disappearance of [the bison] from the plains rendered much less difficult the carrying out of the new policies of the United States government with respect to keeping the Indians [sic] upon reservations.[8]

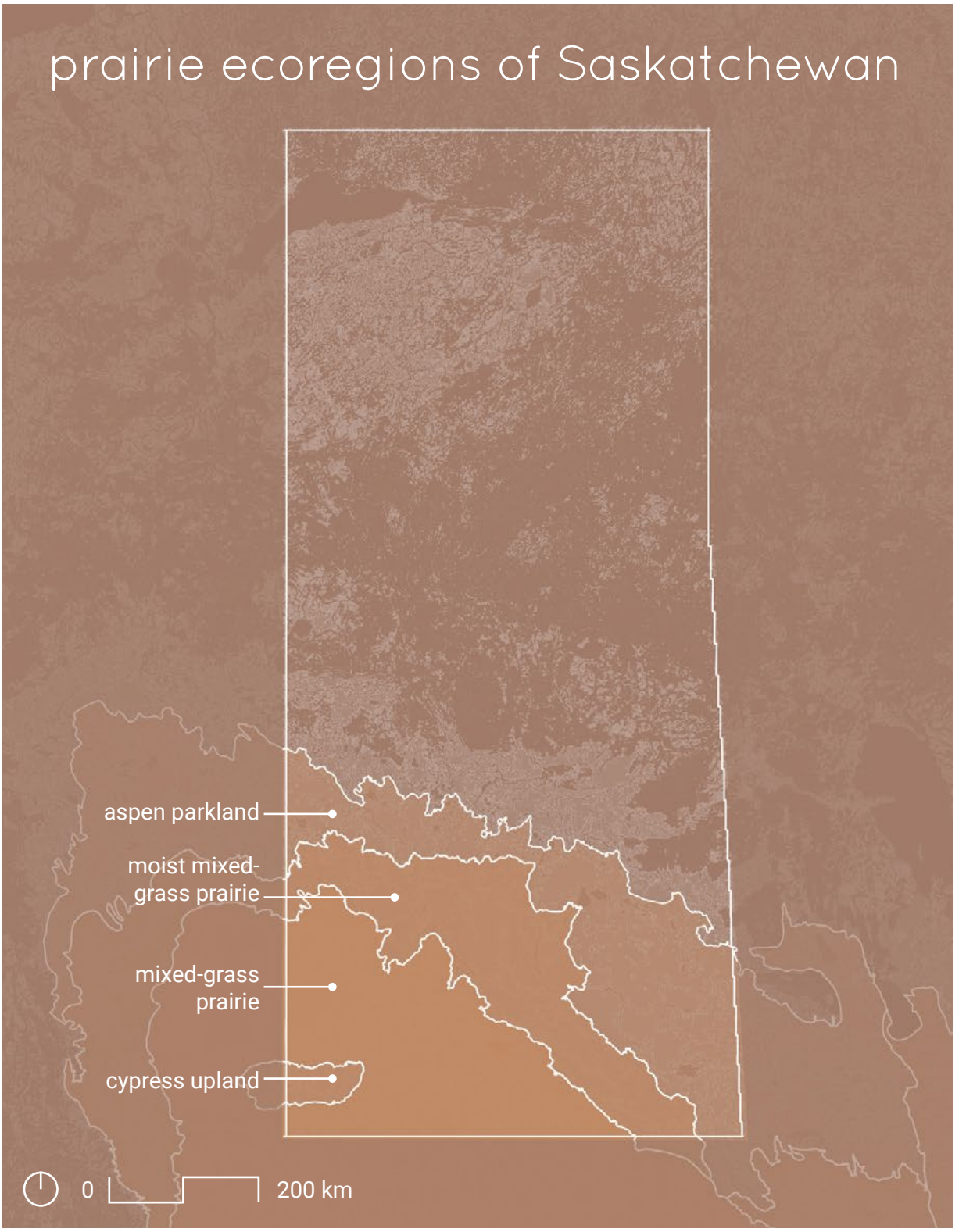
Removing the existing residents of the Great Plains was a condition many in the Canadian and American governments viewed as necessary for the expansion of economic activity in the area.

First among the planned economic activities of the prairies was crop agriculture. In order to understand how today we have been left with only small, disconnected islands of native prairie, we need to look at the bigger picture of the landscape changes over the last century, and crop agriculture's position of privilege in the regional and national economy is an undeniable driver of those changes.

As a colony of Great Britain, the Canadian economy of the early 19th century was driven by resource exportation.[9] The annexation of the prairies by the east was carried out with an eye to expanding this trade. Ottawa looked at that expanse of grassland and imagined fields of grain as far as the eye could see, each acre a source of income that could deepen the pockets of eastern Canada, to such an extent that in its beginnings at least, the new western Canada functioned almost like a colony to the east.[10]

> The Dominion Government exercised all the prerogatives of imperial authority and the Department of the Interior was a veritable colonial office in its relations with western and northern Canada.[11]

It was with the region's agricultural potential in mind that both Canada and Britain sent expeditions to assess the region in the 1850s, well in advance of the purchase of "Rupert's Land." The Palliser and Hind expeditions reported that large swaths to the south were too dry for crop agriculture: both ultimately used the term "desert" in describing the conditions. It is from these expeditions that the Canadian government sketched its first rough map of the environmental conditions


prairie ecoregions of Saskatchewan
aspen parkland
moist mixed-grass prairie
mixed-grass prairie
cypress upland
0
200 km

of the region, giving us the regionally famous "Palliser's triangle", and less well-remembered "fertile belt." The latter, Hind's contribution, roughly accords to the Aspen Parkland ecozone we know today and was proposed as the location of Canada's future agricultural development.[12]

Yet when the Canadian Government began to promote the region for agricultural settlement nearly two decades later, they largely ignored the findings of Palliser and Hind. Why? Why pay for a study on the agricultural potential of a region and then ignore its best advice?

It may have come down to a question of where to allocate other resources, and to what ends. Canada was planning to build a rail line to connect the east with the west coast, and its route would impact the development of the region. Throughout the 1870s, it was widely assumed that the rail would take a northernly path through Hind's fertile belt, but in the end

> the location of the railway had more to do with strategic business decisions than the quality of the land. The main line was to be constructed as close to the international border as possible – even if it was not the best quality farmland – in order to keep out American competition.[13]

It was probably not only the economic threat of American competition that drove the rail line south from the "fertile belt," but the possibility, however remote or plausible it may have been, of a military threat. The American Civil War had ended in 1865, and with its end the United States Government turned its focus and its armies west. To make a great settlement push deep into the heart of the Great Plains, the Americans needed to remove the original inhabitants of the land,

Clay soils in a seasonal creek bed

and while America's wars with its Indigenous population long preceded this post-Civil War period, the conflict reached its climax in these years. Custer's infamous defeat at the Battle of Little Big Horn occurred in 1876. In trying to escape a furious American retribution, Sitting Bull brought a group of Lakota north, seeking refuge in present-day Saskatchewan (some of this group stayed, and still call the area home). We can only imagine how America might have bristled at his escape. Canada was surely aware of the tension and eager to avoid conflict with the

Americans: although some at Fort Benton were sympathetic, the federal government refused to parley with Sitting Bull, eventually starving him back over the border.[14]

While the United States government appeared to respect the political boundary line, individual traders did not, and often crossed the border to do business and occasionally cause trouble. Only a few years prior, American traders had precipitated the Cypress Hills Massacre on Canadian territory, and the government of Canada had not forgotten. It is possible that given how American violence spilled across the border at times in the 1870s, and given the proven might of their armies, that the Canadian-American border seemed too fragile to be left alone.

These were the years of the American Wild West, and that was the political context when John Macoun, a plant geographer from eastern Canada, arrived to conduct another survey of the agricultural potential of the region in 1874. Unlike his

predecessors, who saw the region during a time of drought, Macoun visited the prairies during exceptionally wet years, and was enthusiastic about the southern grasslands. The Manitoba Free Press quoted him in 1881: "There [is] no such thing as the fertile belt at all – it [is] all equally good land."[15]

He was, of course, wrong. Yet given the American context, the Canadian government was eager to abandon the earlier warnings of Palliser and Hind and blindly accept Macoun's enthusiasm for the region. They directed the railroad and with it, the mounted police and the expected scores of settlers, to occupy the lands near the southern border. In the meantime, they set their hopes high:

> Once dismissed as a frozen wilderness, the North-West had been transformed into an agricultural Eden that would provide the means to empire for the young dominion. And because the region was deemed so essential to Canada's future prosperity and well-being, the land had to be settled and


cropped field adjacent to rangeland

> developed as quickly as possible, even if that process conflicted with the interests of the local population.[16]

And, we might add, even if the process conflicted with the environmental conditions and capacities of the landscape.

The truth is that each survey expedition only made its judgements based on the observation of a year or two: they were judgements made about a moment in time in a region that must be observed on a larger scale. The native prairie of North America often exists in a precarious balance in response to its variable climate, and unlike the landscapes of the Canadian government geographers' experiences, it shifts in patterns that require not just years, but decades, even centuries, to understand. There are areas in the drier south that Palliser and Hind had christened as "desert-like" that can be productively farmed, but there are also wide swaths of the region that should never have been plowed due to their natural aridity.

Nevertheless, the railway was built, crop agriculture was promoted, and waves of settlers arrived. Close to centrally located along the rail line, "Pile of Bones," or Wascana, on the banks of the creek of the same name, was designated the new capitol of the North West Territories and renamed Regina when the first CPR train arrived in 1883.[17]

To further the interests of the east, the federal government crafted specific policies to make western settlement attractive, and to not only encourage but even require that settlers plow up their land within a set timeframe in order to keep it. The intent was to grow the agricultural economy of the region as fast as possible, to make good on the investment that the eastern provinces had made in the west (and to the Devil with the desires and occupation of the resident Indigenous inhabitants).

Yet no amount of economic optimism nor ambition can overcome ecological reality. While a land rush immediately followed the completion of the railway, contrary to the Government of Canada's plans and desires, agricultural settlement stalled in the mid to late 1880s. The price of wheat was down, and the wet years of Macoun's delight had passed: drier conditions, if not outright drought, led to a series of bad harvests that

cattle on the Caledonia-Elmsthorpe pasture

despite the federal government's agricultural marketing campaign cast a shadow on the lure of farming the west.[18] People suffered.

Enter ranching. In the 1870s the Canadian beef market was flourishing. Like many other Canadian resources, meat production found a good deal of profit in exporting product to Great Britain. The Industrial Revolution had not only increased the British industrial population, but the meat consumption per capita, and "Just as demand for beef increased, British production collapsed, due to a series of infectious diseases spread from mainland Europe."[19] Disease was present not only in European and British cattle populations, but American as well. Thus Canada's herds, relatively isolated from diseased populations, gained a reputation and a preference in British markets that held nearly until the end of the 19th century.[20]

In addition to the international beef market, there was an increasing demand for beef in western Canada. Not only did those settlers who had come want cattle for their farms, but the recently established North West Mounted Police (NWMP) needed food, and the government had promised, through the treaty process, to provide food to Indigenous Peoples who could no longer hunt bison. Between the settlers, the NWMP, and the promises of the treaties, provisioning was becoming lucrative in the west.[21]

With demand for beef high, and demand for cropland waning (temporarily, at least), the Canadian government briefly revised their plans for the economic expansion of the west and began to promote ranching on the prairies. While grazing leases were included in the Dominion Lands Act from the beginning, they were short term. In 1881, the Dominion Lands Act was amended to allow for grazing leases of 21 years at an attractive one cent per acre per year to a maximum of 100,000 acres, and the leases were closed, meaning homesteading would not be permitted on the land.[22]

These amendments allowed large scale ranching operations to set up across Saskatchewan and Alberta, and policies put in place by the government of Canada encouraged and promoted large scale enterprises over small ones. Examples included the duty-free import of cattle from the United States for large operations (small operations had to pay a duty of 20%).[23] The policies had their intended effect: in Alberta, for example, a mere ten grazing companies operated over two thirds of all the rangeland in the province by the end of the 1880s.[24] Large holdings emerged in Saskatchewan as well. Amongst the notable operations, the Matador Land and Cattle Company from Texas leased a large section of land in Saskatchewan and annually drove their herds up the continent to fatten them on the northern grasslands.[25]

In spite of the early success that the ranching industry had in the Canadian prairies, crop agriculture was still the preferred regional economic activity sanctioned by the Government of Canada. We might speculate that this preference was driven by the same reasons they chose to direct settlement to the semi-arid south rather than the more fertile aspen parklands: crop agriculture typically requires more workers per acre, and usually leads to denser settlement patterns.[26] If the government was indeed concerned with holding the area against American expansion, a denser settlement presence across the region makes sense. Crop agriculture also introduces a more permanent and certainly more visible change to the land itself. Every field plowed and sown therefore served as a flag planted in the soil, declaring that this

land belonged to Canada now, and whether that declaration was intended for the Americans or for the Indigenous inhabitants of the plains, the message was sent.

The government's preference for crop agricultural settlement is evidenced by the fact that the Dominion Lands Act only allowed settlers to lease land for grazing, while settlers who were willing to plow up the sod were offered title to the lands. Additionally, although grazing leases in the late 19th century could be held for periods of up to 21 years, the Minister of the Interior reserved the right to cancel any lease with two years notice in the event it should be wanted for farming.[27]

Government policy helped shape the physical reality of the Canadian prairies, not only by promoting some uses of land over others, or by making land tenure more or less stable depending on your economic activity, but also by dictating how extensive or intensive the activities of the settlers were. Similar to the "plow it or lose it" policies for crop agriculture, the government required ranchers to stock "at least one animal per ten acres within three years."[28] This may seem like a fair ratio, but for context to anyone not familiar with the ranching industry, stocking rates should not be a set standard across the board, with a blanket application from coast to coast. The ratio of animal to acreage depends on the productivity of the specific patch of land being grazed, and often is impacted by precipitation and grass growth in a given season, as well as how often or regularly it has been grazed in preceding seasons.[29] These are important considerations if you have a care for the maintained health of the land. If you do not care about the long-term consequences to the land, and have quick profit as your priority over ecological and thus economic sustainability, you can stock a range so that no grass carries over to the next season.

The policies of the government of Canada would suggest their position on maintaining the health of the grasslands, though if we are generous we might remember that they knew pitifully little about the ecological realities of the region they were trying to settle, and chalk up some of their destructive policies to sheer ignorance. Although the concept of carrying capacity within range science was developed early in the 19th century, with the term entering use in the mid-19th century (predating the science of ecology and the modern conception of sustainability), the carrying capacity of the northern Great Plains does not appear to have been clearly understood.[30]

Perhaps the unfortunate truth is that the settler government did not *care* to understand the realities of the environment. Leases for rangeland were often relegated to areas undesirable for cropland, and little care was taken to guard the health of the drier regions: European settler grazing management practices were inadequate or non-existent, in part, because the prairie grasslands were viewed as "wasteland."[31]

> Rangelands – expanses of native grassland that are grazed by livestock – exist only where the prairie has somehow managed to escape the plow, usually because the soil is too dry, too thin, too rocky, or too steep to be suitable for crops.[32]

Some of the largest preserves of native prairie to be found in the Great Plains today survived because they were unwanted, and considered by many to be useless for other forms of production and industry, following the definition that would have accorded with

hoofprints in clay

the settler worldview of the time. Alongside rangeland, other areas that were preserved include military bases and Indigenous reserves or tribal lands, in Canada and the United States respectively.[33]

Ranching helped preserve native prairie because it was considered a valuable economic activity to settler communities, and it protected the prairies with this economic justification. But it also protected and supported the health of the prairie because the activity of ranching helps to recreate the pattern of grazing present in the evolution of the grasses of North America.

Cattle have proven to be a surprisingly good substitute for bison. While there are some notable differences between the behaviours and tolerances of bison and cattle (we will return to these), they share a common ancestry, and they are more alike than they are different.[34] To an individual clump of grass, it likely doesn't matter which herbivore munches on it. Across a wider expanse of landscape, while the variations in habits between the two manifest in different vegetation patterns,

> Removing wild American bison and replacing them with tame Eurasian cattle – though a stunning act of hubris – was ecologically relatively neutral, the substitution of one large, ruminant herbivore for another on a landscape that had sustained large herds of grazers since the retreat of the glaciers.[35]

The transition was not seamless and there are definitely differences. In addition to the above, Savage points out that "This is not to say that the introduction of cattle to the Great Plains has been completely benign. It has not."[36] This is largely because of the differences in their behaviour and

blue grama grass and wildflowers

preferences. Cattle cannot tolerate the cold as well as bison, and the barbed wire that kept them on the range and allowed settled ranch operations also meant that they could not move across the plains to escape a deep freeze, as the bison did. As anyone who has lived on the prairies knows, winters can bring severe temperatures and storms. For most of the 19th century, Euroamerican ranchers thought that cattle could survive on the open range, without additional feed or shelter in the winters, just as the bison had. But as more range operations were established in the region towards the end of the 19th century, they learned that cattle were not nearly as hardy as bison. The winters of 1886-87 and 1906-07 in particular are mentioned across several range history sources, for the high mortality rates of cattle that froze, or starved to death after they could not dig through the deep snow to get to the grass beneath.[37]

The cattle and their keepers were not the only ones to suffer during the years they were getting acquainted with their new environment. "Grazing management expertise was virtually non-existent on residual natural grasslands during the homestead era," and overuse of the land occurred, particularly on those tracts of "wasteland" that were paid less attention.[38]

The tenuous occupancy of grazing leases provided an unstable setting for many ranchers, and influenced the choices they made when it came to stocking rates. Writing of the ranching industry south of the border, which faced similarly unstable holds on rangeland leases, range historian Edward Everett Dale states:

> [The] general feeling that the business of ranching was temporary in character, together with the uncertain tenure of nearly all lands occupied for pasturage, was productive of many ills. It resulted in a great over-stocking of many ranges which eventually proved disastrous, not only to individual ranchmen [sic] but to the entire industry, since large areas that had formerly furnished excellent pasturage were converted into barren wastes incapable of supporting one fourth as many animals as they had formerly done. Cattle raisers, fearing that they would within a few years be compelled to remove, resolved to get the most possible from the range while it was in their possession.[39]

The introduction of cattle grazing was not simply a balm that one could apply to the prairie and expect it to maintain its health, and we cannot say that the prairie was preserved simply by the introduction of domesticated cattle and their economic influence. Careful management, along with long-term tenure, is required of rangelands in order for them to stay in a healthy condition.

While ranching did not automatically protect native prairie from disappearing, it is still true that a lot of what we have left today is thanks to the efforts of the last century and a half of prairie ranchers.

rangelands vs. native prairie

How can you read the land, if you are driving around Saskatchewan today? What is the state of grasslands in the 21st century?

Rangeland today contains a diverse mixture of native and introduced grasses in various states of health. Some of it was plowed by the earliest settlers, but later abandoned after it became clear that it was not suitable for crop agriculture. Much of this land was turned back to grass, and on these lands you could find a mix of native and domesticated grasses. The ancient topsoils and layers of sod built up over millennia have been disturbed, and are often depleted to greater or lesser extents. Yet if enough of the native grass habitat has recovered, we might still refer to it as native prairie – often with the descriptor "restored" attached.

Lands that have never been plowed are generally referred to as native prairie, but even on rangeland that was never plowed, domesticated and invasive grasses are often present. There are a handful of domestic grasses that can reliably withstand the harsh conditions of the Canadian prairies, and many ranchers trust them to provide additional forage for their herds in hard years. Throughout the 20th century and even today, ranges and pastures are sometimes "improved," by purposefully seeding pastures with domestic grasses. Even in areas that have never been intentionally sown with domesticated grasses, foreign species might be present, having migrated in from adjacent pastures, their seeds carried on a breeze and taken root in a patch of exposed soil.

In spite of its continuing prevalence, the perception that domesticated grasses improve forage or produce it more reliably is largely incorrect. This is the general conclusion of multiple studies published in the 21st century.[40] Having said that, the presence of domesticated grasses in a native prairie does not automatically mean it is less healthy or vibrant, though when the domesticated grasses turn invasive, the balance between native and introduced can be precarious. Still, domesticated grasses are not "bad" grasses, though there is evidence that using monocultures of crested wheatgrass and Russian wild rye reduces soil quality, and eventually reduces carbon sequestration.[41]

The perceived characters of native vs. domesticated grasses, just as much as their physical actualities and habits, have had a real impact on the prairie remnants we have left. What would it mean to call someplace a pristine grassland? Given the scale of human impact in the grasslands region, it is hard to say whether its even possible for the prairie to exist in the same way that it did before settlement. Should we care whether the native grasslands that remain are pristine? Does it mean they are less productive, or that they provide less habitat? In short, no. Though they may be degraded to greater or lesser extents, we can still find patches of native prairie healthy and thriving, even with a few new plants to call it home; if anything this proves just how versatile and resilient the grasslands can be.

grain elevator

boom and bust

the origins of the Saskatchewan Provincial Pastures

As the century turned, and the provinces of Saskatchewan and Alberta came into being, the region boomed. For a time, Saskatchewan was the fastest growing province in Canada: in the six years following its confederation in 1905, the population doubled to just under half a million.[1] This influx brought enormous social and physical changes to the land. Many settlers had no awareness of Indigenous history on the land they settled, nor of the environmental history or particularities of the region. They saw unploughed prairie and equated it with unoccupied. They saw grasses growing lush, and they read that the soil was fertile and that the land would support them. Their attention was fully focused on the future.[2]

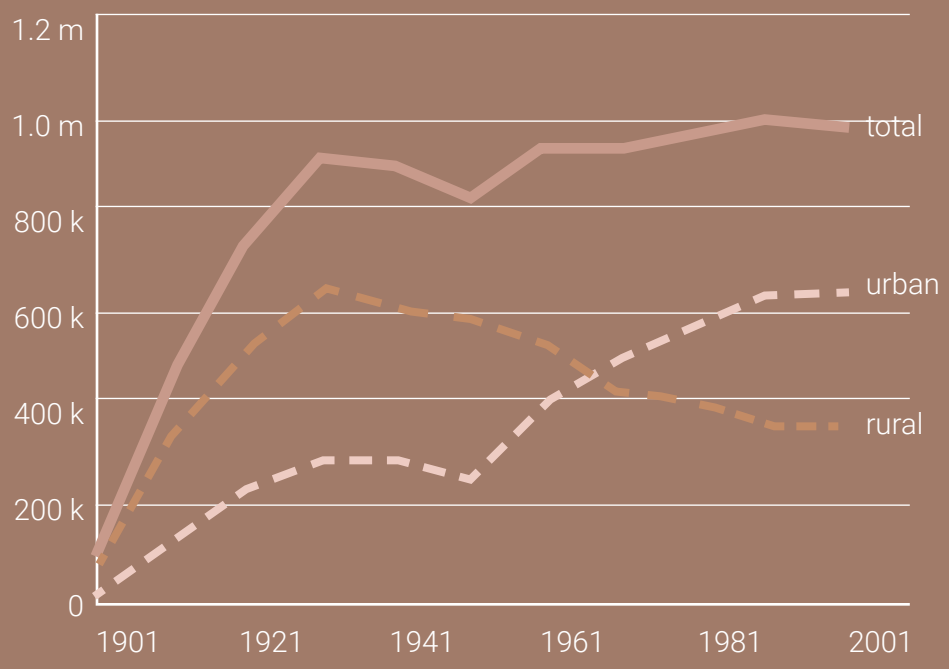
Canadian beef enjoyed a prestige on the national and international markets, and trade agreements with the United States allowed business to flow back and forth across the border. Yet despite the success of the ranching industry, government policies continued to promote crop agriculture over ranching, and the agricultural practices and preferences set in motion in the 1870s and 1880s continued their overwhelming advance.

Lured by cheap land and big promises, hundreds of thousands of immigrants arrived on the prairies, and while the urban centres grew, most of this population settled in rural areas, and their economic activities centred on crop agriculture.[3]

Thrilled that the agricultural settlement of the prairies that they had been pushing since the 1870s was finally booming, in 1908 the federal government pushed homesteading into areas of the prairies that they had previously been deemed too arid, and had thus far been reserved for use as rangelands. Knowing this, the government offered homesteaders in these areas even larger tracts of land for reduced prices, to offset the deficiencies of the soil.[4]

These were years of boom and bust. There were successful harvests aplenty, especially in those first few years after an area was first plowed and the topsoil that had been accumulating under the sod for centuries was harnessed by domesticated grasses like wheat. But there were also years when entire harvests failed. As early as 1913, only five years after pushing homesteaders towards known dry areas, the federal government

population change over time in Saskatchewan



adapted from Waiser, "Urban and Rural Population of Saskatchewan." Graph. In *Saskatchewan: A New History, 498.*

appointed a commission "to investigate whether certain districts should be closed forever to homestead entry and set aside for grazing."[5] The area of greatest concern was in Palliser's Triangle, though even that southwestern corner of the province produced bumper crops, outputting 96 million bushels of wheat in 1915 alone.[6] The seesaw success and failure of crop agriculture as the land tried to find its balance in response to the disturbance of the new agricultural practices at work was a bewildering and frustrating circumstance for newcomers to the region, and is recounted and recorded in local histories both formal and informal – see, for example, *Happyland* by Curtis McManus, and *The Winter Years*, by James H. Gray.

Even during the height of the boom years, crop agriculture in the region produced unsteady results. High yields and high wheat prices made for high times in 1915 with a provincial production of 224.3 million bushels of wheat. Just one year later, 1916 saw disease hit the crops, and drought, an

intermittent but persistent problem for crop agriculture on the prairies since its earliest beginnings, started to hit hard:

> the provincial government had to provide relief to hard-pressed settlers… [and] new farmers were particularly hard hit. In 1916, there were 5,722 homestead cancellations, just slightly less than the 6,247 homestead entries for that year.[7]

Another example, from a few years later, shows the consistency and perpetuation with which people were forced to leave their farms due to uncooperative climate; in 1919, of 2,283 farmers who received land in one particularly dry region of southeastern Alberta, 72% had been forced to abandon the land only five years later. Twenty years later, the abandonment rate for those lands had risen to roughly 95%.[8] These examples serve to illustrate the scale of how badly the government estimated the capacities of some areas, and how little foresight they demonstrated for what was coming.

This is not to say that there weren't people concerned about the steadiness of the economy and the land in the early twentieth century, even well before the devastation of what was to come in the 1930s. The sharp growth of commercial agriculture across the prairies left the regional economy vulnerable and over-reliant on the whims and chances of the harvest, and early in the century the College of Agriculture started actively trying to promote mixed farming – the raising of farm animals alongside crops – as a way to diversify the economy.[9] These warning calls must have echoed the general unrest and feeling of unsteadiness in the farming community that the sharp successes and sharper failures of the early twentieth century must have caused.

The federal government had encouraged and even pushed agricultural settlement of the prairies, had rejoiced at their envisioned profits when hundreds of thousands of settlers took them up on their offer of land and agreed to plow the prairies. But in inviting immigration in such large numbers, they created a group of voters who, facing the uneasy risks that crop agriculture faced in the region, held a certain amount of power at the polls. The federal government soon found themselves needing to appease farmers.

Around 1920, there was talk in the agricultural communities across the prairies about the potential of setting up community grazing grounds, and the United Farmers of Alberta sent a proposal to the Department of the Interior on the topic. Historian David H. Breen writes:

> The community pasture idea was popular and was believed by many to be a necessary measure of assistance to drought-ridden farmers in the south. Since it had been proven that the area could not be relied upon to produce grain crops, unfortunate farmers who remained there were encouraged to improve their position through the purchase of a few head of cattle. However, the problem was that most farmers had insufficient land to keep more than a few head, especially in very dry years.[10]

The proposed solution was to establish a commons for the purpose of community grazing.

private farmland

the commons

Today, discussion of the commons often brings up Garret Hardin's infamous 1968 article, "The Tragedy of the Commons," in which he describes how shared resources can be depleted by overuse and self-interest.[11] The argument and counter arguments have made interesting contributions to debates within environmental ethics and philosophy, but the pervasiveness of the paper has left many people with a specific conception of the commons as systems that are bound to fail. This is not the case, particularly when it comes to common pool resources that are managed, as Nobel Prize winner Elinor Ostrom demonstrated through her significant body of work. While there are commons that fail, as one of the oldest forms of property in human history, there are also a plethora of long-running examples where they succeed.

Commons come in an exceptionally wide variety of forms, but are often a type of property or resource that is in some way shared by a community and serves the common good. Sometimes commons are open to anyone, sometimes they can only be accessed by certain groups, sometimes they are publicly or communally owned, and sometimes they are privately owned but open for community access and use. This plasticity of form is due to the fact that each commons is unique to its place and community, and exists as a result of social agreements, typically very local, and supported by either formal or customary law.

While commons are often highly specific to the particularities of their situation, and in their different manifestations vary in stability or in centrality to a society's economic and cultural traditions, they are present on virtually every continent and found in cultures across the globe, both historically and in modern times. A few examples include village rice fields in Japan, communally owned pastures in Switzerland, forests in India, mir in Russia, fishing grounds in Senegal, and large rangelands in parts of Mongolia.[12]

In Western/European culture, many of our traditions of the commons grew out of or were informed by the Roman conception of the commons. The Romans recognized the commons as one among many types of property in their society, separate from public property, private property, abandoned/empty property, and divine property. What is more, beyond framing the commons as a separate kind of property, they had a concept of "usufruct rights," which could apply to other types of property including public and private, and which are useful to how human relationships with the land were understood throughout the Roman Empire. From the Latin *usus et fructus*, or "the use and enjoyment of the fruits," "The notion of *usufruct*… denotes the right to use and benefit from property that belongs to someone else, as long as the property is not damaged."[13] Roman usufruct rights echo parts of the Code of Hammurabi, which are some of the earliest surviving written laws in human history, dating to around 1750 BCE.[14]

The Roman and Babylonian formal recognition of the commons and common

rights are some of the earliest recorded laws we have regarding the commons, but the commons as a way of human societies organizing and conceptualizing their environments and resources has existed for much longer. Some studies have determined that in England, India, and Mongolia, commons predate all written records.[15]

For settlers on the Canadian prairies, the English system of commons was likely the one that informed many of their perspectives on what commons are and how they function. Commons in England predate Roman occupation; it was not until the arrival of William the Conqueror in 1066 that private property began to gain ground over the commons.[16] For centuries, they were central to life for the majority of the population, because commons provided anyone who was not a landowner or nobility a way of supporting themselves; in the commons people were able to graze their animals, collect firewood or peat, gather gravel or stone for building, hunt wildlife, and forage food from the landscape. If you were an artisan, the commons is where you might have sourced the raw materials for your craft. The term "commoner" can be used to refer to people who made use of the commons for their living.[17]

The use of the commons as a support for the economic activity of an individual or group is typical in commons across the world. Speaking of Senegalese commons, Chimère Diaw, head of the African Model Forest Network, describes commons as "a key, but not the entire system. They are a pool of common resources managed in such a way that when an element of them is appropriated (game, fish, agricultural farm), only the latter becomes a private possession. The resource in itself remains in common."[18] It should also be noted that while there are "open commons" which anyone can use, many commons are closed and only accessible to particular groups. Thus, historically in English commons, you had to be a member of a village or community in order to have a legal right to use the village commons. In some places this practice continues to this day.[19]

As central as they were for such a large part of the population and for such a long time, enclosure, or the privatization/exclusion of communities from the commons, was a near constant threat to the English commons for centuries, and gained an intense momentum during the Industrial Revolution. It has been argued that the commons needed to close in order to force commoners to rely more heavily on the market economy and provide England with an urban labour force to power the burgeoning factories of the 19th century. As more commons were closed, it put greater stress on those that remained open, and the common resources held in those spaces was put at increasing risk of degradation, sending more commoners to the factories in search of a more stable means of economic support.[20]

Historian Derek Wall writes:

> Enclosure in Europe helped fuel enclosure in European colonies. "Excess" populations cleared from the land were resettled in North America, Latin

America, New Zealand, Australia, and other territories. Former commoners from Europe were resettled onto lands that had been the common-pool property of indigenous peoples across the planet. Thus, the destruction of the English commons used their enclosure to create new private property.[21]

Indeed, the economic and social systems for many Indigenous groups on the Great Plains (and across North America) predating the arrival of the Europeans can be understood as a type of commons, with different groups holding usufruct rights over traditional hunting grounds and resources. Wall cites environmental historian William Cronon, in a study of the how the environment and culture of New England changed with the impact of European arrival, noting that the agreements Indigenous groups made with settlers and explorers were almost certainly understood as the extension of "usufruct rights (such as hunting) to land and not its outright alienation and enclosure." [22]

We might imagine that for Europeans and North Americans of European descent, the gradual but persistent closure of the commons over generations in the "Old World" must have destabilized their faith in the institution of the commons. It is possible that this history is part of what drove the absolute enclosure of the prairies, dividing almost all of it up into private property, which over the preceding centuries in Europe had enjoyed far more legal protection than the commons. We cannot know precisely how many immigrants came to Canada because they had lost their ability to claim a livelihood from the land in their countries of origin, but we can imagine that it would have been the case for many of them, and we can imagine how they would then have prized private property. Like a starving animal possessive of a hard won meal, they parcelled out the prairies into private possession; there is a reason it is referred to as the "land grab." And yet, when hard times came, cultural memories about alternative and arguably more traditional ways of supporting both individuals and communities undoubtedly surfaced. Thus, the commons were reborn on the Canadian prairies.

Establishing grazing commons was a popular idea for many of the settlers. The issue was that by 1920, the influx of immigrants and the success of Canada's homesteading campaign had left little unclaimed open space where such a project might feasibly be set up. The surveyors of the prairie grid had been thorough in their measuring, and the land grant system had left little in the way of public space. Settlement had surrounded the rangelands on almost every side, chipping away at the native prairie with hoes and plows. In casting around for untilled land, the settlers turned their eyes to those areas under grazing lease.

In their petition to the federal government, the United Farmers of Alberta suggested that currently held grazing leases should not be immediately renewed, but should instead be held open so that local farmers could apply for a joint grazing lease.[23] This would support economic diversification in a region highly dependent on crop agriculture, without

undue hardship on the farmers, and without any loss of profits or productive acreage associated with crop agriculture.

Of course, this did not sit well with ranchers. The idea that they could lose their grazing rights to a group of crop agriculturalists who had little to no experience raising cattle or tending to grass and stocking rates was understandably upsetting, and the Stock Growers' Protective Association (which over the years also went by the names of the Cattlemen's Protective Association of Western Canada and the Western Stock Growers' Association) campaigned hard to keep grazing leases in the hands of "bona fide stockmen [sic]."[24]

The issue left the federal government in a delicate situation, unable to make everyone happy. As they delayed a decision, fate – working either through the invisible hand of the market or a perceived U.S. presidential grudge against the ranching industry – stepped in.

For decades, Canada and the United States had maintained an easy agricultural trade, with low or even zero duties on cattle. But in the early 1920s, America introduced new agricultural tariffs that sharply curbed the international trade between the two countries. The cattle industry on both sides of the border felt the shock and strain of it. Canadian ranchers saw sharp drops in their exports, and for American companies, like the Matador Land and Cattle Company operating near Swift Current, it made grazing cattle in Canada for sale in American markets decidedly unprofitable.[25]

The Matador was neither the first nor the last large-scale American ranching outfit to pull its operations back from Canada. Several such operations left after the killing winter of 1906-07, and the changing trade agreements of the 1920s made it difficult for a transborder company to continue operating.[26] The Matador story is of particular interest because in 1922, unable to maintain operations, the American company surrendered its lease of 150,000 acres near Swift Current back to the government of Canada, who was then able to lease the land to a collective of locals.[27] Named after the ranching operation that had leased the land for the preceding decades, the Matador Community Pasture became the first in Saskatchewan, and served as a model from which the provincial government was able to establish community pastures around the province.[28]

The Saskatchewan Provincial Pastures came to include 50 pastures across the province, eventually totalling 780,000 acres of land and supporting roughly 12 percent of cattle producers in Saskatchewan.[29]

Of course, this network of community pastures did not burst onto the scene fully formed, and the creation of the Matador Community Pasture didn't herald a flood of similar enterprises across the province. The circumstances which made it difficult to establish the first community pasture in Saskatchewan remained; in what had fifty years before seemed an empty territory of limitless potential, there was a now a land shortage. By 1928, the federal government had disposed of 95 percent of surveyed lands in Saskatchewan; it had been parcelled out into privately owned property or long-term private lease, and was out of public hands.[30]

It took exceptional circumstances to change the course of development on the prairies and allow the public pastures system to grow and become established in the rural fabric of Saskatchewan.

abandoned outbuilding on a private farm


clay-rich soil

when the rains stopped

the dirty thirties and the Prairie Farm Rehabilitation Act

The Great Depression was a global phenomenon, rippling through international economic structures with consequences of varying intensity for countries around the world. In Canada, the stock market crash was felt across the nation, setting off an economic downswing that began in the summer of 1929 and continued on a national scale until the spring of 1933.[1] While the rest of the country began to recover, the prairie provinces remained mired in an economic and ecological crisis that would last until the end of the decade.[2]

Saskatchewan's economy had become increasingly fuelled by and reliant on wheat; by the end of the 1920s roughly 80 percent of a typical farmer's income came directly from wheat sales.[3] In 1930 the global market for wheat crashed; other major competitors (Argentina and Australia) experienced a devaluation of their currencies which lowered the cost of their wheat for international buyers, while at the same time, Russia dumped their wheat, flooding the market.[4] These were global events with disastrous local consequences; within drought-stricken areas, the average Saskatchewan farmer's net income between 1930-1937 was roughly 30% of what it had been in the 1920s.[5] In a province whose economy was so closely bound to crop agriculture, the losses had ripple effects across society.

The falling price of wheat coincided with a cycle of natural drought across the Canadian prairies. Drought under any circumstances is a blow to farmers, but in 1929 it was particularly hard on the already hurting agriculture industry. Expecting it to last just one or two years, farmers continued planting, even increasing their crop acreage, hoping to make up for their losses when the rains returned.[6] However, the severity and length of the drought of the early 1930s across the Canadian plains was greater than anything the settlers had experienced in the roughly fifty years since they had started plowing up the sod and working the land.

Looking back at the drought of the 1930s and the infamous "Dust Bowl," researchers have concluded that while severe and long-lasting droughts are not uncommon in the Great Plains, the drought of the 1930s was exacerbated by the agricultural practices of the early twentieth century across the region.

Agricultural settlement had delivered a "one-two punch" to the ecological functioning of the prairies. While some dryland farming techniques were developed prior to the 1930s, the practices weren't widely applied and hadn't yet been rigorously tested or refined for local implementation. Eastern farmers, used to far moister conditions, ploughed and sowed as they would have in eastern fields. They also ploughed too much land, and in areas that were too dry to be cropped. The latter blame can be laid on the Canadian government, who encouraged settlers to plow not just any plot of land but every plot of land they could.

The physical consequences of plowing native prairie, enacted on the scale that it was in the early 20th century, amplified the effects of the natural cycle of drought.

As the rains dried up, the soil dried out. Soil under the cover of grass (or indeed, standing crops), was held in place by the dense network of roots that grasses weave under the visible surface of the land. Under virgin prairie, where native grasses were only disturbed above ground level by fire or grazing over the course of millennia, this mat of sod was exceptionally thick, and held the soil against the prairie winds. Conversely, in areas where the sod had been broken and removed, the dry soil had no defense against winds that are capable of reaching 100 km per hour and more on the open plains.

The shifting soil made it extremely hard for seed to catch in spring; seeds were often blown away along with their substrate, or buried deep (too deep to catch root), beneath eolian drifts that would reshape themselves mere days later. This wasn't the only problem with blowing dirt and the dust storms that could whip up out of nowhere and turn the sky dark. Dust particles in the air acted as insulators over the region and made the already hot summers even hotter, contributing to further and deeper evapotranspiration of whatever moisture the soil may have managed to retain. It became a feedback cycle: the hotter and drier it was, the more dirt blew away into the air, and the more dirt held in the air, the hotter and drier it got.[7]

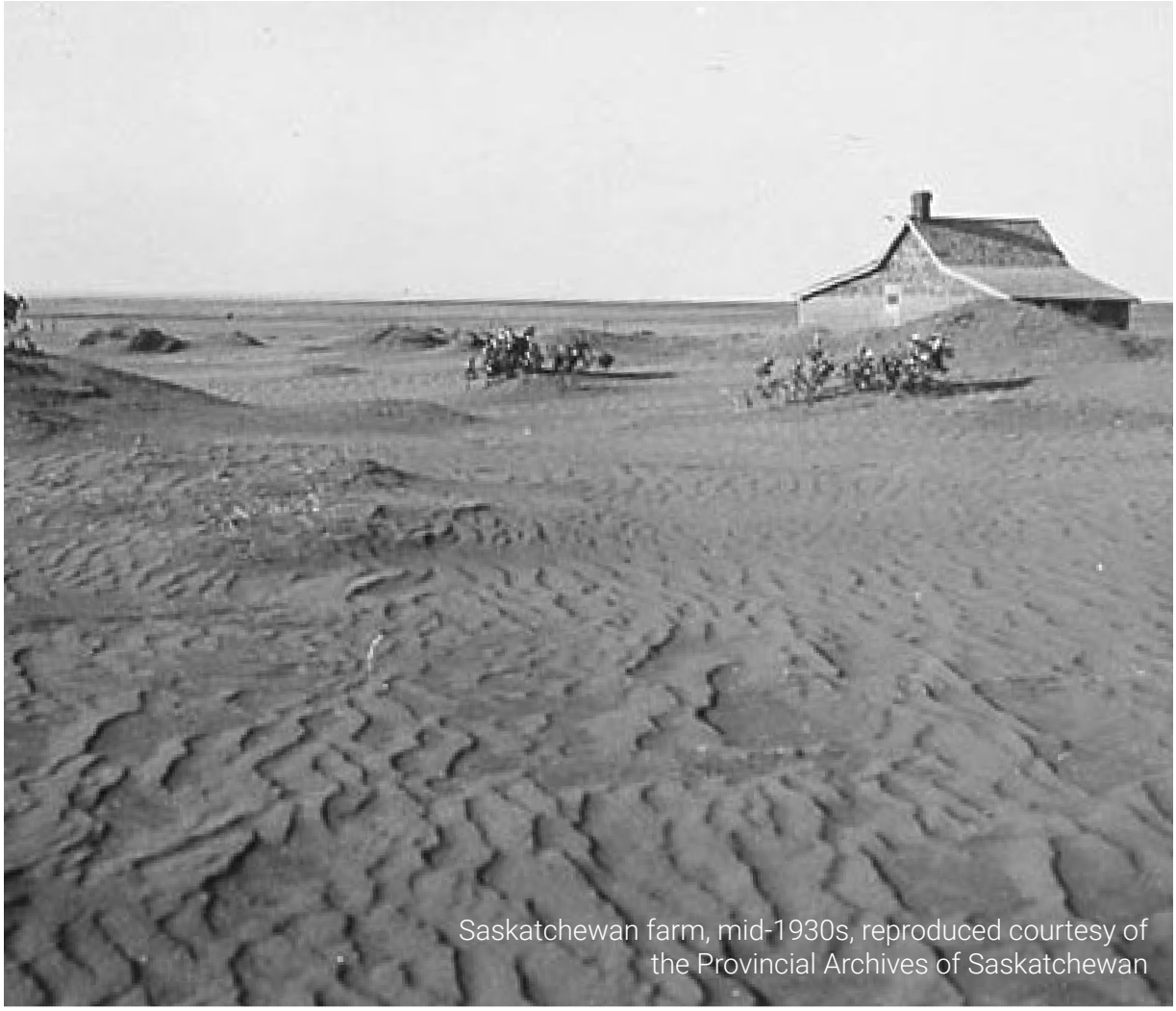
Unfortunately, hot and dry weather makes for perfect grasshopper breeding conditions, and in the early 1930s their populations soared. They ate everything in their path, and by devouring any remaining plants that had survived the heat, wind, and dryness, they reduced the remaining plant cover, which itself in turn contributed to the heat and drought.[8]

Yields across the province decreased year after year, while "severe drought placed a stranglehold on the short grass prairie district."[9] Waiser writes:

> Some fields were so patchy that harvesting seemed a terrible joke. Total wheat production dropped by a third during the decade even though the area devoted to wheat increased by more than a million acres during the same period.[10]

The harvests of 1931, 1933, and 1934 were particularly bad, and when the 1937 harvest was terrible, after eight years of struggling against both the economy and the drought, both the land and the communities that depended on it were devastated.[11]

The social consequences were enormous. The era is called the "Dirty Thirties" in reference to the dust storms, but it is also called the "hungry thirties," the "ten lost years," and the "winter years."[12] The



Saskatchewan farm, mid-1930s, reproduced courtesy of the Provincial Archives of Saskatchewan

sudden increase of poverty affected both physical and mental health and caused expansive harm to individuals, families, and communities. The combined economic and ecological hardships prompted both inter- and intraprovincial migration as people tried to escape local circumstances, more often than not to find things equally hard if not more difficult in their destinations. And yet migration must have created at least a brief window of hope that fortunes could change with a change of location, something denied Indigenous residents, who were tied to their reservation lands and suffering the same drought, the same lost wages, the same uncertainty and increasing despair.

A great number of personal accounts of Depression hardships are captured in Barry Broadfoot's *Ten Lost Years 1929-1939: Memories of Canadians who survived the Depression.* " Survived" is a notable choice of vocabulary – there are many who did not. Starvation, suicide, and disease (hitting immune systems weakened by poverty) all took their toll on Depression-era Canadians.[13]

The crisis left lasting effects not only on a generation but on the structure of the nation, helping to build the social security net we have in place today.[14]

During the early years of the Depression, governments at all levels (municipal, provincial, and federal) delivered financial aid through "make-work" projects, such as the reconstruction of the Albert Street Bridge in Regina.[15] For the most part, both relief projects and direct relief were organized and executed through the provincial and municipal governments, with the federal government providing part of the funding to the provinces.[16] Historian Michiel Horn, writing on the Great Depression and its national effects, notes that "Relief, a negligible item in the public accounts in 1929, by 1935 cost Canadian governments a total of $173 million."[17]

The prairies, and Saskatchewan in particular, required a significant amount of emergency support. In May of 1933, 1.5 million Canadians (about 15% of the population) were on direct relief, and of this number, over 200,000 were Saskatchewan farmers.[18] By 1935, as the rest of the country was recovering and the prairies were still struggling, the federal government was eager to get the region back on its feet.

Perspectives conflict on federal motivation. Historian James H. Gray writes that the federal government

> was becoming restive with the seemingly never-ending appeals from Saskatchewan for assistance. Not many took time to study the situation, and the widespread, if superficial, impression was that Saskatchewan was a rat-hole down which millions of dollars taken from Eastern taxpayers were being dumped.[19]

While historian Daniel Balkwill notes that:

> The rehabilitation bill received little opposition in the House of Commons during its reading. Most participants in the discussion expressed sympathy and recognized the need to deal with the situation.[20]

The two views of the federal government at this time aren't necessarily exclusive; there were likely multiple agendas at play on a federal level, including both the merciful and mercenary. Whatever the motivation, in 1935 the federal government passed the Prairie Farm Rehabilitation Act, with the goal of remediating the drought ravaged properties across the prairie provinces. At the time it was intended to be temporary, educational, and aimed at getting the region off national support.

Initially, the Prairie Farm Rehabilitation Administration, the taskforce that would carry out the Act, focused on developing local water resources and a "cultural" program that would promote dryland farming techniques and application across the region.[21] The former involved dam building at strategic locations across the prairies as well as the expansion of a dugout digging program the Government of Saskatchewan initated in 1933.[22] The latter involved expanding agricultural research, particularly regarding local soils and how to stop them from drifting, and then delivering the findings into the hands of local farmers.[23]

At first, the PFRA framed the problems that the drought and winds caused as a difficulty experienced on individual farms, rather than an ecological disaster against which no individual action could contend.


sun-bleached bones

Looking back at it now, this illustrates how little Ottawa understood of the depth and breadth of the problems that prairie farmers were facing. In consideration of government policy documents around the time of the establishment of the PFRA community pastures, Balkwill writes that:

> Activities under the rehabilitation act were designed to encourage farmers 'to solve their own drought and soil drifting problems by community cooperative action, with a minimum of material and financial assistance from government sources.[24]

Thus, "In the establishment of the PFRA all the emphasis was on the individual farmer and the provision of individual assistance to help him solve his problems."[25] But drought was not an individual problem, it was regional, and it required a regional solution. As Gray writes, "The disaster had gone far beyond anything that could be cured simply by rehabilitating the individual farms. It was the country itself that was being destroyed."[26]

dugout, Regina Beach provincial pasture

In addition to demonstration farms, the PFRA set up "Reclamation Stations" on the worst affected land. Where this land was privately owned, the PFRA leased it from the owners and got to work re-establishing vegetation with drought resistant species.[27] This included both grasses (often non-native forage species, like crested wheat grass), and trees. It was with the goal of halting the blowing dirt of the dust storms that the PFRA's shelterbelt research and planting initiatives were enacted.[28]

PFRA initiatives like digging dugouts and planting shelterbelts were strategically constructed across the Canadian prairies to help farmers adapt to the cyclical challenges of the region.[29] In the years following the height of the 1930s drought, dugouts and shelterbelts were built on such a widespread scale that they are now an undeniable aspect of the vernacular landscape of the modern prairies. Today, they can be found on farms across Alberta, Saskatchewan, and Manitoba.

In addition to these physical interventions on the landscape, another major undertaking of the PFRA was a large-scale soil survey of the southern prairie provinces. This work had been initiated by the various provincial governments earlier in the 20th century, but had progressed slowly, and was far from complete. The PFRA provided the funding and staff to complete it: a massive effort that involved surveying the soil in one-mile intervals.[30] This alone indicates the enormous breadth of the survey, but it also involved a depth of analysis:

> Described as the first of its kind in Canada, the study correlated soil survey information with economic data on farm sizes, cropping practices and yields, livestock production and carrying capacity, financial history, settlement patterns, and farm abandonment. Land was classified according to the minimum acreage necessary to support a family based on its suitability for wheat production.[31]

By the end of the 1930s, the study had concluded that of roughly eight million acres surveyed in Saskatchewan, "Nearly forty percent of this area was considered sub-marginal for wheat production."[32]

These findings, and the undeniable economic damage, environmental degradation, and human suffering (to say nothing of the suffering of non-human communities) caused by the drought, forced the government to revisit again the question of whether some areas of the prairies should be permanently closed to crop agriculture.

decommissioned farm equipment

prairie commons

the PFRA and the community pastures program

The occlusion of crop agriculture from some areas of the prairies had long been discussed, but the 1930s drought and the activities of the PFRA pushed it to the forefront again. A year prior to the passing of the Prairie Farm Rehabilitation Act, the Government of Saskatchewan passed the Land Utilization Act, allowing the province to remove land from cultivation if deemed untenable. This echoed nearly identical legislation that Alberta had put in place almost a decade earlier, in response to a more localized severe drought.[1] But what to do with the land once it had been removed from crop agriculture? Here, the conversations of a decade earlier that led to the earliest provincial community pastures were repeated.[2]

A few key conditions had changed between 1920 and 1935, and in some ways the Great Depression and the drought paved the way for the establishment of community pastures.

One major road block in 1920 was the availability of land. In addition to the legal ability to remove land from cultivation that the Land Utilization Act bestowed on the province, there suddenly seemed to be more land available. The migration away from failing farms left abandoned properties in the care of the municipalities and banks. Others, who had stayed on the land but were struggling to make a living from it, were open to a land trade and resettlement assistance.[3]

With the threat to their own grazing leases removed by a greater availability of land, ranchers were generally open to the idea of community pastures. Furthermore, the extended drought proved the potential utility of such spaces to ranchers. While the effects of the drought were first felt and most easily noticed in lands devoted to crop agriculture, as the drought extended over multiple years and became more intense, rangelands also felt the effects.

Blowing dirt was not a problem for rangeland; covered in established turf grazed by livestock, range soils were not exposed by the plow year after year, and for the most part stayed where they were. But these areas didn't escape the heat, nor the slow dry-up of moisture. By 1935, after years of reduced annual growth due to drought, the grasses of the rangelands were picked over by cattle. When the winter of 1935-36 was

cold and long, cattle producers had to feed them all winter rather than let the animals pick at the cured grasses from the summer before left in the fields, of which there was little remaining. The cattle that survived did so at great cost to their keepers.[4]

The appeal of PFRA pastures for ranchers was the ability to access reserves of grass in times of drought beyond what was contained within their own grazing leases, a kind of emergency feed source that could be tapped if needed.[5] Alberta took the step of establishing dedicated Provincial Grazing Reserves for this specific purpose.[6]

After some initial misgivings about what it would mean for the local tax base, municipalities also got on board with the idea of community pastures

> as a straw at which they grasped for survival… the municipalities embraced the idea of community pastures in their midst. They could become, at very least, a primitive type of crop insurance. On them all the farmers who could run a few dozen head of cattle in the summer could obtain some cash income when their grain crops failed.[7]

With general public approval of the community pastures plan, the Prairie Farm Rehabilitation Act was amended in 1937 to include a third branch; in addition to water development and cultural practices (or measures for the prevention of soil drifting), it would be expanded to include land utilization.[8] With this, the administration began the work of assembling large parcels of land to host the community pastures.

More accurately, municipalities made suggestions on which land could be used, the province assembled the land under the Land Utilization Act, and then delivered the parcels to the Prairie Farm Rehabilitation Administration, where they became federally owned land, again.[9]

The process of assembling land and coordinating the actions and approval of three levels of government was arduous, and if not for another terrible year of drought in 1937, likely would have taken much longer.[10] As a result of the hardship and panic that another exceptionally bad year of drought wrought on the landscape, the first 16 community pastures were established under the PFRA by the end of 1937, enclosing 180,000 acres of land, with the capacity to support between 6,000 – 7,000 cattle.[11] Gray describes the feat thus: "The struggle was by no means over, but a great deal that was good and constructive had been harvested from the crop failure of 1937."[12]

By 1938, 28 established pastures covered over 380,000 acres of the Canadian prairies.[13] By 1942, 64 pastures covered almost 1,150,000 acres.[14] The first five years of the PFRA's Community Pastures Program witnessed an incredibly expansive growth. This isn't to say it was easy:

> In the rush to develop community pastures, PFRA officials encountered obstacles with respect to municipalities, land holding companies, school districts, and individual residents. These problems were compounded by legislation that contradicted the development of community pastures, by encouraging farmers to keep sub-marginal land in cultivation.[15]

Assembling blocks of land that were large enough to support the goals of a community pasture was the biggest barrier to their widespread establishment, despite the

migration and abandonment caused by the Depression. While many people who still occupied lands deemed too poor for crop agriculture were open to resettlement, others were not. Furthermore, as the program continued, less land, and less desirable land, was available for resettlement purposes and trades.[16] Balkwill notes that

> Resettlement under the PFRA program was voluntary. Farmers were not forced to relocate and, availability permitting, could select the resettlement program of their choice. Those unwilling to participate in the program could remain in their present location.[17]

It must be noted, however, that this was only true for landowners or people who held title to homestead, the vast majority of whom were white settlers. For example, the Métis community of Ste Madeleine were evicted from their homes and farms so that the land the town rested on, which was still on record as crown land, could become the Ellis-Spy Hill community pasture. Had this been a settler community rather than a Métis town, it seems likely that the residents would have been recognized as having a claim on the land; they had "improved" it following the definitions laid out by the federal government. But this was a time in Canada's history when the Métis survived as "Road Allowance" people, and their presence on crown land was interpreted as squatting rather than an act or declaration of ownership. The injustice and heartbreak of this particular community's loss is told in Trevor Herriot's *Towards A Prairie Atonement*, and documented in Jean Teillet's *The North West is Our Mother: The Story of Louis Riel's People, the Métis Nation*. It is a dark chapter in the history of the community pastures.

If every community that occupied land desired for a community pasture had been Métis, the rate at which the Community Pasture Program expanded would likely have been faster. As it was, one of the reasons the earliest community pastures were so quickly assembled was that much of the acreage had been compiled from residual crown land.[18] Of the first 1,100,000 acres of community pasture land, only 300,000 had been previously cropped and removed from cultivation for the purpose of restoration.[19] This demonstrates just how difficult it was to assemble the land parcels needed, but it also indicates to what extent many of the PFRA pastures were composed of never-tilled native prairie.

In spite of the challenges, the pastures were established. Be it through desperation of local populations and drought-wrung farmers, or through determination of the administration (Jimmy Gardiner, Federal Minister of Agriculture and both former and future premier of Saskatchewan, played an important role, as did J.G. Taggart, Provincial Minister of Agriculture), pastures were established. And having "broken ground" on the process of just how exactly to return plowed land back to grass, the establishment of the PFRA pastures eased the way for the expansion of provincial pastures, which gained momentum after World War II.[20]

community pastures in Alberta and Manitoba

As the prairies left the Depression behind them and embarked on a tenuous recovery from the severe drought and blowing dirt of the Dirty Thirties, the expansion of both provincial community pastures and federal PFRA pastures slowed, but did not stop for decades. The Saskatchewan Provincial Pastures came to include 50 pastures across the province, totalling 780,000 acres of land. In 2012, when the federal government announced the closure of the PFRA pastures program, there were 85 PFRA pastures across the prairie provinces, including one in Alberta, 24 in Manitoba, and 62 in Saskatchewan (two pastures span the border between Manitoba and Saskatchewan). The PFRA pastures across the three provinces held a combined land base of approximately 2,270,000 acres. Much of their acreage was deemed marginal when assessed for agricultural production; on average, approximately 73% of the pastures was native grassland.[21] In the twenty-first century, the acreage of native prairie held by community pastures represents a veritable and invaluable ecological preserve.

The PFRA Community Pasture Program expanded so rapidly and successfully in Saskatchewan in part because it was the home province of the Federal Minister of Agriculture, J.G. Gardiner, who was tasked with executing the Act. As a former premier, he had strong political ties across the province, and an understanding of how and where to exert influence on the people and system.[22] Saskatchewan was also extremely hard hit by the drought, and desperate for federal intervention.

In Manitoba, the drought was devastating but had been less widespread, and with a comparatively higher urban population in the province there was less political urgency to enact the public pastures scheme. Additionally, unlike Saskatchewan and Alberta, Manitoba never passed something like the Land Utilization Act, which would allow the provincial government to remove land from cultivation where and when it saw fit. This accounts for the lower number of community pastures in the province.[23]

Alberta ended up with the lowest number of PFRA pastures of the three prairie provinces, three nearly adjacent pastures totalling 41,000 acres on the Suffield Military Reserve.[24] This was not because there was no need for the community pastures in Alberta, and it was not because there wasn't enthusiasm for them. Alberta had experienced a severe drought during the 1920s, and during this earlier crisis passed the Special Areas Act, through which they established provincial community pastures, which were already in operation by the onset of the Great Depression.[25] When the PFRA approached Alberta about establishing federally operated community pastures, Alberta was eager to receive additional funding and expand their number of community pastures, but less eager to cede control over these lands to the federal government.[26] This was non-negotiable for both parties; the federal government insisted that if they were paying, they wanted the assurance of control, seeing it as a way to guarantee the longevity and success of the program.[27] In the end, an agreement could not be reached, and the PFRA established pastures on land that already

belonged to the federal government. In the meantime, Alberta's provincial government expanded their community pastures to include Provincial Grazing Reserves, without federal support or funding.

Saskatchewan, through the chance of circumstance and fate, was politically and socially suited to the structure of the PFRA – a Goldilocks match that allowed community pastures to be established nearly everywhere that agricultural settlement had spread.

geographic distribution of federal and Saskatchewan provincial pastures across the prairie provinces

Saskatchewan Provincial Pastures
(1922 - 2019)
315,600 ha

Prairie Farm Rehabilitation Act Pastures
(1937 - 2020)
920,000 ha

0 200 km

Regina Beach, former SPP pasture

a closer look

the public pastures as spaces of conservation

In the decades since the community pastures were first established, a lot has changed in Saskatchewan. The population demographics have shifted, skewing towards a more urban profile. The province has welcomed immigration and has grown to include a more diverse mix of cultures. Saskatchewan has tapped its oil and gas reserves, and the local economy has expanded to include these industries. Over time, land development has progressed, slowly and steadily. The process of settlement that began 150 years ago, the tearing and rending of ancient sods, is still happening, and the loss of native grasslands through suburban expansion, industrial development, and conversion to crop agriculture continues to this day.

A 2015 study estimates that less than 14 percent of Saskatchewan's native grasslands remain.[1] This is why the community pastures are so important. Outside a few other reserves of grass, including Grasslands National Park, First Nations reservations, and military bases, the community pastures are some of the largest intact tracts of native prairie left in Saskatchewan.[2]

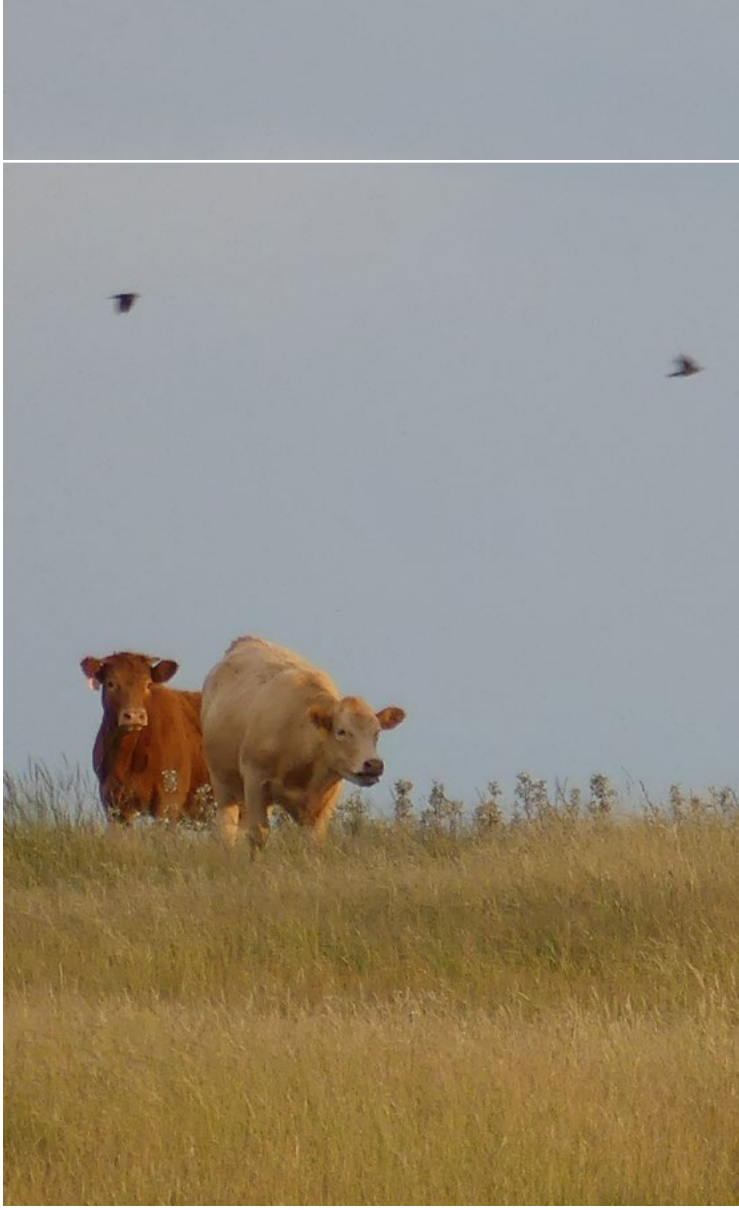
In native grasslands, grass is everything. The living beings who call the grasslands their homes all, in some way or another, rely on grass, or on another species that relies on grass: "Directly or indirectly, everything in grassland is fed by the grass. Whether you are a microbe or a buffalo, all flesh is grass. All of life is grass."[3] Through conserving grass, and doing so in large tracts of land, the provincial and federal governments conserved a whole host of species that needed wide expanses of prairie to survive. This living web of interconnected beings found refuge in the blocks of native prairie as the grasslands surrounding them dwindled. Trevor Herriot, a local author and environmentalist, has referred to the community pastures as "islands of grass," and it is an appropriate metaphor; for non-human prairie communities, each pasture becomes a haven, a refuge, a place to stop from drowning when the ground, or grass, has disappeared beneath your feet, swallowed by an ocean of development.

When considering how best to care for our remaining native grasslands, there is a debate about how close a substitute cattle are for bison when it comes to maintaining

as long as the grass grows

The importance of grass to the Indigenous groups of the Great Plains cannot be overstated. As the main food source of the bison, healthy grass could mean life or death to all the beings, including human, that depended on the bison.

The understanding and value of the role of grass in life on the Great Plains is reflected in its inclusion in the phrase "As long as the sun shines, the grass grows, and the river flows." Often included in treaty ceremonies, the phrase is a promise, traditionally used to seal an agreement, meaning the agreement would stand forever.[4] The inclusion of grass along with sunlight and water indicates that here on the prairies, it is one of the essentials required to support life. Without grass, life would cease and there would be no beings left to keep a promise.



the health of native prairie.[5]

Grass needs to be grazed, or at least cleared from time to time. When it grows tall and is left to accumulate, it starts to form a litter layer, blocking light from reaching new shoots beneath and affecting the soil temperature, which then affects when the grass starts to grow in springtime.[6] Both mowing and grazing are effective ways to cut long grass and prevent the litter layer from accumulating, but grazing is better, and grazing combined with controlled burning

curious cattle, private rangeland

is the best. The combination recreates the conditions under which grass evolved: grazing by large ungulates alongside the application of fire supports the prairie in ways we are still discovering.

Grace Morgan and R.J. Hudson's research on the interactions between grazing and fire is fascinating, showing how combined, they stimulate grass growth more profoundly than grazing or fire alone. Their research article on this topic, published in Morgan's posthumous work *Beaver Bison Horse,* explains how the two work together. Briefly, bison avoid their own dung deposits while grazing (and are attracted to urine patches, where the added nitrogen has stimulated grass growth). This increases the patchiness of their grazing routines. When the field is burned, the dung provides a fuel for the fire, and burns far more intensely than grass alone, directing the heat deep into the ground and releasing nutrients in the soil. Their roots having survived the fire, the grasses then can absorb these nutrients and grow to exuberance, and the cycle begins again.[7]

Cattle exhibit the same preference for urine patches and distaste for dung deposits as bison.[8] Other behaviour diverges. Cattle do not wallow, like bison, and thus do not create new depressions in the soil for water to collect or seeds to take root.[9] Cattle also tend to cluster around water sources, and will graze riparian areas more heavily than bison.[10] They also enjoy a slightly different meal plan than bison:

> Bison prefer a steady diet of grasses, with just a garnish of other plants (forbs and shrubs make up only 5 to 10 percent of their diet). Cattle, by contrast, choose grass as their staple food but they also enjoy a side salad of mixed greens (forbs and shrubs provide between 20 and 40 percent of their feed.)[11]

The preferences result in pastures of slightly different plant composition when grazed by the different species.

Within these general diet guidelines, cattle are notoriously picky eaters: they will selectively nibble their way through a field, choosing the ripest and best tasting grasses.[12] This can result in a patchier field, but it also means that if they are left for long enough in a pasture or range, they will eat all their favourite foods until there are none left. Popularly referred to as "ice cream plants," cattle eat them so completely that they are hard to keep in a pasture, and are classified as "decreasers."[13]

increasers, decreasers, and invaders

There exist some common denominations to categorize pasture plants by their response to grazing.

Decreasers are typically native plants that are usually highly nutritious and well-loved by cattle. Because of this, their numbers tend to decrease in response to high grazing pressure.

Increasers are also typically native plants. As decreasers are eaten, space opens up in the pasture, and increasers take the opportunity to move in. These plants "are normally shorter, lower producing, and less palatable to livestock."[14]

Invaders appear when both decreasers and increasers become weakened by overgrazing. They include many introduced/non-native species and some native plants that are typically unwanted in pastures because they can harm cattle (foxtail barley, for example).[15]

increasers

Alkali cord grass | *Spartina gracilis*
Blue grama | *Bouteloua gracilis*
Hairy wild rye | *Elymus innovatus*
June grass | *Koeleria macrantha*
Little bluestem | *Andropogon scoparius*
Needle and thread | *Stipa comata*
Sand grass | *Calamovifa longifolia*
Sheep fescue | *Festuca ovina*
Slough grass | *Beckmania syzigachne*
Sweetgrass | *Hierochloe odorata*
Tumble grass | *Schedonnardus paniculatus*
Western wheat grass | *Agropyron smithii*

Alumroot | *Heuchera richarsonii*
Aster | *Aster* spp.
Bluebell | *Campanula rotundifolia*
Cactus | *Opuntia* spp.
Clover | *Trifolium* spp.
Early loco-weed | *Oxytropsis sericea*
Gaillardia | *Gaillardia aristata*
Moss phlox | *Phlox hoodii*
Prairie crocus | *Anemone patens*
Prairie sage | *Artemisia ludoviciana*
Scarlet mallow | *Sphaeralcea coccinea*
Roses | *Rosa* spp.

decreasers

Bearded wheat grass | *Agropyron subsecundum*
Canada wild rye | *Elymus canadensis*
Giant wild rye | *Elymus piperi*
Hooker's oat grass | *Helictotrichon hookeri*
Indian rice grass | *Oryzopsis hymenoides*
Marsh reed grass | *Calamagrostis canadensis*
Northern wheat grass | *Agropyron dasystachyum*
Porcupine grass | *Stipa spartea*
Rough fescue | *Festuca scabrella*
Slender wheat grass | *Agropyron trachycaulum*
Tufted hair grass | *Deschampsia caespitosa*
Western porcupine grass | *Stipa spartea* var. *curitseta*

American vetch | *Vicia americana*
Dotted blazing star | *Liatris punctata*
Bush cranberry | *Viburnum* spp.
Chokecherry | *Prunus virginiana*
Pincherry | *Prunus pensulvanica*
Saskatoon | *Amelanchier alnifolia*
Winterfat | *Eurotia lanata*

invaders

Cheat grass | *Bromus tectorum*
Crested wheat grass | *Agropyron cristatum*
Creeping red fescue | *Festuca rubra*
Foxtail barley | *Hordeum jubatum*
Kentucky blue grass | *Poa pratensis*
Mat muhly | *Muhlenbergia richardsonis*
Reed canary grass | *Phalaris arundinacea*
Smooth brome | *Bromus inermis*

(grasses)

Canada thistle | *Cirsium arvense*
Dandelion | *Taraxacum officinale*
Goldenrod | *Solidago* spp.
Leafy spurge | *Euphorbia esula*
Pussytoes | *Antennaria parvifolia*
Russian thistle | *Salsoli kali*
Sweet clover | *Melilotus* spp.
Aspen poplar | *Populus tremuloides*
Spruce | *Picea* spp.[16]

(forbs, shrubs, trees)

owl on private rangeland

Beyond the direct actions and preferences of the cattle, human preference will also impact the species composition in a managed cattle range, as compared to the open native prairie. There are native plants that are poisonous to cattle. With the health of a herd and a bottom line at stake, it is understandable why a rancher might choose to remove a plant from a pasture. Unfortunately, the plants that are poisonous to cattle might also be supporting another species.

A good example of this is showy milkweed – poisonous to a cow, but manna to a monarch butterfly. Milkweed is the only plant that monarch larvae feed upon, their sole food source before they develop wings. Their relationship to the plant is fascinating; the poison in the plant that is damaging to cattle has no effect on the monarch larvae, but is stored in their bodies. It is their protection against all the predators in the grass – the birds, bats, and small mammals that would feast on the otherwise defenseless larvae except that they would be poisoned by the contact.[17]

Showy milkweed does in fact have a warning system for non-monarchs: it doesn't taste good. The amount of poison in a single mouthful is not likely to seriously damage a cow, and the unpleasant taste they experience means they are unlikely to go after a second bite. Showy milkweed is therefore only really a danger when pastures are overgrazed and there aren't other more palatable plants for the cattle to choose. Yet the perception of the risk connected to the plant's reputation as poisonous tends to keep it out of pastures, and for years it was listed as a noxious plant.[18]

Considering the selections that cattle and their human caretakers are making in the composition of a managed pasture or range, there are bound to be differences between cattle-grazed native grass and bison-grazed, open range native prairie. Cattle are not a perfect substitute for bison. Rangeland in the twenty-first century is not a perfect replication of the native prairie as it existed pre-settlement. But neither, likely, is a bison-grazed range in the twenty-first century. Too much has changed. Bison used to roam across massive areas, even with the expanse provided within the boundary of someplace like Grasslands National Park, this still would only provide them with a fraction of the area they would have once covered during the course of a year's grazing.

Another major difference between native prairie today and 150 years ago is the introduction of invasive species. Even a pasture that has never been broken or seeded is at risk of non-native seeds being blown in or carried by animals, and finding purchase. Given this context, we could speculate that wallowing behaviour today might even be detrimental in some pastures as it would open up bare ground in which seeds could take root.

Grass needs to be grazed, and given the size of existing prairie remnants and the presence of invasive species across the region, the more important factor in the health of a pasture or rangeland doesn't seem to be whether it is grazed by cattle or bison, but how that grazing is managed, how each individual parcel of land is treated. Putting cattle on native prairie isn't automatically a good thing; pastures can be poorly managed and become degraded. This, unfortunately, can happen far too easily. *Welfare Ranching,* edited by George Wuerthner and Mollie Matteson, explores the impacts of the cattle industry on public lands in the United States, which doesn't have the same system of land management and overview that the Canadian PFRA pastures had. Cattle, poorly managed or under-managed, can be devastating for the prairie.[19] Good management is absolutely essential, a necessary requirement if cattle are to fill a position as grazers of native grass. Good management is about finding balance, a sweet spot between stasis and crisis, by replicating just the right amount of disturbance. It is not easy, but is rather a hard-won skill, some might even say an art, that is gained through experience and deepened through extensive local knowledge and observation.

the cattle industry and global warming

Increasingly over the last decade, and particularly over the last few years, the cattle industry has come under scrutiny for its contributions to greenhouse gas production and climate change.[20] It has become widely repeated that reducing meat intake in one's diet is one of the most climate-friendly decisions an individual can make. As Herriot has noted, the arguments tend to oversimply the matter.[21]

It is true that there is a type of cattle production that is negatively contributing to climate change, but carefully managed grazing programs operated in areas of temperate grassland are not the problem. In fact, they might even be part of the solution.

We have examined several times now the importance of the relationship between grassland and grazers. Grazing supports the health of the grass, while at the same time providing an economic justification to the local community for keeping it under cover of grass. In areas where grass is the natural dominant species, grazing is an appropriate use of the land.

Environmentalist Bill McKibben, writing in *Orion* magazine, notes that some studies suggest rotational grazing in temperate grassland ecozones could help "put much of the atmosphere's oversupply of greenhouse gases back in the soil."[22]

He is referring, in part, to the efficiency of grass at sequestering carbon in the soil, pulling it from the air and burying it deep beneath its roots. One of the major benefits of the process is that by storing carbon in the soil, it is shielded from drought and wildfire. While forests release their carbon if burned, grass can burn and still hold carbon in the soil.[23] With climate change part of the new reality, this has the potential to increase in importance.

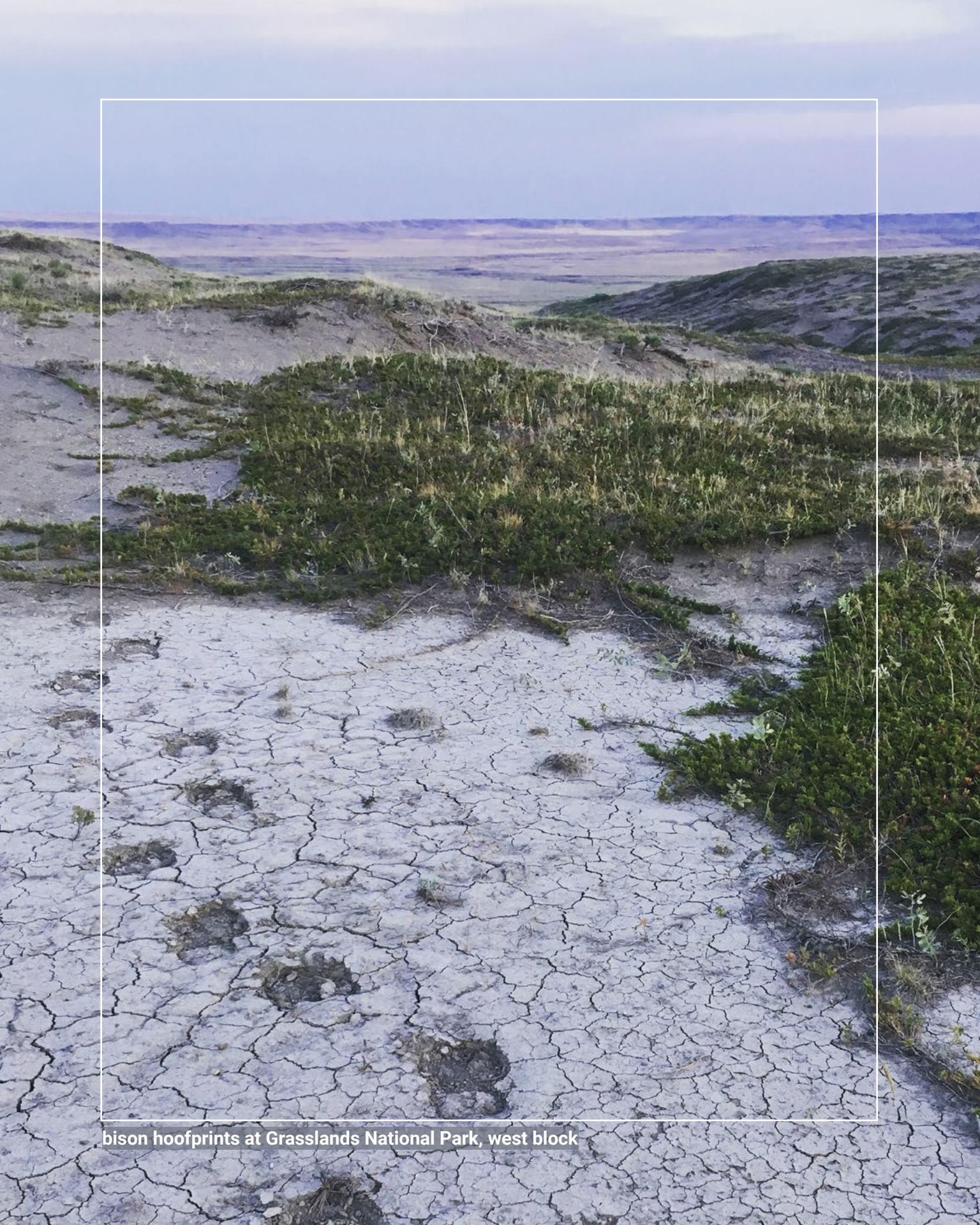
But what about the methane so famously produced by cattle as they digest grass? Methane is a greenhouse gas. It is the same greenhouse gas produced by the millions of bison that roamed the Great Plains for thousands of years. Learning a little more about methane can help us understand why it wasn't a problem prior to the industrial revolution.

Very simply put, methane does not remain methane for a long time after it is released into the atmosphere. It is oxidized in roughly ten years, breaks down and is converted to hydrogen and carbon dioxide (which has a much longer shelf life of closer to 1,000 years). The carbon dioxide that is produced by this process is used by grasses, along with sunshine, to grow, and is then returned to the soil. The carbon produced by cattle is part of the biogenic carbon cycle: it is constantly recycled through the process of grass growth, grazing, and digestion. The methane (ultimately carbon) produced by cattle adds no new carbon to the atmosphere, at least when it is produced by cattle on a healthy and balanced prairie.[24] In fact, since grasses require grazing, cattle grazing on healthy temperate native grasslands arguably maintains the carbon cycle's function.

The problem is that fossil fuels used since the industrial revolution have released so much additional carbon into the atmosphere that it has disrupted the normal biogenic carbon cycle. There are problems within the cattle industry that contribute to climate change, but they mostly arise in places that have been deforested so that cattle can be raised, from feed lots and factory farms where grain is fed direct to the cattle and grass is left out of the equation, from overproduction, and yes, possibly from overconsumption. However, carefully managed cattle grazing on natural grasslands on different continents around the world are not the problem.

Herriot writes that:

> …eventually, we can hope, public opinion may come to a more complex and balanced understanding of how grazing livestock fits into our climate change and environmental issues. When and if that happens, the side of the industry that will be able to justify itself will be the pasture-raised side, especially livestock raised sustainably on native grasslands, with a minimum of finishing on grain… In time, ranchers using native prairie and diverse perennial grasslands are going to need to distinguish themselves from the rest of the industry.[25]



bison hoofprints at Grasslands National Park, west block

grazers at grasslands

When Grasslands National Park was established in the 1980s, it was set aside as a reserve, and for twenty-five years the grass went ungrazed.[26] We might envision it as roping off a section of landscape (or "wilderness") and letting it exist in a state with minimal human intervention. This has a conceptual base in the idea of humans as separate from nature, and nature existing in a pristine, untouched wilderness state.

However, because the keystone species (bison) has been removed, simply removing people from native prairie will fail to keep it healthy. Prairie needs the disturbance caused by grazing and/or fire, and since both natural processes have been disrupted, we need to manually simulate these conditions if we want grasslands to thrive. Actually, we need not consider human management as an artificial recreation of an extinct disturbance regime. As noted earlier, the grasslands of North America have always been inhabited, and were managed through the application of fire by Indigenous peoples for thousands of years. The prairies may have been "wild" before settlement, but they were never untouched by humans. Removing human impact entirely arguably creates a more artificial condition for grasslands in North America than incorporating just a minimal level of management.

The lands that make up Grasslands National Park were privately held or leased rangeland prior to the establishment of the park. In the following years, with the grazers removed, the health of the grass started to decline, and a once thriving expanse of native prairie was beginning to show signs of failure.[27] After the investment of money and effort that it takes to establish a new national park, it was Parks Canada's worst nightmare. Luckily, the problem was understood before it was too late to reverse the damage, and grazers were reintroduced to the park lands. In the West Block, bison were reintroduced after a century of absence, and today roam the park year-round. In the East Block, the park maintains an agreement with local ranchers who bring in their cattle to graze the park outside of the visitor high season. Through a careful grazing management program, the health of the native grasslands were saved and a public treasure preserved.[28]

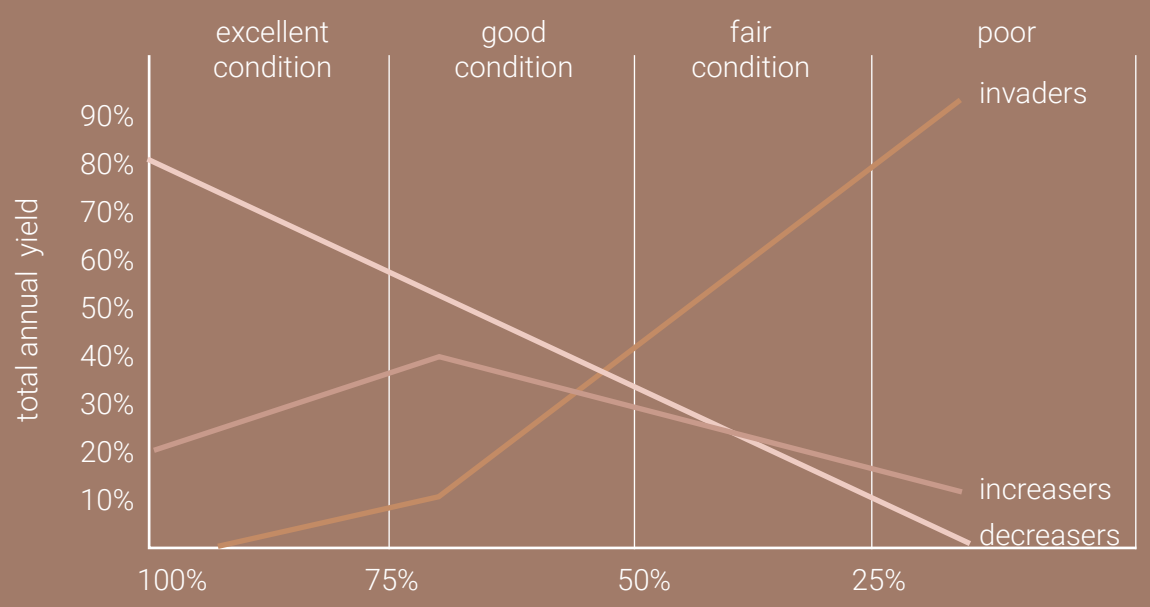
As the two blocks of Grasslands National Park demonstrate, both cattle grazing and bison grazing can maintain a healthy prairie, and while neither can perfectly replicate what has been lost, we could still call carefully managed pastures a conservation success.

How do we define conservation success? As we have already looked at, grasslands are not static, and they are healthiest when they are in some stage of recovery from disturbance. Because of this, it makes it very hard for an untrained eye to simply look at the grass to see if it is healthy; it could have been grazed yesterday, or left ungrazed for months, it could be an exceptionally dry year, or it could be fresh and green from a recent rain.[29]

There are, luckily, other ways of assessing the health of a pasture or range. One typical method for land managers involves identifying and assessing the mixture of plants on the pasture, using the increaser, decreaser, and invader categorizations. If decreasers make up 70% or more of the overall plant material, the pasture health is determined as excellent. If they make up less than 10%, it is considered to be in poor health.[30]

Another way to determine the health of a pasture, or any kind of native prairie reserve, is to examine the quantity and diversity of life that it supports. If the grass is capable of supporting the most sensitive grassland

percentage of climax vegetation in response to overgrazing



adapted from Albert 4-H, "Percentage of Climax Vegetation in Response to Overgrazing." Graph. In *Bison Project - Member Level Two*, 85.

species we have left, then that seems to be a pretty good indicator that it is doing alright.

The approach using sensitive species as an indicator is related to a concept within conservation ecology called a "biodiversity surrogate." This could be a species, a family, or a class of beings. Whatever is selected, it "is a component of the entire biodiversity that one can more easily measure than others, that is used as an indicator of the greater biodiversity in a particular area."[31] In this way, researchers can look for one specific species, or a particular set of species, and use its presence and numbers to assess the health of an ecosystem or landscape.

Of the many species that call the grasslands home, some of the most vulnerable and easily catalogued are grassland birds, making them an ideal choice to assess the health of a pasture or plot of native grass, and they are often selected as biodiversity surrogates.[32]

As a group, grassland birds are threatened and their numbers in decline, largely due to lost habitat, but also thanks to increased predation, lost food sources, and pesticide use. Since 1970, grassland birds of North America as a group have declined on average by 57%; the numbers are even more distressing when broken down further. Of the birds that live on the prairies, some are tolerant of agriculture, and even these birds have seen a decline of 39%; birds who depend on native grasslands, however, have declined by a staggering 87% since 1970.[33] The numbers show how critical native prairie is for the continued existence of grassland birds, even ones that can adapt to the environmental effects of agricultural crop production.

Using the entire group of grassland birds as a biodiversity surrogate is a very broad approach, and we could only expect to use this as the most general kind of biodiversity indicator. But for a first glance, rough assessment of whether the former public pastures function in a healthy and meaningful way, looking at the variety of birds and specifically at how many threatened and at-risk species a pasture is supporting is very telling.

Take, for example, the Caledonia Elmsthorpe pasture, formerly under the PFRA and about a 45 minute drive south of Regina, near Avonlea, Saskatchewan. Data collected and shared through HABISask, a hunting, angling and biodiversity GIS information portal hosted by the Government of Sasktchewan, lists bird species found across the province and their distribution along a roughly 26 kilometer (or 16 mile) grid. HABISask is careful to note to users of the public mapping services that they do not guarantee the accuracy of the mapping application; it records observed species on sight, and there may be other species present that were simply not observed. What has been observed near the Caledonia Elmsthorpe pasture includes 54 different species of birds, including six threatened species, five of special concern, and one (the burrowing owl) that is endangered according to the Species at Risk public registry.[34]

birds on a wire, Caledonia-Elmsthorpe pasture

umbrella species vs. flagship species

If we were using biodiversity surrogates to set conservation goals, rather than in just the most general way to assess the success of community pastures in conserving bird habitat (and extrapolating from this that they preserve habitat for other plants and animals), then we would want to be more specific about a particular species or group of species that we use as a surrogate.

There are two common types of biodiversity surrogates that are used most frequently when setting conservation goals: umbrella species and flagship species.

Umbrella species are selected because their habitat requirements overlap with a large number of other species typically found in the same community. By focusing on just one species, conservation goals can be conceptually simplified, and by providing habitat for one species, habitat for a much larger number of species is also created or preserved.[35]

Douglas Spieles, environmental scientist and author of *Protected Lands: Disturbance, Stress, and American Ecosystem Management*, notes that prairie birds are popular selections for umbrella species. Within the large selection of grassland birds, grouse are a good choice, and three of the 12 grouse that are native to the Great Plains, sharp-tailed grouse, the greater prairie chicken, and the lesser prairie chicken, make particularly good umbrella species selections. This is because

> [their] habitat requirements are well known, and protection of these habitat characteristics are likely to provide habitat for other prairie-dependent species, particularly birds. Grouse have the additional advantage of being familiar to bird watchers and hunters as a kind of icon or flagship species of the prairie.[36]

"Flagship species" differ from umbrella species because the focus when choosing them includes an emphasis on their cultural relevance or presence. They may have a smaller range of habitat overlap with other species, but they are well known, often well loved, and are chosen by conservationists to act "as a symbol or icon for the protection of a particular habitat."[37] A plant or animal could be both a flagship species and an umbrella species specifically, but the selection of the former is often influenced with an eye to funding or public awareness of larger conservation issues rather than how preserving its habitat has directly quantifiable impacts on adjacent species. This does not make flagship species a less useful concept than umbrella species; they are both results-oriented, they just focused on different sections of a single conservation chain that ultimately has the same goals.

Nature Saskatchewan has a variety of stewardship programs that focus on flagship species of the prairies. These programs include: Operation Burrowing Owl (1987), Plovers on Shore (2008), Shrubs for Shrikes (2003), Rare Plant Rescue (2002), and the SOS (Stewards of Saskatchewan) Banner program (2010).[38]

Caledonia-Elmsthorpe encompasses a large area and has a high percentage of native grass coverage, so we would expect it to provide good habitat for Saskatchewan's most sensitive species. It is gratifying and reassuring to know that it is hardly alone in these attributes. An assessment of the public pastures from 2005 lists the total area of each PFRA pasture in Saskatchewan alongside its percentage of native cover. The results suggest that the former public pastures provide a wealth of habitat to numerous sensitive grassland birds species.[39]

We tend to think of conservation in terms of non-human habitat, but the pastures also contributed to the conservation of local economic resources, and provided an incredible number of ecological goods and services to local communities.

In 2008, Suren Kulshrestha (et al.) published a study on the values provided by the PFRA pasture system, assessing their public/private distribution, as well as estimating the costs and benefits of the program. Private benefits associated with the community pasture program included grazing, breeding (the PFRA both owned and seasonally rented bulls for pasture patrons to pair with their cows and ensure the Saskatchewan herd stayed genetically strong), and access to water. Pasture patrons paid a seasonal grazing fee per head of cattle to cover the cost of these benefits, set by the PFRA and standard across the pastures.[40]

As a public program, the goal of these fees was to cover operating expenses, rather than to make a profit. The operating expenses included renting bulls, fence repair, provision of salt licks, and upkeep for various improvements, like dugout or well maintenance, or sometimes portable water sources. Some of the pasture fees also went towards covering the salary of the pasture manager and any seasonal staff hired for the grazing season.[41]

The pasture manager was in a unique position: a federal employee, the manager was responsible for the cattle but also for the health of the land. They typically lived on the pastures year-round in housing provided by the government, and they knew the lands like it was their own backyard, because for all intents and purposes, it was. Pasture managers looked after the cattle, managing the herds for health and weight, but an equal and arguably more essential responsibility was to keep an eye on the health of the land itself. It was their job to keep a watch over the grass and ensure that the pasture wasn't overgrazed or degraded.[42] Maintaining the health of the grass so that it could successfully continue to keep soil from drifting was a primary goal of the establishment of the pastures, and this priority continued throughout the twentieth century.

The neutral oversight provided by a pasture manager provided a kind of balance and security that proved to be a successful combination. When decisions on stocking rates and land management in general can be divorced from financial worries that result from just a few unprofitable years, it is easier to find a healthy balance between productivity and long-term health. While on secure government salaries, the pasture staff were able to assess the land as a third-party might, without a personal stake in the financial profit or loss.[43]

It was the pasture staff and the PFRA , with the resources and knowledge to dedicate to the management of the cattle and grass, that set stocking rates for each pasture, every year.

Caledonia-Elmsthorpe pasture

In November, local producers would apply to the PFRA and a certain number of head per producer would be approved to graze on the pasture for the next grazing season, which opened over May and June.[44] The May long weekend (Victoria Day in Canada) typically signified when cattle would be transported to the community pasture, but the dates were flexible in response to the weather. Access roads to and within the pasture boundaries received various levels of upkeep, and were not always reliable in a bad weather. If you have ever tried to walk through the gumbo of a clay-rich site after a storm and had your shoes sucked off, you will understand why it is not always possible to pull cattle trailers on dirt roads after a rain.

The cattle stayed on the pastures throughout the summer, being herded from one corner to the other, directed by the grass. Cattle were bred until August, when bulls would be separated from cows. As the grasses cured in the late summer heat, drying and preserving themselves for winter, the cattle continued to chew their way slowly through the reserves of grass, until the herds were removed, separated, and returned to their owners for the winter. By November 1, the season was typically over, the cattle gone, leaving the grasses and shrubs to wilder beings that call the pastures home year round (birds, deer, pronghorn, foxes, snakes, rabbits, and many others).[45]

The records that the PFRA collected on stocking rates and management regimes over the 80 years that the community pastures program was running held an incredible value for the industry. It is knowledge that was recorded on paper, but also and perhaps with more depth and application value, it was held by people, in the lived experience of the pasture managers, well-known experts in the field. The understandings of the grass-grazer-land relationship produced through the PFRA have been applied to help set up grazing management programs internationally, which gives us an understanding of the proficiency and value of this knowledge.[46]

The reasonable fees, on-hand expertise, and seasonal help benefitted patrons in a number of indirect ways, as well. As intended, the pastures were used by farmers who planted crops and did not have enough land to raise cattle year-long, or who were too busy during the growing season to also care for a herd. The pastures also supported the cattle production industry in a few different ways. Established ranchers might access the pasture system or breeding program to support their own herds, but the community pastures also had an impact on ranching because they evolved as a support to young producers who were just getting into the cattle industry, and didn't have enough land yet to manage a herd. For these producers, having the opportunity to grow their herd by even just a few head per year until an operation could be profitable made a huge difference in how feasible it was to enter the industry. More producers benefited the entire cattle industry in the province, creating more support in terms of range management knowledge and research, as well as greater collective bargaining power when it came to policy decisions on land use. Having an intergenerational mix of producers also means there are people to "hand the reins to" when ranchers eventually want to retire.

Supporting individual producers thus supports the wider industry, which helps to diversify the local economy. This is an indirect public benefit, one that was clearly understood and prioritized during the 1930s, but is still relevant today.

Grasslands National Park, west block

Kulshretha et al. also found that the community pastures provided several other public benefits, separate from whatever economic support they provide in terms of diversification. These include, but are not limited to, carbon sequestration provided by the native grasslands, biodiversity support, wildlife and waterfowl habitat, preservation of endangered species, protection of fragile ecosystems, watershed protection, and flood protection.

On top of the substantial list of ecosystem goods and services that the pastures provided, there are a series of benefits that the research team labeled as "quasi-public/private goods." These include hunting, non-hunting wildlife related activities (like birding or wildlife watching), the preservation of heritage sites (primarily Indigenous archaeological sites that are preserved by keeping native grassland unploughed), soil conservation, community and rural development, secured access for scientific research, technology transfer, and income distribution.[47]

It can be difficult to place a dollar value on some of the above listed benefits. As native grasslands become more and more rare, some of these benefits could increase, possibly exponentially. When all but a handful of undisturbed sites remain, their archaeological value becomes arguably invaluable, as does their importance as habitat to sensitive and at risk species.

In the 2008 study, Kulshrestha et al. calculated a limited number of the value of public goods they had identified, and found that the benefits to the public outweighed private benefits in a roughly 3:2 ratio. So while this public program did operate to the benefit of private individuals, these were secondary compared to the benefits provided to the public, mostly through ecosystem goods and services.

At the same time, slightly more than half of the costs of the program were born by the private users (ie. pasture patrons). The government was thus getting a good return on their investment. Still, both the private and public sector benefitted: through their estimates the same study found that the ratio of private benefits to private costs was roughly 2:1, while the ratio of public benefits to public costs was roughly 3:1.[48]

In the study year, the whole PFRA community pastures program across the three prairie provinces spent roughly $22 million.[49] As a federal program run on Crown Land, this cost excludes the cost of land, though the authors note that an argument could be made to include the opportunity cost of the land use, this was not factored into the estimate.[50]

Fees charged to patrons were based on how many head of cattle were pastured for the season, and the daily rates were assessed and set on an annual basis. In 2015, the grazing fee was $0.65 per cow per day, with an additional charge for a calf. For a season, a cow calf pair would have cost a producer $122.75.[51] Dave Phillips, in a 2015 report on the pastures, found that the net annual PFRA expenses, carried by the federal government and understood to be directly associated with the "public benefits of CPP operations such as soil conservation, carbon sequestration, and consumptive wildlife use (hunting)" were approximately three million dollars per year around the time of the pastures closure. [52]

Comparing the cost of the PFRA pastures with the money spent on relief during the 1930s presents a stark contrast. Recall that between 1929 and 1935, the government of Canada spent $173,000,000 in relief

(nationwide). This averages out to roughly $29 million per year, but when accounting for inflation, $29 million in 1935 represents approximately $530 million in 2021.[53] Even if the costs of the PFRA pastures had not been offset by the fees charged to pasture patrons, it was still a cost efficient program when compared with the possible millions in relief funding the provincial and federal governments might face in the event of another great drought on the prairies.

We can understand the role that the community pastures played in conservation on a multitude of levels. They conserved soil, habitat biodiversity, and water, by filtering runoff and replenishing aquifers. Socially and economically, they conserved space in the industry for small producers to enter a sometimes hard to break into market, they conserved areas for recreation in a province where crown land is minimally accessible to the public, and they conserved public resources by converting a small government investment into large-scale benefits. The program was a success in so many ways. Which is why in 2012 when the closure of the PFRA program was announced, it was a shock to many.

the gifts of grass

carbon sequestration in soil
carbon will not be released by fire, rising temperatures, or falling temperatures

hotspots of biodiversity
over 60 species at risk rely on Canada's grasslands

mitigation of drought impact
grasses keep dry soil down during drought and reduce heat retention in soil; this is essential to a region where global warming is going to increase drought

economic benefits
sustainable ranching helps diversify a local economy that otherwise relies on agriculture and fossil fuels, which are subject to shifting markets and weather

social benefits
grasslands have the capacity to function as productive working landscapes and as spaces of recreation

cultural benefits
prairies are spaces of learning and research for Indigenous and settler communities alike, spaces where stories are held and exchanged, where we as human beings are refreshed by the beauty of nature

western meadowlark

Old Wives Lake, a former SPP pasture

closure and loss

decommissioning the public pastures

Despite the many benefits that the PFRA community pastures provided, after 80 years of active stewardship over sensitive and marginal prairie lands, in 2012 the federal government announced the discontinuation of the program.

The decision was made under Stephen Harper's conservatives, shortly after they gained a majority in the House of Commons. The PFRA pastures were not the only public program that was cut during that time: the sitting government had a goal of reducing overall government funding, and they did this primarily by cutting back on social and environmental programs. In the years surrounding the announcement of the closure of the PFRA, the federal government also discontinued the Katimavik program (placing youth in volunteer positions across the country to support local community endeavours and leadership development), the National Round Table on the Environment and the Economy, an independent government oversight committee, and the Court Challenges Program, which provided funding to support legal actions by LGBTQ and other rights activists.[1]

In addition to the wholescale loss of these programs, the government made severe cuts to

> At least 10 aboriginal organizations and more than a dozen environmental groups, including the Experimental Lakes Area research site and the Hazardous Materials Information Review Commission… groups working on child care, rights advocates, health-care researchers, numerous immigrant support organizations and women's groups.[2]

Reductions to the budgets of the Canada International Development agency, the Aboriginal Affairs Department, Environment Canada, and changes to Employment Insurance that made it harder to access funding also helped the federal government save money.[3]

In the context of the cuts made in the years of the Harper majority, it is less surprising that the PFRA community pastures should have been among them. Even coming in at a mere three million per year, supporting the program would have been against the


autumn foliage against cured grasses

ideological grain of the party at that time.

The provincial Government of Saskatchewan had similar concerns for balancing the budget, and was already considering the future of the provincial pastures when the PFRA closures were announced.[4] For a time, it seemed that public protest over the loss of the federal pastures would save the provincial pastures, but ultimately these hopes were dashed. In 2017, the Saskatchewan Party under Premier Brad Wall announced they would dismantle the provincial pasture system.

The provincial pastures operated on a "break-even basis," and cost the public very little. This suggests that again, the move to close the pastures seemed to be motivated more by ideology than by budget; in the words of then Minister of Agriculture Lyle Stewart, "We don't believe that looking after privately owned cattle is a core function of government."[5]

The statement highlights how the government had lost sight of one of the core purposes of the community pastures, though perhaps it

PFRA closure in Manitoba and Alberta

When Manitoba received the news that the PFRA pastures would be discontinued, the Manitoba Agriculture and Food and Rural Development Division worked alongside the Manitoba Beef Producers Association to develop a new, self-sufficient entity to manage the pastures. With financial assistance from the province, the Association of Manitoba Community Pastures (AMCP) has largely stepped in to fill the organizational and administrative role that the PFRA filled, to support producers and keep the land under grass and maintained with a healthy grazing model. There were a few community pastures that elected to create their own grazing co-operatives, but the majority have joined the AMCP and continue operations.[6]

Phillips writes that the major difference between Saskatchewan and Manitoba was that:

> From the outset of the transition process, Manitoba operated from the policy position that the primary importance of the lands managed under AAFC's CPP was based on the public benefits these lands provide for ecosystem services. This perspective was rooted in the view that the ecologically fragile lands of the community pasture system would never have been the ones to be chosen for a community pasture system if the primary purpose of such an enterprise had been to provide economic returns to the province. Rather, the lands in the system had been set aside because of their fragility and it was coincidental to the ecological management needs of these lands that the best management prescription for their long term sustainability was controlled grazing. Manitoba has never held an expectation that the province would see a financial return from the reversionary lands.[7]

Thanks to this perspective, the public pastures in Manitoba continue to operate in a way that is relatively consistent with how they functioned under the PFRA administration.

In Alberta, the land that encompassed the PFRA pasture was always federal land, and did not revert back to the province but continued to be controlled by the Department of National Defence. While Agriculture and Agri-Food Canada's management has been removed, grazing on the land continues and is administered by the former pasture patrons.[8]

was an intentional exclusion. When framed as above, it seems far less contentious: of course public tax dollars shouldn't be going towards raising private cattle. This perspective erases the ecosystem goods and services that the pastures were providing to both the province and country.

The announcement of the federal government's divestment of the PFRA pastures brought a lot of attention to them, and consequently to the provincial pastures, likely more public attention than either program had received in decades.

Along with the pasture employees and patrons, several conservation groups were concerned with the news of the closure, as were individuals who knew and loved the pastures as spaces of remnant native prairie. In November 2012 at the annual Agribition in Regina, people gathered to voice their concerns, including ranchers, farmers, Indigenous stakeholders, and concerned citizens. Out of this meeting *Public Pastures – Public Interest* (PPPI) was born as a grassroots activism group dedicated to preserving these spaces.[9]

PPPI wasn't the only group to protest the closure. Notably, they were joined by the Community Pasture Patron's Association of Saskatchewan, the Saskatchewan Wildlife Federation, and the Agricultural Producers Association of Saskatchewan, among others. The groups represent the diversity of parties interested in and effected by the loss of the community pasture systems, and their persistent work in raising public awareness about the value of the pastures is notable. In partnering together and working alongside individual protestors from all the stakeholder groups with an interest in the community pastures, they made great strides, transforming individual concern into collective action.[10]

Among the concessions that the protestors won, the biggest was that the pasture patrons gained the option to lease the lands, rather than buy them outright. This meant that the pastures could be formally retained as public land, even if they would now be under private lease. Given the alternative, it was an issue of essential importance.[11]

Under protest of the large scale of the potential sale of the pastures, the provincial government agreed to lease the land to pasture patron groups for 15-year terms. The pastures had to be leased as a whole, and couldn't be broken up for sublease to individuals.[20] Alongside this concession, the government offered funding to help the pasture patrons form grazing cooperatives and become incorporated as private entities. The transition from public use to private lease was also staggered, so that not all the pastures were closed at once. The last PFRA pasture's public grazing season closed in 2018; the provincial pastures followed a similar pattern, with the last public season in 2020.[21]

It was in large part thanks to public campaigning that these concessions were won.[22] Furthermore, the province set additional responsibilities on the leases of former public pastures. While all crown land lessees must provide surface access to mineral rights holders, not interfere with the course of a natural waterway, and not knowingly interfere with a species at risk, former pasture lessees must also maintain improvements (fences, dugouts, yardsites), and report annually on grazing activities and invasive species.[23] Other crown land lessees are required to have an onsite provincial audit

nurse log, Caledonia-Elmsthorpe pasture

impact and repercussions of the sale of public land

Under the agreement between the government of Canada and the provinces when the PFRA pastures were set up, the land parcels assembled by the government of Saskatchewan would revert back to provincial ownership should the program ever be shut down. When the federal government announced they would be transferring this land back to the province, some 718,000 hectares within Saskatchewan's borders, the provincial government declared the intention to sell it.[12]

This was a significant point of contention. Pasture patrons would be offered the first option to buy the land, but not many of the producers who used the pastures could afford to buy the land outright.[13] If they were forced to pass on the purchase, the sale would be opened to other bidders.

The sale of public land is controversial, and for good reason. The settlement of the southern half of the province left very little crown land in Saskatchewan's prairie ecozone, and over the last decade thousands of acres that had remained under public ownership have been quietly sold off, often without Indigenous consultation as required by the Treaty Land Entitlement Framework Agreement of 1992.[14] PPPI has estimated that between 1 and 1.5 million acres of land have been sold since 2007, when the Saskatchewan Party gained power.[15]

The profits have helped the province balance the budget, though selling off public land is hardly a sustainable revenue stream. Eventually, there will be nothing left to sell. Beyond what this might mean for future coffers, the sale of private land has an immediate impact in the present. Much of the remaining crown land is pasturage, including both native prairie and domesticated grassland. After it is sold, financial incentives often make it more profitable to crop the land rather than keep it as grass, and unless the land is sold with a conservation easement or some similar agreement, cropping seems the most likely fate of recently privatized land.[16]

This means that the ecosystem services provided by crown lands that are held under grass are at risk of being lost after being sold, along with the value of these lands as habitat for at-risk species. The decision to sell public land thus seems to prioritize short term financial gain over long term economic and ecological stability. This is to say nothing of the social and cultural impact of the sale of public land.

Crown land often has secondary uses as spaces of recreation and education, so there is also an opportunity cost associated with the sale of crown lands. The social consequences are most apparent and serious when we examine what the loss of public land means for Indigenous people in Saskatchewan.

Under Treaty 4, which covers a large part of southern Saskatchewan, Indigenous peoples

were promised the right to use lands without standing crops, of which crown lands formed a large part.[17] The sale of crown land into private hands thus diminishes the reciprocity on which the treaty stands: it places the government in violation of the treaty agreement.

Phillip Brass, a Cree-Saulteaux artist, hunter, and activist from Saskatchewan, was interviewed on the subject in 2017:

> Indigenous cultures, no matter where they are in the world, are deeply tied to the land. They are emergent from their land, and cannot survive without access to their land. This is a very critical human rights issue today, in this time of so-called reconciliation. Without these lands, I don't think that reconciliation is something tangible. As we're just beginning to have these difficult conversations in this country, we're liquidating our only opportunity for future generations to have a relationship based upon justice, sustainability, and respect.[18]

To claim commitment to Truth and Reconciliation and at the same time continue to divest public land, a key piece in upholding the treaty agreement between nations, is a contradiction of both action and intent. The continued sale and conversion of native grassland undermines any promises of reconciliation that the government makes, and it needs to stop if we are going to make progress in repairing the relationship between Indigenous and settler communities.

> We have precious little Crown land south of the boreal forest in Saskatchewan. What's left of the natural prairie is less than 15 percent – the rest is cultivated and privately owned. Grasslands are the most threatened and least protected ecosystem on the continent, and our natural prairie's ability to function has largely been obliterated. And yet people seem to think that this ongoing cultural and ecological genocide is somehow normal.[19]

The roughly one million hectares of land held in the public pasture systems – 718,000 ha in the PFRA and 315,600 ha in the SPP, represent a significant area of remaining native prairie in the province, and would have a major impact on both environmental and cultural resources should they be converted to crop agriculture.

of range conditions every 33 years, when their leases are up for renewal, but former public pastures are required to have an audit every six years.[24] Finally, other crown land lessees have complete access control throughout the year: they can deny public requests for entry. Pasture lessees must, however, grant hunting access according to the local season dates, specified per Wildlife Management Zone (falling outside the typical grazing season).[25]

This means that public access to the pastures is, supposedly, largely unchanged from when they were federally and provincially run. When the community pastures were crown land operated by the government, individuals or groups requested permission to enter from the pasture manager. If it was outside the grazing season, they had a duty to accommodate the request – though if there was an elevated risk of wildfire, it could be reasonably denied.[26]

In practice, there is a slight change to access. When the pastures were a cohesive system, any member of the public could contact the program administration and find a way to get in touch with the manager of a specific pasture, to request permission to enter. Now, the process requires more independent research and initiative. Typically, the grazing co-operative is listed on the Crown Land Search, a public record – though at the time of writing in 2021 several of the provincial pastures grazing cooperatives are unlisted. Still, in theory it should be possible to find contact information online, and successfully reach out to request permission. In my own very limited experience, some of the grazing cooperatives were very accommodating of a request to visit, and one did not respond to the request. The system is new, but in the coming years access will be tested in practice, and it remains to be seen how seamless is the preservation of public access.

The future sale of the pastures is still possible. The Government of Saskatchewan agreed not to sell them to third parties, but if the pasture co-operatives decide to buy the land, it can be sold to the patrons with conservation easements that prevent breaking, drainage, and clearing. As of October 2021, PPPI isn't aware of any former public pastures that have been sold.[27]

For now, in theory and in law at least, access for users has been preserved. This includes the many non-pasture patron user groups who had an interest in the pastures, from research scientists to hunters, conservations, Indigenous peoples, and knowledge keepers.

Retained public access was a huge win, as was the arrangement that the lands would be formally retained under provincial ownership. Nevertheless, alongside these victories are things that were lost. Notably, the public has lost access to the knowledge that was held by program employees: a living library of rangeland management, in which was included a wealth of lived experience and generations of apprenticeship and learning about native grass. With the program dismantled and the employees scattered, their collected knowledge and understanding is no longer a public resource from which other citizens can benefit.

We also have to recognize that the systems that functioned to preserve these lands are lost. For the better part of a century, both federal and provincial public pasture systems worked to successfully preserve a significant portion of Canada's remaining native grasslands, but the administration, the immaterial infrastructure, and the initial investment in their creation is now arguably lost. Once let go, we cannot reach back to

Regina Beach, a former SPP pasture

reclaim it.

When pressed on the federal government's reasons for dismantling the program, Lawrence MacAulay, Minister of Agriculture and Agri-Food, responded that

> the Program had more than achieved its original objective… Canada had fulfilled its commitment to rehabilitate lands detrimentally affected by agricultural expansion… [and] stewardship of these lands lasted well into the period where Saskatchewan and the private sector had established capable professional land managers able to guide stewardship.[28]

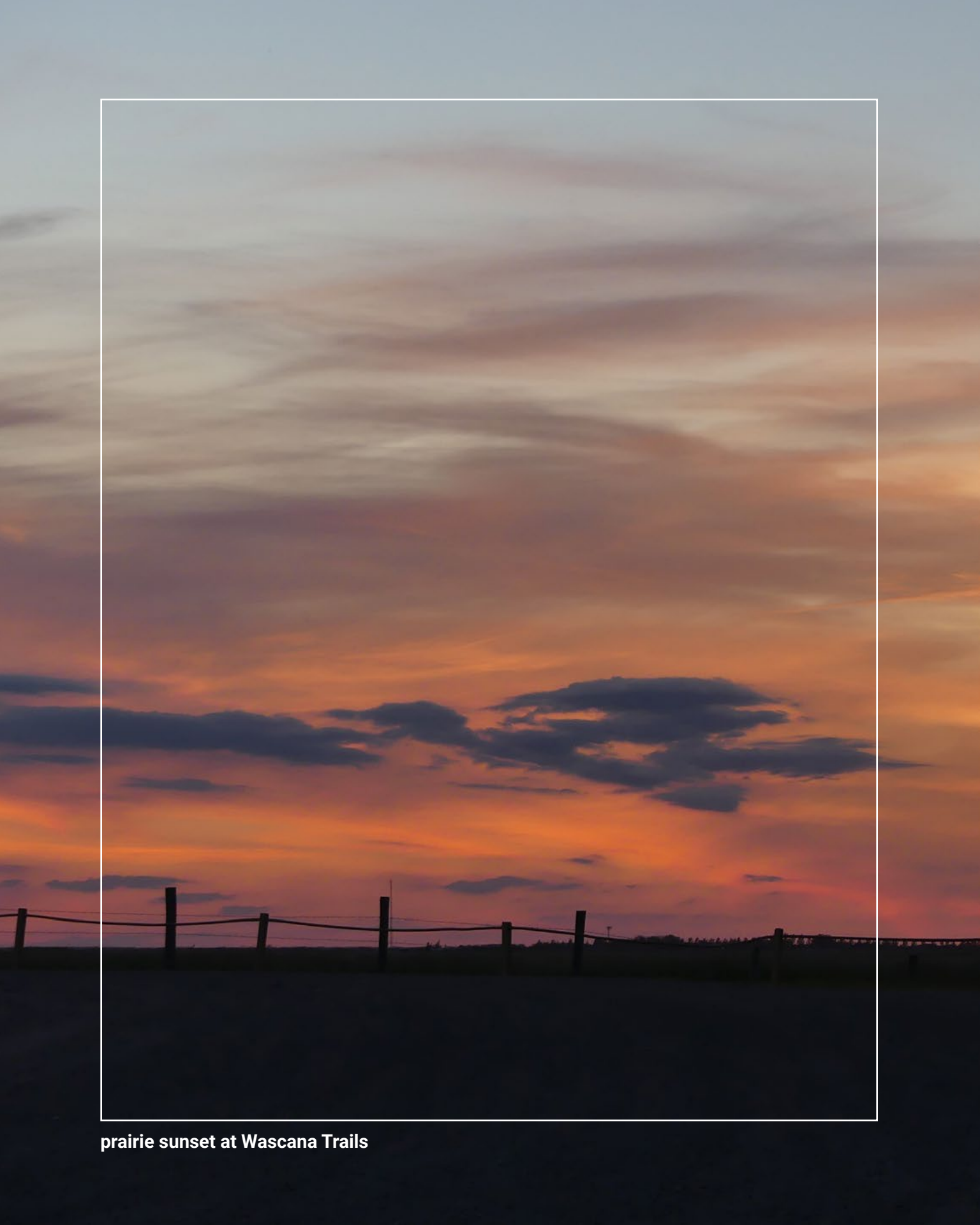
The federal government believed the pastures had served their purpose, and that left to provincial or private management, they would continue to do so. Certainly, the reporting that is required of lessees seems geared towards this end, but the system has changed. Lessees face increased grazing rates while being required to carry the responsibility of supporting the ecosystem preservation services that the pastures provide their communities, which was previously supported by contributions from the government. With higher fees and more responsibility, there are smaller profit margins, and several pastures have seen a corresponding drop in patron numbers.[29]

Katie Doke Sawatzky, who investigated the community pastures while pursuing her Master's of Journalism from the University of Regina, interviewed several pastures staff on the closure, among them Mert Taylor, a retired pasture manager. Only a few years after the transition, he has noticed impacts not only for the pasture patrons but for the communities near the pastures, which used to support the pastures with supplies and summer staffing.[30] Sawatzky writes that:

> it may take years to measure the effects of the pasture transition on the land itself. The biggest threat to the native prairie, so carefully managed for 80 years, is that under the new lease agreements the grass will be overgrazed or invasive weeds will take hold. If this happens, it won't come as a surprise – not because of any flaw in the moral character of the patrons, but because they simply don't have the resources or knowledge to manage the grass appropriately… some patrons have found the resources to invest in range health, but Taylor sees others struggle and says things are starting to go fully circle… "I see a lot of ground drifting and blowing."[31]

It is a particularly chilling observation, given the devastation that blowing dirt wrought in the 1930s.

Regina Beach, a former SPP pasture



prairie sunset at Wascana Trails

temperature rising

climate change in the 21st century

The risk of blowing dust makes the abandonment of government responsibility for the pastures that much more frustrating. While the annual investment into maintaining the functioning of the public pastures was minimal, it took a truly significant initial investment to get the pastures programs up and running. It would only make sense to dismantle them if the government was convinced they would truly never have need of it again.

It is far from evident that we are past the need for grassland conservation, that we are beyond the possibility of drought and drifting soil. On the contrary, we know that these are real risks that are facing the prairies. In an ecozone that has historically experienced cycles of drought, climate change seems poised to hasten these cycles: several models suggest that the prairie provinces will experience droughts that are both more frequent and more severe.[1]

Even if, acting globally, we could reduce the anticipated effects of climate change to their minimally estimated impact, drought will one day return to the prairies. As far as we can tell, from oral history and pre-instrumental record, it always has. It is a question of when, rather than if. We need to reframe the concept of "Next Year Country" (next year will be better, next year we will have a bumper crop) from optimism to precaution.

The termination of the federal and provincial public pastures systems in the face of climate change suggests that we have collectively forgotten, or perhaps never learned, that preserving native prairie and land cover helps mitigate the effects of drought. For people in the 1930s, living through a devastating firsthand experience of severe drought, understanding why it was happening and how to mitigate the result was desperately important. Similarly for the governments that had financially supported the population of an entire region through the crisis: even the possibility that a program like the public pastures initiative could mitigate the circumstances was worth serious spending. In fact, the successful and continued functioning of the public pastures program was so important that it couldn't be left to the management of private citizens or companies. Writing of the PFRA, Balkwill notes that:

> Federal control of the pastures, meant to ensure stability and permanence of the new plan, was part of a growing realization that prairie agriculture needed long-term rather than short-term solutions.[2]

This presents a stark contrast to how the pastures were viewed by both the government and the population eighty years later. Although Saskatchewan has experienced drought over the intervening years, there has been nothing so widespread and disastrous as the arid years produced in the Dirty Thirties. And as the population has skewed urban and the province has managed to avoid a truly severe and long-lasting drought, the conditions of the 1930s have become historical: those stories and hardships belong to the past, to another generation, and are easy to downplay or even forget in the present. We concentrate on current events: the next election, how the Roughriders are doing this season, the Covid-19 Pandemic of 2020-22. The cost of drought and the role of the public pastures were well known in the 1930s, but by 2012 both the government and the wider population lost sight of the role the pastures played in mitigating the effects of the drought.

Meanwhile, its impacts magnified by climate change, the threat of a severe drought looms, somewhere on the horizon.

fallen feathers

the big muddy

retrospective

the public pastures in review

Despite mounting evidence and testimony on the benefits of preserving native prairie, there are still a lot of people who do not understand the full value of grasslands. They see native grass and perceive an empty field, much as the settlers did when they arrived 150 years ago. They do not see the meters of roots beneath the surface of the ground, pulling carbon from the air and burying it deep in the earth. Most people understand the important role that trees play in carbon sequestration, but don't realize the efficiency of grass at the same process.

Neither can people easily see how sod filters water running off the land after a rain, retains moisture, giving it time to soak back into the ground, filtering runoff before it reaches the aquifer, replenishing another public resource hidden deep beneath our feet.[1]

Nor do many people recognize the full extent to which native grasslands provide habitat to the wildlife that has managed to survive here throughout the settlement process. For all the jokes about being able to see to the horizon in every direction, the landscape camouflages a plethora of birds and animals that people often miss.

In a province where the cultural and economic identity is tightly bound to crop agriculture (we are, after all, the mythologized wheat kings), there are still people who equate planted fields with production and prosperity, and native grassland with wasted space.[2] In his 2016 book, *Native Plants for the Short Season Yard,* naturalist and expert prairie gardener Lydon Penner wrote of an encounter, undated, at a farmer's market:

> One day, the merchant who was selling me my potatoes and I somehow got into a conversation about wild spaces. I mentioned Grasslands National Park and in a moment, he was spitting mad. He couldn't *believe* that this land had been "wasted" by the government. All that land just sitting there not doing anything… he simply could not be convinced that land that wasn't being farmed could somehow still have worth.[3]

Even people who value native prairie might not have had any firsthand experience with the community pastures. At the time of their creation they would have been well discussed in communities across the PFRA

Willet, Regina Beach Pasture

area, their intention and purpose relatively clear. Eighty years later, they were familiar to most rural people and in the communities where they operated.[4] However, over the last half of the twentieth century the population demographics of the province shifted, skewing urban, and by 2012 the public pastures do not appear to have had an explicit or direct impact on the lives of the majority of Saskatchewan residents

If we were to examine the community pastures critically, this might arguably be their failing. They were in many ways rural public space, but they did not focus on being accessible to the public beyond the group of primary users; resources went into managing the relationships between the pastures and a relatively small group of pasture patrons. As Crown land, the greater public and specifically Indigenous residents did have the right to access the land, but during the grazing season permission had to be granted by the pasture manager before people could enter, and access could be denied. Typically, this would have only been with good reason – an elevated risk of wildfire, or disturbing actively breeding cattle, for example. Over the years the pastures were certainly accessed and used by various groups that included hunters, birders, hikers, and Indigenous people collecting medicines. However, fostering these relationships and accommodating these parallel uses of the pasture sites was not a declared priority of community pastures at a systems level, and while there are case by case exceptions, they were not on the whole promoted for these kinds of uses. In terms of their recreational, social, or cultural potential, they seem to have functioned as something like a well-kept secret for those in the know.

Similarly, while the pastures could provide opportunities for young producers entering the industry, they could also, in some times and places, exclude people from the pasture. On her investigation and interview with former maspture manager Mert Taylor, Sawatzky notes that:

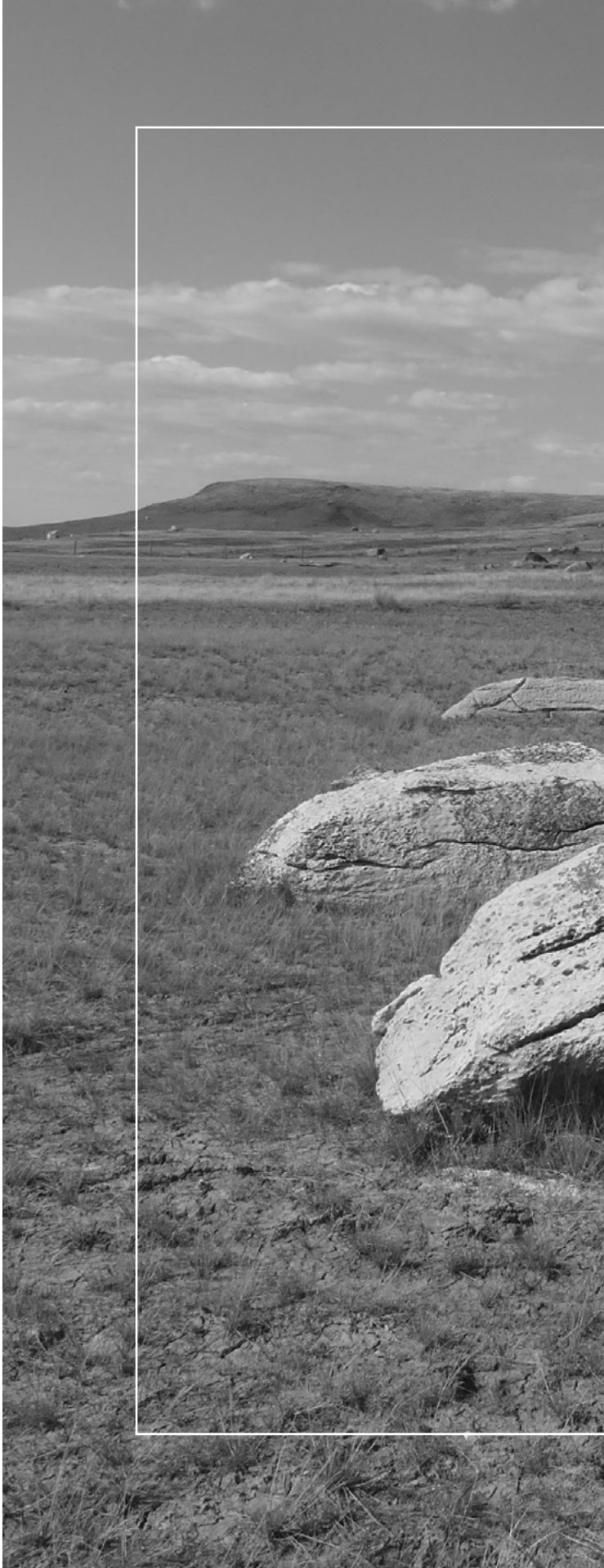
> .the PFRA, in its early days, was a way for new ranchers to get some skin in the game with little investment. But over time, he said, the system became abused by old-timers who never moved on, or who passed their allotment (each pasture had an allotment committee) on to their children. It became an 'old boys' club.[5]

There has also been little research on how many pastures had working relationships with local Indigenous communities, or how frequently the pastures were accessed for traditional uses. There were certainly Indigenous stakeholders who expressed their concern when the pasture closures were first announced, and there is a formal Memorandum of Understanding (MOU) that attended the transfer of land. The MOU clarified that any non-reversionary land (land purchased by the Government of Canada to supplement the provincial crown land they had utilized for the public pastures), was subject to obligations under the treaty and may be required for use with a minimum of notice.[6] This indicates that the issue was under discussion and that parties at the federal, provincial, and patron level were aware of how the pastures, as crown land, should be made available to Indigenous communities if needed or wanted, but it does not indicate how often this actually happened.

A final critique would be that despite their creation to address the largest North American climate disaster of the 20th century, after their creation there was no explicit role

in their administration for education to the public on how the public pastures contributed to sustaining the living system of the prairie.

Neither the PFRA nor the provincial community pastures systems were perfect, and both had room for improvement, or perhaps for a revisitation of priorities, a revitalization of purpose. There was room to remind the public of the goods and services that were being provided by these spaces, and how private grazing supported that. Still, it was a unique relationship and despite any shortcomings, the community pastures quietly benefitted the prairie provinces for decades.



stones, Caledonia-Elmsthorpe pasture

hikers descend a coulee near Grasslands National Park

on sight

seeing and appreciating the prairie landscape

We need to save the prairies. We need to save them for a whole host of reasons: because they are a social and cultural resource that benefits society, because they support a diversified local economy, because they help mitigate the effects of drought on the prairie and could increase regional resiliency in the face of climate change. We need to save them because they are habitat to thousands of species that depend on them, including over 60 species at risk.[1] We need to save them because through their preservation we honour the treaty between nations that is the foundation upon which Canadian society is built. We need them because we need wilderness, and without our last remnants of native prairie, we will not have any local or regional natural spaces left to us.

Wallace Stegner, a well-known American novelist and environmentalist, spent some of the most formative years of his childhood in southwestern Saskatchewan, and was deeply moved by the landscape. It was his memories of a childhood in Eastend that served as the basis for his book *Wolf Willow*, but he also drew on them when he wrote one of his most influential pieces, commonly referred to as the Wilderness Letter. Written in 1960 to persuade the American government to adopt legislation that would protect the remaining areas of wilderness in the United States from development, the letter is an elegant call to action, and an effective one. It was read aloud in the House of Representatives when the Wilderness Act was passed in 1964, preserving 111 million acres across the country.[2]

In it, Stegner writes:

> Something will have gone out of us as a people if we ever let the remaining wilderness be destroyed; if we permit the last virgin forests to be turned into comic books and plastic cigarette cases; if we drive the few remaining members of the wild species into zoos or to extinction; if we pollute the last clear air and dirty the last clean streams and push our paved roads through the last of the silence, so that never again will Americans be free in their own country from the noise, the exhausts, the stinks of human and automotive waste… . We simply need that wild country available to us, even if we never do more than drive to its edge and look

> in. For it can be a means of reassuring ourselves of our sanity as creatures, a part of the geography of hope.[3]

We need, according to Stegner, wild spaces. We need them for our mental, physical, and emotional wellbeing, and indeed for our humanity itself. Stegner specifically mentions the prairies in this letter, writing:

> The sky in that country came clear down to the ground on every side, and it was full of great weathers, and clouds, and winds, and hawks. I hope I learned something from looking a long way, from looking up, from being much alone. A prairie like that, one big enough to carry the eye clear to the sinking, rounding horizon, can be as lonely and grand and simple in its forms as the sea. It is as good a place as any for the wilderness experience to happen; the vanishing prairie is as worth preserving for the wilderness idea as the alpine forest.[4]

The prairie sky, its light, their combined beauty amplified by the scale of the landscape, is equally extolled in *Wolf Willow*:

> The drama of this landscape is in the sky, pouring with light and always moving. The earth is passive. And yet the beauty I am struck by, both as present fact and as revived memory, is a fusion: this sky would not be so spectacular without this earth to change and glow and darken under it.[5]

The way Stegner writes about the beauty of the prairies is powerful. It was so powerful that it influenced the course of wilderness preservation in the United States. But, as Neil Evernden points out in his paper, "Beauty and Nothingness: Prairie as Failed Resource," while some people are tuned in to the unique aesthetic experience that the prairies offer, others simply don't see it. They find the prairies boring, a landscape to endure as they cross from eastern Canada on their way to the mountains or west coast: these "travelers hold their visual breath for a thousand miles."[6]

And yet, with a nod to Stegner, Evernden notes that there are many people who thrill to the landscape views offered by the prairie, who appreciate its austerity, its vast openness, its apparent emptiness.[7] Many people love the sky of the prairies. For others, the beauty of the prairies is about how the land and sky change, from day to day and season to season, even hour to hour as the sun moves across the sky and topography throws unexpected shadows on what was thought to be a flat plain.

How could so many people miss what Evernden, Stegner, and many others see about the prairies? More importantly, why should it matter? How is agreeing or disagreeing that the prairies are beautiful connected to saving them from development or degradation?

Regina Beach, a former SPP pasture

saskatoon in blossom

on beauty

applying environmental aesthetics to landscape conservation

It matters that we recognize what is beautiful about the prairie landscape, because in order to save the prairies, we need more people to care about them. A big part of this is about education: if more people understand all the ways the prairies support both human and nonhuman communities, physically through providing ecosystem goods and services, and even perhaps metaphysically as Stegner argues in the Wilderness Letter, then they will arguably understand why it is important to prevent their further loss. There is a small step to be taken between understanding and action, and we can support the goals of education by exposing more people to the beauty of these spaces. Through beauty, we bring the gifts that the prairies offer us to life, inject breath into them so that they live in hearts and minds. Engaging with thought from the field of environmental aesthetics can help illuminate how beauty achieves this, and arguably can help to guide design in a way that promotes greater care of landscapes in a wider segment of the population.

Aesthetics is concerned with the philosophical enquiry into art and beauty, though for much of its history it focused on the former. Environmental aesthetics is a relatively new field, emerging during the environmental revolution of the 1960s, alongside environmental ethics. The field originally looked to apply theories about beauty and the aesthetic experience to the natural world, but quickly expanded to include human and human-influenced environments.[1]

I would like to focus on four arguments from environmental aesthetics that focus on beauty, supporting the claim that exposing people to the beauty of the prairies would help save them from further loss: beauty sustains attention, beauty invites protection, beauty reproduces itself, and beauty decenters our experience of the world. Before looking at these arguments, it will be useful to review two main positions or approaches within environmental aesthetics.

Some environmental aestheticians hold a cognitive view, maintaining that thought and perception (or anything cognitive, processed by the mind), is central to aesthetic appreciation. Thus, knowledge and information about the nature of an object (or place or process) help us see how

it is beautiful, deepening and extending our appreciation.[2]

In contrast, others hold a non-cognitive view, sometimes called an ambient or affective view. This holds that there is something inherently non-cognitive (or even pre-cognitive) that is central to aesthetic appreciation of the environment, often stressing the contextual dimensions of nature, our multi-sensory experience of it, and the phenomenological immersion that proponents argue true appreciation both demands and creates.[3]

The views need not exclude each other, as several philosophers have argued.[4] Jennifer Foster writes that:

> Our worlds are inescapably both mediated by sensory emotional engagement and cognitively framed by knowledge that accumulates over time… They are experienced individually and collectively, are dynamic and multi-sensory. Encompassing the mundane to exceptional, commonplace to exotic, environmental aesthetics are influential in determining what is appreciated and how.[5]

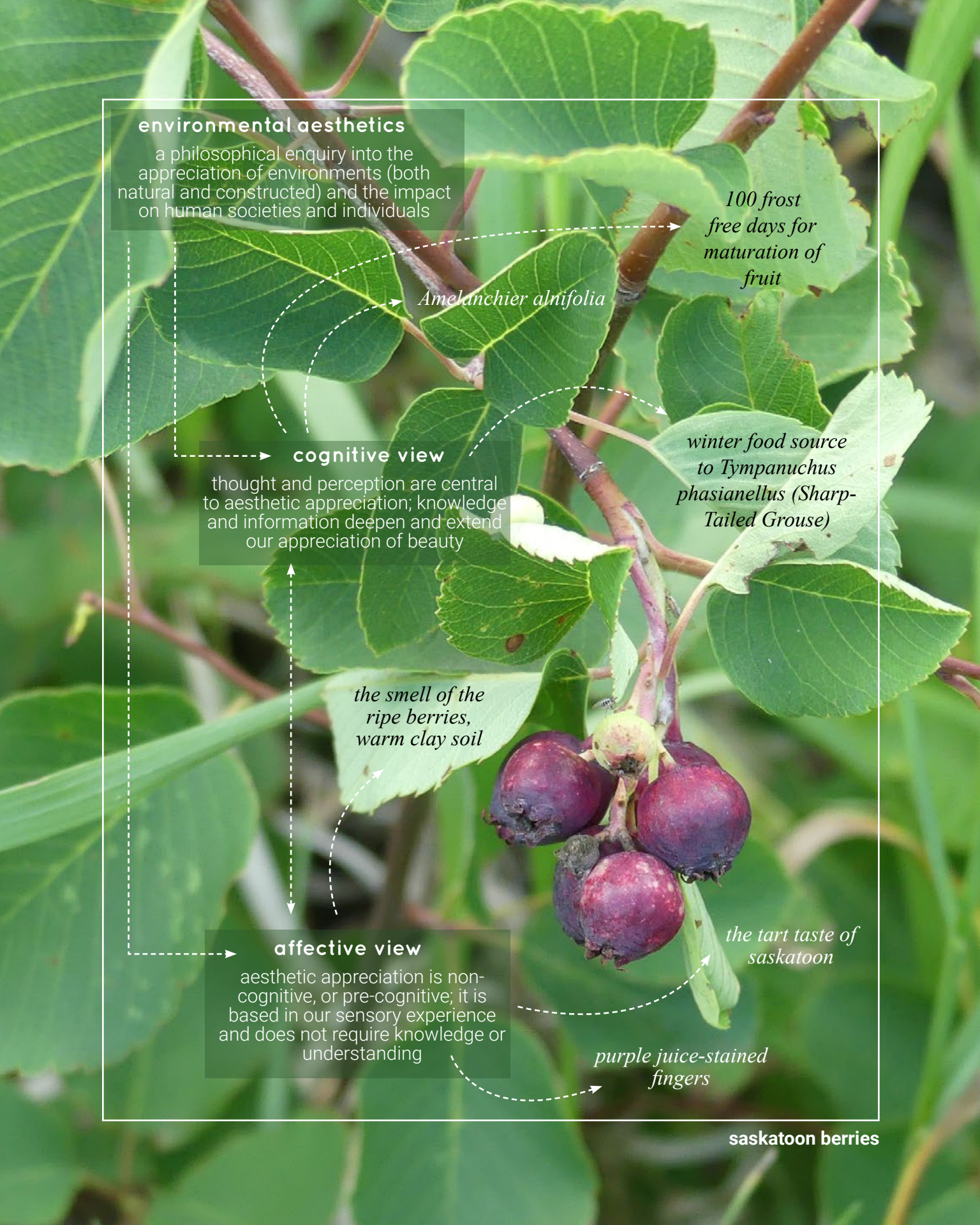
It seems right that both the emotional or phenomenological affect on the observer and the intellectual engagement sparked by information and knowledge should be considered as powerful determinants of what is beautiful and meaningful. When I look at lichen on a stone, I might appreciate its colour or form without understanding its relationship to the rock, air, or place, or indeed without really knowing what it is at all. Yet if I learn that the lichen I admire is a sign of clean air quality in the surrounding environment, or that it only grows a few millimeters a year and thus represents several decades or even centuries of clean air quality, my admiration of the lichen could be considerably deepened. The knowledge of the lichen wasn't required for my initial appreciation, but it does support and prolong this appreciation.

In applying to environmental aesthetics in this current work, it is not necessary to commit to one view over the other. If we are hoping to use theories about beauty and aesthetic experience in a practical application to help save an endangered landscape, it is in fact best to work with both the cognitive and affective views, in the hopes of connecting to a greater number of people through their aesthetic sensibility.

Marcia Muelder Eaton, an aesthetic philosopher who collaborated with Joan Iverson Nassauer on *Placing Nature: Culture and Landscape Ecology*, agrees with philosopher Allen Carlson that environmental aesthetics require

> a model of appreciation that emphasizes both nature and environment and allows for an involvement of all the senses but also of cognition… it is knowledge of nature that should guide our aesthetic experience of nature.[6]

We perceive something and find it beautiful, and upon learning more about it our appreciation is deepened, or potentially diminished, if what we learn is negative. As Nassauer points out, one may find things aesthetically pleasing that do not support local ecologies, or indeed diminish their functioning.[7] In either case, if both knowledge and sensory experience are relevant to aesthetic appreciation, what about those things that we cannot sense directly? Eaton points out that there are many essential processes and elements of nature that are



saskatoon berries

non-perceivable (often because of their scale in space and time relative to human perception), that can still contribute to the aesthetic experience of an environment. She proposes that knowledge of non-perceivable facts is relevant to the aesthetic experience because it can help direct our attention to perceivable, intrinsic aesthetic qualities:

> the knowledge that a microorganism is present, or that drainage is taking place, or that too many deer may result in too few songbirds may very well cause a viewer to perceive genuinely intrinsic properties that would otherwise be overlooked. Just learning the *names* of wildflowers (surely an extrinsic property) does sometimes make it more likely that we will see the flowers. As one learns more about the invisible things that make particular ecosystems healthy, landscapes begin to *look* more or less healthy.[8]

So knowledge about ecosystems can both direct our attention and inform our aesthetic assessment. But beyond this, it can help sustain our attention on what is beautiful. Eaton writes that:

> When one learns something that directs perception to or stimulates reflection on an aesthetic property of an object or event, one is drawn back to the object or event – and, in turn, the rich experience that results may lead one to seek for more information about the object. Knowledge redirects attention, which motivates a desire for more knowledge, which redirects attention, and so on and so on and so on. Thus is attention sustained.[9]

Beauty, aided by knowledge and understanding of the beautiful, sustains our attention. When something is both beautiful and interesting, we long to return to it, to view and experience it again, to understand it more deeply. Eaton notes that it is because of the desire to return to the beautiful object, because of this sustained aesthetic attention, that societies protect great works of art in museums and galleries, so that they may be repeatedly viewed and by a maximal number of people: "aesthetic sustainability exists when cultures provide for repetition of aesthetic experiences over the long haul, as it were."[10]

Because of our desire to see what is beautiful again, and because that desire continues to be felt (we want to see the beautiful again and again, and our attention is sustained), we protect what we find beautiful. The phenomena is often noted: beauty invites our protection. Elaine Scarry in her work *On Beauty and Being Just*, says that "the fact that something is perceived as beautiful is bound up with an urge to protect it, or act on its behalf."[11] It matters to us that what is beautiful survives. We decry the mistreatment of great works of art: imagining a knife slicing into a great masterpiece may indeed evoke a physical cringe, as if the knife sliced a part of one's own body.[12] The instinct can extend to places and landscapes, and often has. How else to explain environmental protestors, somewhat derogatively referred to as "tree-huggers," who have at times put their physical well being at risk in order to try and save a meadow, or a forest, or even just a single well-loved tree.

Nassauer makes an argument for the "cultural sustainability" of landscapes, referring to landscapes that survive over long periods of time due to their value to either particular communities or wider society. Particularly in an age where suburban and industrial development seems intent on staking a

claim in every remnant wilderness,

> Landscapes that attract the admiring attention of human beings may be more likely to survive than landscapes that do not attract care or admiration... People will be less likely to redevelop, pave, mine, or "improve" landscapes that they recognize as attractive. In short, the health of landscape requires that humans enjoy and take care of it.[13]

What is critical, Nassauer argues, is that we align what we find attractive or beautiful in landscapes with what is ecologically sound. Environmental education can help, so that people understand what a healthy ecosystem looks like (and, as she has noted before, healthy ecosystems can look fairly messy).[14] Designers can also use "cues to care" in the landscape to indicate to the public that a place is cared for, even when that care is simply the absence of development.

> [These] cues to care include mowing, tidy fences and walks, bright flowers, and trimmed, straight edges – all used sparingly and placed strategically to frame ecosystems for sustained human attention… they label the landscape as attractive in a way that is familiar and immediately apparent. Framing ecological change in recognizable aesthetic features allows us to use the cultural momentum of the present to benefit the ecological function of the future.[15]

Thus we can use aesthetic cues that already exist in our culture to indicate care, and start to shift what people expect to see in cared-for and managed landscapes. When we see someone has cared for a place, we pay it special attention. We look at it to try to see what was special and worthy of care about the place. In doing so we open ourselves to the beauty of that site, and we give beauty a chance to work on us.

Turning back momentarily to the context of ranching in Saskatchewan, outside of the public pastures systems, it is private producers who have largely been responsible for preserving the remnants of native prairie that are left in the province. This preservation often took place in spite of financial incentives that would have come to them for plowing their pastures. Many of these ranchers have been excellent stewards of the grass, and we owe them a debt. But as Herriot points out, the weakness in leaving the future of Saskatchewan's native prairie remnants in even the most knowledgeable and careful private hands is that whoever's hands they are, they are necessarily mortal. Reflecting on this, Herriot writes:

> I wish that the rancher's love of native grass was enough to protect it and the creatures who depend on it, but their refusal to plow grassland eventually goes to the grave with them, and the next owner, or the one after that, may not share the same ethics. Once public grasslands are privatized there is nothing to stop them from being cultivated or subdivided for ranchettes.[16]

Nassauer's conception of cultural sustainability offers a solution to this inevitable changing of the guard. Cultural sustainability depends on the community, rather than the individual, recognizing the value of the landscape and the need to support its ecological functioning. When the whole community understands and believes this, and has some level of social learning that enables most people to recognize when something is not cared for, then not only is the pool of future caretakers and stewards

castle butte

larger, but there is a kind of social pressure or expectation exerted upon landholders to care for it. If the care that society expects and demands supports the ecologically healthy functioning of native prairie, the risk that it will be lost to development is reduced. Nassauer summarizes the process thus:

> The pleasure of aesthetic experience compels attention and action to sustain our pleasure. Attention to landscapes and sustained action to maintain their ecological function is what we need. In a world dominated by humans, we want landscapes that evoke our care over generations.[17]

By now it should be clear that beauty is a powerful tool, one that can translate to action at a societal level. If more people recognized the beauty of the prairies, it would matter. So it matters that some people think of Saskatchewan as aesthetically barren. Returning to Evernden's observation that some people do not find the prairie beautiful, he offers some thoughts on the cause of the discrepancy:

> when we set out to find correlations between preferences and landforms, we inevitably look for things that seem to explain the correlations. The prairie landscape has a paucity of things to enumerate, hence, little possibility of correlation… we are thwarted in the search when we encounter the great void that is the prairie.[18]

If beauty is conceived of as a quality that an object has (rather than as an experience instantiated in the observer), and the prairie defies objectification, and in fact represents the *absence* of objects, a vast and apparent emptiness, then it has no objects which can have the quality of beauty, and it can't be beautiful. At least, this is what Evernden proposes might be going on when people are stymied finding the beauty in this landscape. On a continent and in an era that is focused on objects and commodification, the prairies cannot be objectified; they can only really be experienced. Evernden writes:

> The prairie is very nearly definable as an absence of things… Tourists complain because they have nothing to focus on. They cannot act as thing-detectors. Their only alternative… is to become a committed experiencer… The prairie is an experience, not an object – a sensation, not a view. The prairie is a way of being and not a thing at all.[19]

Immersion in the prairie is thus important to seeing its beauty. True, lived experience of the landscape is important, and as we will see, this is where landscape architecture can contribute. We need to draw people out to visit the particular places that have harboured remnants of native prairie, because of the ways that beauty can harness attention, care, and protection, all depend on first-hand experience of the thing that is beautiful: beauty does not live in a general idea of a type of landscape, it is instantiated in the specific.

Scarry makes this point in her own experience of palm trees, which she had once thought to be an ugly kind of tree. Yet, as she explains:

> it was a composite palm that I had somehow succeeded in making without ever having seen, close up, many particular instances. Conversely, when I now say, "Palms are beautiful," or "I love palms," it is really individual palms that I have in mind.[20]

This is an important point. We cannot

ask people to accept that the prairies are beautiful if their only experience with native prairie is of blurred fields viewed from a car travelling one hundred kilometers an hour off Highway One, or prairie as portrayed in pop culture films and media. When we think about people, places, objects, processes that we think are beautiful, we do not often imagine some hazy meld of "beauty", but rather the unique and particular experiences we have had that we found to be beautiful. Recognizing this, one of the fundamental tasks of the design for this practicum is to provide people the opportunity to see particular instances of the beauty of the prairie landscape, experienced first-hand.

Herriot has also recognized this need, urging the importance of connecting people to the native prairie landscape:

> The national grasslands, leased rangeland, community pastures, and reserve and tribal grasslands on both sides of the 49th parallel should be treasured… as centres of natural beauty, cultural renewal, carbon sequestration, biodiversity, sustainable agriculture, research and learning. For that to happen, though, people who do not own cattle will need more places where they are welcome to walk and experience the prairie without having to drive five or ten hours to our one and only national park in the grassland biome.[21]

Herriot goes on to connect the urge to protect places to our knowledge, experience, and personal attachment:

> People will defend and speak for places that they know – rivers where they fish, coastlines where they swim and camp, a forest where they hike. Not enough of us, Indigenous or settler, get out to see large expanses of native prairie. Those who live in prairie cities, and many of those living on farms, have never heard the song of a Sprague's pipit, never watched a ferruginous hawk circle into the clouds, never shared a hilltop with a pronghorn antelope.[22]

By connecting people to particular places, providing them the opportunity to connect to the land, and providing hints on where to look, how to look, how to open themselves to the beauty of the prairie, we start to take steps

stand of aspen in winter

towards using the beauty of the landscape and the aesthetic experience of humans to support the conservation of an endangered place.

There are two final arguments for why it should matter that people recognize the beauty of the prairie landscape. First, as Scarry has argued, beauty reproduces itself. It inspires copies: the eye of the artist perceives a beautiful face, and the hand cannot help but to draw it, and draw it again, and again, in an attempt to perfect the copy.[23] In doing so, beauty self-propagates.

The aesthetic experience of a particular instance of beauty, aided by knowledge, inspires devotion to and protection of the place (or object, person, or process). However, we need to protect more than just a single prairie remnant, and this is another way in which beauty will help the goal of prairie conservation. If Scarry is correct about beauty inspiring us to reproduce it, and several millennia of human-produced artwork seems to suggest that she is, then we might

Caledonia-Elmsthorpe pasture

imagine that upon true appreciation of the beauty of the prairie landscape, observers will be inspired to not only protect other remnants, but perhaps even to restore it, return more land to grass, create more places where the aesthetic experience of the prairie landscape can continue to be accessed by even more of the population.

Finally, beauty radically decentres us from our experience of the world. In *On Beauty and Being Just*, Scarry, referencing French philosopher Simone Weil, points out that beauty acts on us in such a way so that

> at the moment we see something beautiful, we undergo a radical decentering. Beauty, according to Weil, requires us 'to give up our imaginary position in the centre.'[24]

Like Stegner's ideas about the value of the wilderness to the human spirit, there is something metaphysical about this. Weil and Scarry seem to suggest that the experience of beauty momentarily erases the ego.

This idea is echoed in Evernden's evaluation of the specific beauty that rests in prairie landscapes:

> The prairie is never really a thing or even a group of things. This absence leaves us with nothing to stand against, nothing to be a subject toward. We cannot play the role of detached evaluator. We can only accept the gentle onslaught of prairie, the sterilizing light and the desiccation of hubris. Exposed on the prairie, we lose any sense of mastery, for what is there to master? The sun on the head bleaches the ego, and we experience the flattening and self-extension that is the essence of the prairie.[25]

Both Evernden and Scarry describe an encounter which enacts a profound humbling of our experience of the world:

> It is not that we cease to stand at the centre of the world, for we never stood there. It is that we cease to stand even at the centre of our own world. We willingly cede our ground to the thing that stands before us.[26]

If nothing else has served to convince us, it is in this line that the argument for exposing people to the beauty of prairies finds a solid ground to stand on. I have found no better description of the kind of conservation that the prairie needs than to "willingly cede our ground to the thing that stands before us." The question then becomes how to move people into the right position to allow them, or teach them how, if necessary, to see clearly what stands before them.

aesthetic conceptions and application

	cognitive view	affective view
programming	programming and events that explicitly reveal imperceivable or unnoticed elements of the site or processes; programming that encourages or stimulates new knowledge or cognitive engagement	programming and events that immerse participants in sensory based elements or processes of the site; events that include significant phenomenological experiences
site design	physical elements of the site design that explicitly communicate information about the site or processes, or design elements that support (but do not explicitly spell out) visitor comprehension or cognitive engagement with the site or processes	physical elements of the site design that aim to stimulate phenomenological perception of the site, tapping into the non-cognitive aesthetic experience and stimulating sensory awareness and appreciation

gumbo primrose

the valley of a thousand devils, Grasslands National Park, east block

show and tell

a role for landscape architecture

Most people tend to look to science and public policy when they want to get traction on issues of conservation, and rightly so. Conservation scientists, including ecologists and biologists, have made strides in protecting various habitats and species throughout the world, and though public policies can be damaging to the environment (as the early 20th century agricultural policies on the Canadian prairies were), they have also helped to protect it (as we have also seen with the Wilderness Act in the United States).

Nevertheless, protecting and conserving what remains of Canada's grasslands is a major undertaking: we might even call it a wicked problem, and we cannot simply tackle it from one direction. While we absolutely need scientists, activists, land managers, and policy makers working on conservation, we also need ways to reach people who are not receiving current messaging. This is where Landscape Architecture can contribute to conservation initiatives. Although Landscape Architecture isn't typically the first field that comes to the minds of most conservationists when considering how to achieve their goals, the discipline is well-placed to connect the general public with intimate and first-hand experience of the beauty of the prairies.

If we are looking for a way to move people into a position to see clearly what stands before them, to willingly cede their ground to it, Landscape Architecture can help to both guide people to the right place to stand, and frame what needs to be seen. To understand why, it is useful to examine the scope and nature of the discipline, and to review some case studies that are relevant to how we might go about using design to support landscape conservation.

The discipline of Landscape Architecture has been variously defined over the years, often described as resting somewhere between art and science. In *Landscape Architecture: A Very Short Introduction,* Ian H. Thompson refers to the (somewhat clinical) definition provided by the International Federation of Landscape Architects:

> Landscape Architects conduct research and advise on planning, design, and stewardship of the outdoor environment and spaces, both within and beyond the built environment, and its conservation

headlights in tall grass

> and sustainability of development.[1]

Locally, the Saskatchewan Association of Landscape Architects (SALA) defines it as

> a creative practice that incorporates the planning and design of outdoor spaces and public areas of varying scales. Landscape architecture integrates both the needs of people and the environment, and aims to promote strong urban design, environmental resource management, and ecological sensitivity.[2]

Meanwhile, the Manitoba Association of Landscape Architects (MALA) defines the profession as one

> that applies knowledge of the earth's natural systems and human cultures to the planning, design and management of urban and rural developments. Its goals are to promote attitudes of respect, care and responsibility in conserving the landscapes of human heritage and understanding the physical and cultural environments in which new places are created.[3]

The above descriptions are general, but they start to communicate how landscape architects work, and the kinds of things they look at. There is an enormous variety in the scales and types of projects that a landscape architect might work on: a project may involve a large scale visual assessment of a proposed industrial or infrastructural development (a wind farm, or a highway, for example), or it may involve the conceptual design for a public amenity (a park, a plaza, a school yard), the detailed design of a commercial site (such as a shopping mall, a gas station, an office building), or a residential design. Whatever the scale or site being designed, assessed, planned, or managed, landscape architects try to honour the profession's commitments to the environment, to sustainability, to human communities and to the non-human world. In doing so, they do all kinds of other things as well, like balancing conflicting needs or requirements of the site, communicating between and amongst clients and stakeholders, and critically assessing the choices that start to shape the built environment.

Of all the things that landscape architects do to support the goals of the profession, one of the most relevant to the current project of preserving native prairie is that they reveal and educate through design and placemaking.

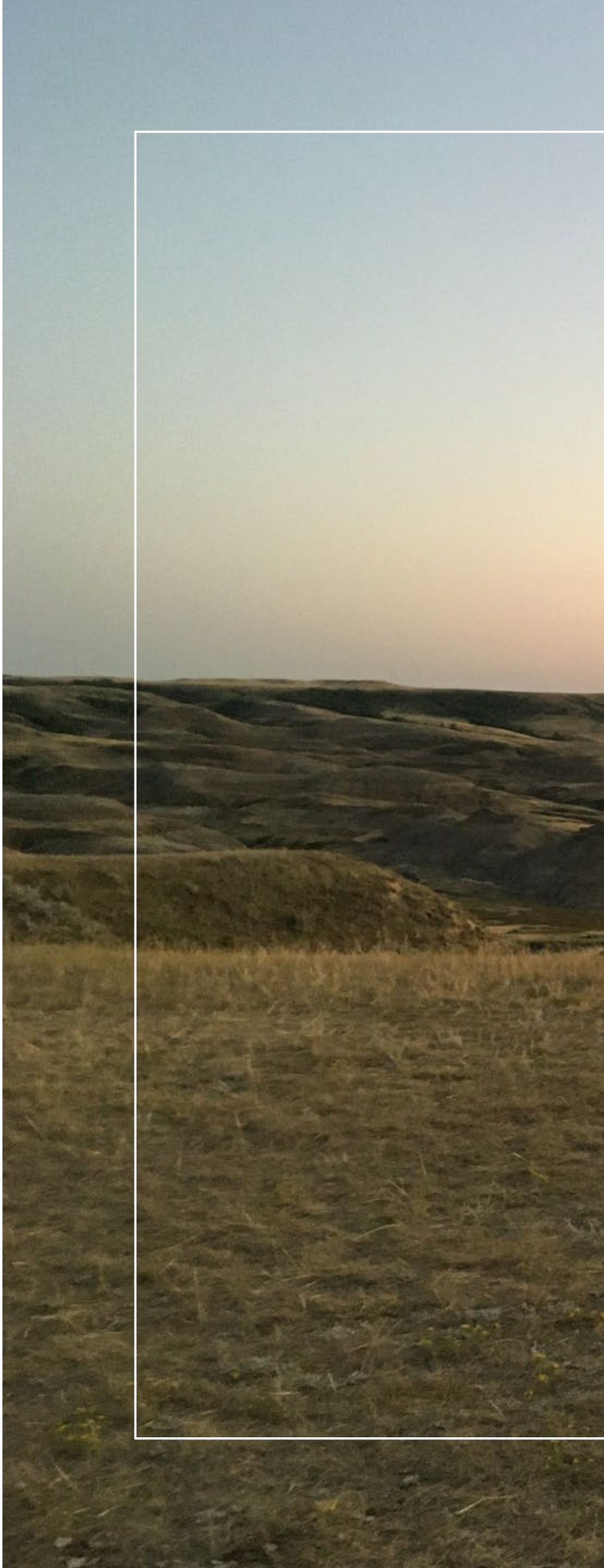
What, precisely, landscape architects reveal through design can vary, and depends on the site, its context and history, and the goals of the designer and/or client. A site design might try to reveal or display something about the history or particular narratives that are associated with the land the design is situated on, or the institution or individual who has commissioned the design – this could be either celebratory or memorial, and sometimes might draw attention to current or past injustices or inequalities. Sometimes a design might try to reveal or communicate a connection or relationship with another place far removed (to highlight a sister city relationship, or to recognize a settler/immigrant community's cultural roots, for example). The design might also aim to reveal ecological processes and functioning that is occurring on or adjacent to the site, often by making visible or highlighting things that otherwise go unseen or unnoticed by the majority of visitors.

Designs that aim to reveal ecological processes have been undertaken with

increasing frequency over the last few decades. Brenda J. Brown, who I have had the pleasure of studying under at the University of Manitoba, edited an exhibition in 1998-99 titled *Eco-Revelatory Design* which collected a number of projects that were specifically geared towards revealing ecological processes or elements through site design.

Many of the contributors to *Eco-Revelatory Design* worked with stormwater management, aiming to reveal more explicitly its presence, management, and movement through the landscape. These contributors included Joan Iverson Nassauer, whose writing on environmental aesthetics and "cues to care" we have reviewed in the previous chapter. Nassauer's project, "Urban Ecological Retrofit," involved stormwater infiltration along a residential street, utilizing land in an existing stormwater easement on both public and private property. The project aimed to fit the stormwater infrastructure, in this case, gardens, into the neighborhood by respecting the existing aesthetic values of the residents, and then pushing them just beyond this to include the slightly unexpected introduction of a wetland planting along the street frontage. Working closely with the residents helped reveal to them how their yards could work within the larger stormwater cleansing and management system of the neighborhood, without compromising the aesthetic appeal of the street.[4]

Eco-revelatory designs continue to be proposed, and seem to be gaining visibility in the public eye. *Living Breakwaters* is a current project by SCAPE that aims to reveal ecological processes in New York Harbour, and in doing so has received fairly significant media attention and captured the imagination of a city.



Grasslands National Park, east block

case study: oyster-tecture, living breakwaters, and the billion oysters project

New York City, United States of America

Over the last 15 years, New York has witnessed a momentum surrounding the restoration of oysters to New York Harbour. Oysters are ecosystem engineers; they filter nutrient contaminants from the water and over time as their population grows their shells create underwater reef structures, which help protect and support other marine life.[5] The waters around New York City were once home to approximately 350 square miles of oyster beds, which had significant impact on a number of things, including water quality and sustainable habitat for any number of species both on and off-shore, not to mention a thriving food source and economic activity for New York residents.[6] However, around 1910 the New York oyster population collapsed, and over the next 90 years many New Yorkers forgot about the city's relationship to the bivalves.

It is only in recent years that designers, engineers, scientists and citizens have started to reflect on the potential that oysters have to play a role in the green infrastructure of the city and its environs. In 2010, SCAPE, a landscape architecture studio based in New York City, proposed a design intervention along various New York waterways and shores as part of the Museum of Modern Art's *Rising Currents* exhibition. *Oyster-tecture* was a speculative design proposal, and imagined reintroducing oysters to the harbour on a large scale, selecting locations where they could grow and simultaneously improve the water quality, and where, after getting a leg up with the help of constructed reefs, they could start to expand the reef with their own constructions, which in turn would support wave attenuation.

In 2014, the Billion Oysters Project (an organization independent of SCAPE but with a similar idea and intention) was founded with the goal of re-establishing oysters in New York Harbour: specifically, one billion oysters by 2035. The founders, both educators at The Urban Assembly New York Harbour School, built educational programming into the organization from the very beginning, with the belief that "restoration without education is temporary."[7] The Billion Oysters Project enlists volunteers from communities and schools around New York to help in restoration efforts, and has developed STEM curriculum that is taught in over 100 New York schools across the five boroughs and reached over 6,000 students. In addition to getting hands on experience, these students study the relationship of oysters to New York Harbor, the roles of ecosystem engineers in broader terms, and learn about "science through the lens of New York City's waterways."[8]

The Billion Oysters Project and *Oyster-tecture* come together in *Living Breakwaters,* a $107 million dollar project supported by Rebuild by Design, an Obama-administration endeavour

that asked designers for solutions to help cities increase their resiliency to climatic disasters. New York's Staten Island was highlighted for funding after the devastation of Hurricane Sandy, and the proposal that was ultimately selected is led by SCAPE with support from the Billion Oysters Project.[9]

Modelled and then tested in a scaled simulation pool, the project involves the installation of constructed breakwaters to slow waves down before they reach island's shores. As opposed to a more conventional levee, subtidal and exposed breakwaters can slow wave action without impacting the visual connection between the water and the land nor sedimentation, which is key to beach-building.[10] The breakwaters will also be seeded with oysters and include different types of infrastructure to help them grow. The project can then monitor and compare the success of these methods and use the information to expand the oyster fields.[11] In turn, oysters will be cleaning the water and helping reduce wave speeds, and by contributing their shells to the breakwater they will both strengthen it and extend its lifespan.[12]

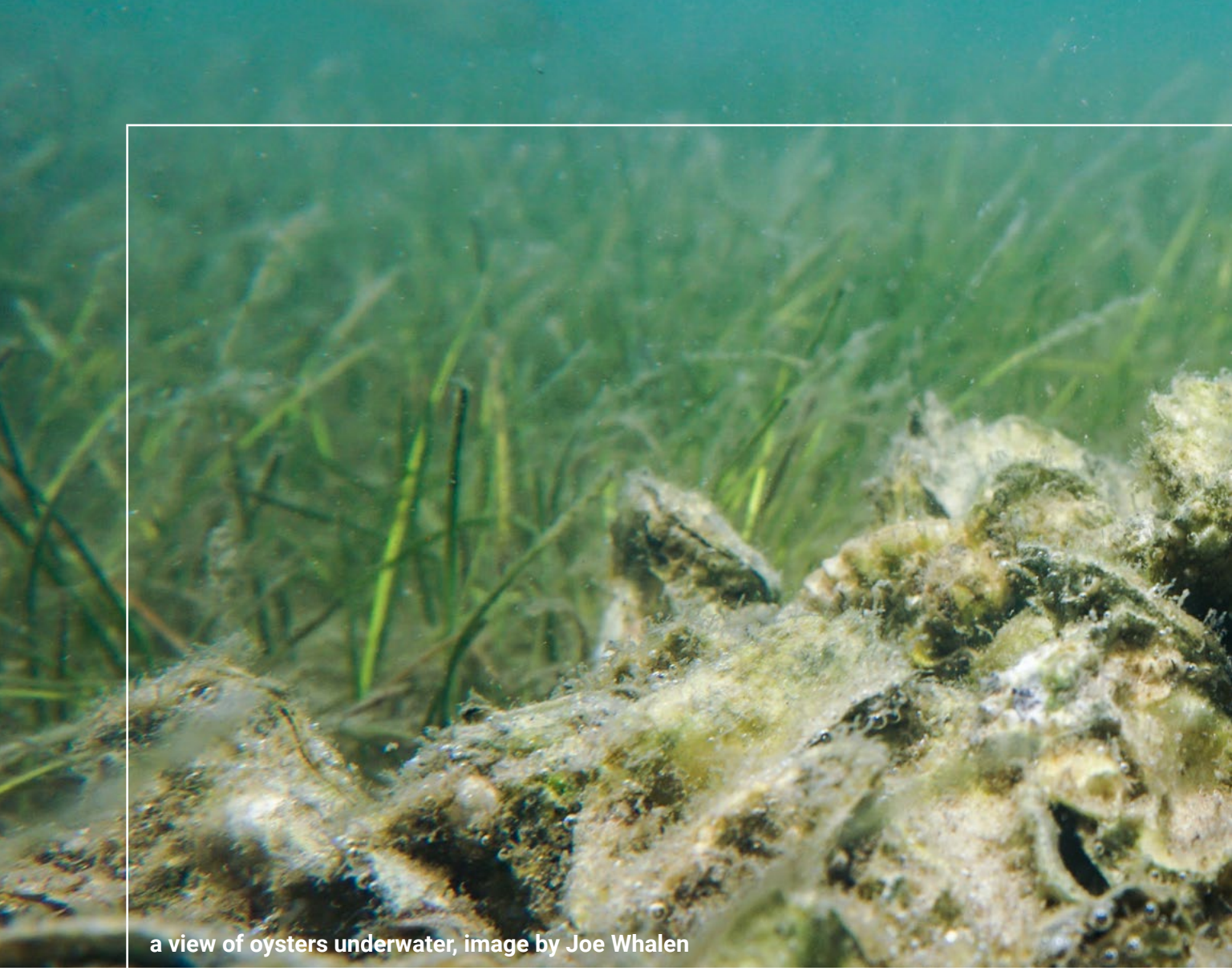
SCAPE writes that:

> Living Breakwaters is a proposal to move beyond single-use flood infrastructure, like levee walls, and focus on a layered approach to risk reduction, mitigating the most life-threatening and hazardous elements of a storm while encouraging water access and shoreline regeneration on a daily basis. The project is a replicable system where the infrastructural "unit of change" is multi-purpose – a necklace of wave-attenuating breakwaters that reduce water speeds and slow erosion, designed for maritime habitat regeneration, and connected to onshore neighborhoods through an educational Water Hub and island-wide school engagement.[13]

The Billion Oysters Project is particularly involved in the latter, connecting the project with schools and communities across the city. They write that "BOP's role in [Living Breakwaters] is to increase the number and concentration of breeding oysters, to build oyster reef habitat within the structure of the breakwater system, and to inform and educate local community members and students about the importance of this work and how they can participate."[14] With education, social connection, and tried and tested designs, *Living Breakwaters* is poised to provide real solutions to anticipated challenges posed by climate change. Construction on the project started in the summer of 2021.[15]

Take Aways

- Education is essential to environmental restoration.
- Designers and Engineers were inspired by the past landscapes of New York City to address current and future problems.
- Programming can make use of existing social structures (for example the public education system) to effectively engage the local community.
- Ecosystem engineers can play a very powerful role in projects, not only effecting physical landscape changes but also by acting as a kind of "flagship species" for the goals of the project.



a view of oysters underwater, image by Joe Whalen

Projects like *Oyster-tecture* and *Living Breakwaters* use landscape architecture to connect the wider public to the ecological goals and processes on a site. The method of connection is related to the cognitive view within environmental aesthetics.

As we previously examined, the cognitive view maintains that knowledge and understanding of a person, place, object, or process support and increase our perception of beauty. It can even do this when the thing that we are learning about is imperceivable, because it helps direct and sustain our attention to what is perceivable and informs our experience at a wider scale and scope.[16]

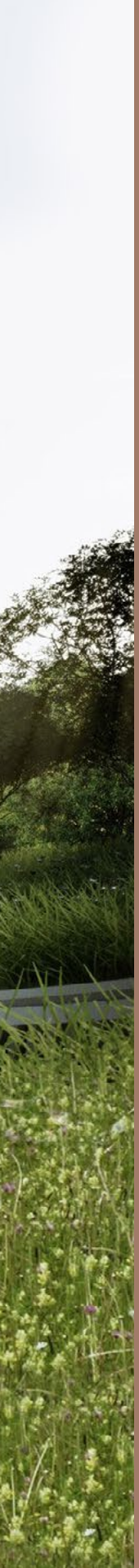
Living Breakwaters is an interesting example of this, because much of the installation will not be visible to residents or visitors, and yet it will be protecting the State Island shore and cleaning the water. It directs our attention to the submerged landscape that is just as much a part of the waters around New York as waves, boats, birds, and the Statue of Liberty. A large part of how it does this is

through the programming and community engagement that has gone into the design. Through educating the community, SCAPE, the Billion Oysters Project, and their partners are building a local appreciation for oysters and green infrastructure.

Programming can be a powerful way of engaging the public. It acts on our aesthetic appreciation of the environment, drawing attention to certain things that we might not see without guidance.

Programming, and design that accommodates or includes programming, is a very active way of extending aesthetic engagement through cognition, but design can also include more passive means of education, by revealing ecological processes through the built environment itself, as is the case with Dale Hodges Park in Calgary, Alberta, and *Where the River Runs*, a winning pavilion design for the Wuhan 10th International Garden Exhibition in Wuhan, China, by Penda.

Where the river runs, image reproduced courtesy of Penda



case study: where the river runs

Wuhan 10th International Garden Exposition, Wuhan, China

The winning design for a temporary pavilion at the Wuhan 10th International Garden Expo, "Where the River Runs" was designed by architecture studio Penda as an ode to water, the most precious of all our resources and yet often one of the most undervalued: "The aim is to highlight that clean water is not an endless resource" particularly in light of impending climate change."[17]

The installation is comprised of a constructed field of undulating hills, through which is carved a pathway that mimics the curves and contours that water cuts through a landscape. People will move through the site as water might along the river, carrying seeds they are given at the entrance and instructed to plant in the planters adjacent to the pathway.[18] The walls along the pathway also record poetry and quotes related to the rivers. Both the seeds and poetry refer to Wuhan's relationships to its rivers, which historically carried trade, knowledge, and flora and fauna (intentionally and unintentionally) to and from the city.[19] The metaphor could easily be applied to the relationship that many cities around the world have with their rivers or bodies of water, which have historically been vectors of commerce, trade, and travel. Of course, this is only one among many things that water does for our cities, our societies, our bodies, and at its most metaphorical level the design aspires to communicate the essential power of water to life.

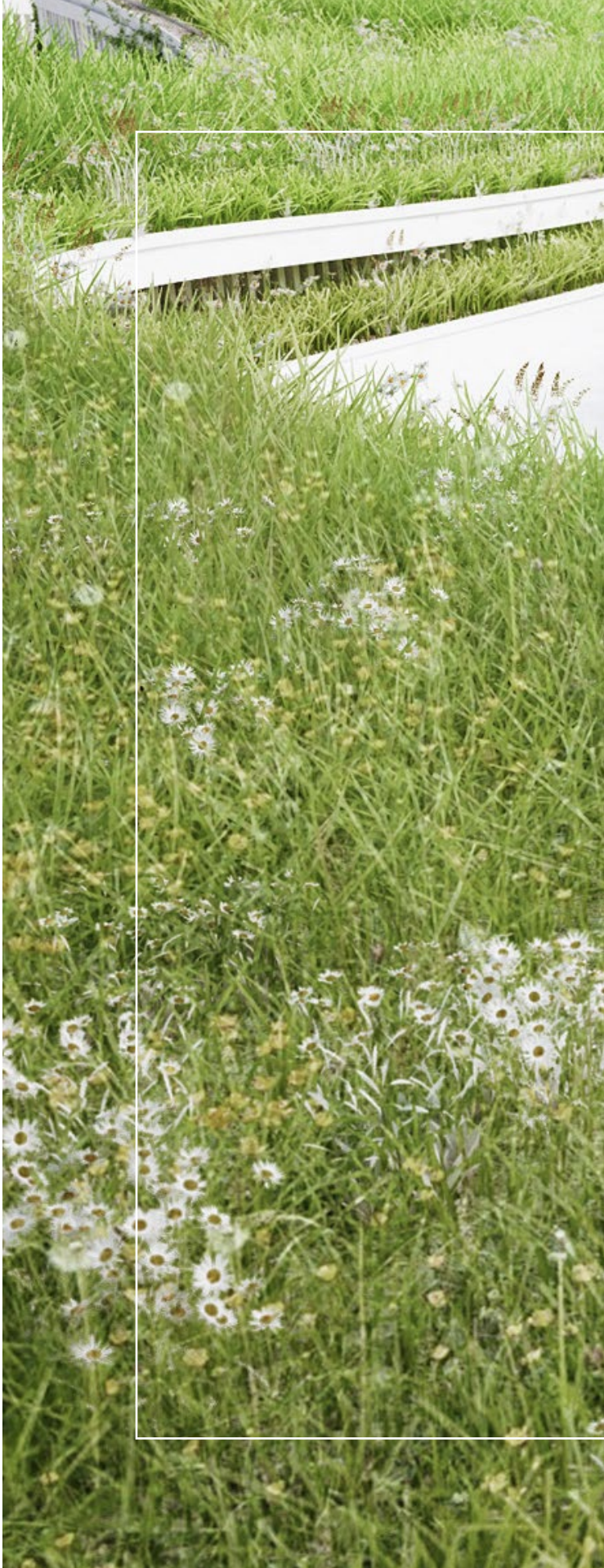
While the paths recall the movement of water, a courtyard opens up near the centre of the pavilion, an "oasis" hidden from the sight of observers exterior the installation and covered by a green roof that continues the undulating surface plane of the meadow above the heads of visitors, and allows for a place of gathering and rest amid the flowing pathways.

The changes in the topography of the meadow mean that while the path sunken into the landscape remains at a constant grade, the land adjacent to the path rises and falls as one moves through the installation, immersing the visitor in the experience of the site. The effect of the rising and falling landscape adjacent to the path, the changing views as visitors move through the site, is mesmerizing and lovely. It is easy to imagine how the experience of walking through the pavilion would elicit an aesthetic impact on the visitor.

The undulating topography directs water runoff to storage tanks beneath the pavilion, which are then used to water the growing plant material, thus reflecting one of the intended messages of the pavilion: that we need to be careful with our usage, and honour water.[20]

Take Aways

- The form of the pathways is highly connected to the statement the designers wished to make on the sustainability of water usage in the modern world: coherence of form and message strengthen the impact of both.
- The constructed topography allows the land to rise and fall in relation to the visitor, bringing plants to eye level and playing with the scale of the visitor's perception of the landscape and plants, bringing the visitor to the level of the landscape, or of water as it moves across and through the constructed topographical features.
- The form (along with programmatic elements such as the seed dispersals and planting) reveals the intended message and focus of the design.
- Beauty creates impact.



Where the river runs, image reproduced courtesy of Penda

case study: dale hodges park

Calgary, Alberta

This recently completed park in Calgary, Alberta, reclaimed a former gravel pit along the banks of the Bow River with the goal of treating and managing stormwater from an urban catchment area of approximately 1,800 hectares. The project involved a collaboration between Calgary Parks, Water Resources, and Public Art (specifically, Public Art's WATERSHED+ program), which each brought in team members including AECOM Canada (engineers), Source2Source (hydraulic engineers), O2 Planning + Design (landscape architects), and Sans façon (an art and concept team).[21]

In meeting the water management goals of the site, the design involved "the interplay of deliberate geometry with natural features."[22] A circular Nautilus Pond sediment removal system by Source2Source is one of the first steps in cleaning the water before it joins the Bow, and is visually juxtaposed against the curvilinear constructed marshes which continue the cleansing process and reflect the existing form of the adjacent river.

In addition to drawing design inspiration from the current Bow River, the design also drew from the river's edge of the past,

> resurrecting a 900 m long seasonal creek that previously flowed through the land. The generalized course of the historic stream, and historic riparian environments, served as form and function inspiration for the created water environments and for the landscape ecology principles underpinning the restored landscape.[23]

Understanding that both the form and function are inspired by the river, one might assume the park would try to recreate the appearance of nature, but the park is obviously constructed, providing ecosystem and cultural services without attempting to read as a "natural" area. The design is very intentional: curvilinear yet crisp. This is born from the collaborative work of the team members, which is particularly notable because the artists weren't brought in at the end to install an art piece in selected places within the site, but were involved from the beginning. The result is "a place where public art has shed its 'thingness,' the whole project is an artwork, a park and a piece of infrastructure all at the same time and indistinguishable from one another."[24]

In creating an artwork that is also a public park and a stormwater management site, Dale Hodges Park has also recreated habitat at the river's edge, and local wildlife has already discovered the restored haven. David Harrison with Calgary Parks describes a young moose interrupting the rehearsal of the park opening in a feature article in *Landscapes/Paysages,* celebrating the park's award of excellence for large-scale public landscapes. Recounted too are the birdwatchers who have already flocked to the park, following Calgary's avian residents.[25]

Dale Hodges Park, image reproduced courtesy of Wilco Contractors Southwest

Take Aways

- The site functions successfully within different contexts and without appearing to sacrifice anything, achieving its social/recreational goals, its ecosystem goals, and its intended visual/aesthetic goals.
- In remediating an industrial site, the design successfully draws on the past of the landscape to restore ecological and social functions.
- The site responds to the natural curves and bends of the river without trying to look like recreated nature, exhibiting an honesty of materials and design.

Where the River Runs includes both programmatic elements (the dispersal of plant seeds by visitors) and the design of the physical landforms to reveal the intended message of the pavilion, which is about water usage and movement in the landscape.

Dale Hodges Park is also focused on water in the landscape, and it is also revealing important truths about water to visitors, but in a much subtler way. The park functions as stormwater infrastructure, both managing and treating urban runoff. The physical

Dale Hodges Park, image reproduced courtesy of Wilco Contractors Southwest

design does not hide the treatment process: rather, it is highlighted by the design and thoroughly integrated into the site. It makes visible the fact that water is polluted as it drains through urban environments and requires treatment before re-entering the river. It also reveals the efficacy of both plants and human-designed infrastructure to clean the water. It does this with a minimal amount of interpretive signage and little to no programming.

What is learned about the environment and about stormwater at Dale Hodges Park comes after the experience of the site itself. Through the lens of environmental aesthetics, we would say that it first appeals to the affective/non-cognitive view of the aesthetic experience. It is a beautiful design, attracting the eye and drawing the visitor to look at it again, and more closely. In looking carefully, one can then discern the water treatment and management processes that are happening on the site. They are transparent enough, and have been made perceivable enough, that they do not need

oyster harvesting, image by John Angel

overt explanation or interpretation, but only because the design has framed them for our viewing, and only because the beauty of the design has drawn us to look in the first place.

Processes (or objects, states, etc.) that are easily understood or perceived without additional explanation thus do not necessarily require programming or overt interpretation to successfully reveal something about the site. When something is not easily perceived or understood, as with the role that oysters serve in the water quality and wave attenuation of New York Harbour, the information needs to be conveyed to the viewer in a more overt or obvious manner, and this can be achieved through programming.

Where the River Runs is an interesting mix of the two facets of aesthetic engagement. It first captures the aesthetic attention through the beauty of form and the phenomenological experience of the site, and through observation of water being collected and reused, the visitor understands something of environmental processes (activating our cognition). Programming supports our knowledge and understanding of the processes, particularly those that are less easily perceived: the distribution of seeds by visitors into the garden serves to bring attention to the fact that water carries and transports objects, whether those be flora, fauna, or ideas.

Things that are difficult to perceive can also be revealed by explicit interpretation that is integrated with the site, such as interpretive panels, or interpretive pamphlets or checklists visitors might carry with them through the site. Somewhere between programming and built elements lie pre-recorded walking tours, or digital guides that use GPS to tell you what is interesting and unseen at a specific location.

There are benefits to using programming or interpretation to highlight or bring attention to things that are perceivable: these strategies need not be reserved for things that require overt explanation. There are lots of things that people can perceive that, if understood better or appreciated in a more focused way, would help sustain aesthetic attention and appreciation. In some cases, what is revealed or explored does not need to be new information in order to capture our aesthetic attention. SongBird Project, based in Vancouver, British Columbia, offers a good example.

case study: songbird project

Vancouver, British Columbia

SongBird Project was a creative collaboration between scientists and artists, co-founded by Beth Carruthers, an interdisciplinary artist and writer, and Nelson Gray, a writer-director, both based on the west coast of Canada. It revolved around four main events, several of which were held annually over the course of five years between 1997 and 2002, and one installation by a landscape architect. The goal was that these initiatives would inspire an understanding and consideration of the non-human habitats and inhabitants of Vancouver and the surrounding area, and in doing so create an opportunity to shift the worldview of local residents to include other-than-human perspectives.[26]

The events included the Living City Forum, which involved presentations within the community by artists, environmental scientists and activists, academics, as well as the Gardens of Babylon Habitat Challenge, "an initiative in partnership with the Institute of Urban Ecology at Douglas College… to encourage the creation within the city of balcony and rooftop habitats as important food and water sources for migratory pollinators."[27]

SongBird Project also incorporated a global event within its initiatives: Dawn Chorus Day is an annual gathering on the first Sunday of May every year. The event originated in Birmingham, in the United Kingdom, in the 1980s and over the last forty years has become an international celebration of birdsong, "nature's greatest symphony."[28] One morning every spring, listeners wake before dawn and can either travel to a rich listening spot, or simply open the window and listen from home. The point is to stop and listen, to pay attention to the bird life in your city or region. BirdSong Project offered additional organization and support for interested participants:

> In neighborhoods throughout the Vancouver area, people rose early to gather at a designated 'listening site' staffed with a birder from the Vancouver Natural History Society. Everyone later assembled at a central location for food, shade-grown coffee, and unofficial community 'bird count' – including a recounting of the morning listening – and performances.[29]

The final event, *SongBird Oratorio,* was held just once, because it took several years to develop. Five composers were engaged to create music based on birdsong native to the region, and the works were then performed for the community. The challenge was that the composers were asked not simply to create music based on bird calls or incorporating birdsong, but "to engage with the perceptual worlds of a species so different from our own… the most powerful aspect of the making of this work was this attempt to comprehend and allow space for the voice of the other."[30]

Finally, artist and landscape architect Claire Bédat designed and built a human-sized bird's nest with cuttings harvested from local botanical gardens, and installed it near the Roundhouse Community Centre in downtown Vancouver, where it stayed for almost a year. The experience of being inside the nest was intended to connect visitors with the idea that

our bodies ultimately share the same home as those of the birds who co-reside in our communities.[31]

Take Aways

- Multidisciplinary efforts can often yield interesting and highly engaging events to their communities.
- Art and installations can be usefully employed to help communicate about environmental science and ecological relationships to non-scientists and the wider public.
- Exciting programming can be developed both from new ideas and by adapting existing programming for a local application (the incorporation of Dawn Chorus Day celebrations into BirdSong Project).

There are elements of *SongBird Project* that appeal to both the cognitive and non-cognitive aesthetic experience. The Living City Forum is highly cognitive, involving discussions and debate about the future of the community. The Gardens of Babylon challenge is also somewhat cognitive: the focus is not on how beautiful the installations are, but on their function in providing habitat for pollinators. Yet Bédat's nest and the *SongBird Oratorio* both seem based in the affective and phenomenological aesthetic experience of nature. Of the nest, Carruthers writes that

> Not everything that comes to us is accessible to, or understood by, our cognitive framing – and this is a good thing, since through this bypassing of our preconceived notions and framing of experiences and world we can arrive at new understanding.[32]

In writing of SongBird project in "A Subtle Activism of the Heart," her contribution to Liza Piper and Lisa Szabo-Jones' *Sustaining the West: Cultural Responses to Canadian Environments* (2015), Carruthers specifically works with "the idea of aesthetic engagement, and of the arts as holding the promise of being key agents of change vis à vis a shift in worldview."[33] With reference to both philosopher Marshall McLuhan and anthropologist Tim Ingold, Carruthers suggests that it is through aesthetic engagement that our perception of the world can be widened or opened, through it that we arrive at knowledge.[34]

Although it is phrased differently, Carruthers seems to be getting at what Weil and Scarry refer to as decentering through aesthetic experience. In expanding or altering our worldview, the balance maintained by keeping the human perspective at the centre is shifted, decentered. *SongBird Project* illustrates how both cognitive and affective aesthetic engagement, applied either separately or together can achieve this.

Each of the projects we have looked at through the case studies show, to various extents, how programming and/or site design can engage in landscapes and ecological processes, can reveal new information and create new understandings and knowledge, or can simply reposition the visitor in a way that frames a place, object, phenomenon, or process in a new light. Applying the lens of environmental aesthetics and examining both the cognitive and affective aspects of aesthetic engagement can help elucidate how art and landscape architecture can be effective in expanding and changing human conceptions and worldview, and this in turn can translate to wider spread care for conservation.

There is a role for art, for design, and for landscape architecture in conservation practices. The design proposed herewith looks at how this can be applied in the context of native grassland conservation in southern Saskatchewan, and specifically of how it might be applied on the sites of the former public pastures.

a history hike through Grasslands National Park, west block

a view from the Dirt HIlls

a proposal

programming to reveal and engage with prairie landscapes

The first goal is to get people out of their cities and towns and experience native prairie first-hand. Design can support or even create aesthetic encounters with the landscape and with nature, but we first need people to visit sites of remnant grassland in the province.

As we have seen, one of the ways to effectively engage people with the landscape, with its stories, its ecological processes, its history, is through programming. If we can devise events or initiatives that are fun and interesting, we can accomplish the first task of reaching people, and position ourselves for the second task of teaching people.

If one of our major considerations is to convey the importance of native prairie conservation to a wider segment of the population than is currently receiving it, and part of achieving this is getting more people out to gain first-hand experience with native grasslands, this means that events and initiatives should aim to reach different groups with different interests, and not primarily people who are already interested in conservation or native prairie. Though conservation-minded people or nature-enthusiasts would certainly be welcome, and we might even imagine them being a significant source of event participants, we need to target people who are not current "prairie converts." With this in mind, we should consider devising events that target different kinds of groups, to try and interest a wide swath of the population. Once they are there, they will be exposed to the combined affective and cognitive aesthetic engagement with the site and programming, and hopefully leave with a positive feeling and memory of the experience and place.

As large remnants of native prairie that are distributed throughout the southern half of the province, the former public pastures are ideal places to host the kind of events or initiatives that would expose people to native grasslands. This is under the assumption that these kinds of events would be welcomed by the current lessees. The reasons they might or might not do so will be explored shortly, but there is some precedent for it: the Caledonia-Elmsthorpe pasture near Avonlea, Saskatchewan, has allowed PPPI in conjunction with Saskatchewan Trails to hold trail rides and interpretive hikes in the past.[1]

cougar tracks at Strawberry Lake Pasture

Imagining a series of events sited at one or more of the former public pastures immediately presents us with some considerations while designing the programming. These include:

- The pastures are working landscapes that have livestock on them from May through November of every year, and depending on the season tourism activities might negatively impact the cattle.
- Some of the native prairie, or some of the wildlife that it supports, could be sensitive to disturbance – the number of visitors, the timing of the events, and where precisely the visitors go would likely need to be managed to a relatively high extent.
- The relative flatness and high degree of visibility on the prairie means that within native grassland sites, where trees and shrubs are few, the more visitors there are, the more likely they are to be able to see each other. This will impact the visitor experience of the site: if one of the things that people value about the prairies is the sense of space, freedom, and emptiness, then seeing lots of other visitors could detract from this.

One of the challenges that comes out of reviewing the above is finding a balance between increasing the number of visitors to the prairie while mitigating the impacts of increased visitorship on any given site. This is a challenge that can be addressed both through the physical design of how the events are laid out on the land, and through part of the design itself.

We can start with a seasonal analysis to see if there are times of year when the pastures might host events that would not conflict with the industrial seasons, and to see whether there are any gaps in the year that additional recreational events could fill.

goals:

create a well-rounded program of events to make use of the pastures in the off-seasons

create a well-rounded program of events that respects and makes use of ecological, industrial, and sociocultural seasons.

seasonal analysis

cattle production

crop agriculture

tourism

hiking + snowshoeing

hunting

sharp-tailed grouse

birding

saskatoon berries

wildflowers

monarch butterflies

cool season grasses

warm season grasses

bees

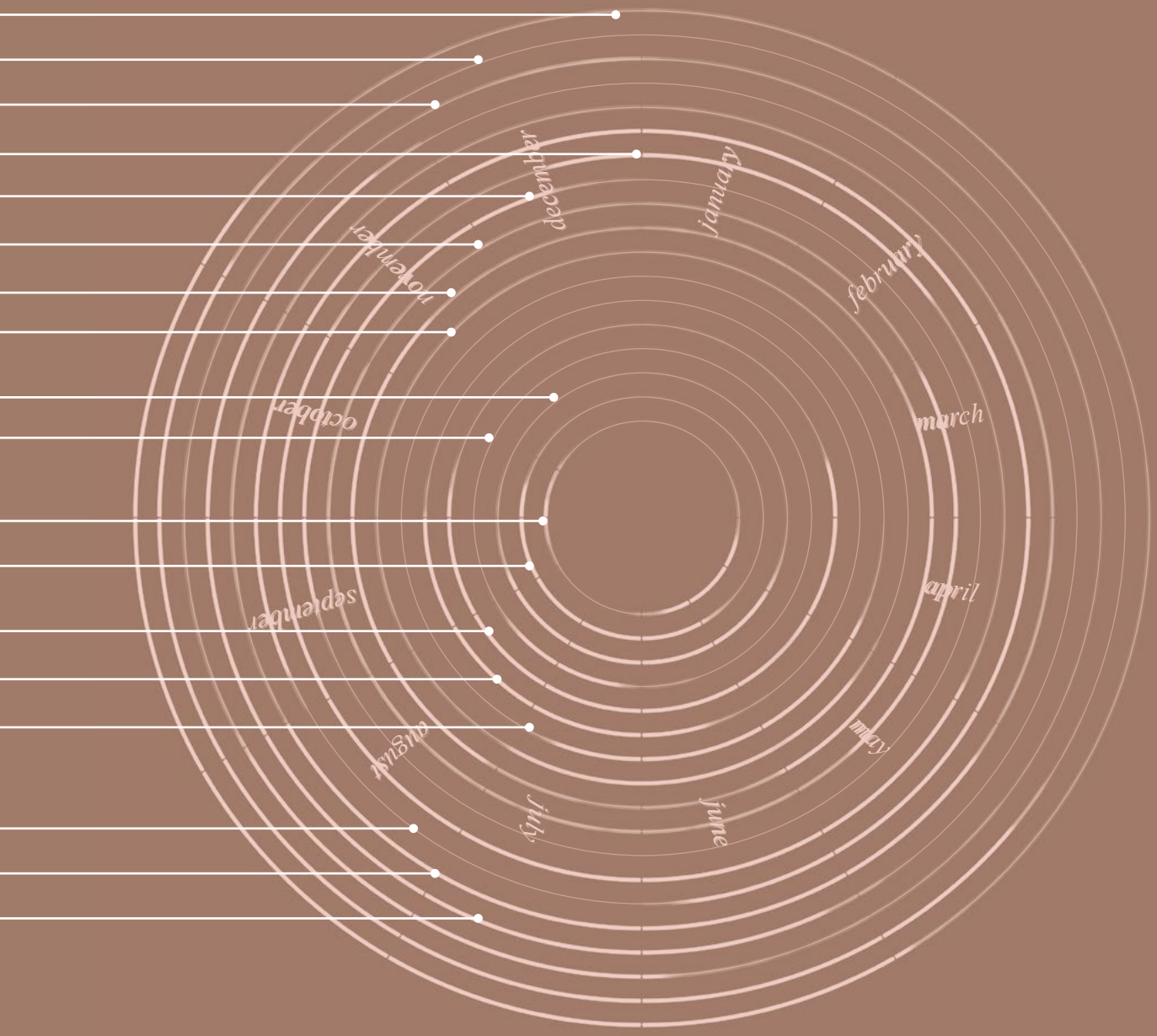
mosquitoes

ticks

school

weddings

roughriders


january
february
march
april
may
june
july
august
september
october
november
december

analysis of event typologies

We should also look at events that work across different contexts. To start compiling a preliminary list of possible and current events that the pastures could host, we can review and draw inspiration from local or regional parks, museums, cultural centres, and community organizations.

There are lots of events that function in a single context, be it recreational, cultural, or ecological. The most valuable events for our purposes will be those that function across multiple contexts.

goal:

create events that function in more than one context (eg. cultural + ecological, ecological + recreational)

current events

possible events

- - - - ➤ *goal: design events that function in more than one context*


ecological
annual entrance + exit of cattle
rotational grazing
controlled burning
dawn chorus day
interpretive
guided tours
(archaeology, history, ecology,
folktale + legend)
trail rides
full moon hikes
x-country skiing
snowshoeing
cowspotting
orienteering course
kite flying
trail running
recreational
music/theatre
performance
cultural
art exhibition
storytelling
beating the bounds
collecting medicines
pow wow
weddings
reunions

blanket flower at the Living Prairie Museum, Winnipeg

a summary of programming goals

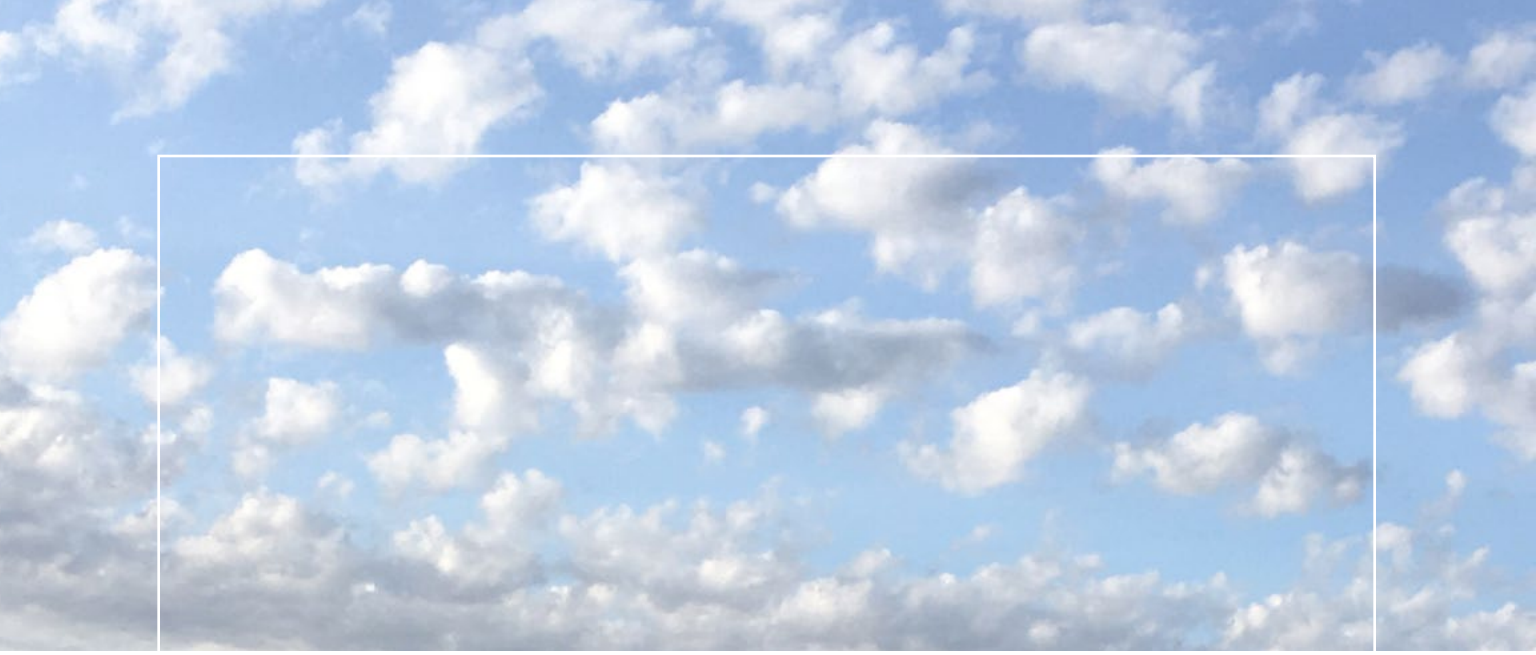
- create a well-rounded program of events to make use of the pastures in the off-seasons
- create events that respect and make use of ecological, industrial, and sociocultural seasons
- create events that function in more than one context (eg. cultural + ecological, ecological + recreational)
- create events that educate people about the value, beauty, and functions of native prairie, including the role of human management
- reveal what is unseen and underappreciated
- create opportunities for people to experience native prairie first-hand

prairie smoke

a program

a schematic of proposed events for the former public pastures

- Kite Flying + Cloud Lessons
- Animal Print Snowshoeing + Winter Ecology Walk
- Beating the Bounds
- Dawn Chorus Celebration
- Controlled Burning Demonstration
- Full Moon Hike + Night Life Ecology Walk
- New Moon Gathering + Naked Eye Astonomy
- Plant Identification + Indigenous Language Lessons
- Grass Braiding + Cultural Art Making
- Prairie Berry Harvest + Cookout
- Local Beef Tasting/Community Barbecue
- Cattle Parade
- Contemporary Dance Compositions
- Community Campfire + Storytelling
- Grass Labyrinth Design Competition
- Treaty Lands Sharing Network Events



kite flying + cloud lessons

Taking advantage of the winds and wide horizons, kite flying events, including competitions and lessons, could be held on a pasture, as it would have minimal impact on the ground.

The event could benefit from some lessons on wind, and particularly how to kite using the winds in Saskatchewan. This kind of information would complement a lesson on cloud formations and what this might tell you about wind conditions.

Finally, lessons on recognizing and understanding cloud formations could be held in conjunction with lessons on how to draw clouds, or how to paint or photograph them. In this way, the event could combine artistic creation with accessible scientific learning, and a family-friendly sporting event.

precedent

windscape festival

Swift Current, Saskatchewan

Every year in June, Swift Current is home to the SaskPower Windscape Kite Festival. The event includes performances and competition, as well as introductory lessons for beginner kite flyers. A market is on site where visitors can buy kites or try to make their own.

animal print snowshoeing + winter ecology walk

So many hiking activities focus on the summer months, but the winter holds great opportunities for outdoor fitness and education.

One of the great capacities of snow is to hold and show the traces of the wildlife that is hiding in our landscapes, that we might not regularly see. A winter ecology walk could easily extend into the pasture during the winter months. Depending on the depth of snow that year, snowshoes would be required or recommended. Subsidized snowshoe rentals are available from Saskatchewan Wildlife Federation through the BigFOOT Snowshoe Program.

Specialized snowshoes could also be created for children to use, which would appear to leave the imprint of animal footsteps behind them in the snow. This could be utilized as a learning aid to discuss how local winter wildlife handles the season.

precedent

winter wildlife interpretive walk

Fort Whyte Alive, Manitoba

Fort Whyte Alive offers interpretive events throughout the year to help visitors understand the local wildlife and ecology. Winter provides the opportunity to hunt for animal tracks in the snow.

becoming bison

University of Manitoba

This was an installation I did at the U of M that involved making shoes that left bison/cattle hoofprints in the snow and leaving tracks across campus, to raise ecological awareness.

beating the bounds

The tradition of beating the bounds could be well combined with a fence survey of the former public pasture, and this is something that could benefit the pastures and patrons, by having more eyes and feet to cover the ground. Participants could walk as groups around the boundaries, checking the fence and flagging where repairs are required, while a group of patrons, skilled volunteers, or volunteers willing to learn could follow up as a fence mending crew or team.

This event would likely need to be adapted based on the size of the pasture surveyed.

The "beating of the bounds" could proceed, with participants carrying switches to hit landmarks with along the way, and a series of picnics could be planned, to honour the tradition of memorizing a location through sensory experiences. It would be particularly encouraged to eat edible berries found in the pasture: for this reason, the event might be best held in early July, though could easily proceed other times as well. Fall, after mosquito season, would also work well.

precedent

fence mending

Saskatchewan

One fact of pasture maintenance is that fences need to be mended from time to time, to ensure that cattle do not escape the boundaries of the pasture. This requires an inspection and typically a party of menders, especially in pastures where a lot of ground needs to be covered. Sometimes mending requires installing new barbed wire, other times a new fence post will be installed beside an old one, and the wire reattached to the new post.

precedent

beating the bounds

England and Wales

A tradition that goes back at least 600 years, "beating the bounds" was an annually performed ritual within communities across England and Wales, where parishioners would walk together around the parish boundary, so that "people learned the boundaries of their community by foot."[1]

"The purpose was to create a shared mental map" of the communal lands.[2] In addition to the parish boundaries, which at the time defined taxes, the practice was also applied to commons.[3]

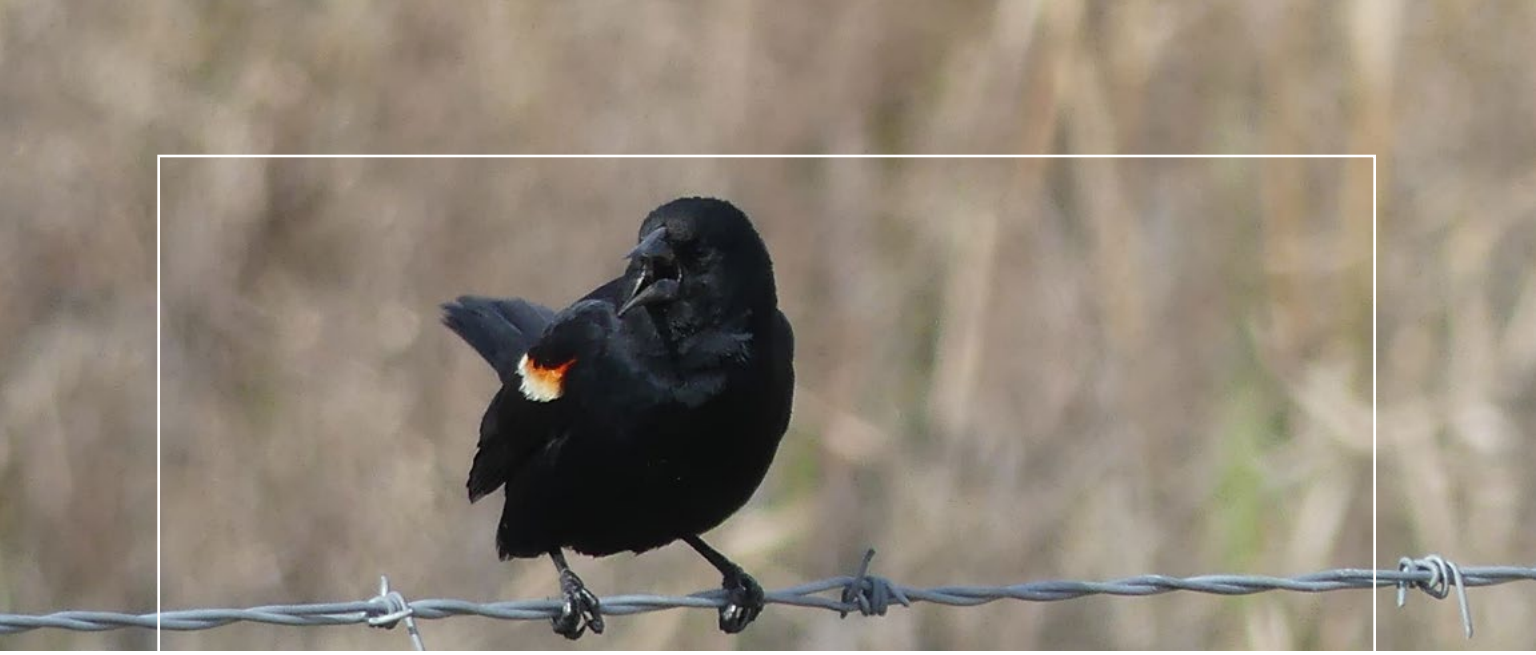
The ritual was necessarily multi-generational, as older community members led the way and impressed the landmarks on the younger generation. Walkers carried willow branches, and when they reached a boundary marker or stone, everyone would take a turn hitting the marker.[4]

Early practices also included using bodily experience, sometimes pain, to impress the locations on the memory. These experiences were often connected to or inspired by the surrounding landscape, and included dunking children in a river, having them jump over a muddy ditch to slide or fall into the mud, or encouraging them to run along a wall in a manner that would likely result in someone falling into a thicket of brambles.[5]

Writing of the tradition, journalist Amelia Soth writes :

> The most practical reason for this tradition was to create a living record of the parish's boundaries, which could serve as evidence in disputes. In one case, for instance, a 75-year-old man testified that he knew exactly where the eastern boundary of the parish lay, because he had been thrown into a heap of nettles there sixty years ago, when he was a boy. Simply asserting that he remembered the boundary would not have stood up in court; it was the vivid, visceral nature of this memory, its connection to a dramatic experience, that helped his parish win the case.[6]

The practice is continued in only a few communities today, as modern mapping and surveying has taken precedence in community record-keeping.



dawn chorus day celebration

This event could be held on the pastures with minimal adaptation, and is one which could easily proceed on the pasture itself without disturbing the site.

Partiicpants could easily join a nearby former public pasture to listen to the birds in early May. This would be facilitated by the fact that the cattle are not typically on the pasture until late May. Some lucky listeners, with local input on the location choice, may even be able to watch the lekking of Sharp-Tailed Grouse.

precedent

international dawn chorus day

worldwide, origins in the U.K.

Listeners around the world gather on the first Sunday morning of May to listen to the birds near their homes. The event encourages the appreciation and intentional acknowledgement of our avian neighbors, as well as the awareness of their fragile dependence on our ecosystems and landscapes.[7]


image by Ryan Hagerty

controlled burning demonstration

Many pastures do not currently burn the grass, but burning could start to be reintroduced in small and controlled patches, and this event is something that the public could both assist with and enjoy as an event. This would have an educational element to it as well; participants would receive some training and education on how controlled burns proceed, how the weather plays a significant role, etc.

This event would be most likely held in spring, as that is often when moisture conditions are suitable, though it could be held in summer or fall depending on the year, and mixing up the time of year the land is burned is often a good idea (this stimulates different plants).

The biggest challenge would be coordinating the date, and letting people know if and when the fire could proceed, as it needs to be confirmed day of, and perhaps even hour of. This is something that would have to be clearly communicated to the public and to voluntary participants.

precedents

living prairie museum

Winnipeg, Manitoba

Many native prairie preserves use prescribed burning to help control invasive plants and maintain the health and dominance of the grasses. The Living Prairie Museum in Winnipeg, Manitoba, has used fire a few times over the years as a management strategy. Doing this necessarily involves communication with the public, as the preserve is surrounded on all sides by development, and the fire might disturb people if they thought it was unintentional. The fire thus becomes an event for the community to watch for.

image by Kumar Ganapathy

full moon hike + night life ecology walk

The wide horizons of the prairie offer a great opportunity to view the full moon, which provides a generous amount of light, though participants would be encouraged to use headlamps or flashlights to supplement the moon's light.

A short guided walk on the pasture could be a wonderful setting for a discussion of local nocturnal wildlife, including nighthawks, bats, and even fireflies (which can be found in some select locations around southern Saskatchewan). With luck, participants might see examples of the local night life.

To aid the hike and prevent people from getting lost, the path of the hike could be marked with temporary reflective stakes laid out earlier that day, and participants instructed not to leave sight of the stakes.

Depending on permission from the pasture manager, this is an event that could proceed in the pasture itself. Cow tipping absolutely forbidden.

precedent

full moon hike

Bryce Canyon, Utah National Park

On full moons, this U.S. National Park offers 1-2 mile guided hikes that explore the moonlit landscape and interpret local nocturnal wildlife. Participation is limited, and the event is so popular that the park hosts a lottery for hiker tickets.

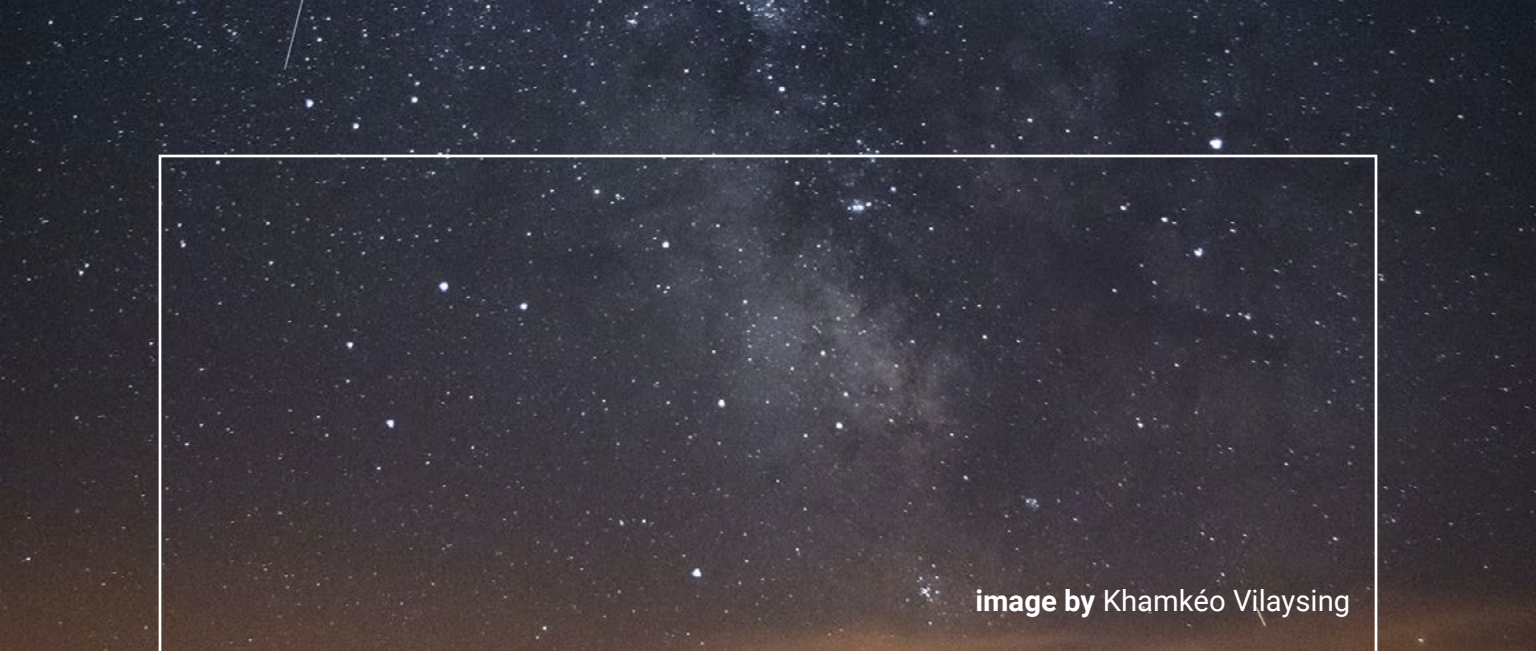


image by Khamkéo Vilaysing

new moon gathering + naked eye astronomy

Another night time event, this would be held during the dark of the moon, and would therefore not involve moving across the landscape or venturing any distance into the pasture. Rather, this event would be held somewhere close to available parking that does not disturb the pasture, but is in an area dark enough to be useful for astronomy. Former public pasture yard sites would be a possible location to hold such an event.

The night skies hold many stories, and this is an opportunity to collaborate with the Royal Astronomical Society of Canada's Saskatchewan chapter, local stargazing enthusiasts and amateur astronomers. Wilfred Buck, located in nearby Manitoba, could also be invited as a welcome guest and presenter, to reintroduce and share Indigenous astronomical teachings and star stories. Organizing different kinds of teachings and experiences could mean that even expert astronomers may learn something new.

precedents

beyond the big dipper

Grasslands National Park

Members of the Royal Astronomical Society host events where they set up telescopes at Grasslands and guide participants in a tour of the night sky

mfnec events

Manitoba

Wilfred Buck, a Cree star-story expert and educator hosts events and programming and events for the Manitoba First Nations Education Centre to educate on Indigenous astronomy.[8]

plant identification + Indigenous language lessons

Planting identification lessons and language lessons could each be held independently of each other, but in combination they would be enhanced, and become a memorable and special experieince.

This is an event that could proceed only with the involvement and co-production of a local Indigenous language teacher, and possibly the participation of a whole community. But welcoming back Indigenous languages, and greeting the native plants by their first names, is something that could have a lot of meaning for both Indigneous and settler participants.

precedent

cultural teachings

Indigenous communities, worldwide

Combining plant learning and language learning is not a new idea. Joe Pitawanakat, an Anishinaabe plant medicine teacher based in Ontario was recently interviewed by the CBC on the value of learning the two together and described how Indigenous names can communicate valuable plant knowledge. Intergenerational teaching practices, including language learning and plant study, precede recorded history.[9]

grass braiding + weaving

This is also an event that depends on the availability and participation of willing teachers, if they could be found.

There are many cultures around the world that practice a form of plant weaving, be that basket making, a form of traditional artwork, or a sacred and spiritual ritual, such as the well known braiding of sweetgrass in many North American Indigenous groups.

This event could focus on a single culture's form of weaving or braiding, but could also feature two or more cultural traditions, and in this way connect people through grass, tradition, and ritual, focusing on the similarities through which we relate to grass, and celebrating the differences.

This is an event that could involve some material collection on the pasture, but would not necessarily need to proceed on the pasture itself, and may even be best accomodated off the pasture, with access to tables, chairs, water, etc.

precedents

wheat weaving

Ukrainian and Slavic communities

Wheat weaving is a cultural artform that originates in agricultural societies of Eastern Europe, and is a practice with pagan roots: the shape of the weave is said to house the spirit of the crop until next year.[10]

sweetgrass braiding

North American Indigenous communities

The ceremonial braiding of sweetgrass is a long held and sacred tradition amongst Indigenous peoples of North America.

prairie berry harvest + making

Residents of Saskatchewan are typically well acquainted with Sasktoon berries, and the treat is celebrated throughout the province. Saskatoons would be an important part of this event, but our consideration of "prairie berries" should be expanded to include other native berries that grow in the province. Some are edible, like the saskatoon berry, some are enjoyed by birds and other wildlife, some can be treated and transformed to become edible or add particular flavours to something (like juniper), and some can used for traditional arts and crafts, as a dye, or dried and shaped into beads (though whether this was practiced locally by Indigenous groups this practicum cannot confirm).

Similarly to grass braiding and weaving, this event depends on the availability of teachers, and the content and berries focused on would be determined by that involvement. The featured berries would also likely depend on the season. Collection could proceed on the pasture, though the "making" could be held off the pasture, ideally somewhere with tables and chairs.

precedent

mortlach berry festival

Mortlach, Saskatchewan

Every year at the end of June, the village of Mortlach hosts a Saskatoon Berry Festival, with a pancake breakfast, a parade, music, vendors, and pie.

image by Vincent Keiman

local steak tasting / community barbecue

Community barbecues are not a new event, and are held in communities throughout the province. However, there is an untapped opportunity for beef producers to showcase local product through a barbecue geared specifically towards this.

The event could include education on the types of cattle that are prominent in Saskatchewan, and could include taste testing between bison and beef.

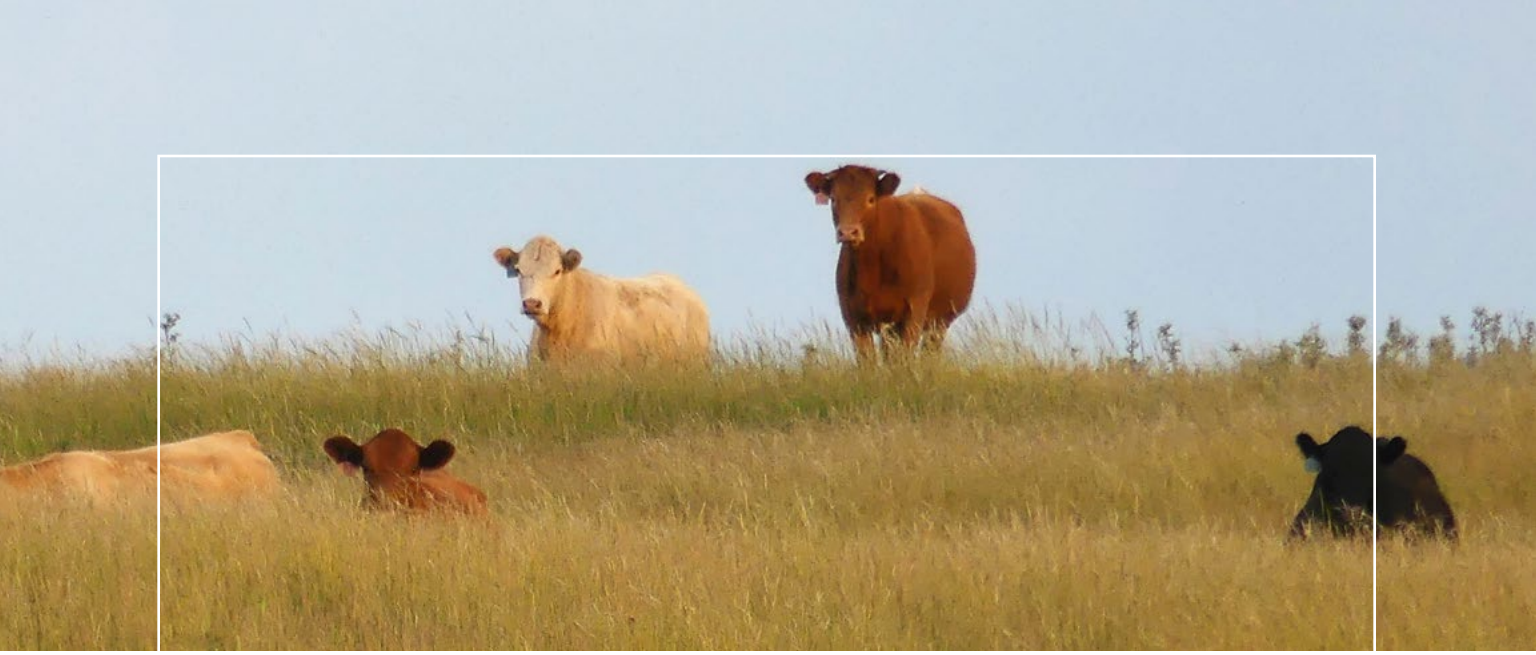
This event need not be held on the pasture itself, and in the event of a drought or particularly dry season would even be best held off site, in case of fire risk. However, there is a benefit of connecting the food we consume and produce with the place where it was raised. This is something we do not often have the opportunity to do, and reconnecting consumers with their local food chain in a physically present way could have a deeper impact on what it means to eat local.

precedent

wagyu beef festival

Tokyo, Japan

Wagyu beef producers from across Japan (notably from Kobe and Matsuzaka) bring samples of their product to this street festival, which is held annually in the fall. Here, visitors can taste and compare beef raised in different parts of the country and with different regimens and diets.



cattle parade

La désalpe could be recreated on the prairie, in a way that suits local tastes. In fact, the base of this event already happens on former public pastures across the province, when grazing co-op patrons bring their cattle to the pasture for the season, and when they arrive to sort and collect their cattle at the end of the season. The tweak would be in welcoming the public to this event, in publicizing it as a community affair, rather than a private business dealing between pasture operations and patrons.

Another possible tweak, borrowed from festivals in Europe, would be to grace the cattle with ribbons and flower crowns. This would create fun photo opportunities and likely attract more visitors and observers, but it also is a visual cue that we are honouring the cattle as part of our communities, our economy, and our food chain.

What impact would it have, if we involved more directly our wider communities in the process of food production? This could be explored through this event.

precedent

la désalpe / alpabzug

Switzerland and France

This festival/parade celebrates the descent of the cattle from their summer pastures in the alps. It is held in multiple villages throughout Switzerland and France in the fall, often near the beginning of October. Some celebrations include the tradition of dressing the cattle in flower headdresses and ribbons. The cattle are brought through the village, and there is often an opportunity to buy locally produced cheese and milk products, particularly those that have been freshly produced. The tradition can be reportedly traced several thousand years.[11]

contemporary dance composition

Imagine this event as a performance by local dance companies and choreographers. What would differentiate it from other performances would be that each dancer or group of dancers could be asked to choreograph a dance inspired by a particular prairie plant. Grass is often described as dancing in the wind - how could grass and wind inspire dancers, direct movements of the human body?

Different grasses or plants could be assigned to different groups, or one grass could be selected per year for everyone to interpret in a different way, or one grass and one group could be selected every year. This would likely be determined by whether the event becomes an ongoing and continuing affair, or whether, like its precedents, it is developed as a one-time performance. Availability of funding to support the performance and performers would determine this.

Research for the composition could be held on the pastures, though the performance itself would be best held off the pasture, to protect the grass from crowds.

precedents

songbird oratorio

Vancouver, British Columbia

A series of musical compositions inspired by local birdsong and performed for the community.[12]

crossfiring / mamawetotan

Claybank National Historic Site, Saskatchewan

This series of art installations interpreted the layered history and cultural significance of the site, and included contemporary dance performances.[13]


image by Timothy Meinberg

community campfire + storytelling

This event offers flexibility to the local community: the stories told could be local history, they could be seasonally appropriate (ghost stories nearing halloween), or they could be performance based, such as retellings of plays and fairy tales.

A community campfire could also be a very informal affair, without a set storytelling or performance, but simply a gathering of community and neighbours around a campfire, much as occurs in backyards around the province.

To support the event, participants could help to collect dead wood from the local pasture, or assist if trees need to be removed. This wood could be used for the community campfires, and the labour of removing the wood gives something back to the pasture.

This event would be best hosted off the actual pasture, to eliminate any risk that it poses to the grass. A firepit would be required, and fires, of course, should not proceed if fire warnngs are in effect. There is the potential to hold this even year-round.

precedent

fireside chats

Grasslands National Park

Park interpreters host campfires with different themed topics, including local stories and legends, stories about the constellations, local histories, and song. This is an example of a formally programmed campfire, though informal campfire gatherings and conversations are a popular activity both in Saskatchewan, and worldwide (where city bylaws permit).

mown grass labyrinth

If a small area of the pasture was set aside for haying each year, the mowing could be used to create a temporary labyrinth in the grass, and the public welcomed to enter and walk it, for the week or two that it stands.

The design could be new every year, and the result of a public competition. In order to not wear down any single site with repeated walking, the location could move every year. This would be best considered for a site that has been supplemented with non-native grasses, such as seeded or "improved" pastures.

Visitors to the labyrinth could walk it for the pleasure of being outside and the smell of fresh mown grass, but they could also use the opportunity to meditate on their relationship with nature, with the prairies, with all the beings that live on grass.

precedent

labyrinths

worldwide

Labyrinths are found in many different cultures around the world. Not to be confused with mazes, which are puzzles to be solved and which include dead-ends, labyrinths are formed of a single continuous path, looping and often with many turns, and walked as a meditation, ceremony, or ritual.[14]

TLSN signage, image reproduced courtesy of the Treaty Land Sharing Network

treaty land sharing network

One of the most important programs that could be enacted on any of the former public pastures, or any remnant of native prairie, is to in some way explicitly honour the treaty relationship. The European settlement of the plains not only damaged the health of the native grasslands, it damaged the health of Indigenous residents who are tied to the land.[15]

The Treaty Land Sharing Network offers a relatively simple and straightforward answer to how individual land title holders might honour the treaty directly, without the intercession of government. A relatively new initiative, it is a grassroots and entirely volunteer-based network of settler farmers, ranchers, and rural land title holders in Saskatchewan who are willing to share their land and provide direct access and use to Indigenous people of the province.[16]

The network grew in response to recent local events, including the 2016 killing of Coulten Boushie, and a 2018 provincial amendment to trespass legislation, "which... [places] the onus on land users to obtain consent from the landowner before entering their land."[17] The legislation comes on the heels of the sale of over one million acres of Crown land sales since 2008, largely sold without First Nations consultation.[18] The legislation also grew out of the context surrounding Gerald Stanley's murder trial, which was extremely divisive across rural Saskatchewan and led to a spike in racist rhetoric on Facebook and discussions both on and off-line about what farmers should be able to do to "protect" their land.[19]

The TLSN was originally born from conversations between Valerie Zink and Phillip Brass in 2018 about "a need for rural settlers to counteract this racism and erosion of Treaty Rights… [about] how landholders might share land with their Indigenous neighbours."[20] After preliminary organizing events in 2019, the network has gotten off the ground. Alongside land-sharing events where people gather together at a shared time and place to explore the land and sometimes engage in ceremony or prayer together, the initiative also involves providing contact information to Indigenous groups and directly communicating to Indigenous communities that people are welcome to come and use the land. Sometimes, with some limitations: not all landholders are comfortable allowing hunting on land that is actively pasturing cattle. Some landholders who do welcome hunting appreciate a call to let them know when someone will be there. For now, the network "encourages access on foot and discourages open fires unless all parties agree to them."[21]

In addition to events and direct communication, the TLSN has also developed signage that landholders can post, something that functions as the opposite of a "No Trespassing" sign. The signs communicate to Indigenous neighbours exactly which lands welcome their use, while also communicating to settler neighbours that the program exists, that this is a simple and direct way to address some of the injustices and inequalities between settler and Indigenous societies, that it is not an

intimidating or difficult thing to do.

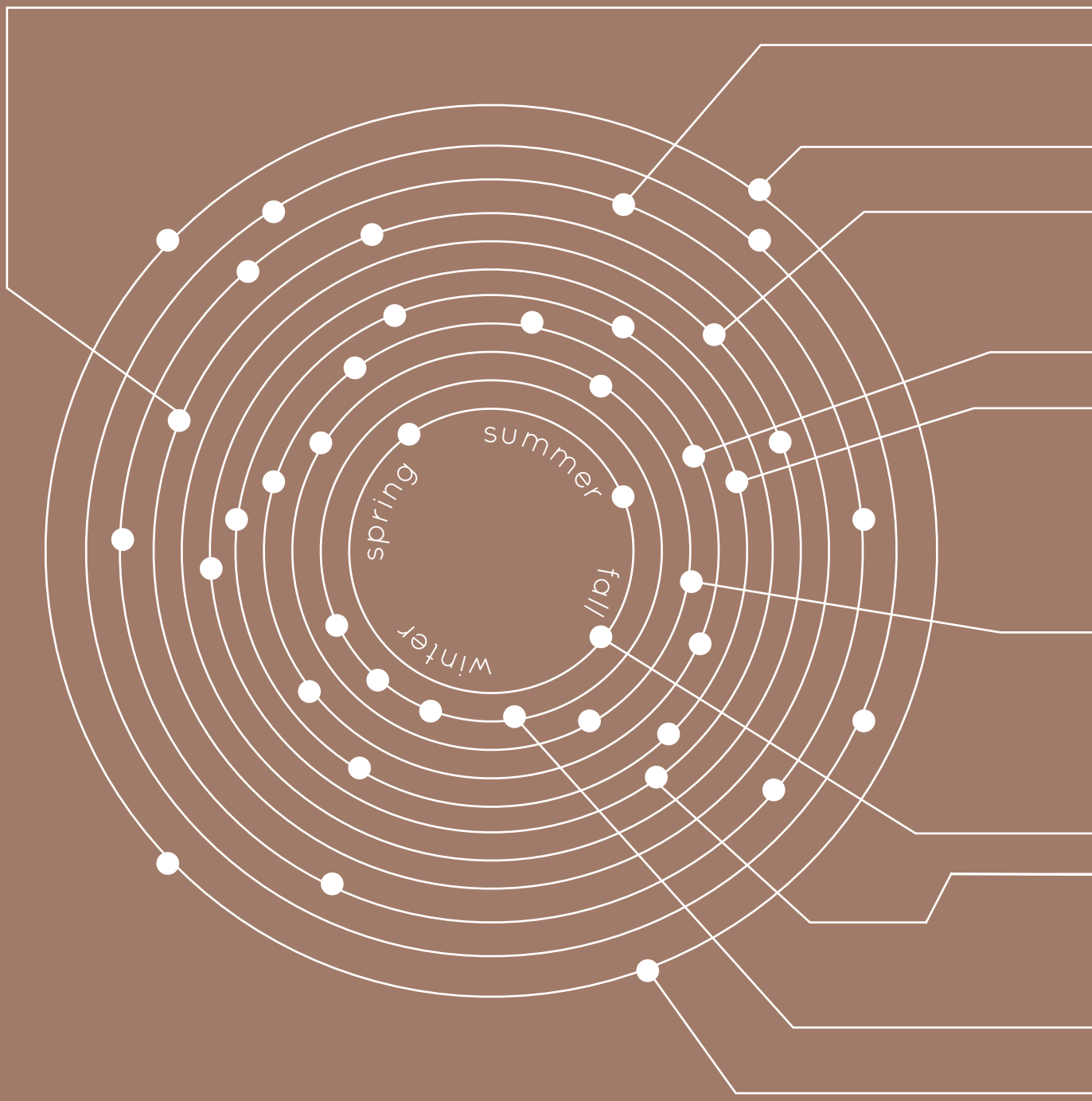
In August of 2020, the Office of the Treaty Commissioner (OTC) formalized a partnership with the Treaty Land Sharing Network through a pipe ceremony at one of the land sharing events. Speaking of the TLSN, Amy Seesequasis, director of public education for the OTC, notes that "We have roles and responsibilities as Treaty people and obligations to teach each other respectfully and give each other fair access, fair space, and have that mutual benefit."[22]

Truly, land sharing is to our mutual benefit. Writing of one of the land sharing events, reporter Katie Doke Sawatzky describes how one settler landholder learned of a former buffalo run on land he pastures, pointed out to him by an Indigenous knowledge keeper during a land sharing event.[23] Another landholder who has joined the network, Mary Smillie, says that "We have to open up these lands because there's so much more to discover than what [I or my family are]… going to… We have such a narrow view of what's here."[24]

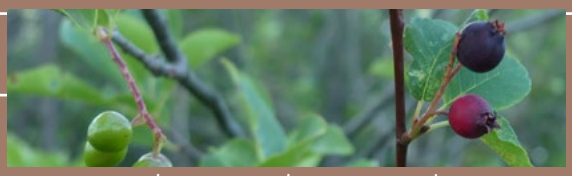
Connecting to the Treaty Land Sharing Network is perhaps the simplest and most effective programming that should take place on the former public pastures. As leased Crown Lands, they are already open to public use outside of the grazing season, but formally and explicitly welcoming Indigenous use of the land is a simple but very powerful and important gesture and act. Restoring and supporting Indigenous use and presence on the land is important for the survival and health of Indigenous culture and society, but it is also something that can support settler understanding of place and a healthy and robust relationship with the landscape.

land sharing event, image courtesy of Valerie Zink

sample of proposed events



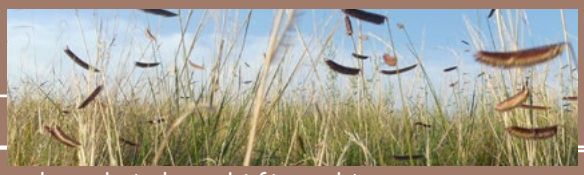
new moon gathering + naked eye astronomy



prairie berry harvest + making

community campfire + story telling

community barbecue



plant identification + language lessons

contemporary dance composition

dawn chorus day celebration

cattle parade

kite flying + cloud lessons

controlled burning demonstration

animal print snowshoeing + winter ecology walk

image citations p. 308-309

pasture gate at Regina Beach, a former SPP pasture

a place

siting the proposal

The series of events and initiatives that have been laid out in the previous chapter could be held at virtually any of Saskatchewan's former public pastures. Many of the events require minimal physical interventions, and of those that do, many could be achieved with a temporary installation of amenities (tents, barbecues, tables, chairs, telescopes, stages, etc). Just as Vancouver's SongBird project did not revolve around any single defined site, the proposed programming could stand on its own and be held rotationally at various former public pastures, or indeed private pastures or other reserves of native prairie.

But as examined through the case studies, programming is not the only way of eliciting an aesthetic experience, or capturing the aesthetic attention of a visitor. For some people, a quiet and solitary walk through a grassland will be a far more effective (and affective) experience than attending a performance or other type of event. If a site can be provided that accommodates independent access without compromising any of the economic, industrial, or ecological functions of the pasture, and can be constructed in a way that reveals or interprets the prairie to the visitor, this would provide a significant resource to the goals of expanding prairie appreciation. This has particular relevance because one of the significant phenomenological experiences that one encounters on the prairie, as described by Stegner among others, is the serenity and awe that comes from standing, "from looking a long way, from looking up, from being much alone."[1]

There is thus an advantage to finding a site to locate the events and initiatives on, and to then install physical interventions that support not only the programming and initiatives, but the goal of revealing what is beautiful, important, and worth protecting about native prairie.

The considerations for the site design are:

- It should be on or adjacent to native prairie
- It should lay lightly on the land, with a minimum impact to the healthy functioning of the adjacent prairie
- It should be accessible to visitors even when the pasture itself is not
- The design should implicitly and/or explicitly reveal and/or interpret events,

processes, states, or objects that have ecological or cultural significance
- The design should support the functioning and goals of the proposed events

This latter means that the design should include the kind of infrastructure that would be required to welcome visitors who have driven a moderately significant distance to reach the site: it should include parking, washrooms, and at least one point of garbage disposal. The design should also include infrastructure that supports the proposed activities and events on the site in a more targeted way. Given that some of these activities are proposed during the winter months, this should include a shelter where visitors can warm up. The shelter would also be useful as protection against inclement weather between spring and fall: Saskatchewan sometimes sees very sudden and dramatic weather events such as intense hail or even tornados, and to be caught on the open prairie without shelter could be potentially harmful. With campfires and cookouts as potential events, a firepit and/or barbecue would be a useful addition to the site, as would a design that provides shade during the hottest and most intensively sunny days. The design should support the possible performance uses of the site, as well as allow areas where groups of people could easily gather to listen to an interpreter or guide. There should also be accessible storage units that can contain and protect other instruments that might be used during an event, like magnifying glasses, telescopes, trail stakes/markers, flashlights, etc.

Furthermore, the design should be easy to access for a large number of people. Grasslands National Park hosts a wonderfully extensive set of programming at both the East and West blocks, but its location along the American border puts it out of the range for day trips for residents of both Regina and Saskatoon. Between the two of them, these centres are home to approximately 46 per cent of the provincial population (according to the 2016 census).[2] Although visitor numbers to Grasslands have been increasing over recent years, there are still many people who head to forests, lakes, and mountains for camping trips or long weekends.[3]

The distribution of the former public pastures throughout the province means that there is a pasture at an accessible distance from virtually any town, city, or village in southern Saskatchewan. We can consider them as potential prairie stepping stones that might lead visitors down to Grasslands National Park, where their experience of the prairies can be deepened through scale and immersion. The purpose of locating the engagement programming is to make people take the first step on the path to prairie appreciation, to draw them out to larger reserves of prairie that are farther from the urban centres.

case study: grasslands national park

Southern Saskatchewan

Divided into two blocks, the East Block near Killdeer, Saskatchewan, and the West Block near Val Marie, Saskatchewan, Grasslands National Park is Canada's only national park representing the prairie ecozone. Both blocks contain large continuous tracts of native prairie abutting the American border, and both are actively grazed as part of their maintenance regimes, the east by cattle and the west by bison. The west block is also home to rattlesnakes, while the east block contains natural instances of both badlands and quicksand. The area that covers the two blocks is also Canada's darkest dark sky preserve, making it an excellent destination for astronomers.[4]

Like other national parks in Canada, Grasslands is open to camping (with both front and backcountry options available) and maintains a network of hiking trails. Visitors can also take equestrian tours run by local companies, or bring their own horses to the park (equestrian camping is available). In addition to these recreational uses, visitors can attend specialized programming unique to the park, including interpretive hikes on history, ecology, archaeology, and paleontology (the East Block is one of the places in the world where the Cretaceous-Tertiary Boundary, or the line of ash indicating the extinction event that ended the dinosaurs, is exposed to the naked eye).[5] Both blocks also hold events in conjunction with the Royal Astronomical Society, as well as sessions focused on art, and campfires dedicated to local stories and legends (some of which are specifically focused on the wild west and cowboys with particular connections to the park). The East Block also has a partnership with a storyteller and artist from the Lakota Nation who hosts a session blending art production with legend.[6]

The physical interventions at the park support the park's programming without compromising the ecology of the mixed-grassland ecoregion. The campground facilities are minimally built up, with dark-sky lighting (low-level, solar-powered garden stake lights are employed to just light only the required areas, like the path to the washroom), and the vault toilets do not include running water. Barbecues are provided in a shelter that can be fully closed against wind and inclement weather.

The hiking trails are minimally maintained. In many places the trail is simply worn by the feet of previous visitors, and marked by yellow metal stakes similar to the trail markers along the Trans-Canada Trail. The next stake is always visible from the previous one along the trail, though otherwise there are no indications of which route you are following or how much further you have to go. This is in contrast to parks like Banff National Park, which has comparatively plentiful signage. The difference responds to the distinct landscape conditions: Grasslands National Park is barren of naturally growing trees, and it is possible to see much farther in any given direction

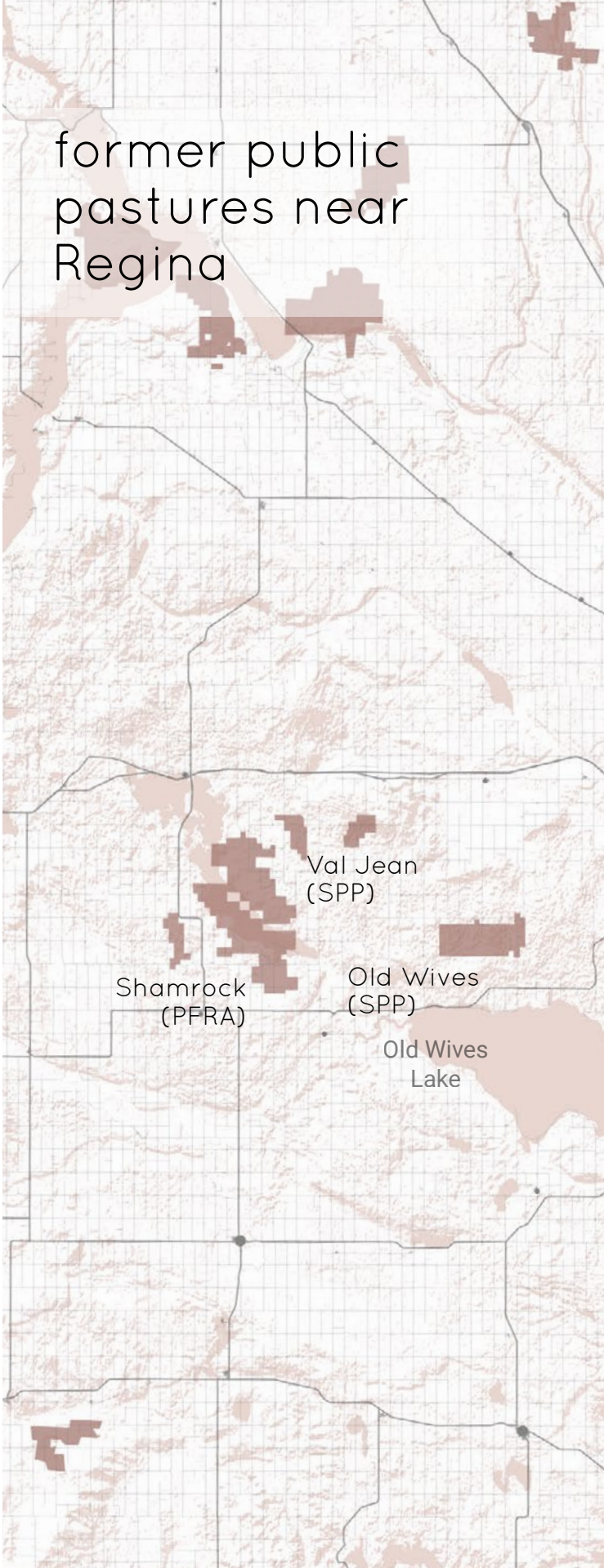
Parks Canada oTentiks overlook the Frenchman River at the west block, GNP

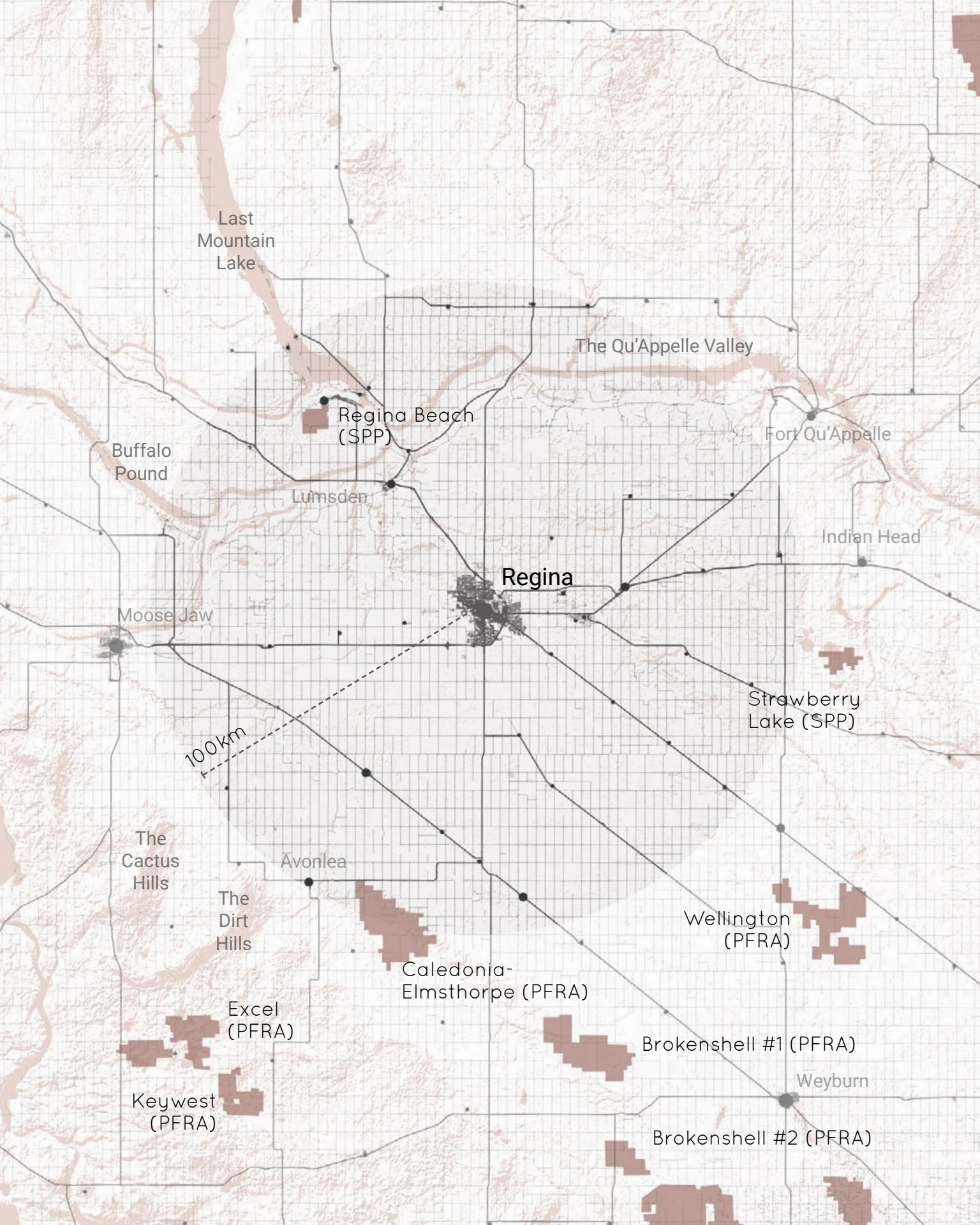
than at other parks. The system of trail marking works smoothly while having as minimal an impact as possible on the land.

Take Aways

- Minimal infrastructure supports a wide variety of programming for approximately 17,000 visitors per year (based on average attendance between 2017 and 2020).[7]
- Programming focuses on the unique ecology, history, and culture and the east and west blocks, respectively.

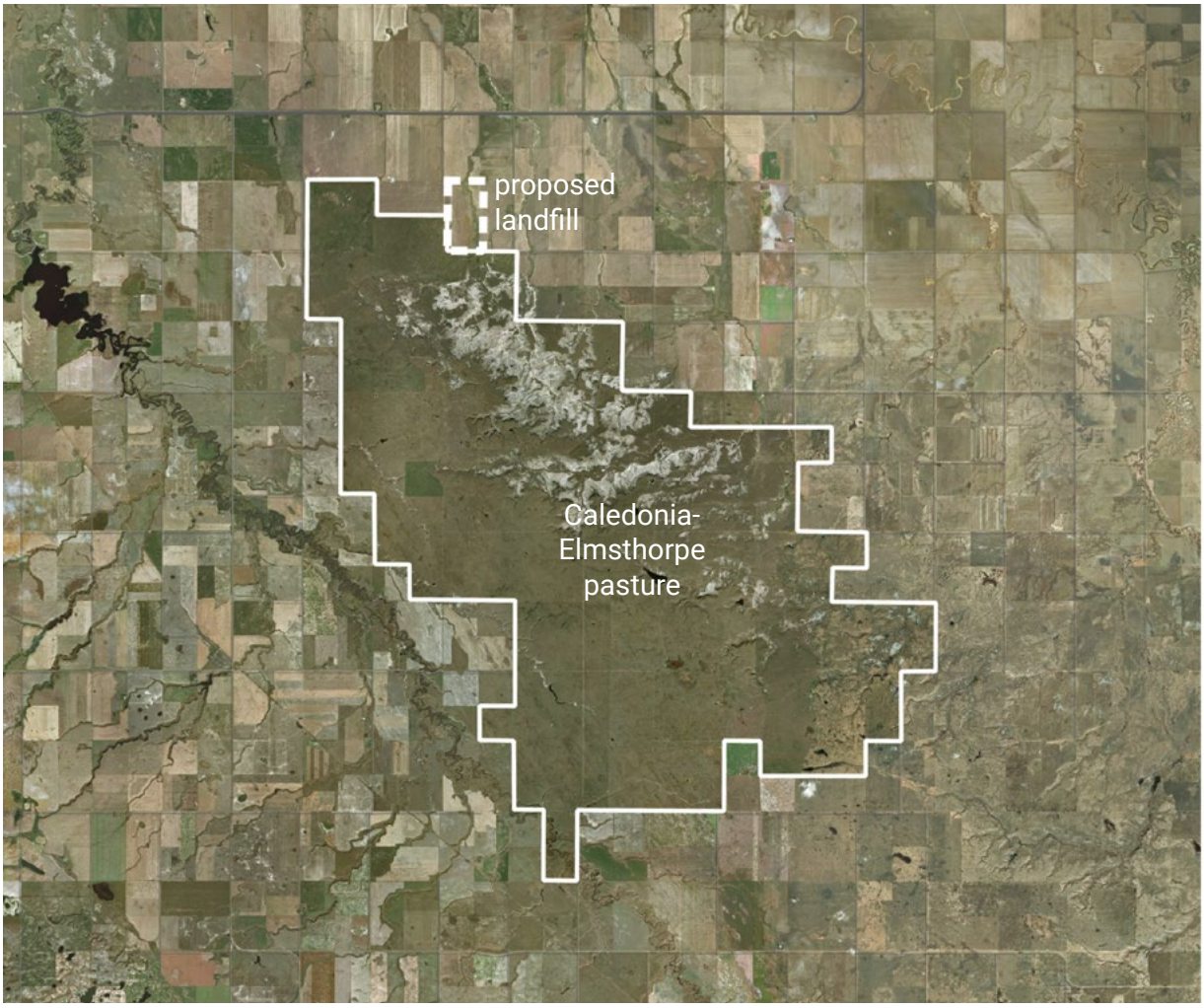
In looking for a site, I narrowed my focus to the pastures that were within an hour's drive of Regina, the provincial capital. With a population representing roughly 20% of the province, Regina provides a good potential source of visitors to the site. Additionally, over 91 schools operate in the city, educating more than 36,500 students every year.[8] If the site design can support school trips or host outdoor education curriculum, it could reach a significant number of youth, and help inform early opinions on the recreational, ecological, and cultural value of prairie landscapes, modelling to the next generation that recreational opportunities are not limited to the forests and lakes of the province.



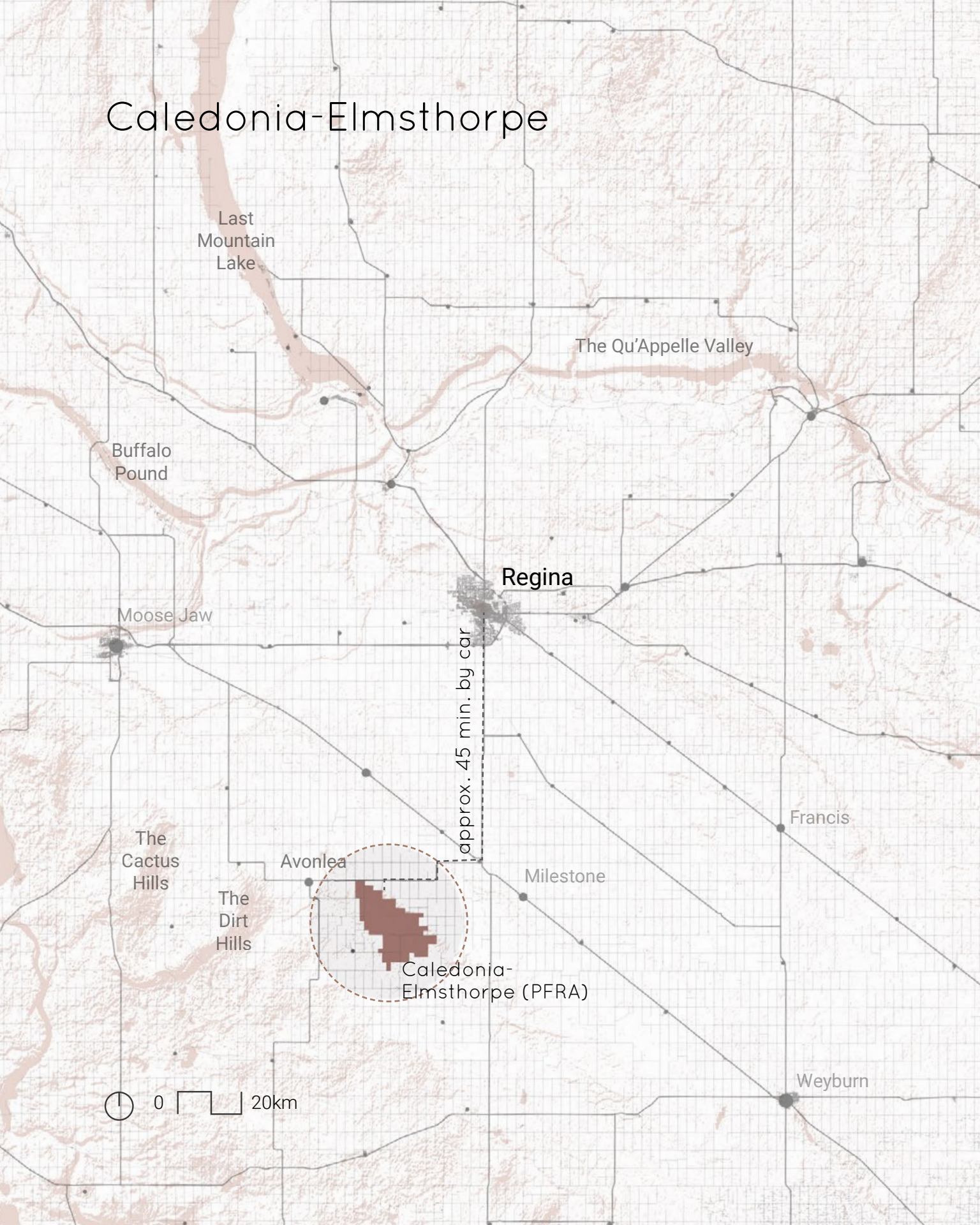

Last Mountain Lake
The Qu'Appelle Valley
Regina Beach (SPP)
Fort Qu'Appelle
Buffalo Pound
Lumsden
Indian Head
Regina
Moose Jaw
Strawberry Lake (SPP)
100 km
The Cactus Hills
Avonlea
The Dirt Hills
Wellington (PFRA)
Caledonia-Elmsthorpe (PFRA)
Excel (PFRA)
Brokenshell #1 (PFRA)
Weyburn
Keywest (PFRA)
Brokenshell #2 (PFRA)

During the research stage for this project, which involved visiting the pastures around Regina, the Rural Municipality of Caledonia received a proposal for the construction of a private landfill on a plot of land adjacent to the Caledonia-Elmsthorpe former PFRA pasture. I became aware of the proposal first through its mention at a prairie conservation webinar, and encountered the news again at the PPPI Annual General Meeting. The news of it was also disseminated via Facebook, local media outlets, and a change.org petition which aimed to halt the proposal.[9]

The landfill was proposed by Loraas Inc., a private waste management company that operates in the province, serving a wide customer base that includes commercial businesses, the construction industry, and a number of smaller rural communities which do not have the resources to manage their own municipal waste operations. Loraas currently operates a private landfill north of Saskatoon, and via this proposed landfill were looking to open another to service their operations in Regina and the surrounding area.



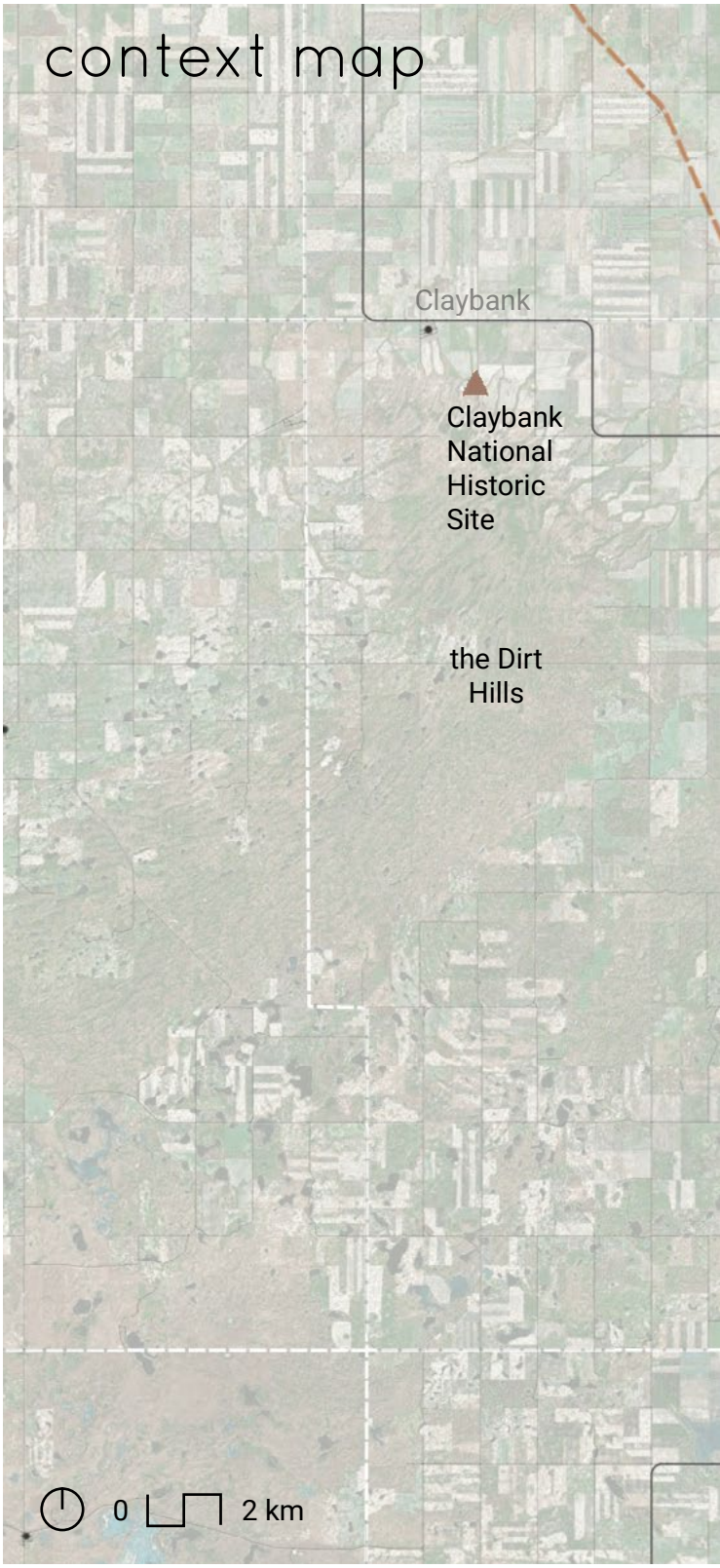
Caledonia-Elmsthorpe

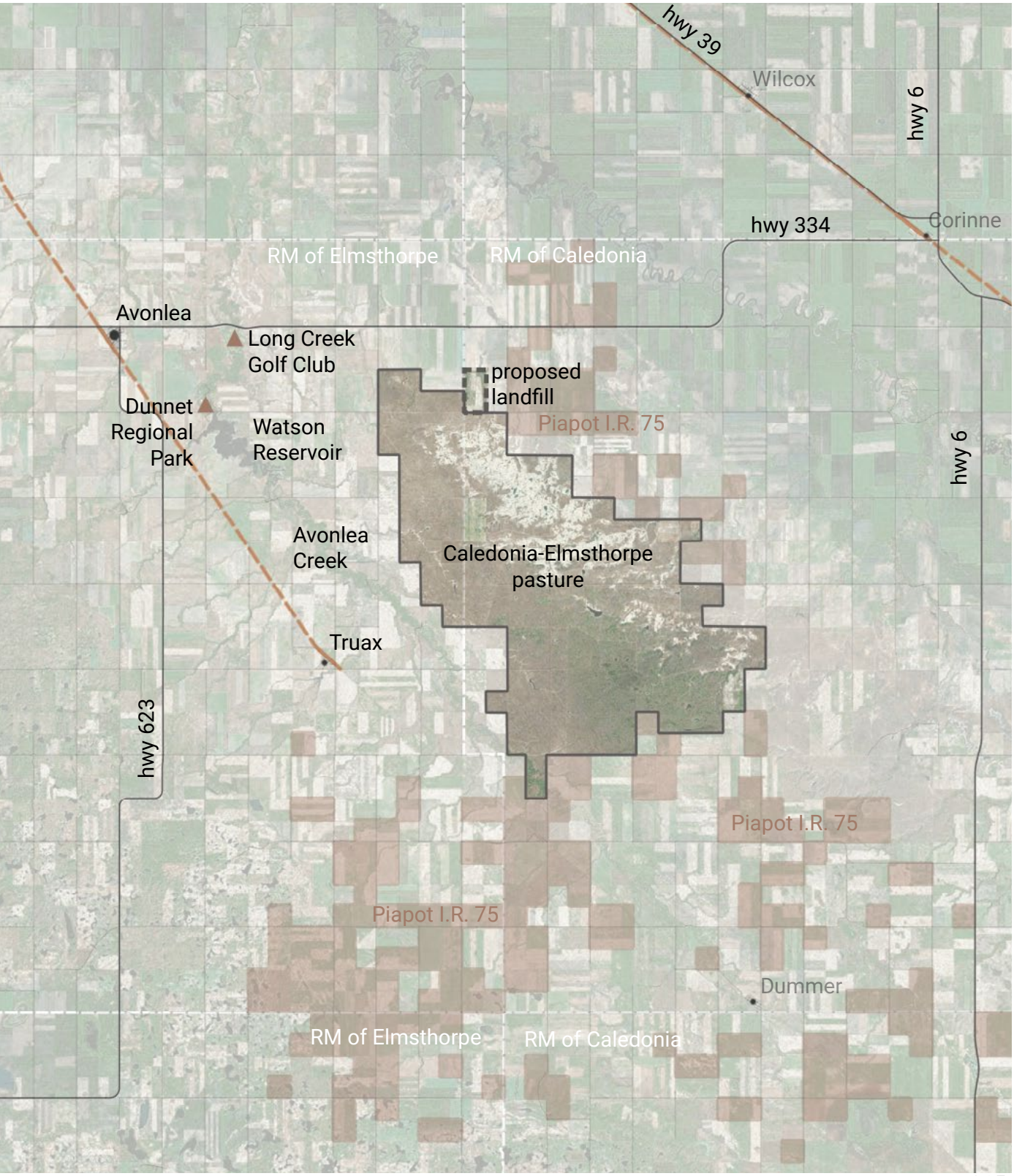


Claybank National Historic Site

the Dirt HIlls

Avonlea




hwy 39
Wilcox
hwy 6
hwy 334
Corinne
RM of Elmsthorpe
RM of Caledonia
Avonlea
Long Creek
Golf Club
proposed
landfill
Dunnet
Regional
Park
Watson
Reservoir
Piapot I.R. 75
hwy 6
Avonlea
Creek
Caledonia-Elmsthorpe
pasture
Truax
hwy 623
Piapot I.R. 75
Piapot I.R. 75
Dummer
RM of Elmsthorpe
RM of Caledonia

There was significant pushback from members of the community, and for good reason. Although the proposed landfill site itself was not native prairie (it is currently cropped), it is bordered on two sides by the former Caledonia-Elmsthrope public pasture land. While the two quarter sections have been plowed seasonally for decades, the land was never drained, retaining both a creek that runs through the parcel and a seasonal water run that drains from the pasture and towards the Moose Jaw River. Though it is a farmed field, it is also an ideal breeding ground for Sharp-Tailed Grouse, and local reports of a lek on the site was one of the reasons that the community campaigned against a landfill.


Regina
(approx. 45 min
by car)
highway 334
field access road
gravel road
abandoned house
creek
seasonal
creek
reported
lek
creek
vehicle gate
badlands

sharp-tailed grouse

If Sharp-Tailed Grouse are familiar, it could be because they are the provincial bird of Saskatchewan, and it could be because they have been mentioned previously in this document. The birds are a well-recognized and well-loved species across the Great Plains, and have been proposed before as an umbrella species for the prairies.[10] This is because their habitat requirements include such a diverse mixture that a landscape that can support Sharp-Tailed Grouse typically also is one that can support a wide range of other prairie species.

Grouse require tall grassland for brood rearing and nesting, but they also like shrubby areas to be nearby: shrubs provide protection from the elements as well as escape cover when a predator is sensed. Shrubs, and riparian areas, also can help protect young chicks against intense heat in the summer. Some shrubs like wolfwillow and wild rose also help to provide winter forage for sharp-tailed grouse, as the birds do not migrate but reside on the prairies year-round. While tall grass and shrubby areas are important, grouse also require open and low grasslands (ideally with a small amount of bare ground mixed in) for their breeding grounds, or "leks." [11]

Sharp-Tailed Grouse, like the Greater-Sage Grouse, are well known for their breeding rituals. In the spring, the males perform an elaborate dance for the females, who watch from the boundaries of the lek, or the dancing grounds. Leks are roughly oval or circular in shape, ranging in area from five to 20 m^2, often with somewhere between 10 to 20 dancing males. While the males dance individually and compete against each other for the attention of the females, the lek is a communal space, shared by a population. The birds have such an enormous attachment to it that they will return to the same lek year after year, sometimes for decades.[12]

Although it was at one time believed that cropping would deter males from using the lek, the place attachment that Sharp-Tailed Grouse have to the lek site is so strong that groups often continue using their leks even after the land is converted to crop agriculture.[13] As long as stubble is left standing in the field over the winter, when it comes times to dance (usually starting in late March, peaking in April, and petering out in May) they will return to the ground. In fact, Sharp-Tailed Grouse prefer a very low plant cover on the lek, which increases the visibility of the dance to any nearby females, and a stubble field can suit their needs – as evidenced by the continued use of the lek near the Caledonia-Elmsthorpe pasture, which is reported to have been used for the last several decades in spite of it being used for crop agriculture.[14]

What does interfere with lek behaviour is if too much of the nearby native grassland is lost to crop agriculture. Lekking can continue on ground used for crop agriculture, but only if there is plentiful brooding and nesting habitat nearby. Successful and active leks tend to be within two kilometers from brood rearing and nesting habitat.[15] Broods range between 50 to 500 acres, with the average range approximately 172 acres, or a quarter section.[16]

male Sharp-Tailed Grouse on the lek, image by Alan Schmierer


habitat for sharp-tailed grouse
adjacent cropland (seeds to supplement adult diets)
low, wet areas with dense forbs (food for adults)
grassland with areas of low shrubs for nesting
open/low grassland or stubble fields for lekking
tall grassland for brood rearing
shrubby areas for protection from elements and predators
shady areas for chicks during summer heat

Lekking behaviour can also be easily disturbed by the presence of humans. Specifically, by visible human presence.[17] If humans interrupt the performance on the lek, the males will escape and seek cover, interrupting the mating process and potentially having adverse effects on mating success.[18]

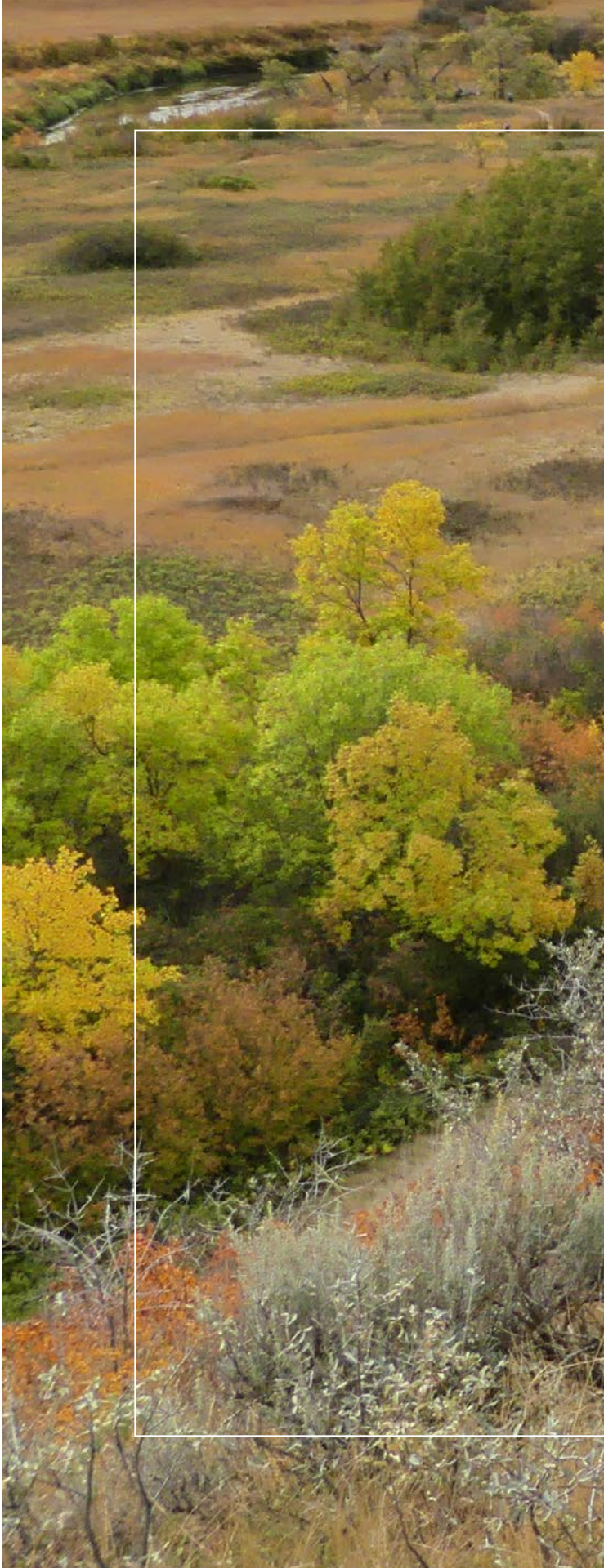
The lekking behaviour, which peaks in the spring but is repeated in a more subdued manner in the fall, is one of the things that makes Sharp-Tailed Grouse so recognizable and loved. This contributes to their ability to serve as a flagship species for conservation efforts, as demonstrated by Sharptails Plus, a Manitoban conservation group that highlights the Sharp-Tailed Grouse as a flagship conservation species.[19]

As previously reviewed, a flagship species is one that is culturally significant, and can act as a representative for conservation efforts. The Sharp-Tailed Grouse is able to fill this role because it is easily identifiable: it has unique colouring with a golden brow and purple air sacs, a robust size and shape, and exhibits highly recognizable dancing behaviour. It also makes a distinct bird call. All of these things together make it a species that amateur birdwatchers and even non-birdwatchers can identify with just a minimum of education. On top of this, the sharp-tailed grouse is culturally significant to several Indigenous groups of the Great Plains; the male's dances are even the source of inspiration for some traditional Indigenous dances performed during ceremony and celebrations.[20]

The Sharp-Tailed Grouse is not the only species that can successfully serve as both a flagship and an umbrella species, but the coincidence of these roles also is not excessively common. There is much potential good that can be done for prairie conservation by emphasizing the needs and importance of this bird, and by elevating and highlighting its cultural value to the local human population.

Although the Sharp-Tailed Grouse is not endangered in Saskatchewan, the population has seen declines over the last decades, mostly due to lost habitat, and it is considered to be a sensitive species. Because it is still relatively plentiful when compared with many other grassland birds, the perceived urgency to protect it is not as high. This is evidenced by the fact that Sharp-Tailed Grouse are still hunted in the province, though there are bag limits.

The place attachment exhibited by Sharp-Tailed Grouse to the lek leaves them vulnerable to unethical hunting. While many hunters care deeply about keeping the sport between the hunter and game fair, and many also care about conservation, it would only take one careless or unethical poacher with knowledge of a lek site to return day after day over the course a few weeks, and pick off an entire local population of grouse. This is one of the reasons that many conservation groups dissuade people from publishing or promoting the location of lek sites. The risk certainly gave me pause when considering this site for the proposed design, as it would entail re-mentioning the location of the lek. The lek site has been previously published, and it was done so for the purpose of trying to save it from development.[21] This was a worthwhile effort, and one that paid off: as of the summer of 2021, Loraas has decided to withdraw their proposal from the site and look for a more suitable location.[22] In the end, I have chosen to locate the lek in this document, trusting that someone who has taken the time to review these pages will honour the lives of this community of birds, and trusting too that the knowledge and design application exhibited in these pages could be useful to others, and that this information could serve an important purpose.



Wascana Trails, a recreational site near Regina

Ultimately, while hunters pose a threat to grouse, lost habitat is the greater and more pressing threat. For decades now it has been acknowledged by wildlife ecologists that "Loss of habitat to agriculture [is] identified as the central cause of population reductions of sharp-tailed grouse in many parts of North America."[23] A proposed landfill on Sharp-Tailed Grouse breeding grounds just happens to be a recent and visible example of how native prairie continues to be lost to development, how their habitat and the habitat of so many other prairie species is slowly but continuously eroded. Installing a landfill on the site of the lek would have forced the grouse to "search for greener pastures." Yet if we continue to treat Saskatchewan's remaining native prairie with disregard, there eventually will not be any greener pastures left for the birds to retreat to.

Beyond its very direct and perceivable impacts on the lekking grounds of the Sharp-Tailed Grouse, a landfill on this location would have had a negative impact on all the other species that use the habitat provided within the Caledonia-Elmsthorpe pasture, including a number of birds who *are* critically at risk and endangered, including Burrowing Owls and Sprague's Pipit.[24] What impact does building a landfill have on the surrounding environment and its most vulnerable inhabitants? Neither animals nor the wind recognize the invisible property lines humans draw on the land, and even with the best human precautions, the impacts of this landfill can not be contained within its site.

the birds of caledonia-elmsthorpe

(54 bird species total)

image citations p. 309


bird decline since 1970
-39% birds tolerant of agriculture
-59% all grassland birds
-87% birds dependent on native grasslands
0
1 km

Studies have shown that the wind is capable of dispersing garbage well beyond two kilometers, and this is particularly true in relatively flat areas with few trees.[25] This dispersal poses a risk for birds and other animals that might try eating the wind-blown trash, using it for nest construction, or who may simply become entangled within something that to a human is beneath notice but to a bird could be life or death.[26]


N
NNE
NE
ENE
E
ESE
SE
SSE
S
SSW
SW
NW
NNW
750
500
250
trash movement
Caledonia-Elmsthorpe Pasture

We also need to consider that during the life of a landfill, we create and sustain a new habitat, and that in doing so we invite different species into the area, including seagulls, crows, ravens, rats, and raccoons, that will be drawn to the new food source we are providing. What kind of competition or even threat will these newcomers pose to species that are already living on a knife-edge of habitat?

Human societies produce waste and we need landfills. Landscape architects have contributed to the design and reuse of former landfills; their after-use has great potential. But during the lifespan of landfills, they change the immediate surrounding environment, and this remnant island of prairie and its inhabitants would be hard-pressed to outlast the life expectancy of the landfill. There are locations around Regina, already heavily impacted by industrial or agricultural uses, that could better absorb the impact of an active landfill. But to place it here, on the edge of a healthy prairie remnant, would perpetuate a disregard for native prairie that has been insidious in Saskatchewan since settlers arrived in the region 150 years ago.

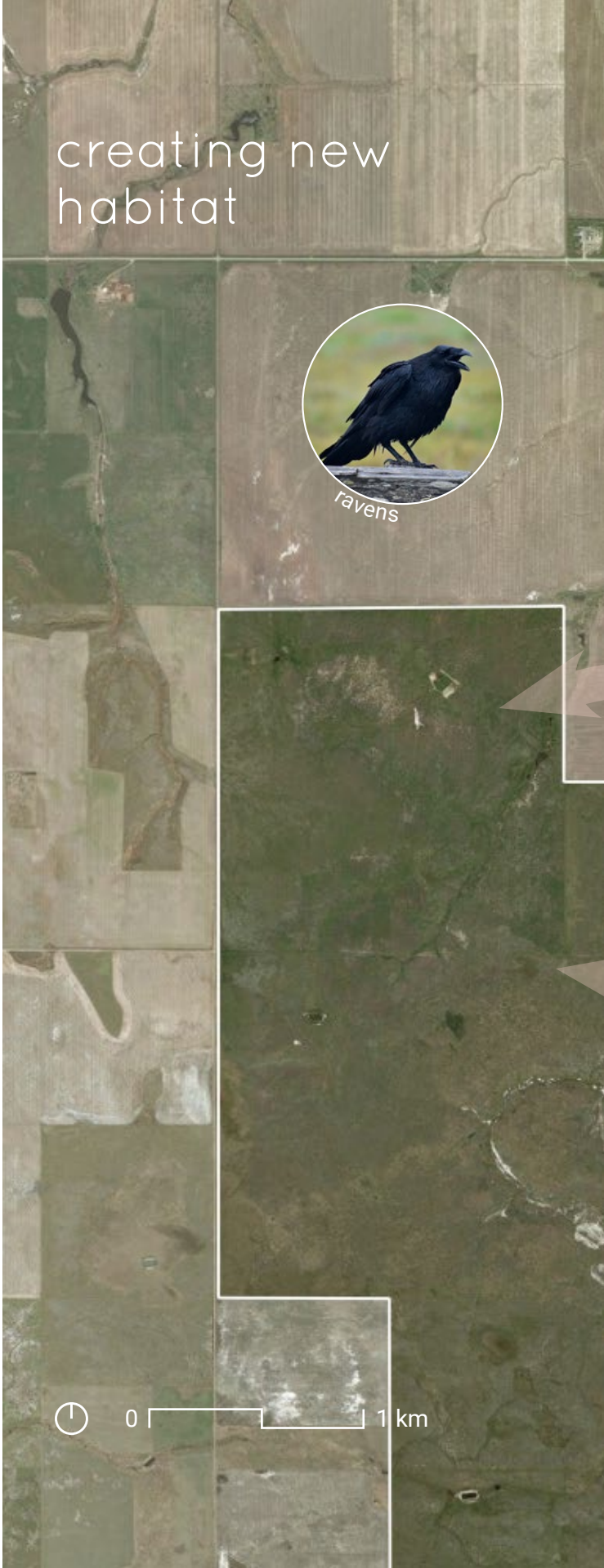
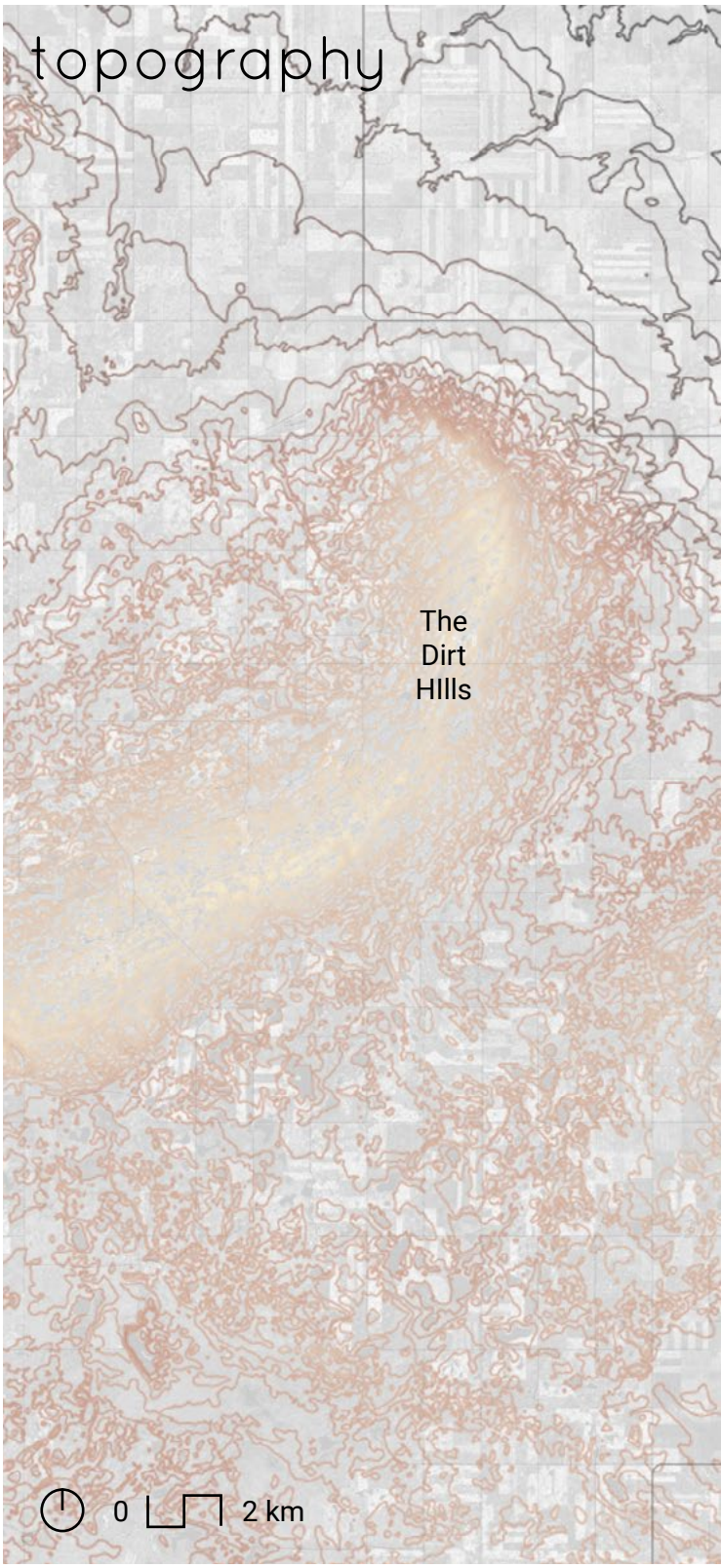
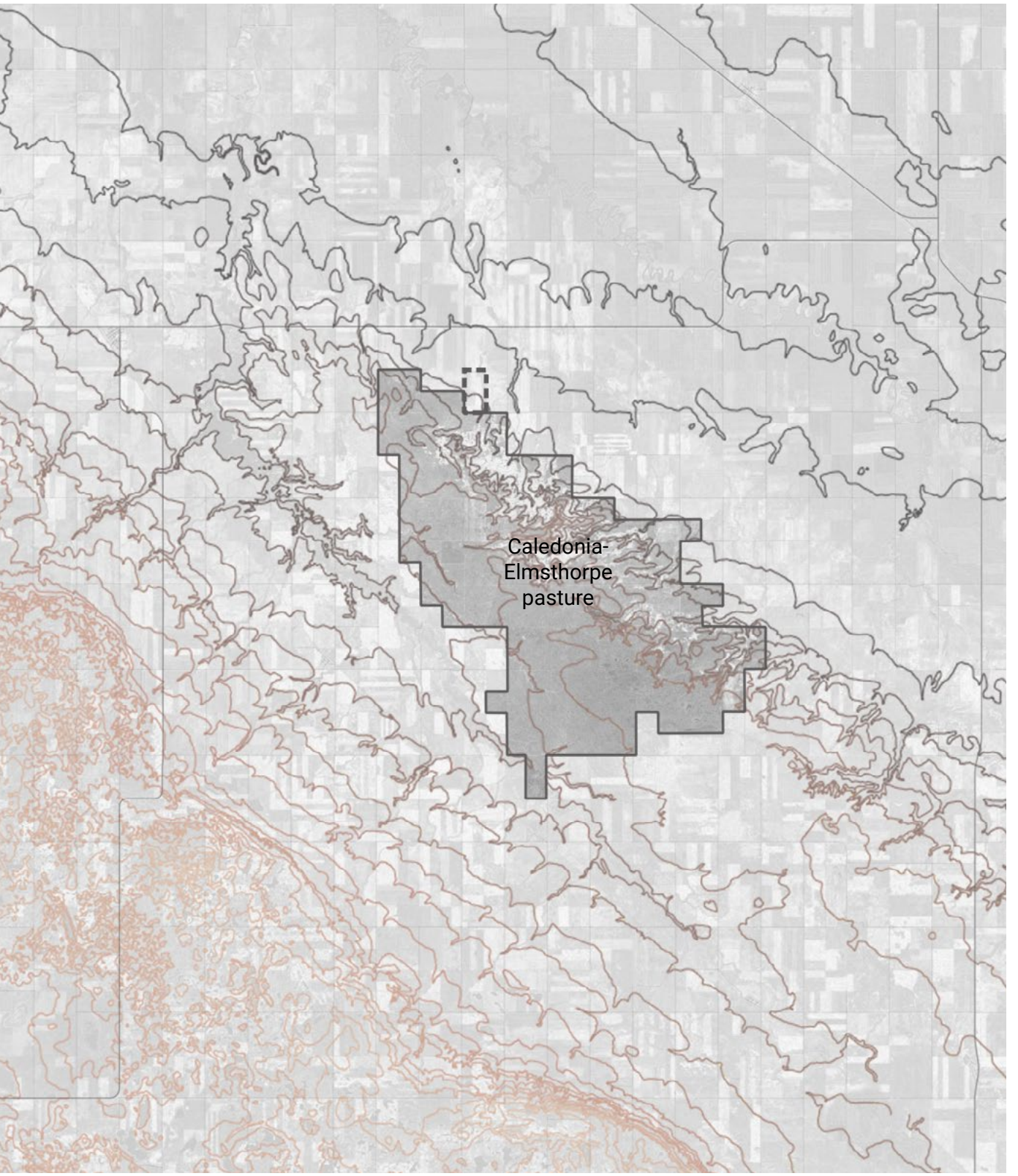


image citations p. 309

We might also ask whether it perpetuates a disregard for the Indigenous residents of the land, as the site of the proposed landfill was in the vicinity of land belonging to Piapot First Nation.[27] Beyond any potential impact to this particular nation, the site also sits in the viewshed of the Dirt Hills, which are rich with Indigenous archaeological sites, and significant to groups beyond Piapot.[28] The view of the land from these hills has already been so altered. We should ask the question whether it truly needs to be altered further via the installation of a landfill, and what that might mean to the people for who those hills are sacred ground.



elevation
860 m
765 m
665 m
570 m


Caledonia-
Elmsthorpe
pasture

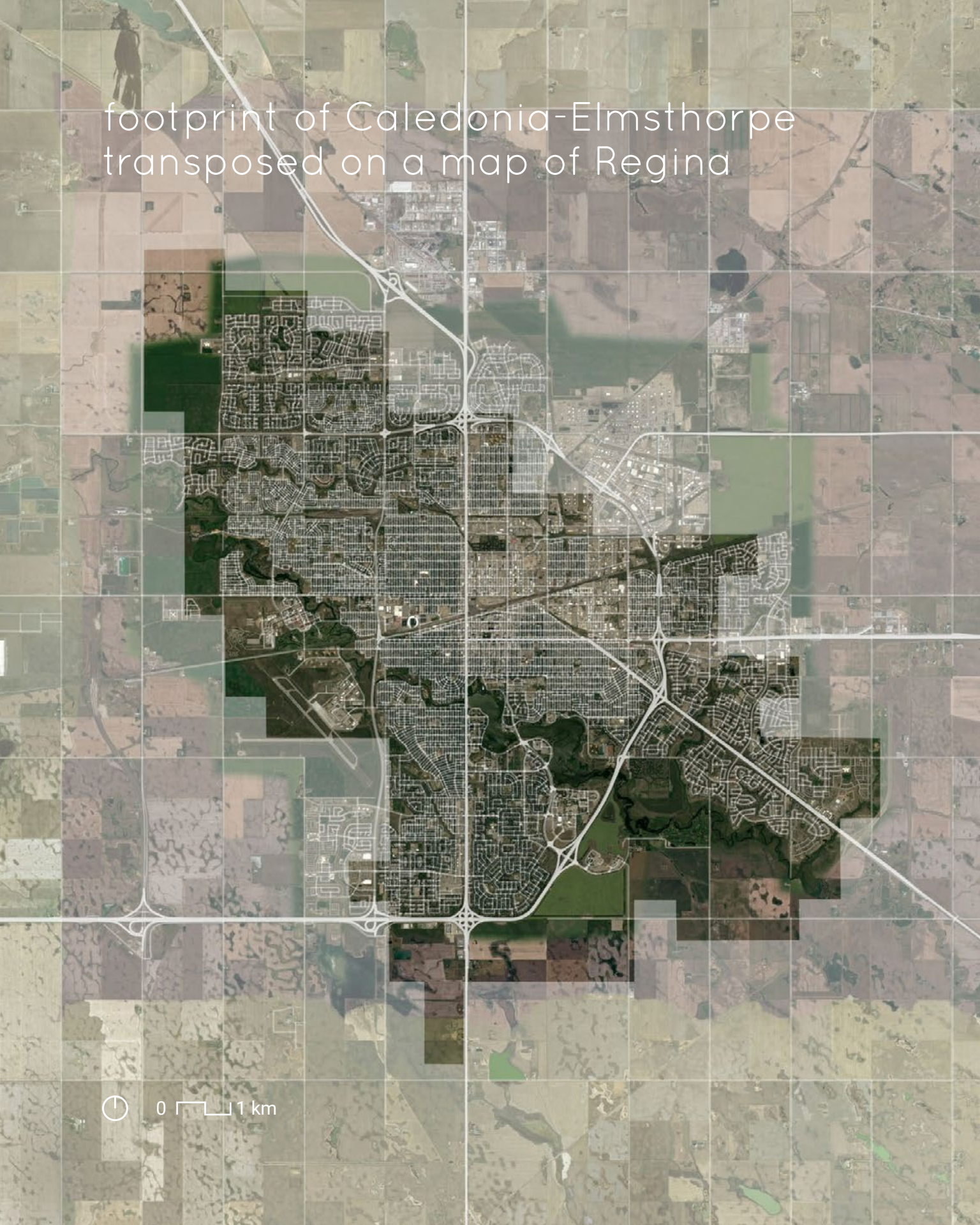
a gateway to the pastures

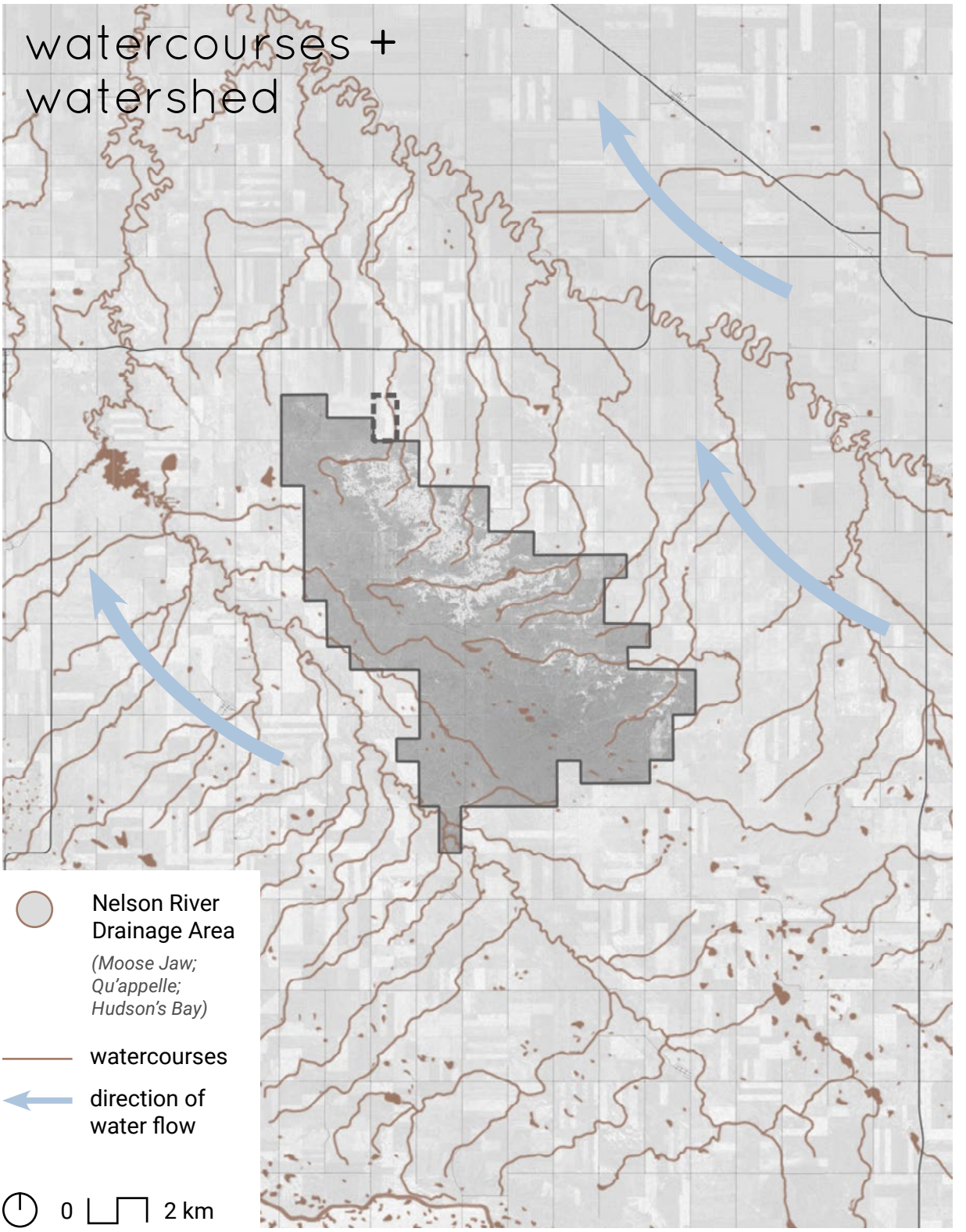
When I learned of the landfill proposal, I was immediately frustrated, but also found in it an opportunity for siting the design of this practicum. Instead of becoming something that threatens the health of the pasture and everyone who relies on it, the site of the proposed landfill could become something that supports the Caledona-Elmsthorpe pasture, extends, and mediates its relationship to the public. What else, and who else, could be invited into this space on the edge of a prairie remnant?

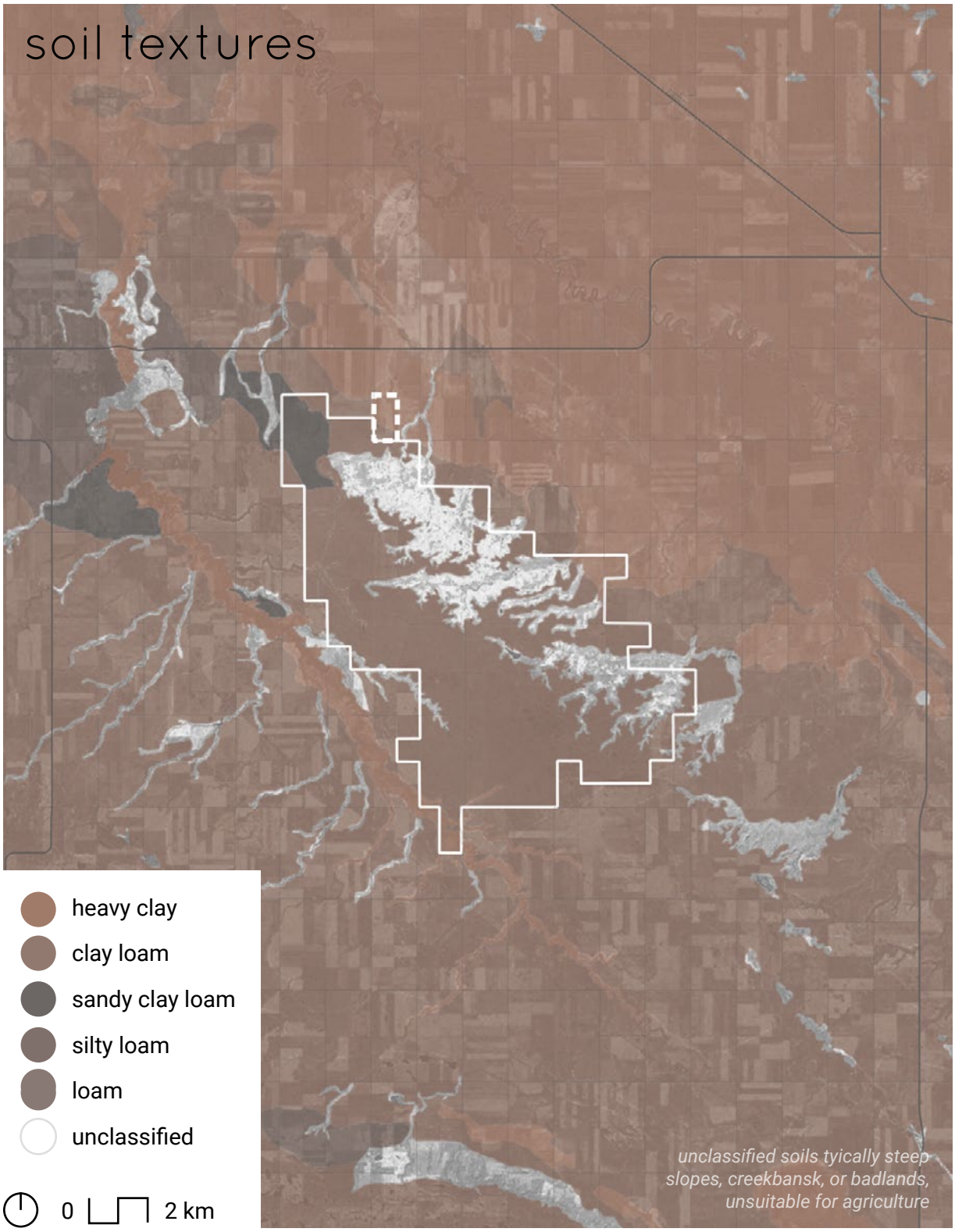
It was coincidence that of the pastures near Regina, Calendonia-Elmsthorpe is the one that has hosted community events in years past, included guided walking tours and trail rides.[29] It also is one of the largest former public pastures within an hour's drive of Regina: at roughly 27,000 acres, it is nearly the size of the city itself.[30] Additionally, the pasture was assessed in 2005 as containing a native grass coverage of 93%.[31]

The scale of the Caledonia-Elmsthorpe pasture means that when inside its boundaries, there are places where the exterior fence is lost to sight, and you become totally immersed in the prairie, its edges invisible underneath the limitless sky.

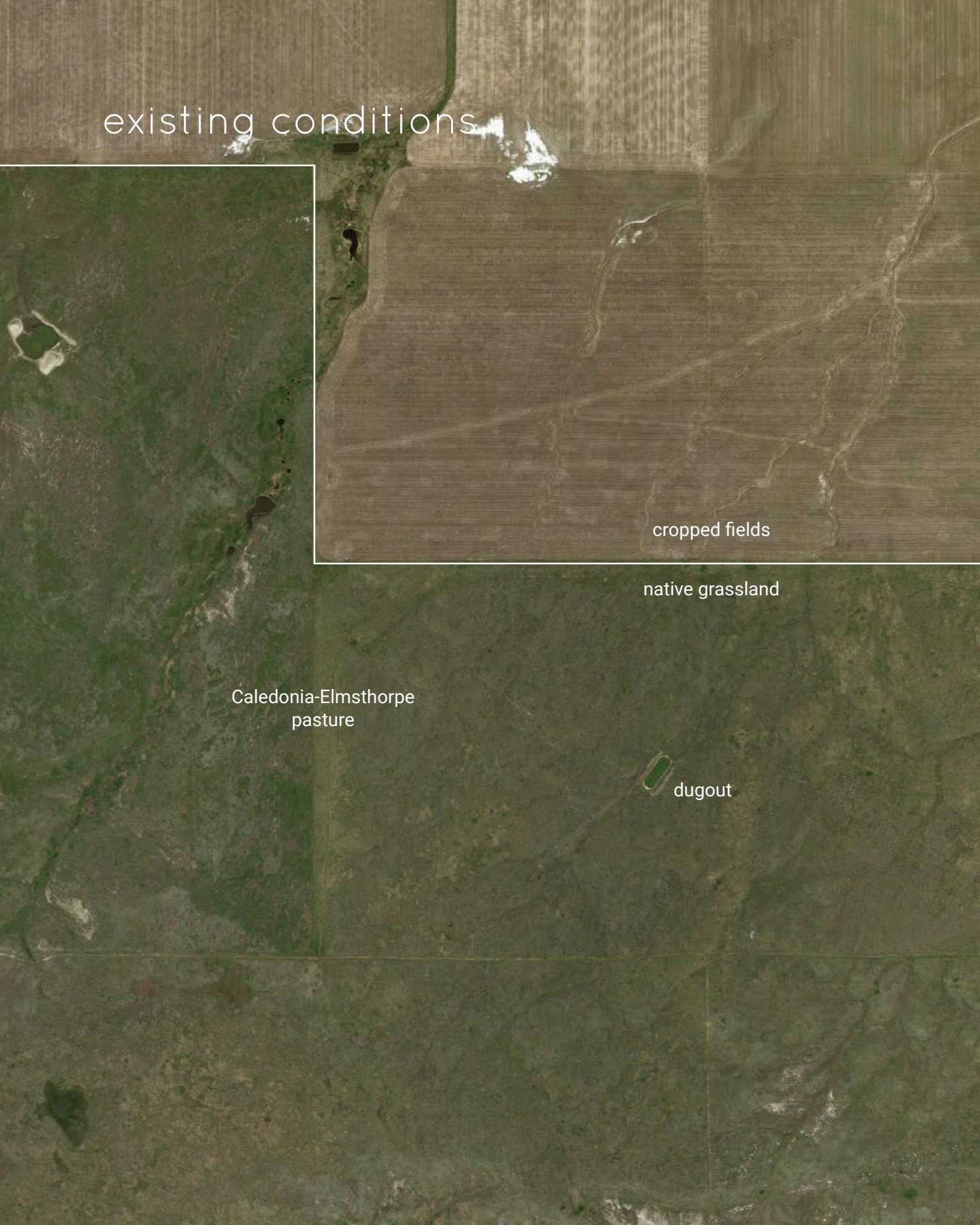
The Caledonia-Elmsthorpe pasture has the potential to act as a space of education and recreation, to welcome people and introduce them to native grass and to the prairies, to provide opportunities to stop and really learn about them, experience them firsthand. The proposal site, separate from but adjacent to the actual pasture, can be open to the public all the time without carving space out from the pasture itself and without the risks to the herd associated with pasture gates accidentally left open by visitors. The site, two quarter sections on the edge of the prairie, is beautiful in its own right, with a creek and riparian edge, a seep bleeding into a surrounding marsh, and an apparently abandoned homestead, a few planted trees keeping the old structure company. With programming and some built elements to frame and enhance its existing beauty and relationship to the pasture, the site becomes a gateway, a mediator, and a threshold.


footprint of Caledonia-Elmsthorpe
transposed on a map of Regina
0
1 km


watercourses +
watershed
Nelson River
Drainage Area
(Moose Jaw;
Qu'appelle;
Hudson's Bay)
watercourses
direction of
water flow
0
2 km

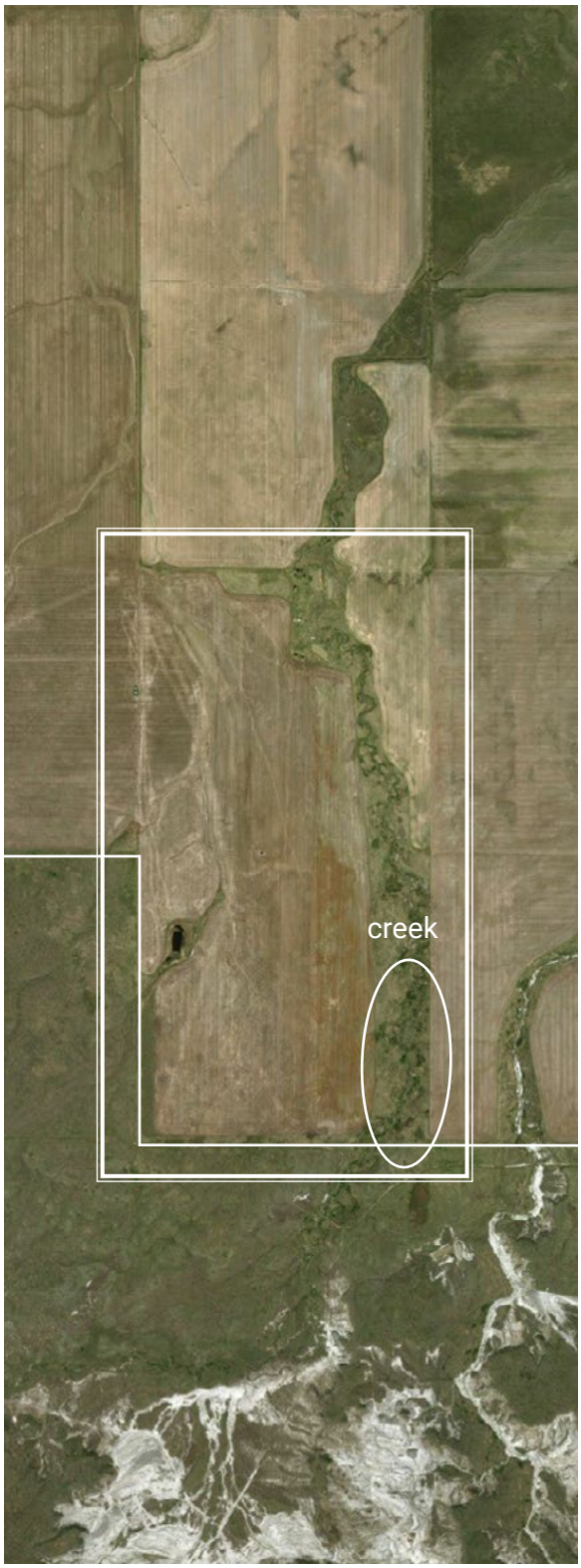

soil textures
heavy clay
clay loam
sandy clay loam
silty loam
loam
unclassified
0
2 km
unclassified soils tyically steep slopes, creekbansk, or badlands, unsuitable for agriculture

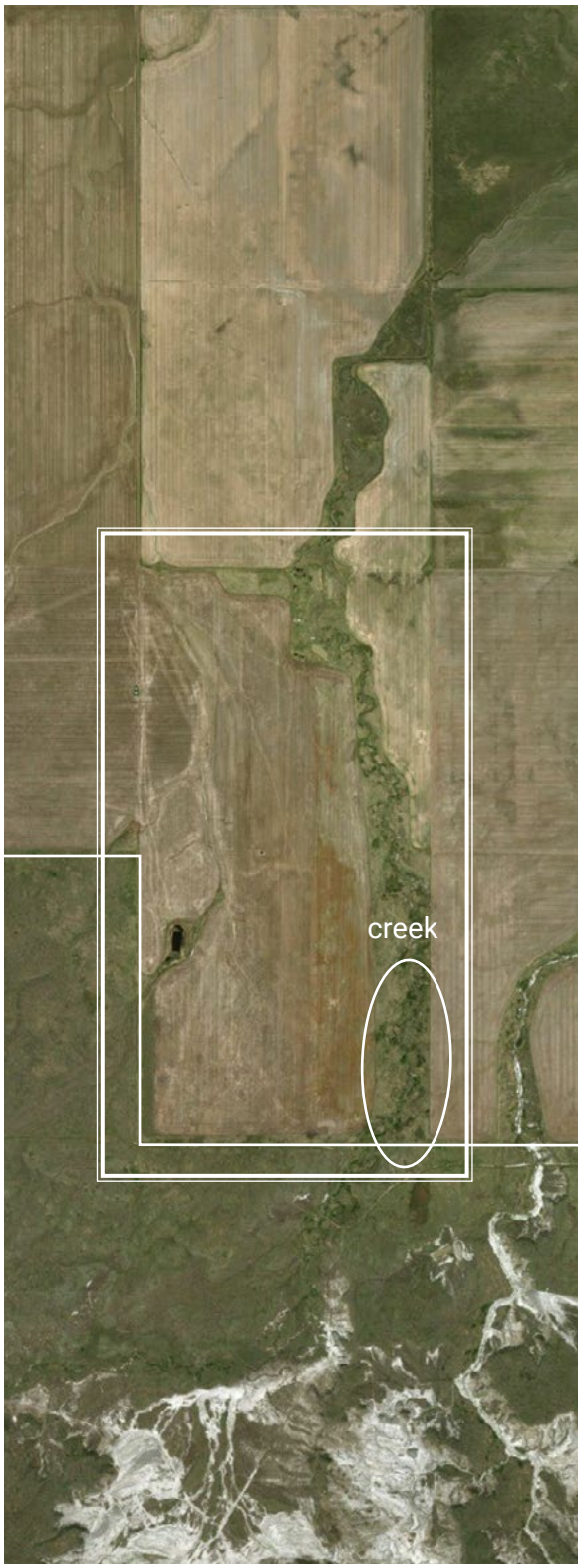
existing conditions

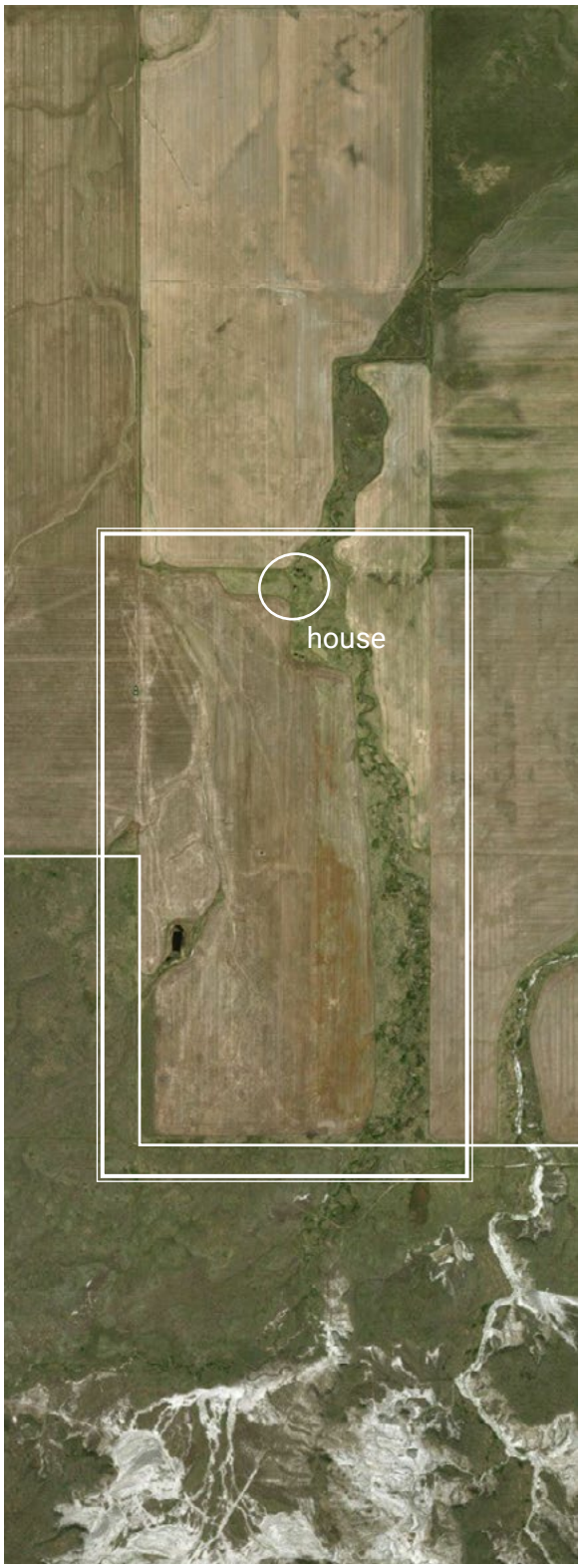


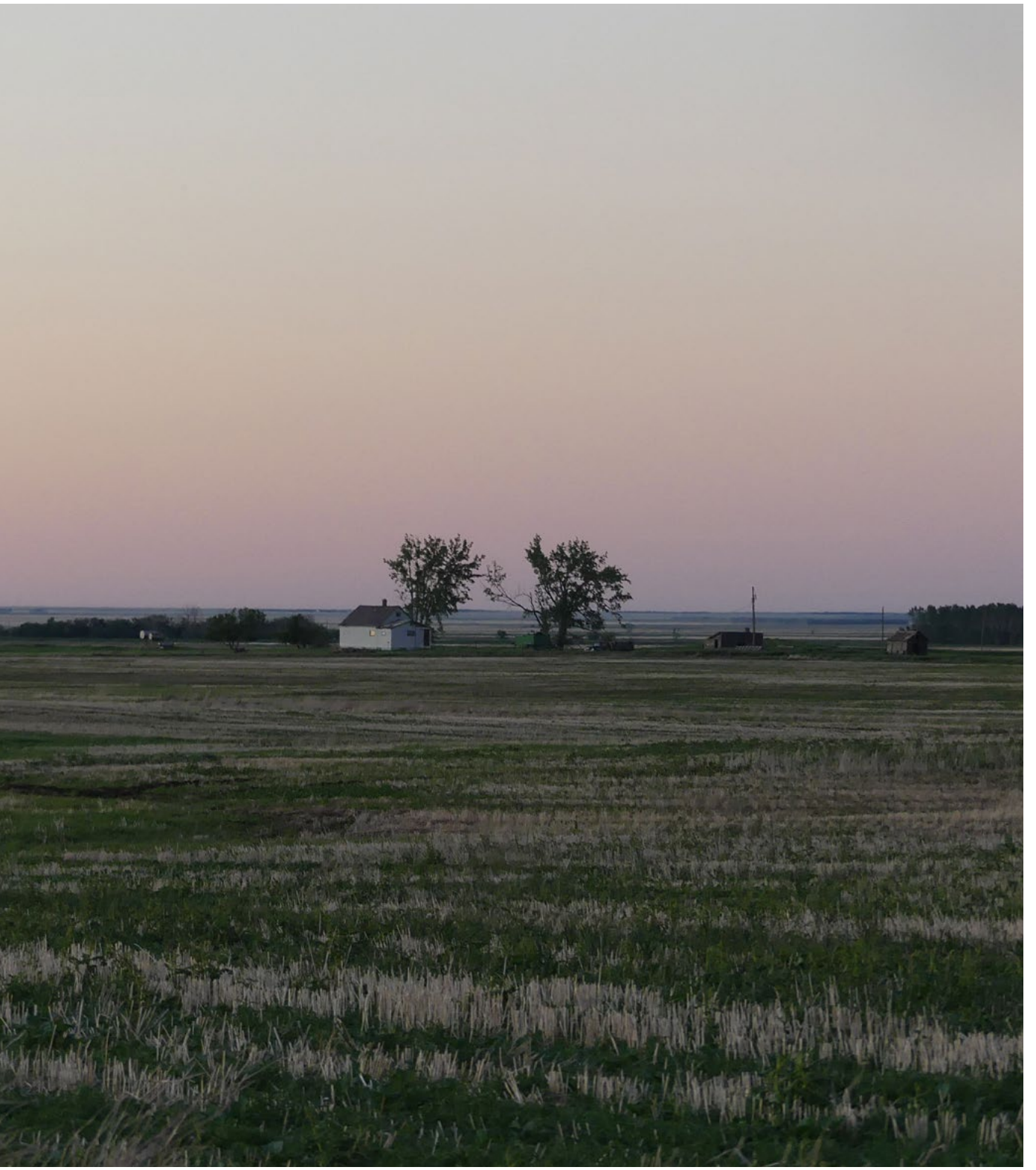

field access road
house (empty)
gravel road
house (empty)
creek + riparian habitat
saline seep
reported lek (estimated)
vehicle gate
badlands

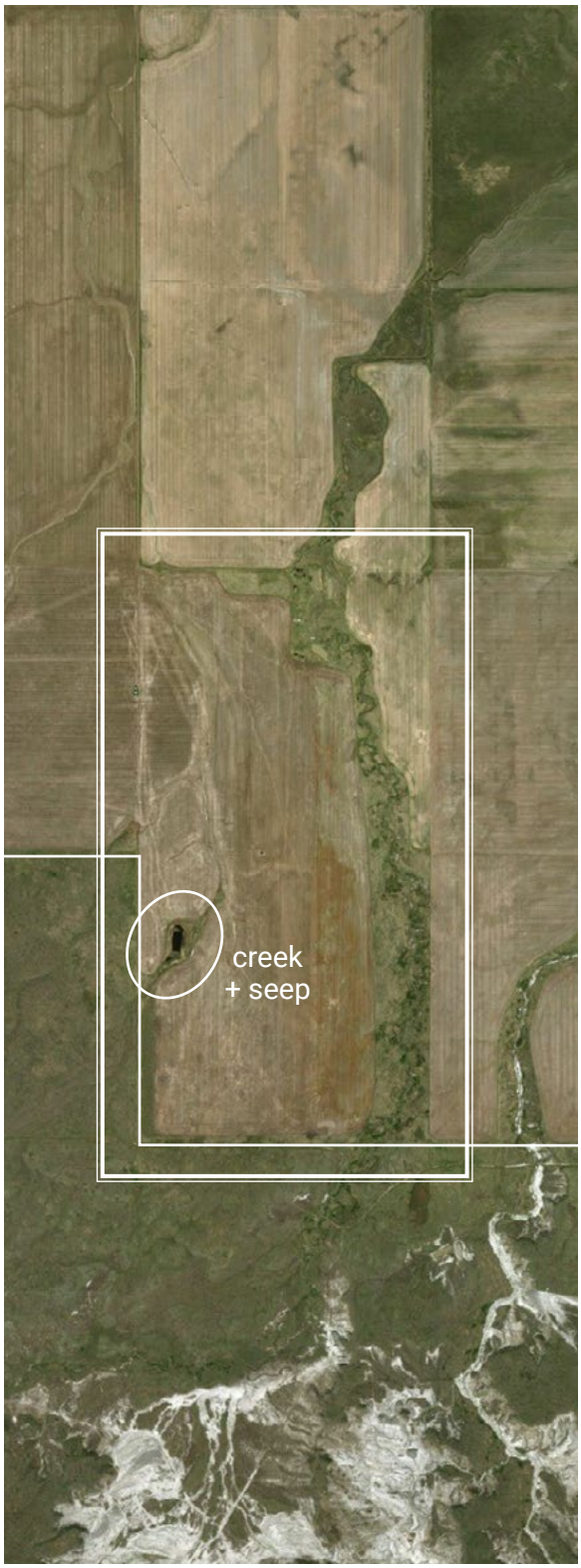

the dirt hills
agricultural equipment
house


creek

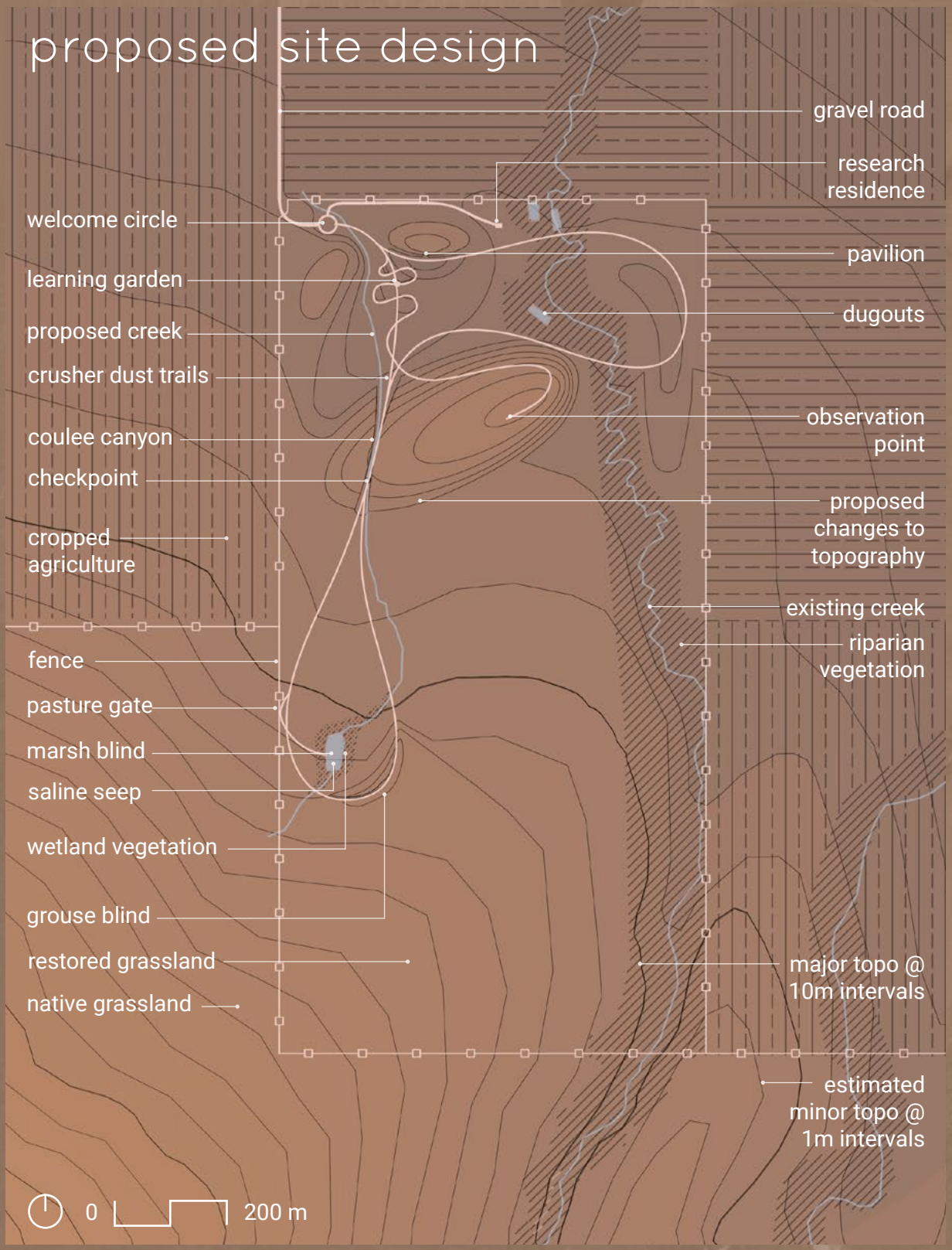

creek


house



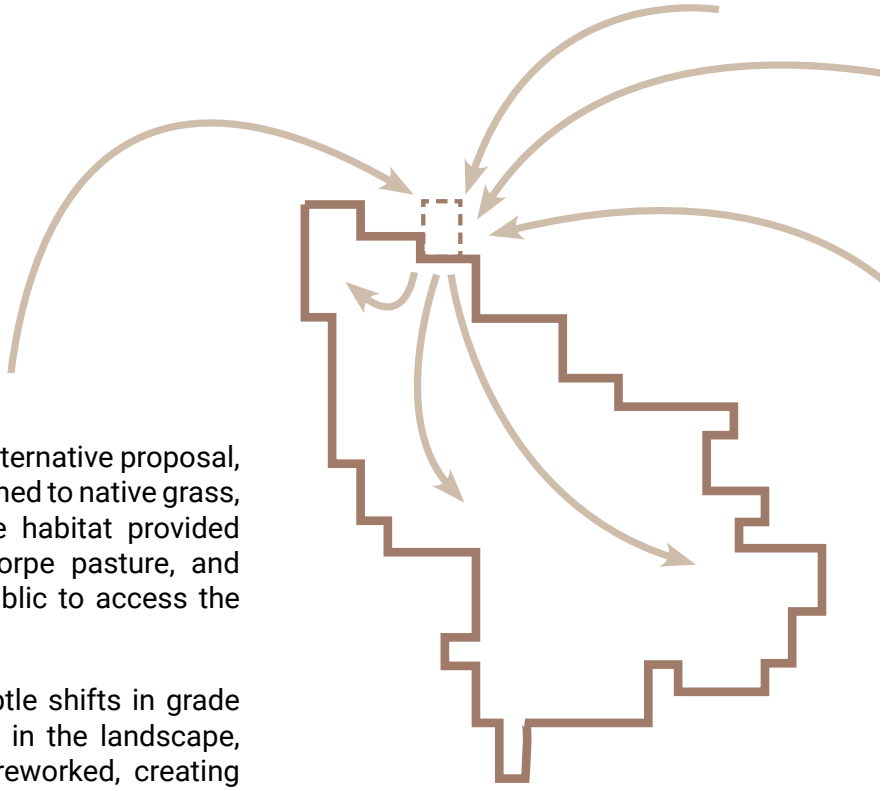

creek
+ seep

proposed site design



placemaking

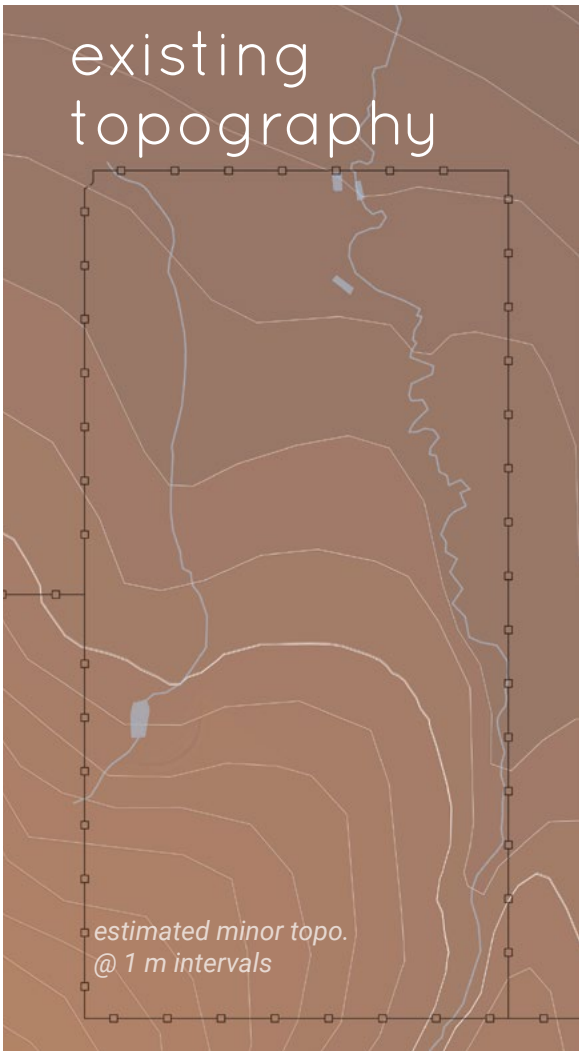
a design to reveal and engage with the Caledonia-Elmsthorpe pasture

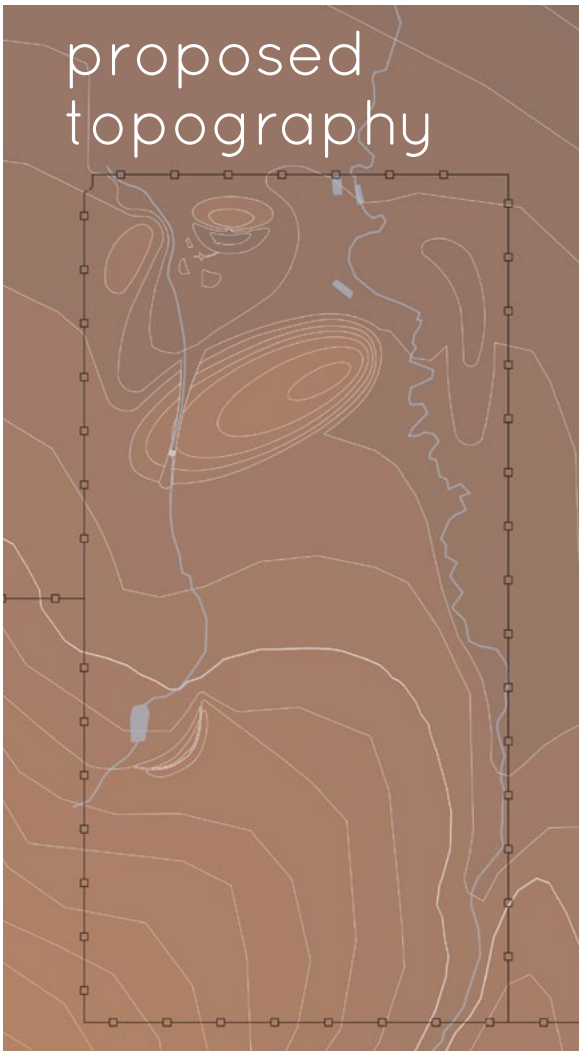


The design imagines an alternative proposal, in which the parcel is returned to native grass, creating an annex to the habitat provided by the Caledonia-Elmsthorpe pasture, and a gateway site for the public to access the prairie.

Inspired by how even subtle shifts in grade can end up hiding things in the landscape, the site's topography is reworked, creating opportunities for the site to be revealed as a visitor moves through the space. A study in cut and fill, the constructed landforms echo the geomorphology of the nearby Dirt Hills, while achieving a near balance between the subtraction and addition of earth across the site.

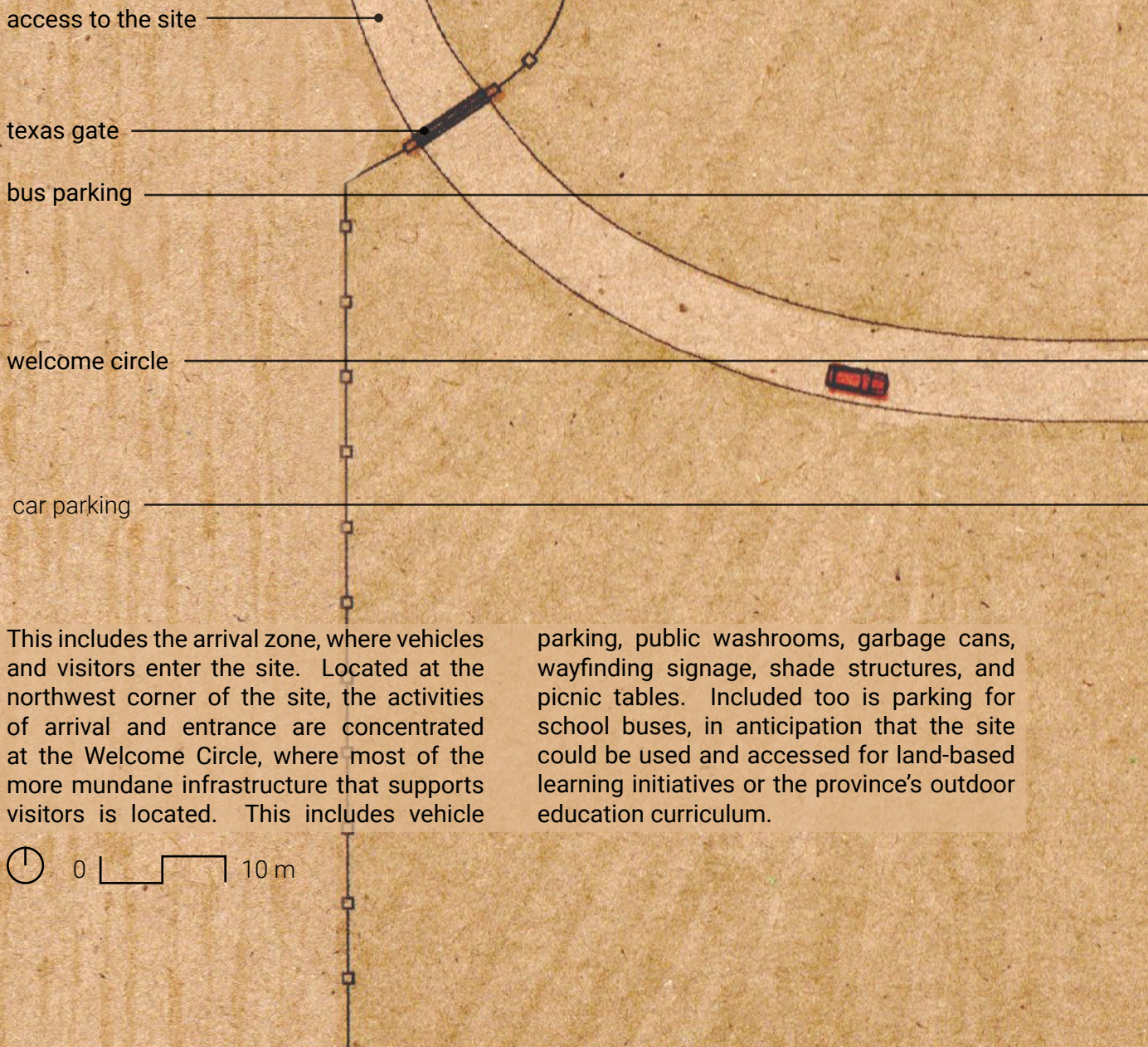
proposed site design



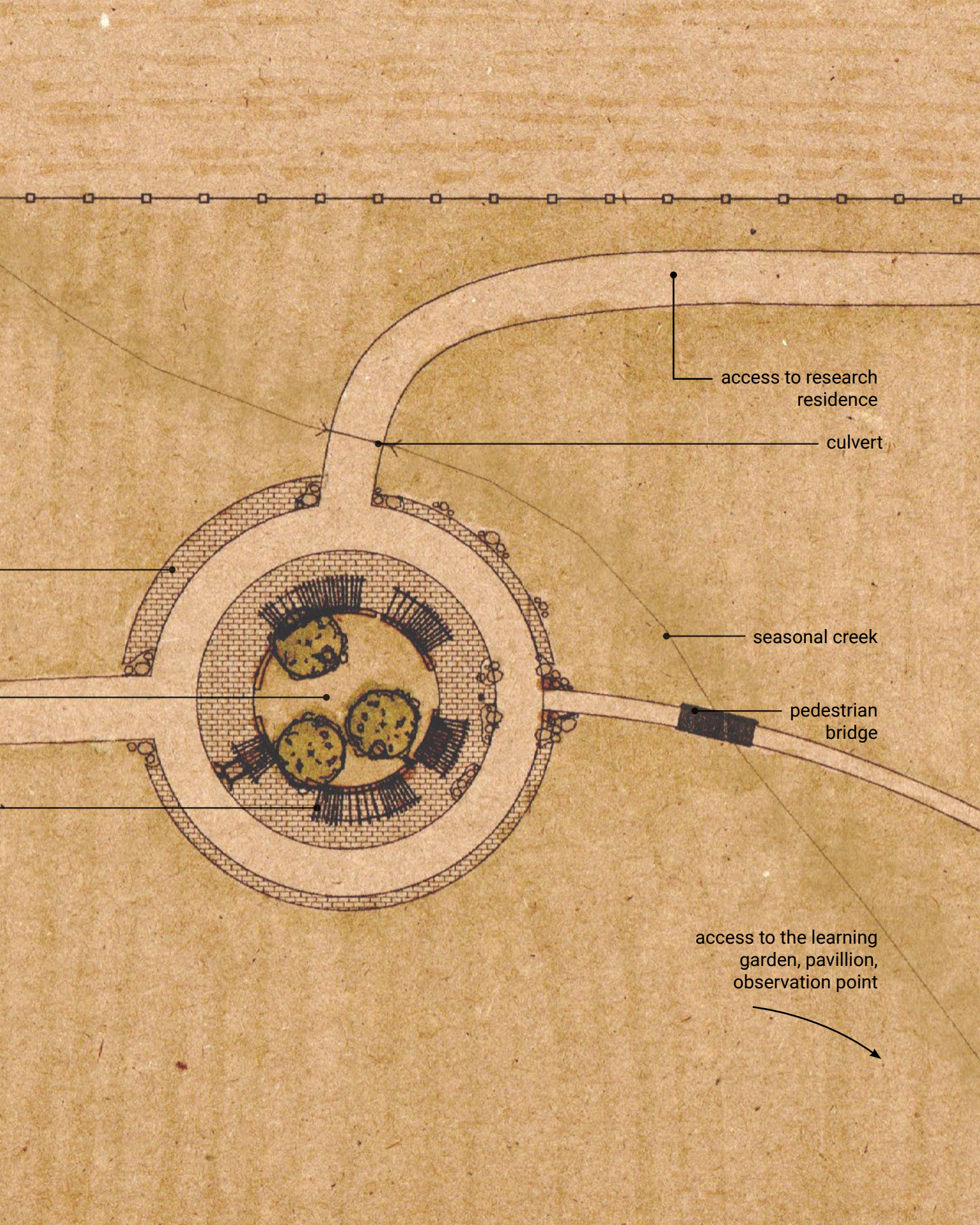


The altered topography achieves several things. The grouping of three "hills," and the space between them, creates a somewhat sheltered centre for most of the activity on the site, blocking some of the views of the wider landscape and creating a sense of privacy on the open plains. This configuration also helps to contain most of the activity of the site a safe distance from the lek and from areas where it is anticipated the Sharp-Tailed Grouse would nest and brood. Sharp-Tailed Grouse are very sensitive to disturbance during the lekking itself, which proceeds during the hours surrounding dawn and dusk from roughly mid-March to mid-May. Some development standards recommend a buffer of 500 meters from Sharp-Tailed Grouse leks.[1] Eight hundred meters is abundantly cautious but felt appropriate. This buffer was one of the major drivers of the design and why many of the built interventions are concentrated on the northwestern part of the site.

welcome circle



This includes the arrival zone, where vehicles and visitors enter the site. Located at the northwest corner of the site, the activities of arrival and entrance are concentrated at the Welcome Circle, where most of the more mundane infrastructure that supports visitors is located. This includes vehicle parking, public washrooms, garbage cans, wayfinding signage, shade structures, and picnic tables. Included too is parking for school buses, in anticipation that the site could be used and accessed for land-based learning initiatives or the province's outdoor education curriculum.


access to research residence
culvert
seasonal creek
pedestrian bridge
access to the learning garden, pavillion, observation point

seasonal creek

fieldstone boulders

bus parking

shade structure

picnic tables

rammed earth retaining wall

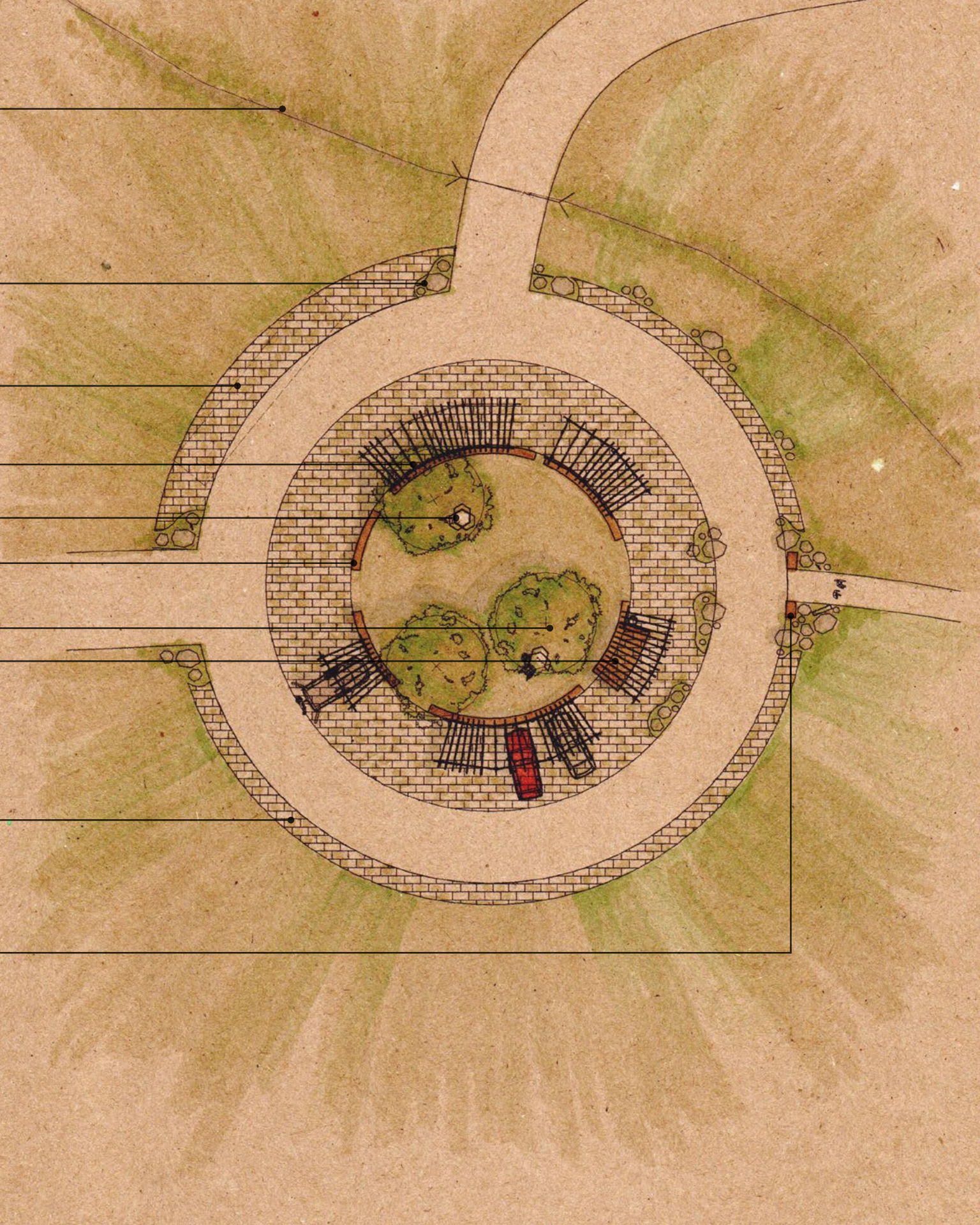
bur oak

bathroom + storage unit, waste receptacle

permeable pavers

rammed earth gate markers

image citations p. 309-310



signage at the welcome centre

In addition to wayfinding signage, the Welcome Circle will also include some additional direction to visitors.

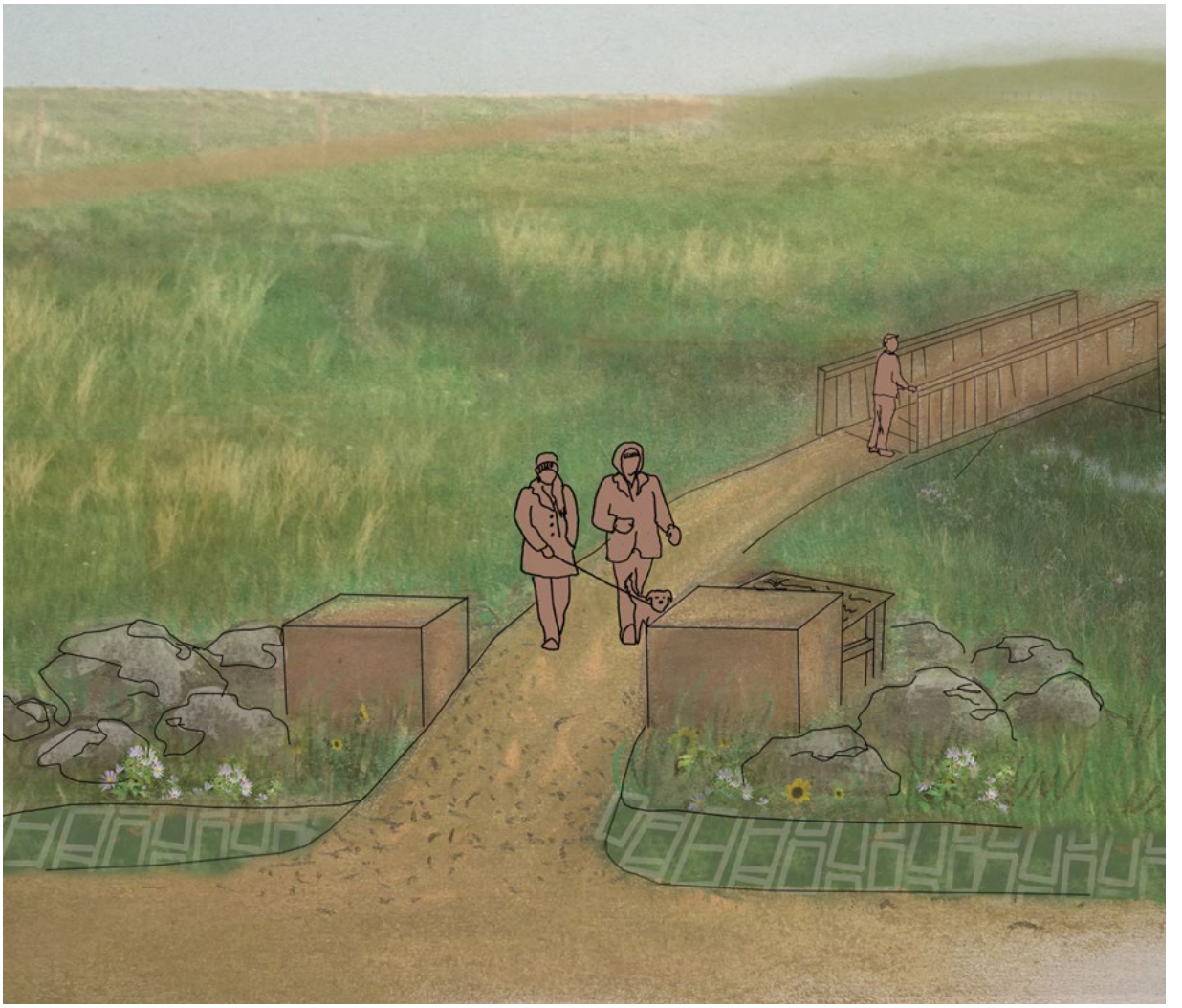
No hunting. Although hunting is a traditional use of the land, as a site that is welcome to visitors throughout the year, safety needs to be prioritized in all seasons, including hunting season.

Dogs must be leashed. Dogs are welcome, but in consideration of prairie birds that often build their nests in taller grasses, and in recognition that Sharp-Tailed Grouse have a connection to the immediate site, and that several other birds on the Species-At-Risk list live in the adjacent pasture, all dogs must be leashed. No off-leash area is provided on the site.

Follow regional fire advisories. Visitors are instructed to consult and obey regional fire advisories. When the fire risk level is high, no campfires will be permitted on the site. Furthermore, when fire risk levels are high, *no smoking* will be permitted on the site. While fires are beneficial to grasslands, an uncontrolled fire could damage not only the site but the adjacent fields and pasture, and could have a severe impact on the livelihood of those who are working this landscape.

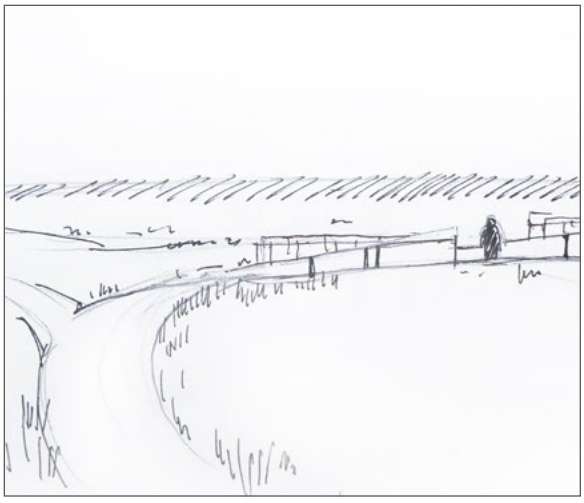
No littering. Visitors are informed that the only waste receptacle is located here, at the Welcome Circle. Visitors are asked to carry any waste they produce with them until they return here.

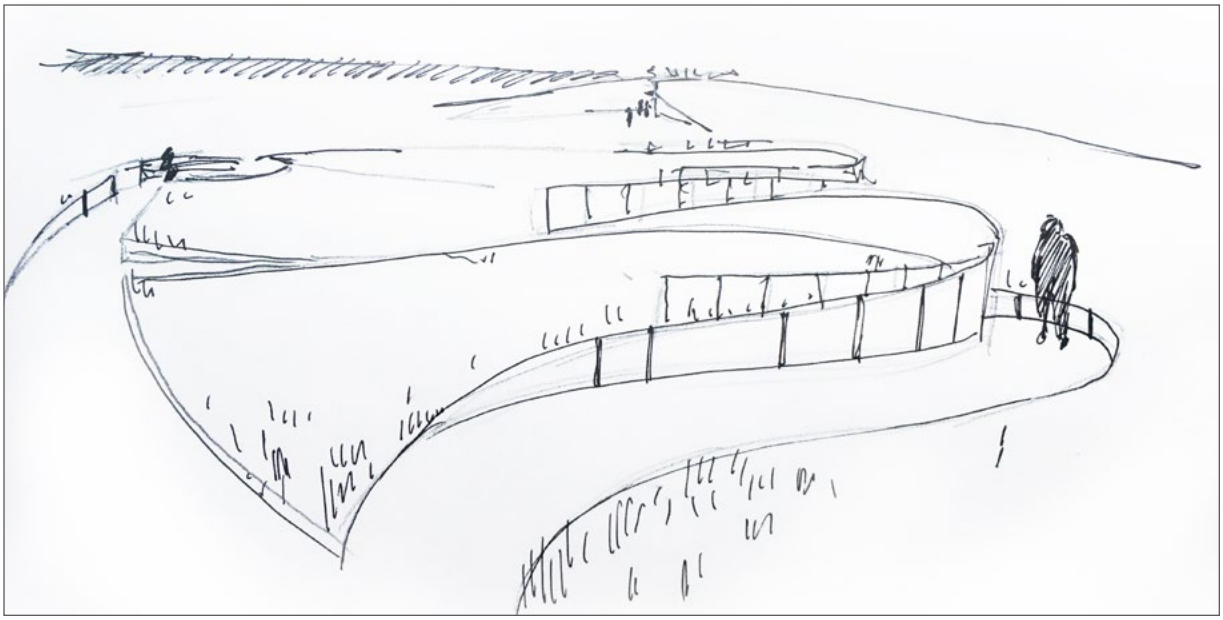
Do not drive vehicles on the grass. While grasses are resilient, the weight and repetition of vehicles driving over native prairie can cause a lot of damage, and it can take years for the land to recover. Only emergency vehicles may access the area beyond the Welcome Circle.



Leaving their vehicles at the Welcome Circle, visitors pass on foot through an open gateway, composed of two pillars of rammed earth, a motif repeated at various points of transition throughout the site. The site, itself a gateway to the public pastures, is also thus a series of gateways, and in passing through the site visitors ultimately gain access to the Caledonia-Elmsthorpe pasture via a final gateway a little over a kilometer from the Welcome Circle.

When management plans for the grass and cattle can accommodate events in the pasture itself, visitors would pass through the site and enter Caledonia-Elmsthorpe. But between the Welcome Circle and the Pasture Gate, the design provides a variety of opportunities to experience the site and the prairie beyond its fence line when the pasture is not open for public access.

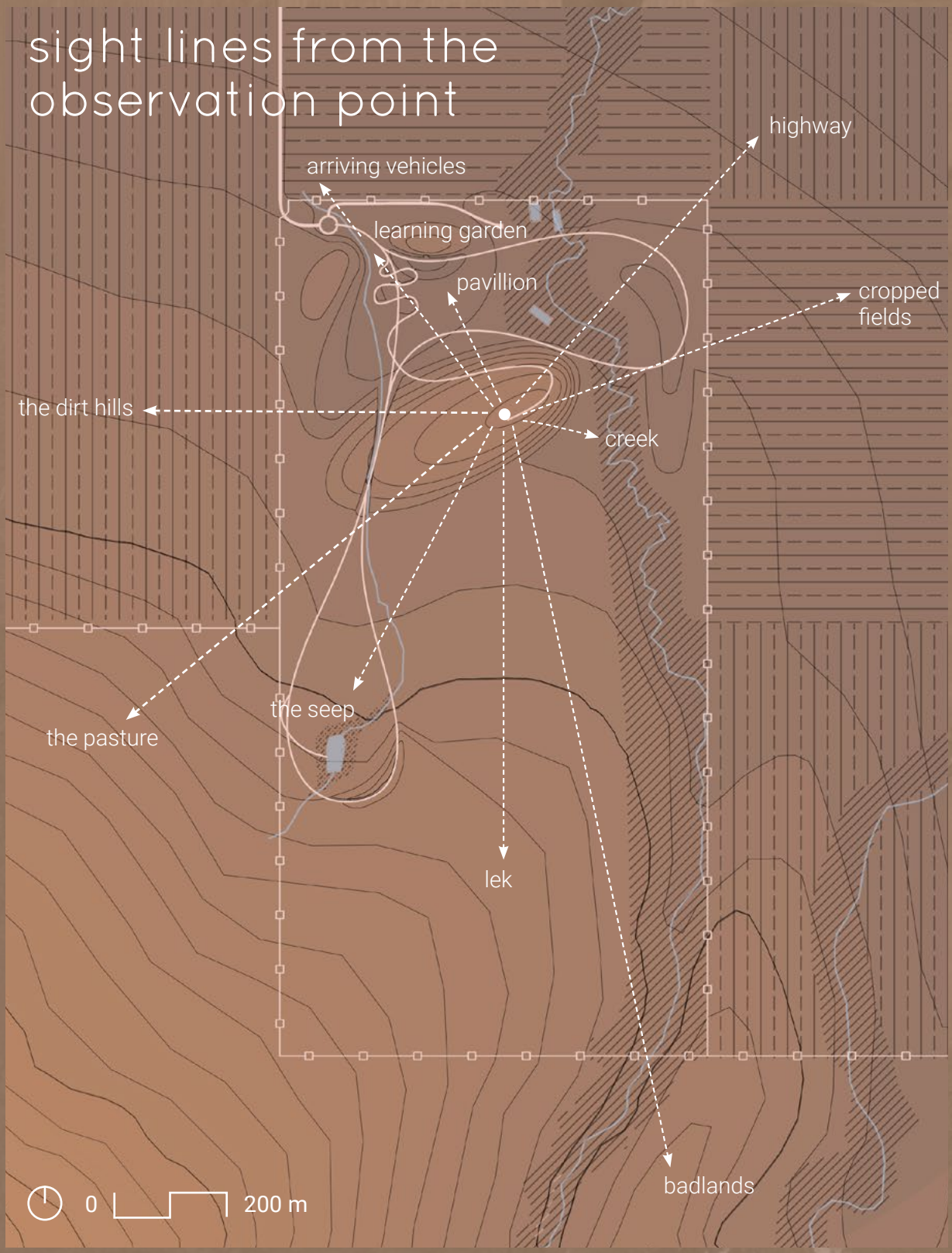




serial vision, moving from the welcome circle to the learning garden

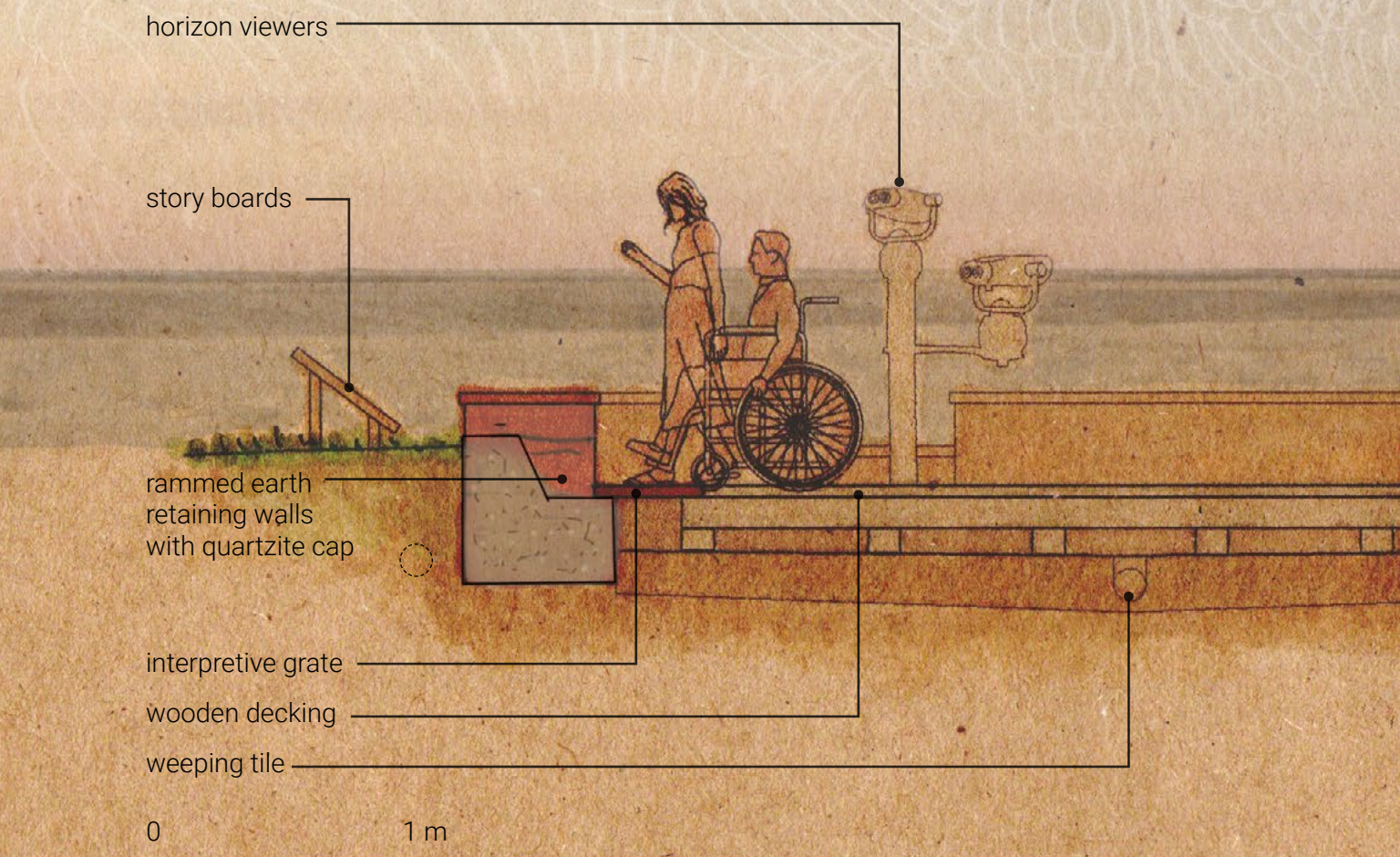
Working with the ideas of framing and directed vision, many of the spaces in the site are designed to draw the eye in specific ways, and some facilitate viewing the public pastures and surrounding landscape even when the pasture is closed to the public.

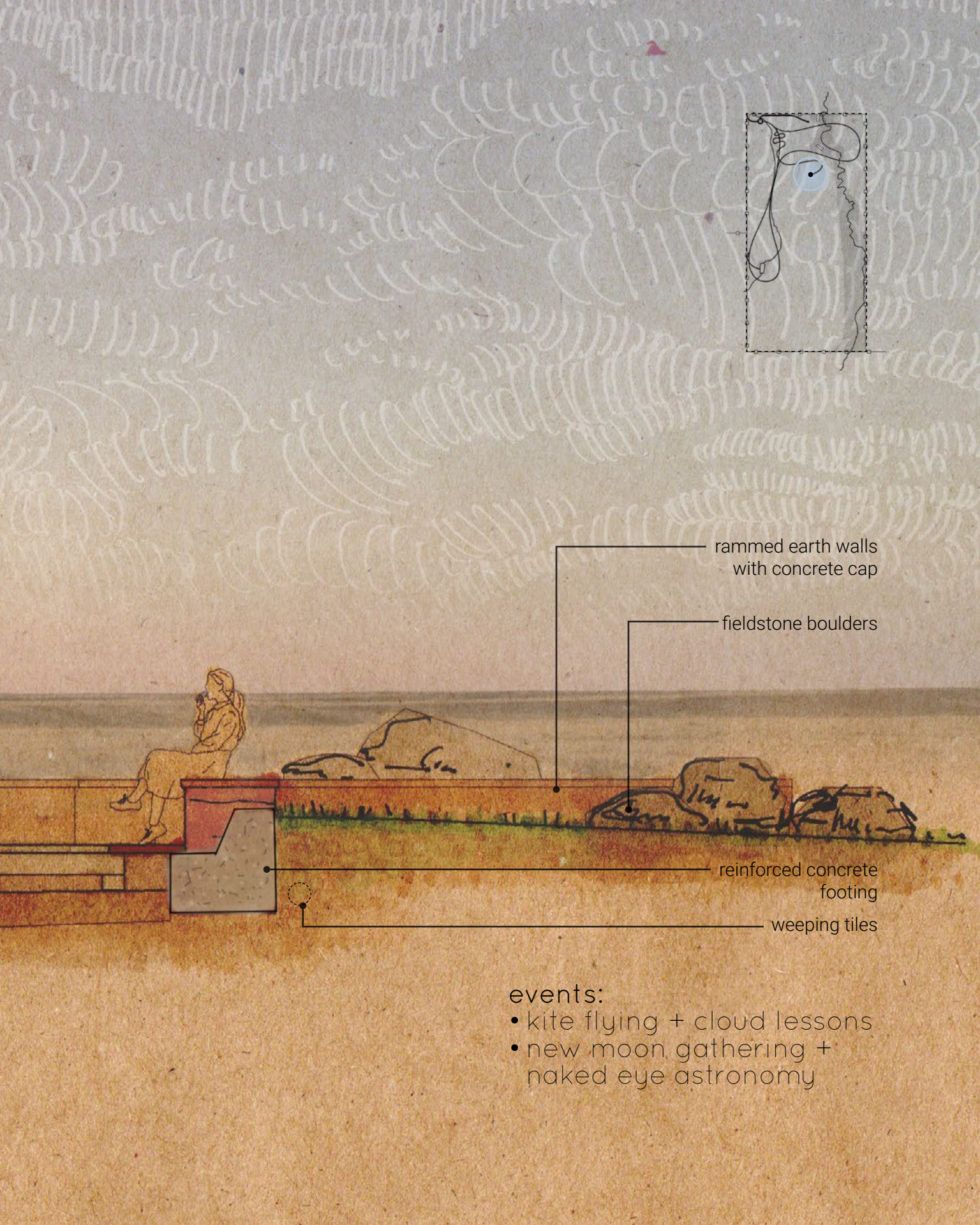
A clear example of this is the Observation Point, which takes advantage of the largest of the constructed hills. From here, visitors view the pasture and the badlands that are just beyond the fenced boundary of this gateway site. The elevation also improves the view of the Dirt Hills to the west.


sight lines from the observation point
highway
arriving vehicles
learning garden
pavillion
cropped fields
the dirt hills
creek
the seep
the pasture
lek
badlands
0
200 m

observation point

Horizon viewers, permanently installed at the Observation Point, help visitors see not only the landscape in every direction, but the sky. This is the place to host lessons on the formation and identification of clouds, on the geomorphology of the Dirt Hills, on how to draw the sky, and would be an ideal location from which to stargaze.



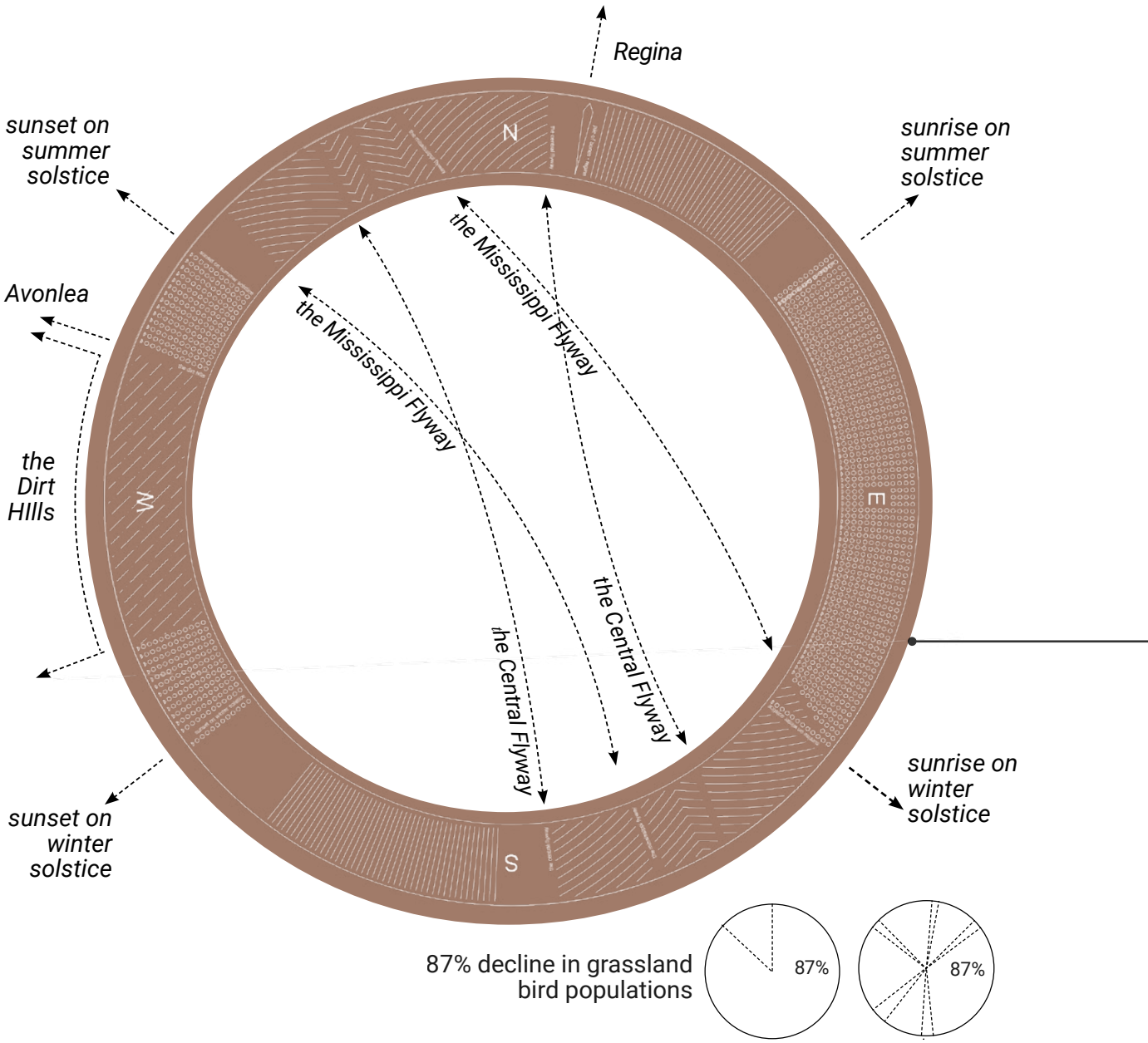


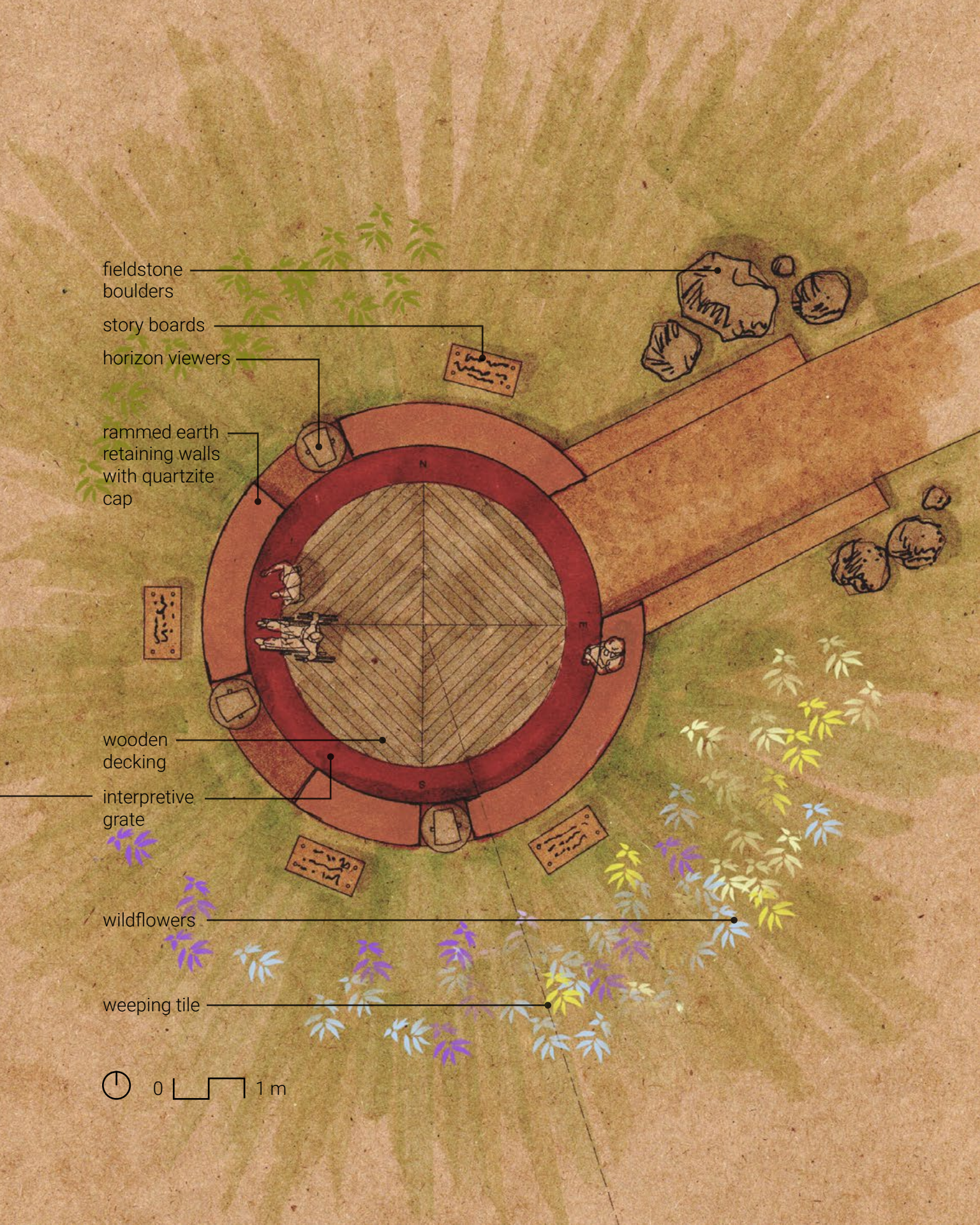
events:

- kite flying + cloud lessons
- new moon gathering + naked eye astronomy

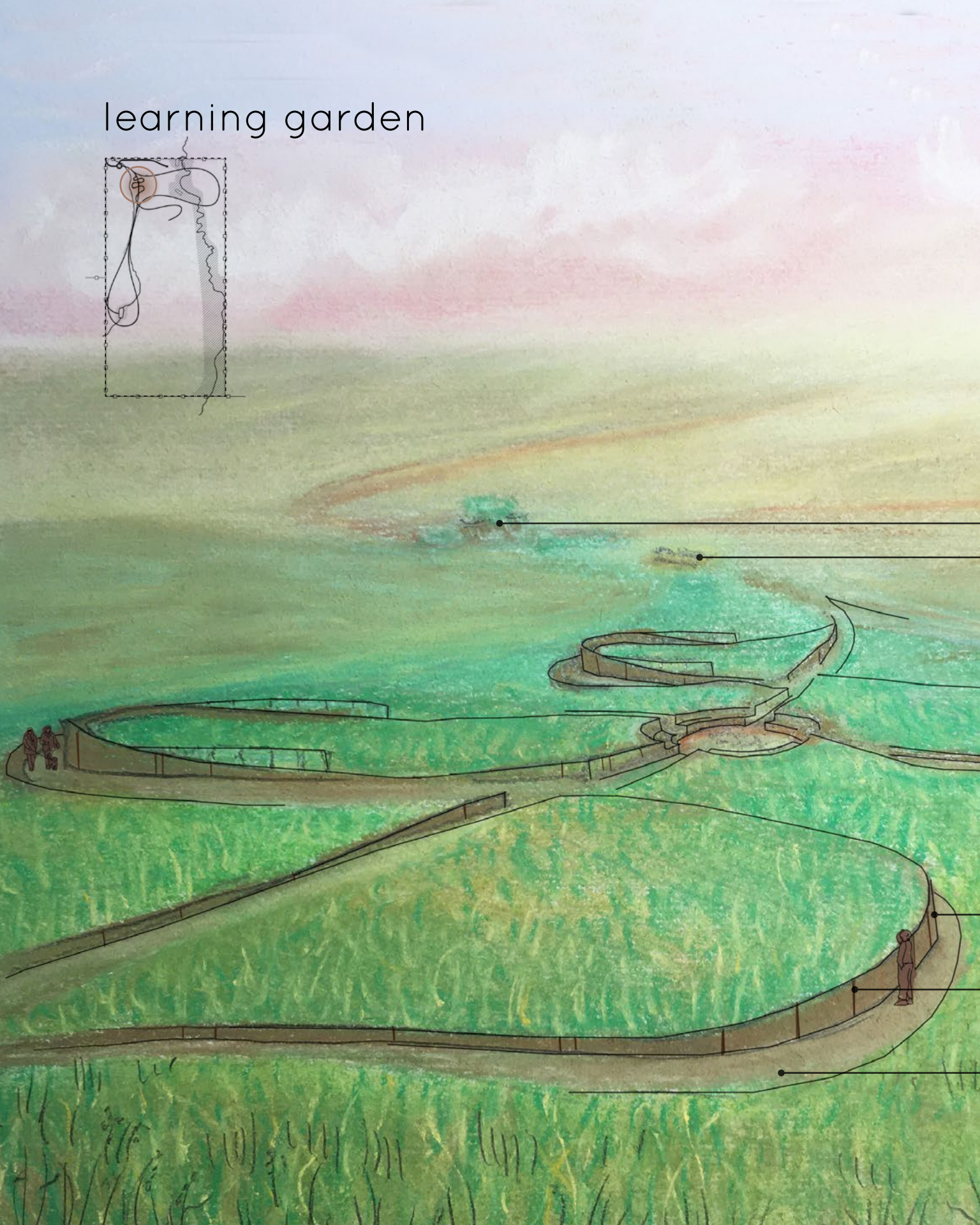
As the design of the grate inset in the decking helps to indicate, the Observation Point is also a place to view birds as they follow their migratory paths across Southern Saskatchewan in spring and fall. The design also contains a graphic representation of the decline in grassland dependent bird species over the last 50 years.

Laying out the seasonal migration of birds on the ground inspired laying out the seasonal blooming of prairie wildflowers around the observation point, which will progress from the earliest flowers to the latest around the circle, lining up with the spring and fall migrations and turning the observation point into a phenological clock.



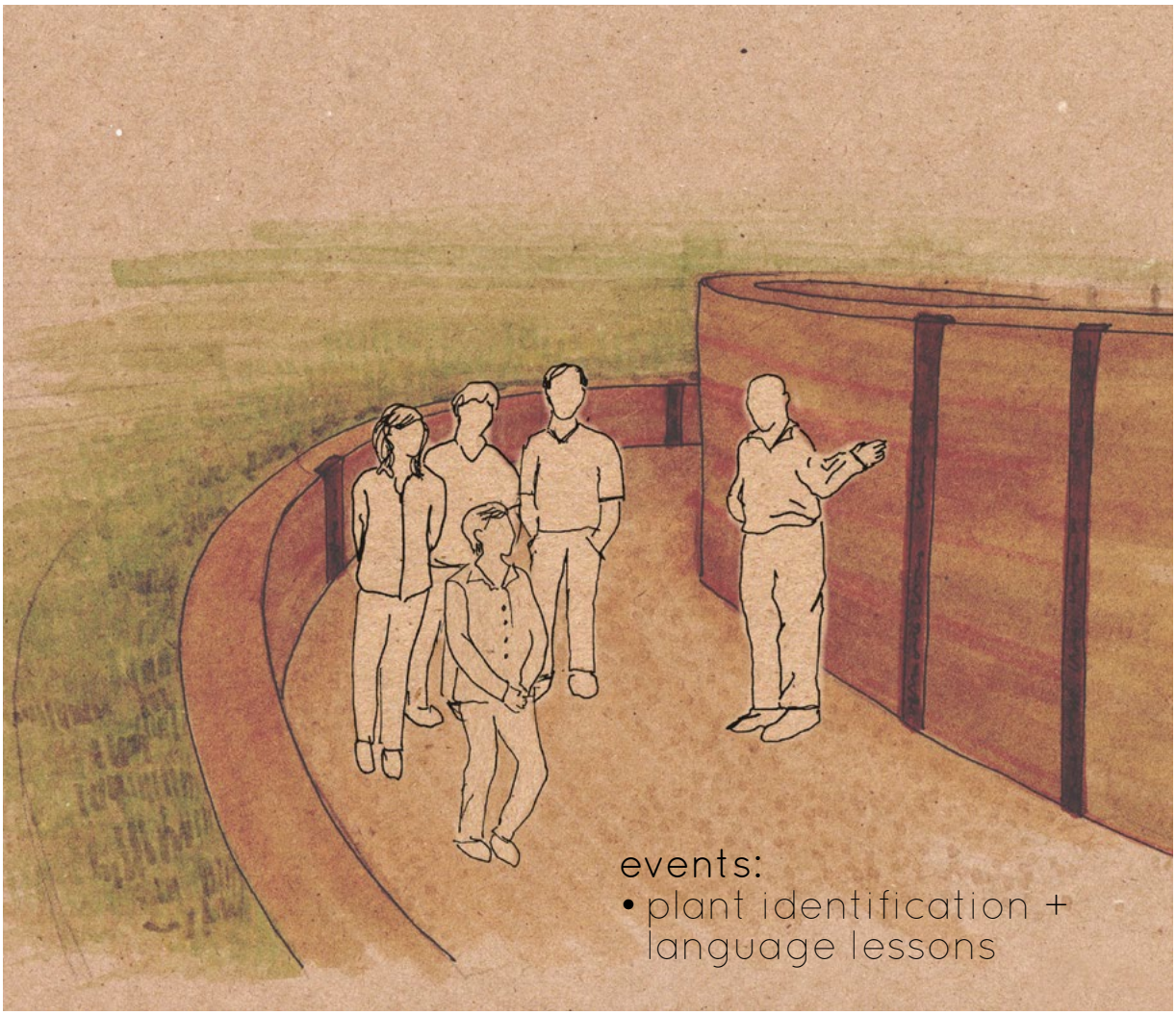

fieldstone boulders
story boards
horizon viewers
rammed earth retaining walls with quartzite cap
wooden decking
interpretive grate
wildflowers
weeping tile
N
E
S
0
1 m

learning garden



At the base of the hill, with the larger scale views of the landscape reduced by the surrounding constructed hills, the view is focused on the foreground rather than the distance. This is most evident in the learning garden, where the rising and falling topography is juxtaposed against the paths that sink and cut into the land, creating a separate horizontal plane and creating raised planting beds as the paths curve and intersect. The plane of the path, diverging from the plane of the grass and surrounding landscape, brings the grass closer to the eye level of the visitors, immersing them in the experience of the grass and perhaps bringing things into a closer and different perspective.


+ HP
587
586
585
584
+ LP
seasonal
creek
585
586
586
+ HP
587
584
585
586
585
weeping tile
585
585
585
+
LP
+ HP
586
585
586
+ HP
586
topo lines @ 0.1 m intervals
0
20 m

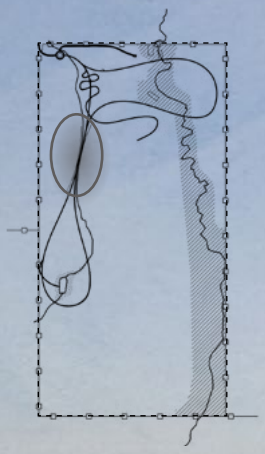


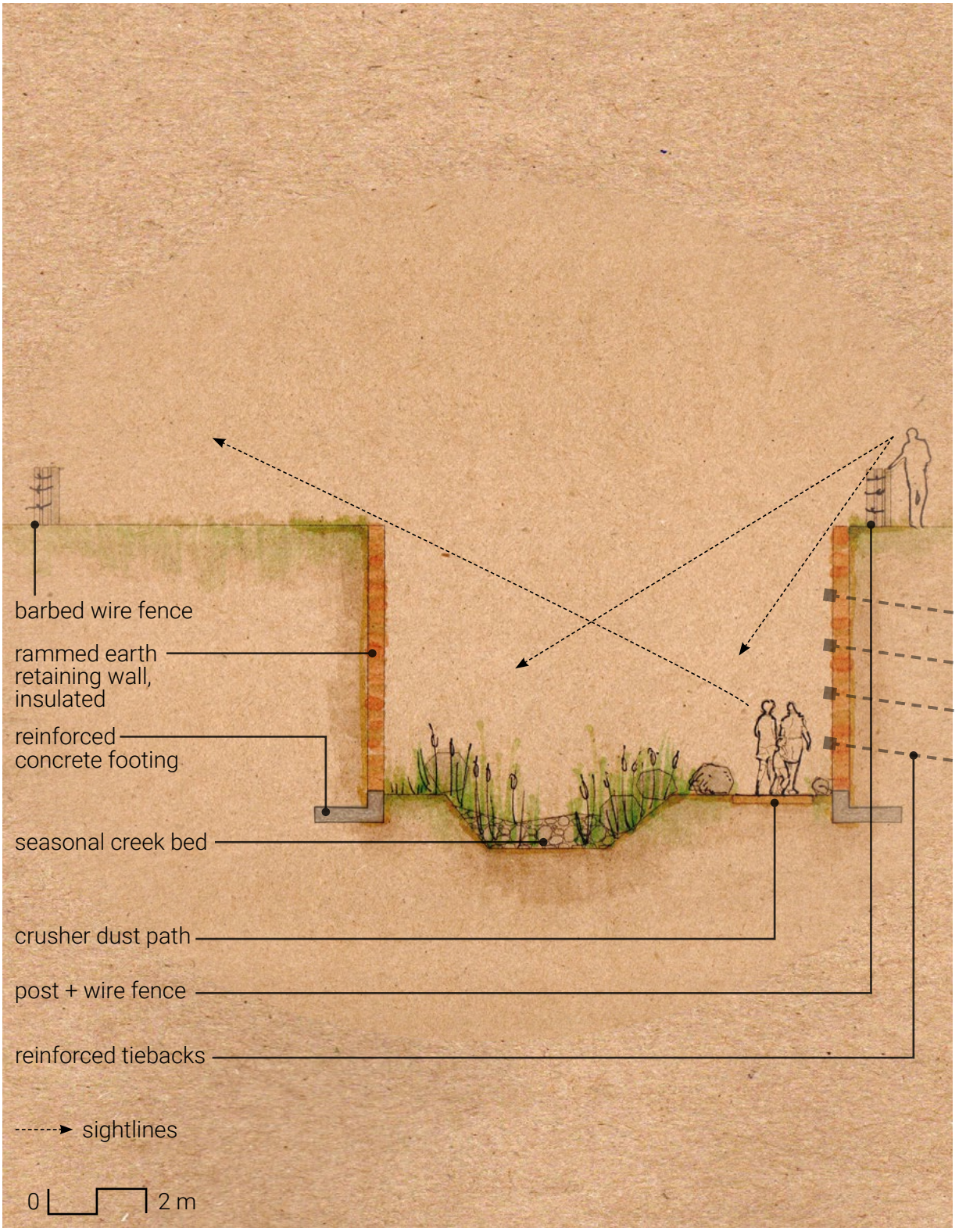
Markers in the garden's retaining walls indicate the different root depths of various native plants, revealing something otherwise imperceivable beneath the soil. These root depths helped to determine the topography of the learning garden, but some native plants have roots which can extend to a maximum depth of five meters, and this could not be achieved in the Learning Garden.[2]

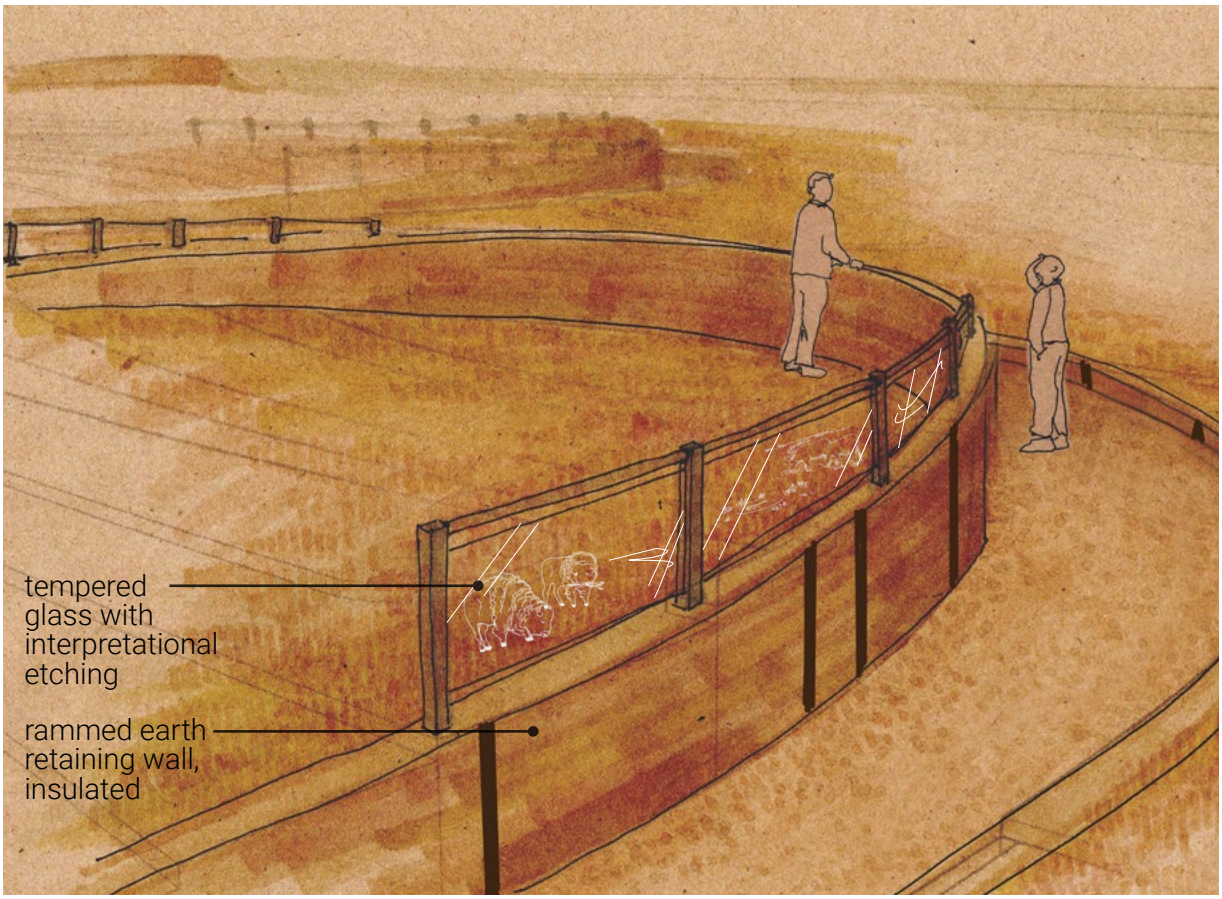
It can, however, be achieved by cutting a corridor through the largest of the constructed hills. At its highest point, the retaining walls of the "Coulee Canyon" reach a height of five meters between the top of the wall and the bottom of the wall, along which the path guides visitors. The indicator markers of the Learning Garden follow the path, rising ever higher over the heads of the visitors and transforming the Coulee Canyon into an extension of the Learning Garden.

A fence at the top of the Coulee Canyon keeps visitors a safe distance from the edge but is strategically placed to minimize its visibility from the bottom of the canyon.

coulee canyon




barbed wire fence
rammed earth retaining wall, insulated
reinforced concrete footing
seasonal creek bed
crusher dust path
post + wire fence
reinforced tiebacks
sightlines
0
2 m



Back in the Learning Garden, a combination fence-parapet grows out of the rammed earth retaining walls where the height of the planting beds could be dangerous should people or cattle climb up for a better look at the grass. To maximize direct experience of the grass, unmediated even by a tempered-glass fence, the fence is only shown where the grade achieves 800 mm or greater differences with the surface of the path. This exceeds the recommendations set by the Building Code of Canada, which requires railings anywhere a height difference exceeds 600 mm. This was done for a few reasons: these areas are designed primarily as planting beds, and the location of the site is remote – it is not expected that a visitor would wander here accidentally, or that a child would be unsupervised (they would have had to drive themselves here, after all). However, if this garden were built and an authority determined fences were required everyone over 600 mm, the barriers could certainly be extended.

The tempered-glass fencing created an opportunity to incorporate another element of storytelling in the Learning Garden. The glass is etched with bison, with visual descriptions of their relationship with grass, of the range of their migration, of their relationship to people. Looking through the fences from the path, the etchings would present as the ghostly silhouettes of bison in the grass, telling the story of what is missing from the land.

material studies: rammed earth as medium and message

Earth is one of the oldest construction materials in human history and has been used in different ways and over the centuries and globe in methods such as adobe, cob, wattle and daub, and rammed earth, to name a few.[3] Rammed earth describes both process and result: forms are constructed, and a mixture of moistened earth (with specific percentages of clay and sand, and sometimes with additional binders or stabilizers mixed in) is poured into the forms in layers and tamped down repeatedly to condense the material. Once dry, the forms are removed, and the rammed earth structure stands on its own.[4]

Rammed earth construction is an ancient practice, but one that is on the verge of a renaissance, thanks in part to its blossoming reputation as a sustainable building material.[5] Because earthen structures are built with the earth itself, the material has been traditionally sourced directly from the construction site. While this practice is maintained as much as possible by environmentally conscious contractors and designers, with modern engineering and building codes available to inform the construction, the earth on-site often needs to be amended to greater or lesser degrees to meet the correct mixtures required, and stabilizers almost certainly need to be brought in. This impacts the embodied energy of the construction. Another thing to consider is that in Canada at least, rammed earth walls often require additional insulation, and this will further impact the embodied energy and carbon footprint of the method.[6]

To protect the roots of the plants in the Learning Garden, and anywhere on the site where grass is intended to grow adjacent to a retaining wall, many of the retaining walls on the site will require insulation. Yet even with insulation, stabilizers, and a protective coating, rammed earth construction can still be an ecologically sensitive and sustainable building method. On a site devoted to encouraging ecological mindfulness and understanding, the inclusion of rammed earth walls is a way of supporting the messaging of the site through the materials of its construction.

In addition to this, rammed earth is beautiful, and incorporating the soil of the site itself so clearly communicates how they belong to this place in a unique and singular way. The layered earth also suggests again the roots of the grasses and plants, which the retaining walls of the Learning Garden refer to. Finally, the visible layering of the rammed earth could also communicate to visitors the layers of history, of archaeology, of geology, that is often so invisible when we look only at the flatness of the prairie. In this way, the medium of the walls themselves serves to reveal and communicate something to visitors about what is unseen on the site and in the land.

The form of the Learning Garden is determined by the convergence of two paths: one that provides a direct route to cut through the garden for visitors with a destination beyond it, and a more meandering path for visitors to explore the garden at a more leisurely pace, viewing the grass as they move slowly along.

The crossing paths create the opportunity to place a Gathering Circle at the heart of the Learning Garden. The form recalls the shape of an imperfect medicine wheel, slightly skewed, but with entrances at each of the cardinal directions. Rather than being designed for a specific event, this space is designed for flexibility, to meet the needs of a variety of events and users. Should the circle be used for an Indigenous cultural or educational event, the physical design of the circle would support it.

crusher dust path

rammed earth retaining walls, insulated, with concrete cap

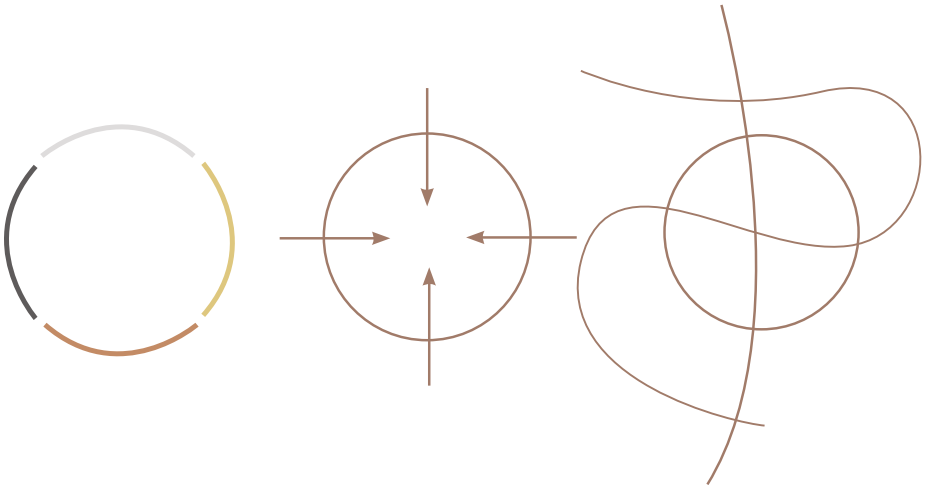
rammed earth retaining walls, insulated, with quartzite cap

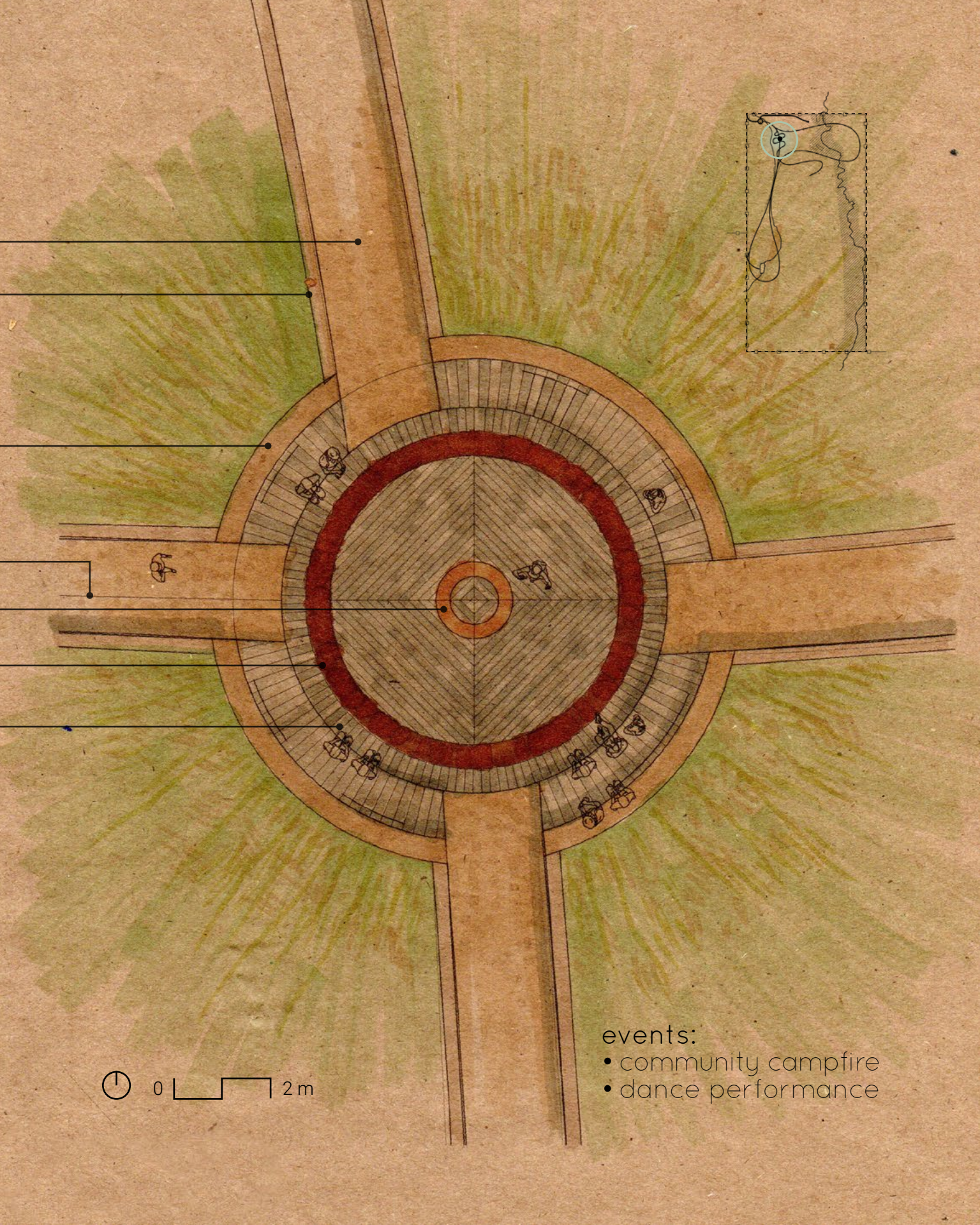
weeping tile

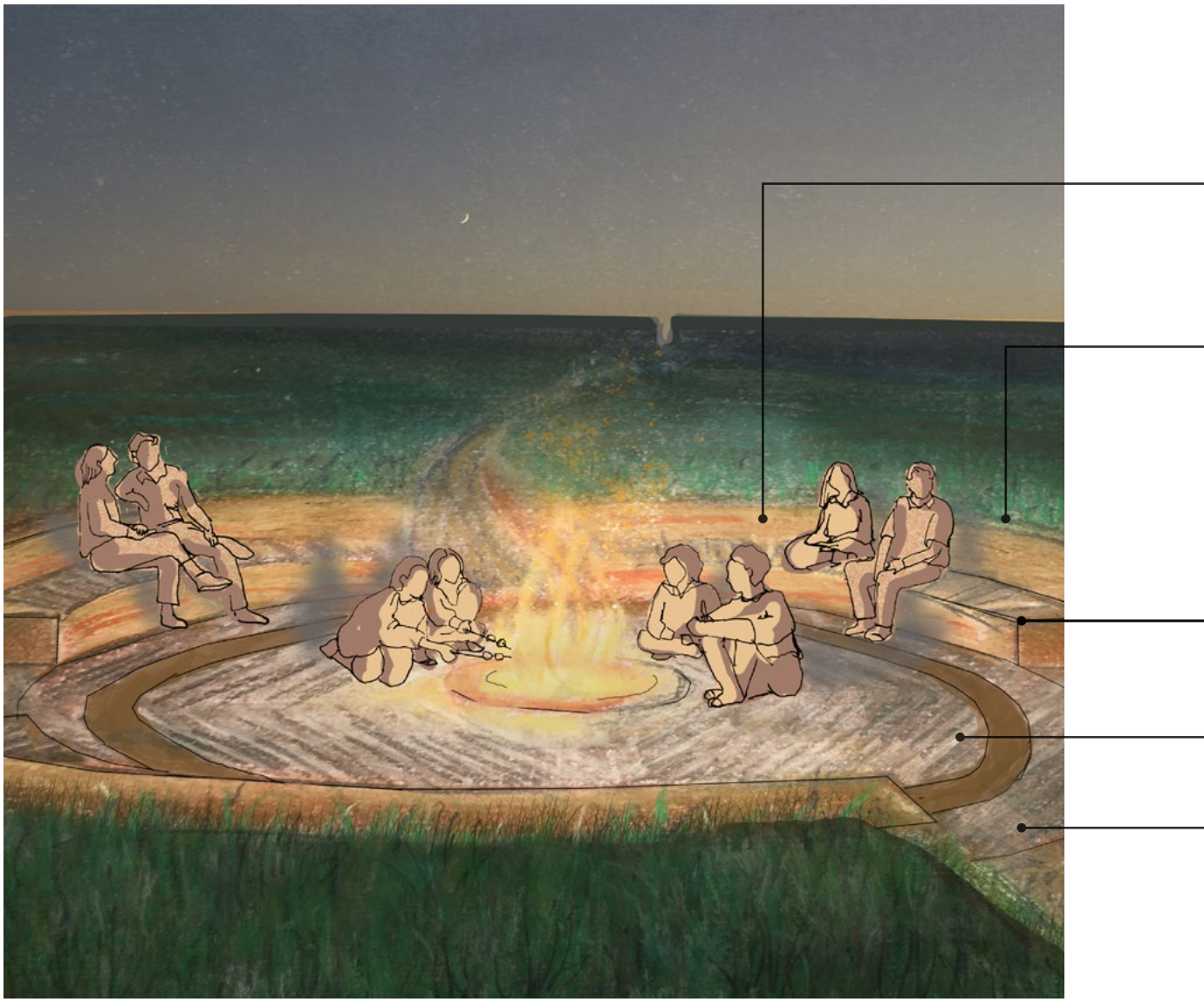
quartzite flagstone

corten steel interpretive grate

wooden decking




0
2 m
events:
• community campfire
• dance performance



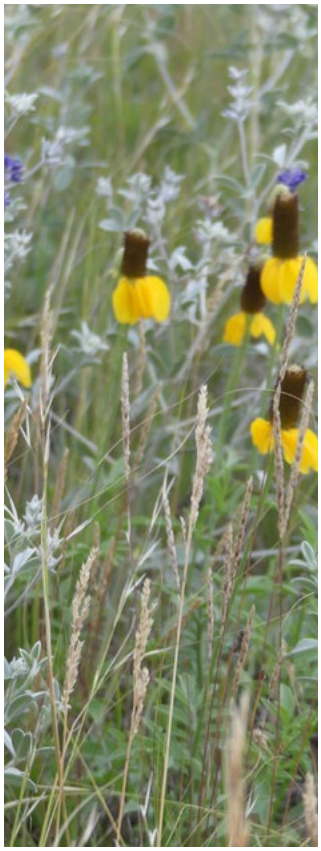
The Gathering Circle can accommodate roughly 40 adults seated comfortably around the circle, or about 60 schoolchildren and a handful of adult supervisors. Here, as at the Observation Point, a Corten steel grate provides both surface drainage for water that reaches the circle, and a canvas for interpretive patterns that tell another story of the prairies and site. Here, the grate is cut with images and patterns of footprints and animal tracks, sampling the traces of all the living beings that have crossed this site over the millennia, have had a relationship with the grass of the prairies.

At the centre of the circle, the wooden decking can be removed to reveal a firepit. The benches of the circle also double as storage that can hold wood or other items that support programming.

rammed earth retaining wall, insulated, with quartzite cap

quartzite flagstones around ring of firepit

wooden seating, with internal storage



wooden decking

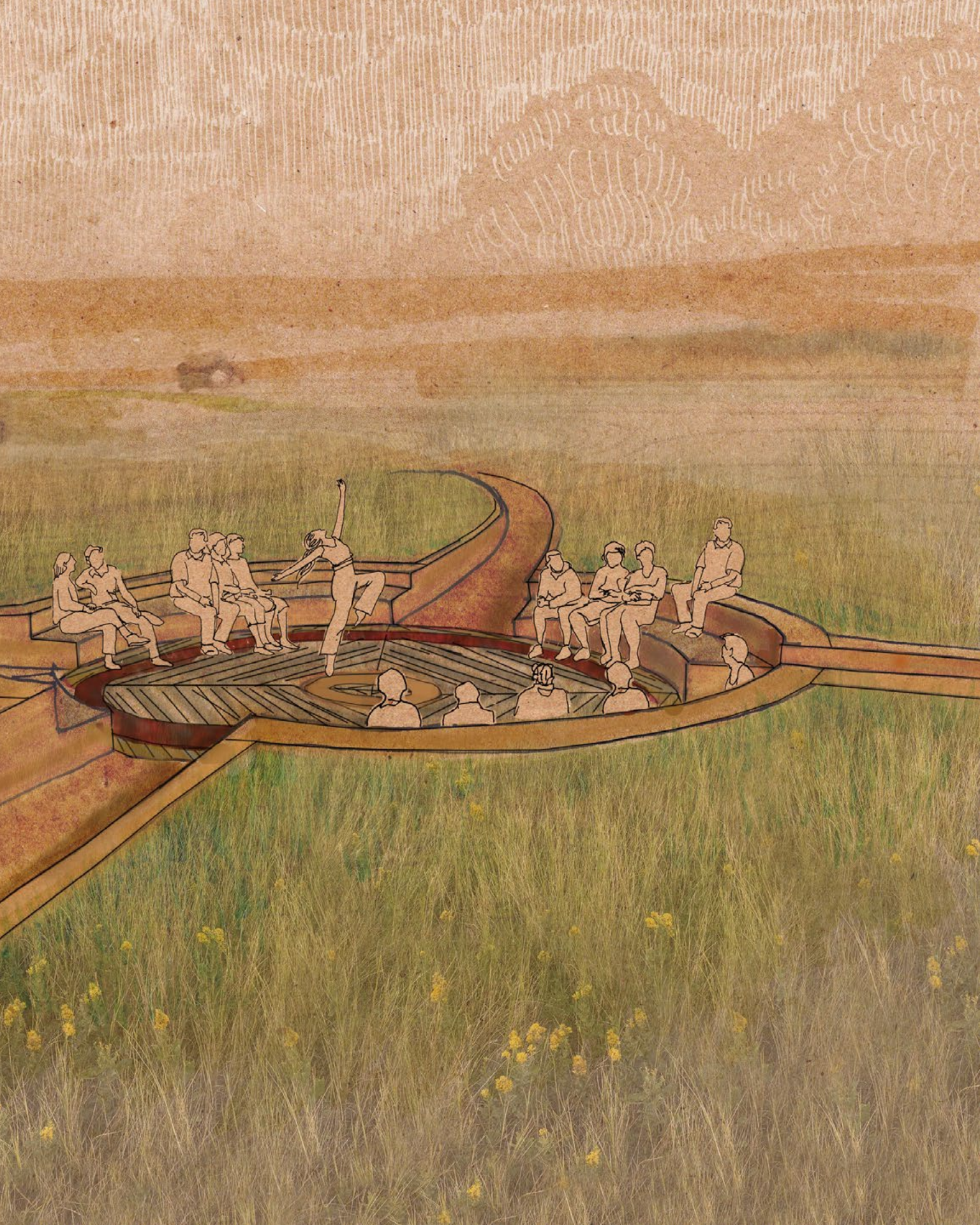
corten steel interpretive grate

image citations p. 310

gathering circle

The Learning Garden is a place for lessons about grass, and the Gathering Circle is a place for storytelling, for education, and for demonstration. Something that emerged during the design process was that the Gathering Circle echoes the lek to the south of the site. It is a place where the view is drawn inwards, where we come together, and maybe where we dance.

As previously mentioned in this document, there are traditional dances within Great Plains Indigenous groups that are inspired by the Sharp-Tailed Grouse mating dance. The Gathering Circle leaves space open to accommodate dancing, whether it is traditional, modern, or just for fun.



pavilion

Adjacent to the Learning Garden, built partially into the side of the hill, echoing the construction of early sod houses built by many settlers, the Pavilion provides shelter from sudden inclement weather, and can function as a warming hut for events held in the winter months. The deck attached to it can be used as a stage for small performances or events, and beyond warming and protecting people, the building can be used for storing larger event infrastructure, like barbecues, tables, and chairs. The large meadow in front of the pavilion accommodates a larger number of people than the learning garden can, and also provides a runway for toboggans coming down the hill in winter.

research residence

Just beyond the pavilion and sitting slightly off the path, the Research Residence sits a little apart from the heart of activity on the site. Restored from an apparently abandoned house that currently exists on the site, this is a piece of programming that was born from the existing conditions and is site specific. Based on the Wallace Stegner Artist's Residence in Eastend, Saskatchewan, this Research Residence could be available to artists and scientists with the idea that the residence guests who stayed at the same time could potentially collaborate in their research and work. Other potential guests, beyond scientists and artists, could include Elders, writers, poets, historians, philosophers, researchers from the fields of medicine, law, mental health, architecture, landscape architecture, or researchers from virtually any of the social sciences and humanities with a particular interest in prairie environments and nature.

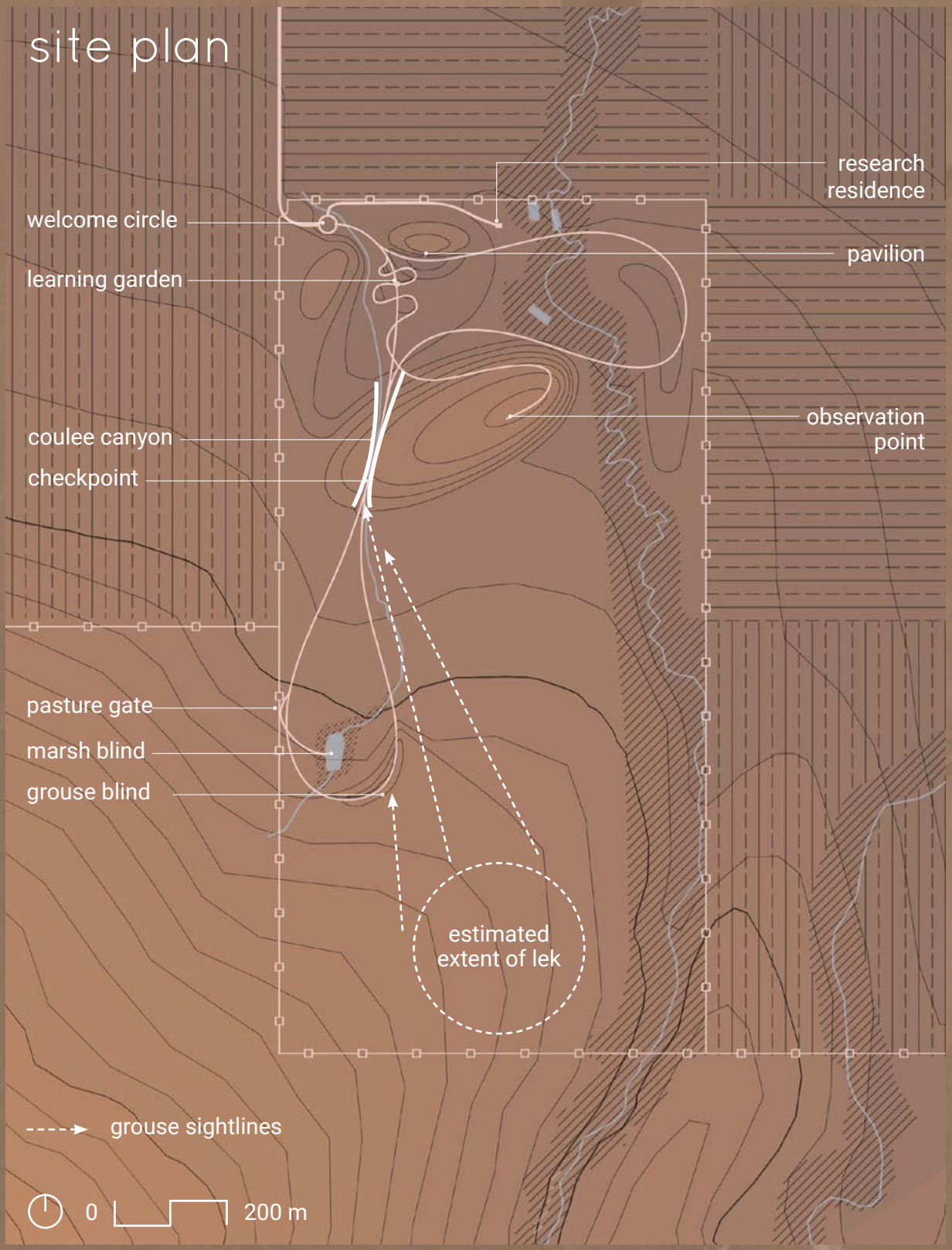
case study: the wallace stegner house

Eastend, Saskatchewan

Wallace Stegner's childhood home in Eastend, Saskatchewan, is maintained as a visiting artist's residency by the Eastend Arts Council, a not-for-profit group of volunteers. The house is available upon application for one-month residencies throughout the year for an honorarium of $500. Writers, artists, and performers who have published or publicly performed their work are welcome to apply and use the time to experience the beauty of Eastend and the nearby Cypress Hills, as well as the solitude and space to dedicate to their own personal projects. Opened in 1989, the property has hosted over 270 writers and artists from around the world.[7]

Take Aways

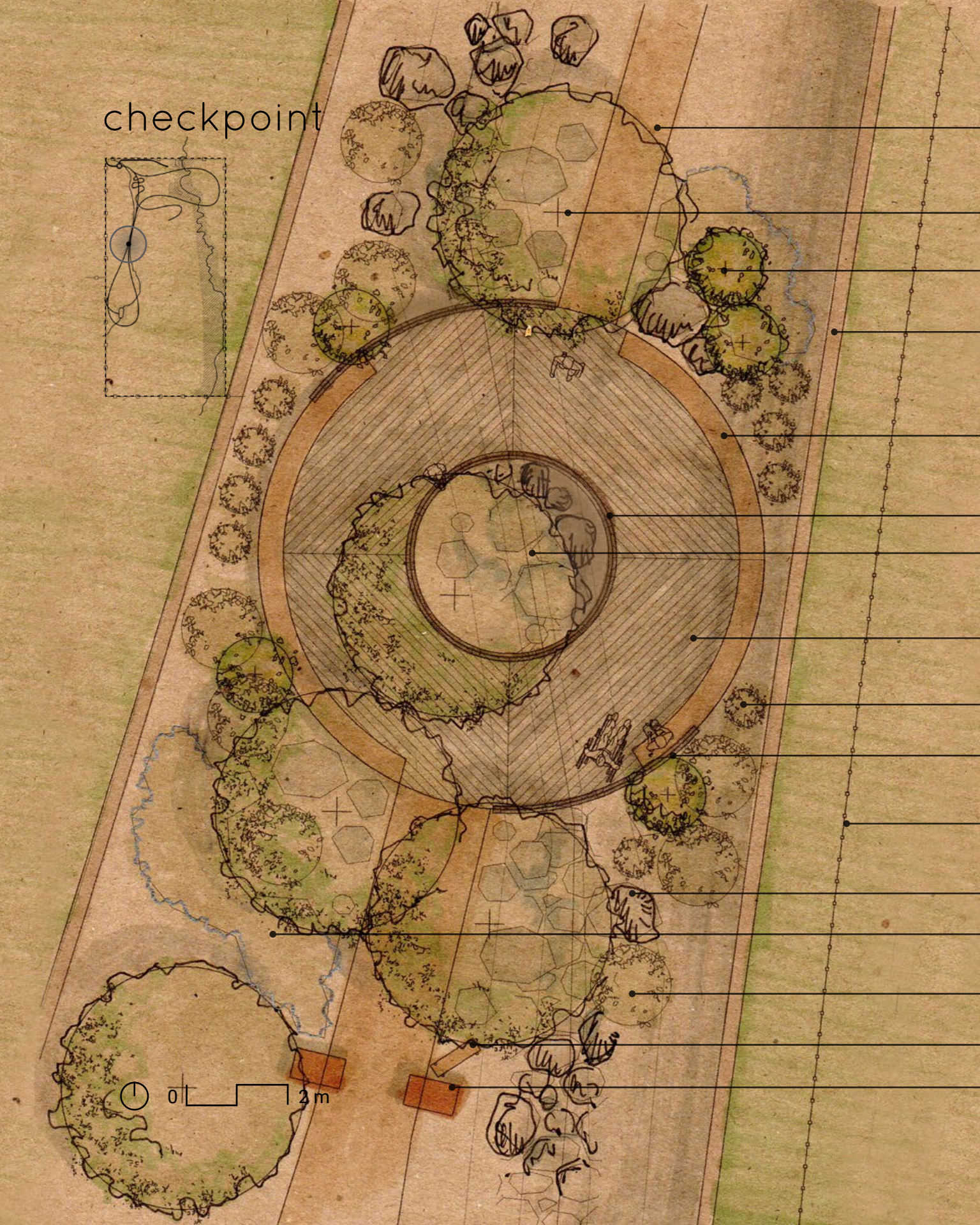
- The residence supports the local tourism industry, provides the community with fresh opportunities to experience locally produced art, and has enhanced a creative caché that the town has a claim to.
- Some of the artworks that have come from these residencies have made meaningful contributions to voicing the local landscape, history, and culture. A case in point: Candace Savage specifically mentions her residency at the Wallace Stegner House in her book, ***A Geography of Blood***, on the Cypress Hills Massacre and the dispossessions of the Métis.[8]


site plan
research residence
welcome circle
pavilion
learning garden
observation point
coulee canyon
checkpoint
pasture gate
marsh blind
grouse blind
estimated extent of lek
grouse sightlines
0
200 m

Beyond the Research Residence, the path crosses the creek via a small pedestrian bridge, providing visitors a brief glimpse and access to the riparian vegetation growing in the shallow coulee of the creek. Providing this access is also intended to limit disruption to any birds or other animals that find habitat and shelter along the creek; providing some access at particular locations addresses the desire to see the creek and eliminates the need to stomp around through the grass and vegetation to get to the water's edge. This is intended to reduce the possibility of disturbing a nest hidden in the grass.

The path loops back, crossing another small bridge, before returning to the enclosure of the hills. Continuing along the base of the observation hill, the path reaches an intersection, and diverges in different directions. Here, a visitor may turn north towards the Learning Garden, the path sinking into the land, or southeast towards the Observation Point, the path rising, climbing the hill at an oblique to maintain an accessible slope along the path of five percent or less. From this point, a visitor may also choose to turn south, travelling through the Coulee Canyon.

Sliced through the largest of the constructed hills, the Coulee Canyon achieves several design intentions. As mentioned, it achieves a retaining wall height of five meters, illustrating the depth of some native plants, but it also allows visitors to move past the observation hill without climbing up and over. At the same time, it permits water to continue to flow across the site in much the same way that it did prior to the design interventions and regrading, as the canyon roughly follows the seasonal creek that drains spring runoff from the site. The angle and position of the Coulee Canyon also does not interfere with the "buffer" function of the observation hill. The sightlines from the lek are such that people are not visible beyond a certain point within the canyon, and just before this point in the canyon, a "Checkpoint" is placed to stop people from proceeding during the most sensitive lekking hours. Here, signage will direct visitors not to proceed past the rammed earth pillar gateway for two hours surrounding dawn and dusk between March and mid-May.


checkpoint
0
2m

crusher dust path

Populus 'Okanese'

Populus tremuloides 'Prairie Skyrise'

rammed earth retaining wall, insulated, with concrete cap

rammed earth retaining wall with quartzite cap

railing

wishing well to seasonal creek bed

wooden decking

Ribes americanum

railing

post + wire fence

fieldstone boulders

Ariala nudicaulus + other groundcovers

Cornus sericea

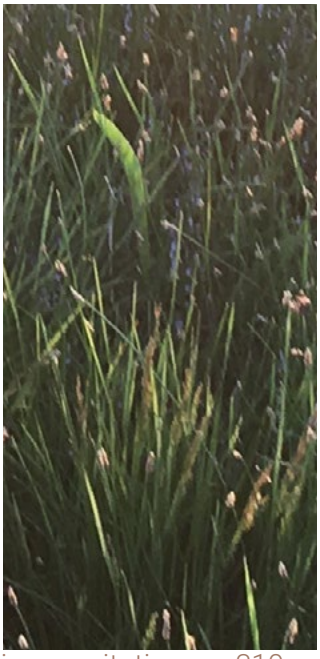
interpretive panel - lek stop

rammed earth gateway

The checkpoint is designed to stop people along the path, but also to create a place that could compensate for not being allowed to continue, even if that prohibition is brief and limited to a few hours a day in spring.

The Coulee Canyon is a checkpoint and a gateway, an extension of the Learning Garden, and a threshold that visitors pass through as they move closer to the Caledonia-Elmsthorpe pasture. It is also a framing tool; entering and exiting the canyon, your vision is directed to what is beyond the canyon's end, glimpsed through the trees rising and surrounding the Checkpoint. The canyon is also a wind tunnel, a natural air-conditioner on hot summer days, and a place to explore the fantastic shapes that the wind can whip snow into during winter.

As opposed to the Observation Point, which directs the view outwards, and the Gathering Circle, which directs the view inwards, the Coulee Canyon directs the view upwards past the walls and to the sky, while the well at the centre of the Checkpoint directs the view downwards, to the sometimes dry creek bed. Here, visitors contemplate the relationship between sky and water, and they listen to the echoes produced by the Coulee Canyon walls as the wind blows through the poplar and aspen leaves, sounding so much like rainfall, or the murmuring conversation of a large crowd.



Populus tremuloides 'Prairie Skyrise'

Populus 'Okanese'

wooden decking

rammed earth retaining wall, insulated, with concrete cap

reinforced tiebacks

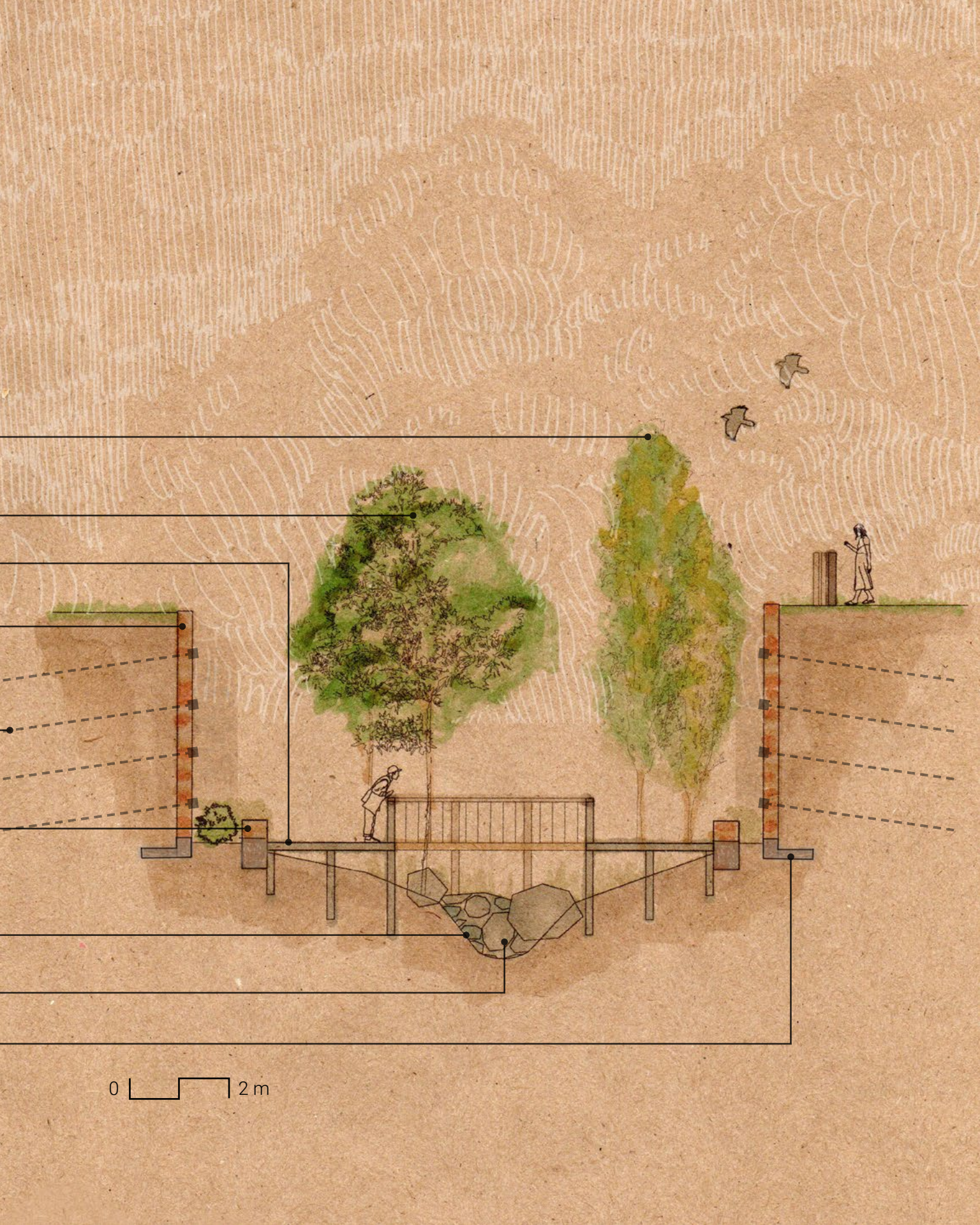
rammed earth seating wall with quartzite cap

fieldstone boulders

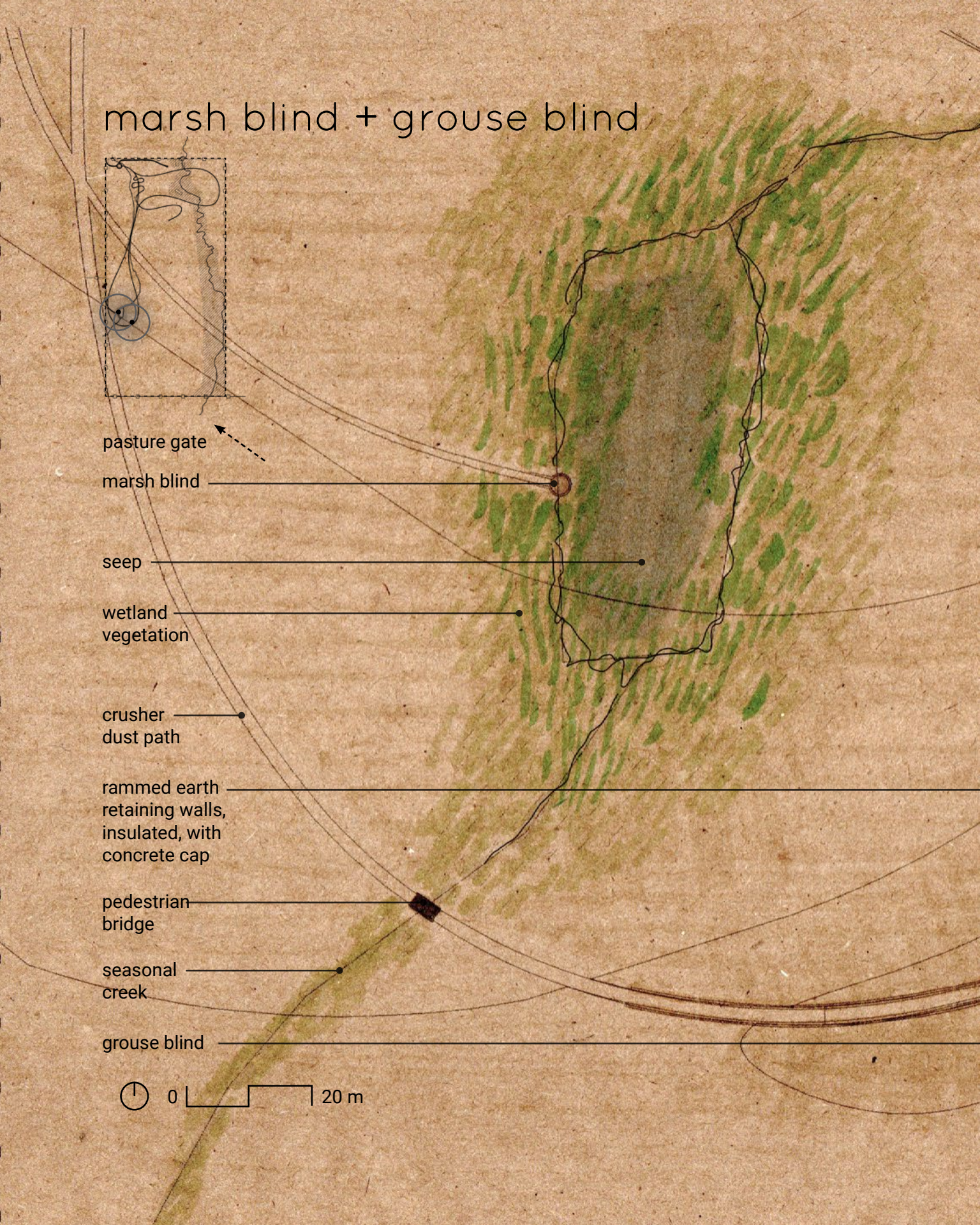
seasonal creek

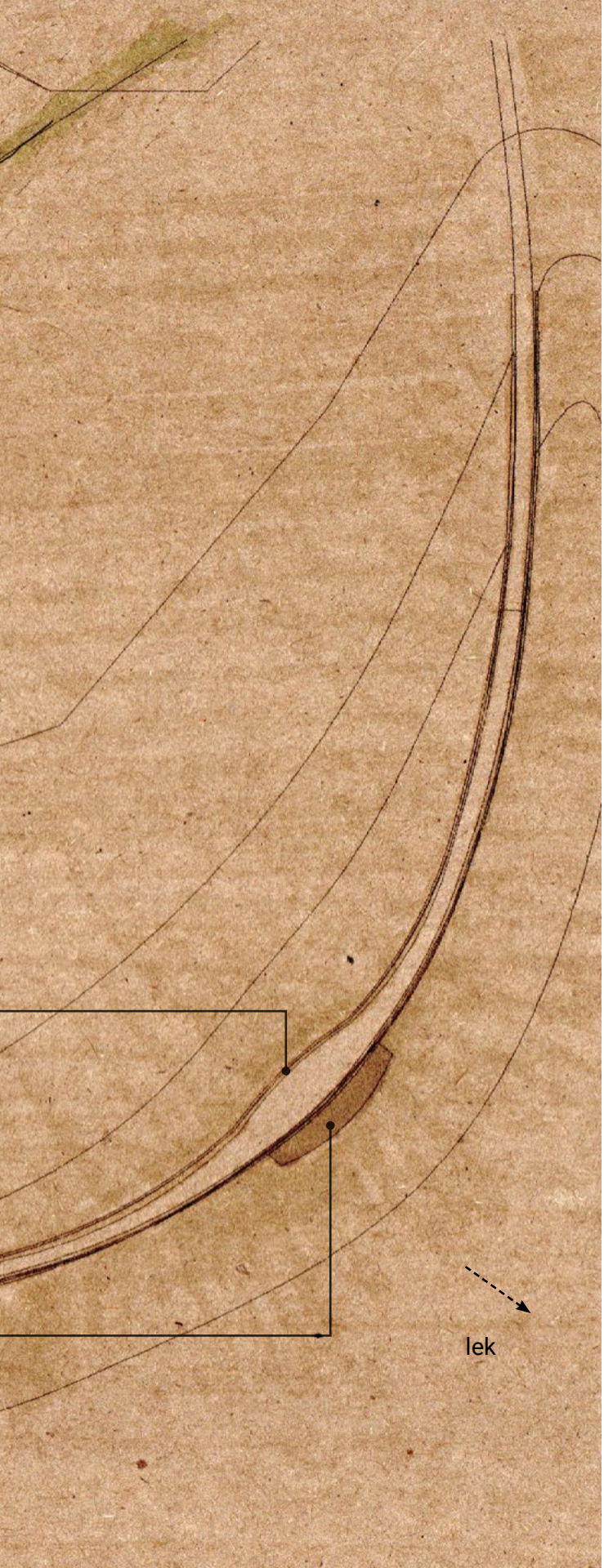
reinforced concrete footing

image citations p. 310


0
2 m

marsh blind + grouse blind





Beyond the Coulee Canyon, the path loops past two bird blinds, both elements of programming that are site-specific. Their design, particularly the grouse blind, which would only be seasonally available and would need to be booked for access, draws on precedents in the United States where there is a quietly thriving Sharp-Tailed Grouse tourism industry (indeed, this particular niche of ecotourism already has roots in Saskatchewan, predominantly near Saskatoon).[9] Viewing the lekking has to be done very carefully, and visitors have to be installed in the lek a minimum of one hour before sunrise. The design for the Grouse Blind is for a semi-sunken structure built into a constructed esker, which would keep the birdwatchers obscured from the view of the birds.

In contrast, the Marsh Blind is open to the sky, tucked into the reeds and cattails that grow around the edge of the seep, as vertically close as possible to the tipping point of the seep, so that the blind will be close to the water but also dry in spring. Following design guidelines developed in the United States, both blinds include seating, and arm/elbow rests near the viewing apertures, which are placed at varying heights.[10] Neither blind is specifically designed for photography. As opposed to the Grouse Blind, the Marsh Blind can be accessed year-round, without advance booking, and at any time of day. Access to the Grouse Blind is restricted to reduce the chance of misuse or damage to the structure, and as a general safety measure.

a further note on site safety, field parties, and vandalism

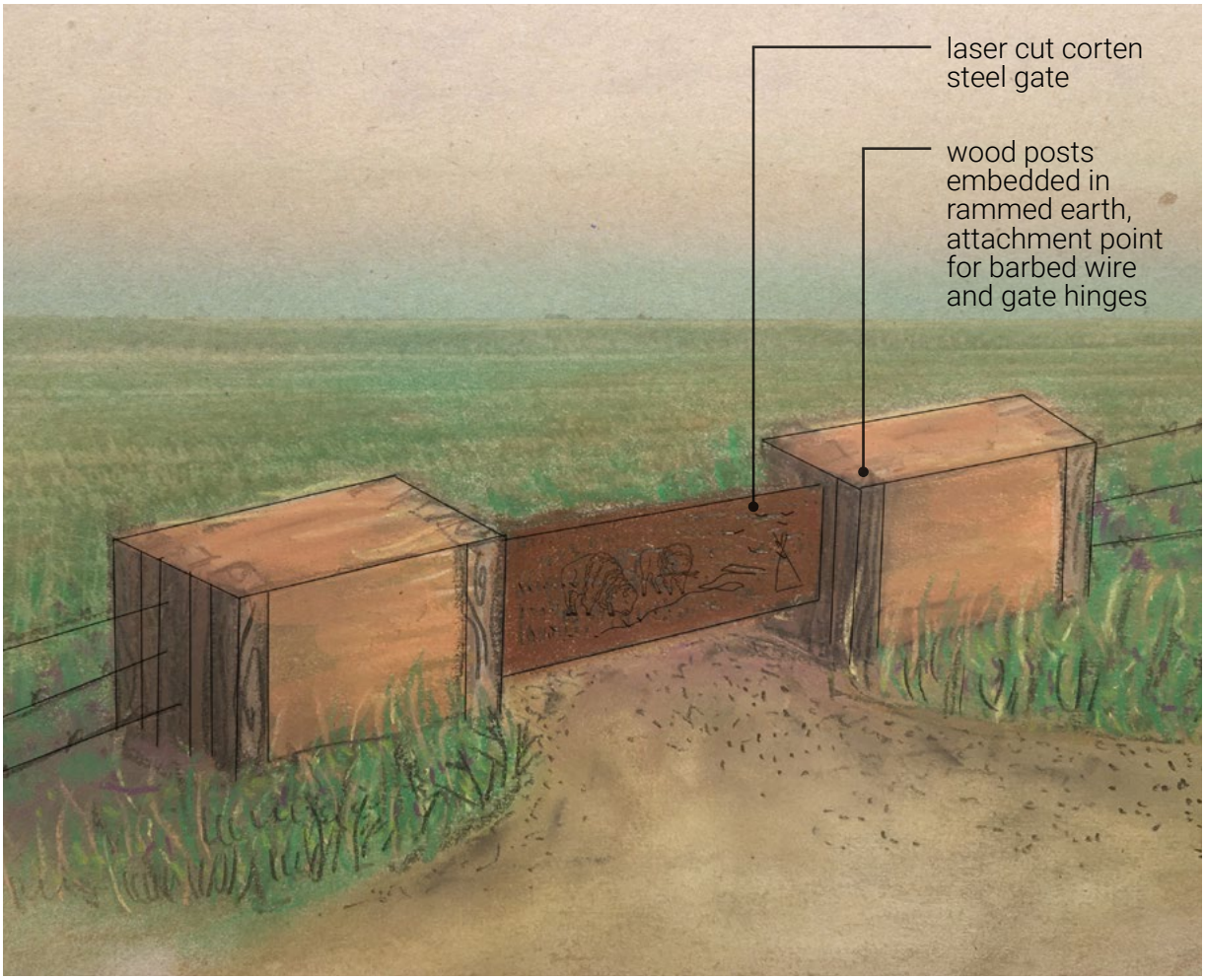
The site is open to the public 24/7 year-round and does not close in the evenings as some public parks do, and it is desirable that it be kept this way. Closing or locking a gate every day would require a level of maintenance and presence on site that is of a higher level than intended or indeed practical for such a remote location. And posting notice that the site is closed after certain hours will only stop visitors from entering after hours if there is a system to monitor their conformity, which also takes more resources than envisioned. Furthermore, since some of the experiences on the site are intended and designed for after sunset, it is not desirable to discourage all visitorship after dark. However, there are some after-dark uses that could be detrimental to the site, or indeed to the visitors.

Only a 45 minute drive from Regina, and even nearer to Avonlea (8 minutes) and Milestone (20 minutes), it is possible that teenage partiers might venture out from their communities, seeking the relative freedom and privacy of a rural site such as this one. During my own high school experience in Regina in the mid 2000s, it was not uncommon for parties held in the early fall or late spring to migrate beyond the city boundary, sometimes to private barns, to the valleys near Regina Beach, or to gravel pits just outside the city (colloquially, “The Pits”).

In the event that the site attracts these kinds of uses, the most likely points of congregation are the Welcome Circle, the Gathering Circle, and the Pavilion. The Welcome Circle is visible from the number 334 highway, and could be unofficially monitored by passersby, community members, or local constabulary (RCMP in the rural municipalities of Caledonia or Elmsthorpe). Any large gathering of cars parked here would be visible and could be investigated.

It is also hoped that the inclusion of the Research Residence would act as a detriment to loud or raucous parties. Since it is intended to be occupied for at least part of any given year, it fills an “eyes on the street” role that would otherwise be absent, thanks to the remote location. As part of the residency, guests could be asked to keep an eye out for partying or late-night behaviour that might be risky or lead to site vandalism – this might entail simply calling the local authorities to investigate a gathering, and would not require that guests try to interfere on their own.

Of course, this would only be in the event that the site faces misuse. It is hoped that visitors, once introduced to the site, would respect it, and respect the intentions behind it.



West of the Marsh Blind, the path diverges. Integrated simply into the barbed wire boundary of the pasture, is the final gateway, the entrance to the Caledonia-Elmsthorpe pasture itself. Compared to some of the other features of the site, the design of the Pasture Gate is modest, like the public pasture lands themselves. The gate, laser-cut corten steel engraved with an interpretive rendering of the history of the pasture lands, functions to communicate when the pasture is open to visitors and when it is not. It also functions to keep the cattle out, or let them in, and with additional timber framing to reinforce the corners of the rammed earth pillars, the gate is robust enough to withstand the inevitable rubbing it will receive as they scratch themselves on its vertical edges.

The intention is that the site would be grazed by cattle, not all season long but at least for a few days every year. The site would also be burnt, on a less frequent schedule, likely every 3-4 years, annual moisture conditions permitting. Both the entrance of the cattle and the reintroduction of fire could be cultural-ecological education and community events, celebrations, and ceremonies.

giving back: the proposed relationship of the site with Caledonia-Elmsthrope and its patrons

This practicum envisions that visitors could periodically be welcomed into the Caledonia-Elmsthorpe pasture, as they have been for particular events in the past.[11] What is the relationship of the site to the pasture and its patrons? How does the annex, or "gateway" site, relate to the adjacent working landscape?

The relationship should be one of reciprocity. While the pasture is crown land, the lease held by the grazing co-op prioritizes their use of it during the grazing season, and events that extend onto the pasture itself, such as interpretive hikes or trail rides, would proceed during the grazing season by the good will of the grazing co-op. What can the site offer and do for the Caledonia-Elmsthorpe pasture and its grazing co-op in return?

First, a partnership like this could increase public understanding and appreciation of the value of careful and sustainable ranching on native grasslands. It could clarify for a greater audience the differences that ranching practices and locations have in terms of impact on the environment. Cattle have a reputation as contributing to climate change, but as we've examined previously in this document, this is a very broad assessment of the industry and is not true of all producers in all places. Programming and education that reach the public through interventions like those proposed could help to address some of the misconceptions that people have, and could provide opportunities to promote local agriculture, separating and celebrating production that is sustainable and supports healthy grasslands.

Greater understanding and valuation of the work and sometimes sacrifices that producers make to maintain local ecologies would be valuable to our society. It would also be valuable to those producers. If a greater part of the population understood and valued the effort that has gone towards preserving the prairie that we have left, perhaps the echoes of that understanding would reach the political realm and find their way into public policy.

After over a century of policies that privilege crop agriculture over ranching, we need policies that support keeping native prairie under the cover of grass. We also need to recognize how much of the native prairie we have left is directly attributable to people who have made often difficult decisions that prioritized protection over profit. In *Islands of Grass*, Herriot writes:

> Economically sustainable grazing management as practiced by traditional ranching families should and must be a vital part of retaining and restoring health to our grasslands. For that to happen, though, we will need agricultural policy that recognizes the cultural, economic and ecological value of native grassland, that roots

> our perverse incentives in the market and in tax and insurance provisions that urge people to destroy the ancient grasslands and seed it to crops. Instead of hidden subsidies that place native grassland at risk, we need regulations and legislation that protect these endangered ecosystems by working with ranchers who want to make a living by grazing native grass, then retire and pass on their land in good condition to someone who will continue the tradition.[12]

Programming and design interventions like the kind outlined in this practicum can support public education about the cattle industry, and possibly inform future public policy decisions, but there are also real physically quantifiable and immediate benefits that an arrangement like this could offer a grazing co-op. We know that fire benefits grass, helps it access nutrients buried in the soil. However, many ranchers feel that to burn a pasture is to waste grass, and are hesitant to sacrifice what they have now for the prospect of a greater return to come – the idea of burning their pastures seems to go against the old dictum of "a bird in the hand is worth two in the bush."

Working with an annex site could be a way to approach addressing this hesitancy to burn, by offering an alternative source of grass. The site is only two quarter sections, a mere 1/84th the size of the Caledonia-Elmsthorpe pasture, but during the years that the site is not burnt (and it should not be burnt every year) the grass could be grazed, or even cut, and offered as additional pasturage or hay. This would allow for a direct exchange, and two quarter-sections could be selected within Caledonia-Elmsthorpe and burned. Although progress would be slow, this would allow the co-op patrons to burn the pasture, piecemeal, without sacrificing any of the year's grass. In this small and slow way, fire could be returned to the public pastures.

Caledonia-Elmsthorpe pasture, south of the design site

When the public pasture itself is not open to the public, visitors have plenty of opportunity to explore this restored grassland site and view the prairie and badlands from within its boundaries, to compare restoration with remnant.

The site is many things: a gateway, a window, a classroom, and a threshold, but tying all these uses together, it represents a commons, reborn. It is a place for the public, for the community, where we commune, with nature, history, and with other people.

looking towards the site from the Dirt HIlls

endings

notes on the title of this practicum and a call to action

The phrase "to put out to pasture" comes from agricultural communities, typically describing the treatment of a horse that is too old to work the fields any longer, or a cow that has stopped producing milk. Having worked hard its whole life, the animal is allowed to rest easy in the pastures, eating hay and fresh grass. The saying has come to be used colloquially to mean something that has been retired, has served its purpose, is no longer useful.

I chose "Out to Pasture" for the title of this practicum because there are ideas we need to retire: the conception of the prairie as boring, as unbeautiful, as worth less aesthetic attention (and consequently less protection) than forests or oceans or mountain ranges. We need to end the practice of undervaluing grasslands.

I also chose it because it describes the proposed solution: we need to get out of our cities and towns and on to the land. The prairie is not something you can experience from your couch or via your phone. And while there are extremely talented photographers and artists who have captured the prairie landscape beautifully, there is no photograph or drawing that can reproduce the experience of standing on that flat plane of earth and letting the sky seep into you. The moment you put the frame of a photograph around it, the limit of a screen or a page, you remove one of the very things that is so powerful about the prairie: it is limitless, vast, uncontained, an anti-object, uncaptured by any one single perspective or photograph. To repeat, again, Neil Evernden:

> We can only accept the gentle onslaught of prairie, the sterilizing light and the desiccation of hubris. Exposed on the prairie, we lose any sense of master, for what is there to master? The sun on the head bleaches the ego, and we experience the flattening and self-extension that is the essence of the prairie.[1]

Katherena Vermette, a Winnipeg-based author, captures something of this feeling of the expansion of the prairies, blending with the expansion of the self, in a passage from her novel, *The Break*:

> Every time she leaves the city, Cheryl takes a deep breath. She loves that last

Caledonia-Elmsthorpe pasture

> moment, the last stoplight before the highway stretches out and there's no slowing down anymore. The land south of the city runs completely flat. The road turns, rolls, outward under the long sky… [she] hopes they look out their windows once in a while to see their country spill out around them.[2]

There are moments in literature and poetry, like the above, that capture the feeling of being on the prairie, or illuminate something for us about the experience. I am frequently impressed and proud of how many great talents have roots in or are connected in some way to Saskatchewan, whose writing, poetry, or visual art reflects inspiration born from this landscape and this place. These artists and writers include Wallace Stegner, Trevor Herriot, Candace Savage, Sharon Butala, Thelma Poirier, Andrew Suknaski, Joe Fafard, Thelma Pepper, Dorothy Knowles, Edward Poitras, and Buffy Sainte Marie, to name just a few. You can learn so much about the prairie, its systems, its inhabitants, its emotional and spiritual impact on its residents, through exposure to the artwork of its people.

But as Kristen Catherwood, a good friend and herself a writer and documentarian of this landscape, told me when I was embarking on a trip to Grasslands National Park to begin early research on this project, you have to get out there to learn the prairie. You learn it from the land itself, from talking to people who know it, who have spent seasons and decades watching it. You learn it through your experience of it, and there is nothing that will quite replicate this in any book, film, or photograph.

As prairie people, we need to go out on the land. The native prairie is fragile, for all its resiliency, and if we don't monitor it, one day we will look for it and find it gone. Visiting it and bearing witness to it leaves us better prepared to sound the alarm when it is in trouble. Heading out to the prairie can be part of a method through which we protect it.

prairie crocus in spring

beginnings

hope for the prairies and the former public pastures

Many residents of Saskatchewan understand the provincial slogan, the "Land of the Living Skies," to refer to the wide views of the horizon, of sunrise and sunset, of northern lights and storms visible from great distances. There is also another sense of "Land of the Living Skies," and it imparts on us a responsibility. As much as the slogan refers to the changing of the sky, it also refers to a sky that is filled with living things, with beating wings that thrum out a heartbeat in the air over the province. To save what remains of our grasslands, of the birds that rely on them and all the other species living in the grass, we need to act.

There is reason to be optimistic about the future. There have always been advocates for grass, including poets, writers, Indigenous leaders, agriculturalists, hunters, and scientists, but in the last few years, a receptivity to the power and significance of native prairie seems to be infiltrating the greater population. This is evidenced by a few choice examples. David Suzuki's *The Nature of Things* produced a special episode on the value of prairie habitats in *Grasslands: a Hidden Wilderness,* first aired in 2020 and watched by viewers across the country.[1] In 2020 the Nature Conservancy of Canada purchased 866 hectares of native prairie along the shores of Buffalo Pound Lake with the twin and related goals of protecting an important water source and the remnant grassland that filters and protects it.[2] Finally, in 2021 the Weston Family Foundation (supported by the owners of the Loblaw group, including Superstore and Shopper's Drug Mart) dedicated $25 million to grassland conservation, distributing the funds to five organizations active across the three prairie provinces.[3]

Each event received media coverage, was transmitted via print, website, television, radio, and together reached thousands if not millions of Canadians' attention. And people are listening, stirring. In 2021, when SGI (Saskatchewan Government Insurance) announced a one-time rebate for vehicle owners, a group of citizens self-organized on Facebook to pool their rebates for a greater cause, and voted to donate the funds to grassland conservation, naming the group "Field of Dreams."[4]

Together, these events are indicative of a growing momentum, a freshened sense

of urgency to protect the prairies that we have left, and a sharpening interest in the recreational, cultural, and spiritual potential of the prairies, deeply tapped by some but still latent to a far greater many.

We might speculate on the role that the closure of the public pastures, and the public response across the prairie provinces, played in the recent galvanization of grassland advocacy. Was the threat of their loss the stimulus to a renewed interest in protecting the native prairie that remains? Were the voices of the pasture patrons, the casual users, the local community members, the activists and conservationists, were they the ones who were loud enough to raise the current alarm?

It was too late to save the public pasture systems. As previously reviewed in this document, the pushback from the public ultimately could not derail the decision to dismantle the programs, though the protestors won major concessions, including keeping the land under grass. We could also credit them, at least in part, with another small victory.

After the dust settled, and after the reactions to the loss had reverberated through the prairies, the Federal Government took a step towards reconciling what had been lost when the PFRA pasture system was dissolved, and in 2017, indicated an intention to pursue a land transfer with the Provincial Government of Saskatchewan, with the goal of creating a new prairie conservation area in the province.[5]

The trade revolved around the non-reversionary lands of the PFRA, those small parcels that were bought outright by the Federal Government rather than assembled by the province during the creation of the PFRA pastures, and which did not revert to provincial ownership at the closure of the program.[6] A significant amount of the permanent infrastructure of the PFRA, including staff housing, corrals, and the yard sites where patrons would load and unload, count and sort their cattle during the spring and fall, was built on non-reversionary land.[7] This infrastructure was useful to the Provincial Government, who could then lease it to the patron groups alongside the pasture lands, and it was desirable for the Provincial Government to acquire it.

The governments organized a transfer, finalized in 2020. The non-reversionary lands of 55 former PFRA pastures were traded to assemble the parcel of Nashlyn, Govenlock, and Battle Creek pastures under federal ownership.[8] The three adjacent former PFRA pastures are located in the southwestern corner of the province and together form a block of native prairie preserve, home to Greater Sage-Grouse, Ferruginous Hawk, Burrowing Owls, Prairie Falcons, Sprague's Pipit, Golden Eagles, Mountain Plovers, Pronghorn, Swift Fox, and Northern Leopard Frogs, among many others. Of the three, Govenlock pasture had been composed of entirely non-reversionary lands; Nashlyn and Battle Creek were acquired to create one contiguous tract of prairie reserve.[9] A combined 800 square kilometers, as of 2020 the lands are now under held by Environment and Climate Change Canada, and collectively will be referred to as the Prairie Pastures Conservation Area. The area will continue to be grazed by local producers, in a lease-hold format similar to the pastures now owned by the Provincial Government.[10]

Victories, like the creation of new grassland conservation areas, like the withdrawal of the landfill proposal adjacent to Caledonia-Elmsthorpe, give us cause for hope, hope

community of grasses and forbs

cattle trail at the Caledonia-Elmsthorpe pasture

that we might still be able to preserve and honour the remaining grasslands that we have left. But as author Zadie Smith has written, "Progress is never permanent, will always be threatened, must be redoubled, restated, and reimagined if it is to survive."[11] She was writing about societal change, specifically with regards to racial equality, multiculturalism, and social justice, but I think the statement applies to conservation, to environmental appreciation and values. A wider spread conservation mindset is also a type of societal change.

Perhaps the lesson from losing the public pastures is that we can not make a few plans for conservation and then leave them alone to run their course. This might work temporarily, it might even be successful for decades, but if we don't actively engage with our conservation initiatives, if we do not continue to educate, re-educate, reengage, and reimagine how we think about and pursue our conservation goals, that initial burst of energy and enthusiasm that propelled the setting of those goals and plans will eventually burn out.

What we can offer as landscape architects is our creativity, our clarity of purpose, our eyes. We can and always should be designing environments that support local ecologies, but we can also design to create opportunities that will shift sentiments and opinions. We can open people's perception to the beauty of overlooked or underseen places. We can use design to educate, to reveal, to inspire, to keep the fervour of conservation alight in the hearts of people. As designers of public space, we have an avenue through which to reach the public. We can support conservation through design.

In *Islands of Grass*, Herriot writes that

> Time is running out, but it is not too late to embrace our prairie remnants as geographies that contain both our history and our possibility as people who live where grass wants to grow. More than "working landscapes," they are places where we can yet discover what it means to be prairie people who regard the land not as commodity but as a community to which we belong.[12]

Time *is* running out, and maybe because of this, the time is right to act. There is a momentum running through our society, an undercurrent that we can take advantage of to push conservation from goals to outcomes, and landscape architecture has something to offer this movement. Design is not the whole solution, but it can be part of the solution.

People across Saskatchewan and Canada are listening, and there is something in the air, the distant rustle of wings.

images

All images by Kathryn *McCudden*, except as follows:

p. 69 "Saskatchewan farm, mid-1930s"

Saskatchewan Wheat Pool fonds, series 10, Box 148, file: History of the Saskatchewan Wheat Pool, Master; accessed October 10, 2021 via digital.scaa.sk.ca/gallery/wheatpool/en_sources.php#182. Reproduced with permission from the Provincial Archives of Saskatchewan.

p. 154 "a view of oysters underwater"

Whalen, Joe/The Tampa Bay Estuary Program. *Oyster Reef*. Photograph. Unsplash, October 28, 2021, https://unsplash.com/photos/HH-MuVCK-al0. Reproduced under the Unsplash License.

p. 156 "Where the river runs"

Penda. *Where the River Runs.* Rendering. *ArchDaily,* November 3, 2015, accessed October 13, 2021, https://www.archdaily.com/776474/penda-designs-river-inspired-landscape-pavilion-for-chinas-garden-expo. Reproduced with permission.

p. 158 "Where the river runs"

Penda. *Where the River Runs.* Rendering. *ArchDaily,* November 3, 2015, accessed October 13, 2021, https://www.archdaily.com/776474/penda-designs-river-inspired-landscape-pavilion-for-chinas-garden-expo. Reproduced with permission.

p. 161 "Dale Hodges Park"

Wilco Contractors Southwest. *Dale Hodges Park.* Photograph. City of Calgary, accessed October 13, 2021, https://www.calgary.ca/csps/recreation/public-art/dale-hodges-park-public-artwork.html. Reproduced with permission.

p. 163 "Dale Hodges Park"

Wilco Contractors Southwest. *Dale Hodges Park.* Photograph. City of Calgary, accessed October 13, 2021, https://www.calgary.ca/csps/recreation/public-art/dale-hodges-park-public-artwork.html. Reproduced with permission.

p. 164 "oyster harvesting"

Angel, John. *Matunuck Oyster Farm in Rhode Island.* Photograph. Unsplash, September 16, 2021, https://unsplash.com/photos/-ZhOg2SdwOQ. Reproduced under the Unsplash License.

p. 187 "controlled burning demonstration"

Hagerty, Ryan/USFWS. *Untitled* (controlled burn). Photograph. Pixnio, January 24, 2017, accessed December 18, 2021, https://pixnio.com/miscellaneous/fire-flames-pictures/fire-crew-burns-fields#. Reproduced under the Creative Commons License, Free to use CC0.

p. 188 "full moon hike + night life ecology walk"

Kumar, Ganapathy. *Untitled* (full moon). Photograph. Unsplash, July 8, 2017, accessed December 18, 2021, https://unsplash.com/photos/ve_uN9V8xqU. Reproduced under the Unsplash License.

p. 189 "new moon gathering + naked eye astronomy"

Vilaysing, Khamkéo. *Les yeux plein d'étoiles.* Photograph. Unsplash, September 17, 2017, accessed December 18, 2021, https://unsplash.com/photos/rpVQJbZMw8o. Reproduced under the Unsplash License.

p. 193 "community barbecue"

Keiman, Vincent. *BBQ.* Photograph. Unsplash, August 13, 2018, accessed December 18, 2021, https://unsplash.com/photos/ul_m5dHThaM. Reproduced under the Unsplash License.

p. 196 "community campfire + storytelling"

Meinberg, Timothy. *Untitled (campfire).* Photograph. Unsplash, February 12, 2017, accessed December 18, 2021, https://unsplash.com/photos/xqV9QdGOSas. Reproduced under the Unsplash License.

p. 197 "mown grass labyrinth"

Ev3177. *Untitled (grass labyrinth).* Photograph. Pixabay, *Septemb*er 8, 2012, accessed December 18, 2021, https://pixabay.com/photos/labyrinth-maze-faith-church-176888/. Reproduced under the Pixabay License.

p. 198 "TLSN signage"

Treaty Land Sharing Network. *TLSN Signage.* Photograph. *Briarpatch Magazine,* July 5, 2021, accessed October 13, 2021, https://briarpatchmagazine.com/articles/view/sharing-treaty-land. Reproduced with permission.

p. 201 "land sharing event"

Zink, Valerie. *Untitled (TLSN event).* Photograph. *Briarpatch Magazine,* July 5, 2021, accessed October 13, 2021, https://briarpatchmagazine.com/articles/view/sharing-treaty-land. Reproduced with permission.

p. 203 "new moon gathering + naked eye astronomy"

Vilaysing, Khamkéo. *Les yeux plein d'étoiles.* Photograph. Unsplash, September 17, 2017, accessed December 18, 2021, https://unsplash.com/photos/rpVQJbZMw8o. Reproduced under the Unsplash License.

"community campfire + storytelling"

Meinberg, Timothy. *Untitled (campfire).* Photograph. Unsplash, February 12, 2017, accessed December 18, 2021, https://unsplash.com/photos/xqV9QdGOSas. Reproduced under the Unsplash License.

"community barbecue"

Keiman, Vincent. *BBQ.* Photograph. Unsplash, August 13, 2018, accessed December 18, 2021, https://unsplash.com/photos/ul_m5dHThaM.

Reproduced under the Unsplash License.

"controlled burning demonstration"

Hagerty, Ryan/USFWS. *Untitled* (controlled burn). Photograph. Pixnio, January 24, 2017, accessed December 18, 2021, https://pixnio.com/miscellaneous/fire-flames-pictures/fire-crew-burns-fields#. Reproduced under the Creative Commons License: "Free to use CC0."

p. 214 "Avonlea"

Google Streetview. *Untitled (Avonlea, SK).* Photograph. Google, May 2013. accessed December 31, 2021, Reproduced under fair dealing.

p. 219 "male Sharp-Tailed Grouse on the lek"

Schmierer, Alan. *Sharp-Tailed Grouse 20-mile lek.* Photograph. Wikimedia Commons, April 19, 2016, accessed December 18, 2021, https://commons.wikimedia.org/wiki/File:Sharp-tailed_Grouse_(2).jpg. Reproduced under Creative Commons License CC0 1.0 Universal Public Domain Dedication.

p. 224 "burrowing owl"

Hennessy, Ray. *Untitled (burrowing owl).* Photograph. Unsplash, September 21, 2016, accessed December 18, 2021, https://unsplash.com/photos/6dR-fozkSV4. Reproduced under the Unsplash License.

"bobolink"

Hudgins, Jim/USFWS Midwest. *Bobolink.* Photograph. Flickr, May 18, 2017, accessed December 18, 2021, https://www.flickr.com/photos/usfwsmidwest/40339664414. Reproduced as public domain material.

"upland sandpiper"

Eslinger, Gary/USFWS Moutain Prairie. *Upland Sandpiper.* Photograph. Flickr, May 20, 2008, accessed December 18, 2021, https://www.flickr.com/photos/usfwsmtnprairie/13876436034. Reproduced under the Creative Commons License, Attribution 2.0 Generic.

"ferruginous hawk"

Bohn, Rick/USFWS Mountain Prairie. *Ferruginous hawk.* Photograph. Flickr, January 27, 2015, accessed December 18, 2021, https://www.flickr.com/photos/usfwsmtnprairie/16382060912. Reproduced under the Creative Commons License, Attribution 2.0 Generic.

"sprague's pipit"

Leavens, Gary. *Sprague's Pipit, with food.* Photograph. Flickr, December 29, 2017, accessed December 18, 2021, https://www.flickr.com/photos/gary_leavens/38673726874 . Reproduced under the Creative Commons License, Attribution-ShareAlike 2.0 Generic.

"loggerhead shrike"

Reago, Andy and Chrissy McClarren. *Loggerhead Shrike.* Photograph. Wikimedia Commons, November 13, 2016, accessed December 18, 2021, https://commons.wikimedia.org/wiki/File:Loggerhead_Shrike_(31027374495).jpg. Reproduced under the Creative Commons License, Attribution 2.0 Generic.

"swainson's hawk"

Nelson, Jon. *Swainson's Hawk.* Photograph. Flickr, April 24, 2017, accessed December 18, 2021, https://www.flickr.com/photos/jondavidnelson/33412118934/. Reproduced under the Creative Commons License, Attribution Noncommercial-ShareAlike 2.0 Generic.

"mountain bluebird"

Anderson, VJ. *Western Bluebird (Sialia mexicana).* Photograph. Wikimedia Commons, April 7, 2019, accessed December 18, 2021, https://commons.wikimedia.org/wiki/File:Mountain_Bluebird_5838.jpg. Reproduced under the Creative Commons License, Attribution-ShareAlike 2.0 Generic.

p. 228 "raccoons"

Ensminger, Chris. *Untitled (raccoon)*. Photograph. Unsplash, March 15, 2021, accessed December 18, 2021, https://unsplash.com/photos/gWo-hfRotrI. Reproduced under the Unsplash License.

"rats"

Jordan, Brett. *Untitled (rat)*. Photograph. Unsplash, August 12, 2019, accessed December 18, 2021, https://unsplash.com/photos/V-QbDB5zyMY. Reproduced under the Unsplash License.

"seagulls"

Thomas, Meritt. *Western Gull perched on a worn jetty rock along a foggy coastline.* Photograph. Unsplash, November 18, 2019, accessed December 18, 2021, https://unsplash.com/photos/ECaSu6RtxOk. Reproduced under the Unsplash License.

The Bialons. *Untitled (seagulls).* Photograph. Unsplash, April 10, 2018, accessed December 18, 2021, https://unsplash.com/photos/5FkWowAowA4. Reproduced under the Unsplash License.

"ravens"

Glebova, Christina. *Close up raven during daytime.* Photograph. Unsplash, May 10, 2021, accessed December 18, 2021, https://unsplash.com/photos/rXded09RfvA. Reproduced under the Unsplash License.

"crows"

The Other Kev. *Untitled (crow)*. Photograph. Pixabay, June 7, 2020, accessed December 18, 2021, https://pixabay.com/photos/old-crow-bald-crow-hurt-bird-5335624/. Reproduced under the Pixabay License.

p. 256 Moshirah. *Rammed Earth Surface.* Photograph. Wikimedia Commons, September 16, 2010, accessed December 18, 2021, https://commons.wikimedia.org/wiki/File:Rammed_Earth_Surface.JPG. Reproduced under the Creation Commons License, Attribution 3.0.

Nyx Lilith. *Garden Path.* Photograph. Unsplash, April 15, 2020, accessed December 18, 2021, https://unsplash.com/photos/XPYaRsTe09Y. Reproduced under the Unsplash License.

Techo Bloc. *Aquastorm paver.* Photograph. Techo Bloc, accessed December 18, 2021, https://www.

techo-bloc.com/shop/pavers/aquastorm/. Reproduced under fair dealing.

p. 277 Moshirah. *Rammed Earth Surface.* Photograph. Wikimedia Commons, September 16, 2010, accessed December 18, 2021, https://commons.wikimedia.org/wiki/File:Rammed_Earth_Surface.JPG. Reproduced under the Creation Commons License, Attribution 3.0.

Whyte Avenue Landscape Supplies. *Natural Flagstone Sunset Gold.* Photograph. Whyte Avenue Landscape Supplies, accessed December 18, 2021, https://whyteavelandscaping.ca/products/natural-flagstone-sunset-gold/. Reproduced under fair dealing.

p. 288 Moshirah. *Rammed Earth Surface.* Photograph. Wikimedia Commons, September 16, 2010, accessed December 18, 2021, https://commons.wikimedia.org/wiki/File:Rammed_Earth_Surface.JPG. Reproduced under the Creation Commons License, Attribution 3.0.

maps + graphs

Maps and graphs created with the following references:

p. 15 "Protected Areas within Prairie Ecozones in North America, 2017." Map, generated Febraury 25, 2020, using QGIS Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data layers:
Ecoregions: The Nature Conservancy. "Tnc_terr_ecoregions." Shapefile. Created October 31, 2019, accessed February 25, 2020, http://maps.tnc.org/gis_data.html.
Protected Areas in North America: The Nature Conservancy. "CEC_NA_PAD_2017." Shapefile. Created September 2017, accessed February 25, 2020, http://www.cec.org/tools-and-resources/north-american-environmental-atlas/map-files.
Base map: Base map: Quick Maps Services. "ESRI Shaded Relief." Created November 14, 2016, accessed February 25, 2020, QGIS plug-in.

p. 21 "Estimated Original Extent of Prairie Ecozones in North America." Map, generated Febraury 25, 2020, using QGIS Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data layers:
Ecoregions: The Nature Conservancy. "Tnc_terr_ecoregions." Shapefile. Created October 31, 2019, accessed February 25, 2020, http://maps.tnc.org/gis_data.html.
Protected Areas in North America: The Nature Conservancy. "CEC_NA_PAD_2017." Shapefile. Created September 2017, accessed February 25, 2020, http://www.cec.org/tools-and-resources/north-american-environmental-atlas/map-files.
Base map: Base map: Quick Maps Services. "ESRI Shaded Relief." Created November 14, 2016, accessed February 25, 2020, QGIS plug-in.

p. 34 "Treaty Boundaries in the Prairie Provinces." Map, generated December 30, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data layers:
Treaty boundaries: Open Canada,. "Traite_Pre_1975_Treaty_SHP." Shapefile. Created 2015, accessed March 2019, https://open.canada.ca/data/en/dataset/f281b150-0645-48e4-9c30-01f55f93f78e>
Base map: Quick Maps Services. "ESRI Shaded Relief." Created November 14, 2016, accessed December 30, 2021, QGIS plug-in.

p. 43 "Prairie Ecoregions of Saskatchewan." Map, generated December 5, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data layers:
Ecoregions: National Soil DataBase. "ecoregions." Shapefile. Created May 3, 2017, accessed February 25, 2020, http://sis.agr.gc.ca/cansis/nsdb/ecostrat/gis_data.html
Base map: Quick Maps Services. "ESRI Ocean." Created November 14, 2016, accessed December 5, 2021, QGIS plug-in.

p. 58 "Population Change over time in Saskatchewan." Infographic, adapted from Waiser, Bill. Waiser, Bill. "Urban and Rural Population of Saskatchewan." Graph. In *Saskatchewan: A New History*. Calgary, AB: Fifth House Ltd., 2005. 498.

p. 80 "Geographic Distribution of Federal and Saskatchewan Provincial Pastures across the Prairie Provinces." Map, generated February 25, 2020, using QGIS Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data layers:
SPP Northeast Region: Created Shapefile, based on Government of Saskatchwan. Map. *Saskatchewan Pastures Program Northeast Region.* Pastures and Pasture Regions - Lands Branch, Geomatic Services, Ministry of Agriculture. Created February 18, 2015.
SPP Northwest Region: Created Shapefile, based on Government of Saskatchwan. *Saskatchewan Pastures Program Northwest Region.* Map. Pastures and Pasture Regions - Lands Branch, Geomatic Services, Ministry of Agriculture. Created February 18, 2015.
SPP South Region: Created Shapefile, based on Government of Saskatchwan. *Saskatchewan Pastures Program South Region.* Map. Pastures and Pasture Regions - Lands Branch, Geomatic Services, Ministry of Agriculture. Created Aguust 11, 2016.
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Base map: Quick Maps Services. "ESRI Shaded Relief." Created November 14, 2016, accessed February 25, 2020, QGIS plug-in.

p. 94 "Percentage of Climax Vegetation in Response to Overgrazing." Infographic, adapted from Alberta 4-H. "Percentage of Climax Vegetation in Response to Overgrazing." Graph. In *Bison Project – Member Level Two.* https://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/4h6873/$FILE/bisonmemberl2i.pdf. 85.

p. 210 "Former Public Pasture near Regina." Map, generated February 25, 2020, using QGIS Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data layers:
SPP South Region: Created Shapefile, based on Government of Saskatchwan. *Saskatchewan Pastures Program South Region.* Map. Pastures and Pasture Regions - Lands Branch, Geomatic Services, Ministry of Agriculture. Created Aguust 11, 2016.
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Base map: Quick Maps Services. "ESRI Shaded Relief." Created November 14, 2016, accessed February 25, 2020, QGIS plug-in.

p. 212 "Caledonia-Elmsthorpe." Map, generated October 17, 2021, using QGIS Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.

Data layers:
Roads: National Resources Canada. "Canvec_50K_SK_Transport_shp." Shapefiles. Created July 24, 2019, accessed February 16, 2020, http://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Transport/
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Proposed Landfill Site: Created Shapefile, based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. "Aerial Map of Garbage and Landfill." Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. "Bing Aerial." Created July 3, 2018, accessed October 17, 2021.

p. 213 "Caledonia-Elmsthorpe." Map, generated October 17, 2021, using QGIS Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data layers:
Roads: National Resources Canada. "Canvec_50K_SK_Transport_shp." Shapefiles. Created July 24, 2019, accessed February 16, 2020, http://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Transport/
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Base map: Quick Maps Services. "ESRI Shaded Relief." Created November 14, 2016, accessed October 17, 2021, QGIS plug-in.

p. 214 "Context Map." Map, generated April 20, 2021, using QGIS Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data layers:
Roads and Railways: National Resources Canada. "Canvec_50K_SK_Transport_shp." Shapefile. Created July 24, 2019, accessed February 16, 2020, http://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Transport/
Reserves: National Resources Canada. "AL_TA_CA_SHP_DC." Shapefile. Created December 16, 2020, accessed March 29, 2021, https://open.canada.ca/data/en/dataset/522b07b9-78e2-4819-b736-ad9208eb1067
Towns, Recreation Sites, Historic Sites, and Rural Municipality Boundaries: Created Shapefile, with reference to Quick Maps Services. "Open Street Map." Accessed October April 20, 2021.
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Proposed Landfill Site: Created Shapefile, based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. "Aerial Map of Garbage and Landfill." Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. "Bing Aerial." Created July 3, 2018, accessed October 17, 2021.

p. 216 "Proposed Landfill Site." Map, generated May 17, 2021, using QGIS Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data layers:
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Proposed Landfill Site: Created Shapefile, based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. "Aerial Map of Garbage and Landfill." Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. "Bing Aerial." Created July 3, 2018, accessed May 17, 2021.

p. 225. "The Birds of Caledonia-Elmsthorpe." Map, generated October 15, 2021, sing QGIS Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data layers:
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Base map: Quick Maps Services. "Bing Aerial." Created July 3, 2018, accessed October 17, 2021.

p. 225 "Bird Decline Since 1970." Infographic, generated May 17, 2021, using Adobe InDesign, 2020. Created with information from North American Bird Conservation Initiative Canada. *The State of Canada's Birds, 2019*.Environment and Climate Change Canada, Ottawa, Canada: 2019. 12 pages. www.stateofcanadasbirds.org

p. 226 "Wind Dispersal of Trash." Map, generated April 26, 2021, using using QGIS Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data layers:
Wind rose: Adapted from Meteoblue. Climate Avonlea. Accessed April 18, 2021, https://www/meteoblue.com/en/weather/historyclimate/climatemodelled/avonlea_canada_5888569.
Trash dispersal: Created Shapefile, based on analysis using Zylstra, E.R. "Accumulation of wind-dispersed trash in desert environments." *Journal of Arid Environments* 89 (2016): 13-15.
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Proposed Landfill Site: Created Shapefile, based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. "Aerial Map of Garbage and Landfill." Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. "Bing Aerial." Created July 3, 2018, accessed April 26, 2021.

p. 228 "Creating New Habitat." Map, generated April 26, 2021, using using QGIS Version 2.18.15, Interna-

tional; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data layers:
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Proposed Landfill Site: Created Shapefile, based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. "Aerial Map of Garbage and Landfill." Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. "Bing Aerial." Created July 3, 2018, accessed April 26, 2021.

p. 230 "Topography." Map, generated October 17, 2021, using using QGIS Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data layers:
Roads: National Resources Canada. "Canvec_50K_SK_Transport_shp." Shapefiles. Created July 24, 2019, accessed February 16, 2020, http://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Transport/
Elevations: National Resources Canada. "Canvec_50K_SK_Elevation_shp." Shapefile. Created January 15, 2020, accessed April 17, 2021. https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Elevation/
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Proposed Landfill Site: Created Shapefile, based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. "Aerial Map of Garbage and Landfill." Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. "Bing Aerial." Created July 3, 2018, accessed October 17, 2021.

p. 232 "A Gateway to the Pastures." Map, generated August 16, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data Layers:
Image: Kathryn McCudden.
Base map: Quick Maps Services. "Bing Aerial." Created July 3, 2018, accessed August 16, 2021.

p. 235 "Footprint of Caledonia-Elmsthorpe transposed on a map of Regina." Map, generated April 5 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data Layers:
Roads: National Resources Canada. "Canvec_50K_SK_Transport_shp." Shapefile. Created July 24, 2019, accessed February 16, 2020, http://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Transport/
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Base map: Quick Maps Services. "Bing Aerial." Created July 3, 2018, accessed April 5, 2021.

p. 236 "Watercourses + Watersheds." Map, generated October 17 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data Layers:
Roads: National Resources Canada. "Canvec_50K_SK_Transport_shp." Shapefiles. Created July 24, 2019, accessed February 16, 2020, http://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Transport/
Watersheds: National Resources Canada. "NH_INDEX_22_INDEX_WORKUNIT_LIMIT_2." Shapefile. Created December 9, 2020, accessed April 20, 2021, https://open.canada.ca/data/en/dataset/a4b190fe-e090-4e6d-881e-b87956c07977#wb-auto-6
Waterbodies and watercourses: National Resources Canada. "Canvec_50K_SK_Hydro_shp." Created July 24, 2019, accessed April 17, 2021, https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Hydro/
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Proposed Landfill Site: Created Shapefile, based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. "Aerial Map of Garbage and Landfill." Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. "Bing Aerial." Created July 3, 2018, accessed October 17, 2021.

p. 237 "Soil Textures." Map, generated April 20, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data Layers:
Roads: National Resources Canada. "Canvec_50K_SK_Transport_shp." Shapefiles. Created July 24, 2019, accessed February 16, 2020, http://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Transport/
Soil Polygons: CanSIS. "Soils of Canada 2% Derived." Shapefile. Created September 30, 2020, accessed April 18, 2021, https://hub.arcgis.com/datasets/5457d3cb7e674de2b6adc20a2c33fba3_6?geometry=-126.591%2C49.379%2C-84.777%2C54.134
Soil Textures: Soil polygons supplemented with soil texture information from Saskatchewan Soil Information System. GIS Application. https://sksis.ca/map
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Proposed Landfill Site: Created Shapefile, based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. "Aerial Map of Garbage and Landfill." Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. "Bing Aerial." Created July 3, 2018, accessed April 20, 2021.

p. 238 “Existing Conditions.” Map, generated October 18, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data Layers:
PFRA Pastures: Created Shapefile, based on Agriculture and Agri-Food Canada. AESB Community Pastures with Land Management Districts. Created 2009.
Proposed Landfill Site: Created Shapefile, based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. “Aerial Map of Garbage and Landfill.” Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. “Bing Aerial.” Created July 3, 2018, accessed April 20, 2021.

p. 242 “Untitled (Photo Key).” Map, generated May 17, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data Layers:
Proposed Landfill Site: Annotation based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. “Aerial Map of Garbage and Landfill.” Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. “Bing Aerial.” Created July 3, 2018, accessed May 17, 2021.

p. 244 “Untitled (Photo Key).” Map, generated May 17, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data Layers:
Proposed Landfill Site: Annotation based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. “Aerial Map of Garbage and Landfill.” Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. “Bing Aerial.” Created July 3, 2018, accessed May 17, 2021.

p. 246 “Untitled (Photo Key).” Map, generated May 17, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data Layers:
Proposed Landfill Site: Annotation based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. “Aerial Map of Garbage and Landfill.” Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. “Bing Aerial.” Created July 3, 2018, accessed May 17, 2021.

p. 248 “Untitled (Photo Key).” Map, generated May 17, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Data Layers:
Proposed Landfill Site: Annotation based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. “Aerial Map of Garbage and Landfill.” Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. “Bing Aerial.” Created July 3, 2018, accessed May 17, 2021.

p. 250 “Proposed Site Design.” Map, generated November 25, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Adapted with reference to Data Layers:
Elevations: National Resources Canada. “Canvec_50K_SK_Elevation_shp.” Shapefile. Created January 15, 2020, accessed April 17, 2021. https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Elevation/
Waterbodies and watercourses: National Resources Canada. “Canvec_50K_SK_Hydro_shp.” Created July 24, 2019, accessed April 17, 2021, https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Hydro/
Proposed Landfill Site: Annotation based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. “Aerial Map of Garbage and Landfill.” Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. “Bing Aerial.” Created July 3, 2018, accessed November 25 2021.

p. 252 “Proposed Site Design.” Map, generated November 25, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Adapted with reference to Data Layers:
Elevations: National Resources Canada. “Canvec_50K_SK_Elevation_shp.” Shapefile. Created January 15, 2020, accessed April 17, 2021. https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Elevation/
Waterbodies and watercourses: National Resources Canada. “Canvec_50K_SK_Hydro_shp.” Created July 24, 2019, accessed April 17, 2021, https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Hydro/
Proposed Landfill Site: Annotation based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. “Aerial Map of Garbage and Landfill.” Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132
Base map: Quick Maps Services. “Bing Aerial.” Created July 3, 2018, accessed November 25, 2021.

p. 253 “Existing.” Map, generated November 27, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Adapted with reference to Data Layers:
Elevations: National Resources Canada. “Canvec_50K_SK_Elevation_shp.” Shapefile. Created January 15, 2020, accessed April 17, 2021. https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Elevation/
Waterbodies and watercourses: National Resources Canada. “Canvec_50K_SK_Hydro_shp.” Created July 24, 2019, accessed April 17, 2021, https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Hydro/

p. 253 “Proposed.” Map, generated November 27, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Adapted with reference to Data Layers:
Elevations: National Resources Canada. “Canvec_50K_SK_Elevation_shp.” Shapefile. Created January 15, 2020, accessed April

17, 2021. https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Elevation/

Waterbodies and watercourses: National Resources Canada. "Canvec_50K_SK_Hydro_shp." Created July 24, 2019, accessed April 17, 2021, https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Hydro/

p. 252 "Site Plan." Map, generated November 25, 2021, using QGIS, Version 2.18.15, International; Adobe Photoshop, 2020; Adobe InDesign, 2020.
Adapted with reference to Data Layers:

Elevations: National Resources Canada. "Canvec_50K_SK_Elevation_shp." Shapefile. Created January 15, 2020, accessed April 17, 2021. https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Elevation/

Waterbodies and watercourses: National Resources Canada. "Canvec_50K_SK_Hydro_shp." Created July 24, 2019, accessed April 17, 2021, https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/shp/Hydro/

Proposed Landfill Site: Annotation based on Citizens Against the Proposed Loraas Landfill in the RM of Caledonia,. "Aerial Map of Garbage and Landfill." Map. Posted January 5, 2021, accessed April 24, 2021, https://www.facebook.com/groups/1088346118253795/permalink/1094859414269132

Base map: Quick Maps Services. "Bing Aerial." Created July 3, 2018, accessed November 25, 2021.

p. 264. "Interpretive Grate." Rendering, produced with reference to North American Bird Conservation Initiative Canada. *The State of Canada's Birds, 2019.* Environment and Climate Change Canada, Ottawa, Canada: 2019. 12 pages. www.stateofcanadasbirds.org;
Texas Parks and Wildlife Department. "Migratory Flyways of North America: Mississippi Flyway." https://tpwd.texas.gov/huntwild/wild/birding/migration/flyways/mississippi/;
Texas Parks and Wildlife Department. "Migratory Flyways of North America: Central Flyway." https://tpwd.texas.gov/huntwild/wild/birding/migration/flyways/central/.

notes

endings: an introduction to the public pastures

1 Les Whittington, "Conservatives dismantling social programs built over generations," *Toronto Star,* December 9, 2013, accessed June 27, 2021, https://www.thestar.com/news/canada/2013/12/09/conservatives_dismantling_social_programs_built_over_generations.html.

2 Dave Phillips, *PFRA Pastures Transition Study*, January 7, 2015, https://www.naturesask.ca/rsu_docs/pfra-final-report.pdf , 1-12.

3 Phillips, *PFRA Pastures Transition Study*, 10-12;

"Sask. Pastureland to be leased out instead of sold off," *CBC News*, June 15, 2017, accessed October 10, 2021, https://www.cbc.ca/news/canada/saskatchewan/saskatchewan-pastures-program-1.4162876;

"Community Highlight: Public Pastures – Public Interest," *EcoFriendly Sask*, October 7, 2021, accessed October 10, 2021, https://www.ecofriendlysask.ca/.

beginnings: a statement of purpose

1 Katie Doke Sawatzky and Joseph M. Piwowar, "Changes in prairie grassland extent in Saskatchewan from 1990 to 2015," *Prairie Perspectives: Geographical Essays* 21 (2019): 1-8.

2 Dan Kraus, "Why Canada's prairies are the world's most endangered ecosystem," *Land Lines* (blog), Nature Conservancy of Canada, October 24, 2016, accessed January 25, 2021, https://www.natureconservancy.ca/en/blog/archive/grasslands-the-most.html.

3 Kraus, "Why Canada's prairies are the world's most endangered ecosystem."

4 Phillips, *PFRA Pastures Transition Study*, 9, 36;

Katie Doke Sawatzky, "The Lost Gem of the PFRA Pastures," *The Prairie Commons Project: a reporter's journey through Saskatchewan's grasslands.* October 1, 2018, accessed May 15, 2021, https://www.prairiecommons.ca/?page_id=156.

prairie: an introduction to the life and legacy of the grasslands

1 Candace Savage, *Prairie: A Natural History, (*Vancouver: Greystone Books, 2004), 8.

2 Savage, *Prairie*, 59.

3 Savage, *Prairie*, 32-59.

4 Savage, *Prairie*, 73.

5 Savage, *Prairie*, 73.

6 Arthur W. Bailey, Duane McCartney, and Michael P. Schellenberg, "Management of Canadian Prairie Rangeland," (Agriculture and Agri-Food Canada, 2010). Accessed January 21, 2021, https://www.beefresearch.ca/files/pdf/fact-sheets/991_2010_02_TB_RangeMgmnt_E_WEB_2_.pdf, iv-v.

7 Savage, *Prairie*, 64.

8 *Corner Gas*, season 1 episode 1 "Ruby Reborn," directed by David Storey, written by Brent Butt, Mark Farrell, and David Storey, aired January 22, 2004, on CBC.

9 Savage, *Prairie*, 263.

10 Meriwether Lewis, William Clark, Charles Floyd, and Joseph Whitehouse, *Original journals of the Lewis and Clark Expedition, 1804-1806,* American Philosophical Society Library, 1905, (New York: Antiquarian Press, 1959).

11 John James Audobon, *The Birds of America*, J.J. Audobon, 1840. (Italy: Miller Graphics, distributed by Crown Publishers Inc., 1978).

12 Joel Berger and Jon Beckman, "Animals large and small once covered North America's Prairies – and in some places, they could again," *The Conversation,* February 19, 2020, accessed January 17, 2021, https://theconversation.com/animals-large-and-small-once-covered-north-americas-prairies-and-in-some-places-they-could-again-126989;

Savage, *Prairie,* 2, 12.

13 "Role of Keystone Species in an Ecosystem," *National Geographic*, September 5, 2019, accessed January 19, 2021, https://www.nationalgeographic.org/article/role-keystone-species-ecosystem/.

14 "Bison Ecology – Elk Island National Park," Parks Canada, last modified July 19, 2018, accessed January 18, 2021, https://www.pc.gc.ca/en/pn-np/ab/elkisland/nature/eep-sar/ecologie-ecology2.

15 Alan K. Knapp, John M. Blair, John M. Briggs, Scott L. Collins, David C. Hartness, Loretta C. Lohnson, and E. Gene Towne, "The Keystone Role of Bison in North American Tallgrass Prairie," *BioScience* 49, no. 1 (1999): 39-50.

16 Denis F. Owen and Richard G. Wiegert, "Mutualism between Grasses and Grazers: An Evolutionary Hypothesis," *Oikos* 36, no. 3 (March 1981): 376-378;

Carlos M. Herrera, "Grasses, Grazers, Mutualism, and Coevolution: A Comment," *Oikos* 38, no. 2 (March 1982): 254-258;

Denis F. Own and Richard G. Wiegert, "Grasses and Grazers: Is There a Mutualism?" *Oikos* 38, no. 2 (March 1982): 258-259;

David J. Gibson, *Grasses and Grassland Ecology* (New York: Oxford University Press, 2009), 33.

Knapp et al., "The Keystone Role of Bison in North American Tallgrass Prairie";

Lisa Henrichs, "Grazing as a Technique for Prairie Restoration," *Restoration and Reclamation Review* 2, no. 5 (Spring 1997). (St. Paul, MN: Student On-Line Journal, Department of Horticultural Science, University of Minnesota).

17 Knapp et al.,"The Keystone Role of Bison in North American Tallgrass Prairie," 41.

18 M. J. Trlica, "Grass Growth and Response to Grazing,"

Natural Resources Series, Fact Sheet No. 6.108, Colorado State University Extension. Reviewed March 2013, accessed January 19, 2021, https://extension.colostate.edu/docs/pubs/natres/06108.pdf;

Savage, *Prairie*, 117.

19 Savage, *Prairie*, 118.

20 Savage, *Prairie*, 126.

21 Morgan Osborn, "What is a Forb?" *Wild Wonderings* (blog), Texas A&M Natural Resources Institute, June 25, 2015, accessed September 4, 2021, http://wild-wonderings.blogspot.com/2015/06/what-is-forb.html.

22 Knapp et al., "The Keystone Role of Bison in North American Tallgrass Prairie," 41;

Henrichs, "Grazing as a Technique for Prairie Restoration," 4.

23 Allen Steuter and Lori Hidinger, "Comparative Ecology of Bison and Cattle on Mixed-Grass Prairie," *Great Plains Research: A Journal of Natural and Social Science* 9 (Fall 1999): 334.

24 Grace Morgan and R.J. Hudson, "Dynamics of Fire and Grazing by Bison on Grasslands in Central Alberta," *Beaver, Bison, Horse: the traditional knowledge and ecology of the Northern Great Plains* (Regina: University of Regina Press, 2020).

25 Savage, *Prairie*, 81, 197;

"Restoring Fire to Native Grasslands," *The Nature Conservancy,* accessed January 20, 2021, https://www.nature.org/en-us/about-us/where-we-work/united-states/minnesota/stories-in-minnesota/restoring-fire-to-native-grasslands/

26 Knapp et al., "The Keystone Role of Bison in North American Tallgrass Prairie";

Henrichs, "Grazing as a Technique for Prairie Restoration," 4.

27 Savage, *Prairie*, 126.

28 Savage, *Prairie*, 57;

Ted J. Brasser, "Plains Indigenous Peoples in Canada," in *The Canadian Encyclopedia*, February 22, 2009, updated March 28, 2019 by Zach Parrott and Michelle Filice, accessed January 19, 2021, https://www.thecanadianencyclopedia.ca/en/article/aboriginal-people-plains.

29 Waiser, *A World We Have Lost: Saskatchewan Before 1905* (Markham, ON: Fifth House Limited, 2016), 54.

30 For a more detailed account of human habitation before colonization, specifically in the area that is today Saskatchewan, refer to:

Bill Waiser, *A World We Have Lost: Saskatchewan Before 1905,* (Markham, ON: Fifth House Limited, 2016);

Jesse Rae Archibald-Barber, ed., *kisiskaciwan: Indigenous Voices from Where the River Flows Swiftly,* (Regina, SK: University of Regina Press, 2018).

31 Waiser, *A World We Have Lost*, 48.

32 Waiser, *A World We Have Lost*, 53-86.

33 Savage, *Prairie*, 83.

34 Savage, *Prairie*, 122.

35 Waiser, *A World We Have Lost*, 38-40.

lost horizon: a brief history of European settlement on the northern Great Plains

1 James Daschuk, *Clearing the Plains:Disease, Politics of Starvation, and the Loss of Aboriginal Life* (Regina: University of Regina Press, 2013);

Grace Morgan, *Beaver, Bison, Horse: the traditional knowledge and ecology of the Northern Great Plains* (Regina: University of Regina Press, 2020),145-146.

2 Waiser, *A World We Have Lost,* 91-92.

3 Charles N. Bell, "The Old Forts of Winnipeg, 1738-1927," *Manitoba Historical Society*, MHS Transactions Series 2, no. 3. Speech read and recorded 1927, accessed January 24, 2021, http://www.mhs.mb.ca/docs/transactions/2/oldfortsofwinnipeg.shtml

4 Waiser, *A World We Have Lost,* 197-205.

5 Waiser, *A World We Have Lost,,* 241-242, 487, 490-491.

6 "The Fashion of Fur," *Canada: A people's history*, CBC, accessed September 6, 2021, https://www.cbc.ca/history/EPCONTENTSE1EP6CH1PA2LE.html

7 Waiser, *A World We Have Lost,* 421-426.

8 IWaiser, *A World We Have Lost,* 432.

9 Savage, *Prairie*, 17.

10 Waiser, *A World We Have Lost,* 417-418.

11 Bailey et al., "Management of the Canadian Prairie Rangeland," 19.

12 Waiser, *A World We Have Lost*, 215-216.

13 Waiser, *A World We Have Lost,* 149-151.

14 Edward Everett Dale, *The Range Cattle Industry: Ranching on the Great Plains from 1865 to 1925* (Norman, Oklahoma: University of Oklahoma Press, 1960), 26.

15 Daschuk, *Clearing the Plains*, 79.

16 Waiser, *A World We Have Lost,* 471.

17 Waiser, *A World We Have Lost,* 362-363.

18 Waiser, *A World We Have Lost,* 399.

19 Waiser, *A World We Have Lost,* 418-421.

20 Waiser, *A World We Have Lost,* 418.

21 Gretchen Albers, "Treaties 1 and 2," in *The Canadian Encyclopedia*. September 25, 2015, edited November 12, 2015, accessed January 24, 2021, https://www.thecanadianencyclopedia.ca/en/article/treaties-1-and-2#:~:text=Treaty%201%20was%20signed%20by,A.G.%20Irvine%2C%20and%20eight%20witnesses.

22 Daschuk, *Clearing the Plains*, 79.

23 Waiser, *A World We Have Lost,* 469-470.

24 Waiser, *A World We Have Lost,* 469.

25 Waiser, *A World We Have Lost,* 452-453.

26 J.M. Bumsted, "Red River Rebellion," *The Canadian Ency-*

clopedia, February 7, 2006, edited November 22, 2019 by Richard Foot, Eli Yarhi, and Andrew McIntosh, accessed January 24, 2021, https://www.thecanadianencyclopedia.ca/en/article/red-river-rebellion.

27 Waiser, *A World We Have Lost*, 462.

28 Waiser, *A World We Have Lost„ 462-463.*

29 Waiser, *A World We Have Lost*, 384.

30 "Homesteading," *Provincial Archives of Saskatchewan,* accessed January 24, 2021, https://www.saskarchives.com/collections/land-records/history-and-background-administration-land-saskatchewan/homesteading.

31 Waiser, *A World We Have Lost,* 494.

32 Savage, *Prairie*, 17.

33 Waiser, *A World We Have Lost,* 494.

34 Waiser, *A World We Have Lost,* 622-624.

35 Trevor Herriot, *Islands of Grass*, (Regina, SK: Coteau Books, 2017), 31-32.

36 Federal, Provincial and Territorial Governments of Canada, "Grasslands," in *Canadian Biodiversity: Ecosystem Status and Trends*, (Ottawa: Canadian Councils of Resource Ministers, 2010), 18-19.

37 Katie Doke Sawatzky, "The state of native prairie in Saskatchewan," *The Prairie Commons Project: a reporter's journey through Saskatchewan's grasslands,* October 1, 2018, updated July 30, 2020, accessed January 25, 2020, https://www.prairiecommons.ca/?page_id=300.

rangelands: remnant prairie in southern Saskatchewan

1 Dale, *The Range Cattle Industry*, xi-xii.

2 Dale, *The Range Cattle Industry*, xii.

3 Herriot, *Islands of Grass*, 19-20.

4 Dale, *The Range Cattle Industry*, 3.

5 Bailey et al., "Management of Canadian Prairie Rangeland," 21;

Cf. Range Ecologist and Historian Alex Johnston points out that cattle were resident at trading posts in the west as early as 1702, in York Factory, and calves were transported by boat to other tradings posts from there. However it seems the earliest cattle to graze in the prairie region were those taken to Red River in 1813. Alex Johnston, "The History of the Rangelands of Western Canada," *Journal of Range Management* 23, no. 1 (January 1970): 3-8. doi: https://www.jstor.org/stable/3895999.

6 Herriot, *Islands*, 89-91.

7 Savage, *Prairie*, 120-122;

Herriot, *Islands*, 89-91.

8 Dale, *The Range Cattle Industry,* 28.

9 *Encyclopedia Britannica,* s.v. "Economy of Canada," accessed October 11, 2021, https://www.britannica.com/place/Canada/Economy.

10 Gerald Friesen, *The Canadian Prairies: a history* (Toronto: University of Toronto Press, 1987), **referenced in** Arthur W. Bailey, Michael P. Schellenberg, Duane McCartney, and Patricia Bailey, "Politics, Policy, Settlers, and Consequences for Canadian Prairie Grasslands: A Range Management Perspective," *Society for Range Management* 32, no. 5 (October 2010): 19, https://www.jstor.org/stable/40927234

11 Lewis G. Thomas, *The prairie west to 1905: a Canadian sourcebook,* (Toronto: Oxford University Press, 1975), **quoted in** Arthur W. Bailey, Michael P. Schellenberg, Duane McCartney, and Patricia Bailey, "Politics, Policy, Settlers, and Consequences for Canadian Prairie Grasslands: A Range Management Perspective," *Society for Range Management* 32, no. 5 (October 2010): 19, https://www.jstor.org/stable/40927234

12 Waiser, *A World We Have Lost*, 421-428.

13 Waiser, *A World We Have Lost*, 489.

14 Grant Macewan, "Sitting Bull," in *The Canadian Encyclopedia,* December 5, 2007, updated February 21, 2017 by Zach Parrott and Michelle Filice, accessed February 13, 2021, https://www.thecanadianencyclopedia.ca/en/article/sitting-bull

15 Manitoba Free Press, April 7, 1881, **quoted in** Bill Waiser, *A World We Have Lost: Saskatchewan Before 1905* (Markham, ON: Fifth House Limited, 2016)455.

16 Waiser, *A World We Have Lost,* 433-434.

17 Waiser, *A World We Have Lost*, , 494.

18 Waiser, *A World We Have Lost*, 586.

19 Matt Todd, "A Rancher's View of the Post-Bison West," in *Bison and People on the North American Great Plains: A Deep Environmental History*, ed. Geoff Cunfer and Bill Waiser (College Station, TX: Texas A&M University Press, 2016), 263-264.

20 Todd, "A Rancher's View of the Post-Bison West," 264.

21 Todd, "A Rancher's View of the Post-Bison West," 265.

22 Todd, "A Rancher's View of the Post-Bison West," 265.

23 Todd, "A Rancher's View of the Post-Bison West," 271.

24 Todd, "A Rancher's View of the Post-Bison West," 265.

25 Alfred Emile Cornebise, "A Decade in the History of the Matador Land and Cattle Company, Limited, 1919 – 1928," (MA Thesis in History, Texas Technological College, 1958), 59.

26 Diana Eastman, "What's the Difference Between a Farm and Ranch?" *Land.com*, December 21, 2020, accessed February 24, 2020, https://www.land.com/buying/difference-between-farm-and-ranch/.

27 Bailey et al., "Management of the Canadian Prairie Rangeland," 20.

28 Todd, "A Rancher's View of the Post-Bison West," 265.

29 Rachel Frost, "Carrying Capacity and Stocking Rate," *Global Rangelands*, accessed February 24, 2020, https://globalrangelands.org/topics/uses-range-and-pasture-lands/carrying-capacity-and-stocking-rate.

30 Nathan F. Sayre, "Carrying Capacity," in *The Berksire Encyclopedia of Sustainability: Ecosystem Management and Sustainability*, (Berkshire Publishing Group, 2012), 54.

31 Bailey et al., "Management of the Canadian Prairie Rangeland," 21.

32 Savage, *Prairie*, 113.

33 Bailey et al., "Management of the Canadian Prairie Rangeland," 1.

34 Savage, *Prairie,* 116-118.

35 Savage, *Prairie,* 118.

36 Savage, *Prairie,* 118.

37 Bailey et al., "Management of the Canadian Prairie Rangeand," 21;

Dale, *The Range Cattle Industry*, 94-98.

38 Bailey et al., "Management of the Canadian Prairie Rangeland," 21.

39 Dale, *The Range Cattle Industry,* 175-176.

40 Michael P. Schellenberg, "Biomass yield differences for introduced versus native grasses in mono- and polycultures in Southwestern Saskatchewan," in "Building Bridges: Grasslands to Rangelands," SRM-EFGC AGM, Paper No. 2138 (Louisville, KY: 2008), **quoted in** Arthur W. Bailey, Duane McCartney, and Michael P. Schellenberg, "Management of Canadian Prairie Rangeland," Agriculture and Agri-Food Canada, 2010. Accessed January 21, 2021, http://publications.gc.ca/pub?id=9.696926&sl=0; 21;

Walter D. Willms, Toby Entz, Ryan Beck, and Xiying Hao, "Do introduced grasses improve forage production on the Northern Mixed Prairie?" *Rangeland Ecol. Manage* 62 (2009): 53-59, **quoted in** Arthur W. Bailey, Duane McCartney, and Michael P. Schellenberg, "Management of Canadian Prairie Rangeland," Agriculture and Agri-Food Canada, 2010. Accessed January 21, 2021, http://publications.gc.ca/pub?id=9.696926&sl=0; 21;

P. G. Jefferson, Alan Iwaasa, Michael Schellenberg, and J. G. McLeod, J.G. 2005. "Re-evaluation of seeding native species for forage/ beef production on the semiarid prairie of western Canada," in *Managing changing prairie landscapes*, eds. Todd A. Radenbaugh and Glenn C. Sutter (Regina, SK: Canadian Plains Research Center, 2009), 79-100, **quoted in** Arthur W. Bailey, Duane McCartney, and Michael P. Schellenberg, "Management of Canadian Prairie Rangeland," Agriculture and Agri-Food Canada, 2010. Accessed January 21, 2021, http://publications.gc.ca/pub?id=9.696926&sl=0; 21.

41 Bailey et al., "Management of the Canadian Prairie Rangeland," 21.

boom and bust: the origins of the Saskatchewan Provincial Pastures

1 Waiser, *A World We Have Lost*, 622.

2 Waiser, *A World We Have Lost*,623-630.

3 Bill Waiser, *Saskatchewan: A New History* (Calgary, AB: Fifth House Ltd., 2005), 494-498.

4 Waiser, *Saskatchewan,* 209.

5 Waiser, *Saskatchewan*, 209-210.

6 Waiser, *Saskatchewan*, 210.

7 Waiser, *Saskatchewan*, 219.

8 Bailey et al., "Management of the Canadian Prairie Rangeland," 20.

9 Waiser, *Saskatchewan*, 217.

10 David H. Breen, *The Canadian Prairie West and the ranching frontier 1874-1924* (Toronto: University of Toronto Press, 1983), 232

11 Garret Hardin, "The Tragedy of the Commons," *Science* 162, issue 3859 (December 1968): 1243-1248.

12 Derek Wall, *The Commons in History: Culture, Conflict, and Ecology* (Cambridge, Massachusetts: The MIT Press, 2014), 23.

13 Wall, *The Commons in History,* 7.

14 Wall, *The Commons in History,* 9.

15 Wall, *The Commons in History,* 24.

16 Wall, *The Commons in History,* 25.

17 Julie Ristau, "What is Commoning, Anyway?" *On the Commons*, March 3, 2011, accessed August 30, 2021, https://www.onthecommons.org/work/what-commoning-anyway.

18 Chimère Diaw, "What lessons can be learnt from the management of the commons in Africa?," interviewed on November 22, 2016, for use at the Agence Française de Développement conference "Commons and Development Dynamics," accessed April 13, 2021, https://ideas4development.org/en/commons-economy-society/.

19 Wall, *The Commons in History,* 6-7.

20 Wall, *The Commons in History,* 73-75.

21 Wall, *The Commons in History,* 79.

22 William Cronon, *Changes in the Land,* **quoted in** Derek Wall, *The Commons in History: Culture, Conflict, and Ecology* (Cambridge, Massachusetts: The MIT Press, 2014), 79.

23 Breen, *The Canadian Prairie West*, 232.

24 Breen, *The Canadian Prairie West,* 232-239.

25 Cornebise, "A Decade in the History of the Matador Land and Cattle Company," 59-61.

26 Waiser, *Saskatchewan*, 217-218.

27 Cornebise, "A Decade in the History of the Matador Land and Cattle Company," 59-62.

28 Ed White, "Roundup time at the Community Pasture," *The Western Producer,* October 30, 1997, accessed August 30, 2021, https://www.producer.com/news/roundup-time-at-the-community-pasture/

29 Government of Saskatchewan, *Saskatchewan Provincial Pastures Land, Pastures Land Education Document*, 2017, accessed August 30, 2021, https://publications.saskatchewan.ca/#/products/91685

30 Daniel M. Balkwill, "The Prairie Farm Rehabilitation Administration and the Community Pasture Program, 1937-1947" (MA Thesis, University of Saskatchewan, Department of History, 2002), 40.

when the rains stopped: the dirty thirities and the Prairie Farm Rehabilitation Act

1 Michiel Horn, *The Great Depression of the 1930s in*

Canada (Ottawa: Canadian Historical Association, 1984), 3.

2 Horn, *The Great Depression of the 1930s in Canada,* 3.

3 Waiser, *Saskatchewan,* 281.

4 Horn, *The Great Depression of the 1930s in Canada,* 5.

5 Balkwill, "The Prairie Farm Rehabilitation Administration and the Community Pasture Program," 24.

6 Waiser, *Saskatchewan,* 294.

7 Benjamin I. Cook, Ron L. Miller, Richard Seager and James E. Hansen, "Amplification of the North American "Dust Bowl" drought through human-induced land degradation," *Proceedings of the National Academy of Sciences of the United States of America* 106, no. 13 (March 31, 2009): 4997-4999.

8 Waiser, *Saskatchewan,* 295-296.

9 Waiser, *Saskatchewan,* 282.

10 Waiser, *Saskatchewan,* 282.

11 Waiser, *Saskatchewan,* 282.

12 Waiser, *Saskatchewan,* 285-303.

13 Waiser, *Saskatchewan,* 283-303;

Barry Broadfoot, *Ten Lost Years 1929-1939: Memories of Canadians who survived the Depression* (Toronto: McClelland & Stewart Inc., 1997).

14 Dennis Guest, "Social Security," in *The Canadian Encyclopedia,* February 7, 2006, edited on December 16, 2013, accessed on August 30, 2021, https://www.thecanadianencyclopedia.ca/en/article/social-security.

15 Waiser, *Saskatchewan,* 286-287.

16 Waiser, *Saskatchewan,* 284;

Horn, *The Great Depression of the 1930s in Canada,* 7.

17 Horn, *The Great Depression of the 1930s in Canada,* 7.

18 Horn, *The Great Depression of the 1930s in Canada,*10.

19 James H. Gray, *Men Against the Desert* (Saskatoon: Western Producer Prairie Book, 1967), 99.

20 Balkwill, "The Prairie Farm Rehabilitation Administration and the Community Pasture Program," 25.

21 Balkwill, 14.

22 Gray, *Men Against the Desert*, 103.

23 IGray, *Men Against the Desert*, 98-120.

24 Government of Canada, *Reports of Work Conducted Under the Prairie Farm Rehabiltiation Administration,1935-36,* 2, **quoted in** Daniel M. Balkwill, "The Prairie Farm Rehabilitation Administration and the Community Pasture Program, 1937-1947" (MA Thesis, University of Saskatchewan, Department of History, 2002), 26.

25 Gray, *Men Against the Desert,* 99.

26 Gray, *Men Against the Desert*, 109.

27 Gray, *Men Against the Desert*, 125-126.

28 Gray, *Men Against the Desert*, 199-200;

J.C. Gilson, "Prairie Farm Rehabilitation Administration," in *The Canadian Encyclopedia,* February 7, 2006, edited January 17, 2020, accessed September 5, 2021, https://www.thecanadianencyclopedia.ca/en/article/prairie-farm-rehabilitation-administration.

29 Gilson, "Prairie Farm Rehabilitation Administration."

30 Balkwill, "The Prairie Farm Rehabilitation Administration and the Community Pasture Program," 28-29.

31 Balkwill, 29.

32 Balkwill, 29.

prairie commons: the PFRA and the community pastures program

1 Gray, *Men Against the Desert,* 106.

2 Gray, *Men Against the Desert,* 106-107.

3 Gray, *Men Against the Desert,* 199-200;

Balkwill, "The Prairie Farm Rehabilitation Administration and the Community Pasture Program," 58.

4 Balkwill, 29-32.

5 IBalkwill, 30-31.

6 Phillips, *PFRA Pastures Transition Study*, 17.

7 Gray, *Men Against the Desert,* 133.

8 Balkwill, "The Prairie Farm Rehabilitation Administration and the Community Pasture Program," 30.

9 Balkwill, 41-46.

10 Gray, *Men Against the Desert,* 152.

11 Gray, *Men Against the Desert,* 162.

12 Gray, *Men Against the Desert,* 166.

13 Gray, *Men Against the Desert,* 178.

14 Balkwill, "The Prairie Farm Rehabilitation Administration and the Community Pasture Program," 68.

15 Balkwill, 48.

16 Balkwill, 63-64.

17 Balkwill, 58.

18 Balkwill, 64.

19 Balkwill, 63.

20 Balkwill, 96.

21 Phillips, *PFRA Pastures Transition Study*, 5;

Government of Saskatchewan, *Saskatchewan Provincial Pastures Land, Pastures Land Education Document*

22 Balkwill, "The Prairie Farm Rehabilitation Administration and the Community Pasture Program," 95.

23 Balkwill, 44, 95.

24 Phillips, *PFRA Pastures Transition Study*, 16.

25 Balkwill, "The Prairie Farm Rehabilitation Administration and the Community Pasture Program" 44.

26 Balkwill, 45.

27 Balkwill, 46.

a closer look: the public pastures as spaces of conservation

1 Doke Sawatzky and Piwowar, "Changes in prairie grassland extent in Saskatchewan from 1990 to 2015," 1.

2 Phillips, *PFRA Pastures Transition Study*, 31.

3 Herriot, *Islands of Grass,* 31.

4 "As Long as the Sun Shines, The Grass Grows and the River Flows," *Team ReconciliAction YEG,* University of Albert Faculty of Law. January 9, 2018, accessed September 6, 2021, https://ualbertalaw.typepad.com/faculty/2018/01/as-long-as-the-sun-shines-the-grass-grows-and-the-river-flows.html.

5 For arguments against cattle grazing on native grasslands, see:

George Wuerthner and Mollie Matteson, *Welfare Ranching: The Subsidized Destruction of the American West* (Sausalito, CA: the Foundation for Deep Ecology, 2002);

Lyndon Penner, *Native Plants for the Short Season Yard*: *best picks for the Chinook and Canadian Prairie Zones* (Canada: Brush Education Inc., 2016), 197-198.

6 Jill Haukos, "The Tallgrass Prairie," Kansas State University Kona Prairie Biological Station, accessed September 5, 2021, https://keep.konza.k-state.edu/prairieecology/TallgrassPrairieEcology.pdf, 8.

7 Grace Morgan and R.J. Hudson, "Dynamics of Fire and Grazing by Bison on Grasslands in Central Alberta."

8 "Discuss how livestock interaction impacts grass growth," *National Forage & Grasslands Curriculum,* Oregon State University, accessed September 6, 2021, https://forages.oregonstate.edu/nfgc/eo/onlineforagecurriculum/instructormaterials/availabletopics/management/livestock.

9 Savage, *Prairie*, 119.

10 Steuter and Hidinger, "Comparative Ecology of Bison and Cattle on Mixed-Grass Prairie," 335.

11 Savage, *Prairie*, 119.

12 Dan Undersander, Beth Albert, Dennis Cosgrove, Dennis Johnson, and Paul Peterson, *Pastures for profit: a guide to rotational grazing* (Madison, WI: Cooperative Extention Publishing, University of Minnesota Extension Service, 2002), 23-24.

13 Savage, *Prairie*, 119.

14 R.A. Wroe, S. Smoliak, and G.W. Wheeler, "Alberta Range Plants and their Classification," *Agri-Facts*, Alberta Agriculture Food and Rural Development, accessed September 5, 2021, https://open.alberta.ca/dataset/56928e5c-cb66-42cb-a348-8736d387e752/resource/b4c8bb55-4c93-44d9-8589-4cf5bc813de7/download/28133192000agri-factsalbertarange-plantsclassification.pdf, 2.

15 Wroe, Smoliak, and Wheeler, "Alberta Range Plants and their Classification," 2.

16 Wroe, Smoliak, and Wheeler, "Alberta Range Plants and their Classification.," 2-5.

17 "About milkweed and monarchs," *Naturewatch*, September 2017, accessed September 5, 2021, https://www.naturewatch.ca/milkweedwatch/about-milkweed-and-monarchs/.

18 "About milkweed and monarchs," *Naturewatch.*

19 Wuerthner and Matteson, *Welfare Ranching.*

20 Bill McKibben, "The Only Way to Have a Cow," *Orion Magazine*, March/April 2010, accessed September 5, 2021, https://orionmagazine.org/article/the-only-way-to-have-a-cow/.

21 Herriot, "The Prairie Crisis – Crossing the Ledger," *Conference Proceedings of the 12th Prairie Conservation and Endangered Species Conference,* Winnipeg, MB, February 20, 2019. (Winnipeg: Critical Wildlife Habitat Program, 2020). http://www.pcesc.ca/media/45404/final-2019-pcesc-proceedings.pdf, 36.

22 McKibben, "The Only Way to Give a Cow."

23 Gord Vaadeland, "Grasslands, forests & wetlands – Nature's carbon capture & storage solution," *Canadian Parks and Wilderness Society*, accessed September 5, 2021, https://cpaws.org/grasslands-forests-wetlands-natures-carbon-capture-storage-solution/.

24 Frank Mitloehner, "The Truth about Cattle and Methane Emissions," Prairie's Got the Goods Webinar Series, hosted by Prairie Conservation Action Plan, March 22, 2020, https://www.youtube.com/watch?v=e_hrfmH2US4.

25 Herriot, "The Prairie Crisis," 37.

26 Herriot, *Islands of Grass, 101*.

27 Herriot, *Islands of Grass,* 56-59.

28 Herriot, *Islands of Grass,* 56-59.

29 Herriot, *Islands of Grass,* 117.

30 Alberta 4-H. *Bison Project – Member Level Two.* Accessed September 4, 2021, https://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/4h6873/$FILE/bisonmemberl2i.pdf.

31 C.J.A. Bradshaw, "How to predict marine biodiversity," *Conservation Bytes* (blog), July 26, 2011, accessed June 20, 2021, https://conservationbytes.com/2011/07/26/predicting-marine-biodiversity/.

32 Douglas Spieles, *Protected Land*: *Disturbance Stress and American Ecosystem Management* (New York: Springer Science + Business Media, 2010), 123.

33 "The State of Canada's Birds, 2019," North American Bird Conservation Initiative Canada, (Ottawa: Environment and Climate Change Canada, 2019) 5.

34 "Saskatchewan Field Checklist of Birds - Mapsheet 72H15", Saskatchewan Bird Atlas Project, accessed April 18, 2021, via *HABISask*, https://gisappl.saskatchewan.ca/Html5Ext/?viewer=habisask;

"Species at risk public registry - Species Search," Government of Canada, accessed April 18, 2021, https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10;

N.B. the above references were cross-consulted to produce the information cited.

35 David B. Lindemayer and Martin J. Westgate, "Are Flagship, Umbrella and Keystone Species Useful Surrogates to Understand the Consequences of Landscape Change?" *Current Landscape Ecology Reports* 5 (2020): 76.

36 Spieles, *Protected Land*, 123.

37 Lindemayer and Westgate, "Are Flagship, Umbrella and

Keystone Species Useful Surrogates to Understand the Consequences of Landscape Change?" 76.

38 "Stewards of Saskatchewan", Nature Saskatchewan, accessed June 20, 2021, https://www.naturesask.ca/what-we-do/stewards-of-saskatchewan.

39 Phillips, *PFRA Pastures Transition Study*, 32.

40 Suren Kulshrestha, George Pearson, Brant Kirychuk and Rick Gaube, "Distribution of Public and Private Benefits on Federally Managed Community Pastures in Canada," *Society for Range Management* 30, no. 1 (February, 2008). https://www.jstor.org/stable/25145349.

41 Kulshrestha et al. "Distribution of Public and Private Benefits on Federally Managed Community Pastures in Canada,";

Sawatzky, "The lost gem of the PFRA Community Pastures," ;

Phillips, *PFRA Pastures Transition Study*.

42 Katherine Arbuthnott and Josef K. Schmutz, "PFRA Community Pastures: History and Drama of a Prairie Commons," *Saskatchewan Notes.* Canadian Centre for Policy Alternatives – SK, April 2013, https://www.policyalternatives.ca/sites/default/files/uploads/publications/Saskatchewan%20Office/2013/04/SKnotes_PFRA_0.pdf, 3-4.

43 Doke Sawatzky, "The lost gem of the PFRA Community Pastures."

44 Kulshrestha et al. "Distribution of Public and Private Benefits on Federally Managed Community Pastures in Canada," 4.

45 Kulshrestha et al. "Distribution of Public and Private Benefits on Federally Managed Community Pastures in Canada," 5.

46 Doke Sawatzky, "The lost gem of the PFRA Community Pastures."

47 Kulshrestha et al. "Distribution of Public and Private Benefits on Federally Managed Community Pastures in Canada," 8.

48 Kulshrestha et al. "Distribution of Public and Private Benefits on Federally Managed Community Pastures in Canada," 9.

49 Kulshrestha et al. "Distribution of Public and Private Benefits on Federally Managed Community Pastures in Canada," 8.

50 Kulshrestha et al. "Distribution of Public and Private Benefits on Federally Managed Community Pastures in Canada," 7.

51 Phillips, *PFRA Pastures Transition Study*, 6.

52 Phillips, *PFRA Pastures Transition Study*, 5.

53 "Value of 29,000,000 from 1935 to 2021," CPI Inflation Calculator, accessed June 20, 2021, https://www.in2013dollars.com/canada/inflation/1935?amount=29000000.

closure and loss: decommissioning the public pastures

1 Whittington, "Conservatives dismantling social programs built over generations."

2 Whittington, "Conservatives dismantling social programs built over generations."

3 Whittington, "Conservatives dismantling social programs built over generations."

4 Phillips, *Executive Summary – PFRA Pastures Transition Study,* January 7, 2015, 1.

5 Karen Briere, "Sask. To nix community pasture program," *The Western Producer*, March 30, 2017, accessed June 27, 2021, https://www.producer.com/news/sask-to-nix-community-pasture-program/.

6 Phillips, *PFRA Pastures Transition Study*, 14.

7 Phillips, *PFRA Pastures Transition Study*, 14.

8 Phillips, *PFRA Pastures Transition Study*, 16-17;

"Middle Sand Hills," *Alberta Wilderness Association,* accessed September 6, 2021, https://albertawilderness.ca/issues/wildlands/areas-of-concern/middle-sand-hills/.

9 Phillips, *PFRA Pastures Transition Study*, 9.

10 Phillips, *PFRA Pastures Transition Study*,3.

11 "Community Highlight: Public Pastures – Public Interest," *EcoFriendly Sask*.

12 Phillips, *PFRA Pastures Transition Study*, 7-8.

13 Phillips, *Executive Summary – PFRA Pastures Transition Study,* 1;

Philip Brass, "Land and Reconciliation: What happens to our treaty relationship when public land is privatized?" interview by Valerie Zink, *Briarpatch Magazine*, October 19, 2017. https://briarpatchmagazine.com/articles/view/land-and-reconciliation?fbclid=IwAR3abCume6D3PdLOrg3wyNadih3tc0wer0OHUsi31roKyE7-IrJoUJYJbFc.

14 Katie Doke Sawatzky, "Sharing Treaty Land," *Briarpatch Magazine*. July 5, 2021. https://briarpatchmagazine.com/articles/view/sharing-treaty-land.

15 Saba Dar, "Selling off Saskatchewan," *Sask Dispatch,* volume 4, issue 4, (July/August 2021): 1. Insert in *Briarpatch Magazine.* July/August 2021.

16 Dar, "Selling off Saskatchewan," 2.

17 Brass, "Land and Reconciliation: What happens to our treaty relationship when public land is privatized?"

18 Brass, "Land and Reconciliation: What happens to our treaty relationship when public land is privatized?"

19 Brass, "Land and Reconciliation: What happens to our treaty relationship when public land is privatized?"

20 "Community Highlight: Public Pastures – Public Interest," *EcoFriendly Sask*.

21 Phillips, *PFRA Pastures Transition Study*, 7-9;

Government of Saskatchewan, "Government to Lease Provincial Pastures to Patron Groups," June 15, 2017, accessed May 15, 2021, https://www.saskatchewan.ca/government/news-and-media/2017/june/15/provincial-pastures.

22 Jordan Crawford, "Legal Challenges to the Government of Saskatchewan's Proposed Sell-Off of Public Pastures," Saskatchewan Association for Environmental Law (opinion piece) August 1, 2018, accessed August 28, 2021, https://www.skael.ca/?p=610.

23 Phillips, *PFRA Pastures Transition Study*, 13.

24 Phillips, *PFRA Pastures Transition Study*,37.

25 Phillips, *PFRA Pastures Transition Study*,19.

26 Phillips, *PFRA Pastures Transition Study*, 13.

27 "Community Highlight: Public Pastures – Public Interest," *EcoFriendly Sask*.

28 Lawrence MacAulay, "Appendix A: Email from the Honourable Lawrence MacAulay, PC, MP, Minister of Agriculture and Agri-Food, to Jordan Crawford," July 6, 2017, **reproduced in** Jordan Crawford, "Legal Challenges to the Government of Saskatchewan's Proposed Sell-Off of Public Pastures," Saskatchewan Association for Environmental Law, (opinion piece) August 1, 2018, accessed August 28, 2021, https://www.skael.ca/?p=610

29 Doke Sawatzky, "The lost gem of the PFRA Community Pastures."

30 Doke Sawatzky, "The lost gem of the PFRA Community Pastures."

31 Doke Sawatzky, "The lost gem of the PFRA Community Pastures."

temperature rising: climate change in the 21st century

1 M.B. Masud, M.N. Khaliq, and H.S. Wheater, "Future changes to drought characteristics over the Canadian Prairie Provinces based on NARCCAP multi-RCM ensemble," *Climate Dynamics* 48 (April 1, 2017): 2702-2703, doi: 10.1007/s00382-016-3232-2;

Barrie R. Bonsal, Rabah Aider, Phillippe Gachon, Suzan Lapp, "An assessment of Canadian prairie drought: past, present, and future," *Climate Dynamics* 41 (August 1, 2013): 514-515, doi: 10.1007/s00382-012-1422-0.

2 Balkwill, "The Prairie Farm Rehabilitation Administration and the Community Pasture Program," 95.

retrospective: the public pastures in review

1 Herriot, *Islands of Grass*, 44.

2 The Tragically Hip, "Wheat Kings," *Fully Completely*, Universal Music Canada, 1992.

3 Penner, *Native Plants for the Short Season Yard*, 191-192.

4 This is anecdotally supported by conversations the author has had over the last several years.

5 Doke Sawatzky, "The lost gem of the PFRA Community Pastures."

6 Phillips, *PFRA Pastures Transition Study*, 11.

on sight: seeing and appreciating the prairie landscape

1 Kraus, Dan. "Why Canada's prairies are the world's most endangered ecosystem."

2 Trevor Herriot, "In defense of wildness and federal lands: the Stegner legacy part I," *Grass Notes* (blog), November 22, 2013, accessed October 9, 2018, http://trevorherriot.blogspot.ca/2013/11/;

"The Wilderness Act," *The Wilderness Society,* accessed August 30, 2021, https://www.wilderness.org/articles/article/wilderness-act#.

3 Wallace Stegner, "The Wilderness Letter," [letter], written December 3, 1960, accessed May 15, 2021, https://psych.utah.edu/_resources/documents/psych4130/Stenger_W.pdf, 4.

4 Stegner, "The Wilderness Letter," 3.

5 Wallace Stegner, *Wolf Willow* (New York: Viking, 1966), **quoted in** Neil Evernden, "Beauty and Nothingness: Prairie as Failed Resource," *Landscape* 27, no.3 (1983): 23.

6 Neil Evernden, "Beauty and Nothingness: Prairie as Failed Resource," *Landscape* 27, no. 3 (1983), 20.

7 Evernden, "Beauty and Nothingness," 23.

on beauty: applying environmental aesthetics to landscape conservation

1 Allen Carlson, "Environmental Aesthetics," *Stanford Encyclopedia of Philosophy,* January 29, 2007, revised April 9, 2019, accessed August 31, 2021, https://plato.stanford.edu/entries/environmental-aesthetics/.

2 Allen Carlson, "Environmental Aesthetics."

3 Allen Carlson, "Environmental Aesthetics."

4 Allen Carlson, "Nature, Aesthetic Judgment, and Objectivity," *Journal of Aesthetics and Art Criticism* (Fall 1981): 24, **quoted in** Marcia Muelder Eaton, "The Beauty that Requires Health," *Placing Nature: Culture and Landscape Ecology,* ed. Joan Iverson Nassauer (Washington, DC: Island Press, 1997), 85-106;

Marcia Muelder Eaton, "The Beauty that Requires Health," *Placing Nature: Culture and Landscape Ecology,* ed. Joan Iverson Nassauer (Washington, DC: Island Press, 1997), 85-106;

Jennifer Foster, "Environmental Aesthetics, Ecological Action and Social Justice," *Emotion, place and culture,* eds. Mick Smith, Joyce Davidson, Laura Cameron, and Liz Bondi, (Surrey, UK: Ashgate Publishing Ltd, 2009).

5 Foster, "Environmental Aesthetics, Ecological Action and Social Justice," 98.

6 Eaton, "The Beauty that Requires Health," 88.

7 Joan Iverson Nassauer, "Cultural Sustainability: Aligning Aesthetics and Ecology," *Placing Nature: Culture and Landscape Ecology,* ed. Joan Iverson Nassauer (Washington, DC: Island Press, 1997), 67-69.

8 Eaton, "The Beauty that Requires Health," 94.

9 Eaton, "The Beauty that Requires Health," 89.

10 Eaton, "The Beauty that Requires Health," 89.

11 Elaine Scarry, *On Beauty and Being Just* (Princeton, NJ: Princeton University Press, 2001), 80.

12 Scarry, *On Beauty and Being Just.*

13 Nassauer, "Cultural Sustainability," 69.

14 Joan Iverson Nassauer, "Messy Ecosystems, Orderly Frames," *Landscape Journal* 14, vol. 2 (January 2007). doi: 10.3368/lj.14.2.161

15 Nassauer, "Cultural Sustainability," 78.

16 Herriot, *Islands of Grass*, 23.

17 Nassauer, "Cultural Sustainability," 76.

18 Evernden, "Beauty and Nothingness," 21.

19 Evernden, "Beauty and Nothingness," 24.

20 Scarry, *On Beauty and Being Just,* 19.

21 Herriot, *Islands of Grass*, 23.

22 Herriot, *Islands of Grass*, 23-24.

23 Scarry, *On Beauty and Being Just.*

24 Scarry, *On Beauty and Being Just.* 111.

25 Evernden, "Beauty and Nothingness," 24.

26 Scarry, *On Beauty and Being Just.* 112.

show and tell: a role for landscape architecture

1 International Federation of Landscape Architects, quoted in Ian H. Thompson, *Landscape Architecture: A Very Short Introduction* (Oxford: Oxford University Press, 2014), preface, Kindle.

2 "About Us," Saskatchewan Association of Landscape Architects, accessed October 1, 2021, https://sala.sk.ca/.

3 "About MALA," Manitoba Association of Landscape Architects, accessed Octobef 1, 2021, https://www.mala.net/profession/.

4 Joan Iverson Nassauer, "Urban Ecological Retrofit," *Eco-Revelatory Designs: Nature Constructed/Nature Revealed, Landscape Journal* special issue (1998): 15.

5 Kate Orff, *Toward an Urban Ecology* (New York: Monacelli Press, 2016), 90.

6 Mark Kurlansky, *The Big Oyster: History on the Half Shell* (New York: Ballantine Books, 2006) **quoted in** Kate Orff, *Toward an Urban Ecology* (New York: Monacelli Press, 2016), 84.

7 "Our Story," Billion Oysters Project, accessed September 27, 2021, https://www.billionoysterproject.org/our-story.

8 "STEM Education," Billion Oysters Project, accessed September 27, 2021, https://www.billionoysterproject.org/stem-education.

9 Eric Klinenberg, "The Seas are Rising. Could Oysters Help?" *The New Yorker,* August 2, 2021, accessed September 27, 2021, https://www.newyorker.com/magazine/2021/08/09/the-seas-are-rising-could-oysters-protect-us.

10 Klinenberg, "The Seas are Rising. Could Oysters Help?";

Orff, *Toward an Urban Ecology,* 242.

11 Orff, *Toward an Urban Ecology,* 250.

12 Orff, *Toward an Urban Ecology,* 250.

13 Orff, *Toward an Urban Ecology,* 238.

14 "Living Breakwaters," Billion Oysters Project, accessed September 27, 2021, https://www.billionoysterproject.org/living-breakwaters.

15 "Living Breakwaters enters construction," SCAPE, September 3, 2021, accessed September 27, 2021, https://www.scapestudio.com/news/2021/09/living-breakwaters-enters-construction/.

16 Eaton, "The Beauty that Requires Health," 92-94.

17 Amy Frearson, "Penda highlights global water crisis with meadow pathway installation," *Dezeen*, October 25, 2015, accessed September 26, 2021, https://www.dezeen.com/2015/10/30/penda-global-water-crisis-meadow-pathway-installation_international-garden-expo-2015-china/.

18 Katie Watkins, "Penda Designs River-Inspired Landscape Pavilion for China's Garden Expo," *ArchDaily,* accessed September 26, 2021, https://www.archdaily.com/776474/penda-designs-river-inspired-landscape-pavilion-for-chinas-garden-expo.

19 Maria Elena Moersen, "Penda creates a river-like pavilion for the 10th International Garden Expo in Wuhan, China," *The Architect's Newspaper,* December 30, 2015, accessed September 26, 2021, https://www.archpaper.com/2015/12/river-runs-pendas-pavilion-10th-international-garden-expo-wuhan-china/.

20 Frearson, "Penda highlights global water crisis with meadow pathway installation."

21 "Dale Hodges Park: a story of collaboration and innovation," *Landscapes/Paysages* 23, no. 2 (Summer 2021), 28-30.

22 "Dale Hodges Park: a story of collaboration and innovation," *Landscapes/Paysages*.

23 "Dale Hodges Park: a story of collaboration and innovation," *Landscapes/Paysages*.

24 Charles Blanc, quoted in "Dale Hodges Park: a story of collaboration and innovation," *Landscapes/Paysages* 23, no. 2 (Summer 2021), 31.

25 "Dale Hodges Park: a story of collaboration and innovation," *Landscapes/Paysages*.

26 Beth Carruthers, "A Subtle Activism of the Heart," *Sustaining the West: Cultural Responses to Canadian Environments*, eds. Liza Piper and Lisa Szabo-Jones (Waterloo, ON: Wilfred Laurier University Press, 2015), 72-73.

27 Carruthers, "A Subtle Activism of the Heart," 73.

28 "International Dawn Chorus Day," The Wildlife Trusts, accessed October 7, 2021, https://www.wildlifetrusts.org/dawn-chorus-day

29 Carruthers, "A Subtle Activism of the Heart," 73.

30 Carruthers, "A Subtle Activism of the Heart," 73-74.

31 Carruthers, "A Subtle Activism of the Heart," 74-75.

32 Carruthers, "A Subtle Activism of the Heart," 74-75.

33 Carruthers, "A Subtle Activism of the Heart," 65.

34 Carruthers, "A Subtle Activism of the Heart," 65, 75.

a proposal: programming to reveal and engage with prairie landscapes

1 Steven Wilson, "Trail Event at Caledonia-Elmsthorpe," *Discover Weyburn*, August 12, 2015, accessed December 26, 2021, https://www.discoverweyburn.com/articles/trail-event-at-caledonia-elmsthorpe-pasture;

"Pasture tour June 22" Public Pastures – Public Interest, email to membership sent May 27, 2019.

a program: a schematic of proposed eventsfor the former public pastures

1 Amelia Soth, "Beating the Bounds," *JStor Daily*, May 7, 2020, accessed October 16, 2021, https://daily.jstor.org/beating-the-bounds/

2 Soth, "Beating the Bounds."

3 Emily Cleaver, "The Delightful English Tradition of Beating Parish Boundaries with Sticks," *Atlas Obscura*, June 6, 2017, accessed October 16, 2021, https://www.atlasobscura.com/articles/beating-the-bounds-tradition

4 Cleaver, "The Delightful English Tradition of Beating Parish Boundaries with Sticks."

5 Soth, "Beating the Bounds."

6 Soth, "Beating the Bounds."

7 *"International Dawn Chorus Day,"* The Wildlife Trusts.

8 Kelly Boutsalis, "Teaching Indigenous Star Stories," *The Walrus*, August 10, 2020, accessed October 28, 2021, https://thewalrus.ca/space-teaching-indigenous-star-stories/.

9 Duncan McCue, "This plant medicine teacher is reclaiming Anishinaabe names for species. Why that could be good for the planet," *CBC*, September 12, 2021, accessed October 16, 2021, https://www.cbc.ca/radio/thecurrent/back-to-the-land-preserving-indigenous-language-1.6152854.

10 "Wheat Weaving," *Culture Days, City of Yorkton,* accessed October 16, 2021, https://culturedays.ca/en/events/c791d8ac-cb90-45a6-8067-ffdabde3b885.

11 Bill Harby, "Flower-covered cows take to Swiss streets – Switzerland's desalpe (alpabzug) explains," *Le News,* September 12, 2019, accessed October 16, 2021, https://lenews.ch/2019/09/12/flower-covered-cows-take-to-swiss-streets-switzerlands-desalpe-alpabzug-explained/;

Juliana Barbassa, "Swiss celebrate return of cows from mountains each fall," *Chicago Tribune*, September 23, 2015, accessed October 16, 2021, https:/www.chicagotribune.com/travel/sns-bc-eu-travel-trip-swiss-cows-festival-20150923-story.html.

12 Beth Carruthers, "A Subtle Activism of the Heart."

13 Kathleen Irwin and Rory Macdonald, *Sighting Citing Siting: theorising practice (Crossfiring/Mama Wetotan)* (Regina, SK: Canadian Plains Research Centre, 2009).

14 Jennifer Billock, "Walk the World's Most Meditative Laybrinths," *Smithsonian Magazine*, January 20, 2016, accessed January 2, 2022, https://www.smithsonianmag.com/travel/walk-worlds-meditative-labyrinths-180957823/;

"New to the Labyrinth," *Veriditas,*, accessed January 2, 2022, https://www.veriditas.org/New-to-the-Labyrinth.

15 James Daschuk, *Clearing the Plains*.

16 Doke Sawatzky, "Sharing treaty land."

17 Doke Sawatzky, "Sharing treaty land."

18 Doke Sawatzky, "Sharing treaty land."

19 Doke Sawatzky, "Sharing treaty land."

20 Doke Sawatzky, "Sharing treaty land."

21 Doke Sawatzky, "Sharing treaty land."

22 Doke Sawatzky, "Sharing treaty land."

23 Doke Sawatzky, "Sharing treaty land."

24 Doke Sawatzky, "Sharing treaty land."

a place: siting the proposal

1 Stegner, "The Wilderness Letter."

2 "Census Profile, 2016, Regina [Population Centre], Saskatchewan and Saskatchewan," *Statistics Canada,* accessed December 30, 2021, ttps://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=POPC&Code1=0698&Geo2=PR&Code2=47&SearchText=Regina&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=0698&TABID=1&type=0;

"Census Profile, 2016, Saskatoon [Census metropolitan area], Saskatchewan and Saskatchewan," *Statistics Canada,* accessed December 30, 2021, https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CMACA&Code1=725&Geo2=PR&Code2=47&SearchText=saskatoon&SearchType=Begins&SearchPR=01&B1=All&TABID=1&type=0.

3 "Number of visitors to Grasslands National Park in Canada from 2011 to 2020," Statista Research Department, October 18, 2021, accessed December 30, 2021, https://www.statista.com/statistics/501609/visitors-to-grasslands-national-park/.

4 "Grasslands National Park," Parks Canada, accessed September 26, 2021, https://www.pc.gc.ca/en/pn-np/sk/grasslands;

Matthew G. Bailey, "Exploring Grasslands National Park, Saskatchewan," *Must Do Canada*, accessed September 26, 2021, https://www.mustdocanada.com/exploring-grasslands-national-park-saskatchewan/

5 A.R. Sweet, F.M. Haidl, and C. Schmidt, *Zahursky Point GeoVista Brochure*, Canadian Federation of Earth Sciences, 2011.

6 "Grasslands National Park," Parks Canada.

7 "Number of visitors to Grasslands National Park in Canada from 2011 to 2020," Statista Research Department.

8 "About Us," Regina Public Schools, accessed December 26, 2021, https://www.reginapublicschools.ca/about_us;

"About Us/Contact Us," Regina Catholic Schools, accessed December 26, 2021, https://www.rcsd.ca/Division/aboutus/Pages/default.aspx#/=.

9 Karen Briere, "Proposed landfill encounters opposition,"

Wester Producer, January 21, 2021, accessed December 26, 2021, https://www.producer.com/news/proposed-landfill-encounters-opposition/;

"Stop Loraas Landfill in RM of Caledonia," Change.org (petition), started by Larissa Sudom in December 2020, accessed December 26, 2021, https://www.change.org/p/sign-our-petition-and-help-us-stop-proposed-loraas-landfill-in-rm-of-caledonia;

Citizens Against the Loraas Landfill in RM of Caledonia, Facebook group, created December 26, 2020, accessed December 26, 2021, https://www.facebook.com/groups/1088346118253795/about

10 Spieles, *Protected Land*, 123.

Benjamin A. Geaumont and Daniel L. Graham, "Factors affecting sharp-tailed grouse brood habitat selection and survival," *Wildlife Biology* 2 (2020). Doi: 10.2981/wlb.00633, p. 2.

11 *Alberta's Sharp-Tailed Grouse through the Seasons,* Alberta Conservation Association, March 2010, accessed May 15, 2021, https://www.ab-conservation.com/downloads/educational_materials/brochures/alberta_sharp_tailed_grouse_brochure.pdf.

12 *Alberta's Sharp-Tailed Grouse through the Seasons,* Alberta Conservation Association.

13 Richard Baydack, "Sharp-Tailed Grouse Response to Lek Disturbance in the Carberry Sand Hills of Manitoba," (Ph.D diss., Colorado State University, Spring 1986), 43.

14 Briere, "Proposed landfill encounters opposition."

15 Joel Potié, "Sharp-tailed grouse (Tympanuchus phasianellus) in a resource development area at the northern edge of the species' range," (M.Science thesis, McGill University, April 2020.).

16 Alberta Conservation Association, *Alberta's Sharp-Tailed Grouse through the Seasons.*

17 Richard Baydack, "Sharp-Tailed Grouse Response to Lek Disturbance in the Carberry Sand Hills of Manitoba."

18 Richard Baydack, "Sharp-Tailed Grouse Response to Lek Disturbance in the Carberry Sand Hills of Manitoba."

19 "Habitat," Sharptails Plus Foundation Inc., accessed October 11, 2021, https://www.sharptailsplus.org/habitat.

20 Keith Confer, "Sharp-Tailed Grouse," All About Birds, accessed October 9, 2021, https://www.allaboutbirds.org/guide/Sharp-tailed_Grouse/overview;

Sharp-tailed Grouse on Upper Souris National Wildlife Refuge, Upper Souris National Wildlife Refuge, accessed August 28, 2021, https://www.fws.gov/uploadedFiles/Grouse%20Blind%20brochure%20and%20map%202019%20webpage.pdf

21 Briere, "Proposed landfill encounters opposition."

22 "Community Highlight: Public Pastures – Public Interest," *EcoFriendly Sask*.

23 Baydack, "Sharp-Tailed Grouse Response to Lek Disturbance in the Carberry Sand Hills of Manitoba," 3.

24 "Saskatchewan Field Checklist of Birds - Mapsheet 72H15", Saskatchewan Bird Atlas Project;

"Species at risk public registry - Species Search," Government of Canada.

25 E.R. Zylstra, "Accumulation of wind-dispersed trash in desert environments," *Journal of Arid Environments* 89 (2016): 13.

26 Andrea K. Townsend, Christopher M. Barker, "Plastic and the Nest Entanglement of Urban and Agricultural Crows," *PLoS ONE* 9, vol. 1 (January 31, 2014): e88006. doi:10.1317/journal.pone.0088006.

27 A review of aerial imagery of the lands around Caledonia-Elmsthorpe belonging to Piapot First Nation suggests they are auxiliary lands used for agriculture, a satellite extension of Piapot I.R. 75. The band office and heart of the Piapot I.R. 75 community is located north of Regina, roughly an hour and a half from Caledonia-Elmsthorpe.

28 Elder Betty McKenna, "Pottery Shards," *Sighting Citing Siting: theorising practice (Crossfiring/Mama Wetotan),* (Regina, SK: Canadian Plains Research Centre, 2009).

29 Wilson, "Trail Event at Caledonia-Elmsthorpe;"

"Pasture tour June 22" Public Pastures – Public Interest, email to membership sent May 27, 2019.

30 AAFC data, **cited in** Phillips, *PFRA Pasture Transitions Study,* 32.

31 AAFC data, **cited in** Phillips, *PFRA Pastures Transition Study*, 32.

placemaking: a design to reveal and engage with the Caledonia-Elmsthorpe pasture

1 *Sensitive Species Inventory Guidelines,* Government of Alberta, 2013, accessed December 30, 2021, https://open.alberta.ca/dataset/93d8a251-4a9a-428f-ad99-7484c6ebabe0/resource/f4024e81-b835-4a50-8fb1-5b31d9726b84/download/2013-sensitivespeciesinventoryguidelines-apr18.pdf, 81-82;

Recommended Land Use Guidelines for Protection of Selected Wildlife Species and Habitat within Grassland and Parkland Natural Regions of Alberta, Government of Alberta, April 28, 2011, accessed December 30, 2021, https://open.alberta.ca/dataset/e269aad8-3664-402a-b7cb-77abe89e9617/resource/6195d2d4-9f7d-43e5-ada5-81a8210fae38/download/3054250-2011-recommended-land-use-guidelines-protection-wildlife-species-habitat.pdf5.

2 "Put Down Some Roots... Plant Prairie," Department of Natural Resources, State of Minnesota, accessed June 7, 2021, https://files.dnr.state.mn.us/assistance/nrplanning/community/roadsidesforwildlife/putdownroots_poster.pdf;

J.E. Weaver, *Prairie Plants and their Environment: a Fifty Year Study in the Midwest* (Lincoln, NE: University of Nebraska Press, 1968);

Becky Harlan, "Digging Deep Reveals the Intricate World of Roots," *National Geographic,* October 15, 2015, https://www.nationalgeographic.com/photography/article/digging-deep-reveals-the-intricate-world-of-roots

3 Tim Krahn, *Essential Rammed Earth Construction: the complete step-by-step guide* (Gabriola Island, BC: New Society Publishers, 2019), 3-6.

4 Krahn, *Essential Rammed Earth Construction,* xi-6.

5 Vera Dordick, "Rammed Earth Construction Gaining Popularity for the Good of the Environment," *Homedit*, Septem-

ber 11, 2019, accessed December 30, 2021, https://www.homedit.com/rammed-earth/.

6 Krahn, *Essential Rammed Earth Construction,* xi-6.

7 "Wallace Stegner House," Wallace Stegner House, Eastend Arts Council, accessed September 26, 2021, https://stegnerhouse.ca/about.

8 Candace Savage, *A Geography of Blood* (Vancouver: Greystone Books, 2012).

9 Deborah Richie Oberbillig, *A Guide to Wildlife Viewing and Photography Blinds: Creating Facilities to Connect People With Nature* (Denver, CO: Colorado Division of Wildlife and Richmond, VA: Virginia Department of Game and Inland Fisheries);

"Sharp-Tailed Grouse Dance Tour," Birding Outfitters, accessed December 30, 2021, https://birdingoutfitters.com/tour-details/sharp-tailed-grouse-dance-tour/;

"Dancing Grouse Tour," *Living Sky Wildlife Rehabilitation,* accessed December 30, 2021, https://livingskywildliferehabilitation.org/dancing-grouse-tour/.

10 Richie Oberbillig, *A Guide to Wildlife Viewing and Photography Blinds: Creating Facilities to Connect People With Nature.*

11 Wilson, "Trail Event at Caledonia-Elmsthorpe;"

"Pasture tour June 22" Public Pastures – Public Interest, email to membership sent May 27, 2019.

12 Herriot, *Islands of Grass*, 20.

endings: notes on the title of this practicum and a call to action

1 Evernden, "Beauty and Nothingness," 24.

2 Katherena Vermette, *The Break* (Canada: House of Anansi Press Inc., 2016), chap. 29, Kindle.

beginnings: hope for the prairies and the former public pastures

1 *The Nature of Things*, season 59, episode 2: "Grasslands: A Hidden Wilderness," *The Nature of Things*, directed by Jeff Turner and Alex Burr, narrated by David Suzuki, aired September 27, 2019, on CBC, https://www.cbc.ca/natureofthings/episodes/grasslands-a-hidden-wilderness.

2 "Buffalo Pound," Nature Conservancy of Canada, accessed August 23, 2021, https://www.natureconservancy.ca/en/where-we-work/saskatchewan/featured-projects/buffalo-pound.html.

3 Candice Lipski, "New $25M grant for prairie grassland conservation goes to 5 organizations," *CBC News,* March 5, 2021, accessed May 101 2021, https://www.cbc.ca/news/canada/saskatchewan/new-grant-towards-prairie-grassland-conservation-1.5938152#:~:text=The%20Weston%20Family%20Foundation%20has,the%20most%20at%2Drisk%20habitats.

4 Sarah Ashley-Hewitson, "Sask. Residents pooling SGI rebates together to protect "Field of Dreams," *620 CKRM,* March 21, 2021, accessed December 30, 2021, https://www.620ckrm.com/2021/03/21/sask-residents-pooling-sgi-rebates-together-to-protect-field-of-dreams/.

5 Saskatchewan Provincial Government, "Federal and provincial governments and ranchers joined to protect Saskatchewan's biodiversity," *SaskToday*, September 8, 2020, accessed December 30, 2021, https://www.sasktoday.ca/south/local-news/federal-and-provincial-governments-and-ranchers-joined-to-protect-saskatchewans-biodiversity-4155053.

6 Karen Briere, "Sask. Ranchers oppose federal pasture partners," *The Western Producer*, June 22, 2017, accessed December 30, 2021, https://www.producer.com/news/sask-ranchers-oppose-federal-pasture-partners/.

7 Phillips, *PFRA Pastures Transition Study*, 5.

8 Saskatchewan Provincial Government, "Federal and provincial governments and ranchers joined to protect Saskatchewan's biodiversity."

9 "Prairie Pastures Conservation Area," *Environment and Climate Change Canada*, accessed December 30, 2021, https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/locations/prairie-pastures.html.

10 Karen Briere, "Pasture transfer finalized," *The Western Producer*, September 17, 2020, accessed December 30, 2021, https://www.producer.com/news/pasture-transfer-finalized/;

"Prairie Pastures Conservation Area," *Environment and Climate Change Canada*.

11 Zadie Smith, "On Optimism and Despair," *Feel Free* (Canada: Hamish Hamilton, 2018), 41.

12 Herriot, *Islands of Grass*, 21.

bibliography

Albers, Gretchen. "Treaties 1 and 2." In *The Canadian Encyclopedia*. September 25, 2015. Edited November 12, 2015. Accessed January 24, 2021, https://www.thecanadianencyclopedia.ca/en/article/treaties-1-and-2#:~:text=Treaty%201%20was%20signed%20by,A.G.%20Irvine%2C%20and%20eight%20witnesses.

Alberta 4-H. *Bison Project – Member Level Two.* https://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/4h6873/$FILE/bisonmemberl2i.pdf.

Alberta Conservation Association. *Alberta's Sharp-Tailed Grouse through the Seasons.* March 2010. https://www.ab-conservation.com/downloads/educational_materials/brochures/alberta_sharp_tailed_grouse_brochure.pdf.

Alberta Wilderness Association. "Middle Sand Hills." https://albertawilderness.ca/issues/wildlands/areas-of-concern/middle-sand-hills/.

Arbuthnott, Katherine and Josef K. Schmutz. "PFRA Community Pastures: History and Drama of a Prairie Commons." *Saskatchewan Notes*. Canadian Centre for Policy Alternatives – SK. April 2013. https://www.policyalternatives.ca/sites/default/files/uploads/publications/Saskatchewan%20Office/2013/04/SKnotes_PFRA_0.pdf.

Archibald-Barber, Jesse Rae ed. *kisiskaciwan: Indigenous Voices from Where the River Flows Swiftly.* Regina, SK: University of Regina Press, 2018.

Ashley-Hewitson, Sarah. "Sask. Residents pooling SGI rebates together to protect "Field of Dreams." *620 CKRM*. March 21, 2021. https://www.620ckrm.com/2021/03/21/sask-residents-pooling-sgi-rebates-together-to-protect-field-of-dreams/.

Audobon, John James. *The Birds of America.* J.J. Audobon, 1840. Italy: Miller Graphics, distributed by Crown Publishers Inc., 1978.

Bailey, Arthur W., Duane McCartney, and Michael P. Schellenberg. "Management of Canadian Prairie Rangeland." *Agriculture and Agri-Food Canada*, 2010. https://www.beefresearch.ca/files/pdf/fact-sheets/991_2010_02_TB_RangeMgmnt_E_WEB_2_.pdf.

Bailey, Arthur W., Michael P. Schellenberg, Duane McCartney, and Patricia Bailey. "Politics, Policy, Settlers, and Consequences for Canadian Prairie Grasslands: A Range Management Perspective." *Society for Range Management* 32, no. 5 (October 2010): 17-25. https://www.jstor.org/stable/40927234

Bailey, Matthew G. "Exploring Grasslands National Park, Saskatchewan." *Must Do Canada*. Accessed September 26, 2021. https://www.mustdocanada.com/exploring-grasslands-national-park-saskatchewan/.

Balkwill, Daniel M. "The Prairie Farm Rehabilitation Administration and the Community Pasture Program, 1937-1947." MA Thesis, University of Saskatchewan, Department of History, 2002.

Barbassa, Juliana. "Swiss celebrate return of cows from mountains each fall." *Chicago Tribune*. September 23, 2015. https:/www.chicagotribune.com/travel/sns-bc-eu-travel-trip-swiss-cows-festival-20150923-story.html.

Baydack, Richard. "Sharp-Tailed Grouse Response to Lek Disturbance in the Carberry Sand Hills of Manitoba." Ph.D diss., Colorado State University, Spring 1986.

Berger, Joel and Jon Beckman. "Animals large and small once covered North America's Prairies – and in some places, they could again." *The Conversation.* February 19, 2020. https://theconversation.com/animals-large-and-small-once-covered-north-americas-prairies-and-in-some-places-they-could-again-126989.

Billion Oysters Project. "Living Breakwaters." https://www.billionoysterproject.org/living-breakwaters.

Billion Oysters Project. "Our Story." https://www.billionoysterproject.org/our-story.

Billion Oysters Project. "STEM Education." https://www.billionoysterproject.org/stem-education.

Billock, Jennifer. "Walk the World's Most Meditative Laybrinths." *Smithsonian Magazine*. January 20, 2016. https://www.smithsonianmag.com/travel/walk-worlds-meditative-labyrinths-180957823/.

Birding Outfitters. "Sharp-Tailed Grouse Dance Tour." Accessed December 30, 2021. https://birdingoutfitters.com/tour-details/sharp-tailed-grouse-dance-tour/.

Bonsal, Barrie R., Rabah Aider, Phillippe Gachon, Suzan Lapp. "An assessment of Canadian prairie drought: past, present, and future. " Climate Dynamics 41 (August 1, 2013): 514-515. doi: 10.1007/s00382-012-1422-0.

Boutsalis, Kelly. "Teaching Indigenous Star Stories." *The Walrus*. August 10, 2020. https://thewalrus.ca/space-teaching-indigenous-star-stories/.

Bradshaw, C.J.A. "How to predict marine biodiversity." *Conservation Bytes* (blog). July 26, 201. https://conservationbytes.com/2011/07/26/predicting-marine-biodiversity/.

Brass, Philip. "Land and Reconciliation: What happens to our treaty relationship when public land is privatized?" Interview by Valerie Zink. *Briarpatch Magazine.* October 19, 2017. https://briarpatchmagazine.com/articles/view/land-and-reconciliation?fbclid=IwAR3abCume6D3PdLOrg3wyNadih3tc0wer0OHUsi31roKyE7-IrJoUJYJbFc.

Brasser, Ted J. "Plains Indigenous Peoples in Canada." In *The Canadian Encyclopedia*. February 22, 2009, updated March 28, 2019 by Zach Parrott and Michelle Filice. https://www.thecanadianencyclopedia.ca/en/article/aboriginal-people-plains.

Breen, David H. *The Canadian Prairie West and the ranching frontier 1874-1924.* Toronto: University of Toronto Press, 1983.

Briere, Karen. "Proposed landfill encounters opposition." *Wester Producer.* January 21, 2021. https://www.producer.com/news/proposed-landfill-encounters-opposition/.

Briere, Karen. "Sask. Ranchers oppose federal pasture partners." *The Western Producer*. June 22, 2017. https://www.producer.com/news/sask-ranchers-oppose-federal-pasture-partners/.

Briere, Karen. "Sask. To nix community pasture program." *The Western Producer.* March 30, 2017. https://www.producer.com/news/sask-to-nix-community-pasture-program/.

Briere, Karen. "Pasture transfer finalized." *The Western Pro-*

ducer. September 17, 2020. https://www.producer.com/news/pasture-transfer-finalized/.

Broadfoot, Barry. *Ten Lost Years 1929-1939: Memories of Canadians who survived the Depression* . Toronto: McClelland & Stewart Inc., 1997.

Bumsted, J.M. "Red River Rebellion." In *The Canadian Encyclopedia*. February 7, 2006. Edited November 22, 2019 by Richard Foot, Eli Yarhi, and Andrew McIntosh. Accessed January 24, 2021. https://www.thecanadianencyclopedia.ca/en/article/red-river-rebellion.

Carlson, Allen. "Environmental Aesthetics." In *Stanford Encyclopedia of Philosophy.* January 29, 2007. Revised April 9, 2019. https://plato.stanford.edu/entries/environmental-aesthetics/.

Carruthers, Beth. "A Subtle Activism of the Heart." *Sustaining the West: Cultural Responses to Canadian Environments*. Edited by Liza Piper and Lisa Szabo-Jones, 65-78. Waterloo, ON: Wilfred Laurier University Press, 2015.

CBC News. "Sask. Pastureland to be leased out instead of sold off." June 15, 2017. https://www.cbc.ca/news/canada/saskatchewan/saskatchewan-pastures-program-1.4162876.

C*BC*. "The Fashion of Fur." Canada: A people's history. In *CBC Learning.* https://www.cbc.ca/history/EPCONTENTSE1EP6CH1PA2LE.html.

The Chicago Manual of Style. 17th ed. Chicago: The University of Chicago Press, 2017.

Citizens Against the Proposed Loraas Landfill in RM of Caledonia. Facebook group. Created December 26, 2020. Accessed December 26, 2021, https://www.facebook.com/groups/1088346118253795/about.

Cleaver, Emily. "The Delightful English Tradition of Beating Parish Boundaries with Sticks." *Atlas Obscura*. June 6, 2017. https://www.atlasobscura.com/articles/beating-the-bounds-tradition.

Confer, Keith. "Sharp-Tailed Grouse." *All About Birds.* https://www.allaboutbirds.org/guide/Sharp-tailed_Grouse/overview.

Cook, Benjamin I., Ron L. Miller, Richard Seager and James E. Hansen. "Amplification of the North American "Dust Bowl" drought through human-induced land degradation." *Proceedings of the National Academy of Sciences of the United States of America* 106, no. 13. (March 31, 2009): 4997-5001.

Cornebise, Alfred Emile. "A Decade in the History of the Matador Land and Cattle Company, Limited, 1919 – 1928." MA Thesis in History, Texas Technological College, 1958.

CPI Inflation Calculator. "Value of 29,000,000 from 1935 to 2021" https://www.in2013dollars.com/canada/inflation/1935?amount=29000000.

Crawford, Jordan. "Legal Challenges to the Government of Saskatchewan's Proposed Sell-Off of Public Pastures." Saskatchewan Association for Environmental Law (opinion piece). August 1, 2018. https://www.skael.ca/?p=610.

Culture Days, City of Yorkton. "Wheat Weaving." Accessed October 16, 2021. https://culturedays.ca/en/events/c791d8ac-cb90-45a6-8067-ffdabde3b885.

Dale, Edward Everett. *The Range Cattle Industry: Ranching on the Great Plains from 1865 to 1925.* Norman, Oklahoma: University of Oklahoma Press, 1960.

Dar, Saba. "Selling off Saskatchewan." Sask Dispatch, volume 4, issue 4. July/August 2021. In *Briarpatch Magazine.* July/August 2021.

Daschuk, James. *Clearing the Plains: Disease, Politics of Starvation, and the Loss of Aboriginal Life.* Regina: University of Regina Press, 2013.

Diaw, Chimère. "What lessons can be learnt from the management of the commons in Africa?" Interviewed on November 22, 2016, for use at the Agence Française de Développement conference "Commons and Development Dynamics." Updated June 17, 2021. https://ideas4development.org/en/commons-economy-society/.

Doke Sawatzky, Katie. "The Lost Gem of the PFRA Pastures." T*he Prairie Commons Project: a reporter's journey through Saskatchewan's grasslands.* October 1, 2018. https://www.prairiecommons.ca/?page_id=156.

Doke Sawatzky, Katie. "The state of native prairie in Saskatchewan." *The Prairie Commons Project: a reporter's journey through Saskatchewan's grasslands.* October 1, 2018. Updated July 30, 2020. https://www.prairiecommons.ca/?page_id=300.

Doke Sawatzky, Katie. "Sharing Treaty Land." *Briarpatch Magazine*. July 5, 2021. https://briarpatchmagazine.com/articles/view/sharing-treaty-land.

Doke Sawatzky, Katie and Joseph M. Piwowar. "Changes in prairie grassland extent in Saskatchewan from 1990 to 2015." *Prairie Perspectives: Geographical Essays* 21 (2019): 1-8.

Dordick, Vera. "Rammed Earth Construction Gaining Popularity for the Good of the Environment." *Homedit*. September 11, 2019. https://www.homedit.com/rammed-earth/.

Eastend Arts Council. "Wallace Stegner House." *Wallace Stegner House.* https://stegnerhouse.ca/about.

Eastman, Diana. "What's the Difference Between a Farm and Ranch?" *Land.com.* December 21, 2020. https://www.land.com/buying/difference-between-farm-and-ranch/.

EcoFriendly Sask. "Community Highlight: Public Pastures – Public Interest." October 7, 2021. https://www.ecofriendlysask.ca/.

Encyclopedia Britannica, s.v. "Economy of Canada." Accessed October 11, 2021. https://www.britannica.com/place/Canada/Economy.

Environment and Climate Change Canada. "Prairie Pastures Conservation Area." https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/locations/prairie-pastures.html.

Evernden, Neil. "Beauty and Nothingness: Prairie as Failed Resource." *Landscape* 27, no. 3 (1983): 20-24.

Federal, Provincial and Territorial Governments of Canada. "Grasslands" In C*anadian Biodiversity: Ecosystem Status and Trends*. Ottawa: Canadian Councils of Resource Ministers, 2010.

Foster, Jennifer. "Environmental Aesthetics, Ecological Action and Social Justice." *Emotion, place and culture*. Edited by Mick Smith, Joyce Davidson, Laura Cameron, and Liz Bondi, 97-114. Surrey, UK: Ashgate Publishing Ltd, 2009.

Frost, Rachel. "Carrying Capacity and Stocking Rate." *Global Rangelands.* https://globalrangelands.org/topics/uses-range-and-pasture-lands/carrying-capacity-and-stocking-rate.

Geaumont, Benjamin A. and Daniel L. Graham. "Factors affecting sharp-tailed grouse brood habitat selection and survival." *Wildlife Biology* 2 (2020). doi: 10.2981/wlb.00633.

Gibson, David J. *Grasses and Grassland Ecology.* New York: Oxford University Press, 2009.

Gilson, J.C. "Prairie Farm Rehabilitation Administration." In *The Canadian Encyclopedia*, February 7, 2006. Edited January 17, 2020. Accessed September 5, 2021. https://www.thecanadianencyclopedia.ca/en/article/prairie-farm-rehabilitation-administration.

Government of Alberta. *Recommended Land Use Guidelines for Protection of Selected Wildlife Species and Habitat within Grassland and Parkland Natural Regions of Alberta*. April 28, 2011. https://open.alberta.ca/dataset/e269aad8-3664-402a-b7cb-77abe89e9617/resource/6195d2d4-9f7d-43e5-ada5-81a8210fae38/download/3054250-2011-recommended-land-use-guidelines-protection-wildlife-species-habitat.pdf5.

Government of Alberta. *Sensitive Species Inventory Guidelines*. 2013. https://open.alberta.ca/dataset/93d8a251-4a9a-428f-ad99-7484c6ebabe0/resource/f4024e81-b835-4a50-8fb1-5b31d9726b84/download/2013-sensitivespeciesinventoryguidelines-apr18.pdf, 81-82.

Government of Canada. "Species at risk public registry - Species Search." https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10.

Government of Saskatchewan. "Federal and provincial governments and ranchers joined to protect Saskatchewan's biodiversity." *SaskToday.* September 8, 2020. https://www.sasktoday.ca/south/local-news/federal-and-provincial-governments-and-ranchers-joined-to-protect-saskatchewans-biodiversity-4155053.

Government of Saskatchewan. "Government to Lease Provincial Pastures to Patron Groups." June 15, 2017. https://www.saskatchewan.ca/government/news-and-media/2017/june/15/provincial-pastures.

Government of Saskatchewan. *Saskatchewan Provincial Pastures Land, Pastures Land Education Document.* 2017. https://publications.saskatchewan.ca/#/products/91685.

Gray, James H. *Men Against the Desert.* Saskatoon: Western Producer Prairie Book, 1967.

Guest, Dennis. "Social Security," The Canadian Encyclopedia, February 7, 2006. Edited on December 16, 2013. Accessed on August 30, 2021. https://www.thecanadianencyclopedia.ca/en/article/social-security.

Harby, Bill. "Flower-covered cows take to Swiss streets – Switzerland's desalpe (alpabzug) explains." *Le News*. September 12, 2019. https://lenews.ch/2019/09/12/flower-covered-cows-take-to-swiss-streets-switzerlands-desalpe-alpabzug-explained/.

Hardin, Garret. "The Tragedy of the Commons." *Science* 162, issue 3859 (December 1968): 1243-1248.

Harlan, Becky. "Digging Deep Reveals the Intricate World of Roots." *National Geographic.* October 15, 2015. https://www.nationalgeographic.com/photography/article/digging-deep-reveals-the-intricate-world-of-roots.

Haukos, Jill. "The Tallgrass Prairie." *Kansas State University Kona Prairie Biological Station.* https://keep.konza.k-state.edu/prairieecology/TallgrassPrairieEcology.pdf.

Henrichs, Lisa. "Grazing as a Technique for Prairie Restoration." *Restoration and Reclamation Review* 2, no. 5 (Spring 1997). St. Paul, MN: Student On-Line Journal, Department of Horticultural Science, University of Minnesota.

Herrera, Carlos M. "Grasses, Grazers, Mutualism, and Coevolution: A Comment." *Oikos* 38, no. 2 (March 1982): 254-258.

Herriot, Trevor. "In defense of wildness and federal lands: the Stegner legacy part I." *Grass Note* (blog). November 22, 2013. http://trevorherriot.blogspot.ca/2013/11/.

Herriot, Trevor. *Islands of Grass.* Regina, SK: Coteau Books, 2017.

Herriot, Trevor. "The Prairie Crisis – Crossing the Ledger." Conference Proceedings of the 12th Prairie Conservation and Endangered Species Conference, Winnipeg, MB, February 20, 2019. Winnipeg: Critical Wildlife Habitat Program, 2020. http://www.pcesc.ca/media/45404/final-2019-pcesc-proceedings.pdf.

Herriot, Tervor. *Towards a Prairie Atonement.* Regina, SK: University of Regina Press, 2016.

Horn, Michiel. *The Great Depression of the 1930s in Canada.* Ottawa: Canadian Historical Association, 1984.

Irwin, Kathleen and Rory Macdonald. *Sighting Citing Siting: theorising practice (Crossfiring/Mama Wetotan)*. Regina, SK: Canadian Plains Research Centre, 2009.

Iverson Nassauer, Joan. "Cultural Sustainability: Aligning Aesthetics and Ecology." *Placing Nature: Culture and Landscape Ecology*. Edited by Joan Iverson Nassauer, 65-83. Washington, DC: Island Press, 1997.

Iverson Nassauer, Joan. "Messy Ecosystems, Orderly Frames." *Landscape Journal* 14, vol. 2 (January 2007): 161-169. doi: 10.3368/lj.14.2.161.

Iverson Nassauer, Joan . "Urban Ecological Retrofit." *Eco-Revelatory Designs: Nature Constructed/Nature Revealed*. *Landscape Journal,* special issue (1998): 15-17.

Johnston, Alex. "The History of the Rangelands of Western Canada." *Journal of Range Management* 23, no. 1 (January 1970): 3-8. doi: https://www.jstor.org/stable/3895999.

Klinenberg, Eric. "The Seas are Rising. Could Oysters Help?" *The New Yorker.* August 2, 2021. https://www.newyorker.com/magazine/2021/08/09/the-seas-are-rising-could-oysters-protect-us.

Knapp, Alan K., John M. Blair, John M. Briggs, Scott L. Collins, David C. Hartness, Loretta C. Lohnson, and E. Gene Towne. "The Keystone Role of Bison in North American Tallgrass Prairie." *BioScience* 49, no. 1 (1999): 39-50.

Krahn, Tim. *Essential Rammed Earth Construction: the complete step-by-step guide*. Gabriola Island, BC: New Society Publishers, 2019.

Kraus, Dan. "Why Canada's prairies are the world's most endangered ecosystem." *Land Lines (blog).* Nature Conservancy of Canada. October 24, 2016. https://www.natureconservancy.ca/en/blog/archive/grasslands-the-most.html.

Kulshrestha, Suren, George Pearson, Brant Kirychuk and Rick Gaube. "Distribution of Public and Private Benefits on Federally Managed Community Pastures in Canada." *Society for Range Management* 30, no. 1 (February, 2008): 3-11. https://www.jstor.org/stable/25145349.

Landscapes/Paysages. "Dale Hodges Park: a story of collaboration and innovation." *Landscapes/Paysages* 23, no. 2 (Summer 2021): 28-30.

Lewis, Meriwether, William Clark, Charles Floyd, and Joseph Whitehouse. *Original journals of the Lewis and Clark Expedition, 1804-1806.* American Philosophical Society Library, 1905. New York: Antiquarian Press, 1959.

Lindemayer, David B. and Martin J. Westgate. "Are Flagship, Umbrella and Keystone Species Useful Surrogates to Understand the Consequences of Landscape Change?" *Current Landscape Ecology Reports* 5 (2020): 76-84. https://doi.org/10.1007/s40823-020-00052-x Published online: 9 May 2020.

Lipski, Candice. "New $25M grant for prairie grassland conservation goes to 5 organizations." *CBC News,* March 5, 2021. https://www.cbc.ca/news/canada/saskatchewan/new-grant-towards-prairie-grassland-conservation-1.5938152#:~:text=The%20Weston%20Family%20Foundation%20has,the%20most%20at%2Drisk%20habitats.

Living Sky Wildlife Rehabilitation. "Dancing Grouse Tour." Accessed December 30, 2021. https://livingskywildliferehabilitation.org/dancing-grouse-tour/.

Macewan, Grant. "Sitting Bull." In *The Canadian Encyclopedia*. December 5, 2007. Updated February 21, 2017 by Zach Parrott and Michelle Filice. Accessed February 13, 2021. https://www.thecanadianencyclopedia.ca/en/article/sitting-bull.

Manitoba Association of Landscape Architects. "About MALA." https://www.mala.net/profession/.

Masud, M.B. , M.N. Khaliq, and H.S. Wheater. "Future changes to drought characteristics over the Canadian Prairie Provinces based on NARCCAP multi-RCM ensemble." *Climate Dynamics* 48 (April 1, 2017): 2702-2703, doi: 10.1007/s00382-016-3232-2.

Matteson, Mollie and George Wuerthner. *Welfare Ranching: The Subsidized Destruction of the American West.* Sausalito, CA: the Foundation for Deep Ecology, 2002.

McCue, Duncan. "This plant medicine teacher is reclaiming Anishinaabe names for species. Why that could be good for the planet." *CBC*, September 12, 2021. https://www.cbc.ca/radio/thecurrent/back-to-the-land-preserving-indigenous-language-1.6152854.

McKenna, Elder Betty. "Pottery Shards." In *Sighting Citing Siting: theorising practice (Crossfiring/Mama Wetotan).* Edited by Kathleen Irwin and Rory Macdonald, 39-41. Regina, SK: Canadian Plains Research Centre, 2009.

McKibben, Bill. "The Only Way to Have a Cow." *Orion Magazine.* March/April 2010. Accessed September 5, 2021. https://orionmagazine.org/article/the-only-way-to-have-a-cow/.

Mitloehner, Frank. "The Truth about Cattle and Methane Emissions." Prairie's Got the Goods Webinar Series. Hosted by Prairie Conservation Action Plan. March 22, 2020. https://www.youtube.com/watch?v=e_hrfmH2US4.

Moersen, Maria Elena. "Penda creates a river-like pavilion for the 10th International Garden Expo in Wuhan, China." *The Architect's Newspaper.* December 30, 2015. https://www.archpaper.com/2015/12/river-runs-pendas-pavilion-10th-international-garden-expo-wuhan-china/.

Morgan, Grace. *Beaver, Bison, Horse: the traditional knowledge and ecology of the Northern Great Plains.* Regina: University of Regina Press, 2020.

Morgan, Grace and R.J. Hudson. "Dynamics of Fire and Grazing by Bison on Grasslands in Central Alberta." In *Beaver, Bison, Horse: the traditional knowledge and ecology of the Northern Great Plains.* Written by Grace Morgan, 219-258. Regina: University of Regina Press, 2020.

Muelder Eaton, Marcia. "The Beauty that Requires Health." *Placing Nature: Culture and Landscape Ecology*. Edited by Joan Iverson Nassauer, 85-106. Washington, DC: Island Press, 1997.

National Geographic. "Role of Keystone Species in an Ecosystem." September 5, 2019. Accessed January 19, 2021. https://www.nationalgeographic.org/article/role-keystone-species-ecosystem/.

The Nature Conservancy. "Restoring Fire to Native Grasslands." https://www.nature.org/en-us/about-us/where-we-work/united-states/minnesota/stories-in-minnesota/restoring-fire-to-native-grasslands/.

Nature Conservancy of Canada. "Buffalo Pound." https://www.natureconservancy.ca/en/where-we-work/saskatchewan/featured-projects/buffalo-pound.html.

Nature Saskatchewan. "Stewards of Saskatchewan." Accessed June 20, 2021. https://www.naturesask.ca/what-we-do/stewards-of-saskatchewan.

Naturewatch. "About milkweed and monarchs." September 2017. https://www.naturewatch.ca/milkweedwatch/about-milkweed-and-monarchs/.

North American Bird Conservation Initiative Canada. *The State of Canada's Birds, 2019.* Ottawa: Environment and Climate Change Canada, 2019.

Oregon State University. "Discuss how livestock interaction impacts grass growth." *National Forage & Grasslands Curriculum.* https://forages.oregonstate.edu/nfgc/eo/onlineforagecurriculum/instructormaterials/availabletopics/management/livestock.

Orff, Kate. *Toward an Urban Ecology.* New York: Monacelli Press, 2016.

Osborn, Morgan. "What is a Forb?" *Wild Wonderings* (blog). Texas A&M Natural Resources Institute. June 25, 2015. http://wild-wonderings.blogspot.com/2015/06/what-is-forb.html.

Owen, Denis F. and Richard G. Wiegert. "Mutualism between Grasses and Grazers: An Evolutionary Hypothesis," *Oikos* 36, no. 3 (March 1981): 376-378.

Parks Canada. "Bison Ecology – Elk Island National Park." Last modified July 19, 2018. https://www.pc.gc.ca/en/pn-np/ab/elkisland/nature/eep-sar/ecologie-ecology2.

Parks Canada. "Grasslands National Park." Accessed September 26, 2021. https://www.pc.gc.ca/en/pn-np/sk/grasslands.

Penner, Lyndon. *Native Plants for the Short Season Yard: best picks for the Chinook and Canadian Prairie Zones.* Canada: Brush Education Inc., 2016.

Phillips, Dave. *PFRA Pastures Transition Study*. January 7, 2015. https://www.naturesask.ca/rsu_docs/pfra-final-report.pdf.

Potié, Joel. "Sharp-tailed grouse (Tympanuchus phasianellus) in a resource development area at the northern edge of the species' range." M.Science thesis, McGill University, April 2020.

Provincial Archives of Saskatchewan. "Homesteading."

https://www.saskarchives.com/collections/land-records/history-and-background-administration-land-saskatchewan/homesteading.

Public Pastures – Public Interest. "Pasture tour June 22." Email to membership sent May 27, 2019.

Rearson, Amy. "Penda highlights global water crisis with meadow pathway installation." *Dezeen*. October 25, 2015. https://www.dezeen.com/2015/10/30/penda-global-water-crisis-meadow-pathway-installation_international-garden-expo-2015-china/.

Regina Catholic Schools. "About Us/Contact Us." Accessed December 26, 2021. https://www.rcsd.ca/Division/aboutus/Pages/default.aspx#/=.

Regina Public Schools. "About Us." Accessed December 26, 2021. https://www.reginapublicschools.ca/about_us.

Richie Oberbillig, Deborah. *A Guide to Wildlife Viewing and Photography Blinds: Creating Facilities to Connect People With Natur*e. Denver, CO: Colorado Division of Wildlife and Richmond, VA: Virginia Department of Game and Inland Fisheries.

Ristau, Julie. "What is Commoning, Anyway?" *On the Commons.* March 3, 2011. https://www.onthecommons.org/work/what-commoning-anyway.

Saskatchewan Association of Landscape Architects. "About Us." https://sala.sk.ca/.

Saskatchewan Bird Atlas Project. *Saskatchewan Field Checklist of Birds - Mapsheet 72H15.* Accessed via HABISask. https://gisappl.saskatchewan.ca/Html5Ext/?viewer=habisask.

Savage, Candace. *A Geography of Blood.* Vancouver: Greystone Books, 2012.

Savage, Candace. *Prairie: A Natural History*. Vancouver: Greystone Books, 2004.

Sayre, Nathan F. "Carrying Capacity." In *The Berksire Encyclopedia of Sustainability: Ecosystem Management and Sustainability.* Berkshire Publishing Group, 2012.

SCAPE. "Living Breakwaters enters construction." September 3, 2021. https://www.scapestudio.com/news/2021/09/living-breakwaters-enters-construction/.

Scarry, Elaine. *On Beauty and Being Just.* Princeton, NJ: Princeton University Press, 2001.

Sharptails Plus Foundation Inc. "Habitat." https://www.sharptailsplus.org/habitat.

Smith, Zadie. "On Optimism and Despair." In *Feel Free,* 35-41. Canada: Hamish Hamilton, 2018.

Soth, Amelia. "Beating the Bounds." *JStor Daily.* May 7, 2020. https://daily.jstor.org/beating-the-bounds/.

Spieles, Douglas . *Protected Land: Disturbance Stress and American Ecosystem Management.* New York: Springer Science + Business Media, 2010.

State of Minnesota, Department of Natural Resources. "Put Down Some Roots... Plant Prairie." Poster. https://files.dnr.state.mn.us/assistance/nrplanning/community/roadsidesforwildlife/putdownroots_poster.pdf.

Statista Research Department. "Number of visitors to Grasslands National Park in Canada from 2011 to 2020." October 18, 2021. https://www.statista.com/statistics/501609/visitors-to-grasslands-national-park/.

Statistics Canada. "Census Profile, 2016, Regina [Population Centre], Saskatchewan and Saskatchewan." https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=POPC&Code1=0698&Geo2=PR&Code2=47&SearchText=Regina&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=0698&TABID=1&type=0.

Statistics Canada. "Census Profile, 2016, Saskatoon [Census metropolitan area], Saskatchewan and Saskatchewan." https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CMACA&Code1=725&Geo2=PR&Code2=47&SearchText=saskatoon&SearchType=Begins&SearchPR=01&B1=All&TABID=1&type=0.

Stegner, Wallace. "The Wilderness Letter." December 3, 1960. https://psych.utah.edu/_resources/documents/psych4130/Stenger_W.pdf.

Stegner, Wallace. *Wolf Willow.* New York: Viking, 1966.

Steuter, Allen and Lori Hidinger. "Comparative Ecology of Bison and Cattle on Mixed-Grass Prairie." *Great Plains Research: A Journal of Natural and Social Science* 9 (Fall 1999): 329-342.

Storey, David, dir. *Corner Gas*. Season 1, episode 1, "Ruby Reborn." Written by Brent Butt, Mark Farrell, and David Storey. Aired January 22, 2004, on CBC.

Sudom, Larissa. "Stop Loraas Landfill in RM of Caledonia." Change.org (petition). December 2020. https://www.change.org/p/sign-our-petition-and-help-us-stop-proposed-loraas-landfill-in-rm-of-caledonia;

Sweet, A.R., F.M. Haidl, and C. Schmidt. *Zahursky Point GeoVista Brochure.* Canadian Federation of Earth Sciences, 2011.

Team ReconciliAction YEG. "As Long as the Sun Shines, The Grass Grows and the River Flows." University of Alberta, Faculty of Law. January 9, 2018. https://ualbertalaw.typepad.com/faculty/2018/01/as-long-as-the-sun-shines-the-grass-grows-and-the-river-flows.html

Thompson, Ian H. *Landscape Architecture: A Very Short Introduction.* Oxford: Oxford University Press, 2014. Kindle.

Todd, Matt. "A Rancher's View of the Post-Bison West." In *Bison and People on the North American Great Plains: A Deep Environmental History,* edited by Geoff Cunfer and Bill Waiser, 263-277. College Station, TX: Texas A&M University Press, 2016.

Townsend, Andrea K. and Christopher M. Barker. "Plastic and the Nest Entanglement of Urban and Agricultural Crows." *PLoS ONE* 9, vol. 1 (January 31, 2014): e88006. doi:10.1371/journal.pone.0088006

The Tragically Hip. "Wheat Kings." *Fully Completely*. Universal Music Canada, 1992.

Trlica, M. J. "Grass Growth and Response to Grazing." *Natural Resources Series*, Fact Sheet No. 6.108, Colorado State University Extension. Reviewed March 2013. https://extension.colostate.edu/docs/pubs/natres/06108.pdf

Turner, Jeff and Alex Burr, dir. *The Nature of Things*. Season 59, episode 2: "Grasslands: A Hidden Wilderness." Narrated by David Suzuki. Aired September 27, 2019, on CBC. https://www.cbc.ca/natureofthings/episodes/grasslands-a-hidden-wilderness

Undersander, Dan, Beth Albert, Dennis Cosgrove, Dennis Johnson, and Paul Peterson. *Pastures for profit: a guide*

to rotational grazing. Madison, WI: Cooperative Extenion Publishing, University of Minnesota Extension Service, 2002.

Upper Souris National Wildlife Refuge. *Sharp-tailed Grouse on Upper Souris National Wildlife Refuge.* https://www.fws.gov/uploadedFiles/Grouse%20Blind%20brochure%20and%20map%202019%20webpage.pdf.

Vaadeland, Gord. "Grasslands, forests & wetlands – Nature's carbon capture & storage solution." C*anadian Parks and Wilderness Society.* https://cpaws.org/grasslands-forests-wetlands-natures-carbon-capture-storage-solution/.

Veriditas. "New to the Labyrinth." https://www.veriditas.org/New-to-the-Labyrinth.

Waiser, Bill. *A World We Have Lost: Saskatchewan Before 1905.* Markham, ON: Fifth House Limited, 2016.

Waiser, Bill. *Saskatchewan: A New History*. Calgary, AB: Fifth House Ltd., 2005.

Wall, Derek. *The Commons in History: Culture, Conflict, and Ecology.* Cambridge, Massachusetts: The MIT Press, 2014.

Watkins, Katie. "Penda Designs River-Inspired Landscape Pavilion for China's Garden Expo." ArchDaily. https://www.archdaily.com/776474/penda-designs-river-inspired-landscape-pavilion-for-chinas-garden-expo.

White, Ed. "Roundup time at the Community Pasture." *The Western Producer*. October 30, 1997. Ahttps://www.producer.com/news/roundup-time-at-the-community-pasture/.

Whittington, Les. "Conservatives dismantling social programs built over generations." *Toronto Star.* December 9, 2013. https://www.thestar.com/news/canada/2013/12/09/conservatives_dismantling_social_programs_built_over_generations.html.

The Wilderness Society. "The Wilderness Act." https://www.wilderness.org/articles/article/wilderness-act#.

The Wildlife Trusts. "International Dawn Chorus Day." https://www.wildlifetrusts.org/dawn-chorus-day.

Vermette, Katherena. The Break. Canada: House of Anansi Press Inc., 2016. Kindle.

Weaver, J.E. *Prairie Plants and their Environment: a Fifty Year Study in the Midwest*. Lincoln, NE: University of Nebraska Press, 1968.

Wilson, Steven. "Trail Event at Caledonia-Elmsthorpe." *Discover Weyburn.* August 12, 2015. https://www.discoverweyburn.com/articles/trail-event-at-caledonia-elmsthorpe-pasture.

Wroe, R.A., S. Smoliak, and G.W. Wheeler. "Alberta Range Plants and their Classification." A*gri-Facts, Alberta Agriculture Food and Rural Development.* https://open.alberta.ca/dataset/56928e5c-cb66-42cb-a348-8736d387e752/resource/b4c8bb55-4c93-44d9-8589-4cf5bc813de7/download/28133192000agri-factsalbertarangeplantsclassification.pdf, 2.

Zylstra, E.R. "Accumulation of wind-dispersed trash in desert environments." *Journal of Arid Environments* 89 (2016): 13-15.