



# TRAVERSING TERRAIN & EXPERIENCE

ATLAS OF THE BATTLE RIVER  
AND  
SOUNDING CREEK WATERSHEDS





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**ATLAS OF THE BATTLE RIVER  
AND  
SOUNDING CREEK WATERSHEDS**

**BATTLE RIVER**

WATERSHED ALLIANCE

PRODUCED BY THE BATTLE RIVER WATERSHED ALLIANCE  
AND OUR PARTNERS

WRITTEN BY HEATHER J. MARSHALL



## Disclaimer

The views, statements and conclusions expressed in this publication are the those of the people quoted and of the authors, to the best of our knowledge at the time of publication. The opinions are not necessarily shared by the Battle River Watershed Alliance board, staff or supporters. Although the author and publisher have made every effort to ensure that the information in this book was correct at press time, the author and publisher do not assume and hereby disclaim any liability to any party for any loss, damage, or disruption caused by errors or omissions, whether such errors or omissions result from negligence, accident, or any other cause.

Battle River Watershed Alliance  
Camrose, Alberta  
www.battleriverwatershed.ca

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Cover photos by Sue Wolfe: Winter scene along the Battle River by Big Knife Provincial park (left), canoe photo on the Battle River west of Dried Meat Lake (bottom), prairie sky with figure is north of Battleford. Inside cover photo taken by Allan Zimmerman. Back cover photo by Rajan Rathnavalu.

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*This Emblem was designed by watershed resident Geordie Nelson in 2017 to commemorate the 10th anniversary of the BRWA. It incorporates the natural and cultural history and geography of our watershed.*

## Who are the Battle River Watershed Alliance?

We are the people who live, work, and play in the Battle River and Sounding Creek watersheds. We are landowners, community members, business people, researchers, and decision makers. We are the people that will ensure healthy natural areas, resilient communities, and a stable economy in this place that we love.

**Our Vision:** The Battle River and Sounding Creek watersheds will sustain abundant life, now and for future generations.

**Our Mission:** The Battle River Watershed Alliance (BRWA) leads in watershed management by connecting people through research, education, and advice to ensure the future of our watersheds.

**Our Values:** Sound Research, Shared Knowledge, Mutual Responsibility, Innovation, Diversity, Collaboration, Sustainability, Leadership,

Adaptive Management, Consensus-based Decision-making, Intergenerational Inclusivity

**Our History:** The BRWA was created in 2006 as a non-profit society. Alberta Environment, under Water for Life: Alberta's Strategy for Sustainability, selected the BRWA as the designated Watershed Planning and Advisory Council (WPAC) for the Battle River and Sounding Creek watersheds within Alberta. WPACs have a mandate to lead in watershed planning, develop beneficial management practices, foster stewardship activities within the watershed, report on the state of the watershed, and educate users of the water resource.

**Our Work:** We work in partnership with communities, watershed stewardship groups, all four orders of government (municipal, provincial, federal and First Nations), industry, academia, environmental organizations, and residents to promote the health and sustainable management of the land and water resources using the best science and social science available. We exist to have a watershed that sustains all life by using sound knowledge and wisdom to preserve our watershed for future generations.

## Our Goals:

To lead watershed management planning in our watersheds. To ensure community members are knowledgeable and engaged with their watersheds. To support the growth of a watershed stewardship ethic. To be a learning organization dedicated to achieving excellence.

## The Author

Heather Marshall returned to Alberta seven years ago and completed her BA in Environmental Studies at the University of Alberta's Augustana campus. She has spent the past three and a half years researching and co-writing a historical biography about early naturalist, Frank Farley.

Working with the Battle River Watershed Alliance has been, for her, a truly wonderful opportunity. The team, and their passion for what they do, is contagious. The stories, people and history of this region — along with the variety and beauty of its natural surroundings — have left Heather with a deep sense of being rooted in a very special place. As you read on, she hopes you will feel the same sense of wonder, curiosity, and connection she experienced while writing the book.





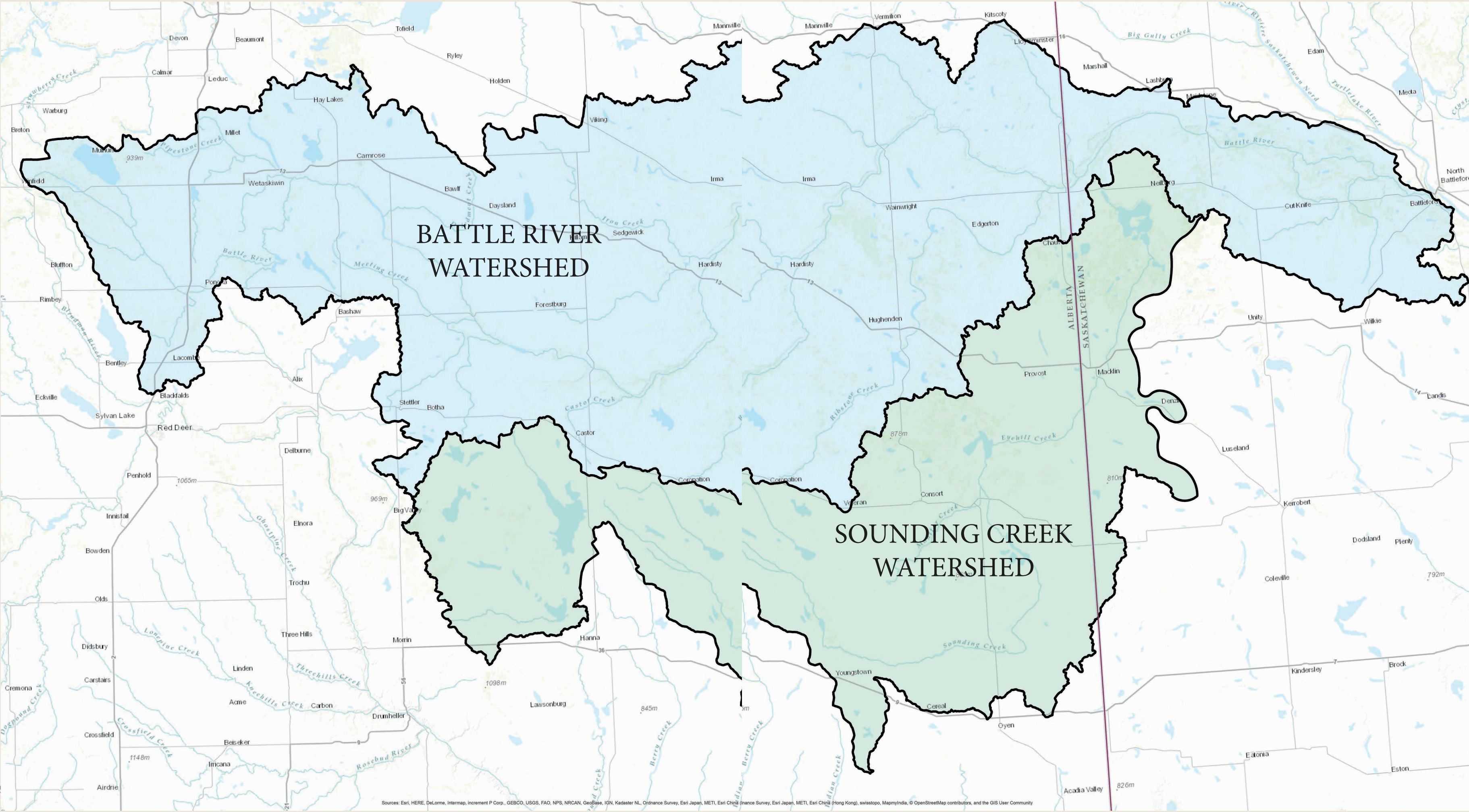




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Carol and Fred Wilson. Carol received an OTIS Award from the Battle River Watershed Alliance in 2012 for her outstanding work in environmental stewardship.

This book is dedicated to Carol Wilson, a woman who sees life as intimately interconnected.

Carol Wilson was a delegate with the Alberta Beef Producers in the 1990s. While out with Peggy Strankman, she noticed the dry state of Beaverhill Lake. Carol wondered about the water source for the farm where she and her husband Fred were raising cattle near Killam. Carol’s work as a delegate was increasing her awareness that water and the environment would be critical issues in the days to come.

This concern led Carol to contact Terry Leslie and Don Ruzicka and arrange a meeting with Beaver County. Ruzicka says his empathy for Carol’s personal journey of healing and her desire to care for creation inspired him. Ruzicka calls Carol “a survivor of the first degree” and says that the statement “sometimes you have to go through hell before you get to heaven” rings true for Carol.

Carol wanted to see the healing she had experienced in her own life reciprocated to the land. Having found her own voice, she courageously spoke out about the difficult experiences of her childhood. She spoke to farmers about dealing honestly with emotional trauma, depression and other issues in their lives. Carol’s passion for stewarding the land was the beginning of a group of concerned people from differing paths and beliefs that came together to work for the education, betterment and protection of their water.

This Atlas is a team project, and would not have been possible without the efforts and funding from many people and organizations. The Battle River Watershed Alliance gratefully acknowledges the contributions of our partners, board, staff, and community members.

We also thank the many people who supplied us with stories, photos, artwork, and ideas. You will see these people mentioned throughout the pages of this atlas. They are the foundation for this book.

However there are many others who contributed to the success of this Atlas whose names you will not see. Behind the scenes were Michell McDougall, from Twisted Ink Design & Advertising Ltd. who helped us create the initial design and layout. Alan Richards, John Olson, Ernie & Gladys Marshalls, and Glen Hvenegaard helped the author with final edits.

Funding Partners

Alberta Beef Producers

We thank the Alberta Beef Producers (ABP) for their financial support. Alberta Beef Producers is a strong, clear, and representative voice speaking and working on behalf of cattle and beef producers in Alberta and contributing to a vigorous and profitable beef industry. ABP demonstrates leadership in environmental stewardship to the land and water while maintaining productivity and profitability.



Alberta Real Estate Foundation

This project is made possible through a grant from the Alberta Real Estate Foundation. The Alberta Real Estate Foundation supports real estate related initiatives that enhance the industry and benefit the people of Alberta. The Foundation’s revenues come from the interest earned on public money deposited in real estate brokers’ pooled trust accounts.



Alberta Environment and Parks AEP

The Battle River Watershed Alliance receives an annual operational grant from AEP which keeps us working towards our common goals. As an ongoing partner in this and all of our projects, we thank AEP for their financial and technical support. Special thanks to their GIS department who contributed many of the maps in this atlas.



Key Project People

Greg Nelson, Alberta Environment and Parks

In BRWA’s formative years Greg was the watershed planner for the Battle River. When BRWA started to plan the development of an Atlas, Greg encouraged us to expand our vision of what an Atlas could look like. He encouraged BRWA to produce an Atlas that contained more than “just maps”- to think beyond the neat line- under his guidance the Traversing Terrain and Experience book was born and given it’s title.

Heather Marshall, Writer and Graphic Designer

Heather Marshall was the turning point to completing the *Traversing Terrain and Experience Atlas*. When contracted to write and design the book, she quickly captured the vision and spirit of the Atlas. Not only is Heather an accomplished writer and hard worker, she is also a brilliant researcher who was able to discover many interesting facts and stories about people and places across the watershed. Heather is a true professional with attention to detail and innate ability to put together attractive page layouts. She is the master of this book.

BRWA Board of Directors

The Directors supported the production of Traversing Terrain and Experience from the beginning and we thank them for their dedication to the watershed. We especially thank Midge Lambert who is an amateur historian and often brings interesting articles and facts to the Alliance.

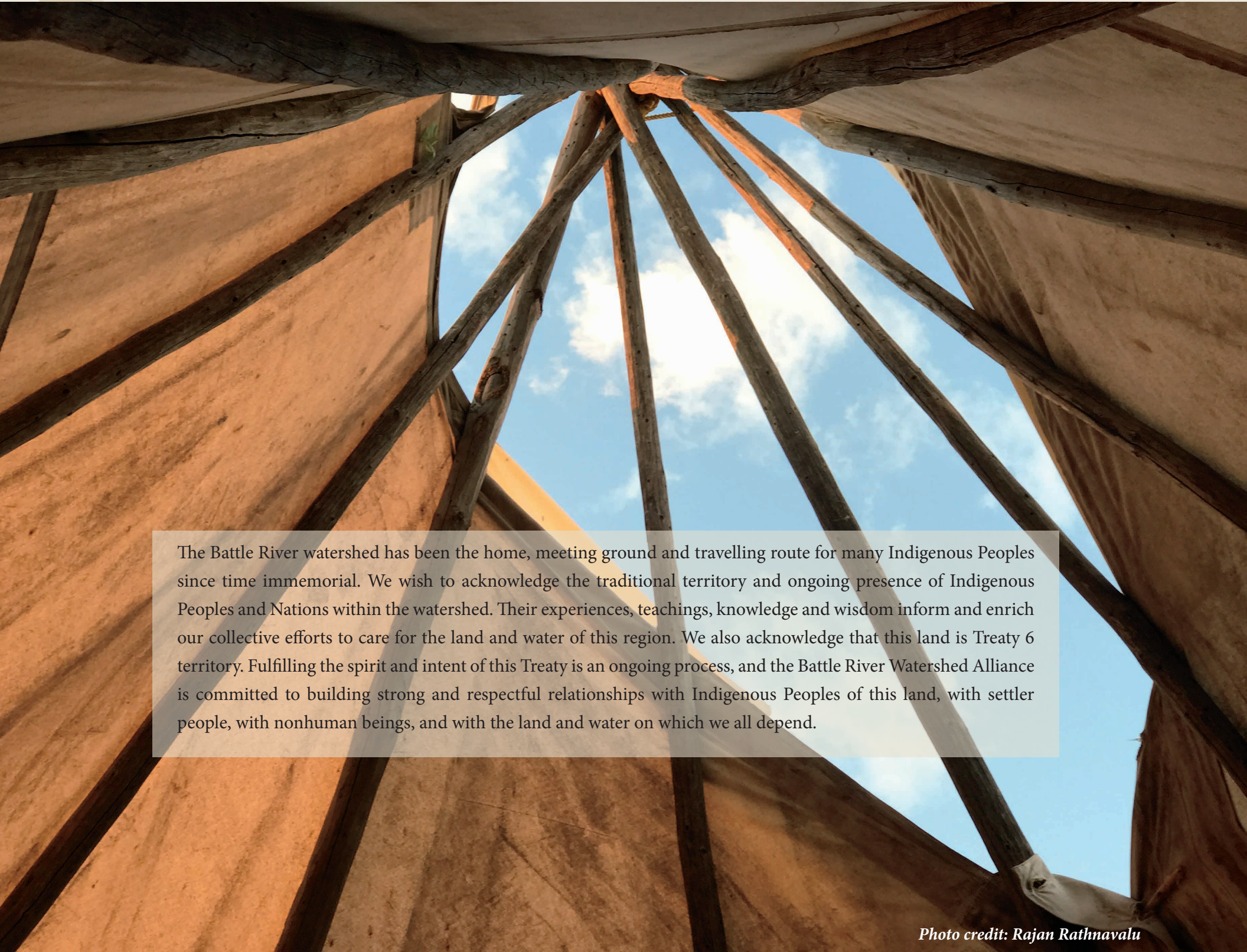
BRWA Staff

Our deep gratitude is extended to the BRWA staff “family”; Sarah Skinner, Susanna Bruneau, Nathalie Olson, Sheila Logelin and David Samm, and our 2017 summer program staff Tannis McNabb. All staff pitched in the help move Traversing Terrain and Experience Atlas to reality. A special shout-out to Nathalie who was the champion of this project. She kept it moving forward, and lead the project to a successful completion.

Photos

All of the photographs used in this atlas were taken by the staff of the Battle River Watershed Alliance material or were stock photos without copyright, unless otherwise indicated.





The Battle River watershed has been the home, meeting ground and travelling route for many Indigenous Peoples since time immemorial. We wish to acknowledge the traditional territory and ongoing presence of Indigenous Peoples and Nations within the watershed. Their experiences, teachings, knowledge and wisdom inform and enrich our collective efforts to care for the land and water of this region. We also acknowledge that this land is Treaty 6 territory. Fulfilling the spirit and intent of this Treaty is an ongoing process, and the Battle River Watershed Alliance is committed to building strong and respectful relationships with Indigenous Peoples of this land, with settler people, with nonhuman beings, and with the land and water on which we all depend.

Photo credit: Rajan Rathnavalu



Kevin Cantalon. "Battle River Near Duhamel Alberta" (2017). 9" x 12", watercolour on paper.





Photo credit: Rajan Rathnavalu

*Stare at a picture long enough and deep enough and you will fall into it. You may begin to smell the prairie grass after a rain, hear bison thunder across the plains, or taste Saskatoons freshly picked from that special bush.*

*We invite you to fall into this atlas.*

This is no ordinary atlas; this is a compilation of stories, art, photography, geography, and interesting facts that make our home unique.

This is an exploration of how the region has shaped our lives, and how we have shaped the region. From time immemorial and far into the future, the people who have lived and will live in this place do so in connection to its environment. Our connection to this place is as deep as the roots of its native grasses. We have responded to the open skies and the harsh winters, the floods and droughts, the trees and animals. We have relied on the bounty and have built our homes and communities in relation to this place. And as in all relationships, this connection is reciprocal. From the dominance of agriculture, the mining of coal, or the construction of highways- we have left an undeniable footprint on this land. And so this relationship continues.

This atlas explore these topics and so many more through the eyes of the people who live here. It includes data, stats, maps, figures, and facts; it also includes stories, perspectives, thoughts and feelings about the same topics. The atlas is divided into three sections: Watersheds, Themes and Perspectives, and our Subwatersheds.

By reading through this atlas you will come to understand the deep and profound relationship between the land, water, people and all living beings. You will see the interconnection between our environment and our economy. You will learn more about the communities which make up this region, and the extraordinary people who call this place home.

The Battle River and Sounding Creek watersheds region is expansive and diverse. We have tried to balance the content of this atlas to ensure equal representation from urban and rural perspectives, from the western headwaters to the eastern confluence, from the northern parkland to the southern grassland, from past, to present, to future. The potential topics and stories are endless. We curated the content for fair representation, unique perspectives, and for our ability to collect the stories. We are by no means able to cover all ideas, perspectives, stories on any given topic. It is a difficult balance, but we hope you see yourself represented within its pages. If you feel an important topic has been left out, feel free to contact the BRWA with the story and we may be able to incorporate the content into future print or online editions.

Why Battle River AND Sounding Creek watersheds?

Battle River Watershed Alliance (BRWA) was designated the Watershed Planning and Advisory Council (WPAC) for the Battle River and Sounding Creek watersheds through the Government of Alberta's Water for Life Strategy. You can read more about this agreement on page 7. The BRWA is in the rather unique position to be in a leadership role for these two distinct watersheds. Although these two watersheds are not directly connected in the way that the Sounding Creek is a closed basin, we have come to see them as a whole.





Photo credit: Rajan Rathnavalu

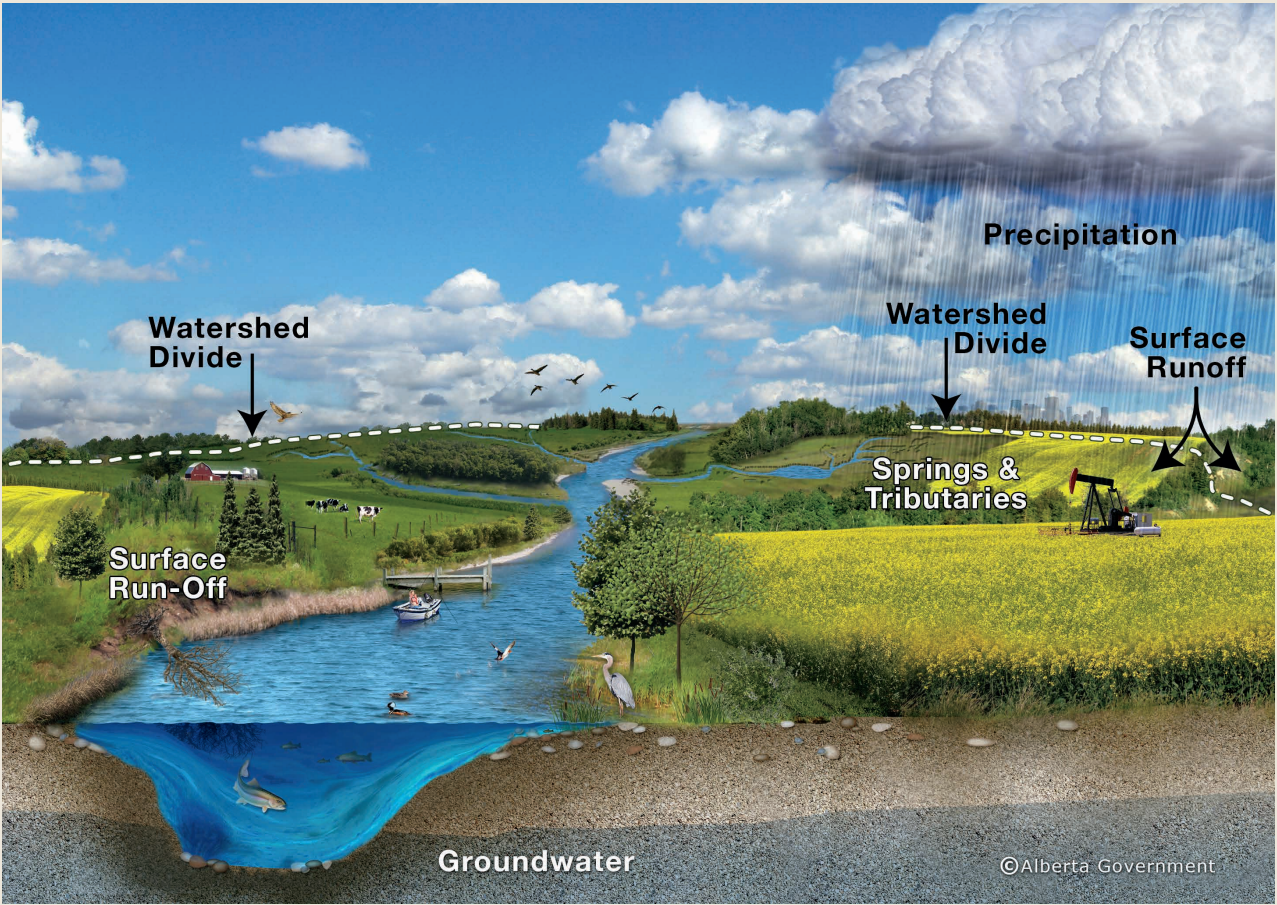
*“A watershed is that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community.”*  
-John Wesley Powell



©Alberta Government

A watershed works like a funnel, collecting rain and snow, and anything caught up in the water, and draining it towards the lowest point- commonly a lake, river or wetland, and eventually towards the ocean. A watershed includes the land, water, natural and human communities living within its boundaries.





A watershed (or basin) is the area of land that catches snow and rain and drains into a common body of water, such as a wetland, lake, or river. As water always flows downhill, the topography of the land defines the size and shape of the watershed. Think of a watershed as a funnel, draining all of the water inside its boundaries into a common point.

Watersheds can range in size from very small (such as around a lake), to very large, such as the entire Saskatchewan River Basin (see page 24-25). A large watershed consists of many smaller sub-watersheds. All watersheds flow from their headwaters (a high point where the water starts) to outlets where the water flows

into a larger body of water, eventually into an ocean. However, there are some exceptions, such as the Sounding Creek Watershed, which is a closed-basin. This means that the watershed does not connect or drain into a larger body of water, and does not drain to the ocean.

Watersheds fulfill three primary functions: to capture water, filter and store it in the soil then release it into a water body. But watershed are much more than that. They are where we live, work, and play. Everywhere on earth is part of a watershed.

Watersheds sit on top of groundwater. Surface water and groundwater are connected in a

watershed. Surface water seeps through the soil, moving downward to fill the cracks and spaces between rocks and soil particles, thereby becoming groundwater. Groundwater is stored in the soil and rock. Groundwater is always naturally in motion. Recharge areas are places where surface water soaks into the soil to become groundwater (e.g. wetlands). Discharge areas are places where groundwater seeps or flows into surface water (e.g. springs). The Battle River is fed by many springs along its length.

Watersheds know no political boundaries. They often cross into different provinces or countries from where they began.



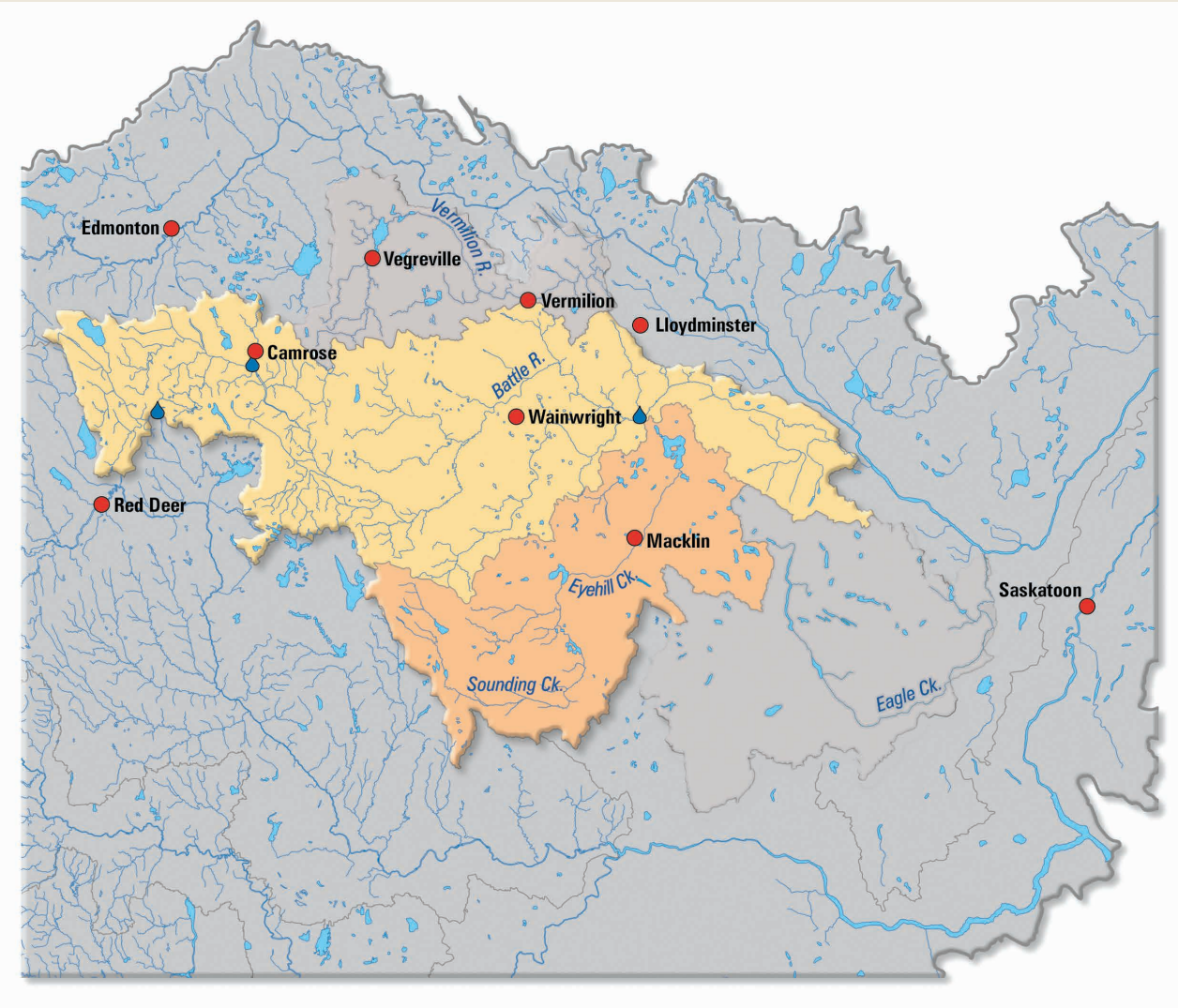
"The Measure of a River" by Dr. Roger Epp

“Western Canada is carved by rivers whose headwaters begin in mountain glaciers, whose reputations have been made by the furs borne on them, the cities built beside them or the distant ports reachable by them. The Battle River can claim none of this. It flows from a small lake in the west-central Alberta parkland and eventually into an oversized valley, hollowed in a geological instant, whose broad floor it can only occupy respectively by means of looping oxbows. The river relies on whatever rain trickles down a thousand creeks to sustain itself after spring runoff . . .

Indeed, the Battle runs through few towns before it joins the North Saskatchewan some 400 twisting miles from its source, surely the slowest feeder river in the great basin that drains into Hudson’s Bay. Any canoeist knows as much, having struggled even once with its serpentine form, its beaver dams, and its shallows, against what turns out to be wildly optimistic projections of arrival time. In the prolonged drought of a recent summer, no flow was recorded along stretches of it. In other words, the Battle is insignificant by measures that judge a river by where it is going and its power and sweep in getting there. Its appeal is not linear at all. Like the Jordan, it is a river define by what it separates and what it joins, by what life it draws to itself and by what life it releases.”

This text is excerpted from an essay, "The Measure of a River," which was first published in *Alberta Views* magazine (2000) and included in *We Are All Treaty People: Prairie Essays* (University of Alberta Press, 2008). It is used here with permission.





The Battle River watershed (yellow), Sounding Creek watershed (orange).  
Source: Partners FOR the Saskatchewan River Basin.

About The Battle River and Sounding Creek Watersheds

The Battle River and Sounding Creek Watersheds are amazing prairie-fed watersheds. Home to over 120,000 people, and spanning through the boreal, parkland, and grassland natural regions of Alberta and Saskatchewan, these watersheds are rich in history, culture, and ecology.

The Battle River begins at Battle Lake, and

meanders some 1,100 kilometers across Alberta and into Saskatchewan, where it meets the North Saskatchewan River at Battleford. The Battle River Watershed covers approximately 30,000 square kilometers (17,667 square miles), 83% of which is within Alberta; the remainder is in Saskatchewan. Within Alberta, the Battle River Watershed has five subwatersheds: Bigstone, Iron Creek, Paintearth, Ribstone, and Blackfoot.

Sounding Creek Watershed is a different kind of watershed in that it is a closed basin, meaning that it does not flow into a larger watercourse or the ocean. Its waters flow around 340 kilometers, across the Special Areas of Alberta to Sounding Lake. Within Alberta, the Sounding Creek Watershed covers approximately 10,300 square kilometers. Rarely, the waters from Sounding Lake spill over into Eyehill Creek, which continues on to Manitou Lake in Saskatchewan.

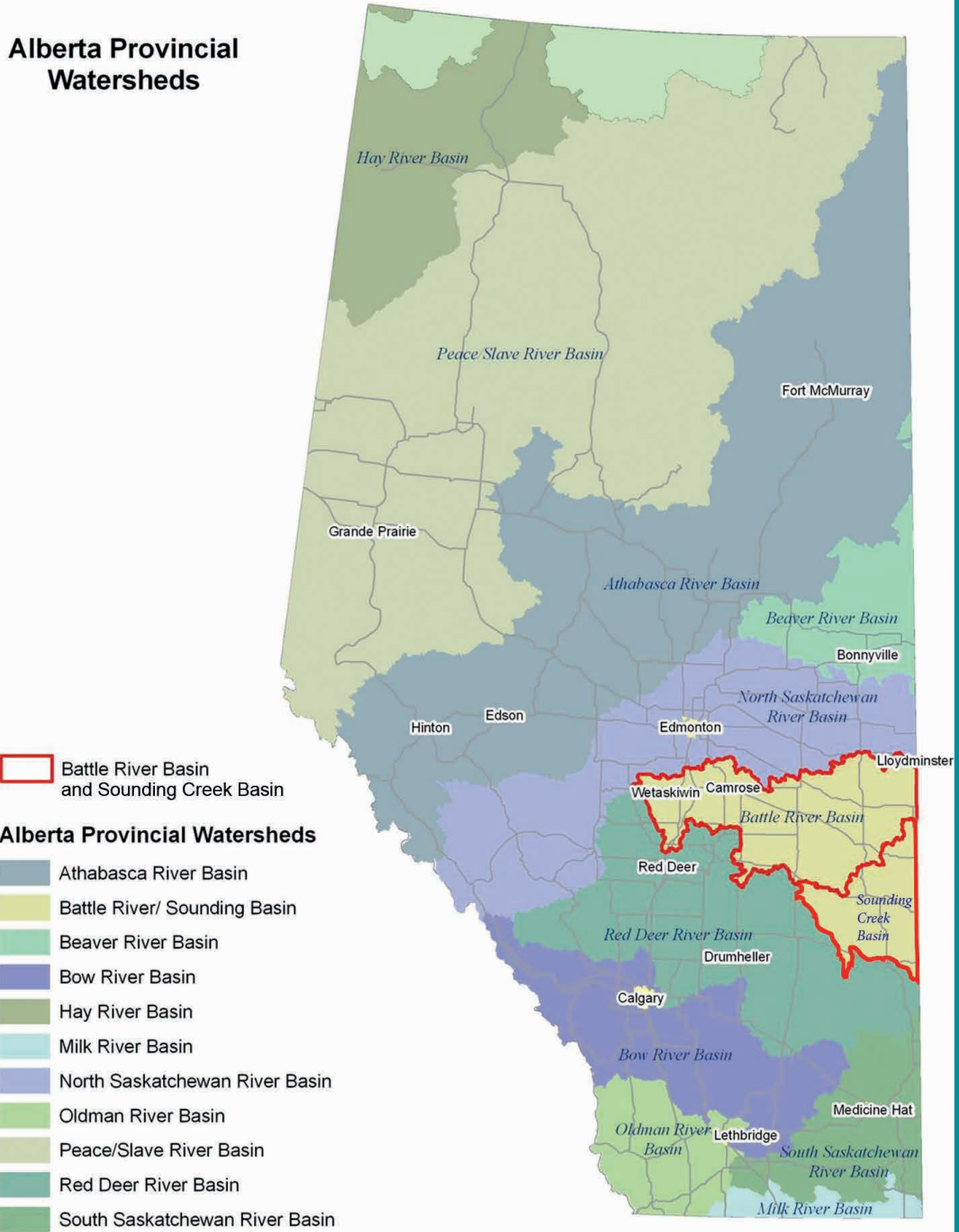
There are 11 major river watersheds in Alberta (north to south): Hay River, Peace/Slave River, Athabasca River, Beaver River, North Saskatchewan River, Battle River, Red Deer, Bow River, South Saskatchewan River, Oldman River, and Milk River.

The waters from these watersheds flow north, east, and south to the Arctic Ocean, Hudson Bay, and to the Gulf of Mexico, respectively.

Most\* of the major watersheds in Alberta have a Watershed Planning and Advisory Council (WPAC). The WPACs work closely with the Government of Alberta to reach the Water for Life Goals, which include 1. Safe secure drinking water supply, 2. Healthy aquatic ecosystems, 3. Reliable, quality water supplies for a sustainable economy. Although all WPACs have their own goals and mandates, each is responsible for reporting on the state of their watershed, creating watershed management plans, and supporting educational and stewardship projects.

\*The Hay River watershed does not have a WPAC. There is a WPAC for the Lesser Slave watershed.

Alberta Provincial Watersheds





"Originating on the eastern slopes of the Rocky Mountains of Alberta and Montana, the Saskatchewan River Basin extends from the continental divide through Alberta, Saskatchewan, and Manitoba to Lake Winnipeg." -Partners FOR the Saskatchewan River Basin

Both the Battle River and Sounding Creek Watersheds are subwatersheds of the North Saskatchewan River Watershed, which is part the larger Saskatchewan River Basin that stretches across much of western Canada. The Saskatchewan River basin is the fourth longest in North America. From the headwaters in the Rocky Mountains, the river flows about 1,940 kilometers to its outlet at Lake Winnipeg. The Saskatchewan River Delta is the largest inland freshwater delta in North America. Covering over 8,000 km2, the delta is a nationally significant wildlife and bird area. Lake Winnipeg has the 11th largest surface area of freshwater lakes in the world.



The Saskatchewan River Basin covers about 405,864 km2, almost the same size as France! Approximately 3 million people live in this great basin, and hence are connected by the same water source; 95% of these people live in urban areas in Alberta or Saskatchewan.

About 90% of the water that flows in the North and South Saskatchewan Rivers originates in the mountains, from glaciers and mountain snowpack. Tributaries make up the remainder of the flow, which peaks in April and May with spring snowmelt and spring rains.

Not only does the basin provide municipal drinking water, it is also an important water source for recreation, agricultural irrigation, industrial manufacturing, energy production, and is a life source for all of our ecosystems.

"The name Saskatchewan comes from the Cree word kisiskâciwanisîpiy, which means swift-flowing river." - PFSRB

Map: The many subwatersheds of the Saskatchewan River Basin. Done by the Partners FOR the Saskatchewan River Basin.

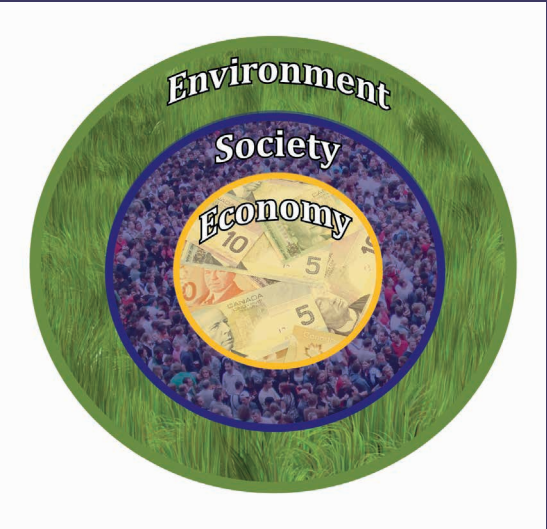




*“When one tugs at a single thing in nature, he finds it attached to the rest of the world.”  
-John Muir*

In this section of the Atlas we explore the human and natural landscapes of Battle River and Sounding Creek watersheds. From weather to population, agriculture to energy, we share the stats, facts, and stories that make up this region.

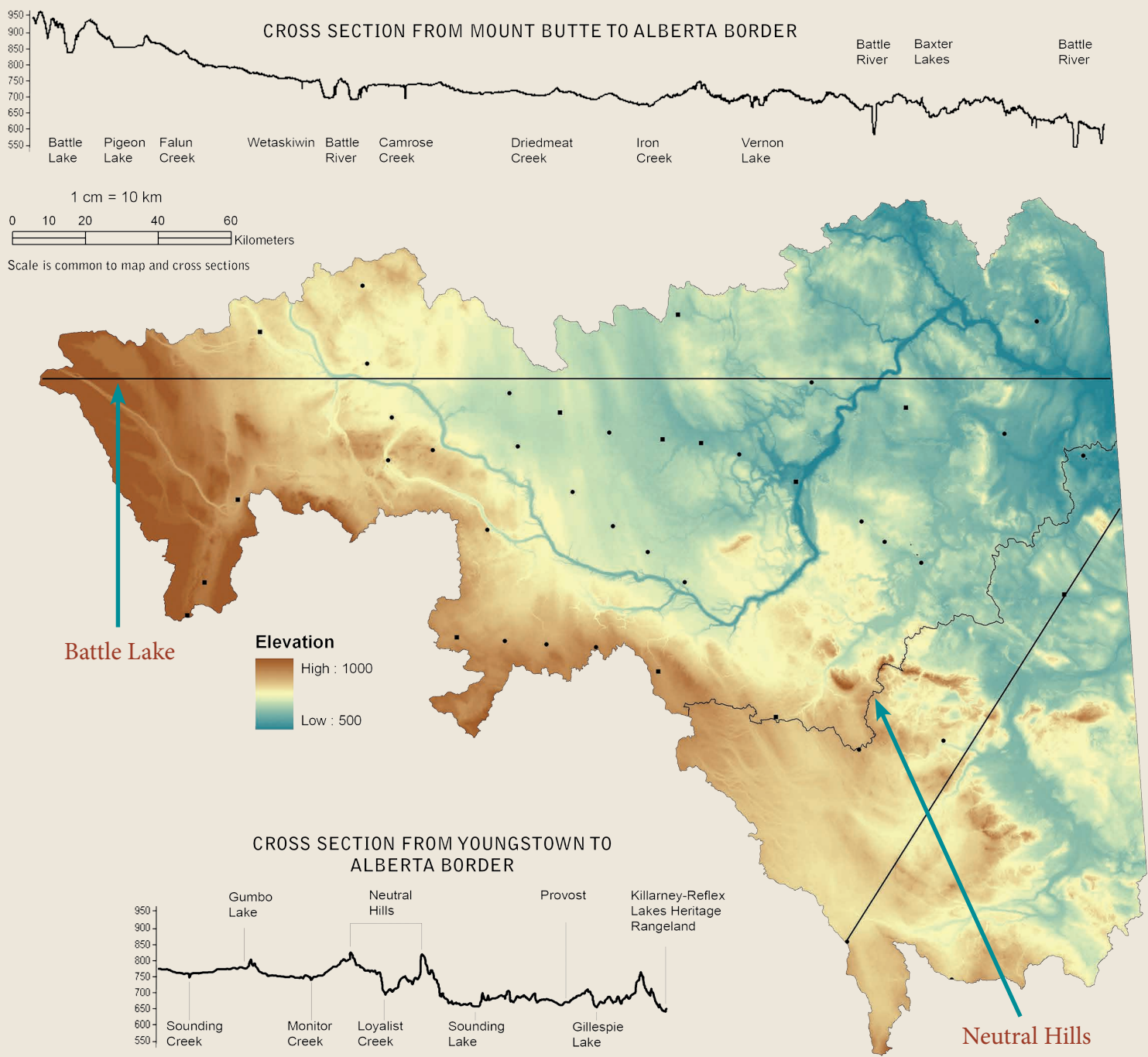
To fully explore the watershed, we must look at the environment, our communities, and the economy, and how they are interconnected. The BRWA sees these connections as three spheres. Our watersheds are the foundation upon which our communities and economy rest. Our society is enriched by the life support systems of the planet, and must be compatible with the capacity of our environment. Our economy is built and sustained through society, and nature.



*Battle River Watershed Alliance's three-sphere sustainability diagram*



As part of the Western Plains physiographic region, the Battle River watershed's meandering route affects the course and speed of water moving through the area. The headwaters in the west are the high point in the watershed and elevations drop to the north and east. Upland areas — any area above 200 metres — mediate plain areas. The Bashaw and Beaver Hills Uplands rise between plain areas in the west; Viking and Neutral Hills Uplands rise between the south central region; plains rise to the Oyen Upland in the southeastern corner of the watershed.



The map and cross-sections provide an overview of the land surface of the Battle River and Sounding Creek watersheds. Uniform colour means that there is little difference in vertical elevation. The slope of the land in the region averages 1.4metres per kilometre. Steeper slopes occur near the headwaters at Battle Lake (northwest) and the Neutral Hills and Mud Butte areas in the southeast.

Apart from the headwaters in the west, the Neutral Hills are the highest point in the watershed, at 891 metres. This 50 square kilometre region between Consort and Czar contains a variety of glacial landforms and ice thrust ridges that are *environmentally significant*.

About 75 million years ago, soft sand and mudstone rock layers from the Belly River Formation were forged into folds under the weight and pressure of glaciers from as far away as the Canadian Shield (700 kilometres). Loose bedrock sheets were pushed into stacks by glaciers to a 30 degree angle. Unusual landforms include “hill-hole pairs”, where glaciers scooped ice-thrust material out of a depression and deposited it nearby. The southeast flowing glacier left bedrock deposits that created a series of ridges. The unique topography of the Neutral Hills make it part of a key transition zone between Northern Fescue Grassland and Central Parkland Natural Subregions.



First Nations say that the Neutral Hills were traditionally a place of struggle between tribes, so a Great Power decided to end the hostilities. The Great Power created the hills to rise out of the prairie flats and the awe that this inspired in the warring tribes caused them to gather together there, hold a feast and make peace. This peace pledge inspired the name. Cairns, arrowheads and tipi ring remnants are evidence of the Blackfoot, Cree and Sarcee people who frequented the Neutral Hills.



FIRST NATIONS HISTORY

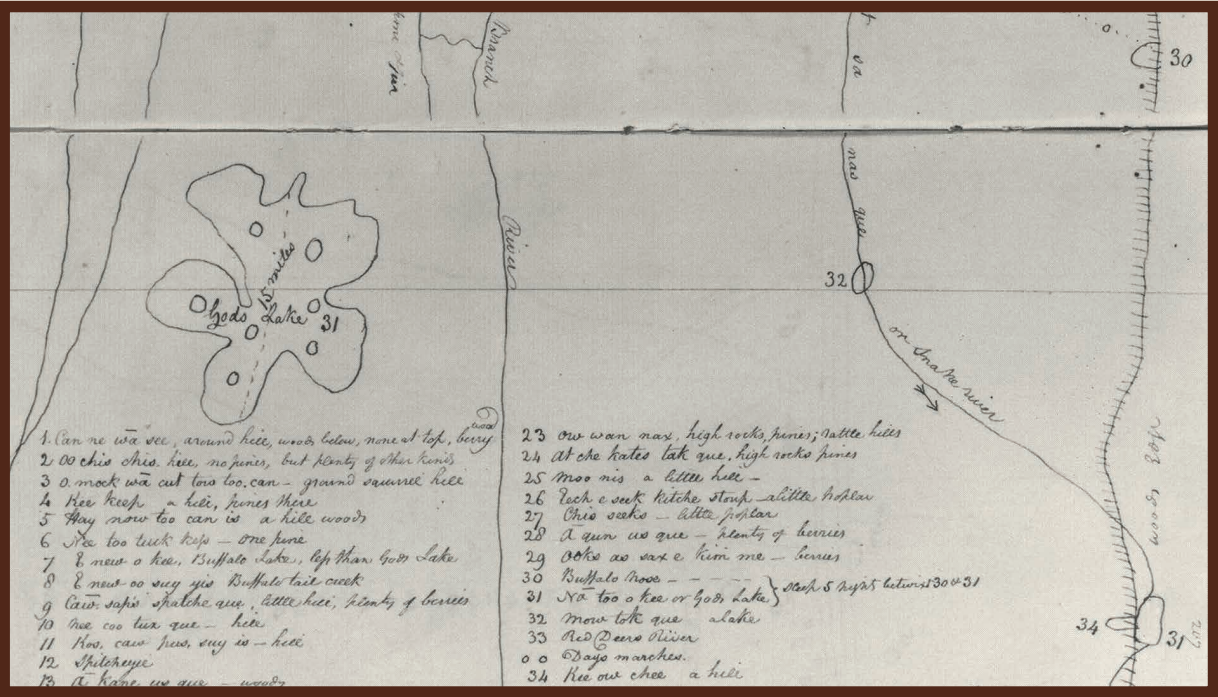
*Disclaimer: We do not presume to be experts or comprehensive in these historical summaries. We have compiled this information using current and local sources to the best of our present knowledge.*

Canada’s first peoples may have arrived after the last Ice Age ten to twelve thousand years ago. Evidence from the Bodo archaeological site near Provost suggests human activity in the Battle River (Notikiwin Seppe in Cree ) watershed as early as five thousand years ago. Offering another perspective, First Nations’ narratives tell of the creation of their ancestors here "at a time when the land was covered by water, and animals were the only living treasures."

Several Indigenous nations occupied the watershed in the mid-eighteenth century. Among them were the Blackfoot Confederacy (Siksikaitsitapi)



No part of the buffalo was wasted by indigenous hunters. Bison hide was used for clothing and tipi covers; bones became tools; horns were used for spoons and headdresses; hair became pillows and medicine balls. Bison fat was used for soap and cooking oil and the bladder was used to make medicine bags and water pouches.



*Portion of the earliest known indigenous map created within our watershed. Drawn by Siksika chief, Ki oo cus, for Peter Fidler. Interesting legend items: "plenty of berries" (#9), "days marches" (following #33).The “woods edge” (farright edge) is likely what was known by fur traders as the border between as the Great Plains and the Small Plains. Familiar landmarks in our watershed include the Neutral Hills’ Nose Hill (#30) Sounding Creek/Sounding Lake (#32). Eyehill Creek/Manito Lake (#31) is found within the Saskatchewan portion of the Battle River watershed. (See following page for full view of map and photo credit.)*

of Kainai (Blood), Piikani (Peigan) and Siksika (Blackfoot) . Also present were the Plains Cree, Assiniboine, Métis and others in the Iron Confederacy (Nehiyaw-Pwat) who functioned as trade intermediaries between the Hudson’s Bay Company and other Indigenous peoples.

The arrival of horses and guns in the early 1700s impacted the inhabitants of this region. The Blackfoot Confederacy cultivated friendly relations with Cree and Assiniboine, trading horses for guns and metal products. Competition and horse raids, however, sometimes led to full-scale battles. The Battle River got its name from the Cree for "fighting river."

The Cree’s use of lands south of the North Saskatchewan River pushed Blackfoot nations further south. East of Edmonton are the Beaver Hills (Amiskwaciy) where, according to David Thompson in 1814, both Cree and Sarcee were present. Later, however, the Cree pushed the Sarcee further south. John Palliser in the 1850s and Joseph Tyrell in the 1880s described the hills in the reports of their expeditions. Two trails used in the fur trade bordered the hills, the Victoria trail to the north and the Battle River trail on the south.

The watershed’s indigenous peoples depended on the bison. Their primary source of food, the

animals were also used for clothing and shelter. By the end of the nineteenth century, Canadian and American hunters had decimated the herds almost to extinction. Famine resulted in the "starvation winter" of 1883-84. Smallpox epidemics in 1781, 1782, and 1837 resulted in widespread fatalities. In 1870, the federal government of the new Dominion of Canada bought the lands of the Hudson’s Bay Company, including those of the Battle River watershed, preparing the way for white settlements made possible by treaties and relocation of Indigenous peoples to reservations. These factors, and the increasing presence of Europeans in the region, led to the First Nations’ reluctant agreement to sign the treaties with the Dominion government.

With Treaty Number Six, signed in 1876, the Cree and Assiniboine ceded area as far south as the Red Deer River. Four Cree reserves were established in the Bear Hills (Maskwacis) region. Three were led by two brothers, Bobtail and Ermineskin, and a close relative, Louis Bull; Chief Samson led the fourth. In 1909, after the Bobtail Reserve had been vacant for a time, part of it was transferred to the Montana Band in 1909 and the rest sold.

The Métis nation emerged from marriages between Indigenous women and white fur traders. In 1982, they were recognized in the Constitution Act as one of Canada’s aboriginal peoples. The National Council defines a “Métis” as "a person who self-identifies as Métis, is distinct from other Aboriginal peoples, is of historic Métis Nation Ancestry and who is accepted by the Métis Nation." They were adaptable cultural mediators

FIRST NATIONS HISTORY



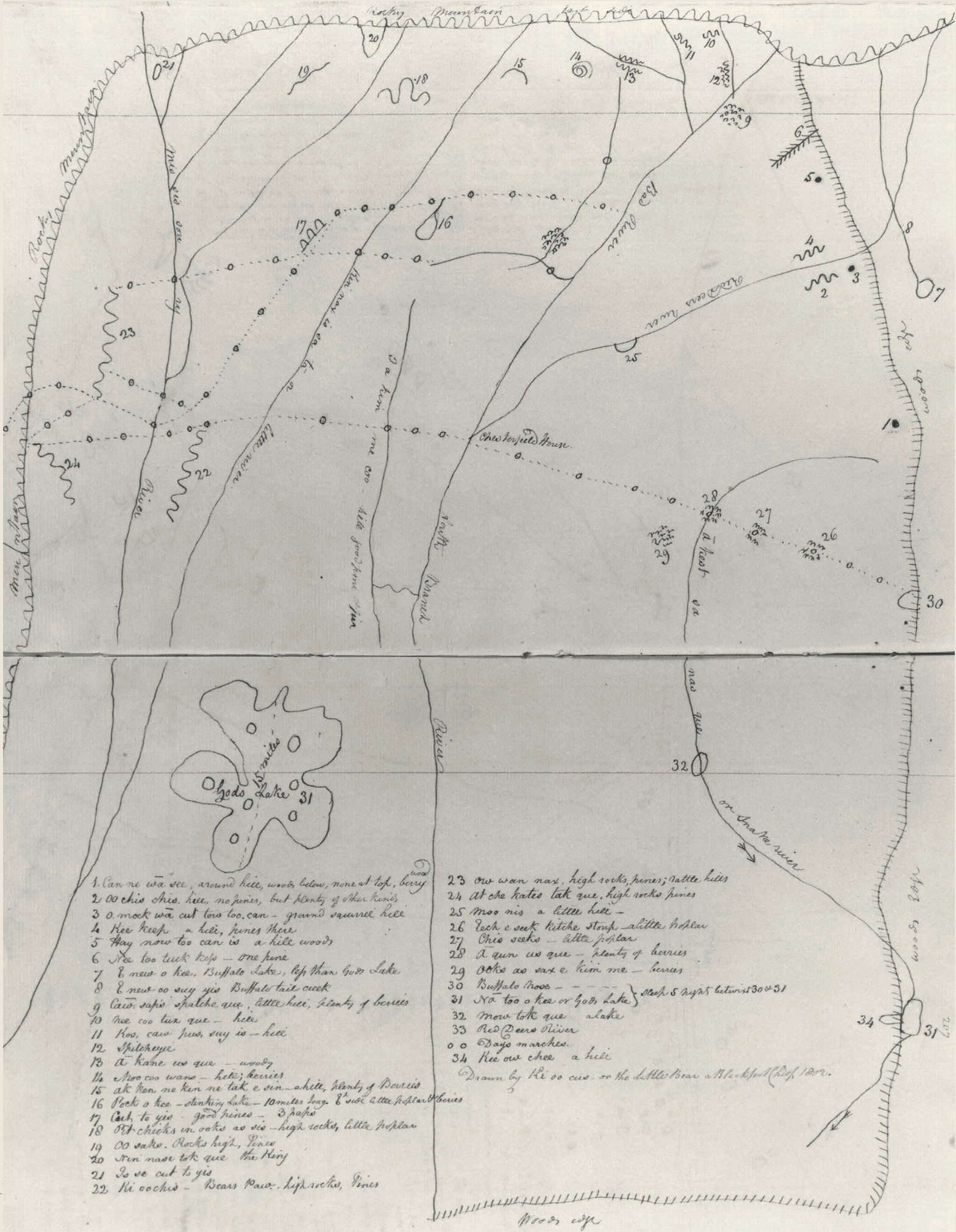
*Manitou stone image courtesy Royal Alberta Museum, Archaeology Program*

The Manitou Stone (known in Cree as Manitou Asiniy — "Spirit Rock" — or scientifically as the "Iron Creek meteorite") is a 145-kilogram (320lb.) meteorite composed almost solely of soft iron. Indigenous elders say it was placed on a hill near the Battle River after a flood created by the trickster, Nanebozho, or by the Great Spirit, Manitou. They believe that the stone attracted lightning to itself and increased in size. Cree, Nakoda and Blackfoot visited the stone to give thanks before and after their buffalo hunts. A prophecy by Cree Chief Mistahi-maskwa (also known as Big Bear) who, opposing the signing of Treaty 6, warned that if the stone were ever removed, there would be war and disease, and the buffalo would disappear. In 1866, to the dismay of Indigenous peoples, missionary George McDougall had the stone removed. Now in the care of the Royal Alberta Museum, there are calls to return the Manitou Stone to its original location.

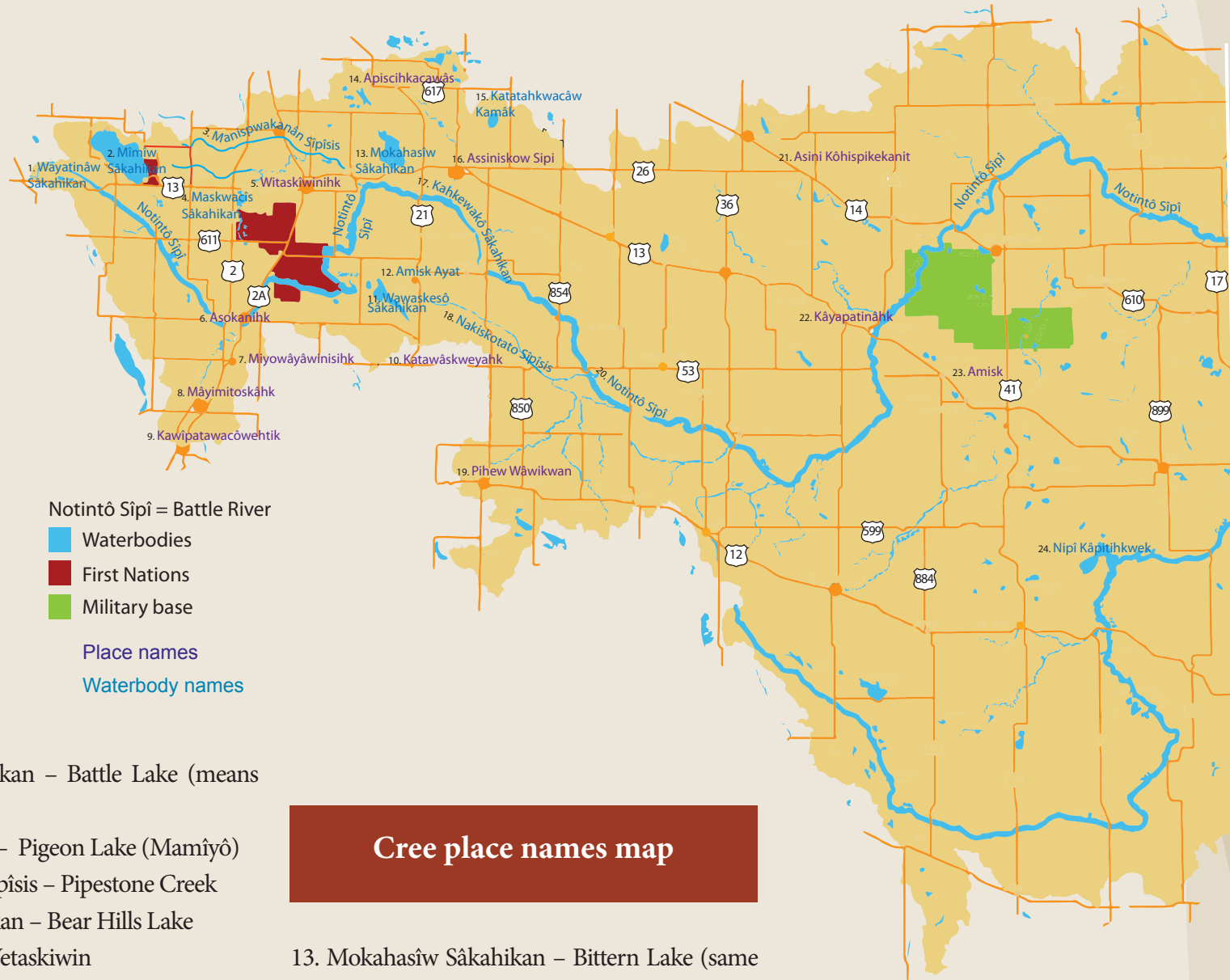


The fact that early nineteenth century indigenous maps do not follow western mapping conventions is strong evidence that indigenous maps existed before the Europeans arrived. Fidler seems to have asked a number of indigenous leaders to draw him maps of lands to the south and west of territories then known to HBC traders. According to historian, Ted Binnema, who has studied the maps in detail, Fidler likely saw similarities in these maps, but could not grasp the ideas and logic behind them. Binnema has speculated that Fidler, at a loss to make sense of the other maps, coached Ki oo cus—who he knew well—in European cartographic conventions. That would explain why Ki oo cus’ map, which is quite different than the other Blackfoot maps, seems to represent a composite of European and indigenous elements.

Image credit: Hudson’s Bay Company Archives, Archives of Manitoba, Peter Fidler fonds, Sketch map “Drawn by Ki oo cus or the Little Bear a Blackfoot Chief 1802,” redrawn by Peter Fidler, E.3/2 fo. 104d.



# FIRST NATIONS HISTORY





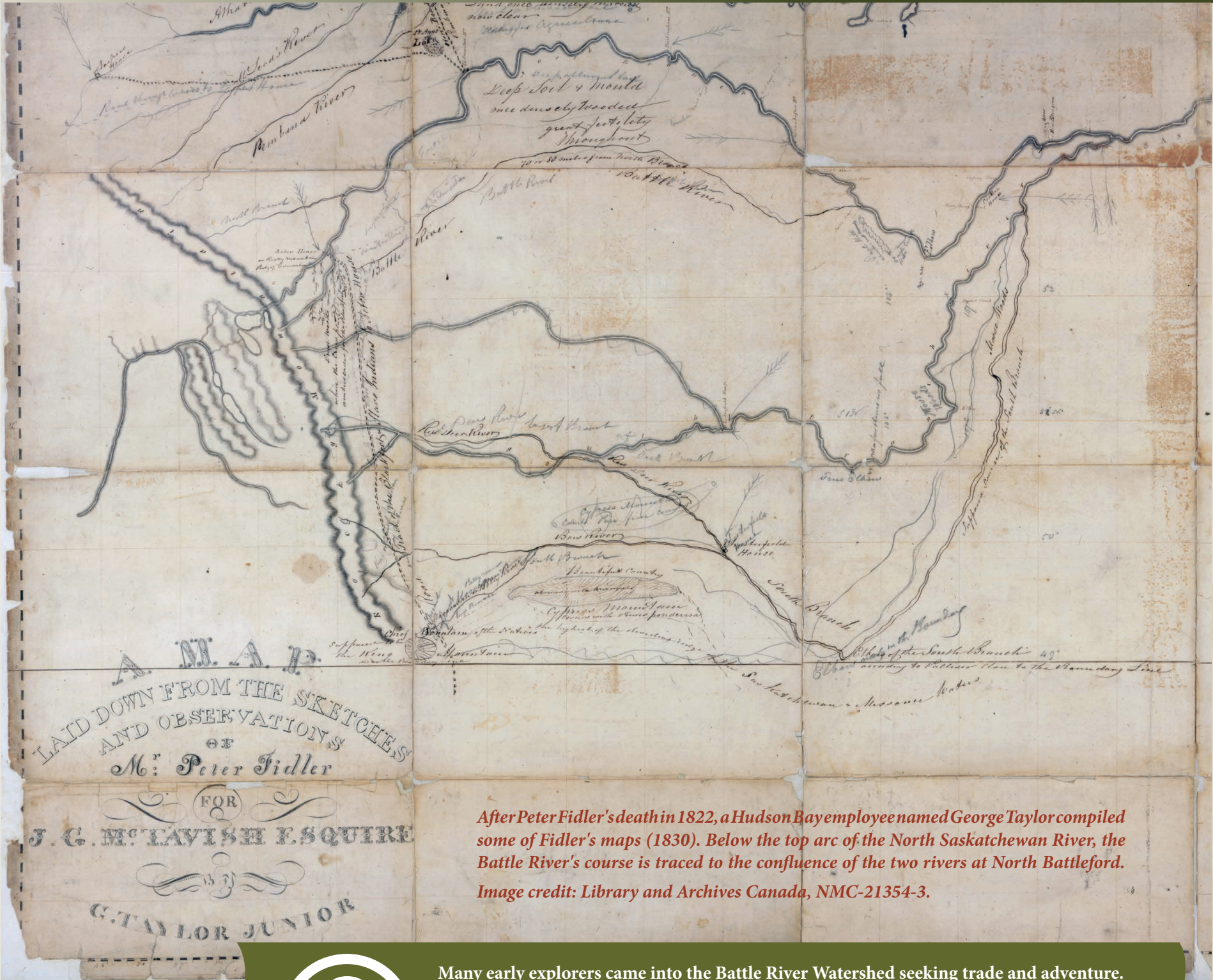
There is some question who was the first European to enter the Battle River watershed. While there is no doubt Anthony Henday came, it is likely that French traders preceded him. The French from Quebec led by La Verendrye had established forts on Lake Winnipeg and Dauphin in the 1740's. They traded with the Indigenous peoples from the plains and in some cases paid better prices than the Hudson's Bay Company. The HBC became anxious about the infiltration of the French into the area they historically claimed from 1670 under the Charter granted by King Charles II. The head of the HBC at York Factory asked for volunteers to travel to establish trading relations with the Blackfoot in present day Alberta. Though only thirty years old, Henday volunteered to lead the expedition. The locations mentioned by Henday in his travel journals are somewhat



Robert Rundle was the first missionary to come to the watershed region and help established a mission on the north end of Pigeone Lake. Image courtesy of Rundle's Mission Society.

difficult to correlate with present day places. Henday did not call the Battle River by its present name; he referred to it as the Chacutenah, a name provided by the Cree. He referred to the plains he passed through as the “Mascuty Plains.” On June 26, 1774 he set out from York Factory on foot with a group of Cree peoples. At this time the Cree did not possess horses, while the Blackfoot had acquired them from the Spanish in the south. Henday entered Alberta on September 11, 1774 near present day Chauvin. Shortly after he made a trade with a Blackfoot for a horse, which could be said to be the first horse trading by a European in Alberta. That same fall, Henday went on to what is now known as Red Deer and later to the headwaters of the Battle at Battle Lake. David Thompson, with the HBC, travelled across the Battle River watershed in 1787 from Manchester House, on the North Saskatchewan River, upstream from present day Battleford. In 1797, after changing his employment to the North West Company, he again travelled across the watershed traversing the Pipestone and Bigstone Creeks. Peter Fidler, like Thompson, a surveyor, worked with the HBC building Fort Buckingham on the North Saskatchewan River. In 1792, with some Piegans, Fidler travelled south across the Battle River to near present day Fort MacLeod. On the route he passed near modern Viking, Bittern Lake and Samson Lake.

Alexander Henry the Younger, a North West Company trader was the first European to write of the Iron Creek meteorite, which was revered by both the Blackfoot and the Cree. He discovered it in 1810. Robert Rundle, a Methodist minister, was the first missionary to arrive in the area. He travelled through the Battle River watershed after his arrival in Fort Edmonton in 1840. In 1848, with the assistance of Benjamin Sinclair and Benjamin's wife, he established a mission on the north shore of Pigeon Lake. Benjamin was the son of a Scottish father and Swampy Cree mother. In 1852 Father Albert Lacombe arrived. He travelled extensively throughout modern day Alberta and the town of Lacombe was named in his honour. John Palliser was head of an expedition requested by the HBC and the Royal Geographic Society and funded by the Imperial government. Its main purpose was to determine if the prairie area should be farmed; there was a serious concern at that time that the Americans would take over western Canada. The expedition set out in 1857 and travelled through present day Alberta in 1858 and 1859. It included scientists who examined the botany and geology of the region while travelling with excellent guides on well travelled trails. The Palliser report is known for its famous triangle which was said to have poor land for agricultural purposes. Part of that area later became known as the Special Areas (see Climate & Weather section).



After Peter Fidler's death in 1822, a Hudson Bay employee named George Taylor compiled some of Fidler's maps (1830). Below the top arc of the North Saskatchewan River, the Battle River's course is traced to the confluence of the two rivers at North Battleford. Image credit: Library and Archives Canada, NMC-21354-3.



Many early explorers came into the Battle River Watershed seeking trade and adventure. Known explorers include:  
Anthony Hayday | David Thompson | Peter Fidler | Alexander Henry the Younger  
| John Palliser | James Carnegie, 9th Earl of Southesk | Henry Youle Hind



For at least 300 years the Cree nations and the Blackfoot nations had fought for supremacy of the parkland area south of the North Saskatchewan River. Sometime around 1867, a large party of Blackfoot were raiding Cree territory and camped a short distance north west of Wetaskiwin in the hills. However, the Cree had learned of their location and moved into positions to attack the Blackfoot. At the time the Blackfoot had a young chief called, Buffalo Child while the Cree had a young chief called Little Bear. Both of them were formidable fighters and hoped to meet someday in combat.

On the eve of battle, the Blackfoot planned a surprise night attack and decided to send their young chief, Buffalo Child, to determine their enemy’s location, in the hills overlooking present-day Wetaskiwin. At the same time, Little Bear, was chosen by the Cree to make a similar scouting trip and went to these same hills. The two were on opposite sides of an open hilltop when they suddenly met face to face. After boldly facing each other and hurling a few insults, Buffalo Child threw his rifle on the



*"Peace Cairn (Governor General Willingdon's visit), Wetaskiwin, 1930." In Photo: Sam Minde, Dan Minde, Chief Standing on the Road, Chief Paree Ermineskin, John Crier (Counsellor Samson Band), Tom Crier (or Counsellor Rocket Simon) & Mike Buffalo.. Photo credit: City of Wetaskiwin Archives. Image #: 88,7-30-001.9*



Peace Cairn Dedication, Wetaskiwin, Alberta, 1927.  
Photo credit: City of Wetaskiwin Archives. Image #: 20231.

*The name “Wetaskiwin Wetaskiwin Spatinow” is Cree for “the hills where peace was made.”*

ground and challenged Little Bear to a fight without weapons. The two chiefs grappled together and fought for nearly an hour. At that point they separated and agreed to rest before continuing further.

Buffalo Child took out his pipe and tobacco and lit it up. Little Bear took out his pipe but found his pipe was broken. Buffalo Child enjoyed seeing his adversary resent the enjoyment he received from puffing on his pipe. However, he suddenly held out his pipe to his opponent and Little Bear seized the pipe and began enjoying the tobacco smoke. Suddenly they both realized that they had shared together the common pipe, which was a sacred and unbreakable pledge of peace

between them. Having made peace, they knew that the two nations where they served as chiefs must also come to peace.

The following morning, the Crees invited the Blackfoot to a council on the hill where the young chiefs had met. Four Blackfoot and six Cree chiefs met and heard the entire story of the evening encounter. They squatted in a circle and smoked the peace pipe together and vowed eternal friendship.

Sixty years later, in 1927 a stone cairn was erected nearby on the old Edmonton-Calgary Trail. At the ceremony of its dedication, chiefs and members of the Four First Nations of Maskwacis were present and dressed in traditional regalia. The cairn was later moved to the visitor centre in Wetaskiwin.

Theresa Cecile Wildcat (nee Minde) was born in 1927 on the Ermineskin Reserve at Maskwacis. Several generations earlier, Theresa’s great grandmother had left Thunderchild, Saskatchewan because of starvation. Chief Ermineskin invited the Minde family to stay at the Ermineskin reserve.

Theresa Minde began her education at the Ermineskin Residential School and then continued her studies at St. Joseph’s Convent in Red Deer. After completing high school, Theresa became the first indigenous woman in Alberta to complete the teaching certificate from University of Alberta’s education program in 1953.

Theresa’s first jobs were at First Nations schools in southern Alberta. There, Theresa was segregated to separate and less comfortable living quarters and was treated as lower-class by her colleagues. But because Theresa’s mother and her grandfather, Dan Minde, had nurtured within her a strong sense of identity, she stood up for herself.

Several years later, Theresa returned to teach at Ermineskin and there she married Sam Wildcat. Sam, was a businessman who was the primary employer at Ermineskin for many years. He worked as a farmer, owned up to fourteen school buses and held the contract for the custodial work at the Ermineskin schools. Theresa and Sam both served on the Ermineskin Council. When she retired from teaching in 1966, she started the school board and served as Chair at the Four-Band Level.



*Theresa Wildcat worked as a teacher after she graduated from U of A. Photo from the archives of Clara Wildcat.*

Carol Wildcat says that her mother, Theresa, was a woman who was ahead of her time. Theresa taught traditional thinking and believed that knowing one’s cultural history can help when deciding how to move forward.

Carol Wildcat is the second of the five children born to Theresa and Sam. All of the children were encouraged to get an education and have become leaders in their respective fields. Carol attended Camrose Lutheran College before studying at the Universities of Alberta and Calgary. Carol was one of four innovative women that were part of the 1988 Winter Olympic Alberta Aboriginal Association. For the Winter Festival, these women showcased indigenous furriers and hired indigenous models in an exhibition called “Beyond Feathers & Beads”.

In more recent years, Carol has worked for the Economic Community Development Arm for Ermineskin Nation. This work includes overseeing a greenhouse for growing fruits and

*Carol Wildcat says that her mom taught her how to lead. “To lead you have to be a visionary and see beyond. Sometimes you see so far that it takes the next generation to carry out or catch up to what you see.”*

vegetables (in partnership with a south Korean company) and working as a consultation coordinator for resource development. Other programs teach skills and employment training for work in custodial, EMS, camp cook, and security positions.

Carol’s son Collin studied to be an Economic Development Officer at the University of Waterloo and he has now served six years on council with the Ermineskin Cree Nation.

Carol’s indigenous name means “Keeper of Mother Earth’s Laws” and believes that Treaty goes far beyond the borders of the reserves. Carol says that water is about Treaty and she believes that we have to help the Earth heal and partner with the Spirit of the Land. Traditionally, water was a meeting place for indigenous peoples and floods are viewed as a symbol of cleansing.



The Central Parkland and Grasslands of our watershed region have undergone extensive change over the past 150 years. A landscape that once had large herds of free-roaming buffalo has been shaped by agriculture, industry and human settlement. Pockets of wildflowers and prairie grasses still dot the land amidst the grids and corridors of human development. These grids and human-made structures that break up the surrounding landscape are known as linear development.

Roads have the greatest impact on birds and wildlife of all linear developments. Animals that use road corridors for travel place themselves at risk of injury, and high road density can push animals out of their natural habitats altogether.

The prairie landscape is made up of patches, corridors and matrices. A patch is a non-linear area that is different from its surroundings. This could vary from a slough to a cluster of trees in a field. An ecological corridor forms a bridge between patches and can be the result of human activities like roads, power lines or shelterbelts. A matrix is the broader background that describes the wider landscape. In our watershed, matrices include Prairie, farmland and communities. Animals use both man-made and ecological corridors for movement between patches for food or habitat.



Alberta Transportation has launched the Alberta Wildlife Watch program and app. Government employees will help collect data about wildlife collisions to identify potentially hazardous portions of provincial highways. The program will also increase driver and wildlife safety.

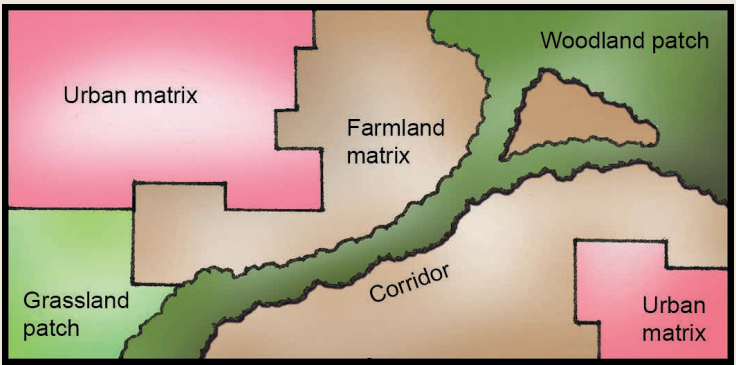
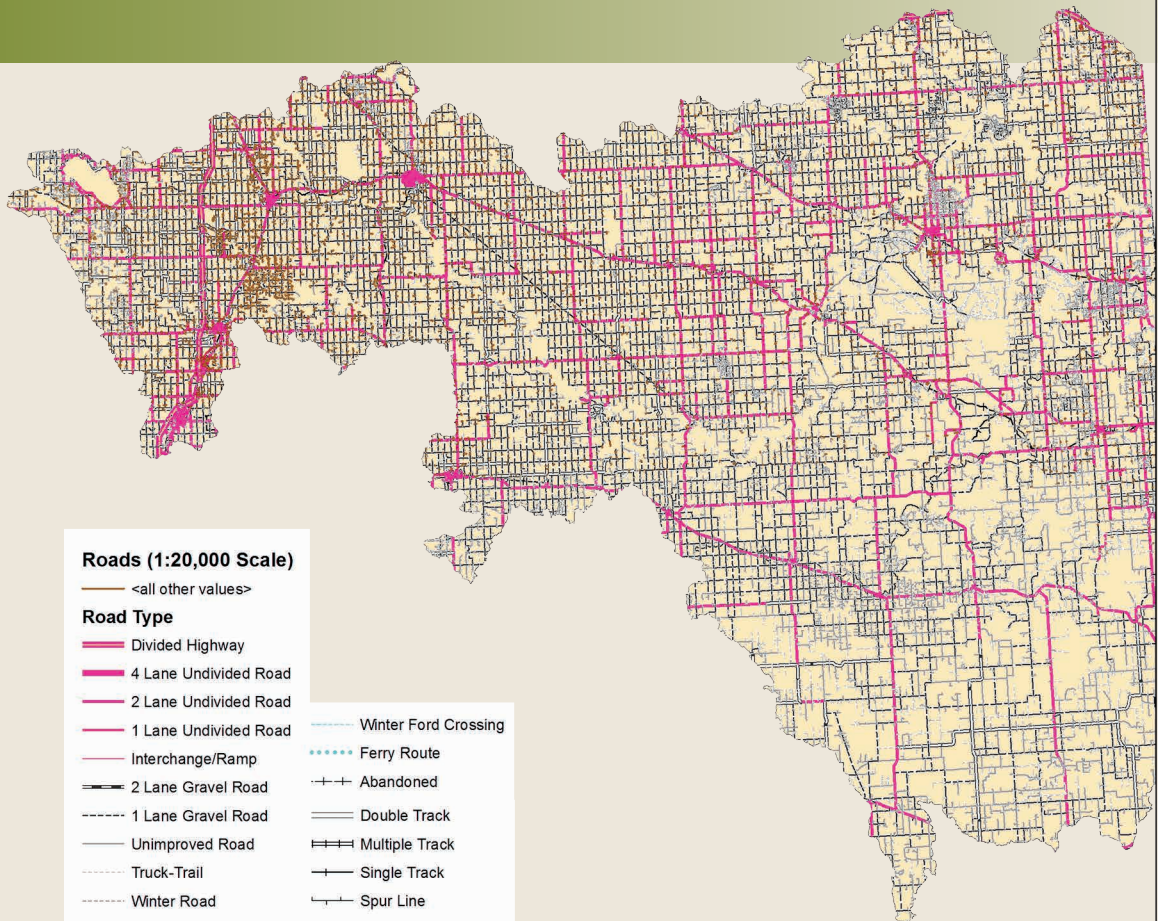


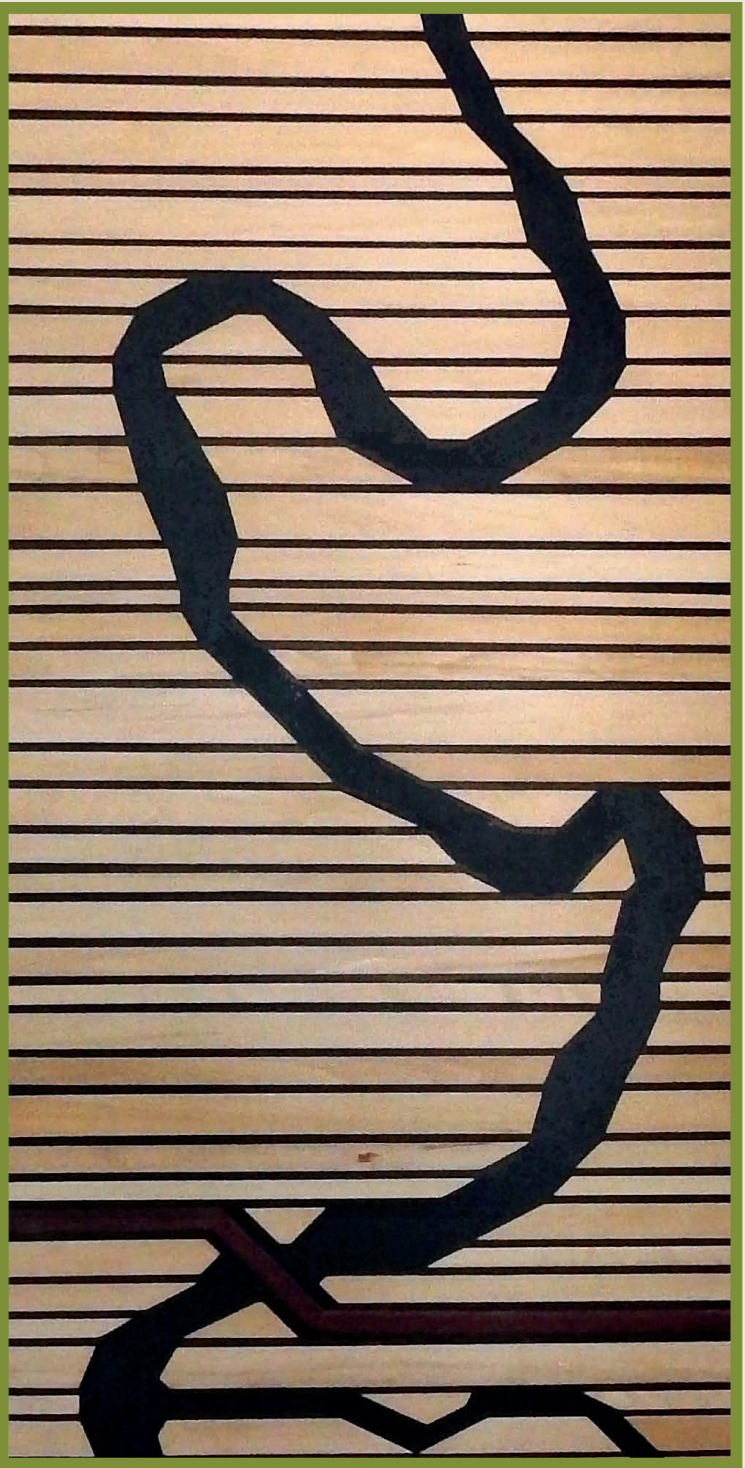
Diagram courtesy of USDA National Agroforestry Center

Alberta Transportation works to anticipate environmental issues or risks associated with roads. Part of this work involves identifying critical wetlands or sensitive species’ habitat that are currently or will be impacted in the future by road construction. By performing bird and wildlife sweeps, Alberta Transportation can determine what species are using the area for nesting or breeding. They can then reduce impacts to these species during the summer months. Culverts in central Alberta are also being upgraded or expanded for fish and water movement. Just south of our watershed, a wildlife underpass is being incorporated into a new bridge near the town of Morrin.

Roger Epp has great respect for his small-town, Sasatchewan roots. In 1990, after post-graduate studies and teaching at Queen’s University in Ontario, he accepted a teaching position at what was then Camrose Lutheran University College, later Augustana University College. Returning to the rural west led him to redefine his professional goals. It was not "an unhappy surprise," he says, "but it took a lot of adaptation."

An important moment in his transition happened in 1995 when Epp picked up Wendell Berry’s book *What Are People For?* Berry is an academic-turned farmer in the Kentucky county where his family has farmed for more than five generations. He is also a prolific writer and environmental critic. His thoughtful perspectives on place and community well-being prompted Epp to see his surroundings, particularly the Battle River valley, with fresh eyes. "I read local and prairie history—trying to be home, I guess," he says, "but I had no idea where this was going or whether it was part of me. Somehow I felt I was losing my way. . . . It turned out it was more about finding a way."

Epp engaged students with the issues and history of their local community and place. He taught courses on rural political thought and Indigenous politics. He took students on field-trips to historical places such as Dried Meat Hill and visited local farm families on their land. In so doing, Epp exemplified his passion for scholarly work that is "rooted in



Slats of local Aspen wood depict the Metis river lots at Duhamel which are intersected by the Battle River. 24” x 48”. Artwork and photo by Roger Epp.

*Thinking of "the world in terms of watersheds," says Epp, "is just another interesting, powerful, stewardly way of thinking about it. He also believes that "place knowledge must be particular when it comes to indigenous presence and indigenous-settler histories. These are not abstractions; nor is reconciliation."*

the problems and limits of a particular place," rather than research that is primarily general and global.

From 2004 to 2011, following Augustana's incorporation into the University of Alberta, Epp served as founding Dean. For the past two decades, Epp has written, spoken, and collaborated with local communities on issues related to rural western Canada and Indigenous-settler relations. Epp wrote *We Are All Treaty People*, co-edited *Writing Off the Rural West*, and co-produced the CBC Ideas documentary "The Canadian Clearances".



Before the final Ice Age, the Plains of Central Alberta were broad, low valleys with sand and gravel deposits.

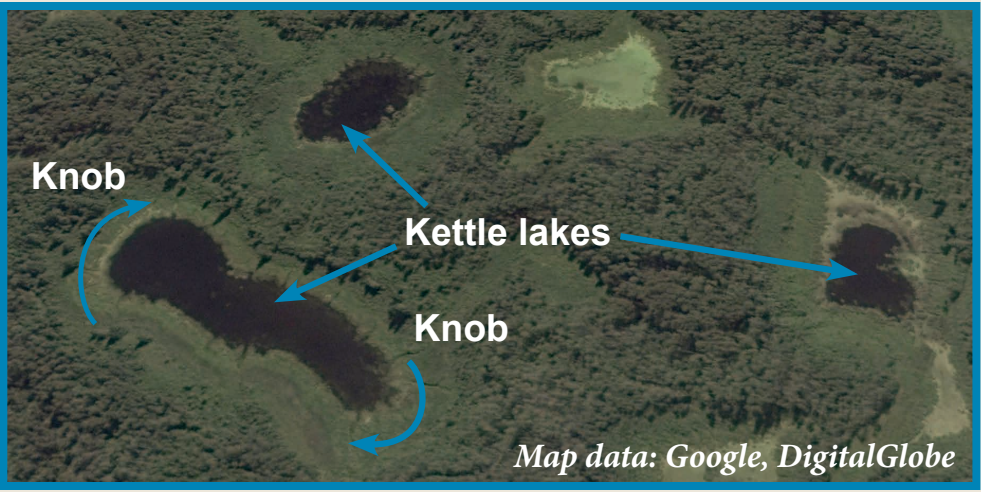
Sometime before 100,000 years ago, the advancing Laurentide glaciers carried igneous and metamorphic rock which was left behind when the glaciers retreated. After each ice advance, warmer periods created large supra-lakes like Lake Edmonton. Melting water carved new pathways that drained quickly via channels. The major outlet of Lake Edmonton was the Gwynne meltwater channel. This glacial river pushed out masses of rock, large icebergs and sediment to forge what is now a major part of the Battle River valley (from north of Leduc to the Big Knife/Alliance area). Advancing and retreating glaciers left behind layers of glacial, fluvial (deposits left by rivers) and lacustrine (deposits left in lakes by glaciers) sediment in the Battle's basin.

Glaciers shaped the upland landscape of our watershed with two common types of moraines (glacial deposits). Dead-ice moraines were created by glacial ice that was stranded under sediment and made slumps in the ground when it melted. This is usually associated with a knob and kettle terrain, and the slumps often contain sloughs or ponds. The ground moraine landscape has flatter areas and more undulating slopes that are good for farming.



Esker comes from the Irish word that means “a ridge between two plains”. Most eskers formed underneath glaciers when sediment in a sub-glacial tunnel got trapped and dropped a large deposit of sand and gravel. These winding ridges are found in areas around Rosalind, Heisler and Stettler. Most eskers in Alberta end in glacial lake basins, as occurs with the Clear Lake esker near Rosalind.

Moving subglacial meltwater likely sculpted this esker landform east of Kelsey (along the Battle River railway). Photo credit: Midge Lambert.



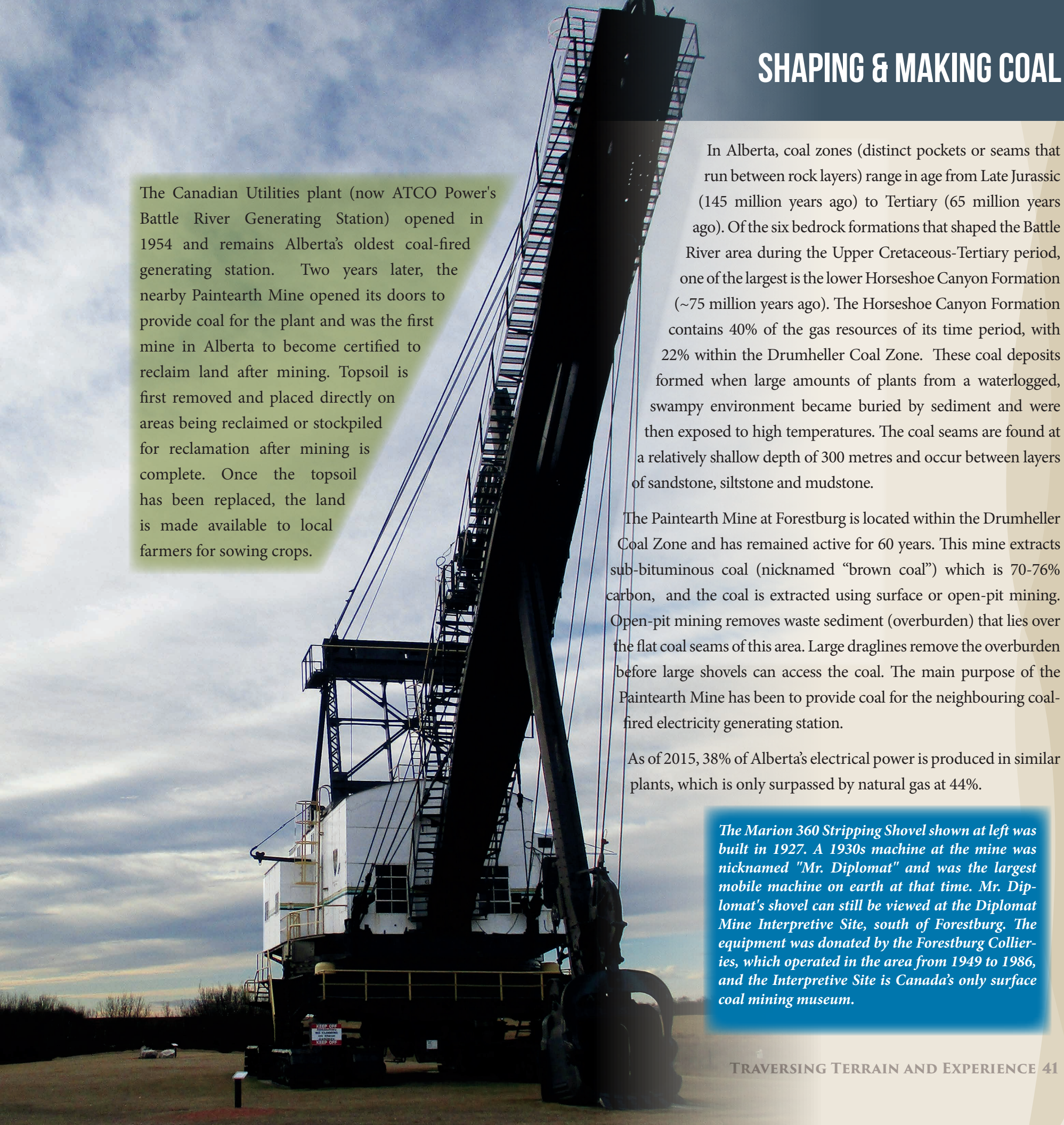
The Canadian Utilities plant (now ATCO Power's Battle River Generating Station) opened in 1954 and remains Alberta's oldest coal-fired generating station. Two years later, the nearby Paintearth Mine opened its doors to provide coal for the plant and was the first mine in Alberta to become certified to reclaim land after mining. Topsoil is first removed and placed directly on areas being reclaimed or stockpiled for reclamation after mining is complete. Once the topsoil has been replaced, the land is made available to local farmers for sowing crops.

In Alberta, coal zones (distinct pockets or seams that run between rock layers) range in age from Late Jurassic (145 million years ago) to Tertiary (65 million years ago). Of the six bedrock formations that shaped the Battle River area during the Upper Cretaceous-Tertiary period, one of the largest is the lower Horseshoe Canyon Formation (~75 million years ago). The Horseshoe Canyon Formation contains 40% of the gas resources of its time period, with 22% within the Drumheller Coal Zone. These coal deposits formed when large amounts of plants from a waterlogged, swampy environment became buried by sediment and were then exposed to high temperatures. The coal seams are found at a relatively shallow depth of 300 metres and occur between layers of sandstone, siltstone and mudstone.

The Paintearth Mine at Forestburg is located within the Drumheller Coal Zone and has remained active for 60 years. This mine extracts sub-bituminous coal (nicknamed “brown coal”) which is 70-76% carbon, and the coal is extracted using surface or open-pit mining. Open-pit mining removes waste sediment (overburden) that lies over the flat coal seams of this area. Large draglines remove the overburden before large shovels can access the coal. The main purpose of the Paintearth Mine has been to provide coal for the neighbouring coal-fired electricity generating station.

As of 2015, 38% of Alberta's electrical power is produced in similar plants, which is only surpassed by natural gas at 44%.

The Marion 360 Stripping Shovel shown at left was built in 1927. A 1930s machine at the mine was nicknamed "Mr. Diplomat" and was the largest mobile machine on earth at that time. Mr. Diplomat's shovel can still be viewed at the Diplomat Mine Interpretive Site, south of Forestburg. The equipment was donated by the Forestburg Collieries, which operated in the area from 1949 to 1986, and the Interpretive Site is Canada's only surface coal mining museum.





Energy sources and their development have propelled industry and technology into new realms of discovery.

Primary energy comes from natural resources like wind, water, coal, gas and solar sources. Once the energy is in a form that can be used, it is known as secondary energy.

Much of the energy used in the past century has come through non-renewable fossil fuel sources like oil, coal and gas. Before coal, wood played a key role in energy for heating homes and businesses. Coal remains an important source of energy in the Battle River region, as demonstrated by the coal-fired generating station south of Forestburg.



View of the ATCO Power Generating Station and the Battle River from the north side.



Left: Juvenile peregrine falcons can glide, but often have problems returning to their high nests. Brian Stenson and Ryan Hunting handle a juvenile before returning it by elevator to its nest 91 metres (300 feet) up on

Station B's stack. A peregrine falcon's ability to streamline its body allows it to reach high speeds when diving for prey. In 2007, a team from National Geographic tracked a peregrine falcon's diving speed at 390 km/h (242 mph)! Photo credit: ATCO Power, Battle River

Canadian Utilities opened the Battle River Generating Station south of Forestburg in 1956. Alberta Power took over operations in 1980 and placed it under the ATCO Power name in the 1990s. The two original units have been retired and dismantled, but three units currently operate in the Battle River valley, 67 metres (220 feet) below the surrounding landscape.

The Battle River Generating Station works to preserve the environment by monitoring

source and ambient air, incoming water, outgoing industrial water, groundwater and soil quality. ATCO Power has partnered with biological research and government groups to protect fish, Northern Leopard frogs, and Peregrine Falcons, and track geese that migrate between Alaska and the southern USA.

In 1995, Phil Trefry asked the Battle River Generating Station if they would install a nesting box for Peregrine Falcons on one of their stacks. Trefry worked with the Canadian

Wildlife Service in Wainwright from 1972-1996 to rehabilitate falcon populations. A year after the box was installed at the generating station, Peregrine populations had stabilized and the government program ended. The Alberta Conservation Association monitored and banded peregrine chicks from 2004-2010 and they trained longtime ATCO Power employee Brian Stenson to work with the birds. The nesting Peregrines and their young remain a familiar sign of spring for ATCO employees.

Renewable energy is on the rise in the watershed region. Wind, geothermal, biomass fuel and solar are among the renewable sources that are growing industries in central Alberta.



A wind turbine spins at the Bull Creek Wind Farm located between Provost and Dillberry Provincial Park. 500 schools across Alberta are benefitting from the project.

Twenty-five Alberta school boards banded together in favour of renewable energy for the next quarter century. Alberta Schools Commodity Purchasing Consortium worked on behalf of school boards to find the right partner for a long-term energy contract and selected Calgary's BluEarth Renewables for their wind-propelled proposal. Each school board then had to decide whether or not it would adopt the new energy alternative. The school boards that opted in wanted to provide a good model and educational tool for teaching children about sustainability.

BluEarth built seventeen wind turbines 20 km NE of Provost for the Bull Creek Wind Project after signing a 25-year energy contract with the school boards. The Battle River School Division, East Central Alberta Catholic School Division, STAR Catholic School Division and Wetaskiwin School Division are the boards in our watershed that signed onto the project. The wind facility became operational in 2015 and four full-time staff keep it running. The 2016 carbon tax means that the foresight of these schools will have long term benefits for the environment and their budgets.



The Bull Creek Wind Facility produces enough power for approximately 10,000 average Alberta homes. This amount of power can offset up to 80,000 tonnes of greenhouse gas emissions each year. The Bull Creek Project was recently awarded the Wind Energy Project Award by the Canadian Wind Energy Association.



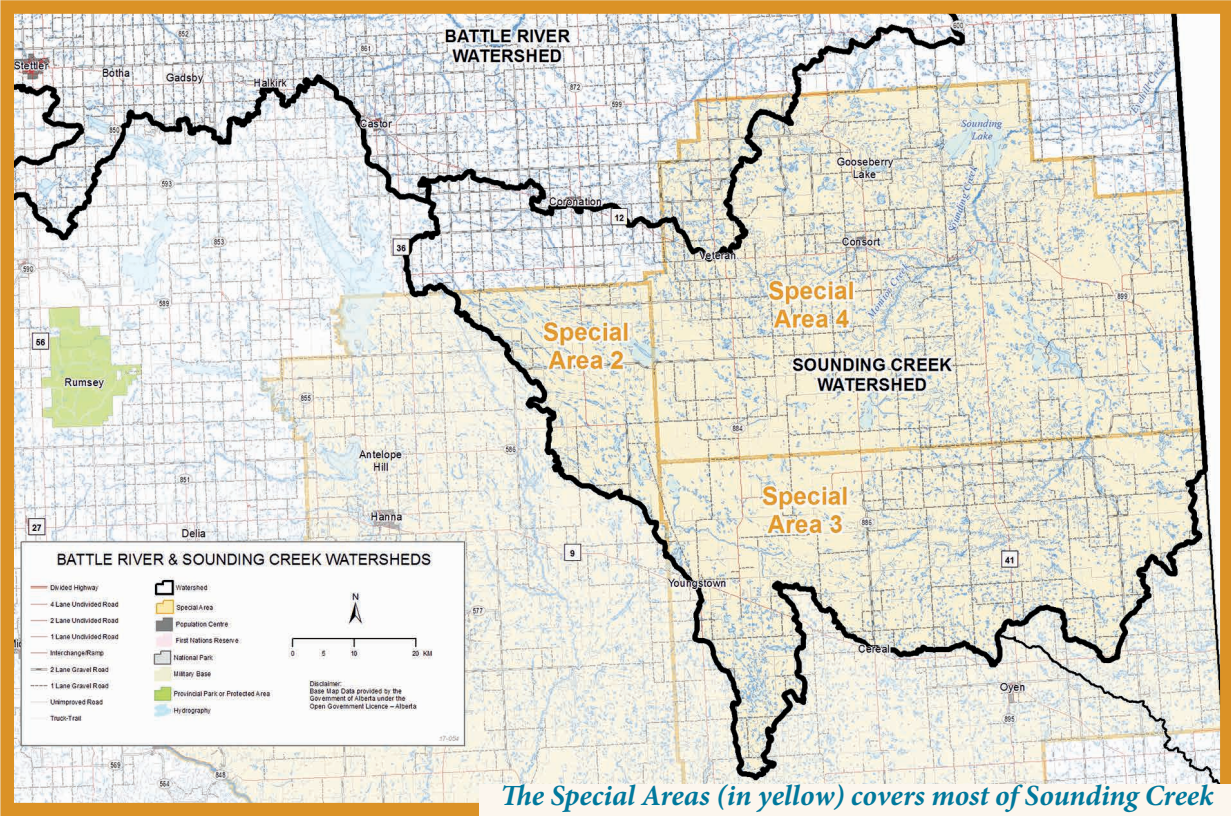
Climate and weather play a critical role in water availability. Temperature and precipitation can impact long-term climate patterns as with the ongoing drought conditions found in the Special Areas or extreme weather events like the Flood of 1974.

When surveyor John Palliser came to what is now southeast Alberta, he reported that some parts of the prairies were not suitable for human habitation or farming. This area became known as Palliser’s Triangle and its redrawn boundaries are known as the Alberta Dry Belt.

Ignoring Palliser’s expertise had dire consequences for those who settled the land. The Dry Belt has low precipitation, high evaporation from heat waves and thin topsoil which erodes with cultivation. Prolonged drought in these areas began as early as 1917 and farmers lost crops and faced heavy debt loads by the late 1920s. People went bankrupt, over 5,000 farms were abandoned, schools and businesses closed. In the mid-1930s, the Aberhart government promised to alleviate farmers’ debt load. Following negotiations with locals, the Special Areas



Cattle ranching remains a vital source of income for residents of the Special Areas.



The Special Areas (in yellow) covers most of Sounding Creek Watershed and the southern tip of the Battle River watershed.

were formed and the Special Areas Board helped farmers diversify their farm units by leasing public lands for farm and ranch purposes.

Today, this 5-million acre area in eastern Alberta is administered by a provincially appointed four-person board, three of whom are elected locally. This board receives direction from locally elected councillors from throughout the Special Areas.

Special Area Number Four’s office is in Consort, the largest urban centre within our watershed’s portion of the Special Areas. The council partners with local innovators to create support for the region in terms of emergency services, water, economic and land strategies and management.

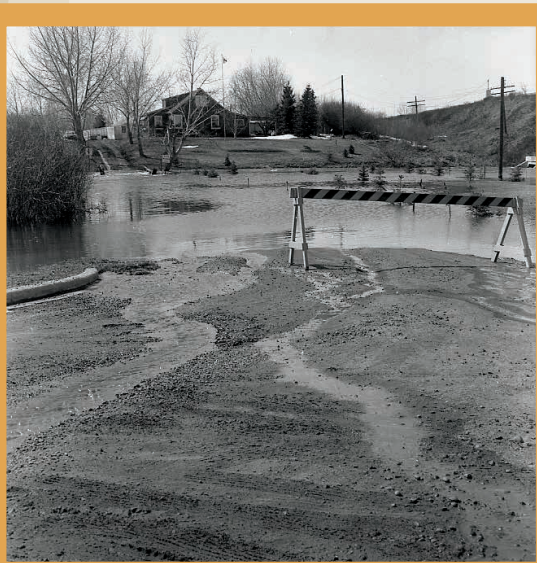
An Environmental Impact Assessment is currently being done to determine whether water could be diverted and stored offsite from the Red Deer River to the headwaters of the Berry Creek and Sounding Creek systems. The study is looking at diverting raw water for irrigation purposes, as well as to benefit livestock that are pastured in the Special Areas. It may also involve using the water to support waterfowl conservation and various types of industrial use, and treating the water for domestic use.



The Mud Buttes are a group of sandstone and mudstone hills that showcase the movement and power of advancing glaciers from the last Ice Age. Sometimes referred to as the Monitor Mud Buttes, the formations are located 13 km east of Consort and 14 km south of Monitor.

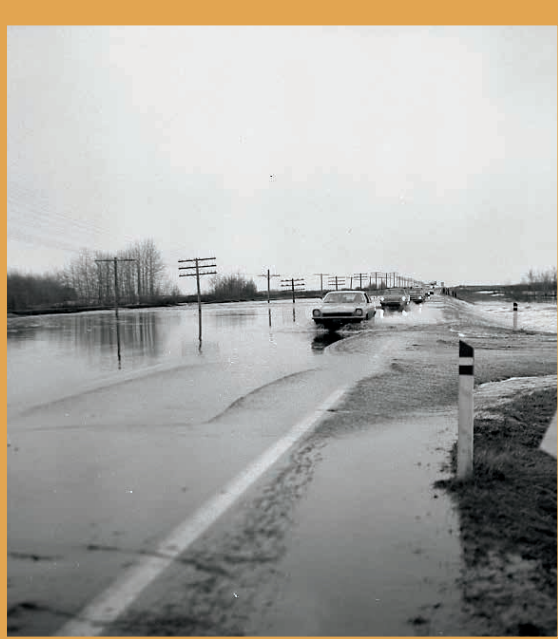
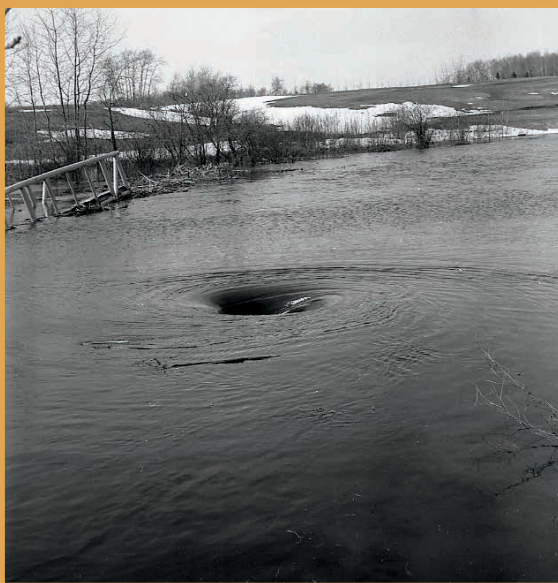


The winter of 1973-74 brought record snowfalls to the Battle River region, with over 100 inches of snow in some areas. In mid-March, operation “WETFOOT 74” was launched as Alberta Disaster Services teamed up with Alberta Environment and provincial representatives to prepare for flood conditions. Warm spring weather in April brought on rapid melting and severe flooding for the Battle River and its tributaries. The Battle River at Ferry Point continued to rise 15-20 centimetres (6-8 inches) per day. The bridge at Galahad was submerged in water. Red Willow Creek north of Stettler overflowed its banks. The flood crested on April 25th and Calgary Power reported that Dried Meat Lake had risen 5.5 m (18 feet) by the end of April. When rail lines were washed out at Bawlf and Duhamel, and a CNR train derailed near Meeting Creek enroute to Edmonton, no one was seriously injured.



Larger urban centres impacted by the floods were Stettler, Wetaskiwin and Camrose but the greatest damage occurred in rural and agricultural areas. Damage compensation for all flooding in northern and central Alberta that year was estimated to be close to \$11 million, with about 38% of that figure going to agricultural claims, 60% to public sector claims and the remainder to private claims. In early May, the provincial government intervened. A critical action was to monitor the water levels between Mirror Lake and Lyseng reservoir so that sewage water would not make its way into Dried Meat Lake. The river swelled to such heights that longtime resident Rudy Gerber told of a man in a canoe who was high enough to pass tree tops and touch power lines. Midge Lambert reports that when she bought her land from Dave Gerber near Ferry Point, you could still see the high-water mark on the power pole — well above the willow trees at the river’s edge.

Snapshots of the 1974 flood show water overflowing embankments, creating whirlpools and making road travel impossible in some areas. Photos were taken for the Camrose Canadian and provided by the Camrose Museum.



This scene captures the beauty of the Battle River Valley north of Edgerton in the wintertime. W.H. Webb. "Winter Panorama" (1997). 35 x 70, acrylic on canvas.



WATER SOURCES

The Battle River watershed makes up about 40 percent of the total area of the North Saskatchewan River Watershed, yet it only contributes about 3 percent of the surface water that flows in the North Saskatchewan River. With its headwaters originating in the Western Plains at Battle Lake, the flow in the Battle River relies on meltwaters that flow across broad, flat tracts of land.

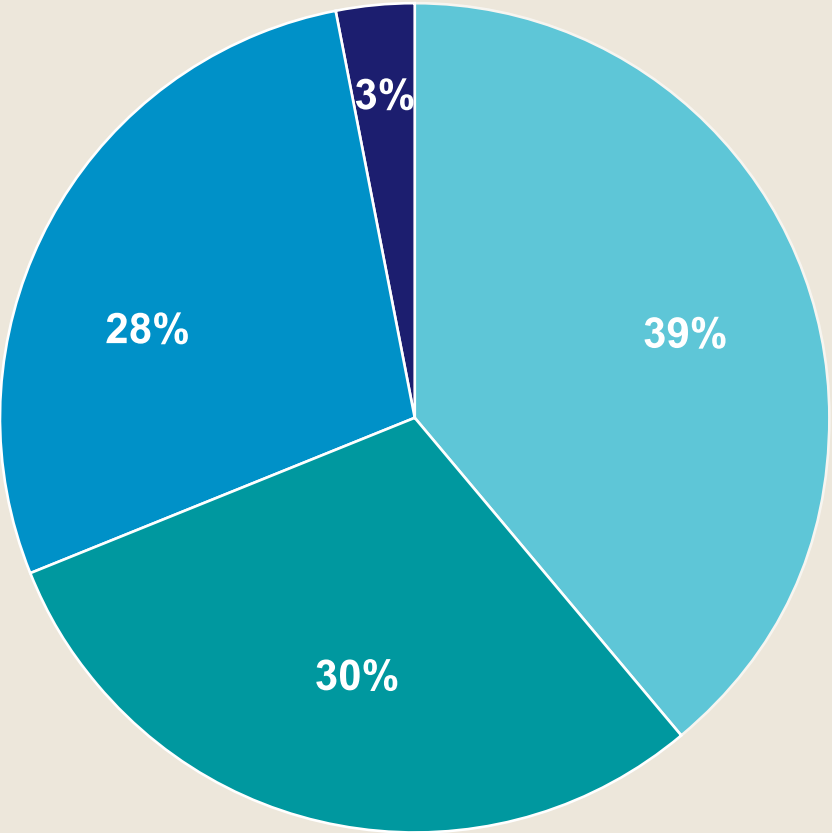
Meltwaters and runoff form streams and tributaries with low volumes and water flow. Some upland areas help the flow of groundwater to low-lying areas that converge in bedrock valleys.

As water moves through the hydrologic cycle, it falls to the earth as snow or rain. Water absorbed by the soil penetrates surface rock layers below and feeds rivers and lakes as baseflow. Groundwater is primarily rain or snow that has seeped through upper soil



*Almost one-third of the residents in the Battle River Watershed Region get their water from either the North Saskatchewan or the Red Deer River. This is known as Interbasin Transfers. Only four communities draw directly from the Battle River itself: Camrose, Wainwright, Ohaton and Bittern Lake.*

Drinking Water Sources in the Battle River Watershed: % of population using different water sources



At high flows it takes approximately 23 days for a drop of water to travel from the Battle River’s headwaters to the Alberta-Saskatchewan border. At low flow times, it has been suggested this time could increase to several months.

layers, fractures and pore spaces. Baseflow is the base level of water in a river during low flow periods of time and is derived from groundwater. Just as groundwater running below the earth’s surface can return to the surface, so surface water can go underground.

WATER SOURCES

There are natural springs throughout our watershed. These springs are especially common in several areas: between the headwaters (near Battle Lake) and Ponoka; from Gooseberry Lake to the south along Sounding Lake and Creek; and north of Edgerton. Camrose County manages one of these springs, known by locals as Beesley’s Spring.

“Turp” Beesley was born in the Dried Meat Lake region in 1912 and farmed there throughout his life. Turp also had a sawmill and produced timbers for mine props in the area. His land sloped down to a natural spring that became known as “Beesley’s Spring”. Gravel deposits were discovered on Beesley’s property in the early 1970s, so he sold his land to Camrose County. Beesley continued to use the spring because he had a life-time-lease to its water rights; he passed away in 2002 at 90 years of age.

In 2000, Camrose County began monitoring Beesley’s springwater due to public use. The County installed pipes and a step for easy collection. The springwater is tested weekly for coliforms, and the results are posted on the County’s website. An advisory sign is posted next to the spring if coliforms are present in the water. More thorough testing is performed



*When Alfred Beesley moved to the area in 1906, this natural spring was already flowing. Turp Beesley inherited the land from his father and at least one Beesley descendant still comes here to draw water. At left, Vivianne Grue has drawn water from Beesley’s Spring since she moved to the area 34 years ago and says that the springwater makes great coffee and tea. For a water source to be considered a true spring, it must be flowing year-round, as is the case with Beesley’s Spring.*

on the water annually and people come from as far afield as Edmonton to collect water from Beesley’s Spring.

Natural springs often occur on slopes or hills but they can also happen in lower areas where there is groundwater pressure. With hillside springs like Beesley’s, a thin covering of soil lies over layers of rock. The soil acts as a purifier and filters out impurities from the rainwater and surrounding landscape. Some of the rocks beneath the soil are watertight, while limestone and sandstone allow water to pass through. Once the seeping water meets waterproof clay layers, the force of gravity pulls water downward until it finds a way out. The amount of water a spring emits depends on factors like precipitation levels, space within rocks and water pressure. If there is enough water coming out at the source, the spring creates a rivulet or stream.



Leonard Standing on the Road became involved with the Battle River Watershed Alliance in its early days to better understand Alberta's water licensing system. Standing on the Road is part of an established Montana First Nation family at Maskwacis and he served on council there between 2005-2011.

Standing on the Road remembers when water tables in the watershed were dropping due to drought in the late 1990s. The wells in Maskwacis were no longer producing enough water. Some of the four First Nations bands at Maskwacis were hesitant to accept the proposed interbasin transfers from the Red Deer River. The government proposed a water treatment plant, but the iron, manganese, and calcium in the aquifers at Montana First Nation were too high and there was no proper facility or infrastructure. Standing on the Road helped set up the infrastructure for proper water treatment at the Montana First Nation plant and was trained to work as a backup operator.

After pursuing other work, Standing on the Road began working at Montana's water treatment plant full-time in 2011. He and others involved with the plant learned that there were better treatment systems available. Bacteria can be used in place of chemicals to eliminate excessive or problematic elements, which is less harmful to the environment. This process is known as biomembrane filtration. The bacteria attaches to the hard water elements; reverse osmosis and some chlorine are also part of the process.



Operator Leonard Standing on the Road in front of the new equipment at Montana First Nation's water treatment plant at Maskwacis. The plant uses eco-friendly technology.

A new water treatment plant was built for Montana First Nation using this technology and began operating in 2016. It is a Class 2 Water Treatment Plant and requires Level 2 certification. Standing on the Road says that the training involves learning about the science behind the elements and how to safely handle the chemicals. Conductivity and water pressures are recorded in a log book. The log book is submitted to the Montana First Nation office and the numbers are checked by Health Canada. The new underground reservoir can store up to 750,000 litres of water and provides water for nearby homes, Montana First Nation's administrative building and the Meskanahk Ka

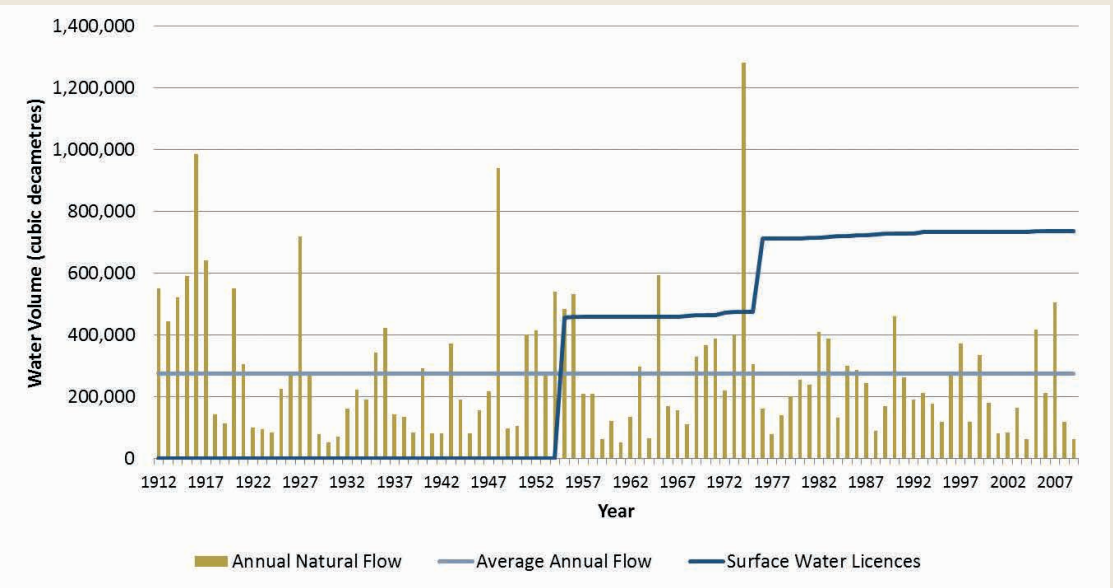
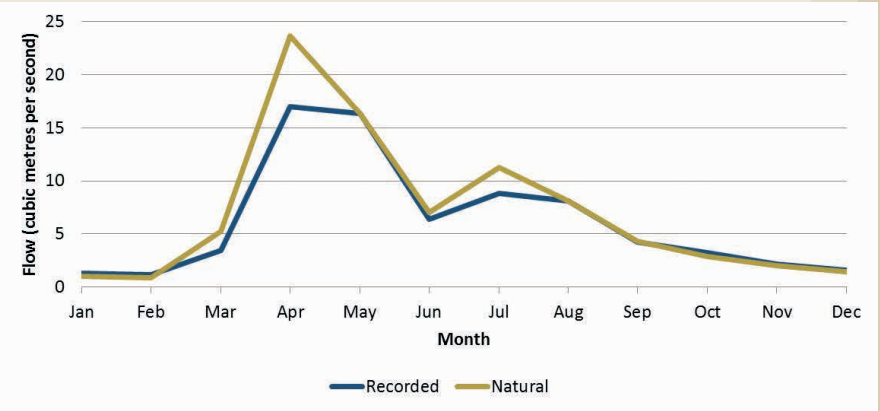
Nipa Wit Community School.

Trainees from other parts of Maskwacis and area have come to the Montana water treatment plant, as it is common for the Four Nations at Maskwacis to share training and resources. Standing on the Road and one co-operator work at the plant seven days a week and they are currently working with six trainees.

Green Arrow Company is the first indigenous renewable energy company in Canada and is owned by Montana First Nation. Green Arrow supplements the power for the water treatment plant and the company is training recruits from Maskwacis.

Having enough water in our streams, rivers, lakes and wetlands is essential to sustaining healthy aquatic systems and safe and secure water supplies for our communities and economy. Water security is a challenge in our watershed, as the rivers and streams of this region have flows that vary considerably on an annual and seasonal basis. The chart at right shows the monthly natural and recorded flows for the Battle River averaged for the years 1980-2004.

In general, peak flows for the Battle River occur during the months of April and May, corresponding with annual snow melt and spring rains. The lowest flows are observed in the fall and winter. These flows are affected by natural long-term changes in climate, short-term seasonal weather patterns, and human-related climate change impacts. The flow regime of our watershed has also been influenced by human use of water and various land use changes and practices. Today, water is allocated and withdrawn for a variety of purposes, including municipal, industrial and agricultural uses.



The chart above shows how the annual natural flow of the Battle River has varied from 1912 to 2008, compared to the average annual natural flow of the river for those years and surface water licences in the watershed. Technically speaking, the Battle River is over-allocated (meaning that the volume of water allocated annually through water licences is greater than the volume of water found in the Battle River in most years). However, only a small portion of this volume is allocated as “licenced water use”, meaning that it can be removed from the natural system and not returned. Most of the water allocated in the watershed must be returned to the natural system after use (for example, municipalities must return treated wastewater back to the natural environment). The Government of Alberta's Approved Water Management Plan for the Battle River Basin (Alberta) (2014) sets a water allocation limit of 57,500 cubic decametres for licenced water use in the watershed. In most years, flows in the Battle River exceed this volume. However, water security will continue to be a concern, as times of lower water availability and drought are an ongoing reality in our watershed.

A cubic decametre is the volume of a cube that has a side length of 10 metres. An Olympic-size swimming pool holds about 2.5 cubic decametres. This means that, on average, the amount of water that flows through the Battle River every year could fill over 100,000 swimming pools!



Soil is the foundation for quality crops and healthy water systems. The Battle River watershed region has some of the best agricultural soil in Alberta.

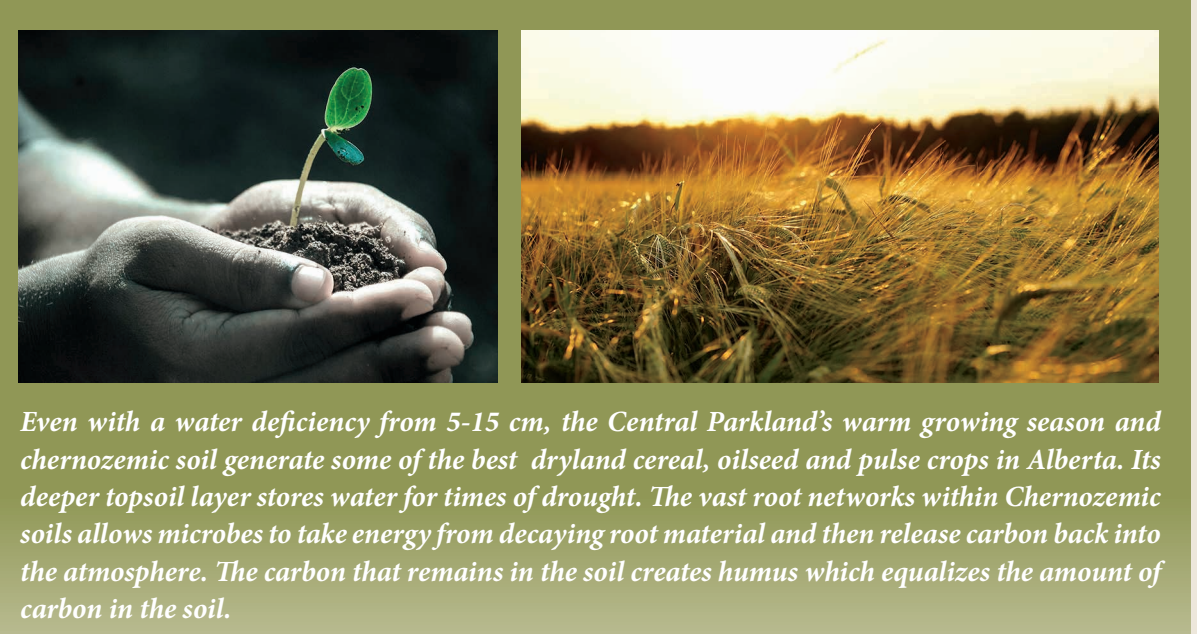
Soil types were primarily developed over hundreds of years by climate, native vegetation and parent material. Large amounts of sediment were moved during the Ice Ages to create the landforms and soil we see today. Most of the soil in our watershed is composed of loam to clay-loam textured parent material. The dominant soil type in the Battle River watershed is Chernozemic and developed under various native grassland vegetations.

The grassland region in the southern part of our watershed is often associated with Brown Chernozemic soil. This soil exists where the average annual temperature is between 0-6 degrees Celsius and is usually limited by availability of moisture during its growing season. As one moves further north and west, these soils become darker and are classified as Dark Brown and Black Chernozemic soils. Darker soil surface colour usually reflects greater moisture availability, which increases native vegetation growth. As increased organic matter is added to the soil, it creates a darker and thicker organic surface soil layer. However, this transition to the darker Chernozemic soils also means slightly cooler temperatures, higher precipitation levels and a shorter growing season.

Although Chernozemic soils dominate our watershed, a north-south belt of Solonetzic soil co-occurs in patches through the watershed's central region.

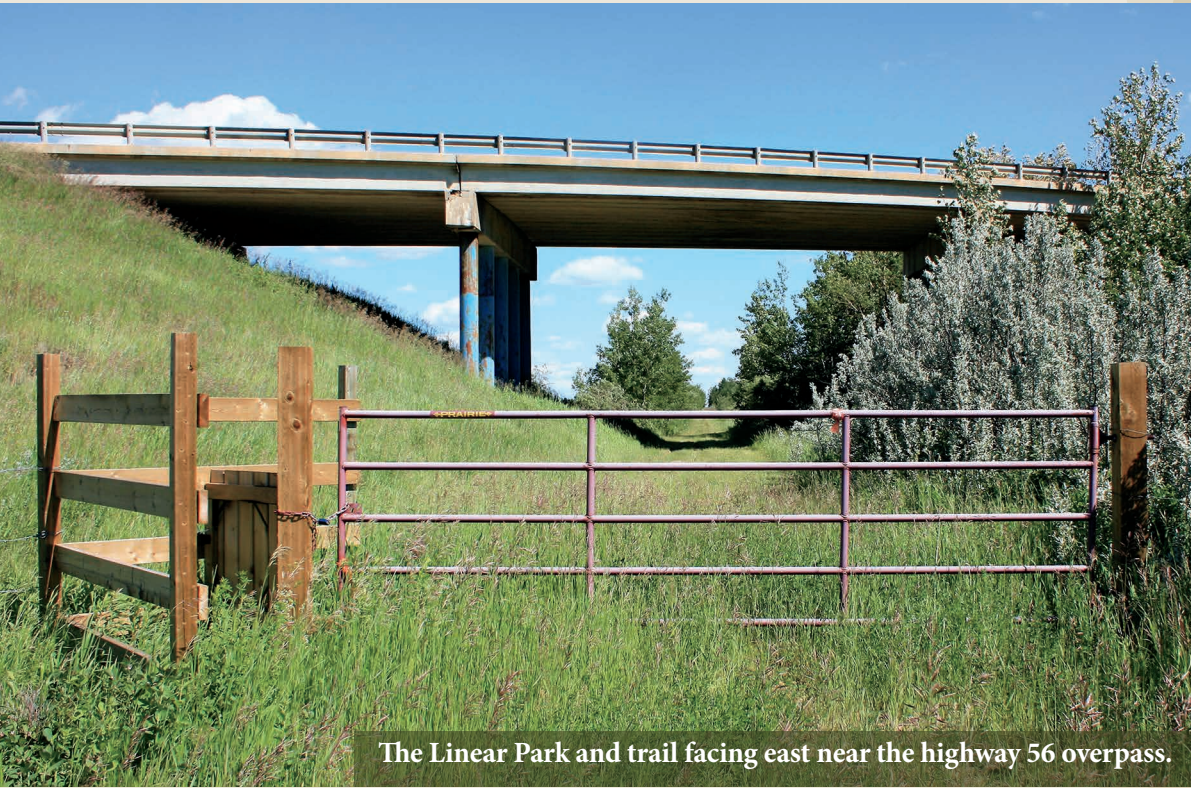


Solonetzic soils are high in sodium and problematic for farming. This soil forms on parent material higher in sodium caused by marine-environment parent material or salt deposits from groundwater. The sodium in Solonetzic soil creates a hard structure, which makes water absorption and root growth difficult. Camrose, Daysland, Castor, Youngstown and Coronation are all part of the prairie belt that contains patches of Solonetzic soil.



Glenys Smith is director of the Canadian Northern Society and Chair of the Camrose Heritage Railway Station. The Canadian Northern Society is a charitable society that stewards three historic rail sites within our watershed: The Camrose Heritage Railway Station and Park, the Railway Station and Roundhouse Interpretive Park at Big Valley, and the Meeting Creek Railway Depot and elevator. The Canadian Northern Society focuses on prairie and railway history, community workshops, educational programs and local ecology.

The Canadian Northern Society is restoring almost two acres of grassland along the abandoned railway line at Meeting Creek. They own the right of way land from the beginning of the Edberg Trail to the overpass on Highway 56, which includes the grassland and Linear Park to the highway 56 overpass. The grassland restoration area and the abandoned right of way now join the Edberg Natural Linear Park overseen by the Alberta East Central Heritage Society, through Meeting Creek to the highway 56 overpass where it enters the Donalda Natural Park.



The Canadian Northern Society is reintroducing native prairie grasses and flowers to the area. Greater biodiversity will improve the local ecosystem and establish wildlife habitat. These native plants also provide erosion control, which benefits the Battle River. Seven interpretive signs will also explain the cultural, ecological and historical aspects of the trail. The project will also serve as an example of organic agricultural practices.

This project is part of a broader initiative by the East Central Alberta Heritage Society (ECAHS) that works to preserve 114 kilometres of railway rights between Edberg and Morrin. The ECAHS has also created 25 kilometres of linear parks, which are trails made from unused railbeds. Because the railbeds use existing bridges, there are no road crossings and minimal interference with the local ecosystem. The trails are open for walking, running, cycling, horseback riding, bird watching, and picnicking. Discovery kits and signage showcase the flora and fauna of the area.



When land-owners want to preserve an area of land for future generations to enjoy, they can partner with local land-trust organizations. While most land trusts focus on biological conservation and the protection of farmland, other priorities include the desire to protect places of cultural, historic and aesthetic significance.



Aspen and birch trees show off their fall colours, while grassland slopes border Pipestone Creek's banks. EALT's Pipestone Creek Conservation Lands borders the south end of Coal Lake, an Environmentally Significant Area. Photo credit: Alex Nagy (EALT).

Edmonton and Area Land Trust (EALT) is a non-profit organization that manages or acquires land to maintain its biodiversity for long-term sustainability while stewarding it for educational and recreational purposes.

Pipestone Creek is one of the nine conservation lands under EALT's oversight. In 2012, Pipestone's 104 acres were destined to become a rural housing development until an anonymous donor purchased the property and donated it to EALT. Located 15 km northeast of Wetaskiwin, Pipestone Creek Conservation Lands is a diverse ecosystem which features a woodland wildlife corridor mixed with drier grassland slopes that border its creek. A baseline study was completed to track changes in vegetation, birds and wildlife in the area. EALT's key goals for Pipestone Creek are to protect the creek and surrounding riparian habitat, while encouraging

the public to access its trails for walking, skiing and snowshoeing (in a low-impact, leave no trace manner).

EALT has partnered with numerous groups to enhance the Pipestone Creek property. In 2014, EALT partnered with Leaf 2 Wing, an Edmonton organization that plants Milkweed to provide Monarch butterfly habitat and other flowers that benefit pollinators. In 2012, the Carbon Farmer planted over 22,000 white spruce at Pipestone Creek, with more trees and shrubs the following year. White spruce, birch and aspen trees will eventually create a canopy over the raspberry, wildrose and dogwood shrub understory. When Highway 28 north of Gibbons was being widened in 2016, the Edmonton Native Plant Group rescued native plants from the ditch areas and then offered the plants to EALT for their land trusts. The

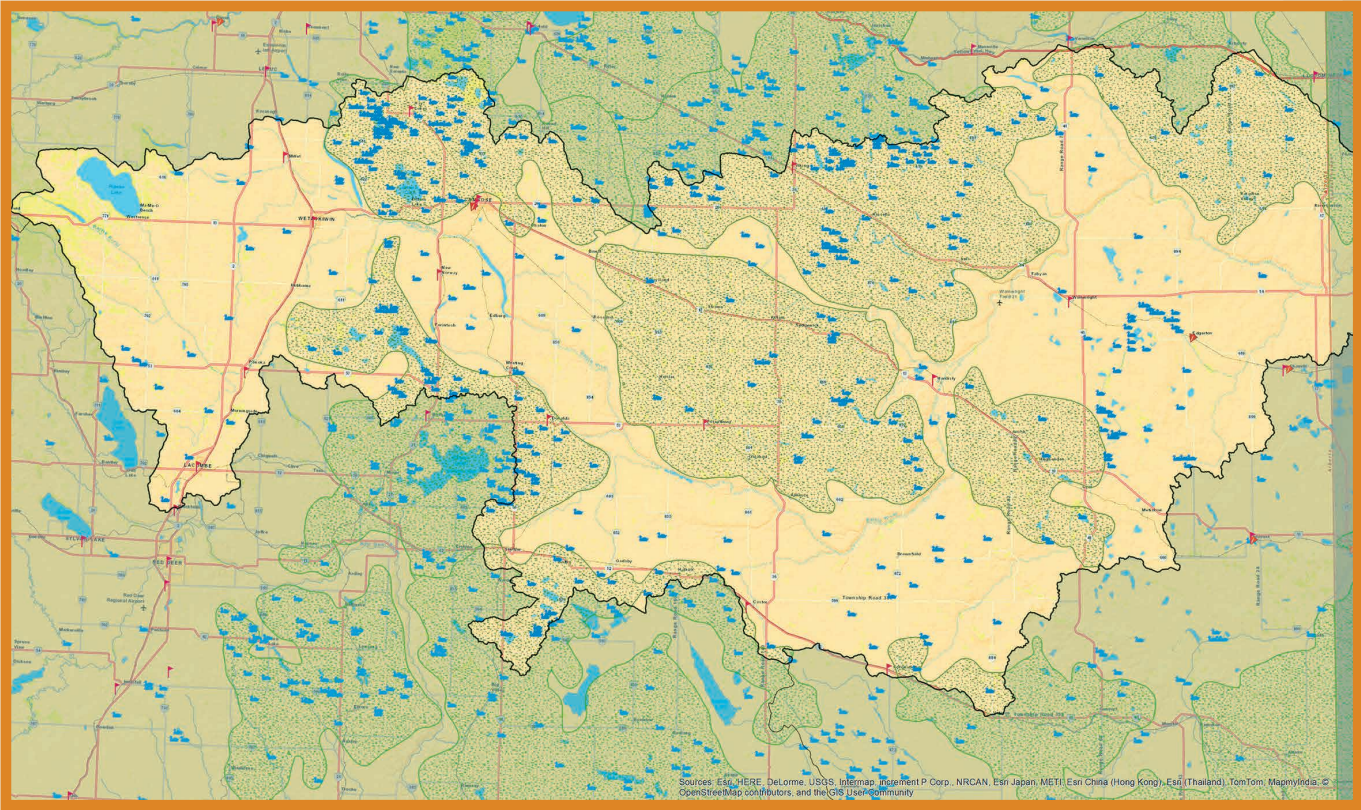
Pipestone Creek property was the beneficiary of transplanted buffalo bean, sage, prairie crocus, graceful cinquefoil and pussytoes. In 2017, EALT installed bat boxes to provide roosting habitat for endangered bat species.



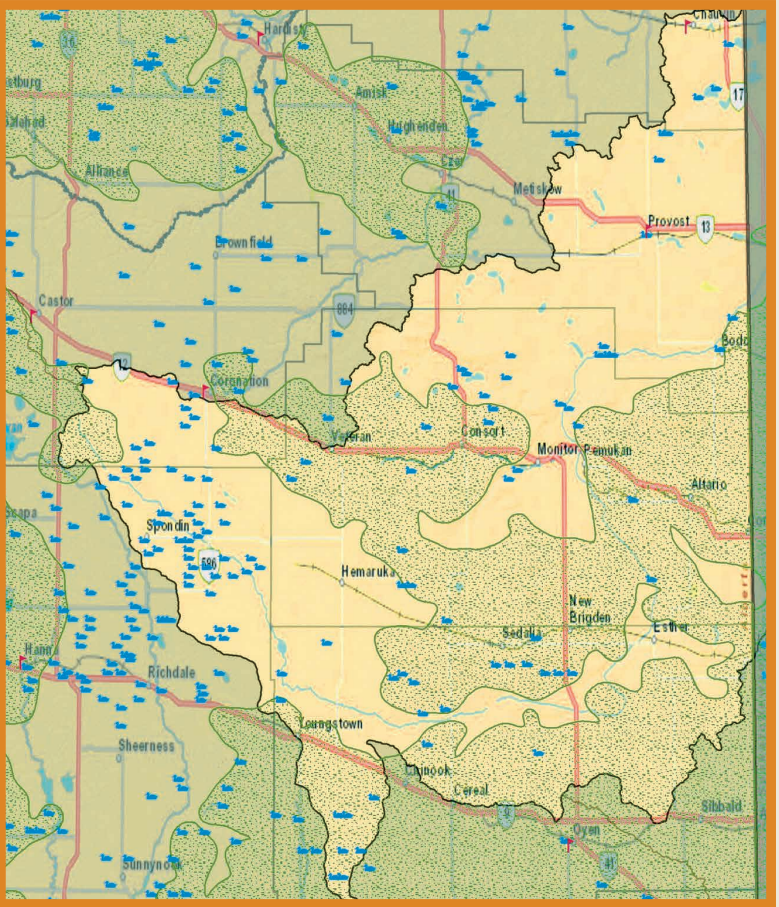
Buffalo beans were among the native plants rescued and moved to Pipestone Creek. First Nations began hunting buffalo when the buffalo beans bloomed in late May to early June.

Right: Ducks Unlimited Canada's projects in the Battle River watershed as of 2016.

- DUC Habitat Projects
- DUC Fundraising Events
- Youth in Education Programs
- DUC Priority Area



Below: Ducks Unlimited Canada's projects in the Sounding Creek Basin as of 2016.

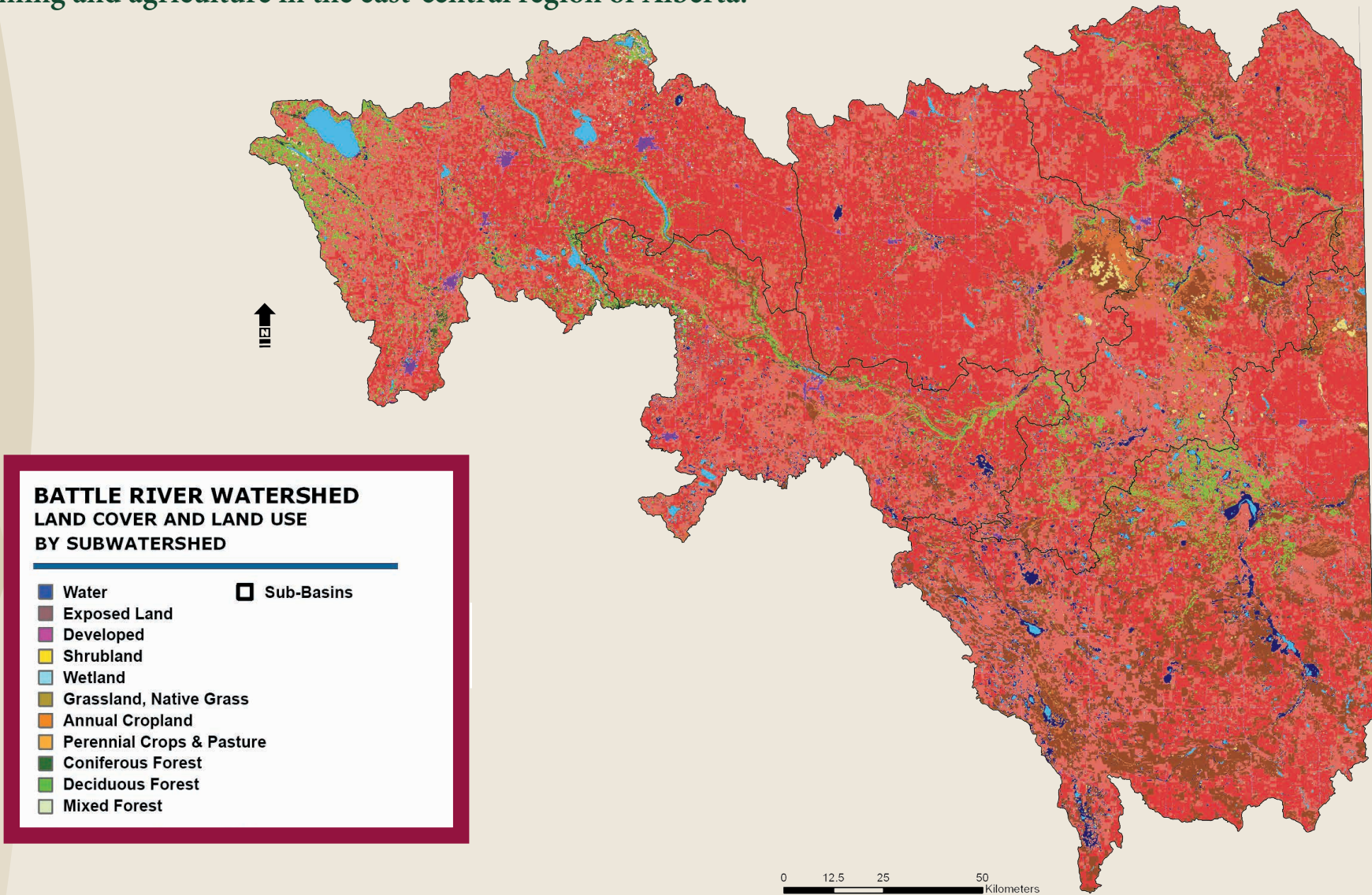


Ducks Unlimited Canada (DUC) is the leader in wetland conservation and conserves wetlands and other natural spaces for waterfowl, wildlife, and people. DUC is a registered charity that partners with government, industry, non-profit organizations and landowners. It was established in 1938 by conservation-minded waterfowl hunters who recognized the importance of wetlands and today, is supported by a wide range of people who are concerned about water, wildlife and the environment. DUC collaborates with Ducks Unlimited organizations in the United States and Mexico to deliver wetland conservation on a continental-scale.

In Alberta, DUC is active in all parts of the province to restore and conserve wetlands. In the Battle River Watershed, DUC has 734 habitat projects covering 131,479 secured acres. They have invested more than \$37.8 million into these projects. In the Sounding Creek Watershed, DUC has 120 habitat projects covering 34,394 secured acres. They have invested more than \$2.5 million into these projects.



The Prairies have been known as Canada’s breadbasket since the turn of the twentieth century. Crops and cattle continue to be the primary sources of farm income in the watershed. Water shortages, changing weather patterns and overall ecosystem changes will be key challenges in the future of farming and agriculture in the east-central region of Alberta.



A 2001 study of the BRW area (excluding Sounding Creek) showed that 91% of the total land base in the watershed is under cultivation (11% of Alberta’s total cultivated land). On the basis of total gross farm receipts, 46% of profits made on farms resulted raising cattle; grain and oilseeds, 24.7%; field and specialty crops, 15.5%; other livestock accounted for 7.9% and wheat followed at 5.9%. Between 1996-2001, the numbers of farms continued to decline by about 10%, whereas the area being farmed only dropped slightly. Cattle farming is most dense in the Bigstone subwatershed region.



At left: Michael & Laura Coen with son Takota and his partner Kolby Peterson on the farm.

Below: Berkshire piglets enjoy crabapple treats



Family photo credit: Jalene Mauws. Other photos provided by Grassroots Family Farm.

Takota Coen is a second-generation organic farmer. His dad, Michael, was raised on a conventional mixed farm ¼ mile from their present farm near Ferintosh. Takota’s mother, Laura, and her family moved to Donalda in her late teens where her parents operated a successful dairy farm. After Michael and Laura married, they farmed using conventional methods. Increasingly concerned about the safety of pesticides and sprays, they began to raise organic pork and cereals on contract. Their mainstay, however, was organic hay for horses and for cattle at auction.

Takota completed a carpentry apprenticeship after high school and continued to help his parents on their farm. In his free time, he researched alternative farming models. He recognized that his parents knew how to produce excellent quality food, but saw that marketing presents its own challenges.

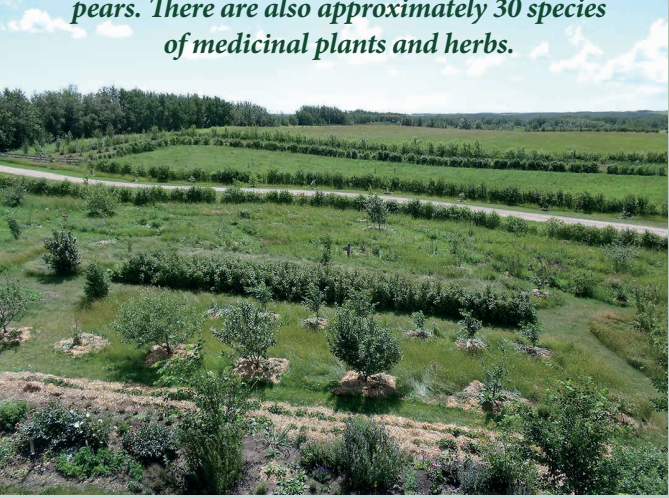
Then Takota discovered permaculture. He describes permaculture as a system that views the land’s dynamic relationships. Redefining their goals, the Coens started rebuilding farm infrastructure and began to connect people in their community to the natural world through healthy ecosystems and eco-education while producing quality organic food.

Key elements of the new farm model are rotational grazing, perennial fruit and nut crops, and an intricate water harvesting and gravity reticulation system. It includes three kilometres of swales that follow land contours and divert rainwater and snowmelt to dams and dugouts. Takota says that the integration of these and other systems on the farm has greatly improved profitability and ecosystem health.

The Coens have also fostered relationships with, and buy-in from, the community. Needing \$10,000 to create a six-acre fruit-and-nut forest garden, they found long-term customers willing to invest in their farm for a 110% payback in products. In the first years, while fruit and nut trees matured, staple customer products included pork and eggs. In 2007 Michael and Laura subdivided and sold their home yard to rebuild and retire from farming. Takota continues to build networks as he hosts tours and tells the Grass Roots Family Farm story at local events.

*“The goal is to tell another story: We [humans] are actually a keystone species and the role that we play can be incredibly beneficial; not only telling that story, but proving it.”*  
- Takota Coen, Grassroots Family Farm

*The Coens’ forest garden has six varieties of apples, three varieties of plums, together with Evans cherries, raspberries, haskaps, black and red currants, gooseberries, grapes, hardy kiwis, hazelnuts, highbush cranberries, and pears. There are also approximately 30 species of medicinal plants and herbs.*





*Photo (right): Dried Meat Creek winds above Gilroy's farm, where he rents land which is used for crop research.*

Stewart Gilroy was born on a farm south of Ohaton, Alberta. He attended Camrose Lutheran College before finishing his Bachelor of Education degree at the University of Alberta in 1975. After a brief teaching stint in Calgary, he worked in sales and ended up buying part of the company two years later. In 1982, Gilroy moved back to the family farm and has also operated a sand and gravel business for almost two decades.



Canola seeds have high oil content at 44%, and the remaining 56% of the seed is used for high-protein meal in animal feed. Canola oil can be used for biodiesel fuel because it emits less greenhouse gases and almost no sulphates. This is not only beneficial for air quality on land, but for aquatic life in close proximity to shipping docks and boats.

As a Canola farmer, Gilroy was elected head of region 11 with the Alberta Canola Producers

Commission in 2003. This led to an executive position with the Canola Council of Canada (CCC), where Gilroy served for five years, spending two of those years as its Chairman. Gilroy feels that he had an advantage being a farmer on the CCC executive because his work was perceived as less biased. He says it was “a great honour to Chair the Canola Council of Canada”, a value chain that includes growers, exporters, processors, the life sciences and environmental sectors.

In 2006, cropland in Alberta represented over one-quarter of the cropland in the entire country, with the production of canola steadily increasing. The increase in canola production is mainly attributed to rising market prices and domestic canola crushing plants, like the Cargill plant south of Camrose. The canola industry produced \$2.6 B in farm cash receipts for Alberta farmers in 2013 and the industry directly employs 43,000 Albertans.



*Gilroy with his Canola crop on the farm south of Ohaton.  
Photos courtesy of S. Gilroy.*







*There are many places to explore across this beautiful region.  
This photo was taken at Big Knife Provincial Park. Photo credit: Sue Wolfe.*



# RIPARIAN PLANTS

Riparian zones refer to the natural communities that border water bodies. While often associated with shorelines, riparian areas encompass a wide variety of landforms and vegetation that include slopes, banks, shores, and floodplains.

Riparian areas serve a variety of functions. Soils and plants that are well-adapted to wet conditions help filter out pesticides, nutrients and heavy metals from water bodies. During flooding, the presence of plants slows high-impact water and reduces the erosion of banks and shorelines. Fine sediment is also trapped by plants during runoff to store moisture and build soil. The organic matter produced by decomposing plants provides soil with nutrients, prevents erosion and enables the soil to hold more water. Roots and soil work together to collect runoff and flood water so that aquifers are recharged for later use in times of drought.

The Battle River Ponoka Riparian Restoration Program (PRRP) was launched in 2015. A 2006-07 study of the Battle River used a fish study called the Index of Biological Integrity to measure the overall health of the river. The overall score for the Battle River was only 42% with specific areas of concern at the testing sites near Ponoka. Water quality index scores from a monitoring station between highway 53 and Ponoka also indicated high levels of nutrients. The presence of high nutrient levels creates harmful excessive algae growth, known as eutrophication.



Before and after photos of a riparian project at Ferry Point show the shoreline that was trampled by cows using the area for drinking (see left). After fencing measures, a marked difference in the shoreline is evident (see right).

Knowing that land plays a critical role in the quality of our water, the BRWA and Cows and Fish decided to partner with Ponoka landowners for change. The goal of the PRRP was “to work with local landowners and residents and provide financial support for projects that help to improve the health of the Battle River and its tributary streams in Ponoka County and the Town of Ponoka.”

Riparian health assessments look at soil, plant and water health. Residents worked with Cows and Fish, the BRWA and various partners to support 11 riparian restoration projects. Various grants and money were available to pay for up to 100% of the project costs.

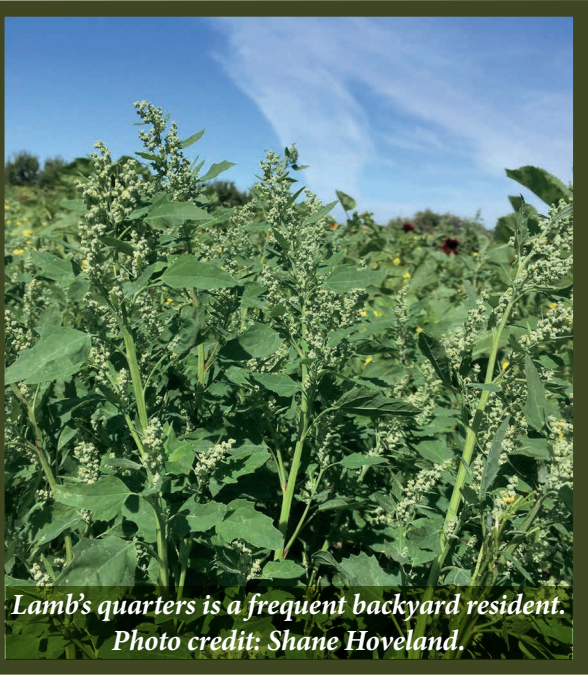
Assessments done by Cows and Fish identified areas where riparian health could be improved and consulted with landowners about possible solutions. Fencing was a critical first step to minimize cattle access to riparian areas so that vegetation could grow back. Partnering with the Agroforestry and Woodlot Extension Society, volunteers planted 10,000 trees in

the program area. Eleven watering systems (primarily solar) have given cows access to the river, tributary streams and wetlands, while protecting the shoreline ecosystem.



Western long-eared bats are one of the bat species that use riparian areas for foraging. On the prairies, the western long-eared bat is usually found in badland, cliff and coulee areas close to water. Drinking water and a diverse range of insects found nearby seem to play a large role in why these bats forage in treed parts of riparian zones. A bat survey along the Battle River reported long-eared bats near Donalda and Big Knife Provincial Park, which is further north than their normal distribution range. Photo credit: MerlinTuttle.org

Our watershed is full of native plants that have been used by traditional peoples for centuries. Lamb’s quarters greens were used in stews and the plant’s seeds were used for making bread. This plant is high in both vitamin A and C and was used by indigenous peoples to prevent scurvy.



Lamb’s quarters is a frequent backyard resident. Photo credit: Shane Hoveland.

Lamb’s quarters grows in fields, forest clearings and along roadsides throughout our watershed. Other names for lamb’s quarters are *pigweed*, *fat hen* (as it was used to fatten up poultry), and *goosefoot* — for its shape. The leaves are diamond-shaped, greenish-blue in colour and have a dusty-white covering.

Although this hardy plant is often considered a weed, it is an edible relative of beets and spinach. All of the parts of lamb’s quarters are edible, except the roots. Its leaves can be prepared and used as a spinach substitute for many recipes.

Another edible part of lamb’s quarters are its seeds. The average plant produces over 70,000 seeds and are eaten by humans and birds alike. While the plant was once thought to be a European import, lamb’s quarters seeds have been found in Blackfoot peoples’ sites that date back to the 1500s. Indigenous people used the plant to prevent scurvy because it was high in vitamin C. Some indigenous tribes still pound the seeds into flour to make bread and hotcakes. The seeds can also be cooked or

dried at low heat and added to salads or a hot cereal like oatmeal. The best time for gathering lamb’s quarters is June to September.

### COLLECTION & PREPARATION TIPS

**Leaves:** Collect younger plant leaves that are more tender (less than 12”/1 ft. high). Rinse well. Stems are edible when plants are younger.

**Seeds:** Rub husks between palms to extract black-brown seeds and roast them at 300 degrees.

### RECIPE FOR LAMB’S QUARTERS QUICHE

Preheat your oven to 450 degrees Fahrenheit.

- 1 X 9” PIECRUST
- 4 STRIPS OF BACON OR 1 C. HAM
- 1 ONION, SLICED THIN
- 1 C. SWISS OR GRUYÈRE CHEESE, GRATED
- ¼ GRATED PARMESAN CHEESE
- 1 C. BOILED, CHOPPED LAMB’S QUARTERS LEAVES
- 4 EGGS, LIGHTLY BEATEN
- 2 C. CREAM
- ¼ T. NUTMEG
- ½ T. SALT
- ¼ T. WHITE PEPPER



Add lamb’s quarters quiche to your summer recipe repertoire

**Method:** Bake piecrust for 5 minutes at 450 Fahrenheit degrees in the oven. Remove the crust and let the it cool on a cookie sheet while frying bacon until crisp. Remove the bacon from heat and strain its grease into a bowl for the next step. Allow the bacon to dry on paper towels.

Use bacon grease to sauté the onion and lamb’s quarters until tender. Sprinkle cheese, onion and lambsquarter leaves into the pieshell. Crumble the bacon over top.

Beat eggs, cream, nutmeg, salt and pepper together and pour them into the piecrust.

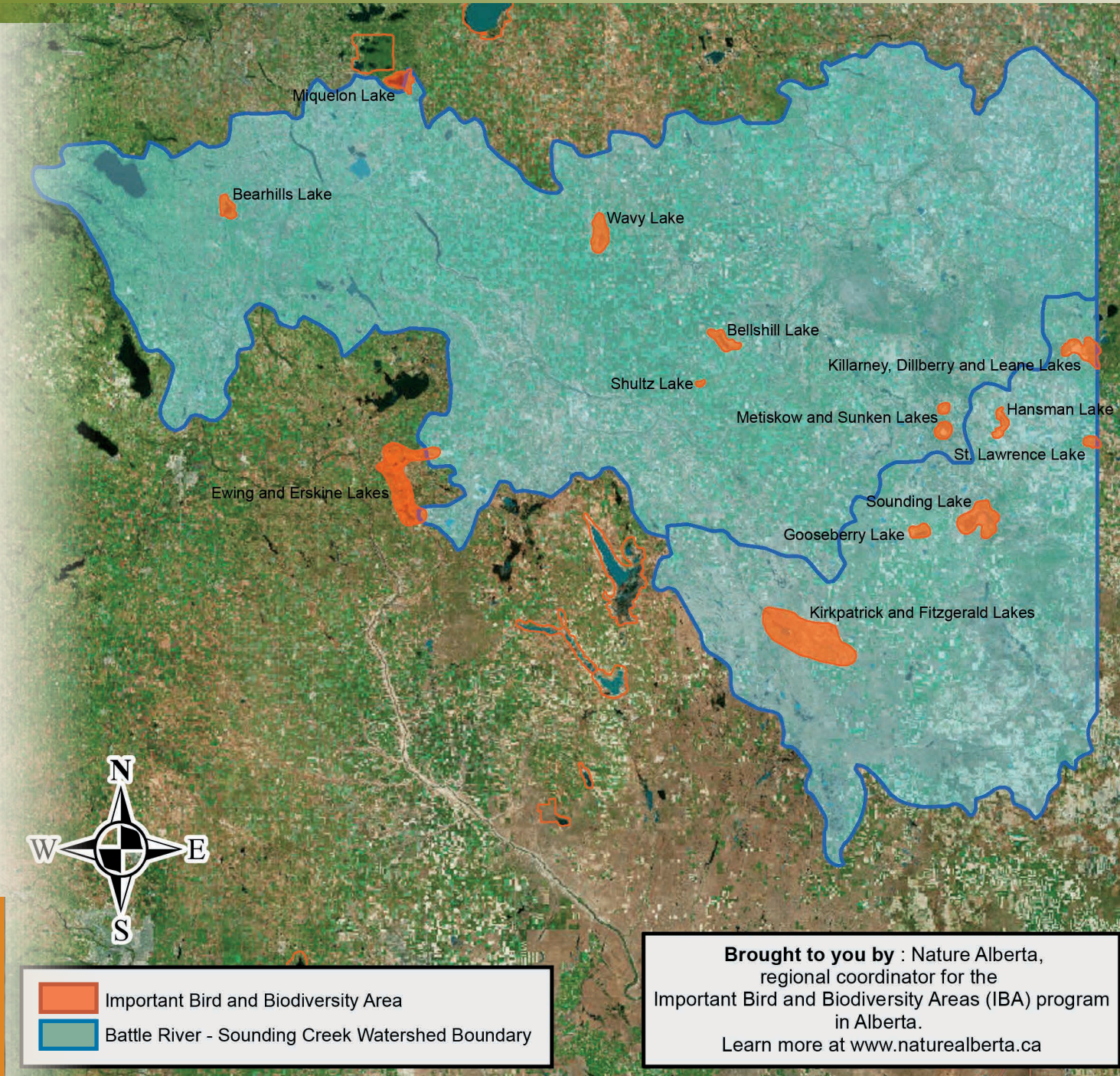
Bake for 15 minutes at 450 degrees Fahrenheit and then lower heat to 350 and bake for about 10 more minutes. A knife should come out clean 1” from the pastry’s edge.

WARNING: Rinse thoroughly. Like spinach, lamb’s quarters contains oxalic acid so some suggest it should be eaten in moderation, cooked or prepared with lemon to neutralize some of its acidity. Seeds should be cooked or dried. Lamb’s quarters is not recommended for pregnant women.



The Important Bird Areas (IBA) program was a global initiative that began in the 1980s. About 90% of Alberta’s birds migrate and come to the prairies for nesting and mating season. By identifying important habitat sites, the program monitors gathering sites for waterfowl and shorebird populations.

*Below: A pair of avocets with rusty-red head feathers. This colouration only occurs during breeding season. Within a day of hatching, young avocets can swim and walk to escape predators. Photo by Allan Zimmerman.*



The American avocet is a shorebird noted for its striking red head and slender curved bill. The avocet prefers wetlands, ponds with cattails and sedges, and open mudflats for its habitat. Although found throughout the watershed, avocets are most common in the Grassland natural region. The avocet’s current status is secure.

*“[E]verything we do in and on the land inevitably winds up in the water, and then runs both by and through fish, they are sentinels for us, signalling the success or failure at managing watershed for health, integrity, and sustainability. They are our distant early warning signals. We should learn to watch for what they are telling us.”*

*Lorne Fitch’s “Two Fish, One Fish, No Fish—Alberta’s Fish Crisis”*

Harley Louis of the Montana First Nations at Maskwacis recalls fishing trips along the Battle River during the 1940s: “My grandfather took me down to the fish traps on the Battle River. We’d catch enough fish [goldeye] to fill our saddlebags and ride back for a big feed of fish with our families.”

Three decades later, biologist Dave Christensen of Alberta Fish and Wildlife had noted a change. In 1977, he canoed “across Alberta on the Battle River, catching fish, talking to people, and getting to learn how a whole ecosystem worked. Locals told me how the big runs of goldeye were almost gone and how you could only catch decent numbers below Forestburg. It was really evident that things were going downhill with big kills of pike in Dried Meat Lake, low oxygen levels in big chunks of the river, and listening to stories about the sad state of the river.”

Another three decades later, a fish-based study



Photo credit: Mike Sullivan

*As part of the IBI study in Ponoka County, Fish and Wildlife fisheries crew electrofish along the Battle River. Fish are sampled in order to determine the impact that watershed disturbance is having on fish biodiversity. Senior biologist, Jason Cooper, is driving.*

### 4 Cs OF FISH CONSERVATION

- COOL:** trapped rain or snow melt for later release & shaded areas due to vegetation are key to ecological integrity
- CLEAN:** without sediment, chemical or too many nutrients
- COMPLEX:** diverse habitat both in and near streams
- CONNECTIVITY:** ability to move between areas maintains genetic diversity

was conducted as an Index of Biological Integrity (IBI) for the Battle River. In the 2006-2007 study of the river, only seven goldeye were found along the 128 kilometre stretch sampled. The majority (80%) of the catch was white suckers and minnows. While white suckers are deemed a hardy fish, they were struggling with the river conditions, bearing lesions and abnormal growths. Provincial Fisheries Science Specialist, Dr. Michael Sullivan, said of the situation, “when [white] suckers are dying, you’ve got a real problem.”

Dr. Sullivan says that the the problems found in the Battle River’s fish are caused by multiple factors. These include deforestation, erosion of riparian banks, wetland drainage and nutrient inputs from farming. Forests and wetlands act as sponges that filter runoff and nutrients before they enter waterways. Without filtration, there is increased algal growth, known as eutrophication. This causes too much flux in dissolved oxygen within the water throughout the river, decreasing water quality and reducing species diversity. A study of the winter dissolved oxygen levels from February to March of 2010 noted that 9 out of 17 sites within the watershed had dissolved oxygen levels that are considered lethal to fish communities.

*Special thanks to Shane Hoveland who helped research and write this section.*



The Northern Leopard Frog is Alberta’s largest and most rare frog. Leopard frogs hibernate at the bottom of oxygen-rich ponds that do not fully freeze. They then seek warm, shallow water habitats for breeding and use open meadows or drainage ditches for foraging. The leopard frog’s diverse diet ranges from worms to fish to small rodents. Since the 1970s, their numbers have dropped significantly in Central Alberta. Reasons for declining numbers include small populations, habitats fragmented by wetland drainage, and disease from other frogs or fish.

Military bases like Canadian Forces Base (CFB) Wainwright develop environmental stewardship plans to ensure the longevity of their training grounds and local ecosystems. In order to help leopard frog populations, CFB Wainwright adapted the Alberta Northern Leopard Frog Recovery Plan. Once it was determined that the leopard frogs were threatened, their biology, population numbers and reasons for decline were studied. Then a recovery plan was established by a team of local stakeholders and experts.



Photo credit: Shane Mascarin  
*Northern Leopard Frogs are either green or brown and can measure up to 13 cm long. Females are generally larger.*



Photo credit: Shane Mascarin  
*View of the Battle River at CFB Wainwright. The river provides critical habitat that is helping northern leopard frog numbers bounce back.*



The northern leopard frogs’ thin skin helps them breathe. Because frogs are sensitive to weather changes, air pollution and chemicals, they are a good indicator of the health of an environment.

Methods for tracking numbers include spring calling surveys (both in-person and use of song meters that record during calling season). Visual surveys of adults and newly hatched young are also recorded and mapped. Recommended land use guidelines are implemented that restrict access dates and set-back distances. New sites are found on the base every one or two years, so the northern leopard frog’s recovery looks promising thanks to the CFB Wainwright’s oversight.

The American Badger is a member of the weasel family which lives throughout the watershed region in open grassy habitats. Badgers are 60-75 centimetres (23.5-29.5 inches) long and weigh between 7-9 kilograms (14-20 pounds). This stocky mammal has a triangular head, a brown and white-striped face and strong, short legs that are useful for digging. Badgers are nocturnal animals that hunt at night and dig elaborate tunnels that lead to their dens. In their dens, badgers store food, sleep and raise their young. They eat a wide variety of food, depending on what is available: birds, fish, plants, eggs, invertebrates and amphibians.

While badgers do not hibernate, they do put on extra fat in the fall and reduce their outdoor activities in the winter. They enter a state called “torpor” to conserve energy. Torpor is a form of temporary hibernation in which the badger’s heart rate and metabolism drops to half its usual speed and they can remain in this state for over a day.

The American badgers’ range has increased due to land clearing and development but their numbers have



Photo credit: Allan Zimmerman  
*Badger fat was considered valuable and was preserved by Indigenous peoples and Ukrainian settlers for chapped skin and cuts. Ukrainians mixed the fat with hot milk to cure whooping cough and numerous traditional cultures also used this fat as a remedy for tuberculosis.*

dropped. Trapping, fewer gophers for food and increased woody vegetation due to fire suppression has led to habitat loss for the badger.

The American badger tends to be solitary, except when breeding. An interesting partnership has been studied where badgers team up with coyotes to increase their chances of catching ground squirrels. The badger will flush out ground squirrels by digging and the coyote will use its speed to nab the rodents.



Labour and the economy play a critical role in our watershed. Key industries include farming, resource extraction, military, education, government and finance. In the face of technology and increasing globalization, some individuals within our watershed region have responded innovatively to the challenges they have encountered.

In 2003, Dennis Steil of Heisler came upon an item in the newspaper stating that Canadian National (CN) would be shutting down “the Alliance sub” rail line between Camrose and Alliance. Dennis called his old classmate, Ken Eshpeter, to tell him the news.

Within a few days the two men had gathered a group of concerned local farmers to discuss the matter. A number of farmers at this gathering decided to go to meet with a group of Saskatchewan farmers in the Eston and Laporte areas to see how they had dealt with a similar situation. The Saskatchewan farmers had joined forces to get service on their line by ordering producer cars through the order desk at the Canadian Grain Commission. The Canada Grains Act mandates that railways must spot (set out at specified points) producer cars for farmer loading.

This collective’s successful producer car group inspired the farmers between Alliance and

Camrose to start their own association. In the fall of 2003, the first fifty cars were spotted at the six towns along the line. This continued until 2008 when CN announced that it was going to discontinue service on the line. Rather than allowing CN to abandon the Alliance sub, farmers from along the shortline met and decided to buy the Alliance sub from CN, using a new generation co-op structure that includes farmers, citizens and businesses. The co-op sold shares and raised \$3.5 million; the majority of these shares are held by the 165 farmers who govern the operation. In June, 2010, the Battle

River Railway co-op officially began. The co-op moves about 1,200 cars per year, and doubled that amount in 2013-14 because of abundant crops. There are five grain handlers along the line: at Rosalind, Heisler, Forestburg, Galahad, and Alliance.

With the end of the Canadian Wheat Board in 2015, the Battle River Railway co-op formed its own grain company in 2017. The company buys grain from local farmers and blends grain to bolster overall grading qualities. This process is referred to as composite blending and helps ensure a consistent product for the end-user.



*Battle River Rail Board members cut the ribbon signifying the official grand opening after purchasing their first engine/locomotive. From left: Howard Vincett, Board Member; John Oberg, Secretary-Treasurer; Ken Eshpeter, Chair; Scott Jackson, Board Member; Dennis Freadrich, Board Member; and Reg Enright, Vice Chair. Photo taken Dec 14, 2010 by The Community Press.*

The town of Hardisty is largely supported by the oil and gas industry, boasting the biggest tank farm in Canada. The oil terminals are adjacent to the town’s core and operations are mainly devoted to what is known as the “midstream sector” of the industry. The midstream sector includes transportation, testing, treating, processing, storage and marketing of crude and refined oil products. At Hardisty pipelines and storage play a major part in bringing usable product to customers.

Gibson Energy has six decades of history in Hardisty. They built their first oil terminal there in 1957 and their interprovincial line helped move oil to eastern Canada. Since then, Gibson has built a fractionation plant that allowed smaller plants to have their natural gas liquids into separated into products such as butane, propane and ethane. Their lab personnel test the quality of the oil: heaviness, density, and dryness. USD Group is a US-owned company that provides all of the rail connections for



*Aerial view of the town of Hardisty with the oil terminals in the distance.*

Gibson and can load up to two 240 railcars of crude oil per day.

Hardisty mayor, Anita Miller, is the administrative supervisor at Gibson; it is her team’s responsibility to track the product that passes through Gibson’s facilities. Other behind-the-scenes work includes administrative personnel, marketing, logistics, maintenance, control room operators, and field operators.

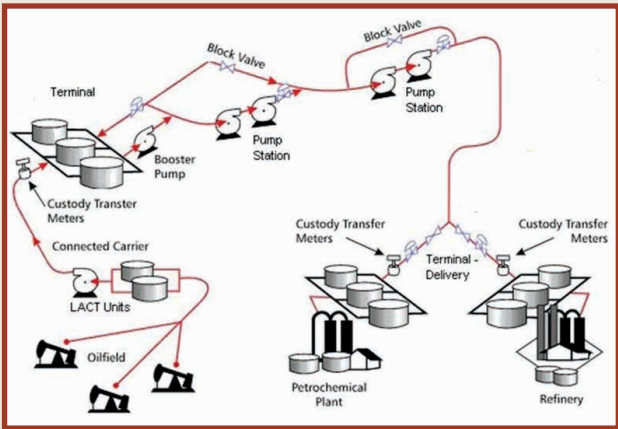
Enbridge has been present in Hardisty since 1952. In the summer of 2017, Enbridge began replacing Line 3 from Hardisty to Wisconsin and this has already doubled Hardisty’s population of 554. Enbridge is also the sole owner of the underground salt storage caverns at Hardisty.

These caverns can be used for storing oil, compressed air, wastewater and natural gas; the Enbridge salt caverns hold approximately three million barrels.

Inter Pipeline’s Cold Lake pipeline gathers bitumen produced in the Cold Lake region and combines it with a diluent before moving it to terminal hubs in Edmonton and Hardisty.

Flint Hills Resources and Husky Energy are among other companies that have terminals in Hardisty.

Various tradespeople service the plant, including millwrights, mechanics, instrument techs, and electricians. The oil and gas companies also hire contract trucking and hydrovac services.

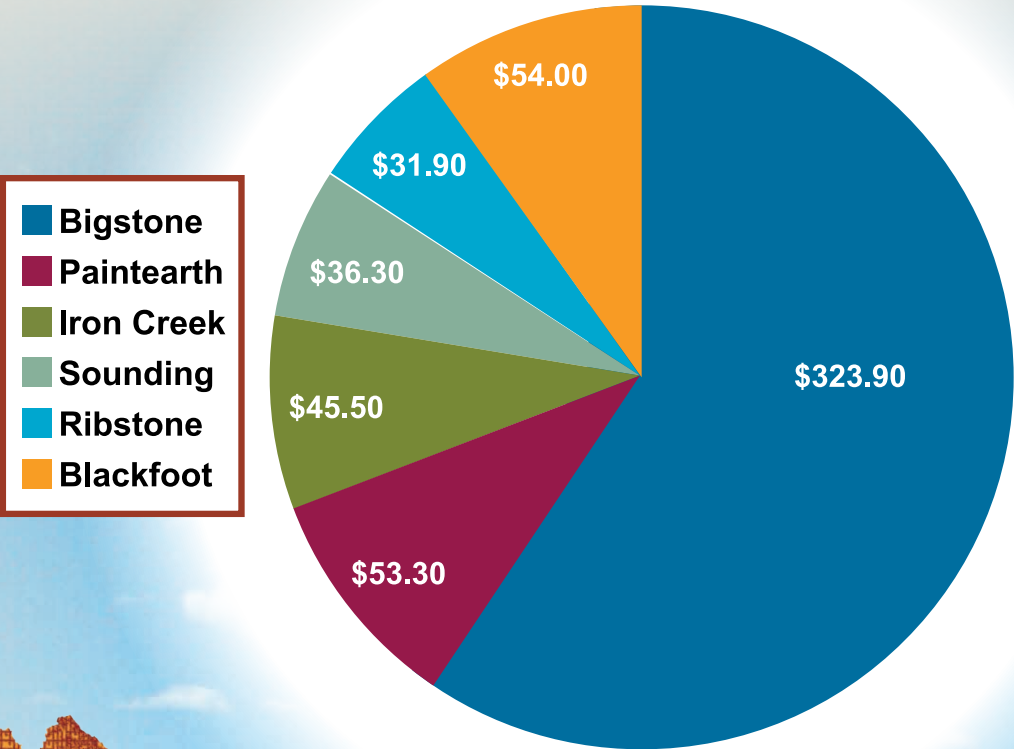


*Diagram gives an overview of oil production, transportation, and processing. Graphic courtesy of Enbridge Pipelines Inc.*

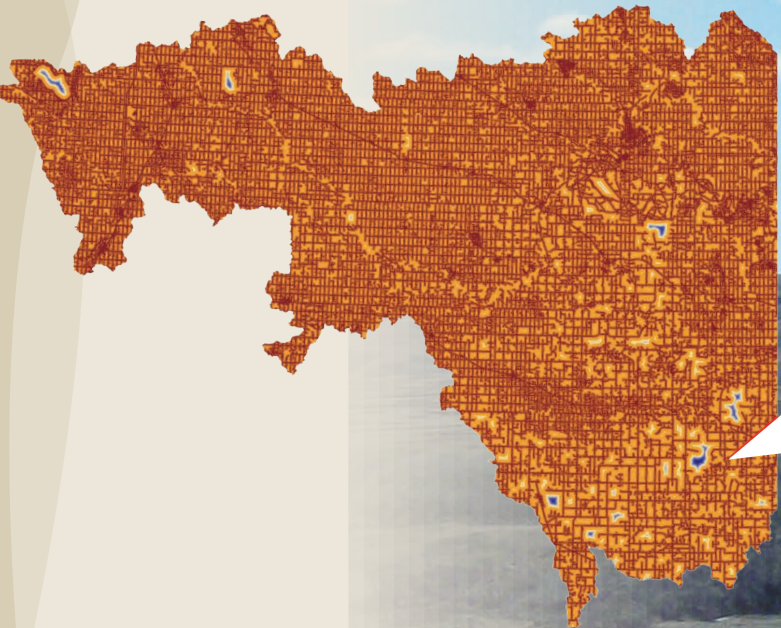


In the past, lakes and rivers were the primary means of transportation for First Nations and fur traders. Transportation routes are not only important for trade, but link people and communities. When the transcontinental railway was built, it connected small prairie towns with larger cities in central Canada and the USA. Highways and airways now facilitate faster and more varied means of getting people and goods around central Alberta.

Transportation and Associated Warehousing contributes \$544.9 million (5.7%) of the total value of economic activity in our watershed (reported as Gross Domestic Product).



Estimated contribution of Transportation to Gross Domestic Product by Subwatershed



This linear feature map shows the most remote location in the Battle River Watershed. It is 3.9 km away from any road or human settlement. It is found in the Special Areas, close to the Grassy Island Lake area.

Photo of Wainwright Trestle Bridge

A Timeline of Cars & Driving in Alberta

- 1901**  
Horse-breeder Billy Cochrane brings the first Locomobile car to Alberta.
- 1906**  
Alberta passes the Automobile Act. Speed limits are 10 mph in town & 20 mph in the country. The first full auto trip on the Edmonton-Calgary Trail takes 2 days.
- 1910-11**  
Car registrations rise 400% in one year and farmers are key players in the car-buying market.
- 1911**  
Alberta establishes minimum age limit for drivers – 16 for men, and 18 for women.
- 1918**  
Alberta has 29,000 licensed drivers.
- 1922**  
The provincial government agrees to share road costs with municipalities, paying 75% for main roads and 25% for “market” or district roads.
- 1927**  
First Road Reports are broadcast on radio.
- 1929**  
Having a driver's licence becomes mandatory.
- 1937**  
Driving exams are made mandatory.
- 1947**  
Oil is discovered at Leduc. Over the next 10 years, Alberta's provincial government spends \$280 million on highways and driver numbers rapidly increase.
- 1950**  
Construction begins on the Trans-Canada Highway. It is formally opened at Roger's Pass in 1962 and is the longest national highway in the world.
- 1977**  
Alberta's highway signs go metric.
- 1986**  
Seat belt use becomes compulsory under provincial legislation.
- 1992**  
The Reynolds-Alberta Museum opens in Wetaskiwin, showcasing former RCAF pilot and car dealer Stan Reynolds' car, agriculture and transportation collection (in partnership with the Alberta Government).
- 2009**  
Alberta has the highest number of light-vehicles in Canada at 1.87 vehicles per household.

A 1929 Model 56A Willys-Knight car (courtesy of the Reynolds-Alberta Museum)



Maudie Jackson of Galahad claimed to be the first female car dealer in Canada. Maudie was only 22 years old when her husband Charles died in 1919, leaving her to raise five young children alone on the farm. After her own crops were in, Maudie cooked for various work crews. Maudie opened a car dealership in 1928, selling Whippet and Willys-Knight cars and taking other cars in trade.





POPULATION DENSITY

Railways were the means for the Dominion to colonize and settle the territory of western Canada. Early population numbers were closely linked with the building of railways. As agriculture grew in importance, railways were increasingly important for the movement of crops across the continent.

The influence of the railways was a key factor in the settlement of the Battle River region. The Canadian Pacific Railway (CPR) came west to Calgary in 1883. The time-consuming route north to Edmonton by stagecoach prompted speculation about a railway between the two larger centres. An independent company called the Calgary and Edmonton Railway Company (C&E) completed the line in 1891 and leased its operation to the CPR. A trip that once took four days by stagecoach was reduced to twelve hours by rail and opened up both settlement and commerce along this corridor.

In 1911, the Canadian Northern Railway (CNoR) created its own north-south line to move coal between Edmonton and Calgary. This line was named the Battle River



*The Wainwright Railway Station, built in 1908. Early rail stations were the hub of commerce and a means of connection to the outside world through transportation and telegram. Stops, elevators and stations were placed 6 or 7 miles apart along rail lines because that was deemed a good distance for a farmer to travel carrying crops by horse and wagon.*

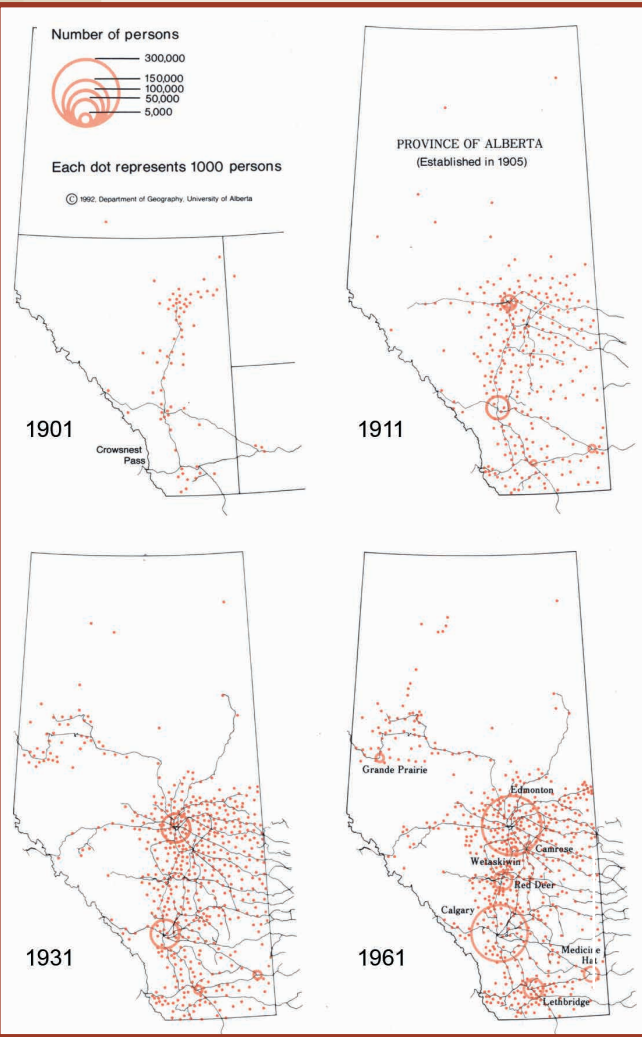
Subdivision and travelled south from Edmonton to Camrose, Meeting Creek, Donalda, and Stettler before diverting west to Calgary, just north of coal operations at Drumheller. The Grand Trunk Pacific (GTP) Railway’s trans-continental line was passing through Wainwright and Edmonton by 1909. From these three lines, branch lines were built throughout the watershed, allowing for settlement and transport of crops.

Farmers and the agricultural industry were a commercial and political force in central Alberta between 1900-1930. In the early 1930s, two-thirds of Albertans lived in rural areas and the majority of these residents were on farms.

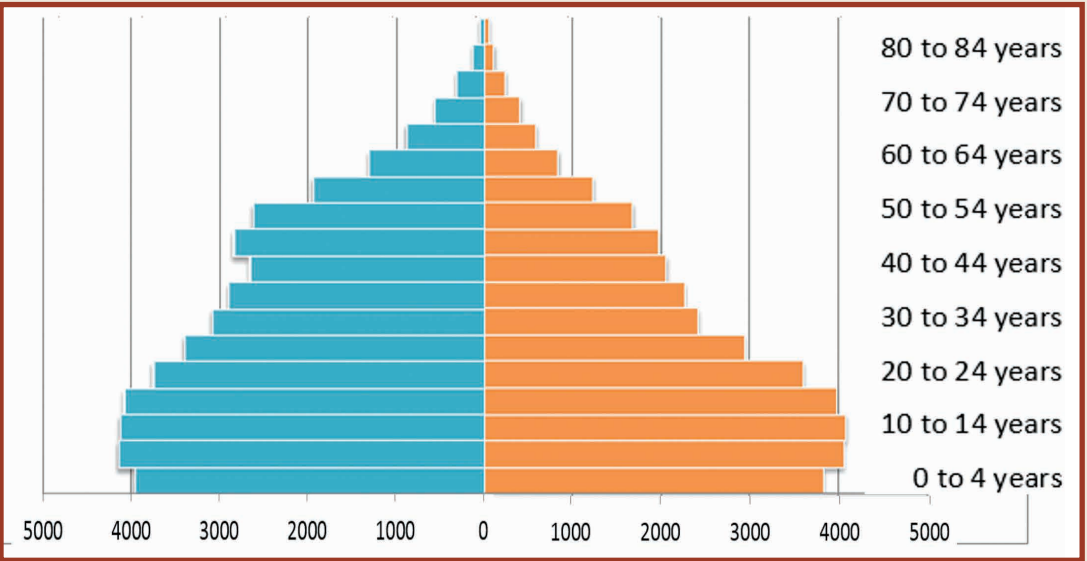
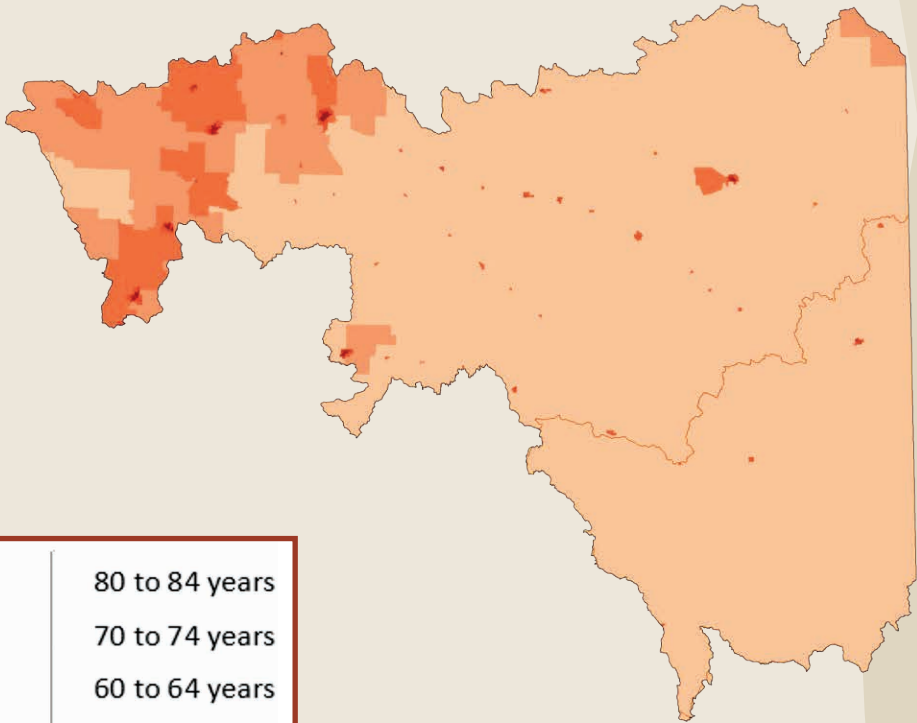
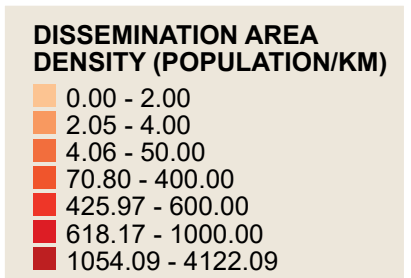
By the Depression, better cars and roads allowed rural people to travel greater distances to larger trading centres and trucks grew in importance for the transportation of goods. This resulted in the closure of stores and businesses in small towns, shrinking populations, and less reliance on railways.

Once oil was discovered at Leduc in 1947, resource towns grew rapidly. Still, the greatest growth occurred in the Edmonton-Calgary corridor and close outlying towns like Wetaskiwin and Camrose. With the Green Revolution following WWII, the family farm grew in land size, but decreased in population. By 1981, only 23% of Alberta’s population was considered rural and many of those living rurally commuted to urban centres for full time or part time work.

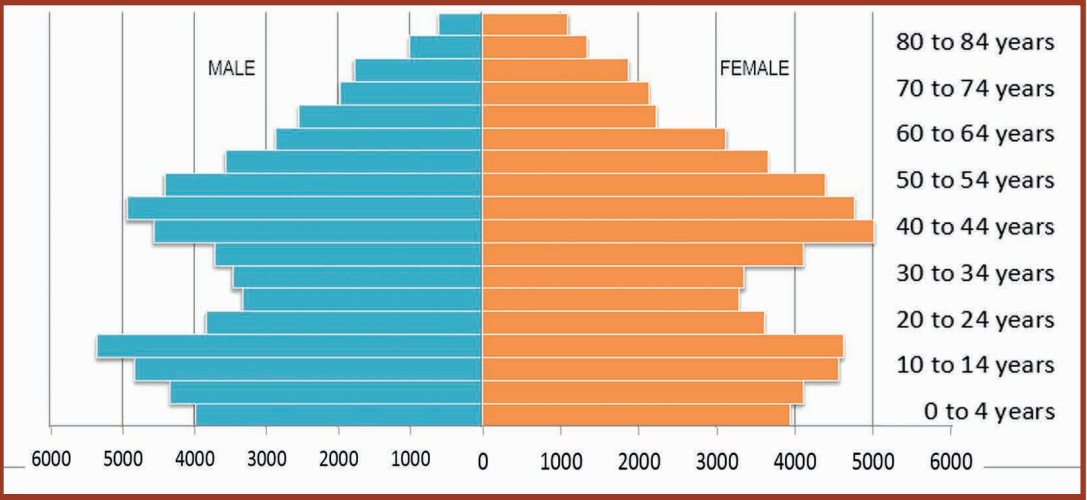
*Left: The maps track how the growth of raillines between 1901 and 1931 led to a great population boom along the Edmonton-Calgary Corridor and throughout central Alberta. Thirty years later, in 1961, population growth continued while raillines either shut down or showed little change due to the arrival of cars and road transportation. Image courtesy of Atlas of Alberta Railways, University of Alberta Press, 2005.*



POPULATION DENSITY



*POPULATION DENSITY 1936  
Canada = 0.9 people per km2.  
Alberta = 1.2 people per km2.  
Battle River and Sounding Creek Watershed = 3.9 people per km2.*



*POPULATION DENSITY 2012  
Canada = 3.7 people per km2.  
Alberta = 5.7 people per km2.  
Battle River and Sounding Creek Watershed = 5.1 people per km2.*

*These population profiles show the structure of the population according to age and sex. 1936 is above and 2012 is below*



Camrose, Wetaskiwin and Wainwright are the largest urban centres in our watershed and their population numbers continue to rise. All three cities provide services for a broad surrounding region. Balancing growth with quality of life is a major factor in urban planning and means ongoing adaptation for city planners and developers.

As the largest city in the region, Camrose is facing a growth rate of 1-2% per year. The city is building infrastructure that is greener, has greater longevity and requires less maintenance. While building Camrose’s new City Hall (completed in 2015), designers and planners embraced opportunities to utilize natural light and heat that would reduce the cost of heat and electricity. Camrose’s recreation centre had solar panels installed on its roof that will offset the cost of about 30% of the facility’s electricity.



The Viewpoint nursing home neighbours the University of Alberta's Augustana campus.



Camrose is one of the urban centres that continues to grow in our watershed. Among its perks are its green spaces and its accessibility to rural areas. Photo credit: City of Camrose.

Camrose is rethinking roadways as vehicle thoroughfares and seeing them as multi-use passageways for cars, bikes and pedestrians. Taking a cue from the trail system found in the Creek Valley, the city is working to create greater connectivity throughout the city with safe commuter paths for cyclists and a trial-run bus system which now operates four days per week.

A challenge for city planners is the balance between outward expansion and revitalizing existing urban areas. The neighbourhood adjacent to the University of Alberta’s Augustana campus is the subject of the Augustana

Neighbourhood Area Redevelopment Plan. This plan builds on services and infrastructure which are already in place in order to create a range of residential options that are sustainable, more densely populated and more affordable for a broader demographic. The redevelopment plan also works to preserve green spaces, minimize commercial development and create safer bike and pedestrian access within the neighbourhood and to the downtown core.

In new areas, the city creates catchment basins which help control flooding, remove pollutants and reduce erosion.

Changes in Population Numbers Between 1970 & 2011		
City/Town	1970	2011 (unless noted)
Camrose	8,892	18,044 (2016)
Wetaskiwin	6,456	12,621 (2014)
Wainwright	3,735	6,289 (2013)
County of Camrose	8,285	8,004
MD of Wainwright No. 61	4,454	4,138
County of Wetaskiwin	8,435	10,866
Coronation	1,111	947
Daysland	630	807
Killam	910	981
Provost	1,475	2,041
Stettler	4,381	5,748
Viking	1,193	1,041
Cereal	200	134
Czar	212	167
Donalda	247	259
Forestburg	698	880 (2014)
Heisler	199	151
Millet	475	2,092
Youngstown	357	178

The town of Millet is one of the small towns in our watershed that has grown substantially over four decades. Its proximity to Leduc, Edmonton and the airport make it a commuter town along the Edmonton-Calgary corridor. Millet combines affordable housing and small town culture with accessibility to employment opportunities in larger urban centres. In the 1970s, the development of the Moonen Heights subdivision along with acreage subdivisions provided more affordable housing for middle and working-class families and increased Millet’s population substantially.

Left: This chart shows how population numbers in urban centres have changed over four decades. At the top (in green), the three largest urban centres in the watershed: Wetaskiwin’s and Camrose’s populations have doubled since 1970; Wainwright has increased by 168%. In contrast, the population of the rural counties and municipalities that surround these sites (in yellow) have remained relatively stable. Towns and villages that have continued to grow include Daysland, Provost, Forestburg, and Stettler (in peach). Millet’s population has quadrupled since 1970 (in blue).

Aerial photo of the town of Millet. Eyot Creek (which joins Pipestone Creek) runs through the soccer field; Moonen Heights is seen in the background. Photo credit: Drone’s World Photography – Millet and District Museum and Archives.





The community of Maskwacis fully reclaimed its traditional name on January 1, 2014. Maskwacis means “bear hills” and is made up of the Samson Cree Nation, Louis Bull First Nation, Montana First Nation and Ermineskin Cree Nation. Residents and elders wanted to shed “Hobbema”, the English name given to it by Canadian Pacific Railway President in 1891. The community felt the name change re-establishes honour for the Cree language and was a step towards greater autonomy and respect.

Verlyn Olson recalls periodic criticism arising about the Hobbema designation when he was at meetings with indigenous leaders from the area. Then, the Samson Cree Nation (need to dbl-check) brought the issue of the name up in a more formal way. Initially, it seemed like it could be a complicated process, until the then Minister of Municipal Affairs, Doug Griffiths told Olson that it was as simple as having the local governing bodies pass resolutions to have the name changed.



Montana Cree Chief Brad Rabbit, Chief Rusty Threefingers of the Louis Bull Tribe, Ermineskin Cree Chief Craig Mackinaw and Samson Cree Chief Marvin Yellowbird sign the memorandum to reinstate Maskwacis' original name. Photo credit: The Wetaskiwin Times.

Dr. Shauna Bruno is an educator who resides in Maskwacis and is part of the Samson Cree Nation. She says that language and naming is an incredibly powerful and sacred act within Cree culture. She says that reclaiming a place's original name is a way of de-colonizing and redefining shared context and identity. She says that speaking and writing in their own language speaks to "the resilience of our own survival."

Ermineskin Cree Nation



Louis Bull Tribe



Montana First Nation



Samson Cree Nation



Mario Swampy believes that the themes of reconciliation and water have important links. Mario was born and raised at Maskwacis, but issues from his childhood took him down some bad roads. After going through rehab in 1994, he returned to work with young people in the Nipisikopahk (Samson) schools. His late mother (a retired teacher and principal) convinced him that there may be more potential to reach youth in their early years through education versus waiting until they’ve reached the stage where they need rehabilitation. After completing his degree in Sociology at Maskwacis College, MacEwan and U of A, Swampy worked as director of the Samson Youth and Sport Development Centre. He soon realized, however, that the underlying problems with the system were part of what was preventing real change. So, he made a bold step to run for Chief. Although he lost by a small number of votes, he is now serving his third term on Council at Samson Cree Nation.

When Swampy joined Council, he was ignorant about issues related to water. In 2009, Swampy’s childhood schoolmate, Danika Littlechild — an international lawyer and an indigenous water rights advocate — contacted Swampy to explain how water was a basic human and Treaty right and how the two must be considered when it comes to pursuing solutions at both the political and technical levels. Littlechild said that water was an issue that would have to be talked through by First Nations and the different levels of government both federally and provincially.

Swampy met with Murray Healy, who has a background in indigenous governance and holds a Class 2 Water License and was also working for



Photo provided by Mario Swampy

While in university, Mario Swampy recalls being frustrated about a historical event he was reading about in an article. He wrote in his essay, “But you can’t rewrite history.” His prof’s challenge made a lasting impact on Swampy. She asked him, “Why don’t you rewrite history?” So that is exactly what Mario Swampy is doing.

the Samson Cree Nation as lead water operator. He began educating Mario about the complex legal and technical sides of the water issue. The led to the creation of the Nipiy (Cree word for “water”) Committee, which considers all facets of the Medicine Wheel model when talking about water and future decisions. These include the spiritual-historical, the legal, the political and the technical aspects of quality drinking water.

Alberta water licenses are based on a premise called First-in-Time, First-in-Right, where those with longest term licenses (use in the area) are given priority in times of shortage. Under Treaty, no water licenses were issued to the province’s First Nations, so the conversation is still open about what level of license Alberta’s First Nations will be given. The Government of Alberta has suggested a piped-in solution for Samson Cree Nation, Swampy considers source water first and tapping into their existing aquifers and water supply before using regional or provincial water lines as viable self-sustainable solutions. He believes this will support his nations ability to have solutions that

work for the nation and move the nation away from the dependency model that many First Nations struggle with.

Two Master’s engineering students from U of A came to the Samson Cree Nation to do research that would help them attain their degrees. As part of their involvement with the Nation they were schooled in the historical and spiritual values of the Cree people and helped create a long-term water plan for Samson Cree Nation. Swampy recognizes that parallel processes need to be embraced. Moving forward, short-term, dependence-driven solutions will overlap longer term ingenuity that will provide a better model.

Swampy wants to see Treaty as an ongoing process of redefining and repairing a broken relationship. He believes that from the Treaty, there are workplans that can be created versus a top-down approach that can be irresponsible on both sides. He is currently in discussions with the province to amend laws and acts and bring healthier processes and technological solutions to water rights.



The conservation of land, habitat and species has a long history in Central Alberta. As early as 1911, Miquelon Lake was protected by local naturalists because it was considered an important bird area.

Protected Areas (PAs) are government designated places set aside for biological diversity, water quality, unique habitats and/or species and recreational opportunities. The Battle River watershed is home to six of Alberta's seventy-six Provincial Parks along with other types of PAs and conservation in the region. These include several Heritage Rangelands and one Ecological Reserve which are found in the eastern portion of the region. Conservation groups and various land trusts partner with local landowners to ensure the health of local ecosystems and species.

Melissa blue butterflies are one of over 500 butterfly and moth species found in Big Knife Provincial Park by Dr. Charles Bird. The male is light blue with black edges, while the females are brown with orange spots. The butterflies lay their eggs at the base of plants and then their eggs are cared for by ants. Melissa Blues prefer open prairie land and clearings and can no longer be found in some parts of Canada.



Butterfly photo courtesy of Dr. C. Bird. Big Knife Provincial Park in autumn with hoodoos in the distance. Photo courtesy of Sue Wolfe.

Big Knife Provincial Park borders the Battle River south of Forestburg. As part of the Gwynne meltwater channel, butte remnants and hoodoos are exposed at the surface in the southern end of the Park and long terraces flank the river's edge.

Although this part of the Battle River was the territory of the Blackfoot Confederacy, it also served as a corridor for other tribes. The Park got its name from a deadly fight between a Blackfoot warrior named Big Man and a Cree warrior named Knife. Explorer John Palliser is said to have noted the badland formations and coal seams when he camped in the Big Knife area in 1858. Following settlement, farmer Jack Nelson operated a commercial still in the area from the mid 1920s until the early 1930s. The still's location was undisclosed for many years, until a Park Ranger found it in 1965.

By the mid-1950s, part of the land was owned by Canadian Utilities. Other parts were privately owned and used for cattle grazing and camping. When locals began to talk about protecting the area, Parks Inspector C.H. Harvie recommended that the area be set aside as a park. The Alberta Government bought a parcel of land of 295 hectares on the edge of the Battle River near Forestburg in 1962.

While Big Knife is a mix of both the Parkland and Grassland regions, its climate has Grasslands' mild winters and dry summers. The Park's upland vegetation is a variety of mixedwood, open grassland and shrubs. The valley floodplain features old-growth White Spruce stands, with sedges and cattails lining the Battle River's banks. Recreation activities include fishing, boating, canoeing, camping, hiking and cross-country skiing.



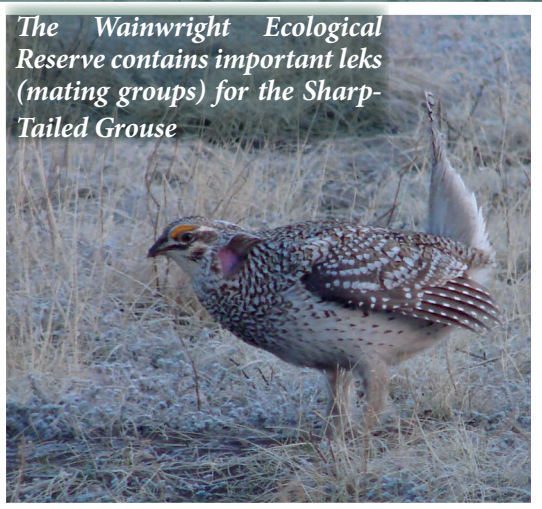
The Wainwright Dunes Ecological Reserve is a 28 square kilometre parcel of Central Parkland, uniquely situated on sand dunes. Protected in 1988, the Ecological Reserve is located just 40 kilometres southeast of the town of Wainwright, adjacent to the southern tip of CFB Wainwright. The public can access the area by foot only.

The Dunes were shaped by winds that blew surface sand continuously from the northwest, after glacial recession. Some dunes remain active and find new shapes, while vegetation has stabilized others. The area drains into the adjacent David Lake due to a large wetland inside the reserve. David Lake is a key staging area for waterfowl and this lake drains into Black Creek, which then feeds into Ribstone Creek, and later, the Battle River. Various types of fens, marshes and meadows also occur within the Reserve area. Sharp-tailed Grouse gather in leks (mating groups) on the Reserve for their mating dance.

In 1948, the Buffalo Park Grazing Association began to manage the land that is now part of the Reserve. After it was made into an Alberta Ecological Reserve in 1988, a team was formed to give oversight of the area. Besides the Grazing Association, this team also included numerous conservation and wilderness groups as well as Wainwright Public Lands. The Grazing Association keeps herds on land next to the Reserve until mid-July, when cattle are given access to the Reserve through the end of September. This is done in order to protect valuable riparian and beach areas that are used as nesting and staging areas for ducks and other migratory birds. Vehicle access is prohibited except for grazing management.

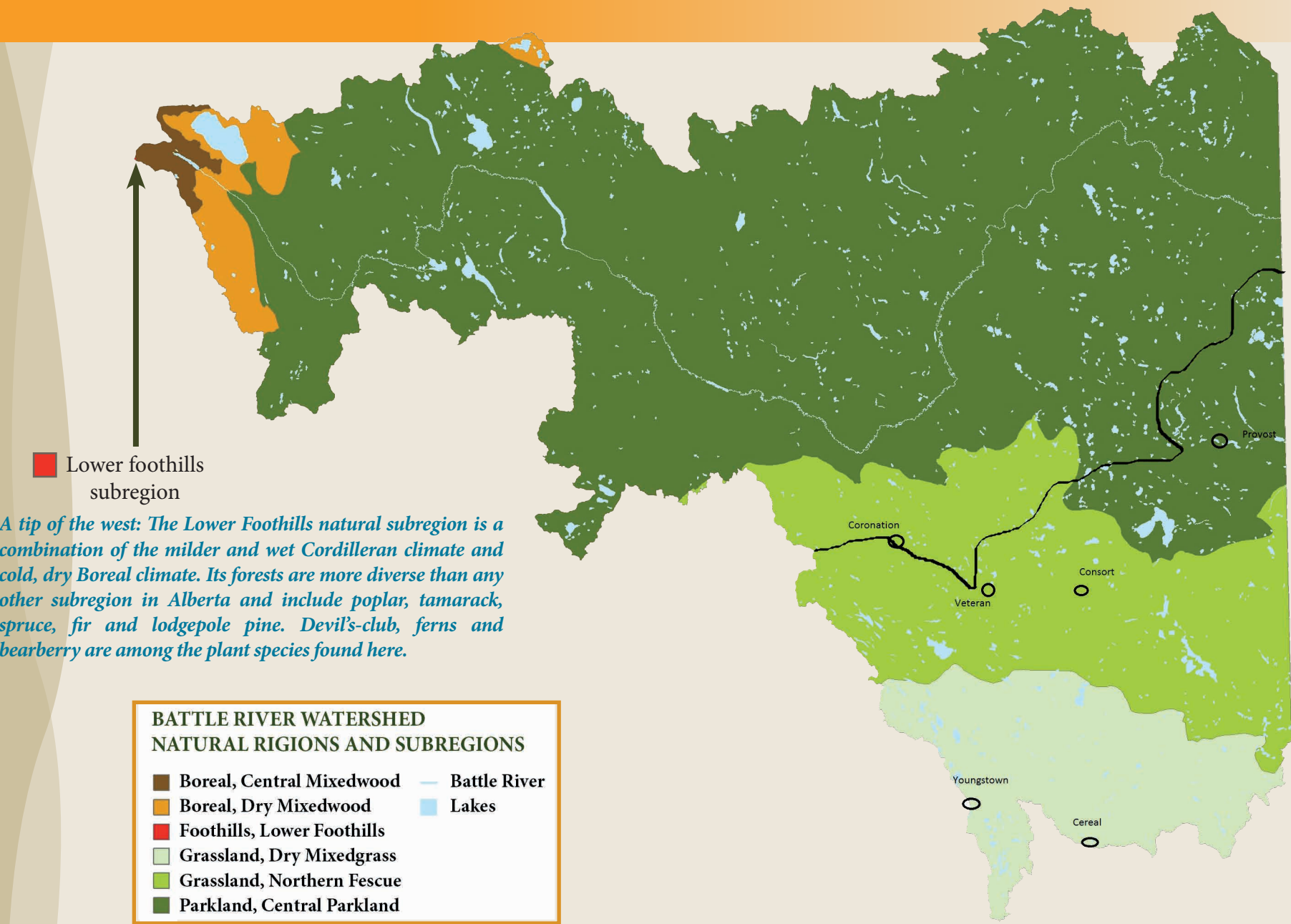
TOP CONSERVATION HONOURS  
IN OUR WATERSHED REGION:

The Beaverhills Region (which includes Miquelon Lake Provincial Park) was named a Biosphere Reserve by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in March 2016. Biosphere Reserves are recognized for their unique ecological features and creative stakeholder partnerships that promote sustainability.



The Wainwright Ecological Reserve contains important leks (mating groups) for the Sharp-Tailed Grouse





There are six Natural Subregions that make up our watershed, with Parkland and Grasslands dominating most of the landscape. The Central Parkland subregion forms a large east-to-west belt across the north of the watershed, while the Northern Fescue Grassland and the Dry Mixedgrass subregions occupy the watershed's southeastern areas.

The Boreal Forest region pushes into the west and northwest parts of the watershed. The Boreal Central Mixedwood is a very wet environment because fens and boggy areas make up over half of this natural subregion. The Boreal Dry Mixedwood is the southernmost Boreal subregion and has the greatest number of growing degree days.

The Northern Fescue natural subregion is the northernmost type of Grassland subregion. To the south, the Dry Mixedgrass is not only the driest of the Grasslands, but the driest natural subregion in Alberta.



*Landscape typical of the Central Parkland: rolling hills, patches of aspen trees and wetlands. Photo credit: Marilylle Soveran.*

Most of Alberta's Central Parkland natural subregion lies within the boundaries of the Battle River watershed. Grasses with large swaths of aspen forest break up this undulating prairie landscape in the uplands, and balsam poplar populate its lower, moister areas. Much of the Central Parkland subregion has been cultivated for wheat, barley and canola crops; remaining areas are used for grazing or resource extraction.

Two species whose primary range falls within the Central Parkland are the Franklin's ground squirrel and the piping plover. The Central Parkland shares many species with the bordering Boreal Mixedwood region to the north and west, including woodchucks and broad-winged hawks. Where the Central Parkland borders the Northern Fescue subregion in the south, the

thirteen-lined ground squirrel and the western meadowlark are among the regions' shared species.

The vital wetlands that make up about 10%

of the Central Parklands have given the subregion the title of being the "duck factory" of North America. The Wainwright Sand Dunes Ecological Reserve and Miquelon Lake showcase some of the unique geological features of the Central Parkland within our watershed.

In aspen stands, saskatoon bushes, wild lily-of-the-valley and chokecherries are commonly found in the understory while in the moister balsam poplar forest, red osier dogwood and high-bush cranberry are common companions.

The prairie vole is the only vertebrate species in Alberta whose habitat is found solely in the Central Parkland. The only known habitat for the Nevada buck-moth in Alberta is in sandy areas with aspen stands near Edgerton.



In a study of nineteen shrubs common to Alberta, wolf willow (or silverberry) was found to be valuable to both wildlife and birds. Silverberries are a staple food source for moose in the wintertime and the shrub's foliage provides cover for birds and small mammals. Historically, the bark was used by Indigenous peoples for making baskets, and its silvery seeds were used to create beads for necklaces.





## MAPPING OUR CONNECTION TO PLACE

In March of 2017, 10 watershed community members came together to create maps of their special places in the Battle River watershed. Their maps answered two questions: 1. “What places in the region are important to you?” and 2. “What personal values make them special?”. The map makers were given three weeks to create the beautiful and personal maps shown here. The maps are each unique; some used specific themes such as seasons, bike routes, or interconnections. Some focused on their home town, while others included areas outside our watershed borders. Each map showed a strong love and connection to this place.

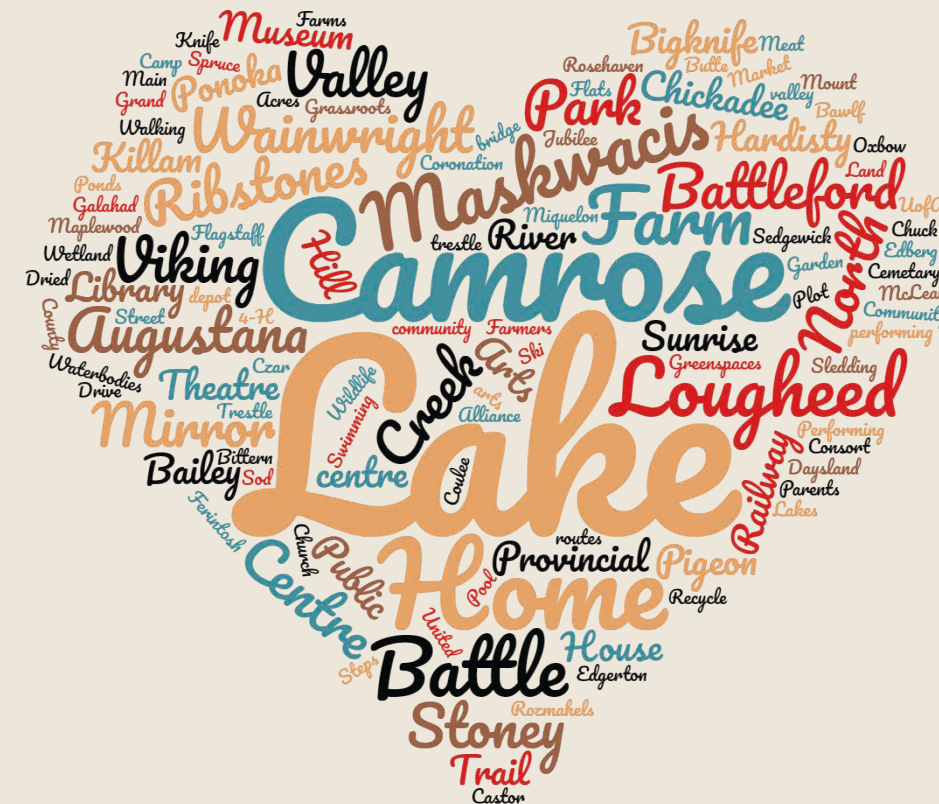


## PLACE & VALUES RESEARCH

These 10 maps told the Battle River Watershed Alliance two main things: what places in the watershed are most significant to the mapper's, and what personal values made them important.

Over 80 places in the watershed were identified and mapped; from parks and natural areas, to restaurants and theatres, to homes and farms. This word cloud used all of places included on the maps. The size of the word is in proportion to the number of times it was mentioned. For example, many people included lakes such as Battle Lake and Mirror Lake on their maps. Because the word lake was mentioned the most times, it is largest in the cloud.

Although many of the specific places would be different for everyone in the watershed, understanding the values which made them important are likely more common. That is why the mappers were asked to use a legend, or otherwise describe what personal values made the place important to them. According to these maps, there are 5 major themes to personal place connection, which represent 31 specific values (mind map image below). These values help the BRWA understand what forms a sense of love or connection to our watershed.



**Personal Place Connection** What do you love about living in your watershed? These 31 personal values (grouped into 5 themes) show what some community members value in this region.

### Activity one:

Choose one of the 31 values - what place do you go to which helps meet or fulfill that value? For example, what place do you go camping, or where do you feel a sense of community?

### Activity two:

Think of a place that you love- can you find the reasons you feel connected to it in this mind map of values? Does it fulfill one of these values?





Members of prairie communities value eating together. Midnight lunches at barn dances and church and community potlucks mean never going home hungry. Vast distances and long travel times between stops can mean roadside stopovers. Prairie diners have been mainstays for truckers moving goods and farmers hauling grain throughout central Alberta. Our modern convenience lifestyle means that eating and drinking often happen outside the home. Eating out ranges from comfort food to innovative ingredients that generate a local following.

Lacombe natives Hans Doef and his friend Dave Vander Plaat turned their passion for beer into a hip microbrewery. Partnering with four others who brought with them a range of skills and experience, they created their brewery and named it for the nearby Blindman River. Selling its first beer in 2015, Blindman Brewing is now a thriving business.

Doef and Vander Plaat value their small-town prairie roots. Doef’s view of work was shaped by the emphasis his parents (owners of Doef’s Greenhouses) placed on hard work and relationships built on trust. He and his partners support local farmers and businesses, and look for ways to give back to the community. In March,



A glimpse inside factory operations at the warehouse and brewery in Lacombe.

2016, Blindman Brewery was part of an event in Red Deer called “Cask Wars” where it won a local brewing contest. The brewery donated its winnings to the Mary C. Moore Public Library in Lacombe. Blindman Brewing also makes an effort to source local ingredients; for example, it purchases base malt from Alix and a specialty malt from Penhold. The brewery currently employs twelve full-time and three part-time staff.

In 2017, Blindman Brewery expanded its operation space and with funds raised through crowd sourcing, bought several 3000-litre oak barrels (“foeders”) from France. Blindman Brewery now produces five mainstay brews and two summer seasonals.



Blindman Brewing co-owners: Dave VanderPlaat, Adam Campbell, Shane Groendahl, Matt Willerton, Kirk Zembal and Hans Doef.



The tasting room at Blindman Brewing. Local ingredients include base malt from Alix’s Rahr Malting, 40 km east of Lacombe.

Chris and Beverly Van Hoek have owned Czar’s Fireside Grill since 2004. In 2012, the Van Hoeks added a lounge to their restaurant and were asking themselves how they could draw more customers. When they heard about an Edmonton restaurant that was dabbling in wild and exotic burgers, they decided to branch out from beef to more unusual burger fare.

Two days into a trial-run of kangaroo and alligator burgers, the exotic meats were selling out. The couple figured they were onto something special, so they began bringing in other meats.

While the beef and yak are locally sourced, most of the meat is bought through suppliers in Edmonton and BC. Frog comes from as far afield as Thailand and the crocodile is imported from Australia.



It is sometimes a guessing game as to what will sell well. Of the exotic fare, kangaroo is the top seller and water buffalo also does well. Sandbar shark and mahi-mahi were a success, but rabbit was not a hit.

The Van Hoeks were initially leery about requests for horse meat, because Czar is located in the heart of cattle ranching country. When they did finally bring some in, it was well received. Beverly says they have had requests for dog, lion and giraffe, but government regulations do not allow these foods across Canadian borders.

Those with traditional burger tastes need not fret over finding a good meal. For the timid palette, there are the more typical beef and bison offerings. For those who prefer something local with a gamier taste: elk, wild boar and red stag are frequently on the menu.

Left: Sarah Skinner enjoys a burger at the Fireside Grill. Right: Yaks are sourced from Feed Me Farms (Vance and Tammi Rendle and family) of Lloydminster. Photo courtesy of the Rendle family.



Above: Chris and Beverly Van Hoek stand next to the burger menu at the Fireside Grill in Czar.





For more than a decade, prairie painter Adeline Rockett found inspiration in the colour, shape and seasons of the Battle River landscape.

Born in 1929, Adeline Rockett is a prairie artist who has drawn lifelong inspiration from water and landscape. Adeline calls herself “a water person” and remembers her father giving her her first watercolour classes at six or seven years of age. Adeline’s father instilled in her a love for observing the water as it melted in the spring along the banks and in sloughs. As an adult, Adeline trained and then taught at the Universities of Saskatchewan and Alberta and did workshops at the Banff School of Fine Arts. Using both watercolour and acrylic media, Adeline’s work focuses on close observations of light’s effect on the natural world -- particularly water — in its various states.

Adeline’s fascination with the Battle River landscape began while she was teaching with U of A’s Faculty of Extension. Part of her work involved travelling to towns across the province to teach art classes. Shorter days and hazardous road conditions often made travelling difficult, so Adeline opted to stay overnight following one night class in Donalda. When she drove back the following morning, she was delighted by the autumn colours and the intriguing cone-shaped landforms that surrounded her. This badland landscape in close proximity to



*Adeline Rockett at work in her earlier years. She says her preferred easel for painting outdoors was an ironing board. Her favourite times to paint are early spring and autumn. Photo courtesy of the artist.*

Edmonton compelled Adeline to return for further exploration.

Meanwhile, a friendship had formed between Adeline and painter Evelyn Vikse through the art classes in Donalda. The two women began to travel throughout the area and painted the Battle River from many viewpoints. Adeline took photos and created quick watercolour sketches; she collected rocks and lichen in order to capture the essence of the forms and colours. In the winter, she would create larger acrylic and watercolour pieces based on her preliminary works. Artist and professor Keith Harder describes Rockett’s work as part of a landscape tradition that grew out of the Group of Seven nationalism; this was paired with a modernist approach in which the details and sense of place are important.

For Alberta’s 75th anniversary in 1980, Adeline displayed twenty-five paintings in

an exhibit called “Celebrate Alberta: The Battle River Series”. The area that most intrigued Rockett was between Dried Meat Lake and Alliance, but she painted as far east as Battleford, where the Battle River meets the North Saskatchewan River.

Adeline was one of 25 Canadian watercolourists chosen (along with 25 American and 25 British) for the “International Waters” show which toured throughout North America and the UK from 1991-93. She also won the Millennium Art Competition and this work remains at the Conservation Hall of Fame in Ottawa. This award is given to individuals who have fostered an environmental ethic at a national level. Adeline Rockett has had over forty solo exhibitions and participated in many group and travelling exhibitions.



*Adeline Rockett. "Spring Thaw - Battle River" (c. 1980). 22.5" x 30", watercolour on paper.*



The Palace Theatre in Daysland has been entertaining audiences for almost seven decades. More than just a movie theatre, it now hosts a wide array of performers and entertainment — both local and international.

The Tury family came to Canada from Czechoslovakia and operated the Riverside Coal Company at Heisler in the mid 1940s. After the mine closed, the Turys left Heisler and moved north to Daysland. In 1952, the Tury family built the Palace Theatre in Daysland and parents Steve and Maria used the upper floor for their living quarters. The theatre opened with a screening of the family classic, “Snow White”; ticket proceeds were donated to the town. A decade later, the Tury’s son, Steve, and his wife, Olga, took over the theatre and kept it running for more than three decades.

After Steve and Olga retired in 1996, they were unable to sell the theatre. Locals wanting to preserve the theatre founded the Daysland and District Cultural Arts Society (DaysArts) in 1999 and persuaded the Town of Daysland and the District Agricultural Society to buy the building. In return, DaysArts leases the theatre and oversees all of its operations and maintenance. This non-profit theatre is a success story due to fundraising, grants and local generosity and is run entirely by volunteers - from concession workers to projectionists. In



Above: The Palace Theatre in 2017. Right above and below: The original 1950s theatre and a 1966 movie calendar.

2013, over \$100,000 was raised to install a new projector and an updated audio system.

The Palace hosts a series of six concerts between November and April, showcasing live performances of dance, drama and comedy and a variety of musical genres. Numerous local drama groups perform at the Palace and a non-competitive, inclusive dance school for children called Kamotion is currently

run at the theatre. School groups attend the theatre for live performances and special film screenings. Besides regular movie screenings for eight months of the year, the Palace has monthly screenings of Indie, Canadian, foreign or documentary films, known as Reel Alternatives. The Summer Theatre Arts program runs summer camps for kids that include dance, art and science themes.

Author Aritha van Herk says that central Alberta has a beauty and quiet intensity that does not exist in any other part of the province. It is a landscape that van Herk knows well. She was raised on farms near Wetaskiwin and Edberg by Dutch immigrant parents, and says that the generosity of her rural community enabled her to accept and practice her difference. van Herk loved to read as a child and life on the farm gave her the freedom to move between the inspiration of the outward, natural world and an imaginative interior world.

van Herk recalls a pivotal moment in her first Canadian Literature course, while studying English at the University of Alberta. As she read a scene from Robert Kroetsch’s *The Studhorse Man*, it mirrored the same scene of the High Level Bridge which van Herk could see from her own apartment. van Herk knew then that she would not need to move elsewhere to find material to write. She told herself, “My world deserves a story.” van Herk began working on a novel for her MA thesis and *Judith* (1978) won the Seal First Novel Award, giving her international exposure. Just as *Judith* explored the struggle of a young woman caught between her urban life and returning to the country to run the family pig farm, van Herk’s novels often feature female protagonists who defy convention.

In the late 1990s Penguin Press asked van Herk to write a history of Alberta from the perspective of a novelist, not a historian. As van



Photo credit: Trudie Lee photography

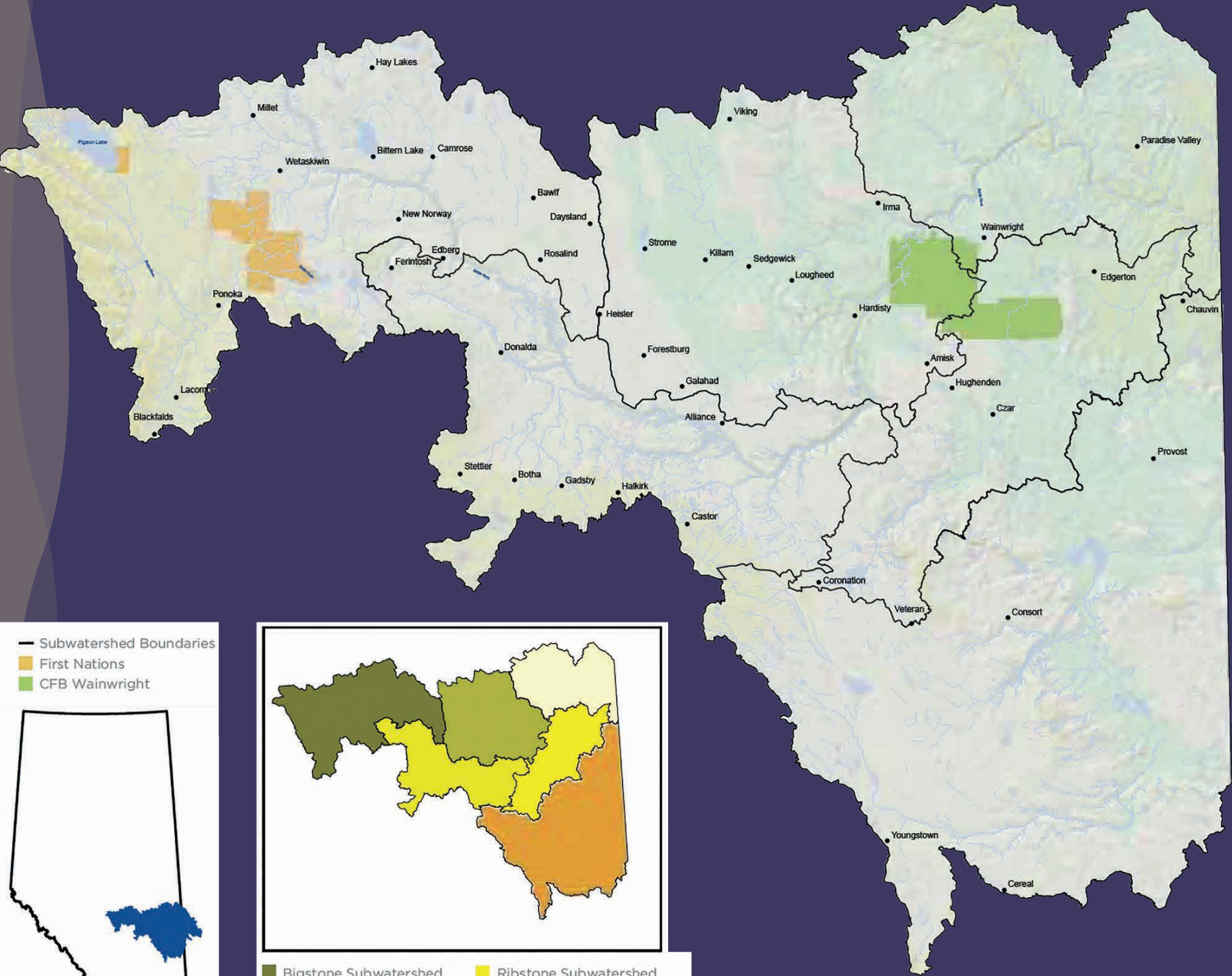
Herk began to read on the topic, she felt like she had been “dropped into the greatest tall-tale in the world. I was completely hooked.” She believed that *Mavericks: An Incurable History of Alberta*, would help explain Alberta to the rest of Canada. Instead, she found the book was mostly overlooked by other provinces, but Albertans loved it. *Mavericks* also won the Grant MacEwan Author Award in 2007. The Glenbow Museum in Calgary then worked with van Herk’s concept to highlight forty-eight innovative Albertans in a permanent exhibition called *Mavericks*.

After working as the Calgary Stampede Artist-in-Residence in 2012, van Herk wrote

Stampede and the Westness of West. The book is a prose-poetry exploration of the history and present of the west, mediated through the iconic Calgary Stampede; it creatively combines her interest in fiction, narrative, and history. van Herk was inducted to the Alberta Order of Excellence in 2011 and currently teaches creative writing and Canadian Literature in the University of Calgary’s English department.

“Our stories are markers of our difference, our originality and our imagination. They’re key to identity. If we don’t know our stories, we don’t know who we are.”  
- Aritha Van Herk





Watersheds come in a variety of sizes, from very large to very small. A subwatershed is a watershed within a watershed. Like Russian nesting dolls, a smaller watershed fits inside of a larger watershed. The water from a subwatershed flows into that of a larger watershed.

For example, the Battle River watershed is a subwatershed of the North Saskatchewan River watershed, which is in turn a subwatershed of the Saskatchewan River Basin, which is also part of the Lake Winnipeg Watershed. The Battle River Watershed also has smaller subwatersheds within it.

The Battle River Watershed has five subwatersheds (west to east): Bigstone, Paintearth, Iron Creek, Ribstone, and Blackfoot. These watersheds all collect water from the land and drain them into creeks, rivers, lakes, or wetlands. The water in their rivers all flow into the Battle River.

You could look even closer to find smaller subwatersheds even within these subwatersheds! For example, the land around Pigeon Lake, the Pigeon Lake watershed, is a small watershed inside of the Bigstone subwatershed. Just like the nesting dolls, the watersheds just keep getting smaller and smaller!





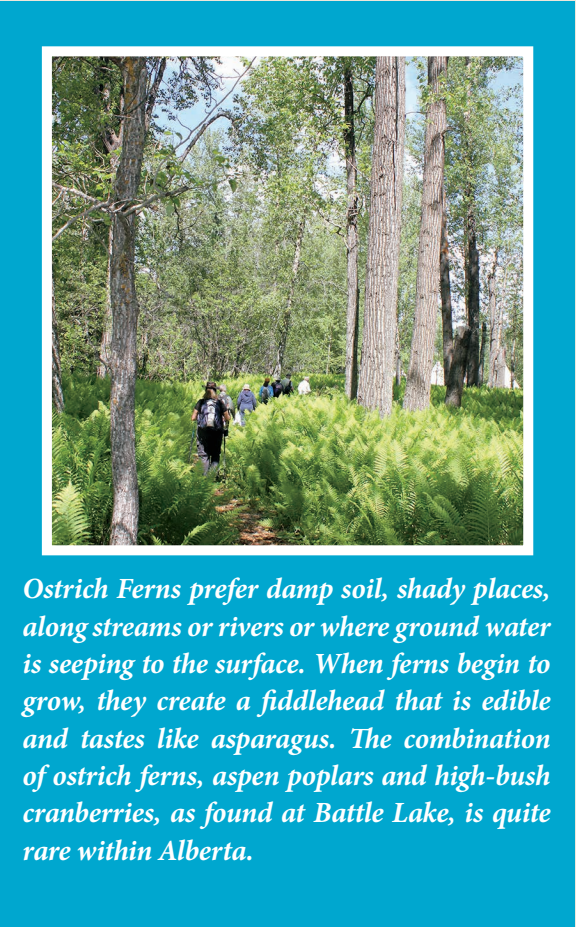


Battle Lake is about 6.4 kilometres long by 0.7 kilometres wide (4 miles by less than 1/2 mile). At its deepest, it is 13.1 metres (43 feet) and its mean depth is just over half that amount. It has over fifteen fewer frost-free days than the City of Wetaskiwin, less than an hour to the east. Its Boreal Mixedwood conditions attract game and larger wildlife more commonly associated with Boreal or mountainous regions. These include moose, elk, deer, black bears, cougars, bobcats, osprey, muskrats, and beavers. It is also a good place for fishing.

In the early 1970s, the County of Wetaskiwin asked the Battle River Planning Commission to draw up a land-use plan for the area surrounding Battle Lake. After the Commission wrote to Battle Lake landowners for their input, local landowners created a document to persuade the Government of Alberta to turn the area into a Provincial

Park. In contrast to Pigeon Lake's intensive-use mandate, Battle Lake residents proposed limited development and low-impact public access that featured Mount Butte. Alternative suggestions included turning the area into a game reserve.

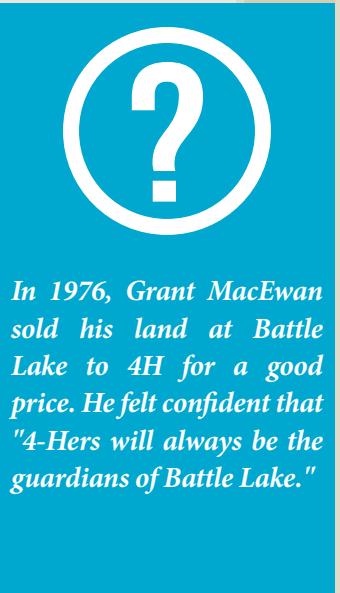
Battle Lake was designated as a Watershed Protection District by the County of Wetaskiwin in the late 1970s. The purpose of this designation is to maintain ecosystem health that includes water quality and habitat protection. Landowners are not allowed to remove more than 20% of the natural vegetation, in order to protect wetland and recharge areas. Lakeshore properties have to be a minimum of 10 acres and lots cannot contain multiple dwellings without special approval. There is a speed limit of 12 kilometres per hour for power boats on the lake in order to keep noise pollution, erosion and bird nest disturbance to a minimum.



**William and Asta Loov moved from Sweden to Canada in 1927.** In the summer of 1933, William Loov moved his family from Calgary to a quarter section of land on Mount Butte, at the northwest end of Battle Lake. William bought slabs for a house from one of the local mills and paddled them back to the other side of the lake by boat. The birch roof was covered in sod that grew dandelions and pigweed every summer. Asta began a garden on a plateau and the whitefish from the lake provided staple protein. Rabbits

and partridge were common fare and Asta made delicious pancakes fried in porcupine lard. Sunburst Motor Coaches began running a daily line between Wetaskiwin and Winfield. Asta and her two oldest children packed up her vegetables every Monday, Wednesday and Friday and took them to the Market Garden at Ma-Me-O Beach. The Loovs bought more land at the end of the lake with insurance money from Sweden. Here, they expanded their garden to 5 acres along the lake and moved their produce by boat. When Asta

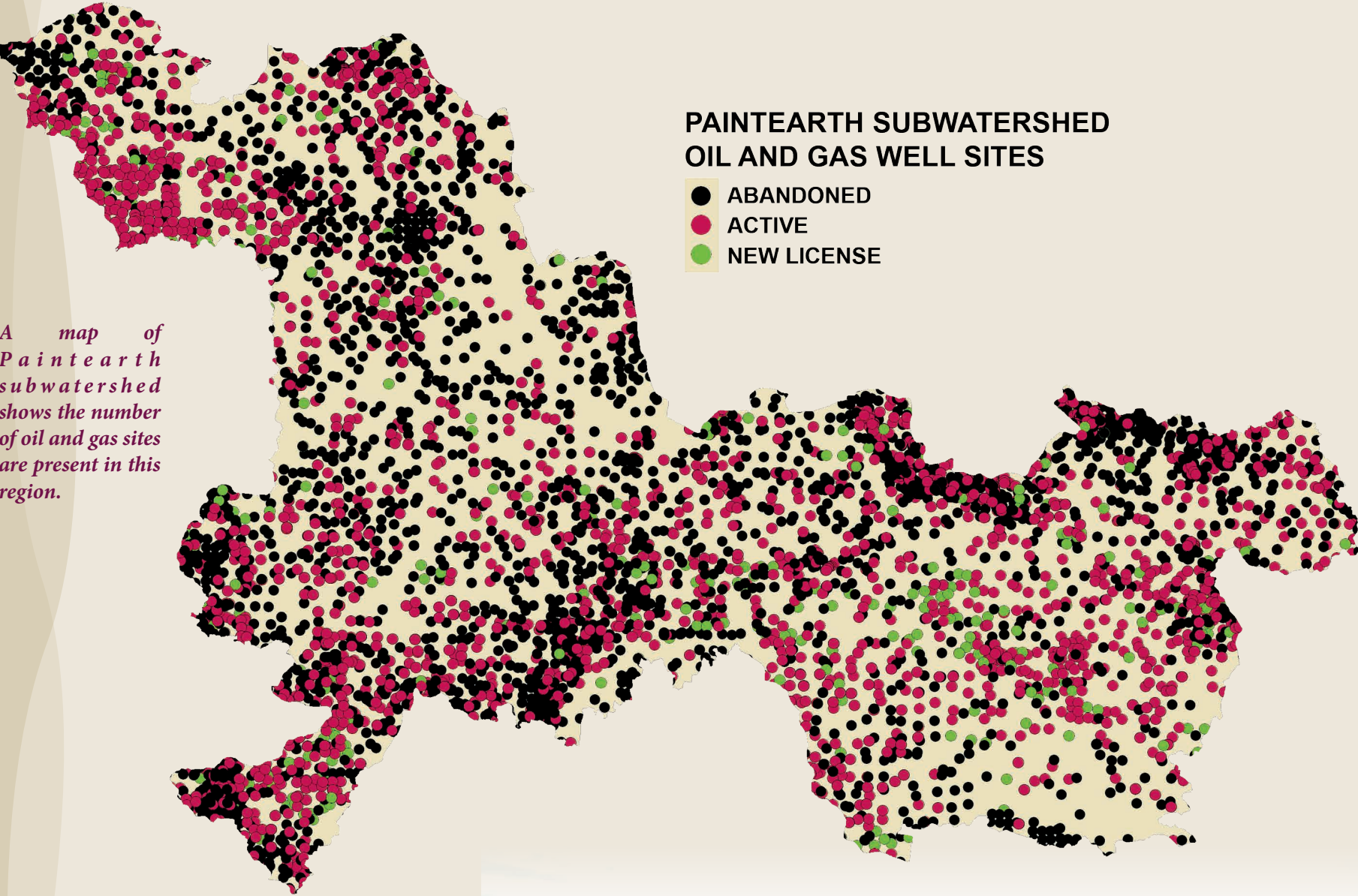
went off to fetch springwater, a host of animals would fall behind her in a line. According to daughter Solveig, although Asta made the best of living in isolation, she missed her family back in Sweden desperately and the rugged conditions took a toll on her health. The Government of Alberta bought some of the Loov land in 1993 and placed a plaque there to commemorate William and Asta Loov, who had moved there 60 years prior.





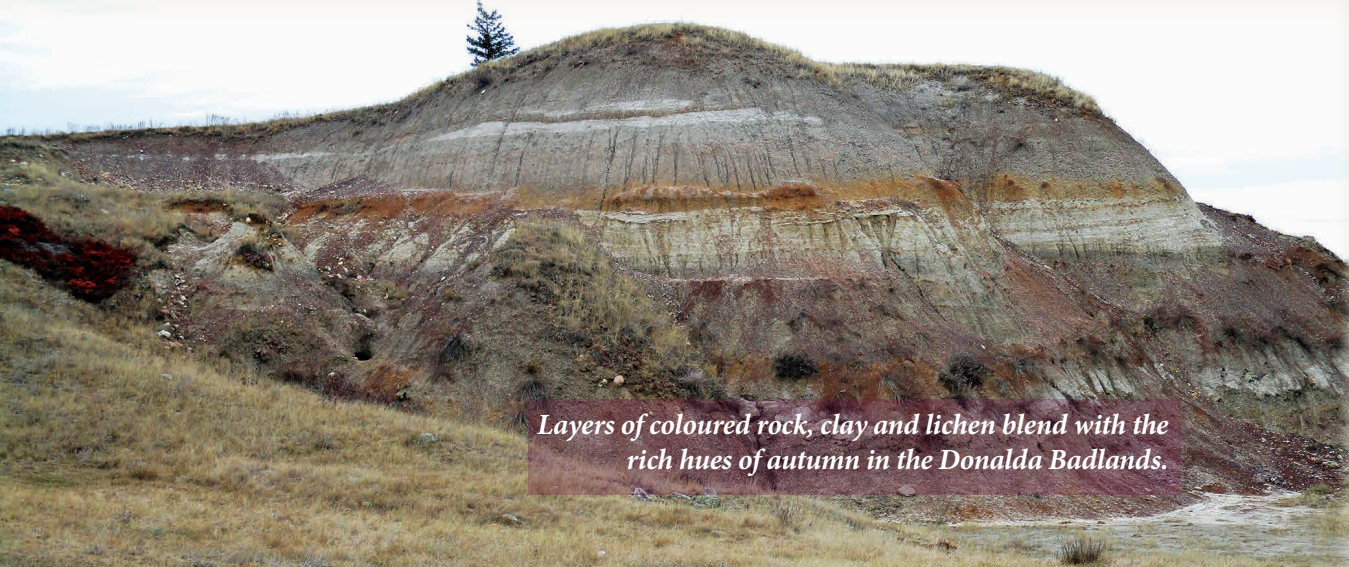
PAINTEARTH SUBWATERSHED

Indigenous peoples came to the colourful badland formations of Paintearth country to gather clays for making paint. Not only rich in coal, this subwatershed is rich in oil and gas resources, intriguing landscapes and early entrepreneurs.



A map of Paintearth subwatershed shows the number of oil and gas sites are present in this region.

Paintearth subwatershed is a landscape rich in colour, coulees and canyons. The Donalda badlands, Willow Coulee, Meeting Creek and Big Knife Provincial Park are some of the natural highlights found in this region. Its hoodoos and landforms have inspired artists such as Adeline Rockett and W.H. Webb. The bentonite clay mineral springs found at Meeting Creek once drew visitors to the area for a dip in the steam bath that was believed to have healing properties.



PAINTEARTH PERSPECTIVES

Early Chinese restauranteurs had to work long hours for little money and faced racism or violence, but saw it as the best opportunity for independence and livelihood. Chinese restaurants represented more than just jobs to immigrating Chinese; they offered a safe place to learn the ways of their new home and culture. They were also a place where children and people of diverse backgrounds were welcomed and treated fairly.



Right: Club Cafe owner, Harry Poon operated the business with his wife, Star. Harry became Canada's first Chinese town councillor in Stettler. Above: Old menus The 1920 Christmas menu featured Stettler sugar-cured ham, mutton with red currant jelly and Yorkshire pudding.



Photo & menus courtesy of Stettler Town and Country Museum

Male Chinese settlers came north to Alberta after the Montana gold rush, finding work as cooks or houseboys. The early years on the prairies were difficult for Chinese residents. In 1892, several cases of smallpox in Calgary were blamed on a Chinese laundry worker. The incident sparked three weeks of violence and rioting against Chinese and the NWMP were brought in to prevent further attacks. A head tax was first imposed in 1885 to slow Chinese immigration. By 1903, the Head Tax was raised to \$500, equal to 2 years' wages for Chinese labourers. Many of these "married bachelors" had wives back home but immigration laws made it difficult for the women to be brought over. Even by 1911, only 3 of the 1,787 Chinese in Alberta were women. The Press spread negative stereotypes, criticizing Chinese bachelors for their gambling, drinking and unclean living conditions.

In 1923, the Chinese Immigration Act (now known as the Chinese Exclusion Act) barred all entry of Chinese into Canada. After WWII, Canada signed the UN's Charter of Human

Rights that allowed Chinese to not only immigrate, but become residents of Canada. In 1976, the Immigration Act created a new "business class of immigrants". Between 1983 and 1996, this brought 700,000 Chinese business people to Canada, mainly from Hong Kong. Small towns like Daysland and Stettler have had Chinese restaurants since their early years. By the 1970s, travellers and locals recognized Chinese cuisine as part of the prairie food repertoire. The exotic experience of "the Orient" had mostly ended by the late 1980s, when a more authentic form of Chinese food was introduced by the new wave of Chinese immigrants.



Small towns like Daysland and Stettler have had Chinese restaurants since their early years. The Club Cafe was opened in 1920 by Harry's father and been a part of mainstreet since the 1920s.

Harry Poon came to Stettler in 1920 at age 13. His father, Poon Yick, had come on his own a decade prior to make a better life for his family back in China. Harsh immigration laws did not permit Poon Yick to bring his wife to Canada but allowed him to send for his son. By the time Harry arrived, his father operated a small laundry and had just opened the Club Cafe on Stettler's main street. Harry was given the job of dishwasher the night he arrived. Harry later returned to China to teach English but his father's health brought him back to Stettler in the mid 1930s. Harry operated the Club Cafe with his father while raising six children in Stettler with his wife, Star.

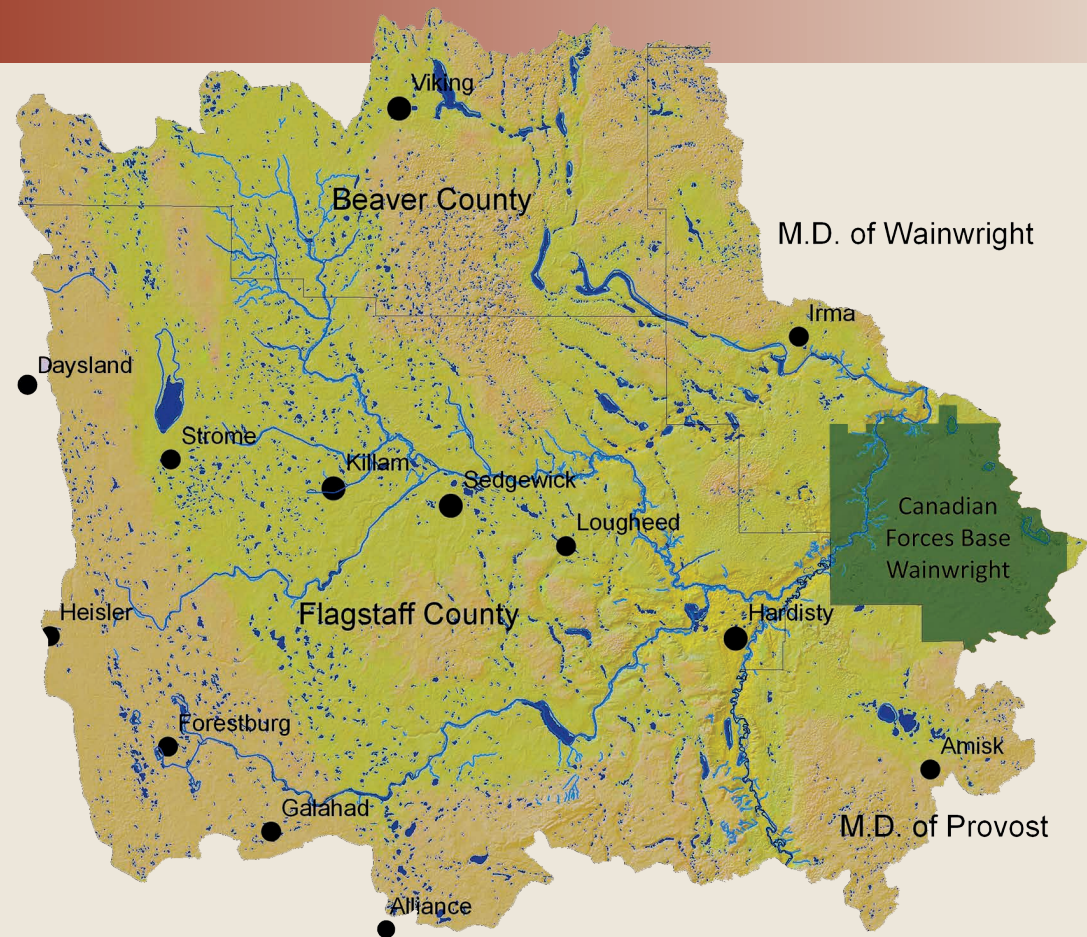
Harry was elected to Stettler's town council in 1954 where he served until 1959. As Canada's first Chinese town councillor, Harry was devoted to his community, an active supporter of local hockey and an avid curler.

He was a member of the Alberta Chinese Benevolent Society (and the Vancouver branch when he retired there) and worked hard to improve conditions for his fellow compatriots. He helped over 3,000 Chinese immigrants obtain their citizenship papers.



The Iron Creek subwatershed contains critical wetland habitats and was an important area for First Nations peoples' buffalo hunts. It is also the birthplace of the watershed's most prominent author and poet, Robert Kroetsch.

On a high point east of the town of Viking are the Ribstones. "There were three ribstones at one time, the Bull, the Cow and the Calf," says Elder Louis Raine, "but now there are only two." Carved from quartzite by Indigenous peoples, they honour Old Man Buffalo's protection over buffalo herds, and the bounty they provided. Long grooves suggest a buffalo's backbone and ribcage. Circular pits are



Iron Creek Subwatershed

*Iron Creek meets the Battle River just northeast of Hardisty. This region shares a portion of the Canadian Forces Base Wainwright.*

said to have been left by bullets or to have been carved in imitation of marks on the surface of the Manitou Stone (see below) to which, aligned as a "V," the two stones point at its 26 kilometers away, near Hardisty, where once it stood. Today, Indigenous people gather at the Ribstones to offer tobacco and other gifts, and to seek spiritual renewal. The Viking Ribstones are among the few monumental stone carvings in Alberta that are still in their original places.



*Known by First Nations as "The Bull, The Cow and The Calf" (the Calf Ribstone went missing many years ago), two of the three Viking Ribstones sit atop Ribstone Hill. The site was used as a buffalo lookout and was part of a network of Ribstones across the Prairies that are sacred to Indigenous peoples.*

As important habitats, wetlands are defined by having saturated soils, water-loving plants, and water at some point of the year, except during droughts. These critical natural systems cover about 20% of Alberta's land area. Prairie wetlands are mainly nutrient-rich marshes and open water ponds. Wetlands are particularly critical in the BRW [spell out], where water supply is dependent on surface and groundwater. As of 2013, it was estimated that Alberta has lost ⅔ of its wetlands in its settled areas (also known as the White Area, found mainly in the central and southern parts of Alberta).

Wetlands provide many benefits to our watershed. They are often called nature's kidneys because wetland plants filter harmful toxins and excess nutrients (such as salt) from surface water and the water entering wetlands helps recharge groundwater. Wetland plants remove carbon dioxide from the atmosphere and store it in the soil (aka "carbon sinks"). These plants also slow water during flood or runoff, help prevent soil and shore erosion and provide important habitat. A wide range of organisms, including fish, birds and wildlife, thrive in wetland areas. Wildlife and livestock also depend on wetland areas for food and water during times of drought. Rural landowners often rely on wetlands for both surface and groundwater on their acreages and farms. Beyond their practical importance, wetlands also provide recreational opportunities like bird-watching, fishing and hunting.



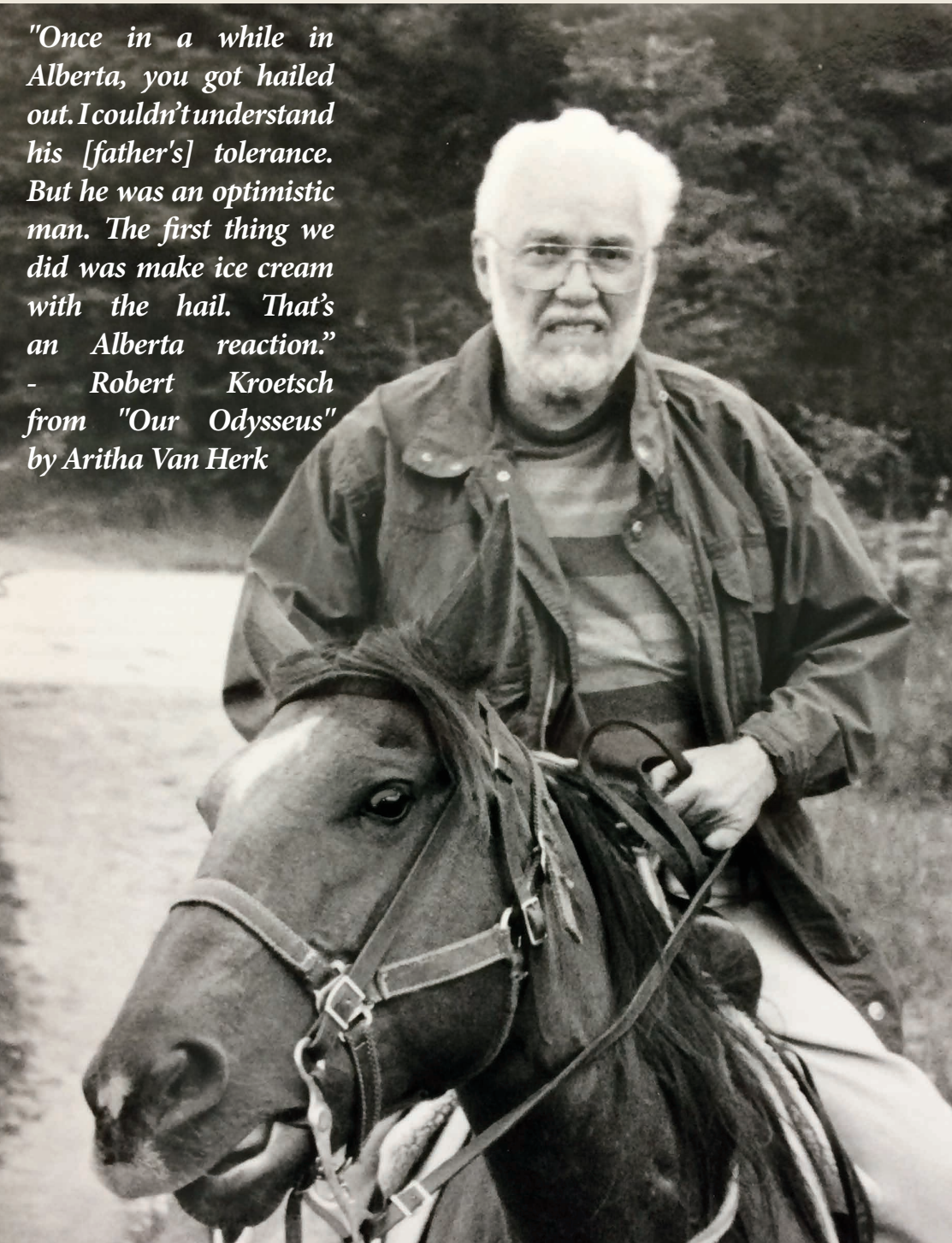
Photo Credit: Marie Ruzicka



The watershed region’s most well-known author and poet, Robert Kroetsch, was born at Heisler on June 26, 1927. Kroetsch’s paternal grandfather moved from Bruce County, Ontario to farm in the Heisler area in 1905. Robert was the first child and only boy in the family, with four younger sisters. He was fascinated by language and first tried his hand at poetry in highschool. When Kroetsch attended the University of Alberta during the Second World War, he felt a deep sense of invisibility -- both personally -- and nationally. This drove him to travel north and write a novel that wrestled with Canadian place and identity. Kroetsch met his first wife, Jane, while finishing his PhD at the University of Iowa. He and Jane had two daughters while he taught at Harpur College, NY.

Kroetsch had a lifelong passion for gardening and drew parallels between the work of a gardener and a poet, as in his long poem, Seed Catalogue. Kroetsch drew on many sources for his funny, fantastic novels. He blended the style of the early beer parlour tall tales with indigenous and classical mythologies in his storytelling. His first three novels played off four prairie political eras and Kroetsch often used humour and parody to question convention.

Despite long absences from Alberta, Kroetsch’s writings often returned to reflections about the prairies as an imagined landscape. Kroetsch befriended other renowned authors, including Prairie novelist Rudy Wiebe and poet Di Brandt. He mentored many emerging writers and



*"Once in a while in Alberta, you got hailed out. I couldn't understand his [father's] tolerance. But he was an optimistic man. The first thing we did was make ice cream with the hail. That's an Alberta reaction."*  
- Robert Kroetsch from "Our Odysseus" by Aritha Van Herk

Robert Kroetsch on horseback. Photo courtesy of his sister, Kay McGill.

worked as Writer-In-Residence at the Universities of Calgary and Lethbridge. Kroetsch continued to write throughout his life and was made an Officer of the Order of Canada in 2004. He received The Lieutenant Governor of Alberta Distinguished Artist Award shortly before his death in 2011.

Don and Marie Ruzicka returned to the family farm near Killam in 1983. The Ruzickas farmed conventionally until they took a course in Holistic Management in 1995-96. Over time, they learned about the importance of wetlands for water quality and quantity from organizations like the Prairie Farm Rehabilitation Administration (PFRA), Ducks Unlimited Canada and Cows and Fish. When the Ruzickas seeded the whole farm to pasture, they saw willows around their sloughs begin to grow back. Because trees and shrubs were still being nipped by hungry cattle in the spring, the Ruzickas decided to fence off their creek. They then partnered with the PFRA in 2008 to fence off 85 acres of wetlands on their 640-acre farm. The Ruzickas still allow their cattle to use the wetlands for shelter in the winter, where they like to bed down in the tall grass. Willows on the property are up to 4.3 metres (14 feet) tall and the wetlands draw many birds, native pollinators and wildlife. Ruzicka Sunrise Farm was originally owned by Don Ruzicka’s maternal grandparents and has been in the family since 1909.



Augustana Environmental Science Professor, Dr. Glen Hvenegaard, has conducted an annual bird survey on the Ruzicka farm since 2004. The farm’s diverse habitat hosts a substantial number of species, including two that are threatened (Barn Swallow and Sprague’s Pipit) and the Horned Grebe, which is a species of special concern (see above inset). Wetland photo credit: Marie Ruzicka.



# BLACKFOOT SUBWATERSHED

The Blackfoot subwatershed is home to the city of Wainwright and the Canadian Forces Base Wainwright. Along the Battle River's banks, a retreat centre provides recreation for nature and music lovers alike. Buffalo lived here a century ago, when the Canadian government worked to protect and revive bison populations.

In 1985, Cliff, Allan and Kathie Brown skied and canoed the Battle River valley in search of land with good elevation to develop a ski hill. In 1988 they found and purchased a quarter section of land northeast of Wainwright and opened two years later with eleven ski runs. The ski hill operated for about a decade, offered night skiing and lessons for school children. The downhill skiing business closed in 2000 due to rising liability insurance costs; cross-country skiing took its place. The ski lodge became Mistahiya Retreat Centre — a place to get away and enjoy nature. The Centre and its rolling hills are the perfect backdrop for weddings, musical events,



Come By the Hills is a kid-friendly festival. A young girl takes in the music and surroundings from a hilltop viewpoint. Photo credit: Jim Zadorozny



Barney Bentall and the Legendary Hearts headlined the Saturday evening show in 2017. Playing some of their classic hits got the crowd up and dancing.

and recent indigenous blanket ceremonies. The Browns are also exploring sustainable development and hope to expand off-grid sources like solar power.

Music has long been a part of the Browns' vision for their property. As former Home Routes hosts, they helped connect Canadian musicians with smaller venues in rural Alberta communities. Now, Mistahiya hosts the Come by the Hills music festival each August. The festival features thirteen (primarily Canadian) artists whose genres range from roots and blues to rock and country. The festival draws attendees from as far afield as Saskatchewan and British Columbia.



Memories of the former ski hill remain in the chalet of the Retreat Centre. One concert-goer called the area "our mountains" and fondly remembers the chalet and lodge as the place her children learned how to ski.

# BLACKFOOT PERSPECTIVES

In 2001, citizens in the Wainwright area met to discuss how to preserve the history and legacy of Buffalo National Park (1909-1940). The Buffalo Park Foundation was the result of that meeting and the Foundation is renovating the historical Wainwright Hotel for use as an interpretive centre and a regional archive.

Buffalo National Park's contentious history dates back to the turn of the last century, when only about 1,100 bison remained in North America. This loss was felt most keenly by the indigenous peoples whose livelihood was rooted in the bison hunt. In 1907, the Dominion government decided to purchase the bison herd from a rancher in Montana, and chose 100,000 acres of land around Wainwright as a suitable place to tend the herd. By the early 1920s, the herd of 748 had grown almost tenfold, and had outgrown its environment.



Above: The Wainwright Prisoner of War Camp 135 barracks in the winter of 1945. Later that spring, two unfinished escape tunnels were found below ground. Despite British orders to underfeed the prisoners once the war had ended, conditions were mostly described as respectful and congenial. Lt. Leo Hamson recalled his first day of work as a Guard Officer at the Camp, where he was surprised to hear about an afternoon hockey match between the guards and prisoners — and four o'clock tea time. Photo credit: Wainwright Camp Collection, Wainwright and District Museum.



Wainwright Park riders corral the buffalo, ca. 1909-1914. Photo credit: J.H. Gano, NC-37-71, Glenbow Archives.

Between 1925 and 1928, the Canadian government shipped 6,673 bison north to Wood Buffalo National Park, leaving the remaining buffalo at Wainwright. This move was strongly contested by biologists and naturalists of the day as it was feared that the two subspecies — the Plains and the wood bison — would interbreed. At least three-quarters of the herd was found to have tuberculosis during a cull in 1923-24, further complicating the matter. Dry conditions, disease, overcrowding, and overgrazing were the largest factors in the failure of the buffalo herd at Wainwright. The last of the herd was slaughtered in 1939 and the area was then used as a German Prisoner of War camp during the 1940s.

Hollywood producer Tom Ince came to Wainwright in 1923 and hired one hundred indigenous people from Maskwacis (then known as Hobbema) to re-create scenes of the Wild West and Buffalo Bill. *The Last Frontier* was Ince's final film and was released in 1926, two years after his death. Ince's sudden death in 1924 was shrouded in mystery and it was alleged that Ince was accidentally shot by newspaper tycoon William Randolph Hearst.

*The Thundering Herd* was a film based on the Zane Grey's novel of the same name. Only a few shots were taken at Wainwright, but the film was one of Gary Cooper's first (uncredited) film roles. The Paramount film has since been lost and no known copies of the film exist.



In 1923, Cree people from Maskwacis gathered for the shoot of the 1925 film, *The Last Frontier*. Risky shots were taken using camouflaged pits and hidden cameras while the buffalo stormed the prairie landscape. Photo Credit: NA-4774-22, Glenbow Archives.



Barb Sjoquist’s parents bought a farm north of Edgerton when she was a teenager. She has now served on council for the Village of Edgerton for over twenty-five years, with twenty-two of those years as mayor. One of Sjoquist’s passions is seeing rural communities revitalized and applying adaptive solutions to a changing economy.

*“It really does take a lot of work to carry a community forward, regardless of its size. .. nothing happens without first having a dream and I often challenge our council and community to have a dream for Edgerton and do all that they can to see the dream become reality. Community wise and personal wise, there are no arrival points . . . everything in Edgerton is always a work in progress.”*

~ Edgerton Mayor Barb Sjoquist

Sjoquist and her Council focus on building for the future. When Edgerton’s arena was no longer safe for hockey, the Council recognized that closing it down would have a domino effect on the community. So, they chose to rebuild the arena in stages. It now has artificial ice, a passive geothermal system, renovated dressing rooms and an expanded lobby area. The village also formed the Edgerton Housing

Corporation in order to build affordable housing for families interested in moving to the area. To deal with a gap in local child care, a licensed Out-of-School Care Program is being set up in the Edgerton school. This service will allow children to stay in school while providing working parents a helping hand.

Sjoquist took action when she noted that



Above: Homecoming parade for the Village of Edgerton's centennial in 2017. Photo credit: Village of Edgerton. Inset right: Sjoquist and her husband Lennis on their Harleys outside of the train station at the Edgerton Museum.



Photo credit: Alexandre Meghan Photography

entrepreneurial possibilities, with the success of Edgerton’s Ribstone Creek Brewery, among other local business initiatives. The village hired Wes Laporte as a summer student to analyze the needs and challenges for local businesses. Laporte now works full-time for the village as head of economic development and currently oversees their new strategic plan. Laporte says

that he has really learned about the value of community from Sjoquist: “what it takes to be a community member, what a successful community looks and acts like, and the intrinsic positives of community spirit and pride.”

ambulance services were being centralized and response times for rural communities lengthened. She partnered with Alberta fire chiefs and first responders to create a living document called the RED Document. This partnership began to provide accountability for how changes in the health care system — especially medical emergencies — are impacting rural communities.

Sjoquist feels hopeful about Edgerton’s

Four former schoolmates were bantering about doing something innovative in their home village of Edgerton. In 2012, these four men — a farmer, a lawyer, a mechanic and a village administrator — decided to partner with an experienced brewmaster to launch a business. With one principal investor, and local shareholders, they transformed a historic tractor dealership into a successful craft brewery.

Ribstone Creek Brewery is named for the local aquifer -- and water source for the brewery -- which is known for its great-tasting water. After filtering the reverse-osmosis water, barley malt, hops, and yeast combine to create liquid gold. Supporting local events and the local area is important to the brewery’s operators: 95% of the brewery’s barley is from Alberta or western Saskatchewan; spent grain is used by a local farmer to feed his cows; the company employs six local people (with five other representatives across the province). Ribstone Creek currently produces over 200,000 L of beer per year and



in 2017, Ribstone Creek’s Abbey Lane won a gold medal in the session ale category at the Canadian Brewing Awards.

The popularity of microbreweries has been increasing rapidly. When Ribstone Creek Brewery opened its doors in 2010, it was the tenth microbrewery in the province; it is now one of 88 microbreweries in Alberta.



A view of Ribstone Creek in the winter months.



When the brewery sent out the call for fresh rhubarb through social media, it took only a few days to get the needed 300 pounds. The sour stalks are used to create Runestone Rhubarb Saison beer and donors were given the first free sampling. Saison beers usually reflect locally sourced, often fruity ingredients and tend to be highly carbonated.





Sounding Creek Basin is an unusual landscape of grasslands and stark geological forms. The Bodo Archaeological Locality was an important site for indigenous peoples for thousands of years.

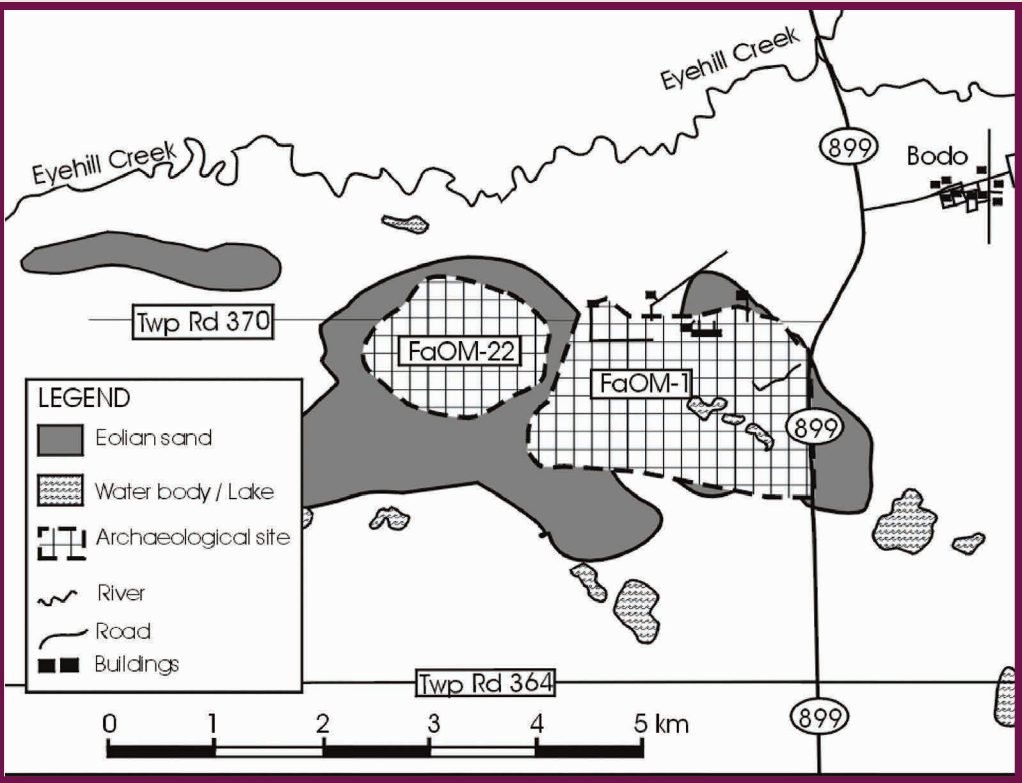
Bodo Archaeological Locality is located in the sand dunes near the eastern edge of the Sounding Creek subwatershed. The 9.7 sq km area consists of two main sites: the Bodo Bison Skulls Site on the east and the Bodo Overlook Site on the west. Stones tools and dart points found in the area indicate that there were indigenous people coming to Bodo as early as 5,000 years ago; soil samples suggest up to 7,000 years ago.

The Bodo archaeological site was first uncovered in 1995 when an oil company noticed a few bison skulls while excavating. When they called on Dr. Terry Gibson’s archaeological firm, Gibson found a wide distribution of exposed bone, some stone fragments, and pottery. Because pottery finds in this part of Alberta have been rare, it quickly became apparent that Bodo was a significant site.

Bodo was closely linked with the hunting of bison and is one of the largest pre-contact human occupation sites in Western Canada. Stone tools, bones, fragments of pottery, and fire pits are among the historic finds at Bodo. In one twenty-square-metre area, archaeologists found close to 110,000 artifacts: 100 kg of bone, 4,500 potsherds,



A sample of Old Women's Phase pottery (not from Bodo). Image courtesy of the Royal Alberta Museum, Archaeology Program.



This map identifies the two primary sites within the Bodo Archaeological Locality.

191 stone tools (scrapers, knives and mauls), many bone tools and 80 points (or point fragments).

For a number of years, researchers from the University of Alberta and most recently, Grant MacEwan University, brought students to the area to work on the site during the summer months. For the last decade, the site has mostly been operated by a non-profit society that educates through heritage tourism and provides public archaeological opportunities.

The peoples that used the site were bison hunters and likely used the land’s topography as bison pounds. There are water holes north and at the east end of the site that remains wet even during years of drought. There is some evidence that these water holes were enlarged, and Gibson believes that the indigenous hunters may have lured the bison down into the water and then hunted the animals from the safety of brush and sand dunes.

After 1500 AD, the Western Mortlach Phase (believed by many to be ancestors of the Gros Ventre and the Assiniboine) moved west into areas identified with the the Old Women’s Phase (ancestral Blackfoot) region and may have lived at Bodo at the same time.



A translucent chert point found at Bodo. Image credit: Dr. Terry Gibson.

The Grassland Natural Region is the warmest and driest natural region in our watershed. This semi-arid region has the longest summer growing season and Chinook winds bring milder winter temperatures. The Grassland Natural Region is the habitat most commonly associated with prairies: rolling hills of grass, dotted with shrubs and forested valleys. Sand plains, dunes and badlands terrain are habitat for some unique species in this natural region, including the Western Hog-Nosed snake, Ferruginous Hawk, Bushy-tailed woodrat, Plains Rattlesnake and Bull Snake.

The Northern Fescue Natural Subregion is the northernmost type of Grassland subregion. It varies from flatter fields used for agriculture to hummocky terrain and rolling hills that are used for grazing cattle. Plains rough fescue is the dominant grass and Solonetzic soils cover one-quarter of the primarily Dark Brown Chernozemic soil. Only 3% of the crescent-shaped area is made up of water bodies, which include Misty Lake, Percy and Kirkpatrick Lake. Interesting features of this subregion are the Neutral Hills, badland terrain and alkali wetlands.



Tall fescue and porcupine grasses rim the shores of Sounding Lake. Sounding Lake and Gooseberry Lake are among some of the alkali lakes in the area that provide important habitat for wildlife and birds.

The Provost and Ribstone Plains have the soil of the Northern Fescue and the treed vegetation of the Central Parkland, forming a transition zone between the two regions.

Many of the species that live in the Grasslands have unique characteristics that help them survive low moisture levels. Among these are Richardson’s Ground Squirrel (commonly referred to as "gophers") which are a food source for predatory birds and mammals. Several species re-use gopher burrows, including snakes, bumblebees and Burrowing Owls. Their digging material also provides a good base for new plant life.

The Dry Mixedgrass subrgion in the south is the driest subregion in Alberta. It boasts the most Effective Growing-Degree Days at 1800 (compared with the Central Parkland’s 1470 Effective Growing-Degree Days ).

Ground squirrels have adapted to survive by drinking very little water; dry fecal pellets retain the water inside their bodies. Adult ground squirrels spend about ⅓ of the year in hibernation and all adults have returned to hibernation by early July. All ground squirrels seen between mid-summer and autumn are juveniles, as with those pictured at left.



An important task in watershed management is being mindful of the fact that waterways continue and upstream actions impact downstream results — regardless of provincial or national boundaries.

In 1948, Alberta, Saskatchewan, Manitoba and Canada formed the Prairie Provinces Water Board (PPWB). The role of this board was to recommend how to best allocate river water that was flowing eastward so that it was shared between the three provinces. In the 1960s, provinces began requesting large allocations of water, so a new solution was needed. In order to address this issue and other issues, the three prairie provinces and Canada signed the Master Agreement on Apportionment (MAA) in 1969. The agreement outlines obligations and entitlements concerning surface and groundwater quantity and quality. The MAA is administered by the PPWB which creates the environment for dialogue and cooperative water management. The basic apportionment formula provides 50% of the annual natural flow to the upstream province and 50% to the downstream province.

In 1992, amendments to the agreement objectives addressing groundwater protection matters and interprovincial water quality objectives were added. Interprovincial water



*In 2012 members of the Battle River watershed community biked 550+km from the headwaters at Battle Lake to the confluence at Battleford. A few of the team are pictured here entering Saskatchewan.*

quality objectives are descriptions of water quality condition that are known to protect specific water uses and are acceptable to upstream and downstream provinces. Board member Sam Ferris says, “ While the initial focus for the PPWB was on surface water quantity which is particularly important in the often dry SW portion of Saskatchewan and southern areas of Alberta, in more recent times increased emphasis on surface water quality and groundwater has emerged, with separate committees and representatives on each area of expertise. One noteworthy

recent achievement has been the revision of the PPWB surface water quality objectives.”

Ferris is referring to the 2015 review of the Master Agreement and updated its water quality guidelines. These include objectives for metals, pesticides, nutrient, and radioisotopes at the PWWB transboundary river stations.



*This painting by Adeline Rockett shows where the Battle River and the North Saskatchewan River converge near Battleford, Saskatchewan. "Battle River Valley", Adeline Rockett, 1980, acrylic on canvas, 48 x 68.*





*This page and facing page photo credit: Rajan Rathnavalu*



I had a good chuckle reading the definition of an epilogue, which says: “An epilogue is the final chapter at the end of a story that often serves to reveal the fates of the characters. They can be used to hint at a sequel or wrap up all the loose ends.” How could I wrap up all the loose ends of theses numerous and diverse stories?

This epilogue is not going to reveal the fate of our main character- the Battle River. I wish I knew how this story would end, but only you- the reader, can determine the fate of our river and the surrounding watershed. Will we as a society become better stewards of the land and water that make up this watershed? Will we make wise decisions to protect our economic, ecological, and social values?

A poem by the late Irish poet John O'Donohue comes to mind: “I would love to live like a river flows, carried by the surprise of its own unfolding,” (Unfinished Poem).

I wish John O'Donohue had finished this poem as I appreciate the sentiment and love how it reminds me of the Battle River. The Battle, that snakes across its watershed from its headwaters at Battle Lake to its confluence with the North Saskatchewan River near North Battleford. Unfolded, the river would stretch over twice its length as it meanders across the two prairie provinces.

The poem also makes me reflect on the people who live, work, and play in the watershed. These are resilient people living in a beautiful part of Alberta and Saskatchewan surrounded by stunning prairie scapes. Like the river we too must continue our journey as we keep learning, acting, doing and improving to actively care for the land and water that sustains us today and into the future. May our stewardship actions continue to unfold and surprise us.

*-David Samm, General Manager*

*Battle River Watershed Alliance*



RELIEF AND TOPOGRAPHY

- Alkaline - having a Ph greater than 7
- Deposition - the laying down of sediment that has been eroded and transported
- Ice Thrust Ridges - a steep hill created by the sudden push of glacial ice
- Saline - possessing the quality of a high salt content

MODERN LANDSCAPE

- Road Corridors - an under or overpass where animals can cross the road safely without the risk of being hit by vehicles

GEOLOGY & MINERAL RESOURCES

- Bedrock - solid rock underlying loose and unconsolidated soils and colluviums
- Laurentide Ice Sheet - a ten kilometer thick continent wide glacier that laid east of the Canadian rockies 80 million years ago

ENERGY CHOICES

- Ambient Air - atmospheric air in its natural state
- Biomass Fuel - energy that is produced by the burning of organic materials and matter
- Generating Station - also referred to as a power plant, powerhouse, or power station, is an industrial facility for the generation of electric power
- Geothermal - heat produced by the interior of the earth
- Non-Renewable - a resource that can no longer be reused or recycled

CLIMATE & WEATHER

- Special Area - an area with little to no precipitation

WATER SOURCES

- Aquifers - these occur when large volume of groundwater pool within sediment or bedrock below the water table
- Biomembrane Filtration - the process which membranes, thin and porous

- sheets of material, separate contaminants from water
- Headwaters - the source of a body of water or river
- Hydrology - the study and science of water and water movement

SOILS

- Chernozemic Soil - a black coloured soil containing high amounts of humus
- Humus - the organic component of soil formed by the decomposition of leaves, plants, and other organic matter
- Loam - fertile soil containing clay and sand

- Microbes - a microorganism or bacteria that causes disease or fermentation
- Parent Material - the geologic material from which soil horizons form
- Solonetizc Soil - contains an impermeable hardpan that happens 20cm into the ground

LAND RESTORATION

- Biodynamic - a holistic, ecological, and ethical approach to farming

LAND TRUSTS

- Carbon Farmer - organization that allows people or businesses to offset their carbon footprint by planting trees
- Land Trust - is either an agreement where one party (the trustee) agrees to hold ownership of a piece of real property for the benefit of another party (the beneficiary) or it is a private, nonprofit organization that works to conserve land by facilitating in the conservation of land

AGRICULTURE AND AGRICULTURE DIVERSITY

- Gravity Reticulation System - an affordable way to provide water for crop or cattle, the basics consists of an elevated reservoir with a pipe coming out of the bottom that feeds water into a drip system
- Oilseeds - seeds yielded from crops that produce oil, i.e. Canola, soybeans, peanuts
- Permaculture - a system of farming designed to be sustainable and self-sufficient

- Swale - a low lying place, usually a depression between two ridges

RIPARIAN PLANTS

- Erosion - the loosening or dissolving and removal of material.
- Eutrophication - the extreme growth of algae in a water body caused by an influx of fertilizers, usually phosphorus and nitrogen
- Riparian - the area surrounding a wetland, stream, lake, or other water body

FISH AND WILDLIFE

- Dissolved Oxygen - microscopic bubbles of gaseous oxygen that are mixed in water, necessary to life within a water body
- Electrofsh - sampling fish by stunning them with mild electric shocks
- Genetic Diversity - the total number of genetic characteristics in the genetic makeup of a species
- Mudflats - coastal wetlands that form with the recession of a river or lake

LABOUR & ECONOMY

- Fractionation Plant - separate mixtures of light hydrocarbons into individual, or industrially pure, substances

POPULATION DENSITY

- Stagecoach - a covered compartment used to carry passengers and goods
- Green Revolution - an increase in crop production thanks to fertilizers, herbicides, and pesticides
- Grade of Grains and Oilseeds - a letter grade grain is given based on the protein content, ripeness, quality, weight, and size

MODERN FIRST NATIONS PERSPECTIVES

- Decolonization - Decolonization restores indigenous world views, culture, and traditional ways to a place of power and respect in families, communities and government. Decolonization requires non-Indigenous individuals, governments, institutions and organizations to create the space and support for Indigenous Peoples to reclaim all that was taken from them.

BLACKFOOT SUBWATERSHED

- Dominion - a term that has fallen away in common usage, ‘Dominion of Canada’ is the country’s formal but rarely used title that was first applied to Canada at Confederation in 1867

SOUNDING CREEK SUBWATERSHED

- Alkali Lake - a lake with a high acidity (pH above 7), these lakes are characterized by high concentrations of carbonate salts such as sodium carbonate

BEYOND OUR BORDERS

- Allocate - to distribute resources or duties for a particular purpose
- Apportionment - to distribute or allocate proportionally
- Radioisotopes - a radioactive isotope
- Transboundary Water Use - use of water that is shared among multiple user groups, generally across regional, provincial, or national borders



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Stay in touch!

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