North Saskatchewan River

"The Story of This River is the Story of the West"

North Saskatchewan Watershed Alliance

Canadian Heritage Rivers
System Background Study
North Saskatchewan River
Alberta
2005

Prepared for

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2005

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Canadian Heritage Rivers System Background Study North Saskatchewan River Alberta

Cover and inside cover photographs by John Ulan 2001

The Story of this River is the Story of the West is the chorus from the song: Roll on North Saskatchewan
Words and Music by James Gordon from his CD "The Song The River Sings" - Pipe Street Records
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jamesgordon.ca

Roll on North Saskatchewan

Born in the Rockies when the ice age receded,
In a Columbia glacier a mile above the sea;
Through wild canyons, the newborn river twists and bends,
Its journey will be long before it ends.

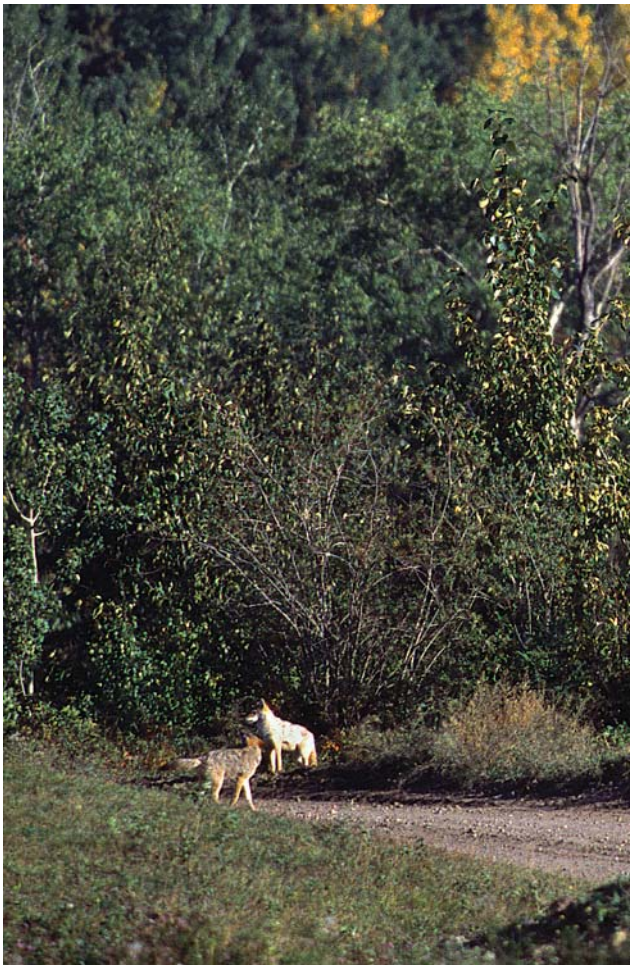
Kelsey, La Verendrye, the Blackfoot and the Cree
All searched that river for their destiny;
Near here David Thompson,
His bride Charlotte by his side,
Felt a country stirring as he looked across the great divide.

Still many miles to go before that river takes its rest,
The story of this river is the story of the west.

At Rocky Mountain House where
The Nor-westers built a post,
They pushed their fur trade empire across to the coast;
Trading with the Peigan and the Kootenays,
They loaded their canoes to make the long paddle east.

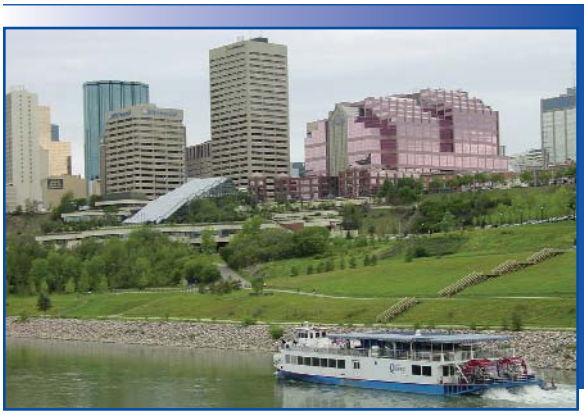
Across the flatlands where that widening river flowed,
Through the territory of the buffalo,
By the time the steel rails stretched across Saskatchewan,
The buffalo who drank from the riverbanks were gone.

Roll on, roll on, roll on you North Saskatchewan.

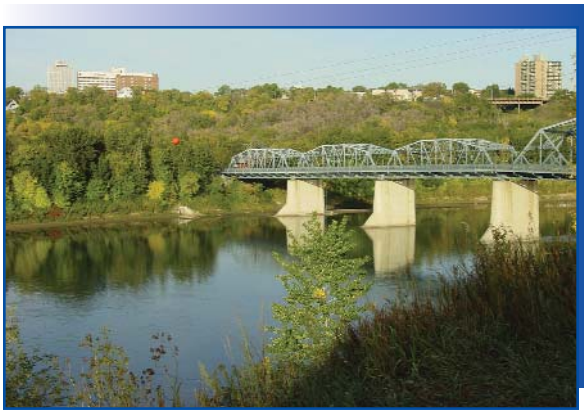


John Ulan Photograph 2001

Section 1



Edmonton Queen - Edmonton
photo Billie Milholland



Dawson Bridge - Edmonton
photo Billie Milholland

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Abraham Lake
photo Billie Milholland

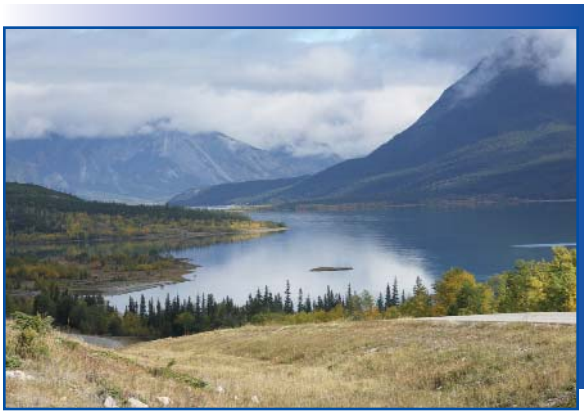

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photo Billie Milholland

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photo Billie Milholland

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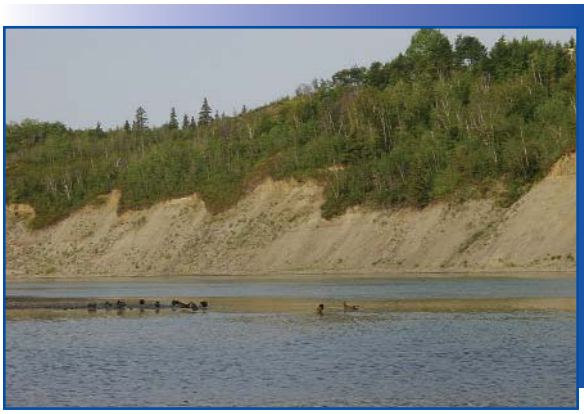
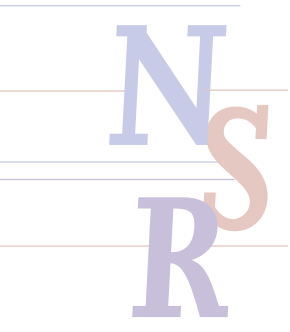


North river bank from Fort Edmonton Park
photo Billie Milholland

York boat
photo Billie Milholland

Executive Summary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Executive Summary

In May 2001, the North Saskatchewan Watershed Alliance (NSWA), a registered not for profit society, decided as a complement to their watershed philosophy, to undertake a Canadian Heritage Rivers System (CHRS) Background Study of the North Saskatchewan River. This type of study is designed to determine if the North Saskatchewan River meets the CHRS selection and integrity guidelines to be nominated as a Canadian Heritage River. The mandate of the NSWA is to protect and enhance water quality, water quantity, and ecosystem functioning of the North Saskatchewan River Watershed within Alberta. In this capacity the multi-stakeholder, non-profit society was well positioned to undertake the Background Study, and is prepared to spearhead the process that leads to nomination of the North Saskatchewan River.

The Government of Canada, represented by the National Parks Directorate of the Parks Canada Agency; and the Government of Alberta, represented by the Parks and Protected Areas Division of Alberta Community Development, agreed to support the preparation of a background study of the North Saskatchewan River. In June of 2001, the NSWA employed summer students to gather data that could be used for the North Saskatchewan River Background Study. Billie Milholland, researcher and technical writer was retained to coordinate the data gathering, to do further research, to analyze, and then to synthesize the information into a background study on behalf of the NSWA.

The North Saskatchewan River Background Study describes the Cultural Heritage Values, Natural Heritage Values and Recreation Values of the North Saskatchewan River. These values provide the basis upon which any community may nominate the North Saskatchewan River or a portion of the river for designation under the Canadian Heritage River System (CHRS).

Purpose of the Study

The purpose of the Background Study is to determine whether the North Saskatchewan River meets the established CHRS selection criteria and integrity criteria to be nominated as a Canadian Heritage River. Because the North Saskatchewan River was identified as an "A List" river, with the second highest evaluation score in the "Canadian Heritage Rivers System Study of Alberta Rivers", completed in February 1996 by Alberta Environmental Protection,[1] a background study is the next logical step in the Canadian Heritage River process.

[1]Seventy-two Alberta rivers were assessed and ranked for possible nomination to the CHRS.

York boat, Fort Edmonton
photo Billie Milholland

This Background Study is designed to supply the Government of Alberta, the Government of Canada, as well as all jurisdictions along the river, with sufficient base information to:

- Document and assess the cultural, natural and recreational resources of the North Saskatchewan River
- Provide a general knowledge base of the North Saskatchewan River for all levels of municipal government, First Nations and Métis people, industry, agricultural users, schools, and interested individuals, groups and organizations
- Prepare a formal request for nomination of the North Saskatchewan River to the CHRS when all CHRS criteria are met, and when major stakeholders reach consensus to forward the nomination.
- Furnish foundational information for further river-related research

Study Focus

The area included in the Background Study is the full length of the North Saskatchewan River flowing from the Banff National Park boundary in western Alberta, to the 'Forks' in the province of Saskatchewan at the confluence of the North and South Saskatchewan Rivers. However, an Alberta nomination would not include the portion of the river within Saskatchewan, and whenever constraints of time and available resources dictated, priority was given to collecting information on the Alberta portion of the river. In 1989, the North Saskatchewan River within Banff National Park was designated as a CHR and is managed through the national parks planning process.

The study area includes the immediate riparian area of the river, as well as land up to and including one mile on both sides of the river. It is important to note that several significant areas, directly related to the river, exist beyond these demarcation lines[2]. Locations that exceed the one-mile boundary yet are deemed particularly relevant to the cultural or natural values of the North Saskatchewan River are included in this study.

Study Findings

The most significant heritage value of the North Saskatchewan River is found in its Cultural Value, in the diverse and continual role the river has played in the development of human history in western Canada. This river was a major transportation and resource corridor from its inception, at the end of the last ice age[3], to the middle decades of the 20th century. Archaeological evidence verifies the important role of the North Saskatchewan River in Paleo-Indian history in western Canada: human activity along the river is evident from about 11,500 B.P. to the present.

Historical documentation emphasizes the pivotal position of the North Saskatchewan River as the main transportation and communication route from eastern Canada to the Rocky Mountains, from the middle of the 17th century to the middle of the 20th century. The river played a significant role in Aboriginal displacement westward, the western expansion of the fur trade, early missionary efforts in the West, major exploration, scientific, survey and military expeditions, as well as in the early European settlement of the West.

The Natural Heritage Value of the North Saskatchewan River is also significant. The river flows through complex and varied ecosystems and for much of its length forms a general geographic demarcation line between boreal forest and prairie grassland, creating interesting and unusual environments that support a broad diversity of wildlife, including many rare plant and animal species. The river flows through four provincially defined Natural Regions within Alberta and through five Natural Subregions, creating a significant variation in recreational opportunities. The recreational value of the river is more significant than the findings of the 1996 Study of Alberta Rivers suggests. That study was published just prior to many important changes in how municipalities, industry and agriculture approach water quality issues. The subsequent improvements, which are ongoing, have improved the recreation value of the river substantially.

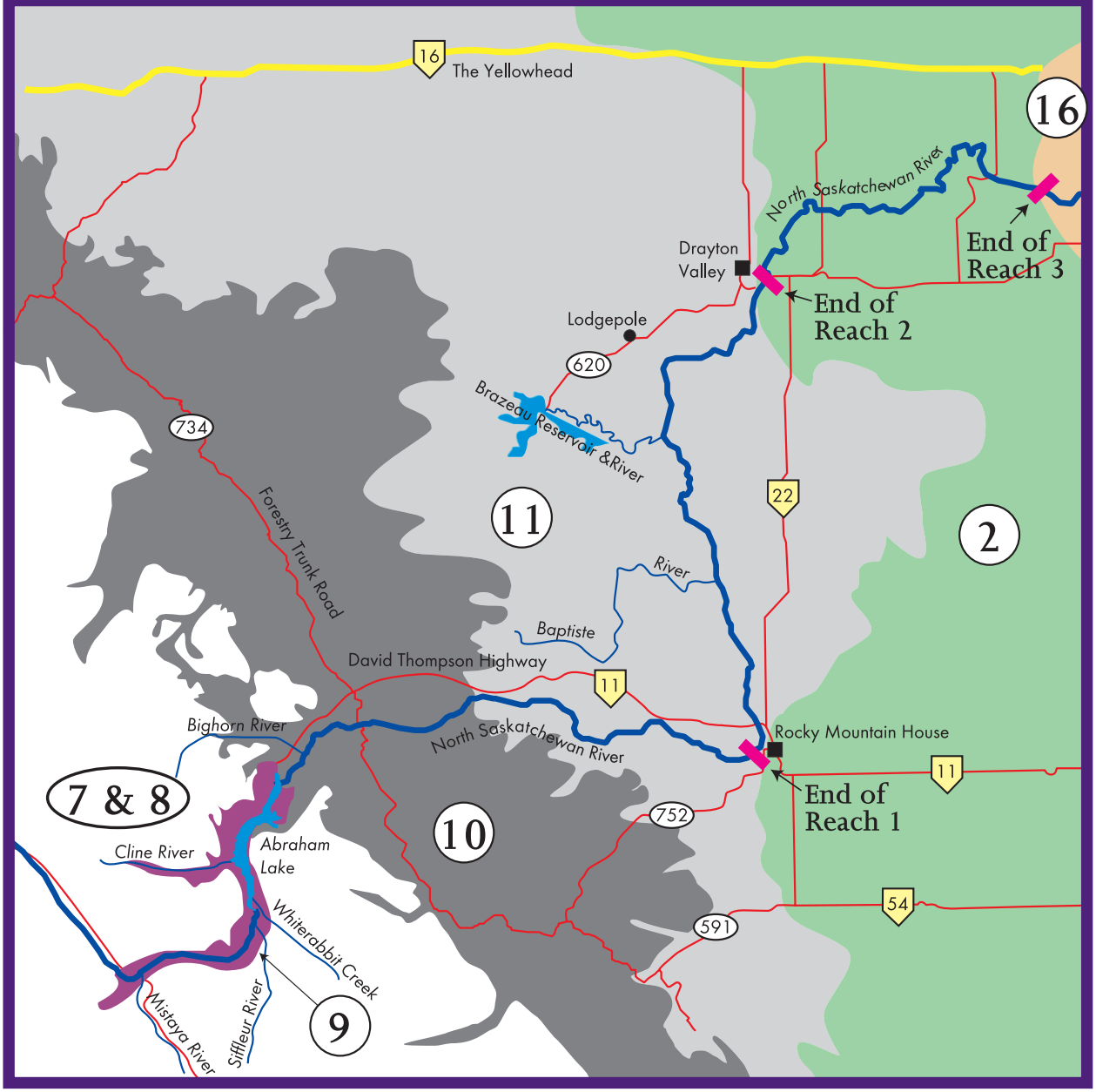
Conclusion

The North Saskatchewan River meets CHRS guidelines and can be nominated on the basis of its Cultural Heritage, Natural Heritage and Recreational Values. It is realistic to expect that the integrity associated with each of these themes can be conserved and maintained with cooperative management strategies. Many regional management plans are already in place along the river and more are anticipated, most notably the NSWA Integrated Watershed Management Plan.

[2]The Frog Lake Massacre is one event, although it occurred outside of the one-mile boundary, it had far reaching implications for the use of the river during the North West Rebellion of 1885.

[3]About 12,000 years ago the last ice sheet to cover Alberta began to melt and *"forests quickly regained the ground that they had lost to cold and aridity"* (from online Global Atlas of Paleovegetation).

Figure 1 - Natural Region Map



Natural Regions & Subregions of Alberta

Boreal Forest Natural Region

Subregion:

1. Central Mixedwood
2. **Dry Mixedwood**
3. Wetland Mixedwood
4. Sub-Artic
5. Peace River Lowlands
6. Boreal Highlands

Rocky Mountain Natural Region

Subregion:

7. Alpine
8. Sub-Alpine
9. **Montane**

Foothills Natural Region

Subregion:

10. Upper Foothills

11. Lower Foothills

Parkland Natural Region

Subregion:

14. Foothills Parkland
15. Peace River Parkland
16. Central Parkland

N

Kilometres 0 10 50 100 kilomtres

Miles 0 10 30 60 miles

Reach One (See Figure 1)

From the *Banff National Park boundary to Rocky Mountain House National Historic Park* the NSR can be nominated for its Cultural Heritage, Natural Heritage and Recreation Value.

Rocky Mountain House
photo Billie Milholland

i. Cultural Heritage Value is emphasized in this reach by an abundance of archeological sites revealing Paleohuman activity dating back to the end of the last ice age, as well as historical sites and documents illustrating the complex history of exploration, the fur trade dating from the end of the 17th century, resource harvesting and early European adventure and settlement history dating from the middle of the 18th century to the last quarter of the 20th century.

ii. Natural Heritage Value is evident as the river flows through the stunning scenery of three distinct Natural Subregions of Alberta: the Montane Subregion of the Rocky Mountain Natural Region, as well as both the Upper Foothills and Lower Foothills Subregions of the Foothills Natural Region. Much of the drainage into the river in this reach comes from the Provincial Protected Areas of Siffleur Wilderness, White Goat Wilderness, Bighorn Recreation Area and Kootenay Plains Ecological Reserve. This preserves the integrity of the river in much the same way as the protection the river receives within national park boundaries. Natural Value is also present in unique biological and geological phenomena, such as a 1,000-year-old Limber Pine (*Pinus flexilis*) and an immense post-glacier Cordilleran erratic.

iii. Recreation Value is high in this reach. Proximity to the National Park and to many protected areas has had a positive influence on the quality of recreational activity. The David Thompson Highway, which follows the river on most of its route from the National Park boundary to Rocky Mountain House, affords countless, well-positioned pullout areas close to the river for river-based touring, wildlife viewing, hiking, climbing and camping. One of the most popular canoeing runs on the river, from Nordegg to Rocky Mountain House, is in this reach.

Reach Two (See Figure 1)

From *Rocky Mountain House National Historic Park to the bridge east of the Town of Drayton Valley* can be nominated mainly for its Natural Heritage Value and its Recreation Value. There is obvious Cultural Heritage Value in this reach, however, many cultural sites are either unmarked or undeveloped.

i. Lack of easy access to the river along this reach, low-grade (Class I & Class II) rapids and numerous islands with white sand beaches, positions this stretch of river for idyllic wilderness adventures. Here, seasoned river voyageurs experience both Natural Heritage Value and Recreation Value. This reach supports good sports fishing and a wide diversity of wildlife. Although entirely within the boundaries of the Lower Foothills Natural Sub-region of the Foothills Natural Region, the Dry Mixed Wood Subregion of the Boreal

riverside trail, Edmonton
photo Billie Milholland

Forest Natural Region overlaps both at Rocky Mountain House and at Drayton Valley creating a transition zone for many wildlife species that use the river corridor.

ii. Well-documented evidence of historical exploration travel, as well as fur trade, early logging and settlement activity suggests substantial potential for future development of interpretive venues to enhance the Cultural Heritage Value.

Reach Three (See Figure 1)

From *Drayton Valley bridge to the mouth of Strawberry Creek* can be nominated on the basis of all three theme values: Cultural Heritage, Natural Heritage and Recreation Values.

i. Cultural Heritage Value is embedded in prehistoric archeological sites; in the westward migration of Aboriginal people along the river, from eastern Canada; in the penetration of the fur trade and in the activities of early scientific expeditions. Early mining and logging activities are well documented for this reach and European settlement history is diverse.

ii. Natural Heritage Value is evident as the river flows through nine Provincial Natural Areas: Washout-Saskatchewan, Pembina Field, Drayton Valley North Saskatchewan, Modeste Creek, Modeste Saskatchewan, Coyote Lake, St. Francis and Burtonsville Island Natural areas. This reach encompasses, exclusively, the Dry Mixedwood subregion of the Boreal Forest Natural Region, and as such, exemplifies a unique and unified ecosystem, distinctly different from the river environment of both Reach Two and Reach Four.

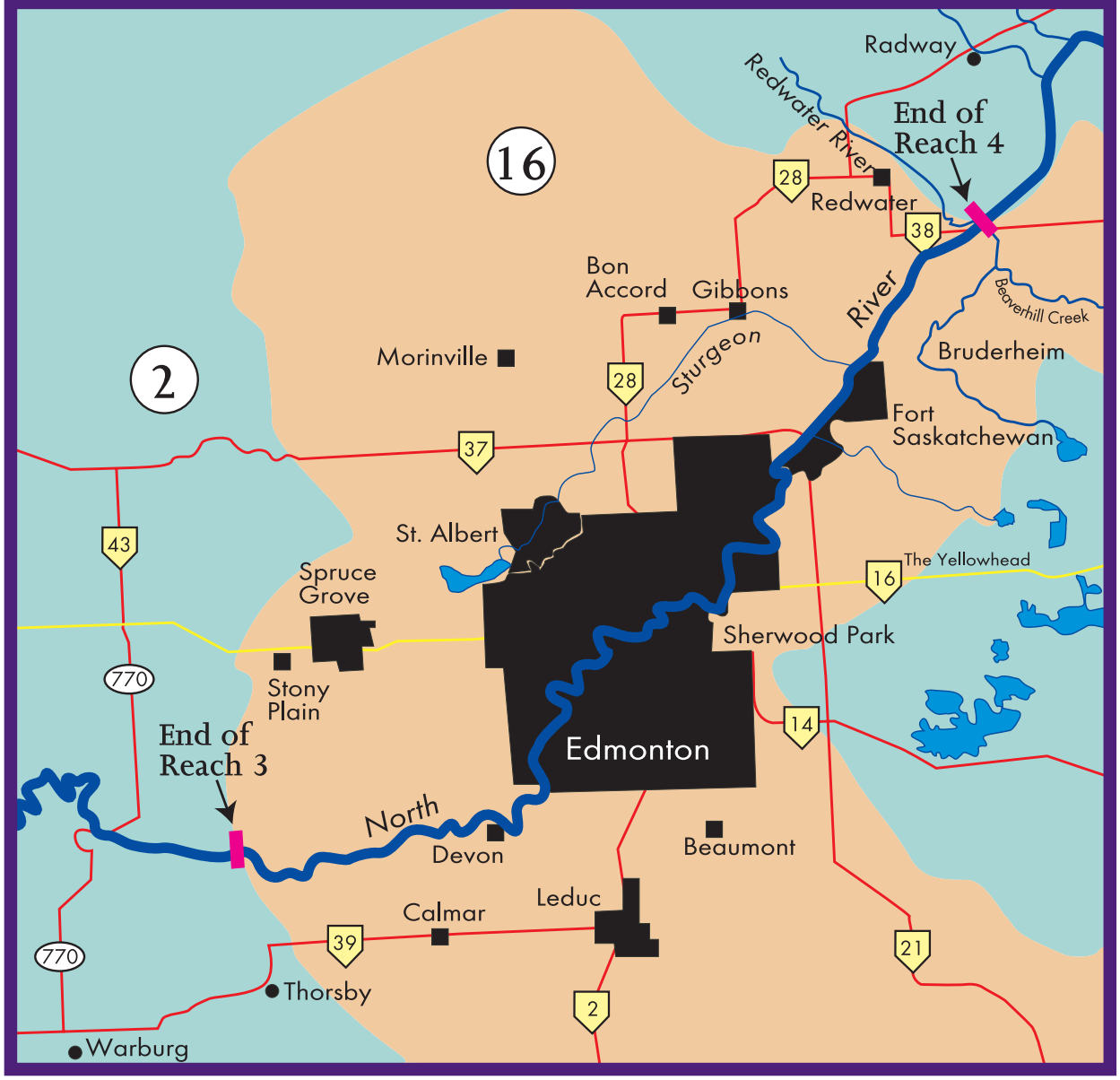
iii. Recreation Value is elevated by the intricate meandering of the river over the course of this reach resulting in a wide variety of wilderness adventure opportunities that capture a wild adventure feeling usually relegated to more remote locations. Canoeists report, "*The many island, and the steepness and depth of the river valley still provide a good sense of leaving civilization behind. The river is home to much wildlife, and spotting bald eagle, deer, coyotes, cliff swallows, beaver and moose is still the norm over a multi-day trip.*"[i]

Reach Four (See Figure 2)

From *Strawberry Creek to the mouth of the Redwater River* can be nominated for its Cultural Heritage Values, Natural Heritage Values and Recreation Values.

i. Cultural Heritage Value of this reach is multifaceted. There is abundant archeological evidence of continual human activity along this reach from at least 13,000 BP, which is interpreted in many different ways through programs, displays and self guided trails at Historic Fort Edmonton, the Royal Museum Alberta, the John Walter Museum, Rundle Park, Strathcona Archaeological Science Park and the Fort Saskatchewan Museum.

Figure 2 - Natural Region Map



Natural Regions & Subregions of Alberta

Boreal Forest Natural Region
Subregion:
1. Central Mixedwood
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4. Sub-Artic
5. Peace River Lowlands
6. Boreal Highlands

Rocky Mountain Natural Region
Subregion:
7. Alpine
8. Sub-Alpine
9. **Montane**

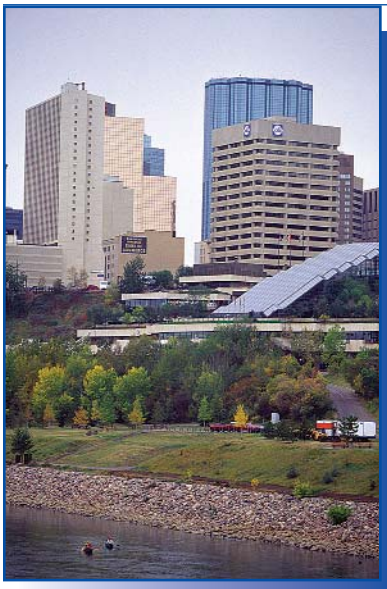
Foothills Natural Region
Subregion:
10. Upper Foothills
11. Lower Foothills

Parkland Natural Region
Subregion:
14. Foothills Parkland
15. Peace River Parkland
16. Central Parkland

N

0 10 Kilometres 50 100

0 10 Miles 30 60



Edmonton
photo John Ulan 2001

ii. Natural Heritage Value is found in the many dramatic river bends, each of which guarantees a continual change of scenery both on the river and along riverside trails, of which there is abundance in this reach. The river here flows exclusively through the Central Parkland Subregion of the Parkland Natural Region. The geological history of the region can be identified along many river banks: the sedimentary layers along "Big Bend" (the river bank opposite Terwillegar Park, Edmonton); a thin layer of Mazama volcanic ash visible on the south bank near the High Level Bridge in Edmonton; and mineral springs seepage at the foot of Government House Hill in Edmonton. Other fascinating geological phenomena along the river include post-glacial wind deposits north of the river at Devon; the continuous 'bed armor' in pools and riffles in Whitemud and Strawberry Creeks, and the fine sand soil near the end of the reach. There is ample evidence of bone fragments from extinct fauna dating back to at least 10,000 BP.

iii. Recreation Value is high in this reach due to the cooperative, multiple municipal planning and development of continuous riverside trails, walking bridges and riverside parks from Devon to Fort Saskatchewan; as well as river-based and riverside festivals and special events. This reach is a favourite stretch for weekend river touring by canoe, kayak, historic riverboats and jet boats. Even within the confines of the City of Edmonton river travel takes on a rural flavour. Canoeists report, *"Our river is often remote from the hustle and bustle of the city through which it flows."*[ii]

Reach Five (See Figure 3)

From the mouth of the *Redwater River to the Highway 38 bridge at Brosseau/Duvernay* can be nominated for its Cultural Heritage, Natural Heritage and Recreation Values.

i. Cultural Heritage Value of this reach is found in early contact history, the intense rivalry of early fur traders, early missionary efforts, the colorful era of river steamboats, and over 125 years of Métis and European settlement history. Much of this history is interpreted at the riverside Provincial Historic Site of Victoria Settlement.

ii. Natural Heritage Value is evident in the rich diversity of flora and fauna on and along the river. The river passes by four Provincial Natural Areas: Astotin, Northwest Bruderheim, Redwater and Victoria Settlement, and is bracketed by two well-managed Community Pasturelands. The wild beauty of this reach, celebrated in many early journals, has been preserved due to a lack of riverside industry and municipalities. Here the river begins to form a demarcation line between the Dry Mixedwood Subregion of the Boreal Forest Natural Region along its north bank and the Central Parkland Subregion of the Parkland Natural Region along its south bank.

iii. Recreation Value in this reach is evidenced by the popularity of river touring by canoe, kayak and jet boat, by regular cart and wagon re-enactments along historic riverside trails, and at regionally supported camping and hiking sites.

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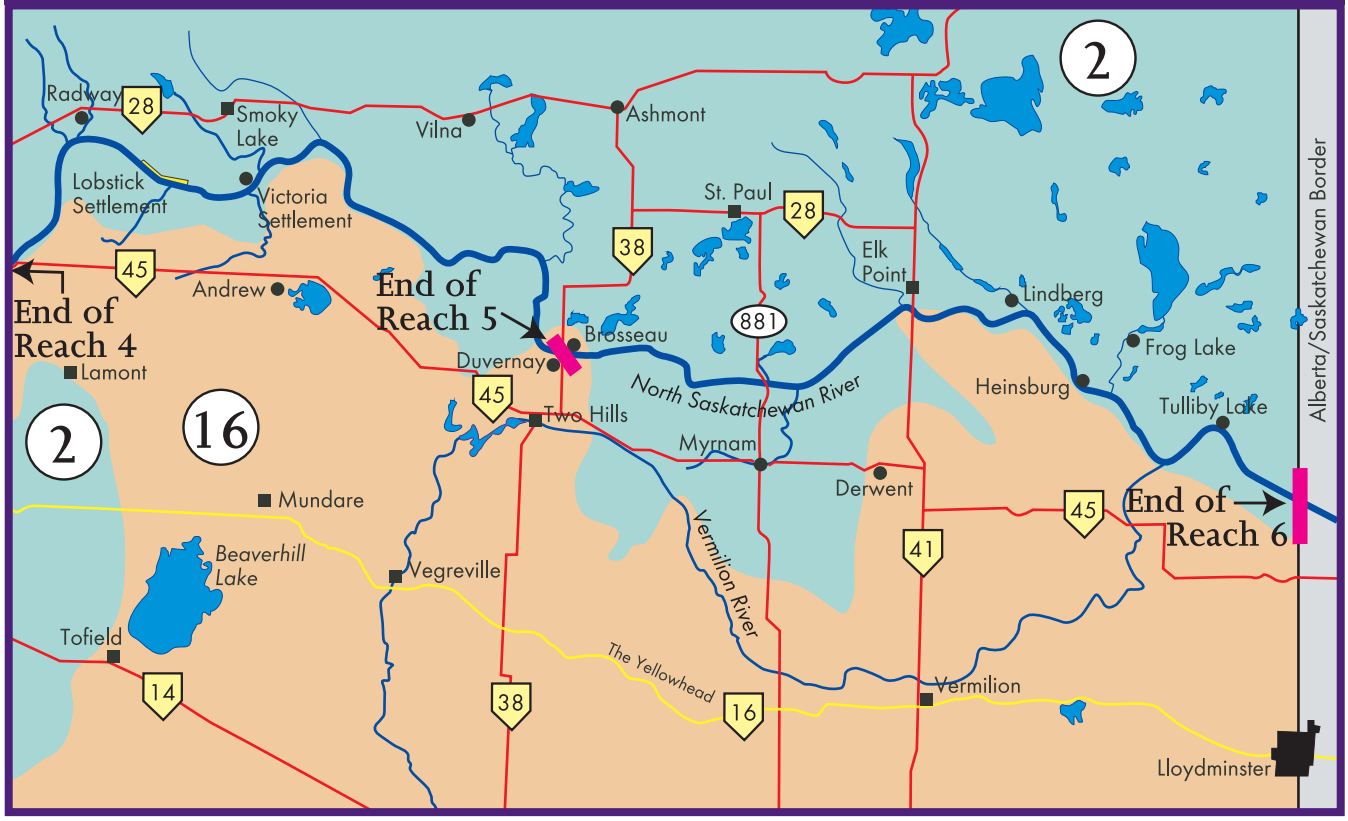
Figure 3 - Natural Region Map



Natural Regions & Subregions of Alberta

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Subregion:
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Subregion:
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9. **Montane**

Foothills Natural Region
Subregion:
10. Upper Foothills
11. Lower Foothills

Parkland Natural Region
Subregion:
14. Foothills Parkland
15. Peace River Parkland
16. Central Parkland

0 10 Kilometres 50 100 kilometres
0 10 Miles 30 60 miles

N

Reach Six (See Figure 3)

From *the Highway 38 to bridge at Brasseau/Duvernay to the Alberta/Saskatchewan border* can be nominated on the basis of Cultural Heritage Values, Natural Heritage Values and Recreation Value.

i. Cultural Heritage Value is evident as the river flows around an island north of Myrnam where the chimneys of 3 different fur trading forts are still visible, past the old site of supply depot Dog Rump House; the Provincial Heritage Site of Fort George and Buckingham House; the area south of Frog Lake traveled by Chief Big Bear's

people during the North West Rebellion; Whitney Lake Provincial Parks, and the site of Fort Vermilion near one of few riverside buffalo jump sites.

ii. Natural Heritage Value is found in an abundance of wildlife encountered every day on the river, in all seasons. Large groups of bachelor and immature pelicans frequent this reach in the summer and the riverbank shelters many communal garter snake hibernaculae. Large islands, including the historic Fort de L'Isle, afford unique camping and exploring opportunities. Geological history is accessible through the abundance of fossilized cephalopods and petrified wood that are found regularly along the north river banks particularly in the area from Fort George/Buckingham House to the border.

iii. Recreation Value is evident in the popularity of this reach for river touring, hiking, picnicking and berry picking, as well as winter snowmobile and snowshoe activities. Since the river is without populous riverside municipalities, river adventures easily retain a wilderness feeling. The recent development of the multi-use Iron Horse Trail, along the river from Elk Point to Heinsburg, further increases the recreational value of this reach.

Reach Seven

From the *Alberta/Saskatchewan Border to The Forks* can be nominated on the basis of Cultural Heritage Values, Natural Heritage and Recreation Value.

NOTE: Reach Seven is beyond the Alberta border, and therefore it can only be nominated into the Canadian Heritage Rivers System by communities in the province of Saskatchewan. However it is discussed in this Background Study to provide continuity and to encourage a broader understanding of the whole river.

i. Cultural Heritage Value is physically evident as the river flows past Fort Pitt Provincial Historic Park; Frenchman Butte National Historic Site; the Paynton Ferry, which is still in operation; Fort Battleford National Historic Site; Fort Carleton Provincial Historic Park, and at least two more operating ferries. The Battle of Fish Creek National Historic Site and the Duck Lake Centre are located in the narrow corridor between the North and the South Saskatchewan Rivers. This reach embodies the major battles and events of the 1885 North West Rebellion, as well as significant early exploration, fur trade and sternwheeler activity.

ii. Natural Heritage Value is evident in the post-glacial wind depositions between the North and the South Saskatchewan Rivers, the dozens of islands of varying sizes, and the shifting sandbars. Many lakes along the river are known for an abundance of migratory bird staging areas. The Redberry Lake Biosphere Reserve, designated by UNESCO in January 2000, is found near the end of this reach.

iii. Recreation Value is found in river travel, camping, hiking and an abundance of wildlife sightings. The many large, treed islands make good camping and hiking spots.

York Boat re-enactment
photo Billie Milholland

Current Management Strategies

The North Saskatchewan River watershed occupies a portion of central Alberta extending from the Rocky Mountains on the west across the Alberta plains and parkland and into Saskatchewan east to the confluence with the South Saskatchewan River. The headwaters are located at the toe of the Saskatchewan Glacier in Banff National Park, and the river flows in an easterly direction towards the Alberta-Saskatchewan border. The watershed is part of the Nelson River basin, which drains into the Hudson Bay.

The watershed is a source of water for rural and urban domestic and municipal users, agriculture, forestry, the oil and gas industry, fishing, traditional use, recreation and tourism. The watershed includes parts of five major natural regions or ecological land classifications and supports recreational, aesthetic, cultural and heritage values. There are two dams on the North Saskatchewan River: the Brazeau and Big Horn dams. The Big Horn Dam creates Abraham Lake. The Brazeau Dam creates the Brazeau Reservoir, located on the Brazeau River. The mean annual discharge from the watershed in Alberta into Saskatchewan is over 7 billion m3. A detailed review of the 18 sub-watersheds within the North Saskatchewan basin can be found in the State of the North Saskatchewan Watershed Report 2005 - A Foundation for Collaborative Watershed Management (NSWA, 2005).

The NSWA is embarking on a 5-year planning process to develop an integrated watershed management plan (IWMP) for the North Saskatchewan River watershed, in consultation and collaboration with stakeholders and the public. It is viewed that a Heritage Rivers Strategy will support and contribute to the IWMP process. Because the NSWA is a watershed-focused organization, it considers the natural, recreational and cultural values of the entire watershed to be significant to watershed health and of great benefit to society. A plan for the river through the CHR designation will highlight specific values of the river, the benefits they bestow to the community's along the river and a strategy for their wise use into the future.

The goal of the IWMP is to provide a plan that will guide the protection, maintenance and restoration of the North Saskatchewan watershed that balances environmental, social and economic needs while considering the needs of the sub-watershed regions.

The objectives of the IWMP (IWMP Terms of Reference, NSWA, 2005) are to:

1. Allow development of strategies that sustain our drinking water, aquatic ecosystems, and economies for future generations.

2. Identify land use practices that could positively or negatively impact water resources; and develop strategies to reduce negative impacts.
3. Identify critical gaps in watershed knowledge and identify agencies or programs that will address these gaps.
4. Be prepared in consultation with watershed stakeholders and the public so that the plan meets economic, social, health and environmental needs.

The NSWA through the IWMP process will where appropriate, support and coordinate efforts with the responsible authorities for existing regional strategies and planning processes. Regional strategies deal with numerous resources and a suite of issues in a region. It is not the intention of the IWMP to replace existing plans, but rather to enhance or support them. Consultation with the responsible authorities through the IWMP planning processes will assist in defining how coordination and enhancements may occur.

Recognizing regional resource management challenges, and their interconnection within a watershed, may require issues arising from the regional sustainable development strategies to be incorporated into the IWMP and conversely issues arising out of IWMP may need to be included in regional strategies.

With specific reference to A Heritage Rivers Strategy for the North Saskatchewan, actions will be outlined and supported that preserve and enhance the values of the river as outlined in this background study, through a collaborative process involving the NSWA and our river communities.

All of the six river reaches in Alberta are suitable for nomination, either separately, or in combination with many of the others. The seventh reach, which extends into Saskatchewan, cannot be included in Alberta's nomination, but is suitable for a nomination spearheaded by stakeholders in Saskatchewan.

Commitment

The NSWA Steering Committee is pleased to act on behalf of the NSWA membership to oversee the completion of the North Saskatchewan River Heritage Background Study and to spearhead the submission of a nomination to the Canadian Heritage Rivers Board for consideration. If the Canadian Heritage Rivers Board accepts the nomination, this Background Study will then provide a foundation for developing a Management Plan for the North Saskatchewan River, and be used to raise the profile and knowledge base locally, regionally and nationally. The extensive information contained in this document, about the rich cultural and natural heritage that connects people to the North Saskatchewan River, will be available to any and all groups and individuals in the watershed. The NSWA believes that this information will assist people in developing the sense of ownership and pride essential to adopting a long-term protection ethic. It is out of a community-imbedded protection ethic that long-term wise-use and management of the historic, economic and environmental resources of the North Saskatchewan River, and its watershed will emerge.

The NSWA has taken as its vision, a watershed where ecological integrity is the foundation for environmental, cultural, social and economic decision-making. It also envisions a watershed where actions taken and policies implemented will result in the wise use and management of the North Saskatchewan Watershed in Alberta. The NSWA was incorporated as a non-profit society in 2000, and now brings together nearly 200 organizations and citizens representing industry, federal and provincial government departments, aboriginal communities, agriculture, municipalities and environmental NGO's from throughout the watershed. The NSWA mission is to protect and improve water quality, quantity and the health of the watershed by seeking, developing and sharing knowledge; optimizing communication and partnerships and by fostering an understanding of the relationship between societal needs and watershed function through an adaptive planning process.

The cumulative impact of human land use has profound effects on water quality and ecological processes. It can also have serious impacts on our cultural and historical resources. Humans need clean, safe water and they desire economic, recreation and learning opportunities. Intact, well-functioning ecosystems produce environments that can meet these human needs and desires.

The NSWA takes a watershed approach in order to be able to suggest management strategies adequate for promoting the long term viability of the river system. Integrated Watershed Management, as interpreted by the NSWA, uses a systems and multi-stakeholder approach to advise management of the watershed as a system that reaches across political and jurisdictional boundaries.

The NSWA operates on principles of inclusiveness and cooperation in order to affect sustainable development in its area of geographical influence. Research and community dialogue sets the foundation for integrated watershed management by providing the members and the general watershed community with the technical data and ecological and historical information on which to base planning, decision-making and public education.

In order to fulfill its mandate, the NSWA membership determined that an Integrated Watershed Management Plan for the North Saskatchewan River Watershed is necessary for the long-term sustainability of the resources of this watershed. Under the Alberta Water Act, the Alberta Framework for Water Management Planning allows for management plans to be created by organizations other than the Alberta Government. This has been further affirmed by the Government of Alberta's Strategy for Sustainability - Water for Life (2003).

Taking this opportunity, the NSWA members decided to spearhead a grass-roots initiative to create a plan for the watershed and to invite the Alberta government to participate as equal partners in the process. To support the sustainability model, an Integrated Watershed Management Plan must address human needs (social and economic) and the needs of the environment. Therefore, the NSWA's IWMP will have several components, addressing key areas including social, economic, water and land-use.

Development of the North Saskatchewan River Background Study and the potential nomination of the River are complementary to the broader watershed mandate of the NSWA and would serve to elevate public awareness of the importance of the River and its care. Submitting this background study during Alberta's Centennial Year further serves to acknowledge the significance of the North Saskatchewan River in Alberta's history, to its present and into the future.

Introduction

Canadian Heritage River System (CHRS)

The Canadian Heritage River Systems (CHRS), established in 1984, is a cooperative venture between federal, provincial and territorial governments. The program is designed to offer international, national, provincial and regional recognition to outstanding rivers in Canada that demonstrate exceptional examples of Canadian cultural, natural and recreation values. The main objective is to ensure long-term management of these rivers in order that their unique values are conserved for the continuing benefit and enjoyment of Canadians and visitors to Canada.

A CHRS designation is an honorary title reserved for rivers that are included in Canada's system of Heritage Rivers. There is no legislated or regulatory authority associated with this designation. Its position is maintained solely through the cooperative efforts within the river communities. The intent of a designation is to increase awareness of the river's cultural/historic, natural, recreational, and economic values. It is to encourage cooperation among river users toward optimizing river use, while at the same time preserving and enhancing the heritage values.

The CHRS operates according to a set of "Principles, Procedures, and Operational Guidelines" (2001) that directs the administration of the CHRS, and sets out the process for nominating and designating rivers to the CHRS. Selection guidelines are outlined for the Natural Heritage, Cultural Heritage and Recreational Values. In general, a river must fulfill one or more of the natural or cultural heritage values guidelines as well as the integrity guidelines in order to be considered for CHRS designation. Rivers must be evaluated in a Background Study according to "A Framework for the Natural Values of Canadian Heritage Rivers" (2001) and "A Cultural Framework for Canadian Heritage Rivers" (2000) in order to determine if the river meets the CHRS criteria.

The CHRS annual report of 2003-2004, indicated that thirty-nine river reaches had been nominated, totalling 9,922 kilometres. Thirty-one of these river reaches have achieved formal designation from the CHRS Board, and have river management plans in place to protect the heritage values. In Alberta, two river reaches, the Athabasca within Jasper National Park, and the North Saskatchewan within Banff National Park, as well as the Clearwater-Christina Rivers have achieved Heritage River status. The Clearwater-Christina Rivers were designated in

2003, with a Management Plan in place. These were the only provincially designated rivers at the time of the completion of this study.

Alberta's Heritage Rivers program

Alberta became a member of the CHRS board in February 1994. Alberta's Heritage Rivers process provides the framework for stakeholders along the river to position their river for nomination, and to prepare the management plan, which must precede a CHRS designation.

In 1996, Alberta Environmental Protection conducted a "Canadian Heritage Rivers System Study of Alberta Rivers". This assessment ranked 72 Alberta rivers for possible nomination to the CHRS, and established priority rivers for further research. The North Saskatchewan River ranked #1 in terms of Human Heritage Values, and #3 in terms of Natural Heritage Values with the highest ranking overall for those two categories. These results indicated that the North Saskatchewan River warranted further study for potential CHRS nomination.

North Saskatchewan River Ranking

The North Saskatchewan River ranked lower in terms of Natural Heritage Values mainly due to compromised water quality. Water quality has greatly improved since the 1996 study; therefore it is likely that the Natural Heritage Value of the river has increased. Water quality initiatives include: the introduction of discharge disinfection and nutrient reduction; the formation of the *North Saskatchewan Watershed Alliance*; and the advent of local watershed stewardship groups. These initiatives have changed and continue to change how urban areas, industry and agriculture impact the water quality of the river.

"An ultraviolet (UV) disinfection unit was added to treat effluent [in the City of Edmonton] in the fall of 1997 and the biological nutrient removal (BNR) was implemented in 2005."[iii]

"Based on the sampling results for the North Saskatchewan River upstream of the Gold Bar Wastewater Treatment Plant, during dry weather conditions, the North Saskatchewan River meets Alberta Surface Water Quality guidelines for secondary recreation 100% of the time … and direct contact recreation 92% of the time. Downstream of the Gold Bar Wastewater Treatment Plant, during dry weather conditions, the North Saskatchewan River meets Alberta Surface Water Quality guidelines for secondary recreation 100% of the time and direct contact recreation 50% of the time."[iv]

The introduction of discharge disinfection and nutrient reduction in 1998 has resulted in reduced bacteria and phosphorus levels downstream of the City of Edmonton (Alberta Environment 2001).

Development and implementation of a management plan is a stakeholder exercise; it is not government driven. Management strategies are developed and implemented by the local stakeholders through cooperation and partnership with public, industry, and government departments. A management plan will offer recommendations and guidelines to be considered by public, industry and

government when planning developments and activities that impact river users and river heritage values. Many regional and specific use management plans are already in place along the North Saskatchewan River. By amalgamating and refining these already well-constructed plans, and incorporating them into the NSWA Integrated Watershed Management Plan, an overall management plan for the North Saskatchewan River could emerge.

Study Area (See Figures 1, 2, 3 & 4)

The North Saskatchewan River flows within the North Saskatchewan Watershed across central Alberta, and into Saskatchewan. The river travels 1287 km from its origins in the Columbia Icefields in the Rocky Mountains of Western Alberta to the 'Forks' within the province of Saskatchewan. This route transects four of Alberta's six natural regions: Rocky Mountains, Foothills, Boreal Forest and Parkland.

On this long journey, the North Saskatchewan River streams from the Saskatchewan Glacier, which is part of the Columbia Icefields in Banff National Park, in the Rocky Mountains. As it tumbles through the steep-walled gorge between Mount Athabasca and Mount Saskatchewan, the waters of Nigel Creek join it, and then the Alexandra River enters the North Saskatchewan River's southeasterly flow. At Saskatchewan Crossing, the Howse and the Mistaya Rivers add volume to the river, which now turns east down through the foothills, collecting outflow from the Ram and Clearwater Rivers before traveling past the Town of Rocky Mountain House.

At that juncture the river turns north, gathering water from the Baptiste and the Brazeau Rivers before continuing past Drayton Valley. North of Drayton Valley, it flows east again, meandering past the town of Devon, and then through the urban sprawl of Edmonton and Fort Saskatchewan. It takes in the Sturgeon River as it leaves major urban centres behind.

It gathers in the waters of the Vermilion River just before it crosses the provincial boundary, then the Battle River as it flows between the two Battlefords in the province of Saskatchewan, and finally, with the addition of several more small rivers, it flows past the City of Prince Albert. At 'The Forks', a dramatic meeting with its sister tributary, the South Saskatchewan River, creates the Saskatchewan River, which now wanders through marshy lake lands until it reaches Lake Winnipeg at Grand Rapids, and eventually makes its way to the Hudson Bay.

The North Saskatchewan River Background Study area includes 1239 km of the North Saskatchewan River, divided into seven reaches, from the Banff National Park boundary to the 'Forks' in the province of Saskatchewan. The Alberta portion of the river (reaches one through six) makes up 599 km. The remaining 640 km, which is reach seven within the province of Saskatchewan, is included in the study for contiguity of the "river narrative", but will not be included in an Alberta nomination of the river. Prior to Reach One, 48.5 km of the river has been designated to the CHRS within Banff National Park, and therefore is not included in the Background Study.

The study concentrates, primarily, on the main stem of the river, as well as the riparian zone and the land bordering the river up to and including one mile on each side. However, there are many areas that exist beyond these demarcation lines, which have both natural and cultural significance, directly related to the heritage value of the river[4]. In these areas, additional adjacent land is incorporated into the study area where it is considered to be inseparable from the Cultural, Natural or Recreation Values of the river.

Background Study Assumptions

- The analysis of the North Saskatchewan River in the "Canadian Heritage Rivers Systems Study of Rivers in Alberta" (1996) classified the North Saskatchewan River as one of the highest ranking in all heritage value categories, therefore it is assumed that this river warrants further detailed study.
- The background study emphasis, while primarily on the river up to and including one mile on either side of the river, remains sensitive to important dynamics within the North Saskatchewan River watershed, and reference is made to aspects deemed significant to any value element.

Background Study Approach

The length of the North Saskatchewan River, the breadth of its watershed, the vast variety of ecosystems and geological terrain through which it passes, the high Cultural and Natural Heritage Values within every reach, as well as the commitment to creating a document which would contain authentic information presented in language accessible to every type of stakeholder created a particular kind of challenge. It was decided to develop a document that, while adhering strictly to CHRS guidelines, would use a more narrative approach, using direct quotations, especially from historical documents, to enhance the illustration of various values.

To encourage widespread use of the study, it was decided to use endnotes, glossaries, as well as sectional bibliographies. It is important that everyone using the study (interested citizens, students, professionals) be able to understand the information easily, be able to apply the information to management planning, and be able to add to the information base as time and interest allows.

Since the significant river stakeholders along the river are members of the North Saskatchewan Watershed Alliance, introductory questionnaires and queries were unnecessary. Summer students attempted to identify broad categories of river-related information. The researcher, in consultation and through interviews with various NSWA members and other specialists along the river, refined the research and completed the writing process.

[4]The area between the North and South Saskatchewan Rivers from the Battlefords to the "Forks" is significant for the major military encounters during the 1885 North West Rebellion.

Background Study Process

- Planning to use some of the research information gathered for the *North Saskatchewan River Guide: mountains to prairie, a living landscape*, the NSWA allocated extra resources for additional information gathering for a background study of the North Saskatchewan River as part of the CHRS nomination process.
- Additional resources were provided through joint funding from the Canadian National Parks Directorate of the Parks Canada Agency, Parks and Protected Areas Division of Alberta Community Development, the Alberta Beef Producers and Fisheries and Oceans Canada.
- A literature review of North Saskatchewan River-related topics and issues that emphasize cultural and natural heritage values was completed.
- Following the CHRS cultural and natural values framework, information was allocated to the specific themes and sub-themes according to these frameworks.
- The North Saskatchewan River Study Area was divided into seven specific reaches following as nearly as possible the Natural Regions boundaries through which it flows.
- Information was verified through consultation with knowledgeable people and stakeholders along the river.
- The cultural and natural heritage values were assessed to determine the North Saskatchewan River's potential for the CHRS.
- Findings were developed into a first draft Background Study and reviewed by Alberta Community Development staff.
- The report was revised according to response from Alberta Community Development staff. Further revision by an Alberta Heritage Rivers planner helped to format the Background Study according to the specific requirements of the CHRS frameworks. The final Draft North Saskatchewan River Background Study was written.

Background Study Organization

The Background Study is organized according to themes outlined in "A Cultural Framework for Canadian Heritage Rivers" (2000) and "A Framework for the Natural Values of Canadian Heritage Rivers" (2001). The Study is also organized to emphasize main categories in such a way that groups and organizations can easily add more information at any time. It is intended that the North Saskatchewan River Background Study be used as a tool for future river research projects as well as a practical workbook for developing various river management strategies.

The five main themes in the Cultural Values section are interpreted by means of designated sub-themes. There are six main themes in the Natural Values section interpreted through designated sub-themes.

Within the Cultural Values section, a chronological sequence is used, where possible, in order to illustrate the dynamic and continuing relationship between the North Saskatchewan River and both human and biotic populations. Specific sources are noted for specific heritage and natural information in an attempt to eliminate the need for making continual general statements to suggest the outstanding heritage value of the North Saskatchewan River.

This allows the story of the North Saskatchewan River, as the main entry point for the early westward movement of displaced Aboriginal people of Eastern Canada, as well as for early explorers, fur traders and missionaries, to unfold elegantly through a time continuum. This method emphasizes the dynamic interplay between the river, and the diverse life forms that it has sustained and influenced over the course of its history. The study is designed to express, in a more narrative style than is often used for River Studies of this type, the compelling story of the river, because it is within the realm of 'story' that a more complete understanding of Heritage Value emerges. *The story of this river is the story of the west.*

North Saskatchewan Watershed Alliance (NSWA)

The North Saskatchewan Watershed Alliance (NSWA) has taken as its mandate the protection and enhancement of water quality, water quantity and biodiversity in the North Saskatchewan River Watershed, within Alberta. The NSWA was incorporated as a non-profit society in 2000, bringing together over 100 member organizations and citizens representing industry, federal and provincial government departments, aboriginal communities, agriculture, municipalities and environmental NGO's from throughout the watershed.

The cumulative impact of human land-use has profound effects on water quality and ecological processes. Humans need clean, safe water and they desire economic and recreational opportunities. Intact, fully functioning ecosystems produce ecological environments that can meet these human needs and desires.

The NSWA takes a watershed approach in order to be able to suggest management strategies adequate for promoting the long-term viability of the river system. Integrated Watershed Management, as interpreted by the NSWA, uses an ecosystem and multi-stakeholder approach to advise management of the watershed as a system that reaches across political jurisdictional boundaries.

The NSWA operates on a principle of inclusiveness and cooperation in order to affect a sustainable development agenda. Research and community dialogue forms the foundation for integrated watershed management by providing members and the general watershed community with the technical data and ecological and historical information on which to base planning, decisions and public education.

In order to fulfill its mandate, the NSWA membership determined that an Integrated Watershed Management Plan for the North Saskatchewan River Watershed is necessary for the long-term sustainability of the water and resources of this watershed. Under the Alberta *Water Act*, the Alberta Framework for Water Management Planning allows for management plans to be created by

organizations other than the Alberta Government. This is further endorsed by the Government of Alberta's Strategy for Sustainability: Water for Life.

Taking this opportunity, the NSWA members decided to spearhead a grass-roots initiative to create a watershed management plan for the North Saskatchewan River watershed and to invite the Alberta Government to participate as equal partners in the process. To support the sustainability model, an Integrated Watershed Management Plan must address human, social and economic needs and the needs of the environment. Therefore, the North Saskatchewan Integrated Watershed Management Plan will have several components that incorporate water, landuse and culture.

Development of the North Saskatchewan River Background Study and the potential nomination of the North Saskatchewan River are complementary to the broader watershed mandate of the NSWA and would serve to elevate public awareness of the importance of the river and its care.

NSWA Membership (as of June 30, 2005)
Non-Government Organizations

1. Alberta Conservation Association
2. Alberta Ecotrust
3. Alberta Lake Management Society
4. Alberta League for Environmentally Responsible Tourism (ALERT)
5. Bow River Basin Council
6. Bow River Project
7. Butte Action Committee for the Environment
8. Capital Health Authority
9. Cows & Fish Program
10. Ducks Unlimited Canada
11. East Central Regional Health Authority
12. Energy Efficiency Association
13. Environmental Law Centre
14. Environmental Resource Centre
15. Federation of Alberta Naturalists
16. Lakeland Regional Health Authority
17. Land Stewardship Centre of Canada
18. Legacy Lands Conservation Society
19. Northeast Alberta Water Management Coalition
20. Northwest Alliance Conservation Initiative
21. Parkland Residents Association
22. Partners FOR the Saskatchewan River Basin
23. Pembina Institute for Appropriate Development

24. Rocky & Nordegg Cooperative Fisheries Inventory Program
25. Rocky Riparian Group
26. Rossdale Community League
27. Saskatchewan Watershed Authority
28. Sierra Club, Prairie Chapter
29. Sombrilla
30. The Living by Water Project
31. TOPSOIL
32. Toxics Watch Society of Alberta
33. Tri-town Environmental Society
34. Trout Unlimited Canada
35. Vermilion River Naturalist Club
36. Wonder of Water

Research/Education

37. Alberta Research Council
38. Edmonton Catholic Schools
39. Edmonton Science Outreach Network
40. Foothills Model Forest
41. Inside Education
42. Riverwatch
43. The King's University College
44. University of Alberta, Kinsella Research Station
45. University of Alberta, Renewable Resources Department
46. Water Institute for Semi-arid Ecosystems
47. YoWoChAs

Culture/Recreation/Tourism

48. Alberta Fish & Game Association
49. Alberta Recreation Canoe Association
50. Alberta Sport, Recreation, Parks and Wildlife Foundation
51. Alberta Trailnet Society
52. Avatar Productions
53. Banff National Park
54. Dickson Fish & Game Association
55. Edmonton & District Historical Society
56. Elk Island National Park
57. Kalyna Country
58. Midwest Tourism

59. Northeast Edmonton Heritage Conservation Initiative
60. Northwest Voyageurs Canoe and Kayak Club
61. River Valley Alliance
62. Riverland Recreational Trail Society
63. The Iron Horse Trail
64. Thorsby Fish & Game Association
65. Voyageur Ventures

Agriculture

66. Alberta Beef Producers
67. Canadian National Committee for Irrigation Drainage
68. Grey Wooded Forage Association
69. Intensive Livestock Working Group
70. Restorative Ecological Agriculture Projects Society
71. St. Mary's Irrigation District
72. St. Paul Grazing Reserve

Aboriginal Communities

73. Enoch First Nation
74. First Nations Alberta Technical Services Advisory Group
75. Métis Nation of Alberta
76. Paul First Nation
77. Saddle Lake Tribal Administration

Industry

78. Alberta Capital Region Wastewater Commission
79. Alberta's Industrial Heartland
80. AMEC Earth & Environmental Ltd.
81. Aquality Environmental Consulting
82. Aquascience
83. Dillon Consulting Ltd.
84. EBA Engineering Consultants Ltd.
85. ECL Environmental Services Limited
86. EduTransfer Design Association Inc.
87. Elk Point Chamber of Commerce
88. EnviroMak
89. EPCOR Water Services
90. Golder and Associates
91. Komex International
92. Noble Resource Management Ltd.
93. Northeast Capital Industrial Association

94. Nova Chemicals Corporation
95. Parkland Stone Landscaping
96. Petro-Canada
97. Shell Canada Ltd.
98. Stantec Consulting Ltd
99. Strathcona Industrial Association
100. Sunpine Forest Products
101. The Canadian Salt Company Limited
102. Top Draw
103. TransAlta Utilities
104. Weyerhaeuser

River at Edmonton
photo Billie Milholland

Government

Federal

105. Agriculture & Agri-Food Canada; Prairie Farm Rehabilitation Administration
106. Canadian Heritage Parks Canada
107. Fisheries and Oceans Canada
108. Department of Indian & Northern Affairs

Provincial

109. Alberta Agriculture, Food & Rural Development
110. Alberta Community Development
111. Alberta Energy and Utilities Board
112. Alberta Environment
113. Alberta Environmentally Sustainable Agriculture
114. Alberta Health and Wellness
115. Alberta Sustainable Resource Development
116. Special Areas

Municipal

117. Alberta Urban Municipalities Association
118. City of Camrose
119. City of Edmonton, Community Services
120. City of Edmonton, Drainage Services
121. City of Edmonton, Planning & Development
122. City of Leduc, Environmental Advisory Board
123. City of Lloydminster
124. City of Spruce Grove
125. City of St. Albert
126. North West Alliance Conservation Initiative
127. Town of Bruderheim
128. Town of Devon

129. Town of Drayton Valley
130. Town of Elk Point
131. Town of Gibbons
132. Town of Rocky Mountain House
133. Town of Smoky Lake
134. Town of Tofield
135. Village of Marwayne

Counties & MD's

136. Beaver
137. Camrose
138. Clearwater
139. Flagstaff
140. Lac Ste Anne
141. Lacombe
142. Lamont
143. Leduc
144. Minburn #27
145. Paintearth #18
146. Parkland
147. Red Deer
148. Smoky Lake
149. St. Paul #19
150. Strathcona
151. Engineering & Environmental Planning
152. Environmental Operations
153. Sturgeon
154. Special Areas
155. Two Hills #21
156. Vermilion River #24
157. Wetaskiwin #10
158. M. D. Brazeau
159. M.D. of Wainwright No. 61

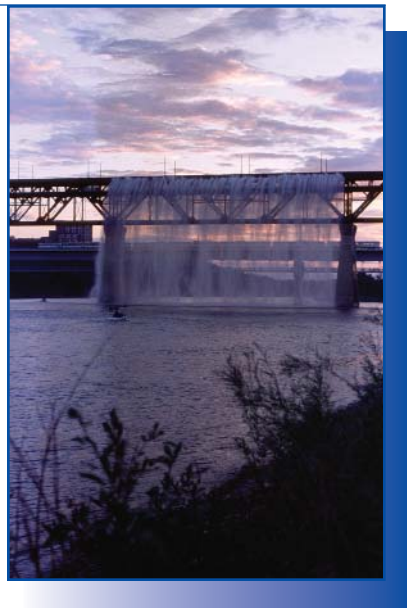
Citizen Members

160-186

Watershed Stewardship Groups

187. Battle Lake Watershed Enhancement Association
188. Beaverhill Watershed Initiative
189. Big Lake Environment Support Society

190. Bonnie Lake Sustainability Association
191. Devon Watershed Alliance
192. Friends of Lily Lake
193. Iron Creek Watershed Improvement Society
194. Rocky Riparian Group
195. Vermilion Watershed Initiative
196. Wizard Lake Watershed Group



River at Edmonton
photo John Ulan 2001

End Notes

i Lund, Mark. Canoe Guide. P.4

ii Lund, Mark. Canoe Guide. P.6

iii The City of Edmonton North Saskatchewan River 2002 Water Quality Sampling Program - Final Report, August 11, 2003, p. 1

iv ibid p. x

Shore of Abraham Lake
photo Billie Milholland

Historical re-enactment - Edmonton, May 10, 2005
photo Billie Milholland

Fishing at the mouth of Big Horn River
photo Billie Milholland

River at Edmonton
photo Billie Milholland

Section II

Cultural Heritage Value

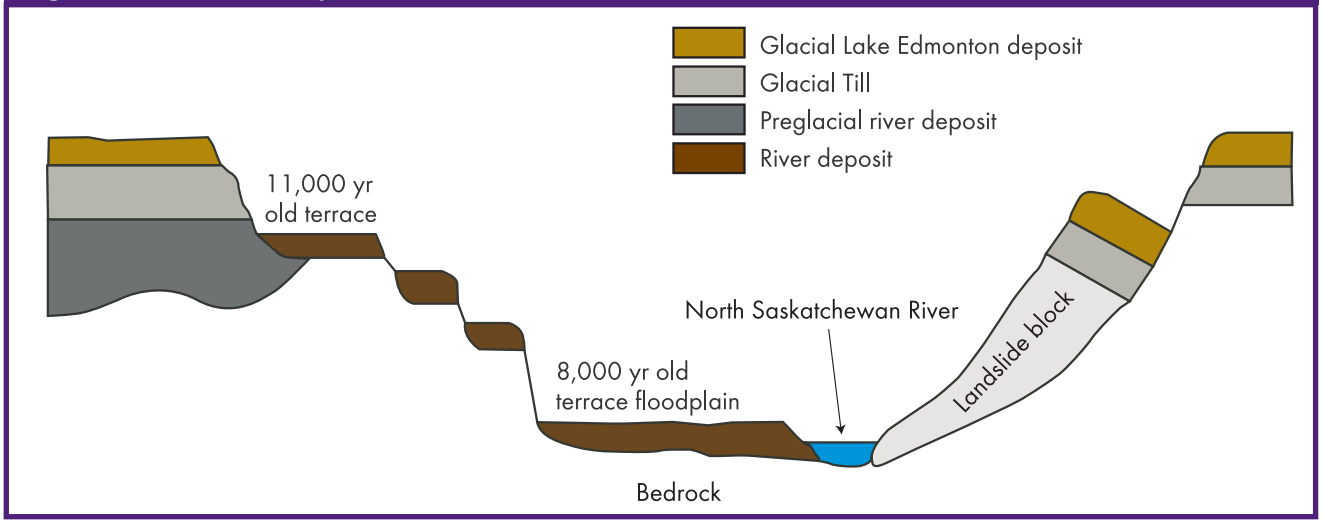
Thematic Analysis of the North Saskatchewan River using
"A Cultural Framework for Canadian Heritage Rivers" (2000)

Cultural Heritage Value
Introduction

The Cultural Heritage Value of a river is related to human use and the influence of the river on human activities. These elements of cultural value can be represented by cultural resources, which are *in situ* evidence of past human activity or belief. For the purposes of this study, human activities are discussed by means of five themes: Resource Harvesting, Water Transport, Riparian Settlement, Culture and Recreation, and Jurisdictional use of the river.

The Cultural Heritage Value of the North Saskatchewan River is diverse and is abundant in all reaches of the river. In fact, in many reaches the cultural value of the river seems to overshadow the other values in both quantity and quality. Few kilometres along the river, from the National Park boundary to the 'Forks' in Saskatchewan, are without, what Robert Burns attributes to the Thames in England, "*Liquid History*". Because the angular direction of receding glaciers, after the last glaciatin, encouraged early repopulation of the area, the North Saskatchewan River has a rich cultural heritage reaching back at least 11,500 years. The river profile at Edmonton (See Figure 4) illustrates how the river's action over millennia, has formed a series of terraces where the continual human use of the river can be read.

Figure 4 - River Valley Profile



Adapted from: Archeaology: Guide & Tour of Greater Edmonton Area, page 5

River at Edmonton
photo Billie Milholland

Due to the pressure of the fur trade, the early-recorded history of the river reflects western exploration efforts of both New France and England. A significant part of the development of western Canada, from the middle of the 17th century to the dawn of the 20th century, is written in the history of this river. The history of the North Saskatchewan River is also the history of early settlement in both Alberta and Saskatchewan. It tells of the expansion of mission fields and of the development of Métis settlements during the middle of the 19th century, as well as the coming of European settlers at the turn of the 20th century. In fact, it has only been since the latter part of the 20th century that human activity along the river has been reduced primarily to recreational use. Recreational use of the river, which is steadily increasing, is enhanced by the river's abundant and varied cultural heritage and by the degree to which this heritage is recognized, preserved and promoted by river communities.

The fur trade in western Canada dominates North Saskatchewan River history from the late 17th Century to the beginning of the 19th Century. By the middle of the 19th Century this history expands to include early mission fields, the quest for gold and adventure, various scientific expeditions, and rapid European settlement.

Many kinds of river crafts have plied the waters of the North Saskatchewan River: bull boats, canoes, York boats, skiffs, rafts, scows, barges and sternwheelers, as well as ferries of every size and description.

Many types of human subsistence activity have been recorded along the entire length of the river: fishing (including early netting and fish weirs); farming (including pre-contact tobacco gardens); hunting (including buffalo jumps and pounds); trapping; boat building; berry and root gathering; and even pottery production. A wide variety of human cultural groups have lived along the length of the North Saskatchewan River, since its inception after the last great Ice Age, including:

- Paleo-Indian people at the end of the last ice age
- Assiniboine people moving west from the Lake of the Woods area
- Woods Cree, Plains Cree, and Willow Cree
- The Blackfoot Confederacy (including the Gros Ventre)
- Fur traders from New France, from the Yankee south (the thirteen colonies) and later from the United States, as well as from England, the British colony of Canada and later from the Dominion of Canada
- Explorers and men on scientific expeditions
- Presbyterian, Methodist, Church of England and Roman Catholic missionaries

- Early entrepreneurs looking for gold and adventure
- The Métis (the children of the fur trade)
- Early European tourist adventurers
- The North West Mounted Police
- River and ferry boatmen
- The famous and the infamous

River-related resource harvesting was not limited to fur. The river's colourful resource gathering history includes:

- Fish and game
- Harvesting pigment clays for decoration, and clay for pottery and brick making
- Mining coal
- Washing for gold
- Cutting timber
- Harvesting plant cash crops like Seneca root, chokecherries and saskatoon berries
- Harvesting food and medicinal plants - berries, nuts, herbage, roots and rhizomes

Mistahimaskwa Big Bear 1825-1888
photo Canadian Heritage Archive

Three National Historic Sites and four Provincial Historic Sites, as well as interpretive Fort Edmonton on the river, are the most obvious indicators of how river history is remembered and preserved. It is interesting to note that, in all seven reaches, local populations are aware, and usually know the location of, many early fur trading posts that do not have an official designation. The plethora of publications which feature various aspects of the history of the North Saskatchewan River are also significant indicators of the river's importance, as well as the local and regional stories which are still told in all of the river communities.

Theme One

Resource Harvesting

Exploring the parameters of 'harvesting river resources' suggests a way to emphasize ancient activities central to subsistence and commercial uses of the river proper. It also provides a specific perspective from which to view more recent river resource harvesting activities. Early peoples throughout the world have relied upon rivers, streams and wetlands for sustenance and for resources for tool making. River resource harvesting means more than just fish; it also includes aquatic and amphibious animals, as well as birds and plants. River water itself, is a harvestable resource, both as liquid and as ice. The elements of the resource-harvesting theme are divided into sub-themes:

1.1 Fishing

1.2 Shoreline Resources Harvesting

1.3 Extraction of Water

Along the North Saskatchewan River, vestiges of the great abundance of plant, animal and mineral resources that were harvested in earlier times, along The North Saskatchewan River, are still evident today. A river journey from middle to late summer reveals a healthy growth of bank-side Saskatoon, Chokecherry, Pincherry, Hazelnut and Highbush Cranberry bushes. Coal seams can still be seen in riverbank strata; modern gold seekers wash the sand and gravel bars, and people still pick and clean silver willow seeds for making distinctive jewellery.

The water-dwelling, fur-bearers that fuelled the fur trade (beaver, otter and muskrat) are still seen along the river; deer and moose still come to the river to drink, and water birds, while not as abundant as in former times, are still sighted regularly on the river: e.g. heron, pelican, cormorant, ducks, and geese. Cattail and reeds continue to be abundant enough for replicating old crafts, and most of the important medicinal herbs used by early Aboriginal people (with the exception of Seneca root) are still harvested along the river.

Although buffalo jumps are often considered a prairie phenomenon, there is evidence of several riverside jumps that were used during the fur trade era, as well as many buffalo pounds in close proximity to the river. Missing along the river today are bison, pronghorn, trumpeter swans, leopard frogs, and various water and upland birds and the once vast meadows of harvestable food roots (mostly members of the lily family).

Historical Medicinal & Food Plants Still Found Along the North Saskatchewan River

Note: This list is for general interest only, intended to emphasize the diverse historical use of plant species along the river. This study does not recommend modern use of these species. An exhaustive list of all medicianal and food plants found along the river is beyond the scope of this study. This list includes only a small sample of the most common plants.

Common Name	Scientific Name	Historical Use
Bearberry, kinnikinnick	*Arctostaphyl os uva-ursi*	A mealy, seedy, dry red berry, often mistaken for low bush cranberry, it is a bland, but edible fruit. Both the fruit and leaves were used to make tea to alleviate symptoms of urinary infections. The active ingredient is a glycoside known as arbutin, found in many members of the heather family.[1] Its other elements are methylarbutin, ursolic acid, tannic acid, gallic acid, some essential oil, and resin. Certain constituents of the uva-ursi leaf combine with chemicals normally found in urine to form hydroquinone (P-dihydroxybenzene), which is bactericidal.[2]
Yarrow	*Achillea millefolium*	Contains a volatile oil with cineol, a tannin, as well as achilleine, achilletin, ivain, aconitic acid, stachydrin, choline, and glycocoll betaine, B-sitosterol and achillin, a lactone, and a bitter caledivain.[3] Yarrow has been used as a tonic and stimulant to induce perspiration and reduce fever in flus and colds, as well as topically as an antiseptic and to encourage clotting in fresh wounds.

Common Name	Scientific Name	Historical Use
Cottonwood, Balsam Poplar	*Populus balsamifera* & *Polulus candicans*	The buds of *Populus candicans*, a relative, contain a balsamlike resin, a yellow volatile oil (primarily humulene), gallic acid, malic acid, mannite, chrysin, tectochrysin, a fixed oil, and two glycosides, salicin and populin. (populin is salicin benzoate.) The term "balm of Gilead" is applied to an ointment made from the buds of the poplar tree as well as from a totally different tree from Arabia. A tea made from the buds is stimulant, tonic, diuretic, expectorant, nephritic, demulcent, cathartic, peristaltic, and nutritive.[4]
Birch	*Betula papyrifera*	*The Merck Index* cites betulin (betula camphor) 10% to 15% in the outer portion of the white bark. Leaves contain betuloresinic acid, essential oil, ether, betuloside, gaultherin, methyl salicylate, and ascorbic acid; in the bark of the sweet birch is salicylic acid. Birch leaf tea has been used as therapy for gout, rheumatism, and dropsy and also for dissolving kidney stones and as a mouthwash.[5]
Fireweed or Métis Asparagus	*Epilobium angustifolium*	The whole plant is edible and the tea from the leaves is stronger than chamomile when used to alleviate restlessness.[6]
Cleavers, Lady's Bedstraw	*Galium boreale*	The plant contains starch, chlorophyll, and three distinct acids: a kind of tannic acid named galitannic acid, citric acid and rubichloric acid. It is probably the acid content that is responsible for the plant's property of curdling milk. The association of this plant with milk is reflected in its name, *Galium*, from the Greek word *gala*, milk, and the common name of cheese rennet. Cleavers is a soothing, relaxing diuretic that influences the kidneys and bladder and acts mildly on the bowels. Cleavers tea, a mild laxative, is also given for diarrhea--probably due to the astringent effect of the tannic acid.[7]
Horse Tail	*Equisetum* species	These plants contain silica, aconitic acid, equisitine, starch, several fatty acids, and even some nicotine. Although used medicinally historically it is not advised to experiment with this herb since it contains Thiaminase, a toxic enzyme, which destroysthe B viatmin thiamine.

Note: When gathering wild foods make certain that the identification is correct. Many good plant identification books are available in bookstores and libraries.

Sphagnum Moss	*Sphagnum* species	This soft, acidic plant absorbs moisture better than a sponge. It is bactericidal and safe to use against skin. Sphagnum was used extensively for surgical dressings during the first World War, and by mothers in Lapland and North America for cradle linings, diapers, and toilet paper. '

Common Name	Scientific Name	Historical Use
Cattail	*Typha latifolia and Typha augustifolia*	The cattail is an ancient plant dating back to the time of the dinosaurs, and has provided food for humans along rivers for as long as humans have lived along rivers. The shoots- called "*Cossack asparagus*" in Russia-are edible both raw and cooked. They taste like a combination of zucchini and cucumber. The male portion of the immature, green, flower head is edible. It tastes like young corn. Cattail pollen, often used in biscuits and pancakes, has a subtle nutty flavour and is a good source of minerals, enzymes, and protein. The starch in the rhizome (the root) tastes a little like cream of wheat porridge. The jelly from between the outside layers of the young leaves can be applied to wounds, sores, boils, carbuncles, external inflammations, and sore gums to soothe pain.[8]
Wild Roses	*Rosa spp.*	The roots were used to make a bitter tea used to treat diarrhea. The hips were eaten fresh or roasted. They are very high in Vitamin A (69,550 IU/100gr), Vitamin c (1025 mg/100gr). The dried fruit remains on the bushes all winter and were often used as travel and/or famine food.[9] The rose hip also provides significant amounts of calcium, magnesium and iron. The whole hip is comprised of 58.1 per cent fat, 23.2 per cent sugar and 7.9 per cent starch.[10]
Common Name	Scientific Name	Historial Use
Root(Sweet Flag)	*Acornus calamus*	The dried rhizome is still chewed by many people today to remedy colds, flus, sore throats and toothaches. In the early days this valuable medicinal root was used by most Aboringinal groups along the river and was also used as a trade item with prairie and mountain tribes.[11]
Maple trees	*Acer negundo*	The Cree made sugar from the Manitoba Maple that grew prolifically along the river and even on many islands.[12]
Silver or Wolf Willow	*Elaegnus commutata*	The dusty green fruits were used as famine food and the striped seeds as a highly decorative bead. The wood, when burned, smells like human extretement so it was not highly prized except for an item used for practical jokes.[13]
Puffball	*Lycoperdon spp.*	All puffballs are edible as long as the meat is pure white. The dusty brown powder in the ripe puffball was used to stop external bleeding and reduce infection. It was also used on the newly severed umbilical cord of babies.[14]

Although not mentioned in any detail in this study, it is worth noting that the river banks provided a variety of accessible stone for making tools, arrowheads, spear points, nut and seed grinding implements, as well as cerimonial pipes. Pipestone Creek in REACH SEVEN, near Fort Pitt is so named because of the valuable stone found in that area.

1.1 North Saskatchewan River Fishing

This sub theme focuses on types of fish harvested, when, by whom and why (i.e. domestic or commercial). There is pre-historic evidence along the North Saskatchewan River to suggest human activity during the early post-glacial era. From European contact onward there is documented evidence of aboriginal people harvesting fish resources from the North Saskatchewan River as well as from its feeder lakes. After contact, the river was also harvested by the Europeans of the fur trade, Europeans from the riverside missions, and eventually, European settlers. Especially at the mouths of creeks, streams and tributaries, the river offered an abundant harvest of fish and molluscs. The names of various lakes and tributaries suggest preferred places for early fish harvests. There are several creeks and lakes still named, Jackfish, Sturgeon, and Fishing. Other examples are Net Setting River, Turtle River, Trout Creek, Perch Lake and Tulliby Lake.

— 8015 BP —

Reach Four:
Bivalve mollusk shells, dating from this era, have been found in terrace alluvium in Strawberry Creek Valley, upstream from the City of Edmonton.[16]

— 4220 BP —

Reach Four:
Mollusk shells, dating from this era, have been found in terrace alluvium in Whitemud Creek Valley in the vicinity of the City of Edmonton.[17]

— 1774 —

Reach Seven:
Samuel Hearne, 14th August, traveled on the *"River Theiscatchiwan to a little creek, which is said by the Natives to abound with fish [and] we found a ware [weir] ready built for ketching [catching] them…"*[18]

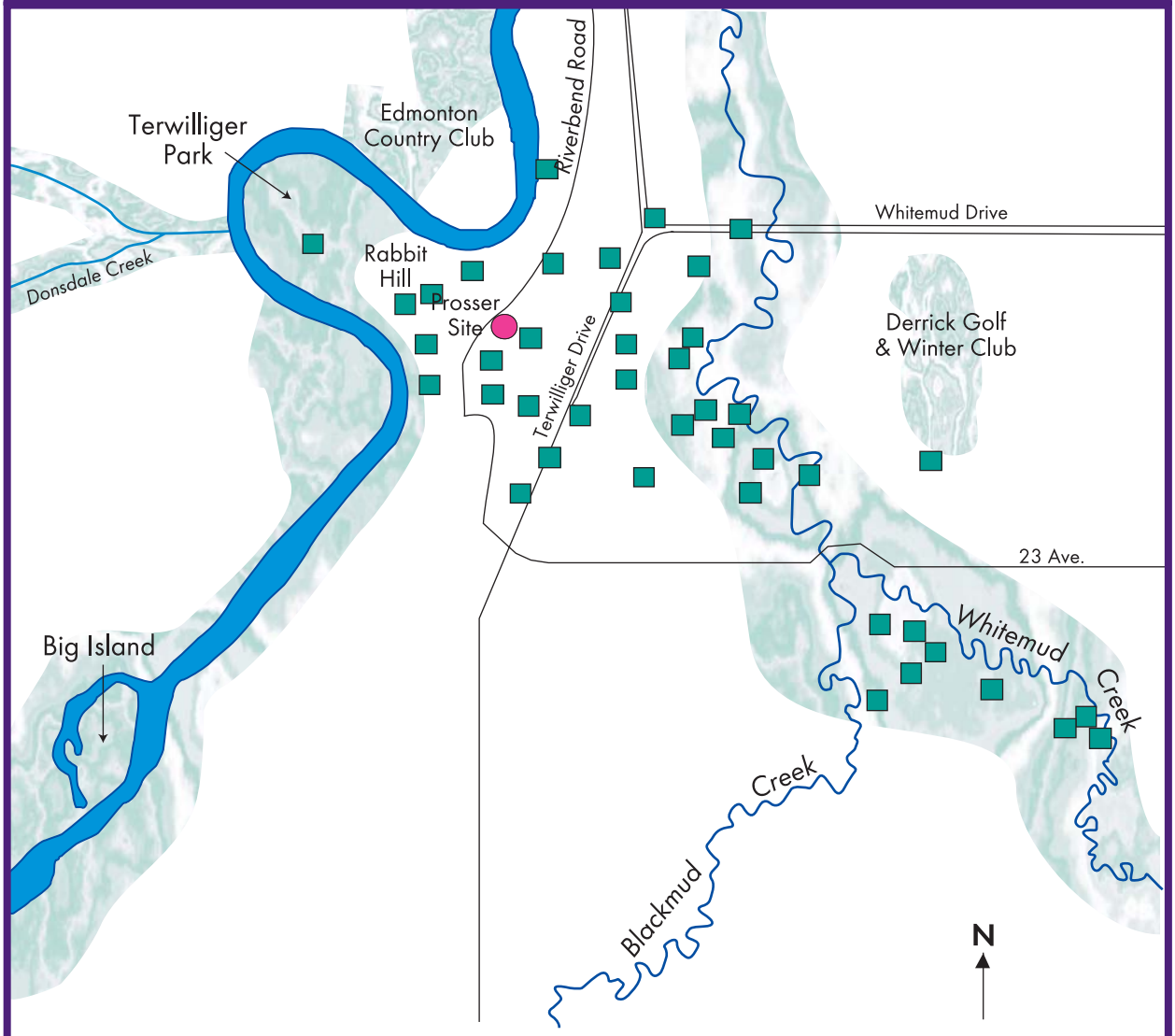
— 1776 BP —

Reach Seven:
J. G. MacGregor mentions net fishing in the Sturgeon River (located upstream of Prince Albert, Saskatchewan), which was also known as Net Setting River.[19]

— 1800's + —

Reach Four, Six and Seven:
Lakes in close proximity of the North Saskatchewan River, which were the main fisheries for the fur trade: Lac Ste. Anne, Frog Lake, Jackfish Lake.[20]

Figure 5 - Archaeological Sites



Archaeological sites in Riverbend and along Blackmud & Whitemud Creek (from Ives, 1985) adapted from Archaeology Guide & Tour of Greater Edmonton Area, page 8

— 1872 —

Reach Seven:

The Fleming expedition, *"The Jackfish-lake River runs, through a beautiful park-like country from this point, into the Saskatchewan…[the lake is] filled with jackfish or pike, and with whitefish, - the finest fresh water fish, perhaps in the world."*[21]

— 1872 —

Reach Four:

The Fleming expedition crossed, "Sturgeon Creek, from which twenty-five pound fish are often taken."[22] (i.e. the Sturgeon River entering the North Saskatchewan near Fort Saskatchewan, Alberta).

— 1875 —

Reach Four:

At Fort Saskatchewan, during the building of the North West Mounted Police barracks, *"Our food at this time consisted of pemmican and mountain trout. The smallest trout weighed 5.5 lbs., and many were over 12 lbs. These fish have a flavour quite equal to salmon…"*[23]

1.2 North Saskatchewan River Shoreline Resources

Harvesting shoreline resources includes trapping river-dwelling, fur-bearing animals for pelts; collection of aquatic plants for food, housing materials and medicine; hunting land mammals and birds, or collecting eggs for food, as well as mining and quarrying.

There is archaeological and historical evidence of the continuous use of the North Saskatchewan River valley for harvesting shoreline resources from the early post-glacial period to the present. The river was a gathering place for land animals in search of water and rich riparian grazing or for a place to ford during migration. This brought additional human food resources into a river valley already favoured for shelter, travel and fishing. Waterfowl and small water mammals such as beaver and otter were abundant in the river valleys and big mammals such as bison also came to the river to drink, to cross the river on migratory routes and to follow the river in grazing patterns. Aboriginal peoples made good use of waterfowl and shorebirds found near rivers. They also harvested the eggs.

Old place names, still in use along the river, are often indicative of what was harvested in the vicinity of the river: Currant Lake, Red Willow Creek, Rose Creek, several Birch Lakes, several Birch Hills, Birch Creek, Strawberry Creek, Poplar Creek; Whitegoat Creek, Bison Creek, Whiterabbit Creek, Waterfowl Lakes, Ram River, Bighorn River, Elk Creek, Elk River, Swan Creek, Swan Lake, Little and Big Beaver Creeks, Deer Creek, Egg Creek, Weasel Creek, Frog Creek, Frog Lake, Moosehills Lake, Maskwa (Bear) Creek and Moswa (Moose) Creek, as well as Gold Island, Gold Bar Island, Willow Island, Pelican Island, Otter Island, Moose Islands, Kinosesis (small fish) Island, Bird Island, Mistapoos (jack rabbit) Island, Rabbit Island and Badger Island (for island names see *North Saskatchewan River Guide: mountain to prairie a living landscape*).

— From 11600 - 7500 BP —

Clay and Meat- Reaches Four to Seven:

During the Paleo-Indian Period, early people used river clay for making pottery.[24] They also hunted 'megafauna' along the river, like Mastodon, Camel, Horse, Big Horn Bison and Giant Beaver.[25] About 11,600 years ago animals returned to this region: *"horse, bison, musk ox, camel, caribou, wooly mammoth, mastodon, ground sloth, lion, giant, short-faced bear, sabre-toothed tiger and wolf."*[26]

— 8185 BP —

Meat - Reach Four:

Bison bones, from this era, cracked for human consumption, were found along the valley of Whitemud Creek near the City of Edmonton.[27]

— *From 7500 BP to contact* —

Clay - Reach Four to Seven:

Early people used river clay for decoration and for pottery. This is evidenced by the names of tributaries where different coloured pigments were harvested e.g. Whitemud Creek, Blackmud Creek, Paintearth Creek, Vermilion River.

— 6000 BP —

Meat - Reach Four:

Bones from post-ice-age bison, found on the banks of the North Saskatchewan River behind the Macdonald Hotel in Edmonton, were eaten by people who lived along the river 6,000 years ago.[28]

Stone- Reach One through Seven:

Quarzite, chert, petrified wood and mudstone were found along the banks of the North Saskatchewan River and used by early people to fashion effective spear and arrow points. Where *"pre-glacial gravel formations were eroded by running water…The North Saskatchewan River Valley and Whitemud and Blackmud Creek valleys were cut deep by water, and exposed these gravel formations."*[29] *"In the Edmonton region, approximately 71 % of all the stone tools found are made from quartzite."*[30]

Plant, Animal and Mineral Resources - Reaches Four & Five:

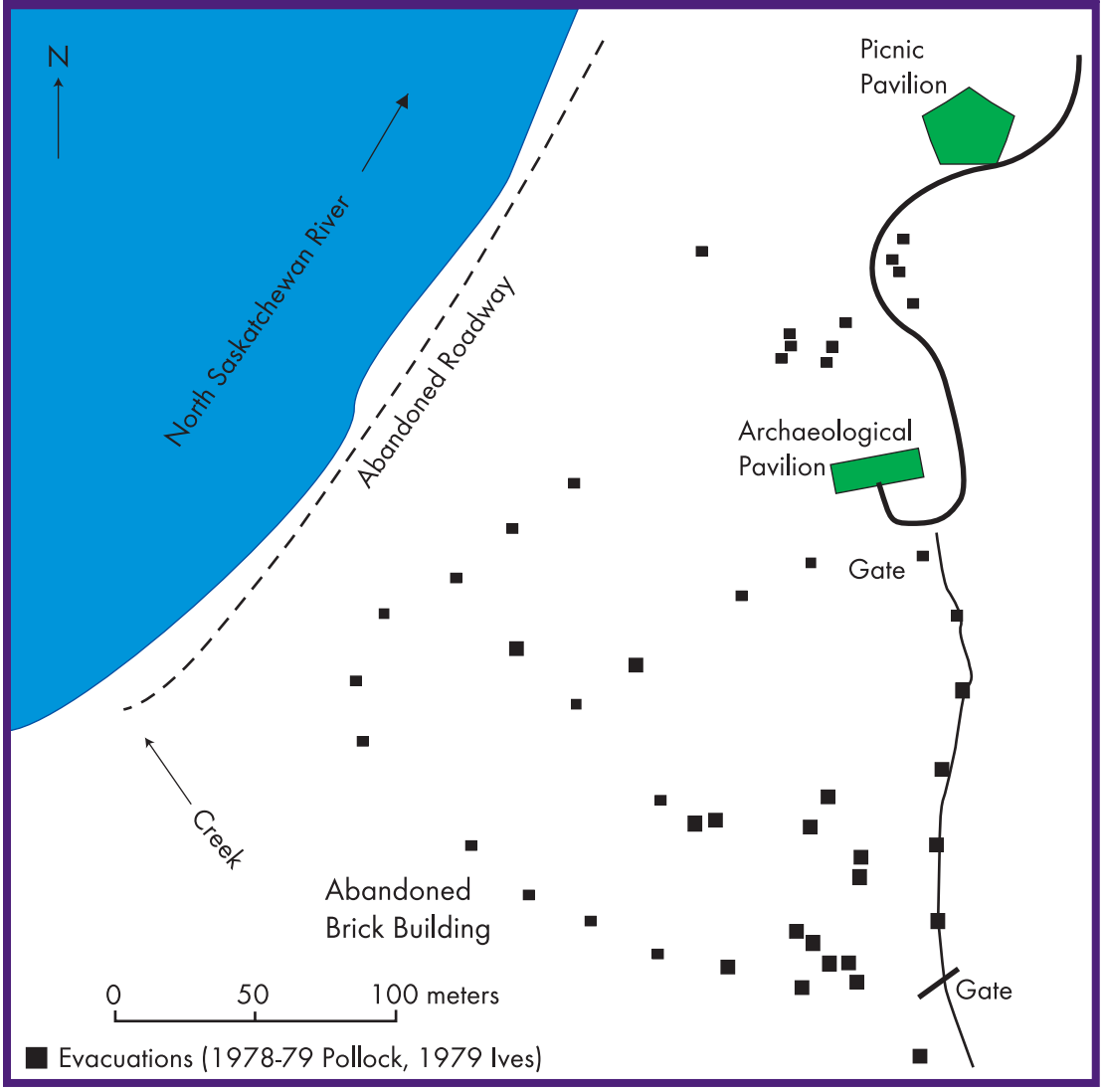
Over 780 archaeological sites have been recorded in the North Saskatchewan Watershed in the Edmonton area (from Redwater west to Morinville, south to Calmar and east to New Serepta). *"In the Edmonton area and elsewhere along the North Saskatchewan River and the creeks running into it, many sites occur along the edges of the river and creek valleys. The river and its resources attracted prehistoric people. Many of the largest sites in the area occur along the upper terraces of the North Saskatchewan River valley."*[31] Two sites within the city of Edmonton, the Riverbend site, which includes the Prosser Site, and the Strathcona site (See Figures 5 and 6) have been identified and partially investigated. There are also other unnamed sites in that area that are potential archaeological sites for future investigation.[32]

— *After 5000 BP* —

Meat and Plant Resources - Reaches Three to Seven:

The megafauna were gone by this time and early people along the river hunted big ungulates like moose, elk and bison, small ungulates like deer and

Figure 6 - Strathcona Science Park



Drawing adapted from Archaeology: Guide & Tour of Greater Edmonton Area, page 50

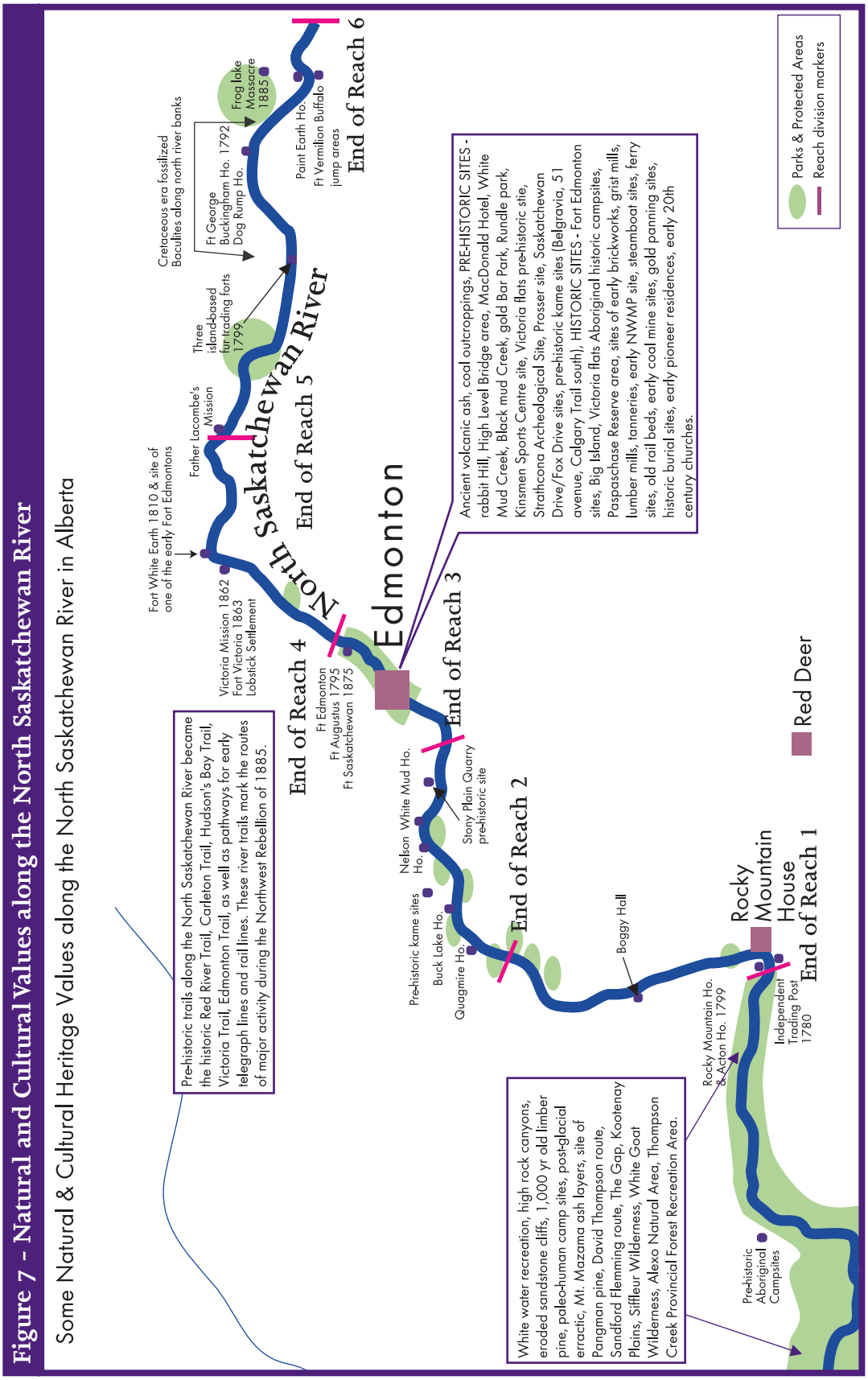


Figure 7 - Natural and Cultural Values along the North Saskatchewan River
Some Natural & Cultural Heritage Values along the North Saskatchewan River in Alberta
Pre-historic trails along the North Saskatchewan River became the historic Red River Trail, Carleton Trail, Hudson's Bay Trail, Victoria Trail, Edmonton Trail, as well as pathways for early telegraph lines and rail lines. These river trails mark the routes of major activity during the Northwest Rebellion of 1885.
White water recreation, high rock canyons, eroded sandstone cliffs, 1,000 yr old limber pine, paleo-human camp sites, post-glacial erractic, Mt. Mazama ash layers, site of Pangman pine, David Thompson route, Sandford Flemming route, The Gap, Kootenay Plains, Siffleur Wilderness, White Goat Wilderness, Alexo Natural Area, Thompson Creek Provincial Forest Recreation Area.
Pre-historic Aboriginal Campsites
Rocky Mountain Ho. & Acton Ho. 1799
Independent Trading Post 1780
Rocky Mountain House
End of Reach 1
Boggy Hall
Pre-historic kame sites
Buck Lake Ho.
Quagmire Ho
End of Reach 2
Nelson White Mud Ho.
Stony Plain Quarry pre-historic site
Ft Edmonton
Ft Augustus 1795
Ft Saskatchewan 1875
End of Reach 3
Edmonton
Ancient volcanic ash, coal outcroppings, PRE-HISTORIC SITES - rabbit Hill, High Level Bridge area, MacDonald Hotel, White Mud Creek, Black mud Creek, gold Bar Park, Rundle park, Kinsmen Sports Centre site, Victoria flats pre-historic site, Strathcona Archeological Site, Prosser site, Saskatchewan Drive/Fox Drive sites, pre-historic kame sites (Belgravia, 51 avenue, Calgary Trail south), HISTORIC SITES - Fort Edmonton sites, Big Island, Victoria flats Aboriginal historic campsites, Paspaschase Reserve area, sites of early brickworks, grist mills, lumber mills, tanneries, early NWMP site, steamboat sites, ferry sites, old rail beds, early coal mine sites, gold panning sites, historic burial sites, early pioneer residences, early 20th century churches.
Fort White Earth 1810 & site of one of the early Fort Edmontons
Victoria Mission 1862
Fort Victoria 1863
Lobstick Settlement
Father Lacombe's Mission
End of Reach 4
North Saskatchewan River
Three island-based fur trading forts 1799
End of Reach 5
Cretaceous era fossilized Baculites along north river banks
Ft George
Buckingham Ho. 1792
Dog Rump Ho.
Frog lake Massacre 1885
Paint Earth Ho.
Ft Vermilion Buffalo jump areas
End of Reach 6
Red Deer
Parks & Protected Areas
Reach division markers

pronghorn, as well as bear, rodents, birds, insects and amphibians. They harvested cattail roots, shoots, leaves, pollen, flowers and seed heads as well as shoots, roots and stems of many other water plants. They also harvested birch bark, birch sap, roots and wood, willow bark, stems and roots, spruce wood, pitch, roots and sap, maple sap and wood, berries and berry bush wood for tools and river meadow roots for food.

— 5640 BP —

MEAT - REACH FOUR:

Wolf (*Canis lupis*) bones dated from this era were found in terrace alluvium in Strawberry Creek Valley, upstream from the City of Edmonton.[33]

— 2765 BP —

MEAT - REACH FOUR:

Bison bones dated from this era were found in terrace alluvium in Weed Creek valley, upstream from the City of Edmonton.[34]

— *At contact* —

ANIMAL AND MINERAL RESOURCES - REACHES FOUR TO SEVEN:

At contact, early people were harvesting, ducks, geese, upland birds and eggs as well as mollusks, turtles, snakes and amphibians along the river. They also used river clay for decoration. *"Paint ranked high with Indians …Paint Earth Creek…Vermilion River …White Earth Creek."*[35]

— From 1796 - 1799 —

FUR - ALL REACHES:

The fur harvest from Edmonton House alone was 35,000 Made Beaver. (This is a sample, over four years, from only one fort on the North Saskatchewan River. It is indicative of the great volume of fur sent to Europe from the valleys of the North Saskatchewan River Basin over the course of at least two centuries.)

BISON - ALL REACHES:

From the late 17th century to the latter part of the 19th century bison were harvested, in all seasons, along the river by both Aboriginal people and Europeans. It is often assumed that prairie bison were only hunted on the prairie, far removed from the great northern rivers. When bison numbered in the millions, the North Saskatchewan River was not an impediment to their migratory patterns and much is written about the spectacle of massive herds crossing the river. There are not many buffalo pounds or buffalo jumps recorded along the river, but locations of a few that existed have been found along the lower reaches near the Alberta/Saskatchewan border.

BISON - REACH SIX AND SEVEN:

Buffalo and buffalo pounds along the river: *"this method was…confined to the parklands adjacent to the North Branch."*[36] ('North Branch' refers to the North Saskatchewan River.)

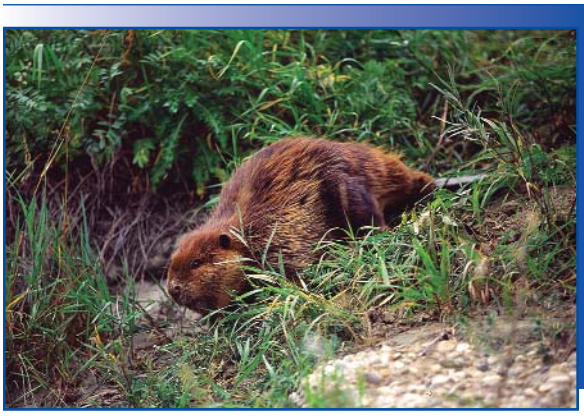


photo John Ulan 2001

Bison - Reach Five and Seven:
MacGregor notes two old Buffalo pound locations on the river still known in 1949, one on the north side of the river at Fort Carleton, Saskatchewan, (Reach Seven) and the other on the south side of the river in the Hairy Hill area of Alberta (Reach Five).[37]

Bison - Reach Six:
People in the Lea Park area (near the Alberta/Saskatchewan border) still know the location of old pounds and one of the few known North Saskatchewan riverside buffalo jumps.[38]

— 1782 —

Bison - Reach Seven:
Mitchell Oman wrote to David Thompson about traveling on the river in the fall in the area around the Battlefords, *"the Bisons were crossing the river in vast herds."*

Pemmican - Reaches Four to Seven:
From the late 17th century to the latter part of the 19th century the fur trade required vast tons of pemmican to feed employees. Aboriginal peoples along the North Saskatchewan River manufactured most of this pemmican and much of it was shipped north to the traders along the northern rivers.

Pemmican
Each day a fur trade laborer had to eat at least eight pounds of meat in order to work efficiently, but that same laborer could work just as well on "a pound to a pound-and-a-half of pemmican a day."[39]

Pemmican - Reaches Four to Seven:
Pemmican stored at the main depot at Cumberland House came from the Saskatchewan River country.[40]

Pemmican - All Reaches:
"For first-class pemmican the marrow of many buffalo bones was taken, the whole put in a sack of the animal, the hair outwards, and well mixed together…sewn up with threads of sinew. The second-class pemmican was composed of meat of the same quality, but mixed with the best of fat melted, while the third-class was of meat not quite so good nor so finely pounded; but it was mixed with melted fat…"[41]

— 1808 —

Pemmican - Reaches Four to Seven:
Alexander Henry the Younger on the supply depot position of Cumberland House, "In the spring we bring down the Saskatchewan to this place from 300 to 500 bags of pemmican and upwards of 200 kegs of grease…"[42]

Pemmican - Reach Six:
The Athabascan brigade would collect pemmican at Isle a la Crosse, which had been *"brought across by dog teams in the winter from Fort George and Fort Vermilion on the Saskatchewan."*[43]

NSR

Pemmican and Dried Meat - All Reaches:

By 1870, the total pemmican and dried meat provisions procured for the Northern Department exceeded 120,000 pounds. Most of this came from along the North Saskatchewan River and on the bordering prairie south.

Fur

Fur is the most well known of the shoreline resources harvested along the river and the vast quantities taken from the North Saskatchewan Watershed have been estimated by many historians based on detailed records of the Hudson's Bay Company (HBC) and the North West Company (NWC) and adding an average estimation from the dozens of free traders on the river from the middle of the 17th century to the amalgamation of the HBCo and the NWCo in 1821. Below is a sample of these estimations.

— 1800 —

Fur - Reach Four:

Edmonton House Hudson's Bay Company - Made Beaver, 4,822. North West Company - 106,000 beaver, 32,000 marten, 11,800 mink, 17,000 muskrat, not to mention any of the lesser furs, *"the majority came from the fur forest along the Saskatchewan."*[45]

— 1801 - 1802 —

Fur - Reach Four:

Edmonton House - Made Beaver 3,843[46]

Other

It is not surprising to discover a significant harvesting of wood for fuel and for constructing buildings and boats, as well as for the 19th century lumber industry. Nor is it unexpected to discover the early harvest of coal from the riverbanks and gold from the sandbars.

Other shoreline resources, harvested for centuries are no longer found along the river. Pronghorn, now present only in Southern Alberta, were once prolific along the south banks of the North Saskatchewan River between Edmonton and "The Forks". Trumpeter Swans, now endangered and seldom sighted along the river, were once harvested in the thousands for their feathers and quills. Into the middle of the 19th century, even Grizzly Bear were commonly hunted along the river to just past Edmonton, for food and floor robes.

As the demarcation line between parkland and boreal forest, for much of its eastward journey, the North Saskatchewan River valley was home to an interesting variety of biotic life, much of which provided food, clothing and shelter for humans.

— 1812 —

Swan Skins and Quills - Reaches Three and Four:

Fort Edmonton shipped east in this year, 1296 swanskins and 450 hundredweight of swan quills.[47]

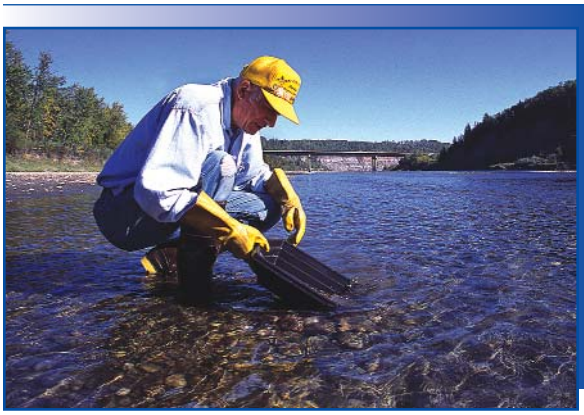


photo John Ulan 2001

— 1820 —

Maple Sugar - Reaches Four to Seven:
In April 1820, Lieutenant Hood of the Franklin Expedition, *"The maple is found in small groves in the Sasaktchewan River valley, and those places are resorted to in the spring by the Indian women for the purpose of sugar making…sugar is produced in the form of hard cakes - very pleasant to eat by itself, but nothing to be compared to cane sugar in its sweetening properties."*[48]

— 1846 —

Pronghorn - Reaches Five to Seven:
September 14th - Paul Kane describing scenery along the North Saskatchewan River *"Saw an immense number of cabrees, or prairie antelopes."*[49]

Grizzly Bear - Reach Four:
September 24th - Paul Kane, Chief Factor Rowand from Edmonton House and "an Indian" shot a grizzly bear and ate the paws.[50]

Geese - Reach Four:
September 26th - eight or ten miles downstream from Edmonton, Paul Kane met *"a party of gentlemen from the fort, who were out shooting wild geese…"*[51] Between the mouth of the Sturgeon River and Fort Edmonton an abundance of fish and fowl fed the fur traders for over two centuries.

Wood - Reaches Three and Four:
September 26th - At Fort Edmonton: *"40 or 50 men…their employment consists chiefly in building boats for the trade, sawing timber, most of which they raft down the river from ninety miles higher up, cutting up the small poplar which abounds on the margin of the river for firewood, 800 cords of which is consumed every winter."*[52]

— 1847 —

Grain - Reach Four:
Between October 1846 and December 1847, the flourmill at Fort Edmonton could grind 15-16 bushels of grain per day.[53] This grain, most likely wheat and barley, was grown along the river.

Mining - Reach Four:
December 5th - Coal - Paul Kane notes, at Fort Edmonton, *"Along the banks of the river…about twenty feet below the upper surface, beds of hard coal are seen protruding…used…in the blacksmith's forge."*[54]

Animals - Reach Four:
December 5th - Paul Kane: *"Outside, the buffaloes range in the thousands close to the fort; deer are to obtained at an easy distance; rabbits run about in all directions, and wolves and lynxes prowl after them all through the neighboring woods."*[55]

Bison - Reach Four and Five:
December 5th - Paul Kane and a group from Fort Edmonton (after riding 9 miles over river ice) finds *"an enormous band of buffaloes, probably numbering nearly 10,000."*[56]

— 1848 —

Bison - Reach Four to Seven:
In January, on a seven-day dogsled journey on the river, Paul Kane and his company: *"We had killed seventeen buffaloes in this journey, for feeding ourselves and dogs."*[57]

Mining - Reach One and Two:
April at Rocky Mountain House, *"beds of coal are seen protruding here along the banks of the river, similar to those at Edmonton."*[57]

— 1849 —

Mining - Reach Four:
In the vicinity of Black Mud Creek, The Earl of Southesk mentions, *"where Indians have dug holes to get a certain substance found there…it was the colour and look of tar, but with no perceptible smell."*[59]

— *In the 1860's* —

Mining - Reaches One to Four:
Tom Clover coming back from failure to strike it rich in the Cariboo panned the North Saskatchewan River upstream from Rocky Mountain House and found enough gold to live on.[60] English Charley and Scotch Charley *"worked the gold bars of the Saskatchewan near Edmonton, where they washed out fine gold in a machine called a "grizzly" or prospected up the river as far as the mountains."*[61]

Mining - Reach Five:
At Victoria Settlement, *"Mining began in the 1860s when gold was mined along the shores of the North Saskatchewan. The returns were small; the hours spent digging and panning long. Towards the end of the decade miners, taking as much as $5.00 per day in gold from deposits in the sand bars, were rich. In those days, wages of $20.00 a month were considered adequate. However, no large scale development took place and by the end of the century miners were finding only $2 a day in gold."*[62]

— 1862 —

Mining - Reaches Three and Four:
60 miners bound for the Cariboo stayed behind in Edmonton to pan for gold in the North Saskatchewan River.[63]

— 1863 —

Mining - Reach Four:
American Millwright panning for gold on North Saskatchewan River near Fort Edmonton.[64]

— 1866 —

Grain - Reach Four:
There was a record harvest of 1,333 bushels of wheat and 553 bushels of barley at Fort Edmonton.[66]

— 1868 —

Grain and Garden - Reach Seven:
Rev. J. Nisbet reports that by spring his mission had 20 acres under crop to potatoes, turnips, barley & wheat. Later he reports harvesting 250 bushels of turnip.[66]

— 1870 —

Mining - Reaches One and Two:
Sir William Francis Butler, on a tour of the North Saskatchewan River observed a great number of gold prospectors along the Upper North Saskatchewan Corridor. He predicted that gold would soon be found on the North Saskatchewan and was concerned that Native Peoples would be harmed by a sudden influx of frantic miners.[67]

— In 1871 —

Mining - Reach Five:
"By the 1870s settlers had discovered coal outcrops on the river banks [around Victoria Settlement] and were using it to heat their homes. Large quantities of coal were found along both banks of the river as well as along the banks of Egg Lake Creek. At Egg Lake Creek a 13-inch seam was found at a depth of about 4 feet. William Garred mined 600 tons of coal from the banks of the creek. Several other mines were worked by tunnelling into the river banks and bracing the ceiling with props."[68]

— 1872 —

Berries - Reach Seven:
Around Fort Pitt, August 21st *"Such common wild fruits as currants, gooseberries, choke-cherries, etc., are in abundance."*[69]

Wood - Reach Six:
Trees in the vicinity of Frog Creek, Middle Creek and Moose Creek, *"there was now what we had often craved for, variety of wood. Clumps and groves of tall white spruce in the gullies and valleys, and along lake sides, branching poplars with occasional white birch and tamarack, mingled with the still prevailing aspen."*[70]

Berries and Ducks - Reach Six:
At the end of August, around Moose Creek, six tents of Crees were living on ducks and berries.[71]

Berries - Reach Six:
August 22nd, around Moose Creek, *"Both yesterday and today, the Saskatoon berries that are put in the best or "berry pemmican" were pointed out to us and the creeper which the Indians make into "kinni-kinnick" when they can't get the bark of the red willow to mix with their tobacco."*[72]

Berries - Reach Five:
August 24th, near Victoria Mission, *"The ground was literally covered with cranberries, bearberries, the uva ursi, and other creepers."*[73]

Wood - Reach Five:

August 26th, from Victoria Mission to Edmonton, *"For thirty miles to-day the trail was through thick woods of aspen, poplars, birch, tamarack, spruce and pine. Much of the wood was good timber, from one to two feet in diameter with tall straight shafts, as thick fifty or sixty feet up as when five or six feet from the ground."*[74]

Mining - Reaches One to Four:

"coal that crops out on the river bank…a bushel or two was brought up from the river side at our request; it looked like shale, or dull, dried stuff from which most of the bitumen had leaked out. Trying it in the smiddy, it burnt well and gave good heat…The section at Edmonton is only three feet thick…but, at the Pembina River, seventy miles to the west there is a seam ten feet thick that we would see; and Mr. Hardisty informed us that at the Rocky Mountain House, one hundred and forty miles distant to the south-west, the seam is ten feet, the coal of a much superior quality, and used regularly in the forge."[75]

Mining - Reaches Four and Five:

"The men who wash the Saskatchewan sand bars for gold make on an average of four dollars per day, but that does not satisfy them; five dollars a day is called wages. This year there were only fifteen miners on the Saskatchewan."[76]

Mining - Reaches Three to Five:

"On the North Saskatchewan the gold miners or washers range up and down for about one hundred and thirty miles, Edmonton being the central point of this distance."[77]

Bison - Reach Seven:

On August 21st, at Fort Pitt, there are still enough buffalo to be used for tent construction. George Grant of the Fleming expedition describes the tent of the horse keeper as, *"a roomy lodge, called 'a fourteen skin,' because it was constructed of so many buffalo hides stretched and sewed together; the smallest lodges are made of five or six and the largest of from twenty to twenty-five skins."*[78]

Bison - Reach Five:

On October 17, Charles Napier Bell, 18 years old, and five Métis arrived at the deserted Roman Catholic Mission at *St. Paul de Cris* on the banks of the North Saskatchewan River near the present site of Brosseau. They gathered there to set up a major Buffalo Hunting camp to supply winter meat to a post at Saddle Lake.[79]

— 1875 —

Eggs and Beaver - Reach Four:

During the building of NWMP barracks at Fort Saskatchewan, Sam Steele and his men ate, *"large quantities of wild duck eggs were obtained from the shores of the lakes in the Beaver Hills…[and] beaver, which when roasted is delicious food."*[80]

Oil/Natural Gas - Reach Seven:

Records of drilling in Saskatchewan indicate that the first well was drilled by the Geological Survey of Canada at Fort Pelly in 1874/75 and the second at Fort Carleton, on the North Saskatchewan River, in 1875.[81]

Maple Sugar - Reach Seven:
In the spring of 1875 a group of Aboriginal people went up river from Prince Albert to tap the sugar trees on Big Island.[82]

— 1880 —

Mining - Reach Four:
Commercial coal mining began along the banks of the North Saskatchewan River in the vicinity of Edmonton. Donald Ross sunk one of the first shafts into the side of McDougall Hill.[83]

— 1881 —

Mining - Reach Four:
From Edmonton Bulletin, *"The Imperial Coal Mining Company, MacDonald, Annand and Yates have a drift in about 30 feet and struck the solid on Saturday. The vein is a little over 3' thick. The Zero Company, Robertson and Humberstone, on the opposite side of the creek." "The HBC began hauling coal from the Imperial drift last week. The main drift is in 45" and coal is being taken out from each side at the rate of about a ton a day per man. The coal costs, laid down at the Fort - $4.60 per ton."*

— 1882 —

Fur - Reach Seven:
Stobart and Co. opened a fur trading headquarters on the North Saskatchewan River at Prince Albert.[84]

— 1880's —

Water and Clay - Reach Four:
A tannery *"was located in Walterdale in order to take advantage of the availability of water from the river."* and the Pollard Brothers started a brickyard on his property *"to take advantage of the deposits of clay."*[85]

— 1895 —

Mining - Reach Four:
Edmonton Bulletin, June 6th, *"More gold is being taken out of the river this season than ever before."*[86]

— 1886 - 1906 —

Mining - Reach One:
"Colleries opened in the Nordegg foothills along the North Saskatchewan River."[87]

— 1899 —

Fur - Reach Four:
Revillon Freres a company based in France opened a warehouse in Edmonton 1899.[88]

— 1905 - 1920's —

Lumber - Reach Five:
At Victoria Settlement, *"from 1905 to the early 1920s, four sawmills were operated by Magnus Cromarty, Snyder and Nelson, Dowsett Brothers and Whitford Brothers."*[89]

— 1909 —

MINING - REACH ONE:
Stanley Washburn, who had explored the upper reaches of the North Saskatchewan River in 1898 before going to college returned to discover a great interest in the coal deposits of the area.[90]

— 1947 —

OIL - REACH FOUR:
after drilling 133 dry wells in a row, Imperial Oil commintted to drilling a series of 'last chance holes'. The first of these, Leduc #1, just south of Devon, became a gusher on Feburary 3, 1947. This discovery changed the scope and shape of Alberta and made Canada a major international oil producer.

— 1948 —

MINING - REACH SIX:
In July, the newly formed Alberta Salt Company started salt production on the banks of the North Saskatchewan River near the Alberta/Saskatchewan border. River water was forced down deeply drilled wells, the brine recovered and the salt evaporated out. This process continues to the present, the plant producing about 425 tons of salt every day by the evaporation of river water.

1.3 North Saskatchewan River-based Extraction of Water

Water extraction identifies the use of river water as a resource. Water may be extracted for direct drive power generation (e.g. mills); human consumption (e.g. drinking, ice and sewage treatment); agricultural extraction (e.g. watering stock, irrigation); and industrial extraction (e.g. pulp and paper mills, breweries, hydro-electric power generation, oil and gas refining processes).

Historically, most of the water removed from the North Saskatchewan River was used for drinking, washing and in the form of ice for the icehouses of the fur trade and later for more diverse settlement use. River ice cooled summer produce in North Saskatchewan River communities into the 1950's. During the late fur trade era there was limited use of water mills for grinding grain during the late fur trade era. Irrigation has not generally been a use of North Saskatchewan River water.

During the long European settlement history on the river, water use for human, animal, agricultural and industrial consumption was continual and largely unregulated. The first users were fur trade communities, missions and the small river communities of Métis that grew up around European settlements. From the end of the 19th century to the middle of the 20th Century, European settlements along the river created a greater need for river water and river ice. This resulted in the formation of municipalities that began to extract river water for human use.

river bend south of
Canadian Salt plant
photo Billie Milholland

— From 1780's until the present —

Water - All Reaches:
The North Saskatchewan River provided a source of domestic, as well as water for agriculture and industry for all of the forts; temporary encampments; cart brigades traveling the river trails; missions; early tent towns, pioneer and modern settlements and homesteaders.

— 1847 —

Ice - All Reaches:
December 5th - Paul Kane describes the use of river ice for icehouses that are built to preserve from "700 to 800 buffalo carcases" - *"As soon as the ice in the river is of sufficient thickness, it is cut into square blocks of uniform size with saws…"*[91] *"Great icehouses were built at Fort Vermilion, Fort George, White Earth, Edmonton and many other Forts des Prairies."*[92]

— 1859 —

Domestic Water - Reach Seven:
The Earl of Southesk mentions women washing clothes in the river in 1859 at Fort Carleton.[93]

— 1913 —

Water Power - Reach Three:
Upstream from Rocky Rapids, Edmonton Hydro-Electric Power planned to build a dam, but it was funded by a British syndicate and all funding stopped with the outbreak of WWI. The great flood of 1915 wiped out all evidence of dam building.[94]

— 1948 —

Water - Reach Six:
In July, the newly formed Alberta Salt Company started salt production on the banks of the North Saskatchewan River near the Alberta/Saskatchewan border. River water was forced down deeply drilled wells, the brine recovered and the salt evaporated out. This process continues to the present, the plant producing about 425 tons of salt every day by the evaporation of river water.

— 1948 —

Water - Reach Four:
Imperial Oil set up the first oil refinery along the river at Gold Bar. *"Oil and gas refineries use water to convert fossil fuels into a useable form"*[95]

Theme Two

Water Transportation

This theme involves the movement of goods and passengers by water, this includes logs on the water as well as lumber on watercraft, using both natural streams and modified channels. Sub-themes include:

2.1 Commercial Transportation

2.2 Transportation Services

2.3 Exploration & Surveying

On the North Saskatchewan River there were few riverside infrastructures built to ease navigation or to modify channels. Boat building facilities appeared on the river in conjunction with most of the early forts and later, many fur trade boat builders started boat building businesses of their own to accommodate the growing need for water craft. During the logging era on the river from about the 1880's to the 1920's there were several attempts at building structures on the river to control floating timbers but none of these structures are still in situ. Natural occurring snyes in the area of Burtonsville Island and Big Island were often used to store log booms.

"The commerce carried by this great highway vies with that of old Cathay in glamour and colour. The [North] Saskatchewan was in very fact a direct connecting link with Cathay and the Orient. At one time, fur trading posts up the Alaska coast and even down beyond San Francisco received their instructions and personnel via the Saskatchewan. Instructions to Hawaii and reports from there to London were transmitted via the great river."[96]

"The Saskatchewan is considered by some not to be fit for navigation but it must be very bad indeed if it is not better than slow going oxen on a muddy road one thousand miles long."
Edmonton Bulletin, November 5, 1881.

From the 'Forks' to Edmonton, during the years of canoe, York Boat and steamboat travel on the North Saskatchewan River, distance between rapids was essential information for river travelers.

Reach Seven:

The 'Forks' to Cole's Falls [Cole's Rapids] - 9 miles
Cole's Falls to Prince Albert - 30 miles
Prince Albert to Carlton House - 50 miles
Carleton House to Battleford - 113 miles
Battleford to Fort Pitt - 106 miles

Reach Six:

Fort Pitt to Moose Rapid - 46 miles
Moose Rapid to Dog Rump Rapid - 13 miles

Reach Five:

Dog Rump Rapid to Eye Rapid - 31 miles
Eye Rapid to Crooked Rapid - 27 miles
Crooked Rapid to Victoria Rapid - 27 miles
Victoria Rapid to Jump-Off Rapid - 26 miles

Reach Four:

Jump-Off Rapid to Stony Bar Rapid - 34 miles
Stony Bar Rapid to Edmonton - 18 miles[97]

2.1 North Saskatchewan River-based Commercial Transport

The sub-theme "Commercial Transportation" incorporates categories of prehistoric trade; historic human-powered freight; powered commercial freight; and surface bulk transportation (e.g. logs).

Specific artifacts from river-related prehistoric trade are not often found, but there is plenty of evidence of prehistoric human activity along the full extent of the river valley. Since it is unrealistic to suppose that early people along the river lived in isolation, unaffected by trade with other groups, this evidence of human activity suggests a river used for trade.

For about 250 years, from the time of the first French fur trader on the North Saskatchewan River to the coming of railroads, river navigation was the only efficient means of importing trade goods from eastern Canada and Europe into 'the West'. It was also the quickest and most efficient means of exporting river resources to eastern Canada and Europe. Canoe and York Boat were used extensively on this river, and in later years scows, barges, rafts and sternwheelers added to the commercial river traffic. The river also provided the main transportation route for logs from forest to mill and often from mill to contract site. Historic North Saskatchewan River transport routes are well documented in the prodigious records of explorers, fur traders, military expeditions and from data indicating the movement of immigrants.

— *1690's* —

Canoe - All Reaches:

Canadian History suggests that Hudson's Bay fur trader, Henry Kelsey was the *"first white man to see the Canadian prairies and to reach the Saskatchewan River…"*[98] It is likely that, the Cree and Nakota people from the Lake-of-the-Woods district, as well as French explorers from New France had been penetrating the area for several decades before that time.

— *1730's* —

Canoe - Reach Seven:

Métis Joseph La France, who traveled to England in the early 1740's to tell his story about traveling in the land of the Saskatchewan, had traversed the river in the 1730's.[99]

— 1748 —

CANOE - REACH SEVEN:
Le Chevalier de la Verendrye, built a small fort "near The Forks of the Saskatchewan."[100] During the last half of the 18th century canoe travel and canoe building on the North Saskatchewan River accelerated.

— From the middle of the 1700's until around the turn of the century —

CANOE - ALL REACHES:
Each year at least 250 canoes and about 550 people from the 'Saskatchewan' traveled to the Bay with their furs. These were largely Cree and Nakota People who formed a formidable middleman trade system with the Atsina and others on the plains who were not interested in making that long trip.[101]

— 1774 - 1820's —

CANOE - ALL REACHES:
"From the opening of its first post inland from the Bay - Cumberland House in 1774 [the Hudson's Bay Company] depended upon canoes…to transport trade good into and furs out of the vast hinterland."[102]

— 1796 —

YORK BOAT - REACH SIX:
Peter Fidler at Buckingham House, close to the present Alberta/Saskatchewan border, had the first York Boat built for the Saskatchewan River system, while his superior, William Tomison, who disapproved of this type of riverboat, was in England on furlough.

— 1797 —

YORK BOAT - REACH SEVEN:
The steepest drop in the river for navigation occurs between present day Prince Albert, Saskatchewan and The Forks. York Boats began to be used on this portion of the river in 1797.[103]

— 1823 —

YORK BOAT - ALL REACHES:
The Hudson's Bay Company gave the building of York Boats official approval.[104]

— 1700's - 1950's —

DOGSLED - ALL REACHES:
After freeze-up, the river continued to be a major highway between forts and riverside settlements. *"Dog teams hitched to long narrow sleighs instead of Indian travois…became almost the sole means of winter travel…"*[105]

— 1848 —

DOGSLED - REACHES FOUR TO SEVEN:
In January, Paul Kane starts down the river by dogsled from Fort Edmonton to Fort Pitt, *"Immediately on leaving the fort we got on the ice of the Saskatchewan River, and traveled down it all day…"*[106] This was a seven-day journey.[107]

— 1871 —

Sternwheeler - Reaches Four to Seven:
In June, Hudson's Bay Company Governor Sir Stafford Henry Northcote, told shareholders, *"Where possible, the brigades of York Boats would be replaced by steamers."*[108]

— 1875 —

Sternwheeler - Reaches Four to Seven:
The first North Saskatchewan River sternwheeler, *The S. S. Northcote*, reached Edmonton from Grand Rapids. It provided the main Hudson's Bay Company transportation between Edmonton and Prince Albert, Saskatchewan until the route was taken over by *The Lily*. *The Marquis* and *The Northwest* were the largest steamers to travel the river. *The Northwest had 80 berths, two bridal suites and a piano.*[109] *Joe Favel - The Northcote's* pilot, in a conversation with NWMP Sam Steele, *"The Missouri, he asserted, was not so good a stream as the North Saskatchewan."*[110] The Northcote was built in the style of Mississippi River boats; *"her hull was built entirely out of Minnesota oak"*; her engines could generate 39.72 horsepower and *"with a load of 150 tons she drew 3.5 feet of water."*[111] On her first voyage to Edmonton she carried a cargo of 130 tons.[112]

— 1877 —

Sternwheeler - Reaches Four to Seven:
"A banner year for steam navigation of the Saskatchewan…a new steamboat The Lily was assembled …and The Northcote had the most profitable season she would ever experience, six successful voyages upstream."[113] Because passenger traffic was increasing on the Saskatchewan it was recommended, *"The Northcote be outfitted to carry paying customers…"* Some years later *The Northcote* is described as having accommodation for fifty passengers.[114]

— 1878 —

Sternwheeler - Reaches Four to Seven:
The Lily launched on her maiden voyage upriver. She was a two-decked sternwheeler with a steel hull, copper steam and exhaust pipes and a brass-fitted engine.[115]

— 1879 —

Sternwheeler - Reaches Four to Seven:
The Lily operated between Prince Albert and Edmonton, delivering 900 pounds of flour and other freight at Battleford on July 1st and 10 days later *"discharged 15,992 pounds of freight for the Company's post."*[116]

Skiff - Reaches Four to Seven:
On August 7, after *The Lily* hit a rock 10 miles below Fort Saskatchewan, passenger Lieutenant Governor Laird had to travel down to Battleford in a rowing skiff.[117]

Sternwheeler, Skiff, Scow - Reaches Four to Seven:
Immigrant adventurer and newly appointed Indian commissioner, Edgar Dewdney, travelled up and down the river during August and September delivering Treaty payments.[118]

— 1880 —

Sternwheeler - Reaches Four to Seven:
The Lily traveled upstream six times this season, her cargo including a steam gristmill, a sawmill, a threshing machine and on a return trip downriver she *"carried coal to be tried as winter fuel at Carleton House."*[119]

— 1882 —

Sternwheeler - Reaches Four to Seven:
An English syndicate, *"with the intention to put a line of steamers on the river"* chartered the Winnipeg and Western Transportation Company. It *"would take over steamboat transportation on the river from the Hudson's Bay Company."* Another company *"the North West Navigation Company, was also involved in the transfer of riverboats to the Saskatchewan."*[120]

Sternwheeler - Reaches Four to Seven:
In the summer of 1882 *"three additional sternwheelers reached the Saskatchewan River. These were The North West, The Manitoba and The Marquis"*[121]

Sternwheeler - Reaches Seven:
Just as a new fleet of sternwheelers began business on the North Saskatchewan River, the river cut a new channel and changed its course at the Sturgeon River downstream from Prince Albert and *"the confidence of shippers in the reliability of the Saskatchewan steamboats to deliver freight was destroyed."*[122]

— 1885 —

Barge - Reach Four:
Between April 30th and May 13th, General T. B. Strange at Fort Edmonton built barges to transport 224 men and one gun downriver to Fort Pitt area to help with Northwest Rebellion.[123]

Barge - Reaches Four to Six:
From May 13th to May 24th General T. B. Strange and his men traveled on the river from Edmonton to Frog Lake where they buried the people killed at Frog Lake.[124]

Barge - Reaches Six and Seven:
On May 27, General T. B. Strange and his men traveled on the river from Frog Lake to Frenchman Butte and then on to Fort Pitt.[125]

— 1887 —

Raft - Reach Four:
An entire barrack room moved by raft downstream from Edmonton to Ft. Saskatchewan by K. A. McLeod.

— 1900 - 1905 —

Sternwheeler - Reaches Four to Seven:
The last steamboats plied the North Saskatchewan River during these years.[126]

— 1909 —

Logs - Reaches Two and Three:
An attempt was made, 125 miles above Edmonton on the North Saskatchewan River, to create a storage pool and sluice gates at a place where logs were often lost during spring freshets. This was the only federally managed project, of this nature, in Canada, outside of Quebec and Ontario. It proved too expensive to operate and was abandoned in 1911.

2.2 North Saskatchewan River-based Transportation Services

The evidence of river-based transportation services is found in sub-theme elements of fur trade posts; navigational improvement (e.g. clearing, widening, dams, canals); shipyards for construction and repair (e.g. wharves, ramps); and facilities for landing and provisioning passengers (e.g. waiting rooms, hitching posts, occasionally hotels).

Wharves and warehouses were prevalent on the North Saskatchewan River only during the era of steamboat travel and only at major destinations like Prince Albert, the Battlefords, Fort Pitt, Victoria Settlement and Edmonton; however, small provision posts along the river during the fur trade were numerous.

Shipyard services along the North Saskatchewan River include early, temporary encampments where birch rind canoes were built each season; however, these are represented in the 'Riparian Settlement' portion of the study. York Boats were constructed at all the major fur trade forts along the North Saskatchewan River as well as at some of the minor forts, like Buckingham House. Only a few steam riverboats were constructed on the North Saskatchewan River, and those in the late 1800's; but John Walter built, at his shipyards on the river bank at Edmonton, all lesser riverboats, scows, barges, and ferries.

— *1790's to early 1800's* —

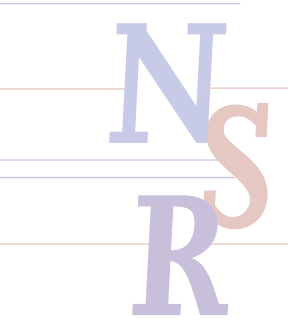
Supply Post - Reach Six:
Dog Rump House

— *1806* —

Supply Post - Reach One:
Jaco Finlay builds a supply post *"on the Saskatchewan, well up in the mountains above Kootenai Plains."*[127]

— *After 1826* —

Supply Post - All Reaches:
Horse guards (semi-permanent pasture areas) were created for each major fort to supply cart and riding horses for the fur trade, as a result of George Simpson's visit to the western fur trade forts after the amalgamation of the HBC and the NWC in 1821.[128]



— 1849 —

Boatyard - Reach Four:
December, Paul Kane at Fort Edmonton: *"building the boats, about thirty feet long and six feet beam, which go as far as York Factory, and are found more convenient for carrying goods on the Saskatchewan…more than one-half of the boats built here never return. This system requires them to keep constantly building."*[129]

Boatyard - Reach Four:
At Fort Edmonton, John Walter was a York Boat builder who started his own boat yard and supplied the whole North Saskatchewan River district with rafts, scows, barges, skiffs, and later, ferries.

Boatyard - Reach One and Two:
At Rocky Mountain House, William Gladstone was the master York Boat builder for thirteen years.

2.3 North Saskatchewan River-based Explorations and Surveying

Many early uses of navigable rivers were associated with Euro-Canadian exploration and route surveys. Elements of this sub-theme include French explorers as indicated by a legacy of archaeological sites and places names; British explorers known for their western exploration and identification of routes as well as surveys for commercial and transportation purposes as still evidenced through recorded routes, place names, monuments and historic markers; surveys for exploration with documented routes; and the use of rivers to facilitate migration and settlement throughout Canada.

The French initiated the earliest European explorations of the West along the North Saskatchewan River. They were the intrepid coureurs des bois who were country born and much more at home in the wilderness than the British perched along the Hudson's Bay. Many of them were Métis, the intrepid children of the fur trade. In the Métis History Index, names like Janvier and Cardinal (common Aboriginal and Métis names along the river today) are listed as operating in the poorly regulated western fur trade as early as 1701. Prior to the end of the Seven Years War in 1763, they made their way up the mighty Saskatchewan at least as far as Rocky Mountain House. How many, we will never know, but physical evidence of their presence along the river is found in archaeological evidence, and the suggestion of their presence is embedded in place names along the river.

The first significant British explorers and surveyors on the North Saskatchewan River were men of the fur trade like Henry Kelsey, Anthony Henday, David Thompson, and Peter Fidler.

Explorers and route surveyors used North Saskatchewan River routes established by the fur trade, as well as ancient riverside trails used by Aboriginal peoples. They popularized these routes in order to open the western Prairie for settlement. The scientific inventories of expeditions up the North Saskatchewan River, like the ones led by John Franklin and John Henry Lefroy, made the concept of a

transcontinental British North American nation seem possible and even desirable. This resulted in exploration and survey expeditions led by men like Blakison, Hector, and Sandford Fleming, seeking an overland route for the transcontinental railroad.

— June 12th, 1690 - Sept. 9th, 1692 —

British - Reach Seven:
Henry Kelsey *"first white man to see the Canadian prairies and to reach the Saskatchewan River…"*[130] (It is likely that French explorers from New France were actually 'the first white men', but traditional western Canadian History has privileged Henry Kelsey.)

— 1740 - 1742 —

Metis - Reach Seven:
Métis Joseph La France traveled to England and told his story about exploring into the interior of Rupert's Land to the land of the Saskatchewan.[131]

— 1748 —

French - Reach Seven:
Le Chevalier de la Verendrye, built a small fort *"near The Forks of the Saskatchewan."*[132]

— 1749 —

French - Reach Seven:
Young Louis-Joseph de La Verendrye penned a letter to Governor-General La Jonquiere of New France who later reported to the King Louis XV of France, the discovery of the Pascoyac River (the Saskatchewan), *"The river [Pascoyac] is the most convenient route by which to pursue the discovery of the western sea from the ease with which you can transfer your effects thither by canoe, get guides there easily and have always the same tribe, Cree, to deal with as far as the height of land…"*[133]

— 1751 —

French - Possibly All Reaches:
Chevalier de Niverville and 10 Frenchmen left Fort Basquia [near The Pas] and traveled 300 leagues up the Saskatchewan to build *La Jonquiere*.[134]

French - Reach Seven:
Jacques Repentigny Legardeur de Saint-Pierre of New France, sent two canoes west to build a small post just east of The Forks on the Pascoyac (Saskatchewan), which he called *La Jonquiere*. A few years later *Chavalier de La Corne* built a fort at The Forks of the North Saskatchewan and the South Saskatchewan, which he called La Corne.[135]

French - All Reaches:
There is some evidence to suggest that explorers from New France, under the direction of Le Guardeur de Saint Pierre established a fort in the area of Rocky Mountain House. He had been directed by the French government to find a route to the great 'Western Sea'.[136]

— 1754 —

British - Reaches Seven to Four:
Anthony Henday traveled up the North Saskatchewan River at least as far as Edmonton. He discovered complex Aboriginal trading patterns already in operation by the Cree and Assiniboine (Rocky Mountain Assiniboines are commonly known as the Stony Indians[135]) who had become middlemen for other Aboriginal groups in the woodlands along and north of the North Saskatchewan River.[138] When Anthony Henday entered the North Saskatchewan River valley in the fall, he found people quite used to the trade goods from the white man.[139]

— 1755 —

British - Reaches Seven to Four:
On March 3rd, at Old Man Creek on the North Saskatchewan River below Edmonton, Anthony Henday crossed to north side of river and camped on March 3rd. He was about two miles upstream from Fort Saskatchewan. On March 5th he and his crew camped just downstream from mouth of Sturgeon River to construct canoes at a traditional encampment.[140] On April 23rd he celebrated St. Georges Day on the riverbank with flag, feasting, drumming and speeches.[141] On April 28th with 15 canoes of Cree and 20 canoes of Assiniboines he traveled down river to York Factory.[142]

NOTE: *Every story of early exploration makes mention of canoe construction; it would not be difficult to estimate how much birch bark, tree resin and spruce root were harvested each time, as well to speculate on the amount of wood used for campfires.*

— 1766 - 1770 —

British - Reaches Seven to Six:
William Pink of the Hudson's Bay Company made four exploratory journeys along the North Saskatchewan River, leaving his canoes at the then abandoned *Fort a la Corne* and traveling west across the Alberta border.[143] This exploration was to determine whether it was worthwhile for the British to build inland posts. During the fall and winter of 1766 and 1767, four Hudson's Bay men wintered along the North Saskatchewan River. When they returned to the Bay, the men commanded 156 canoes heaped with fur - 31, 640 'made beaver'.[144] The next year, William Pink brought 240 canoes to the Bay, laden with furs taken from along the North Saskatchewan River.[145]

— 1767 —

French - Reach Seven:
After the Seven-Year's War the French returned to explore on the Saskatchewan. By 1767 *Francois LeBlanc* and soon James Finlay and others were moving up the North Saskatchewan River.[146]

— 1772 —

British - Reach Seven:
Matthew Cocking, 2nd in command at HBC York Factory explored inland. His Cree guides joined their families at the old *Fort a la Corne* site and it is likely he

wintered in the North Battleford Area. His journals mention tipi rings, stone cairns, native pottery and even a tobacco garden.[147]

— 1775 —

YANKEE - REACH SEVEN:
American Free trader, Peter Pond, with six men, entered the North Saskatchewan River basin, searching for new fur territory. They built a fort on the river near the present site of Prince Albert, Saskatchewan. This is usually referred to as the first Sturgeon River Fort.[148]

— 1776 - 1777 —

BRITISH - REACH SEVEN:
The HBC explored past the Yankees and established Hudson's House upriver from the present site of Prince Albert, Saskatchewan. In 1779 they paid bonuses to their own inland traders and offered £100 a year to any "Frenchmen deserting from the Canadians…"[149]

— 1776 - 1821 —

CANADIAN - ALL REACHES:
By 1776 the North West Company was exploring the river and in 1798 the XY Company joined the search for lucrative building sites. It is impossible to count the number of individual free traders who explored and traded on the Saskatchewan in the intervening years until the amalgamation of the North West Company and the Hudson's Bay Company in 1821.[150]

— 1790 —

CANADIAN - REACH ONE:
Peter Pangman explored so far up river that he celebrated by carving his name and the date in the bark of a pine tree near the present town of Rocky Mountain House, and there it remained for another 160 years until, in the middle of the 20th century, a farmer bulldozed the tree.[151]

— 1792 —

CANADIAN - REACHES SEVEN TO SIX:
Angus Shaw of the North West Company explored upstream from The Forks to a site on the north side of the river southeast of present town of Elk Point, Alberta where he built Fort George.

BRITISH - REACHES SEVEN TO SIX:
William Tomison, of the Hudson's Bay Company, exploring upstream from The Forks to a site on north side of river and across a ravine from Angus Shaw, built Buckingham House.[152]

— 1793 —

CANADIAN - REACHES SIX TO FOUR:
Angus Shaw and four men from the North West Company explored upstream from Fort George to the mouth of the Sturgeon River, then also known as the Tea River or Red Willow Creek.

British - Reaches Six to Four:
Peter Fidler and three men from the Hudson's Bay Company also explored upstream from Buckingham House to the mouth of the Sturgeon River.

— 1798 —

Canadian - Reaches One and Two:
Although the French had been there earlier, European presence at Rocky Mountain House is usually dated from the summer of 1798 when John McDonald of Garth and six men came upriver from the Edmonton area to explore the Upper North Saskatchewan River Corridor. The following year, both the North West Company and the Hudson's Bay Company built permanent trading posts in the area. Duncan McGillivray was in charge of the North West Company fort - Rocky Mountain House, and James Bird commanded the Hudson's Bay fort - Acton House.[153]

— 1800 —

Canadian - Reach One and Two:
Duncan McGillivray explored west of Rocky Mountain House that summer to the headwaters of the North Saskatchewan River.[154]

— 1807 —

Canadian - Reaches One and Two:
David Thompson, guided by the Kootenay people *"followed the North Saskatchewan River valley to Howse Pass."*[155] Thompson went by pack train *"while his family [wife and children] went up in canoes."* They reached Kootenay Plains on June 3rd and The Forks on June 6th.[156]

— 1819 - 1820 —

British - Reach Seven:
The scientific expedition of John Franklin wintered on the North Saskatchewan and traveled up and down the river at least to past Fort Carleton[157] during their exploration of the river twenty-five years before his ill fated attempt to find the North West Passage in 1845.[158]

— 1826 —

British - Reaches Seven to Four:
Aemilius Simpson, a step-cousin to Sir George Simpson (governor of the Hudson's Bay Company after the amalgamation), became a *"hydrographer and surveyor for the Hudson's Bay Company."*[159] Between Fort Carleton and Fort Edmonton, Simpson found the countryside pleasant to look at, but from a 19th century point of view he noted, *"this rich face of country made subservient to the use of civilized man how much would it enhance its beauty and value."*[160]

— 1843 - 1844 —

British - Reaches Seven to Four:
Lieutenant John Henry Lefroy, of the Toronto Magnetic and Meteorological Observatory, traveled up the North Saskatchewan River and carried out detailed observations of terrestrial magnification at Fort Edmonton. He was a

well-known astronomer who measured the magnetic declination at a number of points in Canada.

— 1857 —

British - Reach Seven:
Explorer Lieutenant Thomas Blakiston, of the Royal Artillery, assigned to the Palliser Expedition into Rupert's Land, wintered at Fort Carleton where he set up a small magnetic recording studio. *"He was the first scientific man to ascend the Saskatchewan River and comment on its suitability for steam navigation."*[161]

— 1857 - 1858 —

British - All Reaches:
The British Government sent Captain John Palliser, wildlife enthusiast Eugene Bourgeau, geologist James Hector, and astronomer Thomas Blakison to explore the North West as far as Rocky Mountain House.[162] They were to *"explore the country between the west of Lake Superior and the Rocky Mountains."*[163] In the spring Blakiston traveled up the North Saskatchewan River to Fort Edmonton taking magnetic readings all the way.

— 1870 - 1871 —

British - All Reaches:
William Francis Butler made his famous trip up the North Saskatchewan River, on an exploratory mission to report on the state of the fur trade, the plight of the Indians, and to assess the need for troops in the west. Butler's book, published in 1872, "*The Great Lone Land*", documents his journey on the river, and was a popular travel book right into the middle of the 20th century.[164]

— 1872 —

British - Reaches Seven to Four:
Sir Sandford Fleming expedition.[165] Campsites along the North Saskatchewan River used by the expedition: Fort Carleton, Bear's Paddling lake, Jack-fish Lake, English River, Fort Pitt guard, Moose Creek, Snake lake, Victoria Mission, Deep Creek and Fort Edmonton.[166] Members of the expedition: Engineer in Chief, Sandford Fleming of Ottawa, Dr. Arthur Moren of Halifax, Botanist John Macoun of Belleville, Charles Horetsky, ex-Hudson's Bay officer and photographer, Sergeant Terrance McWilliams, the cook and secretary Rev. George M. Grant of Halifax. Fellow travelers: from Fort Garry to Edmonton - Mr. McDougal, Superintendent of Wesleyan Missions on the Saskatchewan, Hudson's Bay officer, Mr. MacCauley, from Carleton to Edmonton. Guides, voyageurs, and packers: *Maxime, Souzie, Haroosh, Legrace, The Little Bird, Kisanis, and Cheeman*.[167]

— 1874 —

Canadian - Reaches Seven to Four:
1874 is the year of the long march of the North West Mounted Police from eastern Canada to Fort Edmonton. From Fort Carlton to Edmonton, they used the old river trails along the North Saskatchewan River.[168]

— 1910 - 1915 —

CANADIAN - ALL REACHES:
An extensive survey of the whole North Saskatchewan River system from Rocky Mountain House to Grand Rapids was undertaken by L. R. Voligny of the Dominion Department of the Interior, recommending "the construction of several dams to raise the water sufficiently to move grain downriver." [169]

Theme Three
Riparian Settlement

The focus of this theme is on the direct influence of the North Saskatchewan River on the landscape of the settled shoreline, including its influence on dwelling type, community adaptations to the river, and how riverside agricultural land was surveyed. River transportation patterns and river industries also influenced the direction, pattern and style of buildings and dwellings. The sub themes include:

3.1 Site of dwellings

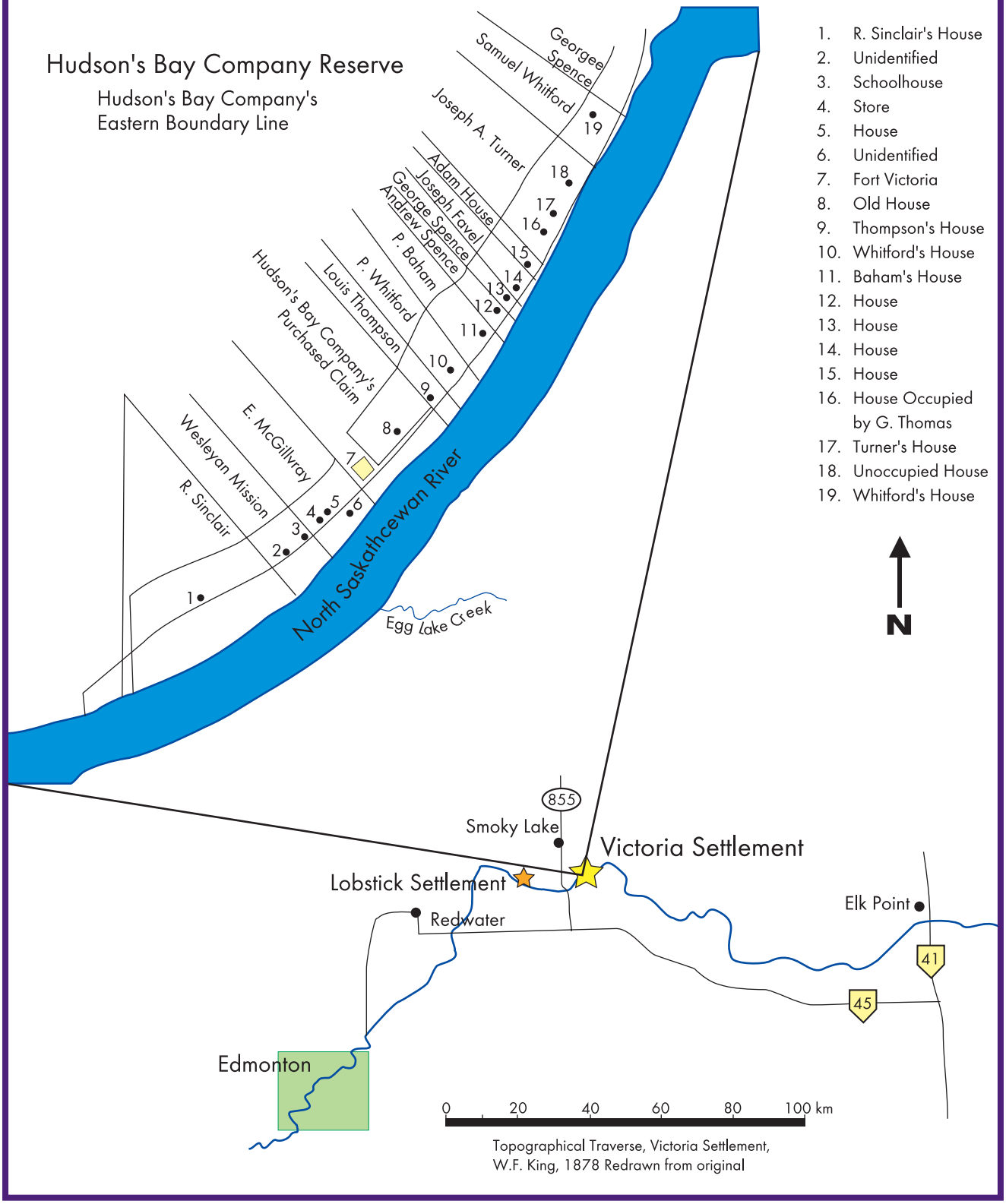
3.2 River-based Communities

3.3 River-influenced Transport

In several places (especially noticeable at Victoria Settlement - see figure 8) the river determined how agricultural land was divided through land surveys. The river lot method of surveying was used for the early communities of Victoria Settlement, Lobstick Settlement and Edmonton. In many places riverside transportation patterns and riverside industries influenced the direction, style, and pattern of subsequent human dwellings. This is particularly evident in the communities that grew up around the sites of logging operations, ferries and fords.

Present urban areas on the North Saskatchewan River, in Alberta: Rocky Mountain House, Devon, Edmonton and Fort Saskatchewan; and in Saskatchewan: North Battleford, Battleford and Prince Albert. Devon, built in response to rapid urban expansion along the river caused by the discovery of oil (Leduc #1), was Canada's first model town - the first community to be planned by a regional planning commission. All these communities have interesting residential and municipal river front architecture. This is particularly noticeable in Edmonton: the river hill advantage of the Provincial Legislature buildings, the river orientation of the heritage CP Hotel (The Hotel MacDonald), and the unique riverbank construction of the Shaw Conference Centre, which seems to rise right out of the river against a backdrop of complimentary architecture provided by the dramatic pink glass and steel of Canada Place towering behind it.

Figure 8 - Victoria Settlement 1878



In Edmonton, the sinuous shape of the river makes possible one of the most unique and intriguing urban skylines in North America, without losing the attractive and essential presence of the riparian ribbon of green. As a result of early municipal foresight in the protection of river valley green spaces, a significant riparian corridor buffers the river and provides extensive river valley trails for the use of residents and visitors. Establishing the river valley trail system not only prevented further development, but also actually resulted in the expropriation and removal of private properties in some communities along the river. The result is an enduring river valley system, Edmonton's Ribbon of Green.

Riparian settlement along the North Saskatchewan River followed the pattern set in place by the fur trade, which had followed a pattern developed by Aboriginal people as they moved from one seasonal encampment to another. The Aboriginal people had chosen sites along the river that were the most advantageous for shelter, resource harvesting and protection. The first Europeans along the river were guided by Aboriginal people and soon adopted the advantageous resting places.

Posts in the areas of Prince Albert, Carlton, Fort Vermilion, Fort George and Fort Edmonton were *"located with the forest on one side and the prairies on the other, were not only good fur-gathering posts but became great provisioning depots as well."* [170]

The three sub-themes of this section categorize representations on the basis of three observable manifestations of human practicality: individual decisions to live beside the river; communities developed beside the river; and the adjustment of transportation systems with respect to the river.

3.1 North Saskatchewan River-based Dwelling Sites

This sub-theme is specified by shoreline seasonal dwellings, which were established according to weather patterns, fish runs, migration of herds and tribal competition; isolated riverside homesteads or farms, which were established by the Métis and later on by early pioneers; permanent riverside dwellings, most of which still exist today; and dispersed dwellings organized in settlement patterns.

Aboriginal groups migrated seasonally from one part of the North Saskatchewan River to another, their seasonal patterns of movement dictated by weather patterns, fish runs, migrating herds, sap, root and berry harvesting, as well as by inter-tribal trade and competition. The archaeological record of pre-historic seasonal campsites is diverse. *"For example, small family groups might move near spawning streams in the spring to trap large numbers of fish, then move elsewhere at the end of the summer to gather berries, or to intercept game animals. At each of these locations they would make, use, and repair their stone and bone implements, often leaving evidence of their activities lying on the ground. For hundreds of generations Native people moved to certain camping areas at specific times of the year building up archaeological record. This pattern was known as seasonal round and is common among northern Native peoples."*[171] (See Figures 5 and 6) There is also plenty of mention of these campsites in the written records of early explorers and fur traders. Place names and physical characteristics also suggest the particular use of many of the river-based dwelling sites.

Permanent riverside dwellings on the North Saskatchewan River were, first of all, the major fur trading posts, all of which (with only one exception - Devon) evolved into the present riverside urban areas of today. Devon is a modern, instant riverside town built specifically in response to the discovery of oil in the last half of the 20th century.

Few of the early permanent dwellings on the North Saskatchewan River were farms in the traditional sense. Most were homes built by the Métis, the direct descendents of fur traders or by retired fur traders or former labourers of the fur trade, like John Walter of Edmonton who initiated many early riverside industries (ferry services, shipyards, saw mills, tanneries and brick yards). Most early settlers grew gardens, had some raised livestock and planted a few acres of grain, but river-related occupations remained their primary employment. The people of the fur trade who settled along the river continued to trap fur, as well as wash for gold; pilot all types of river craft from scows to steamers; guide and translate for explorers, survey crews and eventually for the North West Mounted Police (NWMP); and work on the early logging crews.

Dispersed dwellings that were visibly organized according to a formal plan were most evident at Victoria Settlement where narrow river lots were surveyed similar to the river lot systems of eastern Canada. This was the site of early Métis settlement. In the same area, later, along both sides of the river, Ukrainian settlers sought proximity to each other, creating a different ethnic homogeneity on the river. This is also true of French settlers, downstream in the area around Duvernay. In Saskatchewan it is in the presence of Mennonite communities along the river that this type of ethnic homogeneity exists.

— Pre-contact —

Seasonal Site: All Reaches:

The Birch Hills, at the mouth of the Sturgeon River near present day Fort Saskatchewan, was a well-known and widely used seasonal canoe building encampment.[172] In fact there are several areas along the river called 'Birch Hills' (from upstream of Edmonton to around Prince Albert) and it is likely that they all signify the location of early seasonal sites.

Seasonal Site: All Reaches:

There is evidence that around the mouths of most of the major tributaries to the North Saskatchewan River were locations of early seasonal encampments, many of them in the interest of seasonal fishing, egg gathering and berry picking.

Seasonal Sites: Reaches One and Two:

In the Kootenay Plains along the upper reaches of the North Saskatchewan River, the Kootenays and the Shushwaps *"occupied both the eastern and western slopes of the Canadian Rockies from the North Saskatchewan River, south…both groups fished the lakes and rivers of the Rocky Mountain trench."*[173]

Seasonal Site: Reach Five::
In the area of what became Victoria Settlement, archaeological surveys have revealed evidence of human usage along the river *"that are over 6,000 years old."*[174]

Seasonal Sites - Reach Four:
Many seasonal sites have been identified in this reach that date as far back as 6,000 B. P. (See Figures 5 and 6)

— At contact —

Seasonal Sites - All Reaches:
In the late 1600's *"Since several aboriginal groups traveled to Hudson Bay to trade"*, it has been noted that Cree, Blackfoot, Beaver, Northern and Southern Nakota people traveled and camped in the valleys of the North Saskatchewan River.[175] Most of the women, children and elderly people were left at strategic places along the river when their men went to the 'Bay' to trade. They would slowly migrate down river to a designated meeting place to wait for the return of the men. The Forks was one of the most popular of these meeting places as well as areas around Prince Albert, Saskatchewan and the Fort Pitt area.

— From the 17th Century into the 20th Century —

Seasonal Site - Reach One:
A favourite early European trading and meeting site was at Saskatchewan Crossing, in the upper reaches of the river where three rivers meet: the Mistaya, the Howse and the North Saskatchewan River.

Seasonal Sites - All Reaches:
"For 1,205 miles the great Saskatchewan River flows, a natural roadway from the Rocky Mountains as far as Lake Winnipeg. For centuries the Indian tribes had known and made use of this route. The northern arm of the river was known by them as Kis-ses-kat-chewan (great, swift, angry, flowing waters), and it was not only a great highway, but also a tribal frontier, for, from time immemorial, it had been the dividing line between the Wood and the Plains Indians…Near the mouth of the Sturgeon (this is the river that enters the North Saskatchewan near the city of Fort Saskatchewan in Alberta) there was an ideal spot, for, in that area, there was a grass clearing surrounded on three sides by thickets of birch and spruce. Accordingly, it was named "Birch Hills", a name common to many of their boat-building encampments."[176]

— 1690 - 1692 —

Seasonal Sites - Reach Seven:
The Hudson's Bay Company sent young Henry Kelsey inland into the eastern reaches of the North Saskatchewan River.[177] He would have made use of several seasonal sites to build canoes for returning to the Bay.

— Early 1700's —

Seasonal Sites - All Reaches:
"Pushed westward by white conquest of eastern North America, the Stonys (Assiniboines / Nakotas / Dakotas) came from the Lake of the Woods on the Canadian Shield… west along the North Saskatchewan River to the west edge of the prairies."[178] These newcomers hugged

the North Saskatchewan River up and down its entire length, seeking the resource bounty along its shores, as well as the protection provided by the river from the aggressive people of the plains.

— 1754 —

Seasonal Sites: Reaches Seven to Four:
Anthony Henday wintered near the present site of Edmonton and in the spring he and his group built canoes and returned to the Bay, downstream on the North Saskatchewan River.[179] The families of the men who accompanied Henday to York Fort made their way along the river to The Forks to greet them upon their return.[180]

— 1763 —

Seasonal Site: Reach Seven
On the river north of Birch Hills in Saskatchewan in the area of Prince Albert is an old canoe-building site. Missionary Joseph Smith and his group used it.[181] Later, these canoe-building encampments often became the building sites for trade posts and missions.

— 1767 —

Seasonal Site: Reach Six:
Near Mooswa, where today Canadian Salt has a processing plant and town site, Hudson's Bay man, William Pink, used a seasonal canoe-building site.[182]

— 1787 —

Seasonal Site: Reaches One and Two:
David Thompson, wintering with the Blackfoot, mentions that the Kutenais used to live and hunt from the headwaters of the Saskatchewan, downstream *"right down to the western plains"*.[183] Evidence of dozens of those ancient seasonal sites was in plain view right to the end of the 19th century.

— 1792 to the present —

Heritage Site: Reach Six:
Fort George/Buckingham House Provincial Interpretive Centre, built on the north river bank, west of the Alberta/Saskatchewan Border on the site of two 1792 forts built by the North West Company and the Hudson's Bay Company. There is still river access to this site the same as there was over two hundred years ago.

— From 1780's to the middle of the 20th Century —

Seasonal Site - All Reaches:
Three or four miles from each major fur trading fort, in sheltered meadowland with access to the river, was the 'horse-guard', a place where fort horses and sometimes cattle were pastured and guarded. Hired caretakers and their families would make temporary dwellings here. The horse guard was moved according to seasonal requirements of pasture and protection. The Earl of Southesk mentions horse-guard at Fort Carleton in 1859.[184] This guard held twenty 'pony mares', and about 50 carthorses.[185] There were also significant riverside horse-guard encampments for Rocky Mountain House,

Fort Edmonton, Fort Saskatchewan, Victoria Settlement, Dog Rump Post, Fort Vermilion, Fort Pitt, the Battlefords, and around Prince Albert Mission.

Seasonal Site: Reach Seven

At Fort Pitt, in August of 1859, the Earl of Southesk mentions the horse-guard in charge of *"an old French half-breed named Charlevoix"* and a herd of *"a hundred and fifty"* horses.[186]

Seasonal Site: All Reaches

Around every fur trade fort, in areas called 'plantations', are seasonal campsites of the various tribes who came to trade and visit every season. At any given time there would have been anywhere from five to several hundred tents set up for a few days, a few weeks and even in some cases a few months. The Earl of Southesk mentions, *"six tents of Wood Cree, and also some half-breed "free" hunters…"*[187]at Fort Pitt in August of 1859.

— Early 1800's —

Seasonal Site: Reach One:

Traders on the Upper-North Saskatchewan note old seasonal encampments of the Kutenai people as well as those of the Flathead and the Shoshoni who had been driven over the mountains by the Blackfoot.[188]

— From the early 1800's to the turn of the 20th Century —

Seasonal Site: Reaches Three and Four:

Between the Horse Hills Depot, downstream from Fort Edmonton and the Pembina Depot the horse guards kept 500 to 1,000 horses pastured and maintained for Hudson's Bay Company business at Fort Edmonton. Here several men and their families would put up temporary housing as they moved the hobbled horses from pasture to pasture.[189]

Reach Four:

August 27th, 1872, the Sandford Fleming expedition *"breakfasted fourteen miles from the camp at a little Creek near "Horse Hill," where the "guard" of Edmonton was formerly located."*[190] December 5th, 1848 - Paul Kane mentions 700 or 800 horses of Fort Edmonton, cared for by one horse keeper and his family.

Seasonal Site: Reach Seven

August 1872 - George Grant of the Fleming expedition recorded their campsite at the horse guard of Fort Pitt, *"Every station of the Hudson's Bay Company has a "guard" or judiciously selected spot, well supplied with good water, wood, pasturage, and shelter, where the horses are kept."*[191] *"The grasses were thick and short…still green and juicy though they had been exposed to all the summer's heat. In the marshes the grass was from four to six feet high, and of excellent quality for hay…on account of the grasses being so good, more horses were kept at Fort Pitt than at any other post on the Saskatchewan."*[192]

— 1860's to the present —

Heritage Site: Reach Seven: Fort Carleton

An important fur trade fort on the river until 1885, and now a reconstructed stockade, four buildings, a tipi encampment stand near the site of the old Hudson's Bay Fort.

— 1862 to the present —

HERITAGE SITE: REACH FIVE: VICTORIA MISSION

About 110 kilometres downstream from Edmonton, where the river valley widens, is a Provincial Historical site featuring one of the oldest settlements on the North Saskatchewan River, *"the first diversified settlement in the Canadian interior west of Red River."*[193] Reverend George McDougall established his Methodist mission there in 1862 and the Hudson's Bay Company operated a trading post on the same land to try to discourage the free traders along that part of the river. The clerk's house, which the Bay men built in 1865, still stands on the site making it *"the oldest building in situ in Alberta."*[194] (See Figure 8)

— 1872 —

DISPERSED DWELLINGS: REACH FIVE:

At Victoria Mission, *"The log houses of the half-breeds, (English and Scotch) intermingled with the tents of the Crees, extend in a line from [the fort]… along the bank of the river, each man having a frontage on the river, and his grain planted in a little hollow that runs behind the houses."*[195] *"The settlement is seven years old, and consists now of between twenty and thirty families of half-breeds and from ten to a hundred tents of Crees…"*[196]

— 1874—

HOMESTEAD: REACH FOUR:

Jean-Baptiste Beaupré arrived to settle next to the Lamoureux, near the site of the present city of Fort Saskatchewan.[197] This becomes an early French riverside community.

— 1876 —

MISSION: REACH FOUR:

Bishop Grandin has a Catholic mission built on north side of river across from North West Mounted Police barracks at Fort Saskatchewan.[198]

HOMESTEAD: REACH FOUR:

Joseph Lamoureux's mother, his family, another brother and a son-in-law arrived to settle along the river near him at Fort Saskatchewan.[199]

PERMANENT DWELLINGS: REACH FOUR:

John Walters, the first official settler on the south side of the river, at Fort Edmonton, built his house on the river in 1876 where it still stands just west of the 105 Street Bridge.

— 1877 —

MISSION: REACH SEVEN:

At Fort Pitt, the Catholic mission of Father Leon-Adelard Fafard, one of Father Lacombe's recruits, is built. He led a small contingent from the St. Albert mission north of Fort Edmonton, down river to Fort Pitt to build the St. Jean-Francois-Regis Mission. From here Father Fafard and Father Lestanc followed small Indian bands downriver as far as the Battlefords and upriver to the area around Frog Lake, living with them in their hunting camps and wintering quarters. Father Fafard is known as one of the victims of the Frog Lake Massacre during the Northwest Rebellion in 1885.[200]

— 1880 —

Dispersed Dwellings: Reach Four:
River Lot 8 - site of 1st Fort Augustus and Edmonton House occupied by Louis Grandbois and Felix Pagerie.[201] This is downstream from the present day Fort Saskatchewan, Alberta.

— 1882 —

Sacred Site & Permanent Dwellings: Reach Four:
Originally, an Indian Reserve was surveyed south of John Walter's landing at Fort Edmonton for the Papachase Band but when formal river lots were surveyed in 1882, the northern boundary of this reserve was re-adjusted and the whole reserve later relocated away from the river to make way for the expanding urban area. By the end of 1882, eighteen houses stood along the south bank of the river, all but one within the boundaries of twelve river lots that were to become the boundary of the City of Strathcona. With the coming of the railroad, John Walter's property on the river flats took on new importance. His ferry was then used daily; his sawmill, built on the river to make use of logs floated down from upstream, expanded as the cities on both sides of the river grew.

3.2 North Saskatchewan River-based Communities

Early river-based communities were established as permanent shoreline settlements close to good resources; fortification-based communities located near forts; river industry-based communities (e.g. mill, brewery factory); or river crossing-based communities (e.g. bridge, ferry, ford).

Communities along the North Saskatchewan River began with trading posts and missions that were usually situated on sites favoured by Aboriginal groups as seasonal encampments. These were sites close to fishing, berrying and hunting grounds; sheltered sites from wind and weather; sites not subject to flooding, and sites relatively free of summer insects. The very earliest European settlements along the river were constructed inside fortified stockades, usually referred to as 'forts'. They were constructed this way not only for protection against hostile Aboriginal groups, but also to protect people and property from rival European traders.

Residences and other structures and components of settlements sometimes reflect their origins as river industry-based communities. The early community of Strathcona, across the river from Fort Edmonton, is a good example of this. Here John Walter operated a commercial ferry service, built boats, ferries, scows and barges and eventually operated a major sawmill. An early community built up around his industries. The community of Riverview, downstream (near the Alberta/Saskatchewan border), is built around a riverside salt processing plant, the early Fort Pitt community, after the demise of the fort, built up around small saw milling activities, and the communities adjacent to Prince Albert built up around the lumber industry.

Ferries and fords along the North Saskatchewan River are a significant component of Western Canadian river heritage. At the site of nearly every ferry, a river crossing-based community sprang up. There was a post-office/general store at most North Saskatchewan River ferry crossings and these became the hub of local communication and trade.

— From before Contact until the middle of the 20th Century —

River-Influenced Road:
"the Saskatchewan served in winter as well as summer as the great transcontinental highway and as the North West Passage connecting the Pacific and the Atlantic."[202] *"When express shipments or messages had to be sent, they all went via the Saskatchewan."*[203] One of the most complex networks of interconnected overland trails in the west linked the various inhabited regions of North Saskatchewan River basin. The most frequently traveled was the Saskatchewan Trail, also called, at various times, the Old Saskatchewan Trail, the Edmonton Trail, the Hudson's Bay Trail, the Company Trail and in more recent times, the Carlton Trail.[204]

In 1801, Alexander Henry recorded, in his journal, one of the first indications of use of the Red River Cart in the west, *"men now go again for meat with small carts, the wheels of which are one solid piece sawed off from the ends of trees whose diameter is 3 feet."* At oxen speed of two miles per hour, it took about 40 days to travel the 480 miles from Fort Garry (Winnipeg) to Fort Carlton. To get to Fort Edmonton a cart train needed another 35 days.[205] In 1815, John Rowand, made one of the first recorded journeys that specifically refers to the whole trail. He got tired of waiting for the ice to go out in the North Saskatchewan River so he set out on horseback.[206] His group left Fort Augustus (near present day Fort Saskatchewan) on April 6th, 1815 and arrived at Fort Carleton on April 21st. The trail had not developed into a cart trail yet, but by 1841 the trail from Fort Garry to Carlton had become a recognized overland cart travel route; there was still no established cart trail from there to Fort Edmonton.[207] By the 1850's the overland cart trail had progressed upriver from Fort Carlton, following the North Bank of the North Saskatchewan River to Fort Edmonton.[208]

— 1748 —

Fortified (French): Reach Seven:
Le Chevalier de la Verendrye built a small fort "near The Forks of the Saskatchewan."[209]

— 1751 —

Fortified (French): Reach Seven:
Jacques Repentigny Legardeur de Saint-Pierre of New France sent two canoes west to build a small post just east of The Forks on the *Pascoyac* (Saskatchewan), which he called *La Jonquiere*.[210]

— 1753 —

Fortified (French): Reach Seven:
Le Chevalier de la Corne built Fort La Corne near The Forks of the two Saskatchewan Rivers.[211]

— 1770's —

Fortified (Independent): Reach Seven:
Trading post built by Peter Pond at the confluence of the Shell River and North Saskatchewan River, upstream from present-day Prince Albert.

Fortified (Independent): Reach Seven:
A trading post built by Peter Pangman, independent trader, was downstream from North Battleford directly south of the present village of Denholm, Saskatchewan.

— 1776 —

Fortified (Independent): Reach Seven:
"Peter Pond, Yankee free trader, built a post three miles upstream from present day Prince Albert, near the mouth of the Sturgeon River, known as Net Setting River."[212]

— 1778 —

Fortified (Independent): Reach Seven:
A post, Fort *Montagne d'Aigle*, was built on the North Saskatchewan River in the vicinity of modern day North Battleford.[213]

— 1784 —

Fortified (Canadian): Reach Seven:
Fort Umfrieville built for the North West Company on the north side of the river east of Fort Pitt (used for 10 years).

— 1788 —

Fortified (Independent): Reach Four:
Peter Pangman built a post near present day Edmonton.[214]

— 1792 —

Fortified (Canadian & British) - Reach Six:
Fort George and Buckingham House built by the North West Company and the Hudson's Bay Company, on the riverbank just south of the present town of Elk Point. Duncan McGillivray, at the North West Company post at Fort George, reported in his journal, 24 April 1795, the arrival of a large contingency consisting of Sarcee, Cree, Piegan and Blood Indians. He was astonished that *"before midnight we had clothed 22 Chiefs, a greater number than was clothed before in one day at any settlement in the North West."*[215]

— 1795 —

Fortified (Canadian, British & Independent):
In the summer James Hughes, of the NWC, built Fort Augustus and in October William Tomison, of the HBC, came upstream in five canoes from Buckingham House to build Edmonton House near mouth of Sturgeon River.[216] During this same summer independent Canadian traders built two additional trading posts in this area - Francois Beaubien was possibly one of them and men from David and Peter Grant's Fur Trade Company were the others.[217]

Fortified (Canadian & British) - Reach Four:
Fort Augustus and Edmonton House, the first of several forts of the same names for both the Hudson's Bay Company and the North West Company.

— 1799 —

Fortified (Canadian): Reach Two:
Upstream of the present community of Rocky Mountain House, Rocky Mountain Fort was built by the North West Company and Acton House by the Hudson's Bay Company.[218]

Fortified (Canadian, British & Independent): Reach Five:
Three forts built on an Island near the present day town of Myrnam, Alberta by XY Company, Hudson's Bay Company and the North West Company - all named Fort de L'Isle or Island Fort.

— 1806 —

Fortified (Canadian & British) - Reach Four:
2nd Edmonton House and Fort Augustus.

— 1809 —

Fortified (Canadian): Reach Three:
David Thompson was at Quagmire House, on the left bank of the river about 1.5 km upstream from the Barrymore Ferry. He called it 'Fort Muskey'.[219]

— 1810 —

Fortified (Canadian & British) - Reach Five:
80 miles downstream from 2nd Edmonton house and Fort Augustus - at mouth of White Earth Creek - 3rd Edmonton house and Fort Augustus are built.[220]

— 1829 - 1885 —

Fortified (British/Canadian): Reach Seven:
Fort Pitt, on the north bank of the North Saskatchewan River, was a Hudson's Bay Company fur trade post a halfway point between Fort Carlton and Fort Edmonton. Fort Pitt played important roles in the fur trade, in the signing of Treaty Six and in the North West Rebellion of 1885. Today the park contains the archaeological remains of two different posts. Interpretive panels explain the post's history and a National Historic Sites and Monuments plaque commemorates Big Bear and the signing of Treaty Six.

— 1830 - 1915 —

Fortified (British/Canadian): Reach Four:
Fort Edmonton built near present site of Legislature buildings.[221]

— 1862 —

River Trail - Reaches Four to Seven:
Father Lacombe organized the first non-fur trade cart brigade because he could no longer afford the cost of using the Hudson's Bay cart system. He took 30 Red River Carts along North Saskatchewan River trails from St. Albert

to Fort Garry and back for supplies for his mission.[222] This then became a regular river trail route for the Catholic missionaries and other non-fur traders on the river. Vestiges of this trail, with the deep cart ruts, can still be found along the river, particularly in sections of the river downstream from Victoria Settlement, into Saskatchewan.

Part of this route (from Heinsburg, Alberta, travelling upstream to the Vinca Bridge, north of Lacombe, Alberta) is now used regularly for re-enactment activities by trail riding groups and wagon train enthusiasts. The most significant recent re-enactment took place in the summer of 1992 during the Bicentennial activities commemorating the building of Fort George and Buckingham House. A wagon train journey was made over this trail, carrying commemorative mail, stamped with a specially designed Canada Post cancellation at both ends of the journey. This was to compliment the winter re-enactment, in February of that year, of a historic dogsled mail run on the river ice from the Vinca Bridge to the Fort George/Buckingham House Interpretive Centre. The dogsleds also carried commemorative mail, stamped with a specially designed Canada Post cancellation at both ends of the journey. The Ironhorse Trail, a historic recreational trail following an abandoned railway line uses this route from Heinsburg to Elk Point, Alberta.

— 1862 —

Mission - Reach Five:

Methodist missionary, the Reverend George McDougall, moved his *"small mission outpost from Smoking, now Smoky Lake, to a new site on the North Saskatchewan River. His mission soon attracted about 150 Protestant, English-speaking, buffalo hunting settlers - many from Red River."*[223] An interesting feature of this settlement is *"it was based on river lots - the narrow farms fronting on the river that were found in Red River and which can be traced back to the early settlement of New France."*[224]

— 1860's —

Mission - Reach Five:

People began to settle around missions along the river, particularly at Victoria Settlement. *"In 1865 between 25 - 35 Métis families from the Red River settlement moved to Victoria Settlement. Church attendance was recorded as being as high as 250 people in 1871 - 72."* Agriculture became more important, and the Hudson Bay set up a gristmill in 1873 and Magnus Cromarty brought in the first horse-powered thresher. *"In 1884 the land was surveyed, giving legal recognition to the river lot method of distributing land. A telegraph office opened in 1886 and postal service started in 1887 with delivery coming every fortnight. Reverend J. A. McLachlan was the first postmaster, and the post office was named Pakan, after the Cree Chief who kept his people from joining the 1885 Rebellion."* What began as a Methodist mission and a Hudson's Bay Company post became a rural community.[225]

— 1866 —

Mission - Reach Seven:

Although Europeans had been travelling along the North Saskatchewan River for over a hundred years by that time, Reverend Nesbit and his family are considered the first permanent settlers in the area around Prince Albert.[226]

— 1872 —

River Trail - Reach Seven:
The river trail in the vicinity of Jackfish Lake, in Saskatchewan, during the Sandford Fleming expedition: *"The road followed the high lands where the streamlets or 'creeks' that flows into the Saskatchewan, take their rise."*[227]

Settlement - Reach Five:
Sandford Fleming's trans-Canada expedition noted at Victoria Settlement, *"the log-houses of the English and Scotch half-breeds, intermingled with the tents of the Crees, extend in a line from this west end along the bank of the river, each man having frontage on the river..."*[228]

— 1874 —

Settlement - Reach Seven:
The settlement of Prince Albert *"straggled along the south bank of the river for four or five miles."*[229]

— 1875 —

Fortified - Reach Four:
NWMP barracks, called Sturgeon Post, were built at the present location of Fort Saskatchewan.[230] They were constructed close to where the Sturgeon River enters the North Saskatchewan.

— 1876 —

Government- Reach Seven:
The Battlefords are chosen as the seat of the North West Territorial Government.[231]

NWMP - Reach Four:
June 29, 1876, Colonel MacLeod asks for "$1,000 to complete Fort Saskatchewan." In the beginning the fort was called *"Sturgeon Creek Post, but soon received the more appropriate title of Fort Saskatchewan."*[232]

Modern Riverside Communities

Reach One/Two: Rocky Mountain House
Reach Four: Devon, Edmonton, Fort Saskatchewan
Reach Five: Duvernay/Brosseau
Reach Six: Riverview, Heinsburg
Reach Seven: North Battleford/Battleford, Prince Albert

3.3 North Saskatchewan River-influenced Transportation

Rivers are obstacles as well as well as highways and where people need to cross rivers, they usually choose a shallow place for fording. Ferries were often operated in the vicinity of fords, and eventually bridges joined the overland roadways serviced by the ferries. In this way, the river influences land-based transportation. All along the North Saskatchewan River, where water was shallow enough for tribal communities and their pack animals to cross, there was a 'ford'. Explorers and fur traders used these same river-crossing places. By the time of settlement

there were well-worn cart trails to all the river fords. Settlement meant that people needed to cross the river even when the water was high, so, in the vicinity of fords, pioneers began private ferry services. After 1905, when Alberta and Saskatchewan became Provinces, the provincial governments took over many of these ferries, some of which are still in operation in Saskatchewan. (Historical information on Saskatchewan ferries is sparse in this report; however, ten Saskatchewan canoeists, in July 2001, reported the old Paynton Ferry still in operation).

Bridge south of Elk Point
photo Billie Milholland

- *"John Walter's mill at Edmonton was one of the centers for the building of Alberta ferries."*[233]
- *"When the river was frozen, an "ice bridge" made it possible for transportation to resume."*[234]
- Ferry locations became *"a gathering place for social evenings…the deck of the ferry swept off for the dancing …the river bank set up with tables of food."*[235] *"Corn roasts, potato roasts, barbecues and square dances were held down on the ferry."*[236]
- Sometimes ferries were the sites of river baptisms.[237]
- Berry pickers used ferries in the fall to get to wild fruit on both sides of the river.[238]
- Postmasters near enough to the river acted as ferry operators.[239]
- Ferrymen became newsmen reporting all the happenings of the area.[240]
- From 1905 to 1951, *"The Alberta Department of Public Works administered and maintained the ferry system."*[241]

Bridges did not become commonplace on the North Saskatchewan River until after WWII, except in the larger urban areas of Edmonton and Prince Albert. Bridges were most often constructed in the vicinity of ferry crossings, thereby continuing the ancient river-crossing routes. Most modern highways follow a linear grid pattern but many approaches to river bridges on the North Saskatchewan, even today, wind down to the bridge in the manner of old cart trails. Some of the original bridges built across the North Saskatchewan are still in use. At the Battlefords the most unique older bridge structure crosses the river by way of a large island, now managed for recreational activities. An inventory of other original bridges was not taken for this study.

— 1810 —

Fort - Reach Seven:

Fort Carleton was built at a "natural ford across the North Saskatchewan River. For many years the fort was a major crossroads, accessible both from the river and from the Carlton Trail…"[242]

— 1862 - 1952 —

FERRIES - REACH SEVEN:
The HBC operated the Fort Pitt Ferry from at least 1862 until the Territorial Government licensed it in 1898.[243] In the 1920's and 30's the ferry ride was free between 7:00 am and 10:00 pm; after that it cost ten cents for every person and five cents for every animal more than two attatched to any vehicle.[244]

— Aug. 16, 1863 —

FERRIES - REACH FIVE:
Victoria Ferry: In a letter to his superior in Ottawa, Reverend George McDougall wrote, *"We now have a good scow and the novel scenes of yore have passed away."* He is at Victoria Settlement, describing the more modern way that they now had for crossing the river. The 'novel scenes of yore' involved goods wrapped in a leather tent and tied up like a "pudding bag" to be dragged behind a horse across the river.[245]

— Prior to the 1870's —

Ferries - All Reaches:
"anyone could run a ferry as a private undertaking."[246]

— Fall of 1872 —

FERRIES - REACH FIVE:
Brosseau/Duvernay Ferry: Crossing the river at Brosseau, Alberta, from the north side to the south side, Charles Napier Bell, traveling with a group of Métis, reports the making of a quickly manufactured hide canoe, *"about 12 feet in length, tying and binding the parts together with pieces of shagganappi (strips of raw buffalo hide) which, quickly drying in the warm sun, contracted and became hard and unyielding as bands of iron."*[247]

— 1875 - 1905 —

FERRIES - REACH FOUR:
Fort Saskatchewan Ferries: The Lamoureaux brothers operated a small rowboat ferry between their settlement on the north side of the river to the North West Mounted Police barracks on the south side of the river until 1880 when the Territorial Government installed a cable ferry.[248]

— 1876 —

FERRIES - REACH FOUR:
Fort Edmonton Ferry: Walters operated a ferry, providing the only easy way across the river. His ferry operated sporadically until 1882 when the Hudson Bay Company began to bring in supplies from the south. Since it was the only reliable transportation across the river to Fort Edmonton, it became a major business venture.[249]

— 1877 —

FERRIES - ALL REACHES:
The North West Territorial Government passed its first "Ferries Ordinance".[250]

— 1883 —

Ferries - Reach Four:
From a report by Superintendent A. H. Griesbach at Fort Saskatchewan, There are "*six ferries in the district, four of which are run on the tariff supplied by the North-West Ordinances. The two at Edmonton under the municipal licenses have a much cheaper tariff of charges. The four others are at Clover Bar, Fort Saskatchewan and Red Deer.*"[251]

— 1883 - 1904 —

Ferries - Reach Four:
Clover Bar Ferry: John Walter installed a ferry where the present Clover Bar bridge, in Edmonton, crosses the river.[252]

— 1882 - 1913 —

Ferries - Reach Four:
Edmonton Ferries: Before 1882, numerous accounts mention river crossing by every kind of floatable conveyance. In 1882, John Walter launched "*The Belle of Edmonton*" ferry and it ran it for the next 20 years. Until 1891 the Edmonton ferries were known as the 'upper' and 'lower' ferries. After that, the Edmonton Cartage Company was hauling so much freight that it formed the Edmonton Ferry Company and "installed a free ferry about 100 yards from the "lower" crossing to carry all the freight of the cartage company. When the Low Level Bridge opened to traffic in 1900 the only ferry left operating was John Walter's ferry, which ran until the High Level Bridge opened in 1913."[253]

— 1892 - 1972 —

Ferries - Reach Five:
Victoria Ferry: Installed at an ancient crossing place where a Methodist mission was built in 1862 at the same time as a Hudson's Bay Company trading post. Until an official ferry was in place people continued to cross the river here via leather 'bull' boats, canoes and floating, wheel-less Red River Carts.[254]

— 1896 - 1900 —

Ferries - Reach Five:
Crooked Rapids Ferry: South of Saddle Lake, Alberta.[255]

— 1898 —

Ferries - All Reaches:
The North West Territorial Government "assumed responsibility for the ferries." Licenses were issued for three-year periods.[256]

— 1898 —

Ferries - Reaches Four and Five:
The North West Territorial Government was operating ferries at Victoria Settlement (Pakan) and Fort Saskatchewan.[257]

— 1901 - 1907 —

Ferries - Reach Five:
St. Paul Ferry: Installed at the old site of the St. Paul des Cris settlement of 1865 - 1873, near the present Duvernay Bridge. Sometimes referred to as Lambert's Ferry, it operated until 1907, when the government Brosseau Ferry went in.[258]

— 1901 - 1962 —

Ferries - Reach Five:
Desjarlais Ferry: From Edmonton Bulletin, July 7: *"a new ferry operated by the Saddle Lake Indian Agency is now operating about five miles below"* the old one.[259] It operated under the old Territorial Government until 1909 when it was taken over by the new Provincial Government. It ceased operations in 1962 when the Duvernay Bridge was opened.[260]

— 1905 —

Ferries - Reach Five:
The new Alberta government took over the ferries at Victoria Settlement (Pakan) and Brosseau.[261]

— 1906 - 1962 —

Ferries - Reach Five:
Shandro Ferry: Prior to 1906, settlers from Bukovina settled on both sides of the river at the turn of the 20th century. They used their own rowboat ferry system, operated by Maria Solowan for five cents a crossing, until the government installed an official ferry.[262]

— 1906 - 1917 - 1966 —

Ferries - Reach Three:
Genesee Ferry: At the bend in the river here the old trail to Lac Ste. Anne crossed at a ford. In 1906 *"a local timber man, Charlie Cropley built a scow to ferry passengers and supplies across the river."* In 1910 Cropley put in a cable ferry and at the same time the Scheideman family, four miles downstream from Cropley's ferry, began operating their own ferry from their homestead. The government installed its own ferry in 1917, which was called, until 1924, Fraser's Landing.[263]

— 1907 - 1917 —

Ferries - Reach Four:
Big Island Ferry: In 1907 the ferry was two miles north of Big Island. In 1908 it was two miles south of Big Island.[264] Big Island is upstream from Edmonton.

— 1907 - 1930 —

Ferries - Reach Five:
Brosseau Ferry: during the winter ice bridges were used. In 1929, 35,000 vehicles crossed on this ferry.[265]

— 1908 - 1946 —

Ferries - Reach Two:
Rocky Mountain House Ferry: After the closing of the Hudson's Bay Company Fort in 1876, a little community called Prairie Grange grew up around the river ford area. In 1908 it got a post office and a ferry. A railway bridge was opened in 1913 but the ferry continued to cross all other traffic until a traffic bridge was opened in 1946.[266]

— 1908 - 1967 —

Ferries - Reach Five:
Eldorena Ferry: "*The old Victoria ferry was moved to a point north of Lamont, Alberta on the North Saskatchewan River*" in 1908.[267] This was to answer the needs of the new Ukrainian settlers on both sides of the river.

— 1908 - 1957 —

Ferries - Reach Six:
Lea Park Ferry: Installed on the North Saskatchewan River north of the village of Kitscoty, Alberta, near the mouth of the Vermilion River, this ferry "was used extensively for crossing cattle herds in the spring and fall to community and private pastures."[268] The first ferryman was Louis Patenaude, a Métis who had taken part in the Riel Rebellion of 1885.[269]

— 1908 - 1970 —

Ferries - Reach Six:
Hopkin's Crossing Ferry: Until 1915 this ferry crossing, southeast of St. Paul, housed the post office and a general store.[270]

— 1909 - 1920's —

Ferries - Reach Six:
Hood's Crossing: Charlie Hood operated a scow to get people across the river in the vicinity of the "*old fur trading posts of Buckingham House and Fort George,*" southeast of the present town of Elk Point.[271]

— 1910 - 1980's —

Ferries - Reach Six and Seven:
Meridian Ferry (Alberta Ferry prior to 1920)[272]: Installed by the Alberta government for transportation "*between Onion Lake and Lloydminster.*" The first ferryman used to row across the river a couple of times a week to transport a woman and a big dishpan of rising bread dough. This new settler had no oven and needed to use the ferryman's oven to bake her bread. Being hampered by shifting sandbars, in 1920, the ferry was moved east of the 4th meridian and operated jointly by the Alberta and Saskatchewan governments. It was moved several times after that for the same reason but the two provincial governments continued to administer it, jointly. In 1974 it carried 26,000 vehicles and 1,600 loose animals.[273]

— 1913 - 1950 —

Ferries - Reach Seven:
Frenchman Butte Ferry: Yankee Bend 1913-15, North Bend 1915-49, Fr. Butte 1950. Traffic in 1915-16 - 2,951.[274]

— 1911 - 1965 —

Ferries - Reach Three:
Holborn Ferry: Operated in the vicinity of Stony Plain, Alberta this ferry was stranded mid-stream many times by log booms sent down river from Rocky Mountain House.[275]

— 1911 - 1963 —

Ferries - Reach Six:
Lindbergh Ferry: Installed at an ancient river crossing near the present Windsor Salt Plant, this crossing has been known also as Tyrol Crossing, Mooswa Crossing and Telegraph Station Crossing.[276]

— 1913 - 1920 —

Ferries
Durlingville Ferry: Although it operated on the North Saskatchewan River for eight years, little is known about this ferry.[277]

— 1913 - 1966 —

Ferries - Reach Five:
Vinca Ferry: Installed north of Bruderheim, this ferry was used, in later years, extensively by oil companies until the Redwater Bridge was built on Highway 38 in 1967.[278]

— 1913 - 1950 —

Ferries - Reach Six:
Elk Point Ferry: It hauled vehicles, people and herds of cattle. From 1930 to 1933, when the government installed a "go-devil" (an enclosed cage that swung by cable over the river), the ferry operated a "jigger" for emergency use in the spring and fall. This was a rough platform suspended from the ferry cable that could hold two people. The local country doctor, F. G. Miller, who was the only doctor in hundreds of miles of Elk Point for many years, used it.[279]

— 1914 - 1970 —

Ferries - Reach Five:
Myrnam Ferry: Installed north of the present village of Mynam. The last ferry crossing, made in 1970 at the opening of the Myrnam Bridge, carried Mrs. Nick Bodnar, wife of the first ferryman, four vintage cars, many local dignitaries and a RCMP escort.[280]

— 1914 - 1963 —

Ferries - Reach Six:
Heinsburg Ferry: This was a busy crossing employing two ferrymen at a time and during peak times, three ferrymen. It was used "extensively to transport herds of cattle to their summer range."[281]

— 1916 —

Ferries - Reach Four:
Oliver Ferry: used by the CNR Railway just outside of Edmonton to ferry construction crews while building track and bridge.[282]

— 1916 - 1983 —

Ferries & Ice Bridges - Reach Four:
Berrymoor Ferry: This ferry operated south of Tomahawk, Alberta, Ice bridges were built and used in winter.[283]

NOTE: All along the river ice bridges were built in the winter, and often, between the time the ferry was removed from the river and the ice was thick enough to begin an ice bridge, people would keep open a small channel for a small boat that could be pushed by someone carrying a long pole in case the ice gave way.

— 1917 - 1960 —

Ferries - Reach Six:
Forbesville Ferry: this ferry went in between the Meridian Ferry to the east and the Lea Park Ferry to the west. After the Lea Park Bridge opened in 1957, ferry traffic diminished and the ferry ceased operations in 1960.[284]

— 1916 - 1963 —

Ferries - Reach Five:
Warspite Ferry: Private ferries ran here from what was known as Frances Siding and Smoky Lake Centre Crossing. The official government ferry was installed in 1920 and operated until the Waskatenau Bridge was built.[285]

— 1920 - 1963 —

Ferries - Reach Five:
Waskatenau Ferry: Settlers on the south side of the river built their own private ferry in 1920 to get across the river to the railway. They operated it until the provincial government took it over in 1924.[286]

— 1948 - 1951 —

Ferries - Reach Three:
Woodbend Ferry: At new town of Devon, this ferry operated where highway 60 now crosses the North Saskatchewan River.[287]

— 1954 - 1957 —

Ferries - Reach Three:
Drayton Valley Ferry: Two major oil discoveries in the area turned the little village of Drayton Valley into a boom town over night and the traffic became too much for the Berrymoor Ferry so another ferry was put in about three miles upstream from the present bridge.[288]

Theme Four
Culture and Recreation

Rivers inspire and provide a location for artistic expression, spiritual life and leisure. Spiritual association may include sacred or spiritual sites, ritual or ceremonial sites, and early Aboriginal or European burial sites. Culture is expressed through museums, art galleries, cultural sites and architecture. Early recreation included recreational boating, angling, land touring as well as organized river recreational facilities and clubs. Sub-themes include:

4.1 Spiritual Association

4.2 Cultural Expression

4.3 Early Recreation

Early burial sites along the North Saskatchewan River in Alberta are largely unidentified except for assumed burial sites at the known fur trade posts, the Aboriginal burial sites around the Big Horn Dam area, and the Aboriginal burial sites in the area of Rossdale Flats in Edmonton. It is not known if any specific burial sites are identified along the North Saskatchewan River in Saskatchewan.

Every riverside community along the North Saskatchewan River has at least one museum, which contains artifacts related to river heritage, as well as sites that commemorate historic events and people associated with the river. As expressed in the Framework Guidelines, *"in themselves, these buildings and sites have no intrinsic heritage value, [however] this framework recognizes the significance of these to the cumulative value of a river's heritage."*

Along the entire length of the river there are many reconstructions and interactive interpretations of historic sites and events. Many of these are associated with the early fur trade, which was completely river oriented.

The whole of the North Saskatchewan River, except for the uppermost reaches, which are not the subject of this study, is one, long, historical canoe route, due primarily to its prominence in the long history of the fur trade. Within this long canoe route are a wide variety of specific modern day canoe routes, many of which have been used for various re-enactments, like the National Voyageur Canoe Competition of 1967 that began on the river at Rocky Mountain House.

There are many other river and riverside expeditions whose routes are ripe for future interpretation (Kane, Franklin, Palliser, Strange, to name a few) and these remain as potential re-enactment opportunities for future promotions of river-based recreation. Most modern river tour groups, both commercial and non-commercial, incorporate some interpretation of river history into the programs of their routes. These groups are always seeking additional relevant historical information.

The David Thompson Highway, west of Rocky Mountain House, is the only major transportation route that follows the river closely for any significant distance. The Yellowhead Highway generally parallels the river for some distance in

Saskatchewan and in Alberta until it reaches Edmonton. At the Battlefords, in Saskatchewan, the Yellowhead Highway crosses the North Saskatchewan River from its north riverside route (beginning downstream where it crosses the river from the south between Langham and Borden, Saskatchewan). The cross-Canada highway follows this south riverside route, roughly parallel to the river, until it crosses the river again at Edmonton. After the Yellowhead Highway was constructed, a commemorative roadside sign was erected in Alberta. This sign refers to the Yellowhead Highway as the transportation route that usurped the long-standing role of the North Saskatchewan River.

On two sections of the river, one in Alberta and one in Saskatchewan, two settlements face each other across the river. In Alberta, the town of Brosseau, on the north side of the river played a dominant role in river history when Father Lacombe established St. *Paul de Cris*. European settlement toward the middle of the 20th Century resulted in the town of Duvernay coming into prominence on the south side of the river. Today, vestiges of Father Lacombe's mission, including a commemorative cairn and a church, stand on the north side of the river facing the riverside hotel at Duvernay and a few residential buildings on the south side of the river. In Saskatchewan, just upstream from where the Battle River enters the North Saskatchewan River, the larger community of North Battleford on the north bank faces the smaller community of Battleford on the south bank on a strip of land bracketed by the North Saskatchewan River and the Battle River. A bridge that crosses over Finlayson Island connects the two.

4.1 North Saskatchewan River-based Spiritual Association

This sub-theme is concerned with the in situ physical manifestations of spiritual associations with rivers. This sub-theme includes sacred/spiritual sites such as natural features (e.g. cliff face, river rock, spring) with sacred properties and possibly commemorated with pictographs and petroglyphs, or sites of tragedies marked by crosses; ritual/ceremonial structures and sites (e.g. churches); as well as Aboriginal and European burial sites marked by tombs, gravestones or memorials.

In the vicinity of every National, Provincial and Municipal Heritage Site, as well as near all the other fort sites along the river, is a traditional gathering place of Aboriginal peoples. Often, because it is assumed that the primary reason for gathering at these sites was for trade, little emphasis is put on ritual and ceremonial uses of these sites that do not coincide with the economy of the fur trade. Early Europeans took little interest in any Aboriginal ritual and ceremony that did not directly relate to a European agenda. However, since most of the major Fur Trade posts were built at popular seasonal encampment sites, it is reasonable to suggest that these sites also represent Aboriginal spiritual associations with the river.

The relationship that early Aboriginal peoples had to their landscape differs dramatically from the landscape relationship familiar to the first European inhabitants of the 'New World'. For many Aboriginal groups, the earth and everything of the earth was believed to be sacred and they saw themselves as an

intrinsic part of an interactive landscape. The way they belonged to the land was so foreign to Europeans that it was dismissed as superstitious primitive paganism. Aboriginal people felt they were part of the land, as well as connected to animals, plants, water and stones. Although this connection with the landscape may not yet be well understood by non-Aboriginal people it must be mentioned in any interpretation of sacred places. These specific sites are already located, described and protected according to a Eurocentric paradigm. There remains an opportunity for a wider interpretation of Aboriginal spiritual association.

Heritage Site - Reach Seven:
National Historic Park (Fort Battleford)

Heritage Site - Reach Seven:
Saskatchewan Provincial Historic Park (Fort Pitt)

Heritage Site - Reach Seven:
National Historic Site (Frenchman Butte) and near it the site of the 1885 battle between Wandering Spirit's Cree warriors and General Strange's Canadian troops during the North West Rebellion.

Heritage Site - Reach Seven:
Saskatchewan Provincial Protected Area (Pine Island Trading Post)

Heritage Site - Reach Six:
Alberta Provincial Historic Park (Fort George/Buckingham House)

Heritage Site - Reach Five:
Alberta Provincial Historic Park (Victoria Settlement)

Heritage Site - Reach One:
National Historic Park (Rocky Mountain House)

Heritage Site - Reach Four:
Municipal Historic Site (Fort Edmonton)

Heritage Site - Reach Seven:
Provincial Historic Site (Fort Carleton)

— 17th - 18th Century —

Sweat Lodge Sites - Reach One:
"In the Big Horn reservoir area, 61 campsites of Indians were recorded. On the Kootenay Plain, the larger sites were not excavated…Sweat lodges were also discovered and one indicator of their presence was fire-broken rocks piles, stone cairns and fire pits."[289]

— 1848 —

Sacred Site - Reach Seven:
In January, Upper Canadian artist Paul Kane, discussed theology with famous Cree Chief and warrior, Maskipiton, at the Chief's traditional stopping place, upriver from Fort Pitt. This is the same Cree Chief who had been painted by American artist George Catlin in 1832, who corresponded using Cree

syllabics with Reverend Robert Rundle, and who hunted along the North Saskatchewan River from Fort Pitt to the Rockys.[290]

— 1863 —

Mission - Reach Five:
Riverside Victoria Mission was relocated from an earlier Methodist mission site on Smokey Lake, north of the river. The McDougall family lived for a time in a buffalo hide tipi before their permanent dwelling was completed.

— 1866 —

Mission - Reach Seven:
Rev. James Nisbet, Prince Albert Presbyterian Mission to the Crees, at present site of Prince Albert, Saskatchewan. Around this gathered *"the nucleus of a thriving Scotch settlement."*[291] This had been a traditional celebration site for Aboriginal peoples prior to European arrival.

Mission - Reach Five:
St. Paul de Cris - on the north side of the river at the present Duvernay Bridge. Father Lacombe chose this site because it was a traditional gathering place for the Cree people.

— 1872 —

Pow Wow Site - Reach Seven:
On the Jackfishlake River where, *"on a little hill, near the stream, a great annual "pow-wow" is held in the spring…"*[292] This is near where the Jackfishlake River enters the North Saskatchewan.

— 1876 —

Signing of Treaty 6 - Reach Six:
In August, at Fort Carleton and Fort Pitt, Treaty 6 was signed with the Cree. The Commissioners from Winnipeg traveled up the river by way of Battleford. Bishop Grandin of the Roman Catholic Church, *"traveled from Edmonton to Fort Pitt and Battleford to see the Commissioners and assure them of his good will."*[287]

— 1927 —

Heritage Site - Reach Four:
On August 8th an historical cairn was unveiled on the site of the 1st Fort Augustus & Edmonton House, just downstream from Fort Saskatchewan, Alberta.

4.2 North Saskatchewan River-based Cultural Expression

River-based cultural expression is found in riverside museums and art galleries using cultural artifacts related to the river or reconstructions of sites and recreation of significant events. It is also found in the homes and buildings of well-known people. River-based cultural landscapes may be designed waterfronts as well as industrial/commercial riverfronts; architectural responses to river locations through landscaping, facades, river-facing doorways, raised foundations

Covered wagons, Heinsburgh, Alberta
photo Billie Milholland

or entire buildings. The North Saskatchewan River has museums and cultural centres along all of its reaches. These museums and cultural centres interpret the history of the river, and local history clubs and societies keep the culture of the river alive.

Reach One:

The Nordegg Historical Society operates the Nordegg Heritage Centre and the Brazeau Collieries Industrial Museum, which are situated in the Shunda Valley, west of Rocky Mountain House, along the David Thompson Highway in Big West Country. The Shunda Valley, and the entire Upper North Saskatchewan River Corridor, has a long history of native occupation, archaeologically estimated at close to 10,000 years. Nestled in this ancient valley, the settlement of Nordegg, Alberta supports a centre for the Brazeau Collieries coal operation. In many ways, this country remains unchanged from days gone by, retaining much of its early fur trade characteristics, its wildlife, its well-stocked streams and lakes, numerous horse and foot trails, and its natural beauty.[294]

Reach Four:

Edmonton's Royal Alberta Museum of Alberta houses Alberta's major collection of natural and human history, pioneer settlement, as well as exhibits detailing the lives of Canada's Aboriginal peoples. Three permanent galleries display all the works: the Habitat Group, the Native's People Gallery and the Natural History Gallery. It has recently developed the state of the art Syncrude Gallery of Aboriginal Culture. Fort Saskatchewan has an active Historical Society that operates a Museum and Historic Site.

Reach Five and Six:

Kalyna Country Eco-museum is a "living museum", which showcases the natural and cultural history of East European farming settlements and Indian Reservations within the drainage basin of the North Saskatchewan River. A self-guiding driving tour of the historic Victoria Trail now offers panoramic vistas of the North Saskatchewan River as it winds from the former ferry crossing at Vinca Bridge, to Heinsburg and beyond. The recently developed Iron Horse Trail uses an abandoned railway right-of-way following the river from Heinsburg to Elk Point.

Reach Six:

The privately owned Elk Point Museum has one of the most diverse collections of historical items in western Canada. The early fur trade collection is significant.

Reach Seven:

From Frenchman Butte to Prince Albert, every river community supports historical collections, sites and programming.

— 1980's —

Cultural Landscape - Reach Seven:
The Forks - Saskatchewan Provincial Protected Area.

4.3 North Saskatchewan River-based Early Recreation

This sub-theme addresses early recreational activities along the river including recreational boating (e.g. canoeing) as evidenced by well-used canoe routes, campsites and portages; recreational angling sites, camps and lodges; land-based touring along river valley routes via hiking, horseback, ATV, and motoring; as well as activities sponsored by recreational clubs and other organizations.

Emphasizing the early nature of recreational activities along the river lends a sense of continuity to what is now considered the modern recreational value of the river. Modern river-based recreation on the North Saskatchewan River retains, to a large degree, a heritage character beyond the practical enjoyment factor. Modern day voyageur canoes still ply the river, replicated steamboats are a re-occurring river recreation theme and even the early use of river rafts has its modern day equivalent. Recreational boating routes followed by early tourists on the North Saskatchewan River were mostly by means of canoes; however, some early tourists made use of Hudson's Bay York Boats when they could, as well as Sternwheelers during the last part of the 19th century.

It is difficult to separate the recreational sites along the North Saskatchewan River, associated with early hunting and angling, from the sites used for regular food harvest for sustenance. The sites were often the same. Early tourists on the river who hunted and fished for food (i.e. artist Paul Kane) did so as a recreational supplement to the diet provided for by the hired hunters who accompanied them. This is similar to fishermen today, who may cook the fish they catch even though they are not dependent upon them.

Hiking and horseback riding have been part of the recreational experience on this river from the beginning of human presence on the river.

We often limit our acknowledgment of Aboriginal use of the river and the river corridor to that of efforts to survive. It is important to remember that wherever humans congregate, games and other sporting events ensue. We may not be able to identify favoured places for races and other early Aboriginal recreational activities along the river, but we must acknowledge their existence.

Often fur traders would depart from their watercraft, while on regular fur trade business and walk or ride along the river for sport, while their crew brought along the canoes or York Boats. Every fort had hired hunters and fishermen to provide for the daily needs of the employees, but this did not prevent employees from hunting and fishing for their own pleasure whenever they had a chance.

— 1825 —

Land & Water Based Touring - Reaches Four to One:
"Thomas Drummond, a Scottish botanist, was the first naturalist known to visit the Canadian Rockies. He traveled from Edmonton …[to the Rockies] and returned to Edmonton in 1826."[295]

— 1846 —

Land & Water Based Touring - Reaches Four to Seven:
The first recorded river journey taken by a cat is a round trip by canoe from Fort Edmonton to Fort Carleton and back again. Artist Paul Kane recorded the incident in his journal. Kane met the cat's master at Fort Carleton in September of 1846. Mr. Rundle, a missionary, had come downstream from Fort Edmonton in a canoe; bringing his cat with him in fear she would be eaten if he left her behind. He decided to join Paul Kane's group on horseback for his return trip upriver. The cat, however, was opposed to riding stuffed in his coat and in her attempt to escape she clawed his horse, which bucked Rundle off. This caused a great commotion among the Indians who had not seen a cat before. Kane reports, *"we left her behind for the men to bring in the boats, evidently to the regret of her master…"*[296]

— 1854 —

Land & Water Based Touring - All Reaches:
In *Narrative of a Voyage to the North West Coast of America*, published in 1854, Gabriel Franchere, another wilderness adventurer, describes the country on the north side of the river, *"The country north of the Saskatchewan is mostly thick woods, from the Rocky Mountains to old Buckingham House."*[297]

Land & Water Based Touring - All Reaches:
Eastern artist Paul Kane was one of the first recorded 'tourists' on the North Saskatchewan River. His sketches and subsequent publication of his travel journals encouraged others to plan adventures on the "Saskatchewan" for purely recreational purpose.

— 1848 —

Horse Racing - Reach Seven:
Four days journey below Fort Pitt, a war party of the Blackfoot Confederacy stops to camp with Chief Factor Harriot of Fort Edmonton and engage in *"a horse race, to which they are very partial, and at which they bet heavily; they generally ride on those occasions stark naked, without a saddle, and with only a lasso fastened to the lower jaw of the horse…"* Paul Kane sketched this scene - it is represented in Sketch No. 16.[298]

— 1859 - 1860 —

Land & Water Based Touring - Reaches Seven to Four:
James Carnegie, sixth de facto and ninth de jure Earl of Southesk was the next prominent tourist to make use of the North Saskatchewan River linkage to the West: *"He had a taste for adventure…was a passionate sportsman… [He brought along] a portable table, … camp stool and an India-rubber-bath"*.[299] His journey along the North Saskatchewan River began at Fort Carleton in July of 1859, and by August

Near Lea Park Alberta
photo Billie Milholland

2nd he had reached Fort Pitt. On August 9th he met another tourist going along the river trail, "*Met an American, Mr. Hind, with a Saskatchewan man driving pack-horses, on his road from Edmonton to Carleton.*"[300]

— 1862 —

British - Reaches Seven to Four:
Young aristocrat William Wentworth-Fitzwilliam, the Viscount Lord Milton, with his friend, Dr. Walter Cheadle traveled by steamer upriver toward Fort Edmonton. At Fort Pitt they hired one-handed Métis guide, Louis Battentotte, the Assiniboine.[301] Passing Victoria Settlement they remarked on the beauty of the landscape, "*rich and beautiful: a country of rolling hills and fertile valleys…*"[302] These young English gentlemen substituted the traditional "European Grand Tour" for grand tour of the Canadian Northwest via the North Saskatchewan River route. The book they wrote upon their return was a popular travel guide to the Northwest, for the rest of the century.

— 1881 —

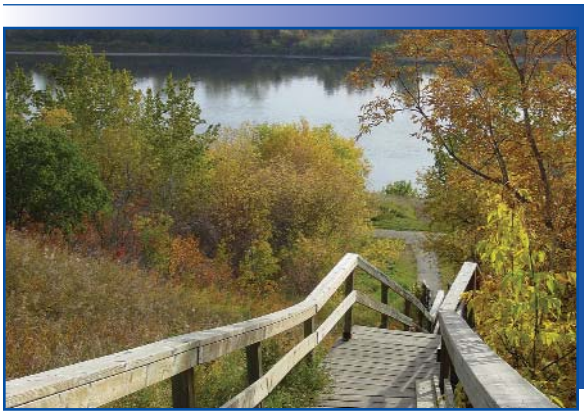
Boat Tour - Reaches Seven to Four:
The Dominion Governor General, the Marquis de Lorne and his suite made an official tour of the Northwest Territories. He was escorted to Carleton House by "*50 red-coated Mounted Police…down into the river valley at Carleton House…on August 26 [he] embarked on the Northcote and the following morning arrived in Prince Albert.*"[303] On August 30 He boarded the Lily to go to Battleford. River festivities and sports events were held at every stop along the way.

— 1885 —

Organized Recreation - Reach Four:
On Victoria Day, May 25th celebrations along the river began around the time of Confederation. They usually featured sports events and were held at traditional gathering places along the river. This particular Victoria Day celebration featured a baseball game between nine members of the 65th and nine members of the Mounted Police and Scouts who were all gathered at Fort Saskatchewan for action in the Northwest Rebellion. After a rousing sports day everyone who could, attended a ball in the evening.[304]

— 1880's - 1920's —

Unorganized Recreation (Extreme Sport) - Reach Four:
At Fort Saskatchewan, sleighing down the river hills, especially the hill at the north end of what is now 101 Street was one of the most popular winter sports. As many as 16 people would squeeze onto a sleigh; that way they could get up enough speed to go down the hill, across the river ice, make a U-turn and come back down across the ice. Several hundred people would gather to watch this extreme sport.[305]



Riverside Trail Edmonton
photo Billie Milholland

— 1902 —

ORGANIZED RECREATION - REACH FOUR:

On January 17th at Fort Saskatchewan, a curling rink "*is being prepared on the river below Shera's Mill.*" Two weeks later the rink was completed and lit with electric lights from a generator at Shera's Mill, which also lit the hockey rink built on the river.[306]

— *From the 1860's to the present* —

ORGANIZED RECREATION - REACH SEVEN:

Finlayson Island near the Battlefords in Saskatchewan is the site of early community picnics and excursions as well as modern recreation activities. This is also true of Big Island, upstream from Prince Albert, Saskatchewan. Today Highway16A between North Battleford and Battleford crosses to Finlayson Island on "two old steel arched bridges."[307] There are self-guided nature trails and picnic areas on the island, which are used in all seasons.

ORGANIZED RECREATION - REACH THREE:

Another big island that was used for early recreation as well as modern hiking and camping is Burtonsville Island, south of Wabamun Lake, Alberta.

— *1900's - WWI* —

ORGANIZED RECREATION - REACH FOUR:

Big Island, upstream from Edmonton, the site of early daylong community picnics and excursions. Upstream from E.L. Smith Water Treatment facility and across from the Windemere Golf Course is Big Island. "Big Island is 16 mi. up the river [from Edmonton] one of a series in a twisting stream between Edmonton and Devon. There's Midnight Island, Fraser's Island and Big Island…70 acres, 12 city blocks…Just before WWII there was still a grove of 80' poplar growing there."[308] Long time residents of Edmonton remember family stories of Sternwheeler excursions to Big Island where everyone would picnic and party very late and the babies and small children would sleep on the upper deck.[309] Today it is still a popular picnic and barbeque site accessed by watercraft.

Theme Five
Jurisdictional Use

The use of rivers by government indicates their economic, public and social importance. The North Saskatchewan River was pivotal in the signing of Treaty 6, as forts up and down the river became staging areas for these significant events. The North Saskatchewan River was often used as military routes in times of conflict, particularly during the Northwest Rebellion of 1885. In peacetime the importance of river ecosystems is recognized by governments through intervention to protect the rivers and their ecosystems. The sub-themes include:

5.1 Conflict and Military Associations

5.2 Boundaries

5.3 Environmental Regulation

Aboriginal groups used the North Saskatchewan River as a jurisdictional dividing line between the plains people to the south and east of it, and the river and forest people to the north and west of it.

The Hudson's Bay Company had sole jurisdiction over the whole North Saskatchewan River Watershed from 1670 until Confederation. The river, during that era, became a racetrack for rival fur trade interests. France, through the fur traders of New France, attempted to usurp the English jurisdiction of Rupert's Land along the North Saskatchewan River. Neither country had any means of defending territory except by the dominance of their fur trading activities. The geographic position of the river allowed fur traders to penetrate the west rapidly and build riparian posts from which to launch expeditions both north and south.

Until the coming of the railroads, most government travel into the north-central areas of what are now Alberta and Saskatchewan, from eastern Canada, was by means of the North Saskatchewan River. The North Saskatchewan River provided a welcome river route for the North West Mounted Police, both during their first long trek west, and then during the hostilities of the North West Rebellion of 1885. Most of the military encounters of this rebellion took place on and along the North Saskatchewan River.

5.1 North Saskatchewan River-based Conflict & Military Association

Conflict and military associations with rivers includes conflicts between rival Aboriginal communities, between rival European communities, and between Aboriginals and Europeans. Rivers were used to transport troops and equipment for military expeditions.

Most of the recorded skirmishes, massacres, pitched battles and other outbreaks of hostilities that occurred on, near, or in relation to the North Saskatchewan River happened as a result of the North West Rebellion of 1885. There is, however, also some evidence of European/Aboriginal conflict during the fur trade as well as European/ European and Aboriginal/Aboriginal conflict during that

same era, especially during the time before the amalgamation of the Hudson's Bay Company and the North West Company in 1821.

The two main military expeditions on the North Saskatchewan River that required the efficient transportation of troops involved the coming of the North West Mounted Police (NWMP) to the west in 1874 and the North West Rebellion of 1885.

— 1832 —

ABORIGINAL - REACH SEVEN:
Just up river from the mouth of Turtle River not far from the Saskatchewan/Alberta border - a battle between the Cree and Blackfoot that is still remembered when the Fleming expedition passed by there in 1872, *"forty horses were killed, an extraordinary number…"*[310]

— 1848 —

ABORIGINAL - REACH SEVEN:
On June 1st, four days downstream from Fort Pitt, *"a large war party of mounted Indians, riding furiously toward us…Blackfoot Indians, Blood Indians, Sar-cees, Gros Ventres and Pay-gans…1,500 warriors, from 1,200 lodges…in pursuit of the Crees and Assiniboines…"*[311]

ABORIGINAL - REACH SEVEN:
June 6th, at Fort Carleton, Paul Kane and a Hudson's Bay brigade hear of Indian battle upstream between 90 lodges of Cree and the 1,200 lodges of the Blackfoot confederacy. The Cree lost 14 warriors and suffered 40 wounded. The Blackfoot lost less than a dozen. The Cree were forced to flee their camp, leaving their tents behind with *"two old enfeebled chiefs"* remaining at the best lodge, *"having dressed themselves in their gayest clothes and ornaments, painted their faces, lit their pipes, and sat singing their war songs, until the Blackfeet came up and soon dispatched them."*[312]

— 1873 —

NWMP - ALL REACHES:
On August 20th, the North West Mounted Police force was created specifically to bring official law and order to the vast territory that had had, for the previous two hundred years, only the amelioration of the Hudson's Bay Company's authority to keep a European kind of peace.[313]

— 1874 —

NWMP - REACHES SEVEN TO FOUR:
Aug. 1 - 'A' division under Inspector Jarvis, Sub-inspector Gagnon and Sergeant Major "Sam" Steele left (what is present-day southern Saskatchewan) for Fort Edmonton via Fort Carleton and Fort Victoria along the North Saskatchewan River.[314]

Sept. 11, 1874 - Reached Ft. Carleton. Left with 10 ox-drawn wagons.
Oct. 19, 1874 - Reached Fort Victoria.
Oct. 24, 1874 - Camped west of Vermilion Creek.

Oct. 26, 1874 - Reached Sturgeon Creek.
Oct. 27, 1874 - Reached Fort Edmonton, 900 miles later with only 4 ox-drawn wagons…the other oxen having died along the way.[315]

— 1874 - 75 —

NWMP - Reach Four:
During this winter, the NWMP operated out of Hudson's Bay Company Fort Edmonton.[316]

— 1875 —

NWMP - Reach Four:
During the spring, Commissioner French issued orders for establishment of permanent barracks on south side of river somewhere downstream between Fort Edmonton and the mouth of the Sturgeon River. Chief Factor of Fort Edmonton - Richard Hardisty had picked out site for permanent police fort on site of the present University of Alberta.[317] Inspector Jarvis wanted a down-stream location because he believed that any railroad that would be built could not cross the river at Edmonton and so the main community would eventually be the one near the mouth of the Sturgeon where the land was flatter.[318] D. Ross, who presided over a public meeting protesting the building of the police fort 20 miles away, he remembers, *"Col. Jarvis [asked the committee] if they would pay the difference between the contract price of the timber at Fort Saskatchewan…one of the committee answered that the people of Edmonton could pay for a delegation to Ottawa to secure the change of the site. Jarvis got mad and built Fort Saskatchewan."*[319]

NWMP - Between April and July - Sturgeon Creek Post was built to accommodate the new police force. The Cree called it *Si-ma-gan-is* (Soldier House). The French at the St. Albert Mission called it, *chez les soldats*.[320]

— 1875 —

Aboriginal - Reach Seven:
In July, attempts to install a telegraph line along the river between Fort Carleton and Fort Pitt are thwarted by Cree Chiefs, Star Blanket and Big Child. They had been promised a treaty and, since it had not been forthcoming, they said, *"no treaty, no telegraph line."*[321]

— 1876 —

NWMP - Reach Four:
March 16th Commissioner MacLeod wrote to Ottawa regarding the placement of the new police fort, "the site chosen for the Fort is much more likely to be the center of a settlement (Edmonton abounding in swamps…)…There is no settlement at Edmonton to speak of, only a few scattered houses here and there. The banks of the river, particularly the south bank (at Edmonton) are very high and steep and the other (Fort Saskatchewan) the banks slope down on both sides."[322]

NWMP - Reach Four:
By August, the new fort is called "the barracks" or *"les Casernes"* or "the Mounted Police fort" and then *"le fort de la Saskatchewan"* or *"le fort Saskatchewan"* and finally Fort Saskatchewan.[323]

Aboriginal - Reach Seven:
In August at Fort Carlton and in September at Fort Pitt Crees signed Treaty Six. As witnesses to the historic agreement, boatloads of non-aboriginals traveled up and down the river to be present. The witnesses included: the Commissioner and Inspector of the NWMP, Bishop Vital Grandin, Father Constantine Scollen, Rev. John McDougall, Peter Erasmus, Dr. Alfred Jackes and Mary McKay[324].

— 1877 —

Aboriginal - Reach Four:
On August 21, more people from the Cree Nation signed Treaty Six at Fort Edmonton.[325]

— 1878 —

Aboriginal - Reach Four and Seven:
On August 29, people from the Stony Nation signed Treaty Six at Battleford and the Woods Cree Nation signed at Fort Carleton. On September 3, people from the Cree nation sign at Fort Edmonton.[326]

— 1879 —

Aboriginal - Reach Four:
On December 20th *Kak-Say-Kwyo-Chin* (Swift Runner) was hung at Fort Saskatchewan for cannibalism.[327] The incident happened in the Peace River District, but due to the ease with which the circuit Judge could get up the North Saskatchewan River and to the fact that the NWMP at Fort Saskatchewan had the only gaol (jail), the trial and execution occurred at Fort Saskatchewan.

— Early 1880's —

European - Reach Seven:
One summer in the early 1880's a stagecoach was robbed and the thief not caught until the following winter when the stagecoach driver spotted the man watering his horses through a hole chopped in the river ice just below Prince Albert. He confessed that he followed the river trail east of Prince Albert looking for a place to hide his loot and finally buried it under a boulder at The Forks. Not even he recovered the money because he had marked the boulder with charcoal and by the time he got out of jail it had all washed off in the rain.[328]

NWMP - Reach Four:
The post at Fort Saskatchewan is put under the jurisdiction of Battleford.[329]

— 1884 —

NWMP - Reach Seven:
Captain Francis Dickens (son of author Charles Dickens) is in command of Fort Pitt with 20 men.[330]

— 1885 —

North West Rebellion - Reach Six:
In April, the Frog Lake Massacre occurred (30 miles NW of Fort Pitt).
Reach Four: At Fort Saskatchewan the fortification is strengthened. Eighty-four women and children are taken within the fort walls with 15 NWMP officers and 35 special officers.[331]

NWMP - Reach Seven:
On April 15th Inspector Francis Dickens and his few troops get into a leaky scow to escape from Fort Pitt downstream to the Battlefords.[332]

North West Rebellion - Reach Four:
On May 1st General Strange and the men of the 65th, after riding across country from Calgary, arrive at Fort Edmonton.

North West Rebellion - Reach Seven:
On May 15th, the McLean Family (volunteer hostages of Big Bear) are in a camp with 700 to 800 of Big Bear's people on the banks of the river on the west bank of Pipestone Creek.[333]

North West Rebellion - Reach Seven:
May 25th, the McLean Family, along with the survivors of the Frog Lake Massacre, are still with Big Bear's people, now on the river at Frenchman Butte. This day they get word that the 'Red Coats' are coming.[334]

North West Rebellion - Reach Seven:
May 26th, at Battleford, Chief Poundmaker *"delivered himself up voluntarily…to stop the bloodshed and re-establish peace in the country."*[335]

North West Rebellion - Reach Seven:
May 27th, from the south bank of Red Deer Creek at Frenchman Butte, General Strange fights the 'Battle of Frenchman Butte' with Métis and their Aboriginal supporters.[336]

North West Rebellion - Reach Seven:
June 22nd, at Fort Pitt, on the Sternwheeler *Marquis*, the McLeans have their first bath and change of clothes since they became hostages 2 months prior.[337] From here they travel by sternwheeler down to Prince Albert.

North West Rebellion - Reach Seven:
July 2nd, at Fort Carlton, Big Bear and his young son, Horsechild, surrender.[338]

North West Rebellion - Reach Seven:
July 4th, at Fort Pitt, on the sternwheeler North-West, Colonel Arthur T. H. Williams dies of Typhoid Fever.[339]

North West Rebellion - Reach Five:
During the North West Rebellion a "rebel party from Saddle Lake had traveled to Fort Victoria with the intention of raiding the fort." Many of the settlers, hiding in the brush across the river, saw them and they watched the lone Hudson's Bay man, left behind to guard the stores, holler and yell and shoot over their heads until he scared them away.[340]

NWMP - Reach Four:
By December, due to the rebellion, there are now 69 NWMP stationed at Edmonton and 30 at Fort Saskatchewan.

— *1886* —

NWMP - Reach Four:
On October 2nd, the new barracks for the headquarters of 'G' division are completed at Fort Saskatchewan.[341]

— *1944* —

Aboriginal - Reach Two:
On May 25, at Rocky Mountain House, people from the Cree Nation sign Treaty 6.

— *1950* —

Aboriginal - Reach Two:
On May 13, people from the Chippewa nation sign Treaty 6 at Rocky Mountain House. Four women sign this treaty, the first time that Aboriginal women are formally included. [342]

5.2 North Saskatchewan River-based Boundaries

River-based boundaries have been used to delineate international (U.S.-Canada), interprovincial/inter-territorial and land use (i.e. public-private) boundaries, and conversely some rivers are transboundary and flowing across political boundaries. This sub-theme is represented by a river itself, as well as by structures related to movement of people and goods across political borders (e.g. customs houses, or structures used by smugglers).

The North Saskatchewan River acted as a natural boundary between the Cree and Assinaboine people on the north side of the river, as they moved west under pressure of the advancing fur trade, and the Blackfoot Confederacy on the south side of the river, who had become more mobile with the introduction of the horse at the end of the seventeenth century. The North Saskatchewan River, on its north/south route also provided an obstacle giving temporary protection to the Kootenay, Shushwap and Flathead people from the same aggressive plains groups. After the Kootenay, Shushwap and Flathead people retreated west across the mountains for good, the Cree and Assinaboine used the east/west obstacle of the river for protection from the people of the plains. At the river near the early forts at Rocky Mountain House, the Blackfoot and the Cree used separate places to cross the river and those two locations are still known as 'the Blackfoot Ford' and 'the Cree Ford'. Most of the forts of the fur trade era were built on the north or west side of the river to keep a barrier between them and the plains people.

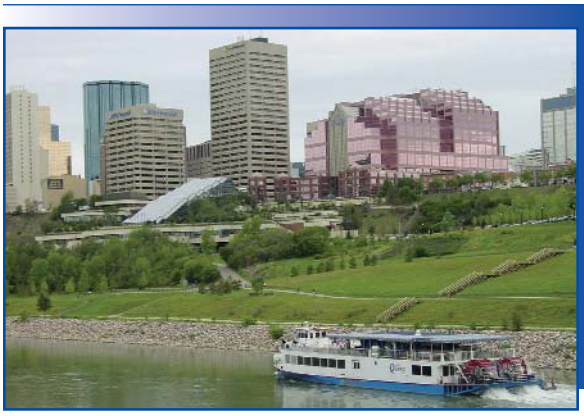
Edmonton
photo Billie Milholland

After Alberta and Saskatchewan became Provinces in 1905, the provincial governments took over the ferries on the North Saskatchewan which had been operated by the Territorial Governments and eventually they assumed control of many of the privately operated ferries as well. The North Saskatchewan River is a "transboundary river", crossing through the Provinces of Alberta and Saskatchewan. During the era of ferries there was sometimes some confusion as to which jurisdiction had responsibility for the ferry services near the border, but in general, sharing the river has not resulted in any transboundary disputes. In fact, today, groups concerned for the welfare of the North Saskatchewan River cooperate between the two provinces. (E.g. The North Saskatchewan Watershed Alliance, based out of Edmonton, Alberta, and Partners for the Saskatchewan, based out of Saskatoon, Saskatchewan).

5.3 North Saskatchewan River-based Environmental Regulation

Rivers form the base for ecosystems and as a result need mitigation from the effects of human use of the river. Humans too, often need mitigation from river forces on their property (E.g. efforts at flood control -. historic dykes, canals, dams); improvements to water management and aquatic ecosystems to improve/repair river values (e.g. legislation, advocacy, fish ladders, monitoring stations); as well as regulation of river access and use through regulations and establishment of protected areas.

Established provincial legislation, policy and guidelines pertinent to present land use activities should serve as a basis for the evaluation of compliance. Where circumstances dictate, inappropriate activities from a regulatory perspective should be reviewed in the context of planning and management goals for a Canadian Heritage River. Provincial legislation likely to be used in the evaluation of compliance includes the Alberta *Public Lands Act*, *Alberta Environment Protection and Enhancement Act*, Alberta *Forestry Act* and the Alberta *Water Act*.



River Boat at Edmonton
photo Billie Milholland

Section Three

Cultural Value Conclusions

"The entire North Saskatchewan River is an important geographic feature for human heritage."[343] The most significant heritage value of the North Saskatchewan River is found in the diverse and continual role it played in the development of human history. This river was a major transportation and resource corridor from its inception, after the last ice age, to the middle decades of the 20th Century.

Archaeological evidence verifies the important role of the North Saskatchewan River in Paleo-Indian history in Western Canada: human activity along the river is evident from about 11500 BP to the present. *"Prehistorically, it was an important boundary between Plains and woodland oriented Native groups. It also formed a boundary for the large Plains bison herds, which were so valuable to prehistoric and historic peoples."*[344]

Historical documentation emphasizes the pivotal position of the river as the main transportation and communication route from eastern Canada to the Rocky Mountains, from the middle of the 17th Century to the middle of the 20th Century. It played a significant role in Aboriginal displacement westward, the western expansion of the fur trade, early missionary efforts in the West, major exploration and survey expeditions, as well as in early European settlement of the West.

Inventories of identified cultural sites are abundant in every reach except Reach Two, which has unexploited cultural site potential.

Table #1 - Phase 2 of the Canadian Heritage Rivers Systems Study of Rivers in Alberta 1995 - Human Heritage Evaluation

Component	Subcomponent	Score	Rationale
1ST Nations Pre-Contact	Temporal/Cultural Affinities	10	Excellent representation of a range of temporal & cultural affiliations - Early Prehistoric to Historic periods.
	Resource Exploitation	10	Stoney Plain Quarry Site FiPm 6, Kitto Lake Quarry FhPgq 1, Stathcona site FjPi 29, and killsite FiPn 9 are examples of the resource exploitation sites identified on the North Saskatchewan River.
	Habitation	10	Numerous campsites & some stonecircle sites have been identified on the river.
	Ideology	10	Burials ElQd 1, ElQe 12, & FbQc 23.
1st Nations Contact	Fur Trade	10	Seafort burial FcPr 7 (Iroquois burials), Rossdale Power Plant Burial FjPi 63. Plantation sites associated with fur trade sites.
	Rebellion	7	Frog Lake 1885 Rebellion began north of the North Saskatchewan & warriors travelled along the river to Fort Pitt & Frenchman Butte. Natives associated with Victoria Mission area (Pakan) remained loyal to the Canadian Government. *[NOTE: the 1995 study does not recognize rebellion activity in Saskatchewan. North West Rebellion history along the NSR in REACH SEVEN would score 10]*
	Treaty	0	*[NOTE: the 1995 study does not recognize Treaties signed in Saskatchewan. The Treaties signed at Fort Pitt and Fort Carleton on the NSR in REACH SEVEN would score 10]*
	Traditional Land Use	10	Indian Reserve 125, 144A. Kootenay Sundance Lodges FaQc 23, Sundance Lodges FbQc 21; Sweetgrass FbQc 22. Palliser notes Cree Village near Vermilion River mouth.
Metis	Habitation	7	River lot settlement. Lamoureaux settlement near Edmonton.

Component	Subcomponent	Score	Rationale
	Provisioning	7	Buffalo were hunted on the plains south of the river and brought to the North Saskatchewan posts for trade. *[NOTE: the 1995 study does not recognize bison and other provisioning activity right along the river, on both sides. If it were factored in this score would increase]*
	Rebellion	8	Events of the 1885 Rebellion occurred along the eastern length of the North Saskatchewan River. *[NOTE: the 1995 study does not recognize rebellion activity in Saskatchewan. North West Rebellion history along the NSR in REACH SEVEN would score 10]*
Fur Trade	Contact (1670 - 1778)	10	1754 Anthony Henday explored the Saskatchewan River system (both North & South branches). Fort La Jonquiere may have been located on the North Saskatchewan.
	Rivalry(1774 - 1821)	10	Fort Vermilion/Paint Creek House FjOn 1, 1802-1810, 1811- 1816; Fort George/Buckingham House, FlOq 1&2 1792-1801/2; Fort de l'Isle IIFkOs 1, 1799-1801; Lower Terre Blanche House (Fort White Earth) GaPb 3, 1810-1813; Fort Augustus I/Edmonton House I, 1795-1801; Fort Augustus II /Edmonton House II, 1801-1810; Fort Augustus III /Edmonton House III, 1812-1915; Upper Terre Blanche 1799-1801; 1810-1811; Muskeg Fort>1808; Boggy Hall FgPt 5 >1808; Rocky Mountain House/Acton House 1799-1834
	Monopoly(1821 - 1859)	10	Dog Rump Creek House >1827; Rocky Mountain House II 1835-1861.
	Free Traders(1850-1940)	10	Rocky Mountain House III 1866-1875; Fort Victoria GaPc 6.
Settlement	Exploration	10	Henday followed from Sturgeon River area back to Fort York. Tomison headed the HBC fur trade expansion up the anorth Saskatchewan River. Alexander Henry was an important trader on the river. Palliser expedition followed from Fort Carleton to the river's source.
	Legal Survey	10	First settlements occurred along the North Saskatchewan River valley, concentrating in Edmonton and the Victoria Mission/Pakan area.

Component	Subcomponent	Score	Rationale
	Missions	10	Victoria Methodist Mission site. Roman Catholic, Methodist & Anglican missionaries the North Saskatchewan as a transport & travel corridor from the 1840's onward. Historic churches are located within Edmonton including the 1874 Anglican Diocese FjPi 2.
	Agrarian Settlement	10	Farmstead FcPr 21; Historic settlement & structures in Edmonton (including government House); concentrations of ethnic settlements (Ukrainian, Moravian, German, etc.) Agricultural settlement of modern Alberta was initiated along the route of the North Saskatchewan.
	Ranching	0	
	Law & Order	10	Fort Saskatchewan NWMP Post FkPh 15, outposts & patrols. Original Fort Saskatchewan Provincial Penitentiary,.1885 Alberta Rifles crossed at Heinsburg on way to quell Frog Lake Rebellion.
Resource Development	Lumbering	0	*[NOTE: the 1995 study does not recognize early lumbering activity along the river, but it is recognized in the North Saskatchewan River Background Study & recognition of it would increase this score.]*
	Fishing	0	*[NOTE: the 1995 study does not recognize early fishing along the river, possibly because it was not commercial in the more modern sense. Fish were harvested out of this river to a great degree right into the 20th century & recognition of this activity would increase this score.]*
	Mining	10	Coal mine FjPi 42, several small coalmines were located in the Edmonton region along the river. Windsor Salt mine at Lindbergh.
	Petroleum	10	Both the Redwater & the Leduc oil fields extend into the river area. Devon was established as a company town for oil exploration & development.
	Clay Products	10	Pollard brickyards FiPj 27. White Earth Creek used as plastering clay source by McDougalls at Victoria Mission in 1860's.
	Gold		*[NOTE: the 1995 study does not recognize early gold mining on the river, but it is recognized in the North Saskatchewan River Background Study & recognition of this activity would certainly produce a score.]*

Component	Subcomponent	Score	Rationale
Transportation	River Communication	10	Important fur trade water route; numerous ferries (>30 individual ferry locations). Steamboat travel on the North Saskatchewan.
	Land communication	10	Palliser noted Snake Portage to Lac La Biche near Saddle Lake area, may be the same as that beginning near Brosseau; Lac La Biche to Fort Pitt Trail crossed the river; Victoria Mission was junction for several trails including the Carleton to Edmonton Trail, a trail to Edmonton from the south side of the river, and a trail to the southeast which linked up with the Vermilion River & Battle River. Edmonton was the starting point for the Athabasca landing Trail & the terminus for the Calgary to Edmonton Trail; Rocky mountain House Trail crossed river near forts.
	Telecommunication	10	Telegraph & telephone lines were established along the river valley.
Events		10	Edmonton became a staging ground for the 1898 Klondike Gold Rush. Edmonton became provincial capital in 1905. Alberta Mounted Rifles arrived in Edmonton May 1, 1885 on route to Frog Creek area & then on to Frenchman Butte & Loon lake.
Personages		10	David Thompson, Peter Fidler, Tomison, Alexander Henry, Bird, John Rowand, Richard Hardisty, George & John McDougall, Robert Rundle, Chief Maskepetoon, Chief Pakan, Chief Big Bear, Albert Lacombe, Emily Murphy, Dr. E. A. Braithwaite & many others.

Total Human Heritage Theme Score - 88.1

York Boat
photo Billie Milholland

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Red River Cart Heinsburg
photo Billie Milholland

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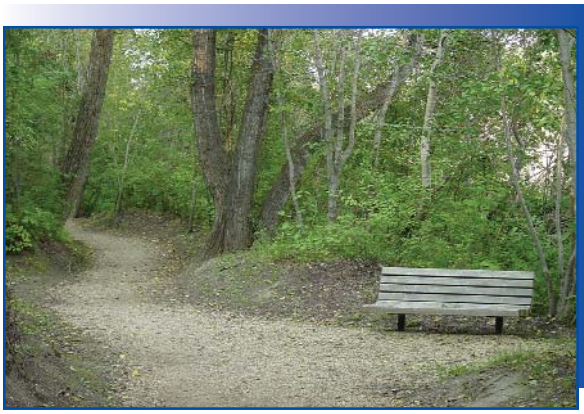
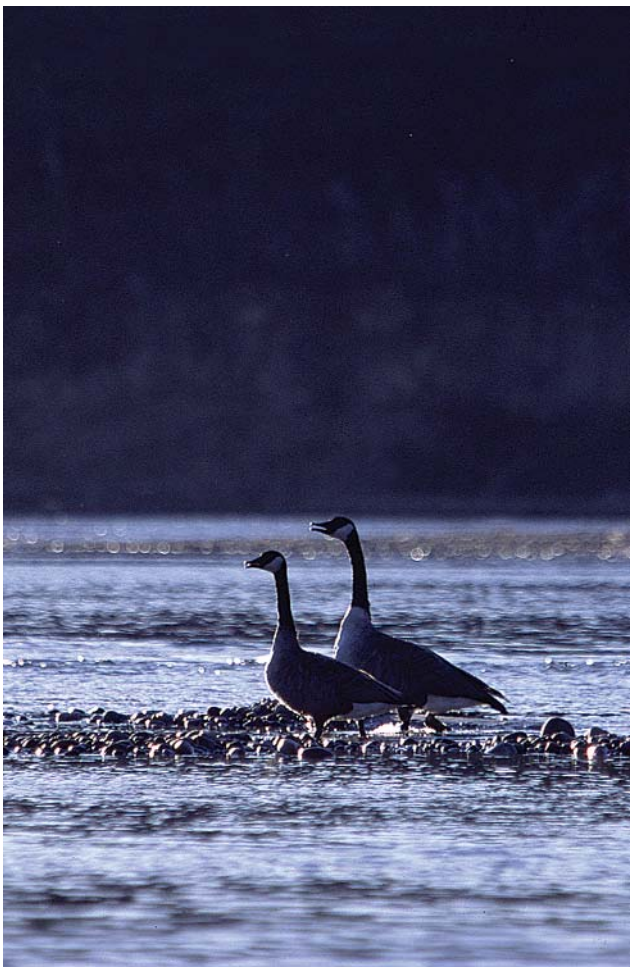


Riverside trails within the City of Edmonton
photo Billie Milholland



John Ulan Photograph 2001

Section III

Natural Heritage Value

Thematic Analysis of the North Saskatchewan River using the
"A Framework for the Natural Values of Canadian Heritage Rivers" (2001)

Natural Heritage Value
Introduction

The Natural Heritage Value of a river can be demonstrated through abiotic (non-living) and biotic (living) features that result from interactions between climate, land, water and living organisms. These complex interactions create the physical profile and the character of a river and its community. Abiotic river features include climate, hydrology, physiography and river morphology. Biotic river features include aquatic and terrestrial organisms and their intricate associations.

Additional to the value of individual abiotic features and biotic species, and perhaps more significant, a river system has ecological value as a biological corridor, linking diverse ecosystems within local reaches, as well as linking larger regional ecosystems, across the watershed. A river corridor, consisting of the aquatic channel, the floodplain, the slopes and the transitional upland fringe, functions as a *"dynamic and valued crossroad in the landscape. This movement provides critical functions essential for maintaining life such as cycling nutrients, filtering contaminants from runoff, absorbing and gradually releasing floodwaters, maintaining fish and wildlife habitats, recharging ground water, and maintaining stream flows."*[1] An extensive and diverse corridor system, such as the one created by the North Saskatchewan River, is an important element in the creation of a significant bioregional conservation network. Bioregional conservation networks are linked systems of core wild areas, buffer zones and corridors of suitable habitat nested within areas dominated by human activity (Bennett, Andrew F. 1999.Linkages in the Landscape: The Role of Corridors and Connectivity in Wildlife Conservation. Cambridge, UK: International Union for Conservation of Nature and Natural Resources. Forman, Richard T.T. 1995. Land Mosaics: The Ecology of Landscapes and Regions. Cambridge: University Press.). The purpose of a bioregional conservation network is biodiversity conservation. The North Saskatchewan River corridor and its associated tributaries link diverse wetland, forest and shrub/grass ecosystems in a complex pattern across the regional landscape, as well as providing habitat and resources essential for the survival of a vast number of living organisms.

This natural corridor also plays an important role in the quality of life of urban residents. The ecological goods and services provided by natural ecosystems within cities has been well documented in improving air quality, cooling temperatures, preventing soil erosion, improving water quality and providing aesthetic and spiritual relief for urban citizens. (White, Rodney R. 2000.Building the Ecological City. Woodhead Publishing, Cambridge, England). The North Saskatchewan River corridor links a number of growing urban centres, including the City of Edmonton, to the regional landscape, preserving natural ecosystems within the urban matrix. City planners are increasingly cognizant of the value of natural ecosystems and the City of Edmonton has made strides to protect both the river valley and upland ecosystems within its jurisdiction through the implementation of Policy C-467, Conservation of Natural Sites on Edmonton's Table Lands.[2]

The entire river corridor is accessible for a variety of river-based recreation experiences: river boat touring and historical river adventure touring, river-related hiking, biking, water craft events, bird and wildlife watching and river bank concerts and fairs. These activities are encouraged and supported by regulation, and by innovative infrastructure built by municipalities, agriculture and industry along the river.

In the 1996 Study of Rivers in Alberta, the North Saskatchewan River "*ranked 11th overall for recreational values* [because of] *industrial factors and water quality factors downstream of Edmonton.*"[3] Significant improvement of water quality since the publication of the 1996 study suggests the North Saskatchewan River would rank much higher today.

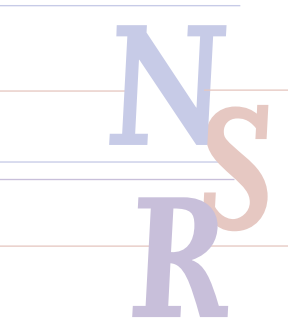
Water quality affects the integrity of aquatic and terrestrial ecosystems, and is an important component in assessing a river's potential for heritage river designation. Because North Saskatchewan River water is used for human consumption by all riverside municipalities, from the Town of Rocky Mountain House in the Province of Alberta to the City of Prince Albert in the Province of Saskatchewan, water quality has emerged as a significant issue. Over the past decade industry, agriculture and river communities have initiated many innovative programs to protect the river's aquatic and terrestrial integrity.

The "Cows & Fish" voluntary stewardship program works in partnership with landowners, farmers, ranchers, cottage owners, communities, agencies and groups to promote awareness of land/water issues and to encourage more informed management practices.

The St. Paul Grazing Reserve, downstream of Edmonton, uses a management system that restricts cattle from grazing riparian areas, and that uses renewable resources such as wind power and solar power for pumping ground water for the cattle.

Many other groups are proactive in their involvement with improving the integrity of the natural values of the North Saskatchewan River. Below is a brief sampling:

- Ducks Unlimited Canada (DU) is an affiliate of the Ducks Unlimited organization that also has representation in the United States and Mexico. The Institute of Wetland and Waterfowl Research (IWWR) is DUC's research arm, searching for leading-edge science to solve problems in areas that are most threatened.
- Trout Unlimited Canada (TU) initiates programs that stem the flow of habitat degradation and assist in making a difference with clean water. They emphasise public education focusing on the importance of restoring and maintaining the natural flow of clean, fresh water. They also work with government agencies to put policies in place that benefit Canada's coldwater resources.



- Alberta Conservation Association (ACA) is a non-profit, non-government association working collaboratively to conserve and enhance Alberta's wildlife, fisheries and habitat. Logging practices, farming and even the cutting of dead trees for firewood has removed much of the mature woodland required for the cavity-nesting species. For a number of years, (ACA) has worked to reverse this trend through its Duck Nest Box Program. Under this program, ACA constructs and places plywood nest boxes on trees situated near wetlands in Central Alberta. Partners in this project include Ducks Unlimited Canada, Fish and Wildlife, Windsor Plywood and participating land managers.
- The Alberta Fish and Game Association is a volunteer-based, not-for-profit charitable organization that advocates the common interests of ethical hunters, anglers and outdoor enthusiasts dedicated to the responsible stewardship of Alberta's environment. The AFGA is recognized by all levels of government as the official spokesmen for organized hunters and anglers interested in the conservation of fish and wildlife.
- The Alberta Environmental Network AEN is a non-profit, non-partisan umbrella organization dedicated to helping preserve and protect Alberta's environment. Membership in the AEN is open to any non-profit, non-governmental organization demonstrating sincere concern and action toward a healthier environment.

Since 1991, The City of Edmonton Drainage Services and EPCOR Water Services have spent millions of dollars on river protection. The North Saskatchewan Watershed Alliance (NSWA), comprised of 196 member organizations and inidividuals (as of June 30, 2005), is a non-profit society whose purpose is to protect water quality and ecosystem functioning within the watershed in Alberta. EPCOR Water Services, the City of Edmonton water supplier, is a member of the NSWA. EPCOR's Water Public Advisory Committee provides residential, industrial and commercial input on various water issues. The Water Quality Advisory Council discusses technical water quality issues from the Capital Health Authority, Alberta Environment, large industrial water users and other organizations. These examples demonstrate recent and extensive public involvement in water management along the North Saskatchewan River.

A joint City of Edmonton, Alberta Environment, EPCOR Water Services monitoring project (2003/04) has placed 23 monitoring stations on the North Saskatchewan River in Edmonton to monitor water quality for pesticides, endocrine disruptors and pharmaceuticals. This is in addition to monitoring that was already in place for toxins, bacteria and parasites (information from Asoke Weerasinghe, Alberta Environment a member of NSWA).

Because recreational value of a river has economic implications, it is, and will continue to be, significant to the management planning process. In 1997, Environment Canada initiated a survey on the *Importance of Nature to Canadians*, which assessed the social and economic value of nature-related activities to Canadians. Socio-economic insights based on survey results like this one can contribute to management strategies for the North Saskatchewan River, since the entire river is

accessible and desirable for a full range of recreational activities. Because natural areas and wildlife are renewable resources managed by the current generation in trust, management activities must strive to maintain, and increase the value of these resources where it is reasonable.

Theme One
Hydrology

Using four sub-themes, the hydrology theme expresses the relationship between land and water. This section considers river location; changes in seasonal river flow; chemical and physical river water properties; and river volume and length.

1.1 Drainage Basin

1.2 Seasonal Variation: changes in river through the seasons

1.3 Water Content: physical and chemical water properties of the river

1.4 River Size: river volume and length

1.1 Drainage Basin

There are five oceanic drainage basins in Canada: **Hudson Bay Basin**, Atlantic Ocean Basin, Arctic Ocean Basin, Pacific Ocean Basin and Gulf of Mexico Basin. Watersheds of drainage basins mark the fundamental divisions between major river systems.

1.1.1 Hudson Bay Drainage Basin

The North Saskatchewan River forms the North Saskatchewan River watershed within the Hudson Bay Basin. Rivers that flow into Hudson Bay cover 38% of Canada's land surface.[4] The North Saskatchewan River is the 11th longest river in Canada flowing through a watershed that covers 80,000 km^2 in Alberta, or 12.5% of Alberta's landmass.[5] It is a major tributary in the Saskatchewan-Nelson River system.

1.1.2 Sub-watershed Regions

An active river system is more than the simple ribbon of blue that bears its name on a map. At the largest scale, it is the sum of every tributary, both large and small, that feeds the river main stem. When and where these tributaries enter the main river system helps define the character of the river. Collectively, these tributaries form the watershed, but at the smaller scale there are many sub-watersheds, which incorporate lesser tributaries and other related water bodies such as lakes and ponds. The North Saskatchewan River Watershed is comprised of thirteen sub-watersheds. These are: Cline, Ram, Clearwater, Brazeau, Modeste, Sturgeon, Strawberry, Beaverhill, Vermilion, White Earth, Frog, Monnery, and Battle River. Each sub-watershed is named for the highest order tributary within that system.

1.1.2a Sub-watershed tributaries & other water bodies:

Cline Watershed Region

Cline River, Alexandra River, Howse River, Mistaya River, Siffleur River, Cataract Creek, Huntington Creek, Entry Creek, Shoe Leather Creek, Waterfalls Creek, White Goat Creek, McDonald Creek, Coral Creek, Rampart Creek, Owen Creek, Louden Creek, Corona Creek, Arctomys Creek, Silverhorn Creek, Noyes Creek, Totem Creek, Bison Creek, Kaufman Creek, Sarbach Creek, Murchison Creek, Spreading Creek, Wilson Creek, Allstones Creek, Crooked Creek, Kidd Creek, Whiterabbit Creek, Norman Creek, Norman Lake, Coleman Lake, Landslide Lake, Mistaya and Waterfowl Lakes, Cirque Lake, Chephren Lake, Epaulette Lake, Abraham Lake, Pinto Lake.

Ram & Clearwater Watershed Regions

North Ram River, Clearwater River, Joyce River, Big Horn River, Baptiste River, Tay River, South Creek, Teepee Creek, Gap Creek, Dutch Creek, Jock Creek, Grace Creek, Dizzy Creek, Deep Creek, Tauton Creek, Saunders Creek, Slippery Creek, Lewis Creek, Sunset Creek, Jackfish Creek, Shunda Creek, Lynch Creek, Cripple Creek, Philip Creek, Pinto Creek, Fall Creek, Tawadina Creek, Makwa Creek, Nice Creek, Easy Creek, Chambers Creek, Brewster Creek, Deserters Creek, Trout Creek, Kiska Creek, Tershishner Creek, Elk Creek, Rocky Creek, Cut-off Creek, Swan Creek, Prairie Creek, Cow Creek, Rough Creek, North Prairie Creek, Prentice Creek, Buster Creek, Prairie Creek, Chicken Creek, Canyon Creek, Little Beaver Creek, Big Beaver Creek, No Name Creek, Jock Lake, Gap Lake, Swan Lake, Cow Lake, Crimson Lake.

Brazeau Watershed Region

Brazeau River, Nordegg River, Elk River, Blackstone River, Cardinal River, Sand Creek, Nomad Creek, Ruby Creek, Southesk Creek, Chungo Creek, Wawa Creek, Rundle Creek, Chimney Creek, Thistle Creek, Coast Creek, Brown Creek, Marshybank Creek, Marshybank Lake, Thunder Lake, Muskiki Lake.

Modeste Watershed Region

Modeste Creek, Bucklake Creek, Tomahawk Creek, Mishow Creek, Washout Creek, Rose Creek, Poplar Creek, Shoal Lake Creek, Wabamun Lake, Jackfish Lake, Buck Lake, Mayatan Lake, Hasse Lake.

Sturgeon Watershed Region

Sturgeon River, Riviere Qui Barre, Atim Creek, Little Egg Creek, Lac Ste. Anne, Isle Lake, Sandy Lake, Deadman Lake, Birch Lake, Big Lake, Manawan Lake, Gladu Lake, Deadman Lake, Muir Lake, Atim Lake, Cut Bank Lake, Horseshoe Lake, Kirk Lake, Kinokamau lake.

Strawberry Watershed Region

Strawberry Creek, Sunnybrook Creek, Cutbank Creek, Irvine Creek, Whitemud Creek, Blackmud Creek, Conjuring Creek, Wizard Lake, Saunders Lake, Yekau Lake.

Beaverhill Watershed Region

Beaverhill Creek, Norris Creek, Pointe-aux-Pins Creek, Oldman Creek, Horse Hills Creek, Astotin Creek, Ross Creek, Boag Lake, Ball Lake, Bennett Lake, Halfmoon Lake, Beaverhill Lake, Hastings Creek, Cooking Lake, Drygrass Lake, Astotin Lake, Blackfoot Lake, Tawayik Lake, Miquelon Lake, Ministick Lake, Joseph Lake, Oliver Lake, Antler Lake, Hastings Lake.

Vermilion & White Earth Watershed Region

Vermilion River, Waskwei Creek, Deer Creek, Irish Creek, Birch Creek, White Earth Creek, Egg Creek, Kennedy Creek, Weasel Creek, Waskatenau Creek, Peno Creek, Whitford Creek, Namepi Creek, Redwater Creek, Whitford Lake, Smoky Lake, Wakomao Lake, Skaro Lake, Gregory Lake, Campbell Lake, Birch Lake, Watt Lake, the Vermilion Lakes.

Frog & Monnery Watershed Region

Blackfoot Creek, Slawa Creek, Atimose Creek, Frog Creek, Frog Lake, Fishing Lake, Two Hills Lake, Prairie Lake, Rock Island Lake, Chrisopher Lake, Lac Sante Cyr, Lac Bellevue, Perch Lake, Tulliby Lake, Lac Dufance, John Lake, Laurier Lake, Whitney Lake, Ross Lake, Mitchell Lake, Moosehills Lake, Lake Eliza, Lower Therien Lake, Upper Therien Lake, Lac Poitras, Saddle Lake.

Battle River SubWatershed

Battle River, Maskwa Creek, Bigstone Creek, Pipestone Creek, Battle Lake, Pigeon Lake, Samson Lake, Coal Lake, Bittern Lake, Red Deer Lake, Nelson Creek, Paintearth Creek, BigKnife Creek, Castor Creek, Young Creek, Red Willow Creek, Meeting Creek, Frenchmans Creek, Iron Creek, Grattan Creek, Vernon Lake, Bellshill Lake, Wavy Lake, Hattie Lake, Blackfoot Creek, Ribstone Creek, Black Creek, Grizzly Bear Creek, Buffalo Creek, Ribstone Lake, Border Lake, Wallaby Lake, Houcher Lake, Horseshoe Lake, Shorncliffe Lake, Bruce Lake, Normandin Lake, Clarke Lake, Albert Lake, Earlie Lake, David Lake, Dolcy Lake, McCafferty Lake, Sounding Creek, Sounding Creek Reservoir, Eyehill Creek, Loyalist Creek, Monitor Creek, Fitzgerald Lake, Craig Lake, Kirkpatrick Lake, Bloor Lake, Antelope Lake, Misty Lake, Currant Lake, Grassy Island Lake, Percy Lake, Manitou Lake.

1.2 Seasonal Variation

Fluvial features are influenced most dramatically during seasonal flood events. While the existence of the Bighorn Dam on the North Saskatchewan River and the Brazeau Dam on the Brazeau River tributary have occasional impact on river flow, peak flow rate fluctuation on the North Saskatchewan River is most often the result of springtime snow melt and heavy summer rainfall entering the river from tributaries below the dams. Low river flow is sometimes due to adjustments at the dam sites, but most often low flow results from dry summer periods and from winter freeze-up.

The North Saskatchewan River undergoes significant seasonal variation between its peak flow rate in the early summer and its low flow rate in the late fall. The river has generally a stable flow during winter (under ice cover). The river's flow

is influenced by TransAlta Utilities Bighorn Dam, which stores spring run-off and releases it over low flow periods during the rest of the year. During December to March much of the river is frozen, except for some sections within the city of Edmonton. During this time very little run-off water enters the North Saskatchewan River, and variations in water level are most often influenced by dam regulation.

"The mean yearly flow in the North Saskatchewan River is just over 200 m^3 per second, but peak flows can exceed 800 m^3 per second. The river has stable flows during the winter season under ice cover, but is susceptible to rapidly changing flows during the spring season when snowmelt and spring run-off situations occur. Heavy rainfalls during the summer also increase the river flow rate."[6]

"The Clearwater, Brazeau & Nordegg Rivers comprise 6%, 36% and <1% of the winter flow, and 13%, 30% and 3% of the summer flow, respectively." [7]

Peak Flow: June to early July.

Low Flow: October to April.

Table 2 - North Saskatchewan Monthly Flow Volume (dam^3)

Month	Median	10-Year Minimum
June	891,648	324,000
July	969,581	299,981
August	621,389	305,338
September	479,520	316,224
October	415,152	289,267
November	344,736	251,424
December	329,443	235,699

From: EPCOR Surface Water Quality & Quantity Table 4.4.17

1.2.1 Dam Influence

The two dams that affect the flow of the North Saskatchewan River are located in the first two Reaches of the River:

Reach One: The Big Horn Dam is a 300-foot earth-filled dam on the North Saskatchewan River, upstream from Rocky Mountain House and south of the town of Nordegg. This dam has regulated the river for hydroelectric purposes since 1974.

Reach Two: The Brazeau Dam is not located on the North Saskatchewan River. It is a 400-foot dam on the Brazeau River, a North Saskatchewan River tributary, which enters the main stem southwest of Drayton Valley. This dam has regulated the river for hydroelectric purposes since 1964.

Each dam, operated by TransAlta Utilities, has two generators, which, combined, feed 475,000 kilowatts, annually, into Alberta's electrical grid. Exclusive rights, granted by the province, allows TransAlta Utilities to adjust water levels according to the power needs of the province as well as to avert flooding, to ameliorate drought conditions and to respond to other emergencies. "The summer flows at Edmonton average 210 m^3/s. the winter flows range from 90 m^3/s to 345 m^3/s, however, TransAlta Utilities attempts to maintain the winter flows between 90 m^3/s and 110 m^3/s"[8]

"These dams control flow out of about 50% of the most water productive part of the basin and change the annual flow distribution significantly."[9] As noted, the dams have reduced seasonal flood events, and have also modified the severity of various rapids between the Big Horn Dam site and Blue Rapids (twenty km downstream from the Brazeau Forks), downgrading them to Class II rapids, and even in some cases to Class I. Prior to the construction of the Big Horn Dam, expert white water paddlers were challenged to a great degree by a series of vigorous rapids upstream of Rocky Mountain House. Now the more subdued stream is only rigorously challenging to beginning white water adventurers and experienced open canoe paddlers. Few rapids exceed a Class III rating any longer. This is detrimental for white water adventure recreation, but conducive to a wider use of the river by family groups and educational organizations.

There is some indication that loss of the spring 'freshet' marginalizes some plant, fish and invertebrate species, in particular the ones that depend on seasonal variations in water levels and velocity to complete their life cycles. This, however, does not need to remain a permanent condition. If it becomes an issue in the over-all health of the river system it is possible to change water use plans to introduce a spring freshet event.[10]

Water flow and water temperature changes, as a result of the dams, has caused Brown Trout to extend their habitat downstream as far as Drayton Valley, Mountain Whitefish downstream as far as Edmonton, and Goldeye upstream as far as Drayton Valley. This increases sports fishing interest in the river. The transition zone from cold water to warm has moved downstream from Rocky Mountain House to the vicinity of Drayton Valley.

There is very little pre-dam baseline data available. This creates a need for a concentrated, systematic effort to collect anecdotal information of pre-dam historical fish distribution, as well as, the distribution of other riparian species populations. Because of the age of local and regional fishermen and other river users an effort of this kind is time-sensitive.

What has not been fully studied is the long-term effect on river and riparian ecology dependant upon these seasonal extremes for certain life cycles. It is known that heavy spring flows, in rivers and streams, trigger upstream trout migration for spawning. Cottonwood trees and willow seeds, released in June, are designed to be deposited on new sandbars created by fast moving spring water. When river levels fall naturally in the autumn, decaying leaves and other vegetation decompose in shallow areas to feed caddis fly, mayfly and midge larvae over winter. These insects provide food for fish, frogs, snakes and water birds. It is not known how the change in the dynamics of these natural cycles has affected the river eco-systems. This is an area open to future study.

1.3 Water Content

This sub-theme describes the river's physical and chemical properties.

The physical properties of river water are described according to the presence of and the amount of *suspended solids* (sediment content). Physical deposition of sediment along riverbanks and river bottoms creates a variety of fluvial features that affect the ecology of the river as well as human activities along the river. Total Suspended Solids (TSS) are the portion of solids in water retained when water is filtered. High levels of suspended solids can decrease light penetration and reduce photosynthesis.

The chemical properties of river water are described according to the presence of and amount of *dissolved solids*. Dissolved solids are chemicals, nutrients and minerals bound within the water matrix and usually cannot be seen. This discussion involves nutrient values, the levels of which, result in either the presence or absence of different life forms.

The North Saskatchewan River is a naturally turbid river with a heavy sediment load (>400mg/L) and a high level of total dissolved solids (>100mg/L). Turbidity, in and of itself, is not an indication of the cleanliness or safety of water, merely a measure of how clear the water is. In the case of the North Saskatchewan River, turbidity is due to 'glacial flour' (rock finely ground from glacial activity, and from soil eroded from the steep banks).

"Turbidity measurements are an indication of the clarity of the water, measured by the intensity of light scattered by a sample. Turbidity is caused by suspended particles in the water, such as clay, silt, fine organic and inorganic particles, microorganisms, and plankton. Turbidity is significant for many reasons: excessive silt can clog fish spawning grounds; waters with high turbidity are less desirable for swimming, for both aesthetic and safety reasons; and high turbidities create challenges for water treatment processes. As well, suspended particles may contain heavy metals and other contaminants."[11]

Water quality is determined by analyzing a multitude of physical, chemical and biological parameters. Physical parameters include colour, turbidity and pH. Chemical parameters include hardness, dissolved oxygen, alkalinity and any chemical compound. Common biological parameters include coliforms, which are a broad range of bacteria that in high levels can indicate human or animal contamination. Assessing water quality conditions is complex science, however, the following intends to highlight some characteristics of North Saskatchewan River water quality.

Variability is the most predominant water quality feature of the North Saskatchewan River. Water quality is generally consistent during the winter, but during spring runoff and summer storm events, surrounding land and creeks are naturally flushed and all water quality parameters can change significantly within short periods of time.

1.3.1 Physical Properties:

The soils in the North Saskatchewan watershed are primarily glacial clays, which results in high turbidity during high flow in the spring and summer. Most of the riverbanks have *"silty, alluvial, floodplain deposits that are sensitive to disturbance and erode easily."* This sand and mud mixture results in a naturally turbid river.[12] Turbidity can range from less than 10 NTU (Nephelometric Turbidity Unit) to greater than 2000 NTU at Edmonton. Similar to turbidity, colour at Edmonton normally ranges around 40 TCU (true colour units) while it can exceed 100 TCU during spring runoff or summer storm events. The North Saskatchewan River tends to have a slightly basic pH around 8.0 at Edmonton.[13]

Turbidity
Max: +2000 NTU
Mean: 35 NTU

Colour
Max: +100 TCU
Mean: 40 TCU[14]

1.3.2 Chemical Properties[15]:

Alkalinity is an important determinant of the types and abundance of different species that are found in river systems. Within the North Saskatchewan River it tends to be around 125 mg/L. North Saskatchewan River water is naturally fairly hard as it picks up calcium and magnesium ions from limestone rock within the basin. The river has an average hardness of 165 milligrams of calcium carbonate per litre in Edmonton. Dissolved oxygen tends to be around 10 or 11 mg/L around the city of Edmonton.

1.3.3 Biological Properties:

As with physical and chemical parameters, the water's biology is also variable. At Edmonton, total coliforms are typically around 24

counts/100 ml while *Cryptosporidium* spp. and *Giardia* spp. range from a few oocysts and cysts per 100 L to tens of thousands per 100 L. Microbes are transmitted through animal and human feces.

Overall, according to Alberta Environment's 2003/2004 surface water quality index, the North Saskatchewan River at Devon and Pakan, upstream and downstream of Edmonton, respectively, is rated as good.

1.4 River Size

River size is measured according to two variables: average flow volume and total river length. The average flow volume of the North Saskatchewan River is measured as the average annual flow (m^3/sec) at its lowest section. The total river length is the length of the river from its source to the ocean, *of which the nominated section forms a part*.

The North Saskatchewan River is a medium river in terms of volume (85-400 m^3/sec), but large in terms of length (>1000 km).

1.4.1 Average Flow Volume (annual):

The North Saskatchewan River's annual flow rate ranges from 150 m^3/sec at Whirlpool Point in **Reach One** (prior to Abraham Lake), to 250 m^3/sec at Rocky Mountain House at the start of **Reach Two** (regulated somewhat by the Bighorn Dam). At Edmonton the average flow is from about 175-325 m^3/sec. In terms of volume/year, flow ranges from 5,704,750 acre-feet[16] at Edmonton to 6,253,000 acre-feet[17] near the Forks. The mean annual flow for the North Saskatchewan River is just over 200 m^3/sec making it a medium flow river.

1.4.2 Total River Length:

The total length of the North Saskatchewan River, from the Rocky Mountains to where it joins the South Saskatchewan River to form the Saskatchewan River, is 1287 km with 640 km of its length within Alberta.

Theme Two
Physiography

This theme describes physiographic features and processes that are directly related to rivers. These are expressed in four sub-themes:

2.1 Physiographic Region

2.2 Geological Processes

2.3 Hydrogeology

2.4 Topography

2.1 Physiographic Region

Canada is divided into physiographic regions: Canadian Shield-Kazan, James Bay and Laurentian regions; Appalachian Acadian Uplands; St. Lawrence Lowlands; **Prairies**; Peace-Slave Lowlands; Mackenzie Lowlands; Hudson Bay Lowlands; Cordilleran Eastern Ranges; Cordilleran Plateau/Mountains; and West Coast Ranges.

The North Saskatchewan River flows mainly within the **Prairie Physiographic Region**, which covers 10% of Canada. So far, there are no designated Canadian Heritage Rivers within the Prairie Physiographic Region. The first section of the river, flowing from headwaters in the Columbia Icefields to the Banff National Park boundary, and already designated, contributes to rivers found within the **Cordilleran Eastern Ranges Physiographic Region**.

2.2 Geological Processes

Seasonal changes in river flow create fluvial features yearly; geological processes and events reconfigure the land through which the river flows over the course of many eons. *Bedrock formation* describes the underlying bedrock over which the river flows. *Surficial material deposition* describes landforms created as a result of glacial action such as glacial scouring, transport, rebound, melting or movement, as well as inundation, and aeolian events such as wind deposition.

2.2.1 Bedrock Formation

"Most of Alberta is underlain by a 2 to 3 km thick blanket of erosional debris"[18] created by millions of years of Canadian Shield and Cordillera erosion. Therefore much of the North Saskatchewan River flows over this sedimentary rock deposited during the late cretaceous and early tertiary eras. This results in riverbanks composed of various combinations of sandstone, shale, coal and bentonite clays.[19] A variety of mineral material from subsequent ocean inundations was then deposited over these sediments. *"Oceans have ebbed and flowed across [western Canada] for many hundreds of millions of years."* The evaporating oceans deposited various layers of sediment, resulting in marine sedimentary rocks, which are largely the material of which western Canada is made.[20] Most of the sedimentary rock through which the North Saskatchewan carves its course was deposited during the late cretaceous era. *"Outcrops of these rocks are rather rare because of their tendency to weather and become covered with vegetation. Usually it is only along the banks of major rivers like the North Saskatchewan...that they may be seen."*[21] They are particularly evident in the river valley around Edmonton (Reach Four) and around Prince Albert, Saskatchewan (Reach Seven).

In Reach One, at Whirlpool Ridge, *"Precambrian rock of at least 600 million years old has been forced over rock of the Middle Cambrian and even younger strata, forming a very hard ridge."*[22] In this area, the North Saskatchewan River runs parallel to the ridge, and the actual 'whirlpool' marks the place where the river changes course and actually cuts through the ancient ridge.

Several sites of high palaeontological sensitivity exist along the river in the Edmonton area (Reach Four). Exposed shale-like rock weathers to reveal fossilized plants some over 60 million years old. The two most common fossils are *metasequoia* and *cercidiphyllum*.[23] Each year when the river undercuts the banks near Genesee a *"new series of shalelike rocks"* are exposed. When cracked along their seams, *"almost perfect fossil plants"* are exposed.[24] This is significant because *"in western Canada, animals are much more commonly fossilized than plants..."*[25]

In Reach Six fossil cephalopods from the cretaceous era are regularly shed from the north facing riverbanks every spring. While *"fossil cephalopods are common in western Canada"*[26], they are not usually this readily accessible to the ordinary passer-by. Enterprising youth leaders in Reach Six make regular canoe trips with scouts, guides, home school groups, and other young people to observe these ancient fossils.[27]

2.2.2 Surficial Material Deposition

The North Saskatchewan River flows over a variety of surficial material, which is the result of glacial transport, glacial melting, glacial movement, wind deposition and inundation. *"Till, colluvium and bedrock are more prominent in the mountain and upland areas, whereas glaciolacustrine sediments, glaciofluvial deposits and till are dominant on the Western and Eastern Alberta Plains."*[28]

"A diversity of surface expressions coincides with the wide range of parent materials. These grade from ridged and steeply inclined in the mountains to hummocky and undulating on the plains."[29] *"Numerous remnants of glacial activity are also evident including: drumlins; spillways; alluvial fans; and sand dunes."*[30]

A river of mountain origin, the North Saskatchewan, over the course of its journey, has smoothed *"immense volumes of broken rock material left by the melting of the glaciers."*[31] The riverbed in Reach One is full of these smooth round stones and gravel. The massive ice sheets of the last ice age melted and left behind a *"till or moraine blanket…many hundreds of feet thick…in the old river valleys."*[32] This kind of glacial till, in the form of ground moraine and hummocky moraine forms the river valley from the last part of Reach One stretching nearly to the end of Reach Two.[33] The river in Reaches Three, Four and Five flows through the silt and clay deposits left by glacial lakes. In Reach Four, between Devon and Edmonton, there is a substantial area along the north river bank where obvious post-glacial river, lake and wind deposits of sand and gravel have created sand dunes.[34] (See Figure 11 for specific locations of sand formations along the river) In Reach Six there is a small area around Heinsburg with surficial deposits of sand and gravel, and by the time the river reaches Lea Park, there is ground moraine on the north side of the river, and either silt and clay, or sand and gravel on the south side of the river.

2.3 Hydrogeology

This sub-theme describes the physical and chemical properties of the land through which the river flows.

Bedrock can consist of porous rock (sandstone) that permit seepage between grains; pervious rock (shale, slate) that permit seepage through layers and cracks; soluble rock (limestone, dolomite - generally called carbonate) that are dissolved by water and result in underground watercourses; and impervious rock (granite, gneiss) that are erosion resistant and only permit seepage through fractures.

The North Saskatchewan River flows over porous (sandstone), pervious (shale), soluble (carbonate) bedrock types along its reaches.

2.3.1 Bedrock Type

From the foothills to the Saskatchewan border, the Interior Plains region rest upon bedrock put down during the Tertiary era, which includes sandstone, shale and coal, as well as bedrock put down during the Upper Cretaceous era. Sandstone, shale, coal and bentonite characterize Cretaceous bedrock.[35]

Non-marine sandstone and coal of the Upper Cretaceous era, as well as sandstones, shale and coal of the Tertiary, compose the predominant geological material underlying the river. Around the Edmonton area, the river flows through sandstone, siltstone, shale, coal and minor bentonite. Near the Alberta/Saskatchewan border the river flows through shale and minor sandstone, and in Saskatchewan, through sedimentary rock - mainly sandstone, shale, conglomerate, and bentonite.

Reaches One: The river is carbonate rich at the headwaters, contributing to the milky green colour of the river upstream of Nordegg.

Reaches Two & Three: Sandstone, shale and coal.

Reaches Three, Four & Five: Sandstone, shale, coal and minor bentonite.

Reach Six: Shale and minor sandstone.

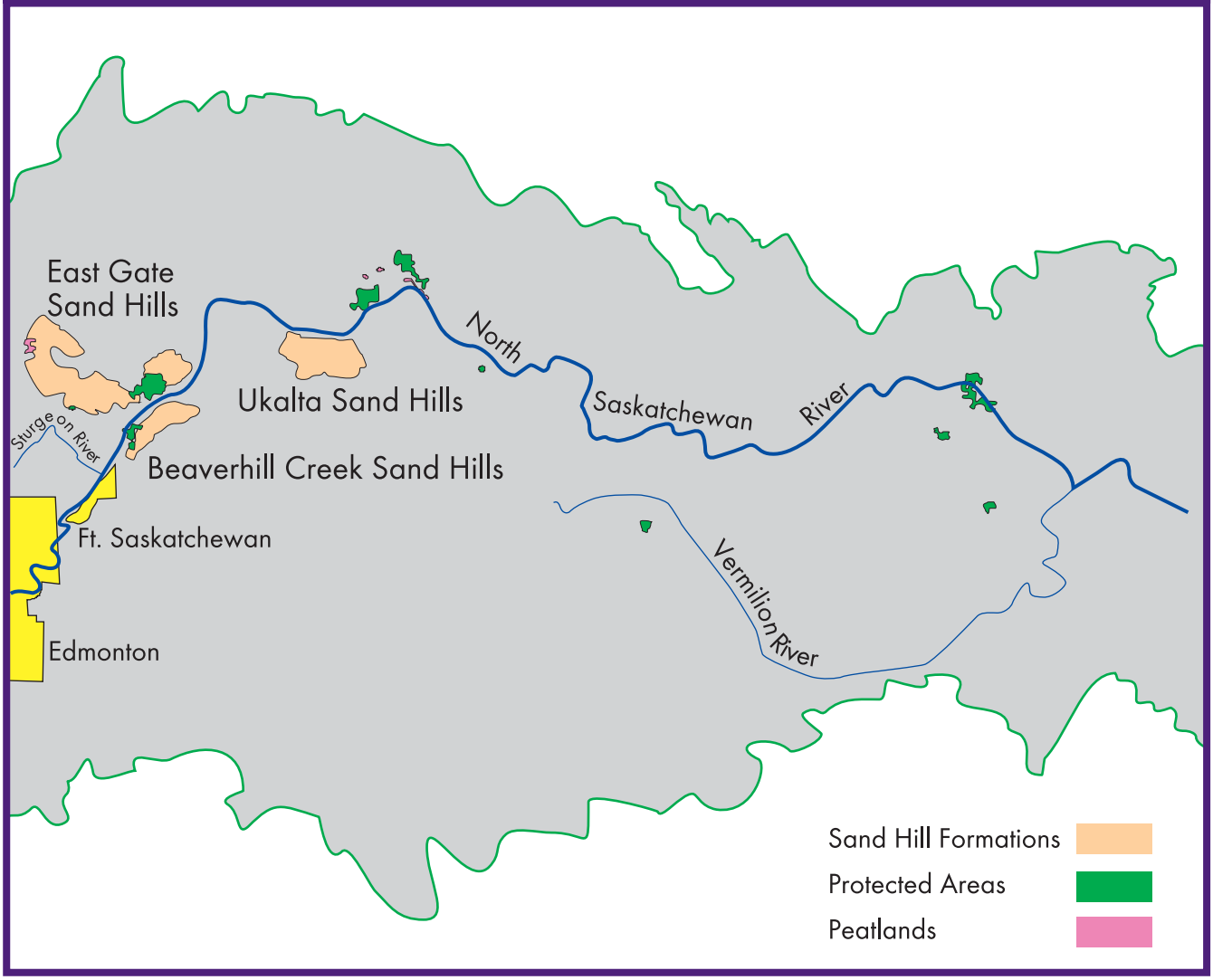
2.3.2 Surficial Unconsolidated Material

The bedrock of the North Saskatchewan River is overlain by unconsolidated materials such as glacial till, sand, silt and clay deposits therefore ranging from high porosity (thin soils and barrens) to medium porosity (sand, gravel) to low porosity (fine clay and silt).

2.4 Topography

Topography is the general configuration of the land surface. River topography involves the relief and gradient of the river. Relief is the height of the river above sea level and measures the vertical distance the rivers water must travel to reach the sea. River relief may be significantly lower than its surroundings. The river's velocity is determined by its gradient, which is the overall height difference over a length of the river. Waterfalls and rapids, as well as lakes and ponds produce

Figure 9 - North Saskatchewan Watershed - East Section



steps in gradients. The gradient, through its influence on velocity, therefore influences the aesthetic qualities and recreational uses of the river.

2.4.1 Gradient

River Gradient classification: Shallow (1m/km), Moderate (1-2m/km), Significant (2-5m/km) and Steep (>5m/km).

The North Saskatchewan River is a long river, originating in the Rocky Mountains where its gradient is classified as significant, and flowing down through the lower elevations of the central parkland. In general, the North Saskatchewan River can be classified as a river of moderate gradient.

Reach One: Gradient varies from 1.4 m/km to 4.8 m/km, but generally drops at approximately 2 m/km.[36]

Reach Two: Gradient consistent between 1.1 m/km to 2.7 m/km.[37]

Reach Three: Gradient varies between 0.3m/km to 1.8 m/km.[38]

Reach Four: Gradient varies from 0.3 m/km to 0.9 m/km.[39]

Reach Five: Gradient varies from 0.3 m/km to 0.6 m/km.[40]

Reach Six: unknown

Reach Seven: unknown

2.4.1 Relief

Relief is classified by ranges of 0 - 400m, 400 - 1000 m, and >1000m. The first third of the river **(Reaches One & Two)** has a high relief, the next third **(Reaches Three & Four)** has medium relief and the remaining third **(Reaches Five, Six & Seven)** into Saskatchewan has a low relief.[41]

Reach One before the Ram River: 1830 - 1220 m above sea level.

End of Reach One & Part of Reach Two: 1220 - 915 m above sea level

Reaches Two, Three & Four: 915 - 610 m above sea level.

Reaches Five & Six: 610 - 305 m above sea level.

Reach Seven: unknown

Theme Three
River Morphology

River morphology includes river-influenced features resulting from the combined effect of hydrology **(Theme 1)** and physiography **(Theme 2)**. This theme looks at three spatial perspectives - cross-section, horizontal, and vertical - in the first three sub-themes, and a time dimension in the fourth sub-theme. The sub-themes include:

3.1 Valley Types

3.2 Channel Patterns

3.3 Channel Profile

3.4 Fluvial Landforms

3.1 Valley Types

Valley types reflect the geological history of the river and contribute significantly to the river user's recreational and educational experience. A river valley may be characterized as having concave, convex or straight walls with non-existent valley-floors, or as having wide flood plains and peaked, round or flat interfluves. The North Saskatchewan River Valley alternates between "*broad flat or rolling floors [and] sections sliced narrowly into bedrock.*" One example is the "*North Saskatchewan River gorge from Devon downstream with the open valley from Edmonton to beyond Fort Saskatchewan.*"[42]

3.2 Channel Patterns

The channel patterns of a river are defined as viewed from above, and are characterized by stream configuration, as well as by natural impoundments such as lakes or ponds.

The North Saskatchewan River channel varies from braided and sinuous in the mountains and foothills (Reach One & Two), to occasional tortuous and branching sections through Reaches Three & Four, to a wide meandering channel in Reaches Five, Six & Seven. The meander bends may have tall sandstone cliffs and low gravel shores, and many of the meander banks have been undercut.

Reach One: Braided Channel - "*From the start at Dutch Creek [below the Big Horn Dam] the river flows in an intricate braided channel*" until it approaches the Gap in the Brazeau Range.[43]

Reaches Two to Four: Snyes - Most of the interesting snyes occur between these two reaches.

Reach Four: Meandering - from the area of Burtonsville Island to Jackfish Lake area.

Reach Seven: Sinuous - at the Saskatchewan River Forks are examples of oxbow lakes.[44]

3.2.1 Lake Systems

Several feeder lakes provide water to the North Saskatchewan River via connecting tributaries. Main feeder lakes[45] for the North Saskatchewan River include:

Reach Three

Jackfish Lake
Water flows from Jackfish Lake in intermittent years if water table is high.

Lac Ste. Anne
Lac Ste. Anne outflows to Sturgeon River, which flows into Big Lake and then into the North Saskatchewan River.

Twin Lake
Twin Lake is located on a topographical divide between three major river basins: North Saskatchewan, Battle and Red Deer. Lake outflow, via a fork of Poplar Creek, flows into the North Saskatchewan River 25 km East of Drayton Valley.

Wabamun Lake
The Paul Band of the Stony Indian Nation settled on a reserve on the east shores of Wabamun Lake, in 1876, after signing Treaty 6. There are two

electrical power-generating plants on the lake and the cooling pond of a third plant within the North Saskatchewan River the North Saskatchewan River and the blow-down water is returned to the river. Wabamun Creek is the lake outlet and it flows into the North Saskatchewan River along with water from the Sundance cooling pond. There is a still sport fishing in this lake in all seasons.

Reach Four

Isle Lake

Lake Isle drains into the Sturgeon River, which flows eastward, to the North Saskatchewan River by Fort Saskatchewan, via Lac Ste Anne, Matchayaw Lake and Big Lake.

Sandy Lake

Sandy Lake has no active outflow, however it is still considered a feeder lake because high water levels flow out of the lake into the Sturgeon River.

Wizard Lake

Wizard Lake is drained by Conjuring Creek, which enters the North Saskatchewan River north of Calmar. Used to be called Conjuring Lake by Aboriginal people who had a story about a strange conjuring creature that made noises in the lake.

Beaverhill Lake

Beaverhill Lake is drained by Beaverhill Creek into the North Saskatchewan River. It is one of the most important bird staging areas in Alberta. It is also a RAMSAR site designation with International significance.

Reach Five

Lac St. Cyr

Lac St. Cyr outflow is to Siler Lake and then into the North Saskatchewan River south of St. Paul. The outlet has not run for many years.

Other feeder lakes[46] include:

Reach Four:
Tawyik Lake.
Reach Five:
Astotin Lake, Smoky Lake, Whitford Lake, Saddle Lake, Cucumber Lake.
Reach Six:
Lac Sante, Lake Eliza, Lac Cote, Moosehills Lake, Simmo Lake and Frog Lake.

Saskatchewan Feeder Lakes (Reach Seven)

Oldman Lake, Brightsand Lake, Turtle Lake, and Jackfish Lake

3.3 Channel Profile

The horizontal profile of a river illustrates its descent from source to destination. The North Saskatchewan River descends from mountain to prairie, with sections of steep & swift descent in Reach One. This results in a variety of *white water elements*: riffle, cataract, prolonged rapids, whirlpool and chute. The relatively gradual descent over the rest of the reaches results in *level water elements*: swift water & pool & riffle.

3.3.1 White Water Elements

Reach One - here the river has a compilation of white water features varying from ripple to the more challenging cataracts, prolonged rapids and exhilarating whirlpools. Between Nordegg and Rocky Mountain House is one of the most popular canoe and kayak runs on the river. There are over fifteen sets of rapids that grade from Class I to Class III. The named rapids include the "Gap" rapids, Gray's Rapid, Upper Fisher's Rapid, Greer Rapid, Lower Fisher's Rapid and Brierley Rapid. There are also strong eddies and boils and thrilling swift water in the vicinity of shale ledges in the Devil's Elbow, about 103 km, below the Big Horn Dam. Upper Fisher's Rapid, 120 km below the dam, "*is the most technical rapid of the whole run to paddle…*"[47] Between Saskatchewan Crossing and the Abraham Lake Reservoir strong eddies around Whirlpool Point make a little white water for an exciting ride.[48]

3.3.2 Level Water Elements

Most of the rest of the river consists of Level Water Elements

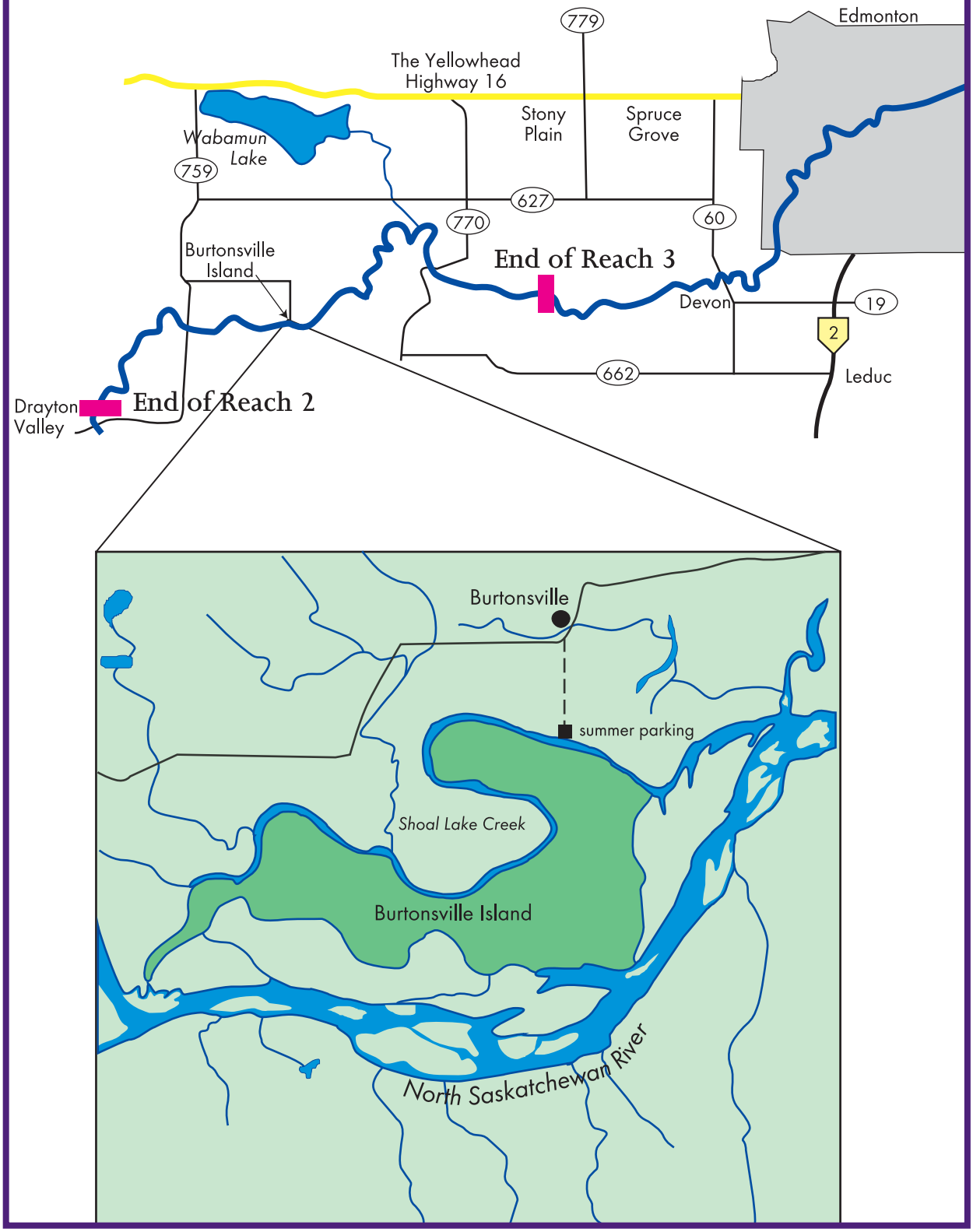
3.3.3. Confluence Waters

An interesting hydrological condition occurs at the confluence of the North Saskatchewan River with the Brazeau River in Reach Two. Here, the clear blue water of the Brazeau remains unmixed with the brown silt-laden water of the North Saskatchewan River for at least a half a kilometre creating a spectacular sight.49 The other two spectacular confluence areas are both in Reach Seven: at the Battlefords where the Battle River meets the North Saskatchewan River and at The Forks where the North and South Saskatchewan Rivers join.

3.4 Fluvial Landforms

Fluvial landforms are the result of the ongoing development and evolution of rivers; they are either depositional or erosional. The evolution of the North Saskatchewan River has created a variety of fluvial landforms, most of them depositional.

Figure 10 - Burtonsville Island



3.4.1 Depositional Land Forms

The most spectacular *braiding* in the river occurs in **Reach One** on the sections of river leading into and out of Abraham Lake. Interesting *oxbows* are found in the area surrounding Burtonsville Island in **Reach Three**, and at the other end of the river system, in **Reach Seven**, in the vicinity of The Forks. Burtonsville Island in **Reach Three** is a spectacular example of a depositional landform where the big island is continually eroded at its upstream section and rebuilt by deposited sand and gravel at its downstream section. This is the general nature of islands in the North Saskatchewan River.

The most accessible tufa accumulation on the river is the vividly coloured mineral deposits on a terrace below Government House Park on the north river bank in the City of Edmonton. The red, white and black encrustations are the result of water seeping through mineral rich rocks and sediment. *"The red deposits are formed from iron oxide minerals… the white tufa is made up of calcium carbonate. The black mineral, called wad, is composed of manganese oxide minerals."*[50]

During part of the post-glacial era the climate was very dry and it was then that *"northwest winds formed large sand dunes…"*[51] The sand dunes along the North Saskatchewan River are generally stabilized by vegetation. Where they occur in forests "they carry jackpine, juniper and blueberries on the sandy ridges, but marshes lie in the depressions between."[52] (See Figure 9 for sandhill formation along the North Saskatchewan River)

Reach Two

Glacial erratic: (9 m long, 6 m wide and 5 m tall). Approximately 1 km north of Rocky Mountain House. This erratic is not as big as 'Big Rock' at Okotoks, but it belongs to the same group. Alexander Henry first documented it in his fur trade journal.[53] It fell from a mountain (Gog Group rock), on to a glacier ice flow 18,000 years ago and traveled on the ice until the glacier melted at the end of the last ice age and left it where it stands today[54].

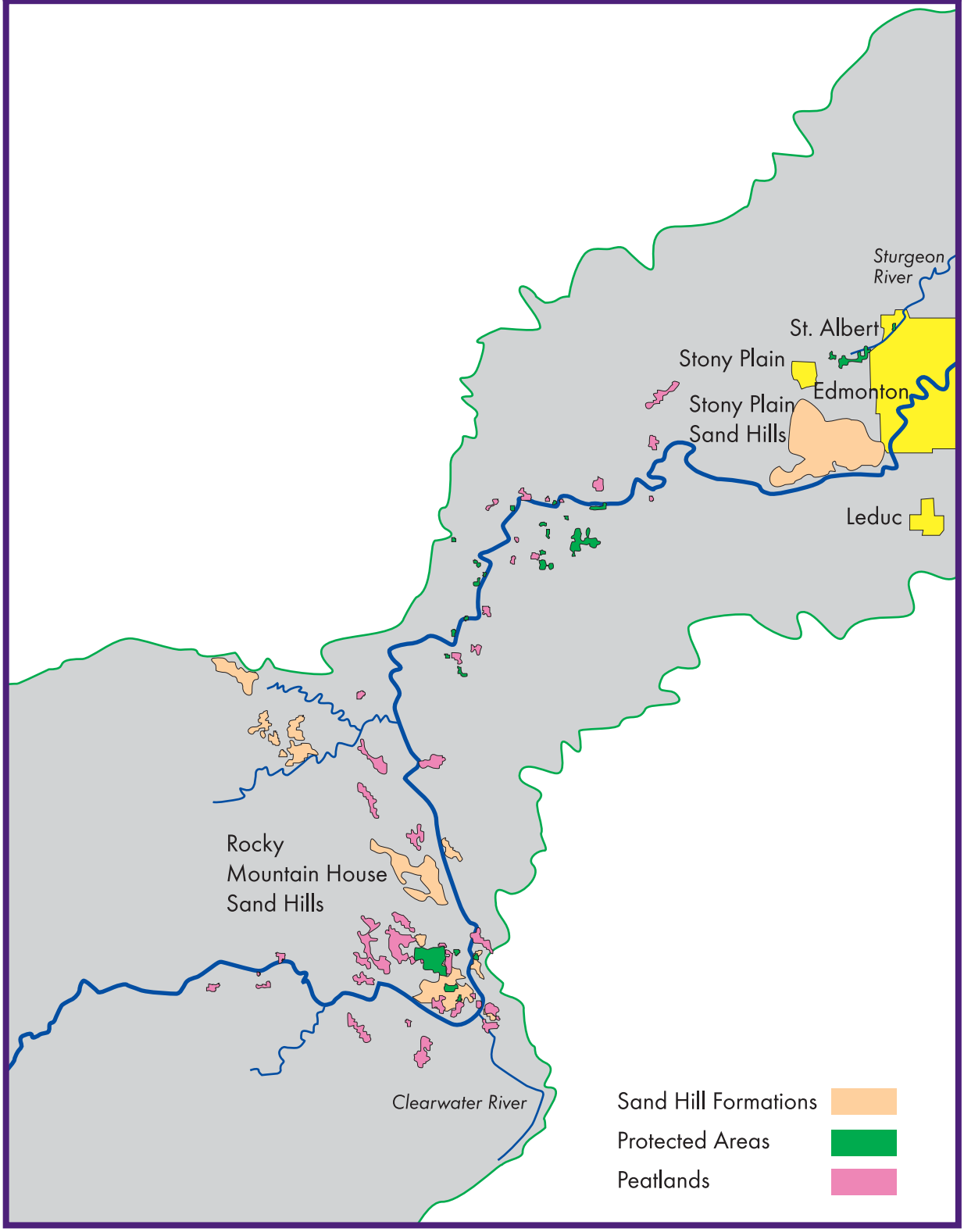
Sandhills: North of Rocky Mountain House are the Rocky Mountain House Sandhills.

Islands: From Rocky Mountain House to the mouth of the Brazeau River there are numerous long islands with white sand beaches.

Reach Three

High Sandstone Cliffs: Downstream of the Berrymore Ferry to the Genesee Bridge, there is "a maze of islands and side channels"[55] which wind along high sandstone cliffs.

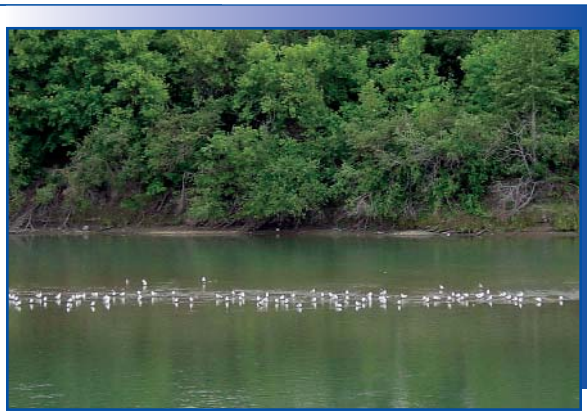
Figure 11 - North Saskatchewan Watershed - West Section



Reach Four

Sand Dunes: Along the north bank of river at Devon are unique arrangements of post-glacial wind deposits that create unusual ecosystems within an otherwise Boreal Forest region.

Sand Dunes: Between Devon & Edmonton is a continuation of the post-glacial wind deposits at Devon. South of Stony Plain are the Stony Plain Sandhills.



River at Edmonton
photo Billie Milholland

Reach Five

Sandhills: In the area of Redwater/Radway, on both sides of the river are East Gate Sandhills and Beaverhill Creek Sandhills.

Hills: The unusual sister hills - the Snipe Hills on the north side of the river and the Snake Hills on the south side of the river are north and south of the river near Willingdon.

Sandhills: Ukalta Sandhills across the river from Victoria Settlement.

Glaciolacustrine Deposits: The river dissects glacial moraine (knob & kettle) near Hairy Hill[56].

Reach Seven

Sand Dunes: From Rosthern, Sask to the Forks, the post-glacial wind deposits are the most northerly examples of this type of landform south of the massive dunes near Lake Athabasca in Northern Alberta.

Aeolian Deposits: Fine and medium-grained sand and silt reworked by wind form undulating and rolling topography (Aeolian Hummocky) in the Rosthern/Forks area.

Islands: From Fort Pitt to The Forks, *"Islands…some of them more than a mile long…"*[57]

Glaciolacustrine deposits: Sand, silt and clay accumulations, deposited by receding glaciers, are found in small glacial lakes from the Alberta border to The Forks.

Drumlins/Flutings and Ridged moraines: Ridges perpendicular to glacial ice flow are found in the area of North Battleford. There are also obvious till ridges in the ground moraine, oriented transversely to the direction of ice movement - NW to SE. Flutings made by glacial ice are also found in this area. South of Paradise Hill there are more examples of drumlins/flutings

Sandbars & islands: From the Battlefords to Prince Albert, Saskatchewan there are spectacular populations of shifting sandbars and long, treed islands of every size.

Melt Water Channel: From the Alberta border to Prince Albert, Saskatchewan the river follows its original glacial melt water channel.

Theme Four
Biotic Environments

The first three themes classified the abiotic river characteristics. The combined effects of hydrology **(Theme One)** and physiography **(Theme Two)** produced the river morphology **(Theme Three)** and laid the physical foundation for the river's biotic environments **(Theme Four)**. Biotic environments are divided into two sub themes:

4.1 Aquatic Ecosystems

4.2 Terrestrial Ecosystems

The North Saskatchewan River's largely undeveloped riparian area supports an abundance of plant and animal species. High biodiversity flourishes along the river due to the natural function of diverse interconnecting ecosystems (the river flows through four of Alberta's six natural regions), as well as to the proximity to at least twenty Provincial Environmentally Significant and Protected Areas.

4.1 Aquatic Ecosystems

Aquatic ecosystems are classified as riverine, lake, estuarine, and wetland systems. These reflect the potential of a river to support plant and animal species. The North Saskatchewan River is a riverine system with its head zone within the boundary of Banff National Park comprising the section of river already designated as a Heritage River. The middle zone of the river passes through Reach One and Two with the lowland zone comprising all the other reaches. One of the characteristics of the lowland zone is high species diversity, and it is within this characteristic that the North Saskatchewan River represents an outstanding example. The aquatic ecosystem of the river also influences and is influenced by several large lakes in the watershed that support significant populations of water and shore birds. (See Figure 11 for identified peatlands along the North Saskatchewan River)

Reach One

Kootenay Plains Ecological Reserve supports significant plant communities in a willow-birch fen and a spring fed wetland. (See ESA's on the North Saskatchewan River by reach)

Reach Two

South of Highway 11, near Dovercourt *"a seldom-visited patterned fen extends for several kilometres in a north-west-south-east direction. Here a floating mat of densely intertwined sedges supports black spruce and tamarack in places and a multitude of buck bean throughout but will not support the weight of a human. Dwarf birch and willow line the perimeter of the fen."*[58]

Crimson Lake Provincial Park area adjacent to the river to the west supports diverse wetlands, including beaver ponds and black spruce and tamarack fens. (See ESA's on the North Saskatchewan River by reach)

Pembina Field Provincial Natural Area supports breaks and floodplain of North Saskatchewan River, abandoned river channel environments, diverse shrublands on hillsides and in old channels, and mature riverine balsam poplar. (See ESA's on the North Saskatchewan River by reach)

Reach Three

Buck Lake Creek Provincial Natural Area supports mainly a black spruce ecosystem and Labrador tea peatland. (See ESA's on the North Saskatchewan River by reach)

Burtonsville Island is a provincial Natural Area encompassing one large island and several smaller islands, which host a variety of riverine habitats. Vegetation is abundant, bird life plentiful and diverse, and there is also a wide variety of mammals and amphibians. Surrounded by the fresh water of the North Saskatchewan River and Shoal Water Lake Creek, other than some logging in the 1940's and 50's, the island has sustained minimal impact. Because the island is only accessible by boat or on foot it still receives little impact from the nature groups that use it. The island serves as a location for Outdoor Education experiences for the University of Alberta, Grant MacEwan College and various youth groups in the Edmonton area. *"The island is very rich in natural resources of educational value and is designated formally as an educational natural area. Burtonsville Island can accommodate a wide variety of user interests, and is large enough to isolate and disperse the sites where outdoor activities may be conducted."*[59]

Common Vegetation on Burtonsville Island

Aspen (*Populus tremuloides*), Balsam Poplar (*Populus balsamifera*), Paper Birch (*Betula papyrifera*), White Spruce (*Picea glauca*), Black Spruce (*Picea mariana*), Chokecherry (*Prunus virginiana*), Red Osier Dogwood (*Cornus stolonifera*), Saskatoon (*Amelanchier sanguinea*), Willow (*Salix discolor*), Alder (*Alnus rugosa*), Buckbrush (*Symphoricarpos occidentalis*), Hazelnut (*Corylus cornuta*), Lowbush Cranberry (*Viburnum edule*), Wild Raspberry (*Rubus strigosus*), Wild Rose (*Rosa acicularis*), Aster (*Solidago laevis*), Canada Anemone (*Anemone canadensis*), Fireweed (*Epilobium angustifolium*), Golden Rod (*Solidago lepida*), Horsetail (*Equisetum pratense*), Lungwort (*Mertensia paniculata*), Meadow Rue (*Thalictrum dioicum*), Sweet Scented Bedstraw (*Galium triflorum*), Wild Strawberry (*Fragaria virginiana*).

Reach Four

Big Lake is a feeder lake to the North Saskatchewan River by way of the Sturgeon River. In 2000, Big Lake was designated an Important Bird Area (IBA) by Bird Studies Canada. In that same year the Province of Alberta, under the Special Places 2000 program, also designated it as a "Conservation Natural Area".

Big Lake is recognized as an important waterfowl moulting and staging site, and is considered one of 20 most important waterfowl habitat units in Alberta. Most of the waterfowl consist of dabbling and diving ducks, but a large number of tundra swans are present during the last weeks of October. The west bay of Big Lake supports a large colony of nesting Franklin's gulls. Nesting colonies of eared grebes and black terns are also found on the lake. In low water years, a variety of migrating shorebirds can also be observed at the north end of the lake. Common species include yellowlegs, dowitchers, pectoral sandpipers, American avocets, and a variety of small sandpipers.

Reach Seven

Redberry Lake

The Redberry Biosphere Reserve, designated a UNESCO World Heritage Site in 2000, is located just west of the North Saskatchewan River, southwest of Blaine Lake and west of Waldheim, Saskatchewan. It is primarily a wildlife sanctuary that has been protected since 1915. Although not a feeder lake for the North Saskatchewan River, pelicans, herons and other water birds from this sanctuary come to the North Saskatchewan River to fish since Redberry Lake is saline and does not support fish.

4.2 Terrestrial Ecosystems

Rivers modify the different terrestrial ecosystems through which they flow by providing additional accessible water and by creating various types of micro-climatic variations. The North Saskatchewan River flows through the Montane Subregion of the Rocky Mountain Natural Region; it passes through both the Upper and Lower foothills Subregions of the Foothills Natural Region before crossing the Dry Mixedwood Subregion of the Boreal Forest Natural Region. Next it moves across the Central Parkland Subregion of the Parkland Natural Region, and finally, it flows again through the Dry Mixedwood Subregion, with the

Table 3 - Specific Terrestrial Ecosystems

(areas greater than 400 acres)

Reach Five	• Riparian habitat north & east of Bruderheim • Ukalta Dunes south of Victoria Settlement • Egg Creek west of Duvernay (riparian habitat) • North slope west of Duvernay (riparian habitat)
Reach Six	• North slope east of Duvernay (native forbs & grasses) • South slope Rannich area • Fort D'Isle • South slope at Fort D'Isle • Death River Valley • North slope Fort George/Buckingham House

From Study of Rivers in Alberta 1995, Phase 2

Central Parkland Subregion never far from, and sometimes overlapping its south bank until it leaves Alberta.

Within Alberta's Subregions and Natural Regions are Environmentally Significant Areas (ESAs) and Parks and Protected Areas. The Environmentally Significant Areas identify land that is to be given special consideration during planning and implementing land uses. The Parks and Protected Areas are areas protected under legislation. All of these designated areas support terrestrial ecosystems that express high species biodiversity.

4.2.1 Environmentally Significant Areas (ESAs) and Protected Areas

In 1992, Maryhelen Posey wrote a discussion paper, "Saving Strands of Life: Alberta's Biodiversity" for the Environment Council of Alberta, wherein she points out, "the term biological diversity or biodiversity is a relatively new way of describing a very old, very complex, natural phenomenon."[60] It was in response to concern for protecting biodiversity that Environmentally Significant Areas and Protected Areas, in Alberta had their genesis. Since the greatest biodiversity in any landscape occurs in the riparian area surrounding water bodies, it is not surprising that many ESA's are found in and around the North Saskatchewan River. Designating and protecting these valuable habitats contributes to the Natural Value and Heritage Integrity of the North Saskatchewan River.

ESA's on the North Saskatchewan River by reach:

Reach One

In the upper section of REACH ONE the river flows through the Montane Subregion of the Rocky Mountain Natural Region, encountering six ESA's.

- Siffleur Wilderness Area - 41, 215.943 hectares
- White Goat Wilderness Area - 44, 457.140 hectares
- Kootenay Plains Provincial Recreation Area - 108.260 hectares
- Kootenay Plains Ecological Reserve brackets the river from upstream of Abraham Lake to just past Whirlpool Point. This 35 km^2 provincially protected area is a primary wintering ground for large ungulates (elk, mule deer, mountain sheep and moose). There is 5 km of managed hiking trails to Siffleur Canyon and falls, but overnight camping and motorized vehicles access is prohibited. Vegetation ranges from dry grassland & open aspen forests to closed lodgepole pine and white spruce forests. On the west-facing slopes above the North Saskatchewan River, over 60 bird species, 14 mammal species and 2 amphibian species have been recorded.

  Key Features:

  - Vegetation mosaic of open forests and grasslands typical of the Montane.

- Desert-like climatic conditions with above average temperatures, low annual precipitation and frequent Chinook winds.
- North Saskatchewan River valley with fluvial and glaciofluvial terraces and fans as well as areas of glaciolacustrine, aeolian and morainal deposits.
- Wildlife habitat important for wintering of ungulates and for wildlife movement to adjacent lands.
- Native ceremonial and religious activities that have historically occurred at Kootenay Plains.
- *Rare plant species: Glandular Labrador Tea* (*Ledum glandulosum*), Alaska Willow (*Salix alaxenis*), One-flowered Ironplant (*Haploppus uniflorus*), Mountain Mare's-tail (*Hippuris montana*), Leafy Braya (*Braya humilis*), Whitlow-grass (*Draba fladnizensis*).
- 1000 year old Limber pine at Whirlpool Point most northerly in NA, and found to contain unique genetic material (Mitton *et al.* 1999)
- Significant plant communities, habitats & features [Willow-Birch fen, Channel edge, Meander pools, Calcareous cliff vegetation, Spring fed wetland, Peripheral pond vegetation, Tree of Renown]. (*From Alberta Protected Areas fact sheet*)

Alexo Provincial Natural Area is located around the mouth of Shunda Creek. These 33.387 hectares of land are adjacent to Camp Alexo (Boys' and Girls' Club of Red Deer).

Key Features:

- Tributary creek of Shunda Creek
- Pine forests
- Aspen-poplar and mixedwood forests
- Scenic views of Front Ranges from vantage points
- Historical interest (abandoned mine site)
- Diverse terrain (elevation 1250 m to 1310 m). (*From Alberta Protected Areas fact sheet*)

Douglas Fir Provincial Natural Area is found along Abraham Lake, with access by foot and canoe only. 320.250 - hectare area.

Key Features:

- Highly diverse plant communities
- Relatively uncommon Douglas fir found in abundance in pure & mixed stands
- Wintering range for bighorn sheep and elk. (*From Alberta Protected Areas fact sheet*)

Reach One & Two

Through most of **Reach One** and all of **Reach Two** the river flows through the Foothills Natural Region, passing six ESA's.

Mill Island Provincial Natural Area is on the North Saskatchewan River 12 km north of Rocky Mountain House at the mouth of Chicken Creek. Canoeists mostly access this area of 79.844 hectares.

Key Features:

- Floodplain of North Saskatchewan River dissected by numerous dry river channels
- Area becomes an island during high water
- Mature mixedwood (spruce and poplar) stands
- Calcareous marsh along a river channel
- High use by wildlife
- Numerous orchid species (*from Alberta Protected Areas fact sheet*)

Crimson Lake Provincial Park - 3,208.959 hectares

Key Features:

- Diverse wetlands, including beaver ponds and black spruce and tamarack fens - sand dunes -uplands of aspen and lodgepole pine - several plant species of Concern (ANHIC)
- Wildlife includes black bear, moose, mule deer, and beaver
- Forest includes aspen, spruce, and pine
- 51 species of birds including the song sparrow, robin, loon, and woodpeckers

Washout-Saskatchewan Provincial Natural Area - 428.845 hectares

Key Features:

- Rolling uplands and steep banks along North Saskatchewan River
- Incised by numerous drainage gullies and small creek ravines
- Some river terracing, flood plains and meander scars
- Generally mixedwood forests comprised of aspen, balsam poplar, white spruce and paper birch of varying ages and dominance patterns
- Willow shrublands and sedge wetlands

Additional Comments:

- Within Pembina Oil and Gas Field so some parcels heavily disturbed
- Adjacent gravel operation with access through Natural Area
- Receiving current use, mainly by campers, picnickers
- Scenic value and good recreational potential
- Good wildlife habitat

Washout Creek Provincial Protected Area - 129.095 hectares

Key Features:

- Creek through area
- Moderately diverse
- Mature upland mixedwood of aspen-white spruce-balsam poplar
- Black spruce and black spruce-tamarack wetlands
- Young aspen-balsam poplar/shrub community along creek

Pembina Field Provincial Natural Area - 250.00 hectares

Key Features:

- Breaks and floodplain of North Saskatchewan River
- Abandoned river channels
- Aspen woodlands
- Mature white spruce
- Diverse shrublands on hillsides and in old channels
- Mature riverine balsam poplar

Additional Comments:

- Heavily disturbed in areas of oil and gas field activity
- Scenic, although disturbed
- All parcels show recreation use

Rocky Rapids Natural Area - 65.154 hectares

Key Features:

- Moderately undulating with creek
- Cover mainly mixedwood of aspen, white spruce, scattered paper birch, lodgepole pine and balsam poplar
- Willow shrubland
- Wet meadow
- Beaver ponds along creek

Reach Three

Reach Three crosses the Dry Mixedwood Subregion of the Boreal Forest Natural Region through ten ESA's.

Drayton Valley Provincial Natural Area - 695.187 hectares

Key Features:

- Adjacent to North Saskatchewan River
- Rolling to incised uplands cut by creeks

- Steep river embankments
- River floodplain and old channels
- Mixedwood stands and aspen woodlands
- Mature balsam fir and white spruce forest along some river breaks
- Riverine balsam poplar
- Diverse shrublands and wetlands

Additional Comments:

- Substantial petroleum and natural gas activity in this area
- County park development in 10 and 11; access road has been a cause of concern
- Proposed ski trail development
- Diverse and scenic
- Excellent recreation potential, especially 2, 10, 11 and 14
- Current recreation use
- Good wildlife habitat

Buck Lake Creek Provincial Natural Area - 129.499 hectares

Key Features:

- Creek and steep, terraced embankment
- Diversity of habitats, but mainly black spruce- Labrador tea peatland
- Uplands of mature aspen with balsam poplar and white spruce
- Lodgepole pine-white spruce stands
- Young aspen regeneration
- Silverberry shrublands
- Good wildlife habitat - many game trails observed

Alsike Bat Lake Provincial Natural Area - 114.647 hectares

Key Features:

- Both parcels contain small, marshy lakes
- Lakes ringed by sedge meadow, cattail and willow
- Small black spruce-larch/Sphagnum community
- Rolling uplands of aspen and balsam poplar with some birch and white spruce
- Diverse fauna

Additional Comments:

- Good site for aquatic-based educational studies
- Good access to Drayton Valley

North Saskatchewan Provincial Natural Area - 269.00 hectares

Key Features:

- Rolling uplands, river terraces, ravines and steep banks of North Saskatchewan River
- Rich diverse forests
- Mainly aspen-balsam poplar forest
- Variety of mixedwood stands comprised of aspen, balsam poplar, paper birch, white spruce
- Some pure white spruce/feathermoss forest
- Several rare or occasional plant species: *Thalictrum sparsiflorum*, *Malaxis monophylla* (S2), white lady's-slipper (probably white form of *Cyprepedium calceolus*)
- Shrublands near river and on cliffs
- Small sedge wetlands

Additional Comments:

- Value for wildlife and for conservation due to diversity and presence of uncommon plants
- Low disturbance

Modeste Creek Provincial Natural Area - 388.903 hectares

Key Features:

- All parcels include parts of Modeste Creek
- Rolling uplands of aspen with some balsam poplar and white spruce with rich shrub and herb understory
- Creek terraced with small ponds (spring-fed)
- Plant fossil material outcropping along creek (SW 20)
- Steep creek banks
- Excellent wildlife habitat

Additional Comments:

- Scenic
- Strong local interest
- Current recreational use

Modeste-Saskatchewan Provincial Natural Area - 403.310 hectares

Key Features:

- Steep banks, flats and terraces of the North Saskatchewan River
- Small creeks in several parcels and part of Modeste Creek in NW 5

- Most parcels dominated by aspen forest with balsam poplar, paper birch and white spruce
- Pure stands of white spruce and of paper birch
- Variety of shrublands
- NW 22 mainly wetland complex of black spruce-tamarack/Labrador tea/peatmoss

Additional Comments:

- Recommendation to drop NE 7 because it is heavily grazed and access is through private land
- Overall these parcels are fairly undisturbed
- NW 5 and N 1/2 11 are quite diverse
- 13 & 14 are not as diverse, but are good wildlife habitat and have recreational potential
- NW 22 is a good example of a boreal wetland

Coyote Lake Provincial Natural Area - 1,253.311 hectares

Key Features:

- Small lake in S 1/2 30; part Coyote Lake in NE 29
- Rolling upland of aspen; some balsam poplar and white spruce
- Various depressional wetland communities, including larch-black spruce/Sphagnum, sedge meadows, birch willow shrublands
- Excellent wildlife habitat and diversity
- Rare plant and bird species

Additional Comments:

- Local support for Natural Area
- Good access and recreational potential
- 29, 30 have been zoned for wildlife and passive recreation by the county

St. Francis Provincial Natural Area - 126.000 hectares

Key Features:

- Scenic, with recreational potential
- Low disturbance

Additional Comments:

- Order-in-Council 333/79 erroneously deleted NE 2, NE 10, LSDs11 & 14 of 10, SE 18 (South/River), N 1/2 26 from original Natural Area (Order-in-Council 454/71)
- Recommendation to re-establish SE 18 and NW 26 as Natural Areas, and also to add the island in N 1/2 25

Burtonsville Island Provincial Natural Area - 328.000 hectares

Key Features:

- Large island in North Saskatchewan River
- Variety of riverine, successional communities
- Shrubland dominated by red osier dogwood with scattered paper birch & balsam poplar
- White spruce-balsam poplar stand with diverse shrub layer
- White spruce/feather moss forest

Additional Comments:

- The University of Alberta and the Edmonton Public School system for education purposes have used island since 1958.

Genesee Provincial Natural Area - 179.398 hectares

Key Features:

- Moderately rolling upland incised by two creeks
- Adjacent to North Saskatchewan River
- Aspen-dominated forest with white spruce, balsam poplar and paper birch present, and with a dense understory
- Important fossil bed, with specimens dating back 60 million years, in river bank

Additional Comments:

- Key wildlife area (white-tailed and mule deer, and moose)
- Quite undisturbed
- In the past, large numbers of amateur rockhounds collected fossils in a destructive manner. This activity apparently ceased and the scientific community appears to be seeking permission prior to collecting

Reach Four

Reach Four is where the river enters the Central Parkland Subregion of the Parkland Natural Region and travels through 2 ESA's and a unique series of riverside parks and protected green areas under the stewardship of the municipalities of Devon, Edmonton and Fort Saskatchewan, and the counties of Leduc, Parkland, Strathcona, and Sturgeon.

Thorsby Provincial Natural Area - 65.150 hectares

Key Features:

- Strawberry Creek and accompanying flats, floodplains and meander scars
- Fairly level with occasional depressions in north half
- Mainly dense aspen forest with diverse and dense shrub and herb layers

- Small stands of white spruce in ravine bottoms
- Shrublands on south-facing slopes and on creek flats

Additional Comments:

- Heavily utilized by deer and moose
- Used presently for hunting
- Undisturbed

Strathcona Science Provincial Park - 109.168 hectares

Key Features:

- Park contains three major attractions: the Natural Resources Science Centre, the ski lifts and a ski chalet, and the Archaeological Site and Research Pavilion.

Reach Five

Reach Five is where the river becomes an interesting boundary between the Boreal Forest Natural Region's Dry Mixedwood Subregion and the Parkland Natural Region's Central Parkland Subregion.

Redwater Provincial Natural Area - 2,200.000 hectares

Key Features:

- Sand dunes of transverse, parabolic and barchan types on deltaic deposits of glacial Lake Bruderheim
- Jack pine-lichen woodlands on dune crests
- Diverse wetlands in dune depressions: black spruce-tamarack/Sphagnum moss muskeg, sedge and dwarf shrub fens, and occasional open sloughs ringed by cattails
- Aspen-paper birch stands rim wetlands
- Diverse fauna (including butterflies)
- Hudsonia tomentosa occurs near southern limits of its distribution

Additional Comments:

- Military personnel have used site since about 1970
- Used by hiking and naturalist clubs, Edmonton Motorcycle Club
- Commercial trail riding (licence of occupation)
- Heavy off-highway vehicle and snowmobile use in some parts
- Parts heavily disturbed by petroleum and natural gas activity

Astotin Provincial Natural Area - 129.500 hectares

Key Features:

- Gently rolling topography with creek in southeast corner
- Sandy knolls and depressions in north
- White spruce-aspen forest
- Birch-white spruce stands
- Willow shrub fens rimmed with aspen
- Abundant wildlife
- Jack pine woodlands on sandy knolls

Additional Comments:

- Extensive, patchy fire 1988
- Important habitat-island for wildlife
- Existing trails, existing recreational use: snowmobiling, horseback riding, cross-country skiing
- Close to Edmonton, surrounded by mainly patented, cleared land, located within a large heavy industrial zoned area, will provide a good buffer to any new adjacent developments
- Educational potential

Victoria Settlement Provincial Natural Area - 14.164 hectares

Key Features:

- Island in North Saskatchewan River
- Steep south-facing embankment

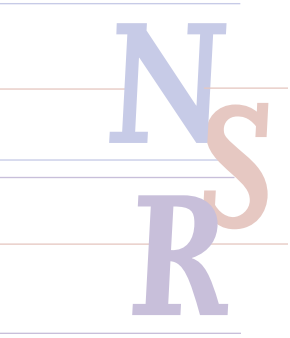
Additional Comments:

- Small area with difficult access
- Good wildlife habitat
- Small area

North Bruderheim Provincial Natural Are - 438.877 hectares

Key Features:

- Rolling stabilized sand dunes
- Upland jack pine woodlands
- Variety of wetlands in dune depressions including: willow/sedge, sedge-reed grass, black spruce muskeg
- Sloughs and deeply incised ravine of Beaverhill Creek



Additional Comments:

- W 1/2 LSD 12 of 20-56-20-W4 under recreation lease (Boy Scouts)
- N Bruderheim NA Recreation Development Plan concept in 1988
- Management plan draft 1994
- Add SE 29 and N 1/2 20 to Order-in-Council
- Special Places CNT on whole area
- Bruderheim Natural Areas Society has a REC lease (920021) on whole area
- Some landowners and users are having confrontation with OHV users

Northwest of Bruderheim Provincial Natural Area - 388.900 hectares

Key Features:

- Upland sand dunes and sandy plateaus interspersed with lowland wetlands
- Jack pine-lichen woodlands on uplands
- Variety of wetlands including: black spruce- tamarack/Labrador tea, dwarf birch-willow, sedge-cotton grass meadow
- Lowland communities grade into poplar woodlands

Additional Comments:

- Used for military exercises, adventure games

Reach Six

In Reach Six the river continues its passage through the Boreal Forest Natural Region's Dry Mixedwood Subregion to the north and the Parkland Natural Region's Central Parkland Subregion to the south.

Whitney Lakes Provincial Parks - 1,488.786 hectares

Key Features:

- Series of lakes in a rolling countryside
- Uplands of pine and spruce aspen and birch, diversity of wetlands
- Good wildlife habitat

Theme Five
Vegetation

Theme Five focuses on exceptionality of plant species. This theme is divided into 2 sub-themes:

5.1 Significant Plant Communities - communities of plants

5.2 Rare plant species - significant individual plant occurrences

5.1 Significant Plant Communities

The elements of this sub-theme define species type, those that are prominent in various plant communities (e.g. aquatic/riparian, vascular, trees/shrubs) as well as the exceptionality of particular plant communities (e.g. extent in numbers, unusual location, community dynamics, diversity). Plant communities that qualify to be mentioned here inhabit areas where *"outstanding concentrations of plants of Canadian interest and significance are found."*[61]

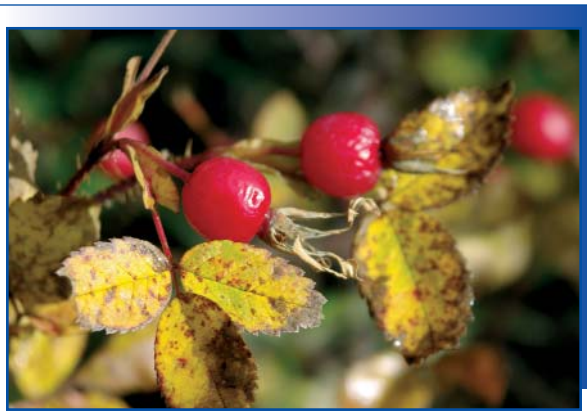
Because the North Saskatchewan River flows through four Natural Regions and five Sub regions, it supports a unique variety of vegetative communities. Although many vegetative communities are not unique in and of themselves, taken together with all the other diverse vegetative communities supported by this river system, the over all biodiversity of vegetative communities along the North Saskatchewan River becomes an exceptional representation in the CHRS system. To emphasise the importance of interconnected plant communities, each community is described in some detail. Mapping the overlapping mosaic of inter-related units of plant assemblages is beyond the scope of this study. However, because of the importance of the emerging science of 'plants that live together' to resource management this concept is mentioned. Because it is now well understood that biotic species or communities do not exists without interlinking with other biotic species and communities, many new questions must be asked during the water management process. Not only is it important to discover how and why plant species arrange in specific communities, it is also possible to explore the place and order of animals in an ecosystem by investigating their affiliation "with various plant communities."[62]

Because, for the purpose of this study, the river reaches identified in the Alberta portion of the North Saskatchewan River follow provincial Natural Subregion boundaries fairly closely, representative plant communities found in each Subregion is described.

In Reach One the river passes through the Montane Subregion of the Rocky Mountain Natural Region, and both the Upper Foothills and Lower Foothills Subregions of the Foothills Natural Region.

Montane Subregion

Tree species characteristic of the Montane Subregion include: *Pseudotsuga menziesii* (Douglas fir), *Pinus flexilis* (limber pine) and *Picea glauca* (white spruce). Ridgetop



Rose Hip
photo Billie Milholland

open forests, dominated by Douglas fir and limber pine, are dry forest communities supporting great habitat diversity.

Typical understory vegetation in closed Douglas fir forests include: *Calamagrostis rubescens* (pine grass), *Elymus innovatus* (hairy wild rye), *Carex concinnoides* (northwestern sedge), *Arctostaphylos uva-ursi* (bearberry), *Juniperus* spp. (junipers), and *Symphoricarpos albus* (snowberry).

Limber pine forests, found mostly on exposed rock outcrops and eroding morainal or colluvial slopes, are generally open. Typical understory species include: *Arctostaphylos uva-ursi* (bearberry), *Juniperus* spp. (junipers), *Agropyron spicatum* (bluebunch wheat grass), *Festuca idahoensis* (Idaho fescue), *Galium boreale* (northern bedstraw), *Cerastium arvense* (mouse-ear chickweed), *Penstemon eriantherus* (crested beard-tongue) and *Phacelia* spp. (scorpion-weed).

White spruce forests occur on more mesic sites especially along streams on fluvial terraces. Aspen forests occur characteristically on fluvial fans and terraces often with Regosolic and Brunisolic soils.

Upper Foothills Subregion

Upland forests of the Upper Foothills Subregion are mostly coniferous, dominated by *Picea glauca* (white spruce), *Picea mariana* (black spruce), *Pinus contorta* (lodgepole pine), and, occasionally, *Abies lasiocarpa* (subalpine fir). Some hybridization between white spruce and Engelmann spruce (*Picea engelmannii*) and between subalpine fir and balsam fir (*Abies balsamea*) occurs in portions of the subregion.

Lodgepole pine forests understory species include *Menziesia ferruginea* (false azalea), *Shepherdia canadensis* (buffaloberry), *Rosa acicularis* (prickly rose), *Ledum groenlandicum* (Labrador tea), *Cornus canadensis* (bunchberry), *Linnaea borealis* (twin flower), *Epilobium angustifolium* (fireweed), *Vaccinium vitis-idaea* (bog cranberry), and the feathermosses (*Hylocomium splendens, Pleurozium schreberi, Ptilium crista-castrensis*).

The understory of upland spruce forests in this subregion is similar to that of the lodgepole pine forests with older stands on mesic[1] sites often having a well-developed moss layer dominated by feathermosses (*Hylocomium splendens, Pleurozium schreberi, Ptilium crista-castrensis*).

Black spruce dominates the lower wet sites. Typical understory species include *Ledum groenlandicum* (Labrador tea), *Betula* spp. (dwarf birch), *Lonicera involucrata* (bracted honeysuckle), *Equisetum* spp. (horsetails), *Mitella nuda* (bishop's cap), *Linnaea borealis* (twinflower), *Sphagnum* spp. (peat mosses), and brown mosses (*Aulacomnium palustre, Tomenthypnum nitens*).

1 Mesic: In forest environments a mesic site is one that is neither very wet nor every dry.

Lower Foothills Subregion

The transitional nature of this subregion is reflected in mixed forests of *Picea glauca* (white spruce), *Picea mariana* (black spruce), *Pinus contorta* (lodgepole pine), *Abies balsamea* (balsam fir), *Populus tremuloides* (aspen), *Betula papyrifera* (paper birch), and *Populus balsamifera* (balsam poplar). Lodgepole pine communities are one indication of the lower boundary of this subregion with the adjacent Boreal Forest mixedwood forests. The upper boundary to the Upper Foothills Subregion is marked by the absence of mixed deciduous-coniferous forests and a nearly pure coniferous forest cover.

Lodgepole pine forests occupy extensive portions of the upland in this subregion, especially following a fire. Understory species on drier sites include *Shepherdia canadensis* (buffaloberry), *Spiraea betulifolia* (white meadowsweet), *Juniperus* spp. (junipers), *Arctostaphylos uva-ursi* (bearberry), and *Vaccinium myrtilloides* (low bilberry). On more mesic sites, white spruce and aspen are more frequent in the tree layer and the understory contains a large number of species including *Rosa acicularis* (prickly rose), *Ledum groenlandicum* (Labrador tea), *Cornus canadensis* (bunchberry), *Linnaea borealis* (twin flower), *Epilobium angustifolium* (fireweed), *Vaccinium vitis-idaea* (bog cranberry), and the feathermosses (*Hylocomium splendens, Pleurozium schreberi, Ptilium crista-castrensis*).

Black spruce forests occur on moist upland sites in the north as well as on wet Organic soils (muskegs). Typical understory species include *Ledum groenlandicum* (Labrador tea), *Betula* spp. (dwarf birch), *Lonicera involucrata* (bracted honeysuckle), *Equisetum* spp. (horsetails), *Mitella nuda* (bishop's cap), *Linnaea borealis* (twinflower), *Sphagnum* spp. (peat mosses), and the brown mosses (*Aulacomnium palustre, Tomenthypnum nitens*).

Fens, both patterned and unpatterned, are common in much of this subregion. These communities typically contain scattered trees of black spruce and tamarack (*Larix laricina*) with an understory of *Betula* spp. (dwarf birch), *Ledum groenlandicum* (Labrador tea), *Salix* spp. (willow), *Carex* spp. (sedges), *Menyanthes trifoliata* (bog bean), *Deschampsia caespitosa* (tufted hairgrass), and both peat and brown mosses (*Sphagnum* spp., *Tomenthypnum nitens, Aulacomnium palustre*).

Along the river the Kootenay Plain at the south end of Abraham Lake "*offers a unique montane environment that is as dry as the plains of southeastern Alberta. Disjunct grasslands, limber pine forest, fern-rich cliffs, calcareous wetlands, and riverine dune fields contribute to the diversity of this area. ....The grasslands are dominated by June grass and northern wheat grass, with lesser amounts of pasture sage and dragon wort.*"[63]

In **Reach Two** the river passes exclusively through the Lower Foothills subregion of the Foothills Natural Region.

In **Reach Three** the river passes exclusively through the Dry Mixedwood Subregion of the Boreal forest Natural Region.

Dry Mixedwoods Subregion

Dry Mixedwood Subregion vegetation is transitional between the Central Parkland and Central Mixedwood Subregions and there are community types common to all three. The differences are largely in the proportion of various vegetation types and other landscape features. *Populus tremuloides* (aspen) is an important species in all three Subregions, occurring in both pure and mixed stands. *Populus balsamifera* (balsam poplar) frequently occurs with aspen especially on moister sites in depressions and along streams.

Successionally, *Picea glauca* (white spruce) and, eventually in some areas, *Abies balsamea* (balsam fir) can be expected to increase or replace aspen and balsam poplar as stand dominants. However, frequent fire seldom permits this to occur and pure deciduous stands are common in the southern part of the Dry Mixedwood Subregion. Coniferous species are more common further north in the Dry Mixedwood Subregion with mixed stands of aspen and white spruce being widespread. Older stands in protected sites, such as islands, may have significant amounts of balsam fir.

Upland aspen forests contain a diverse understory that may include *Viburnum edule* (low-bush cranberry), *Corylus cornuta* (beaked hazel), *Rosa acicularis* (prickly rose), *Cornus stolonifera* (red-osier dogwood), *Calamagrostis canadensis* (marsh reed grass), *Aralia nudicaulis* (sarsaparilla), *Rubus pubescens* (dewberry), *Lathyrus ochroleucus* (cream-coloured peavine), *Pyrola asarifolia* (pink wintergreen) and *Linnaea borealis* (twinflower). Both balsam poplar and *Betula papyrifera* (paper birch) may occur in these forests as well.

Coniferous, spruce or spruce-fir forests are not common but generally have a less diverse understory with greater moss cover especially of the feathermosses (*Hylocomium splendens, Pleurozium schreberi, Ptilium crista-castrensis*).

Mixedwood forests generally contain a mosaic of deciduous and coniferous patches with species typical of each occurring through the stand.

Dry, sandy upland sites are usually occupied by *Pinus banksiana* (jack pine) forests. These may be quite open and have a prominent ground cover of lichens. Other understory species may include *Arctostaphylos uva-ursi* (bearberry), *Vaccinium myrtilloides* (low bilberry), *Vaccinium vitis-idaea* (bog cranberry) and *Rosa acicularis* (prickly rose).

Peatlands are common throughout the Subregion but are not as prevalent as in other Boreal Forest Subregions. Peatland complexes typically contain both nutrient-poor, acidic bog portions, dominated by *Picea mariana* (black spruce), *Ledum groenlandicum* (Labrador tea), and *Sphagnum* spp. (peatmosses) and more nutrient-rich fens, containing *Larix laricina* (tamarack), *Betula* spp. (dwarf birches), *Carex* spp. (sedges), and brown mosses (*Aulacomnium palustre, Tomenthypnum nitens, Drepanocladus* spp.). Patterned peatlands occur in several areas.

In **Reach Four** the river passes exclusively through the Central Parkland Subregion of the Parkland Natural Region.

Central Parkland Subregion

Within the Central Parkland Subregion, there is a continuum from south to north of grassland with groves of aspen (*Populus tremuloides*), to aspen parkland, to closed aspen forest in the north. True parkland vegetation with continuous aspen forest broken by grassland openings is now very rare due to large scale clearing.

Two major forest types are recognized here on morainal and glaciolacustrine materials; a *Populus tremuloides* (aspen) type and a *Populus balsamifera* (balsam poplar) type on moister sites in depressions and in the northern part of the subregion. Both are characterized by a dense, lush, species-rich understory.

Aspen (*Populus tremuloides*), also known as: quaking aspen, trembling aspen, golden aspen, mountain aspen, poplar and trembling poplar. It will grow in a great variety of soil conditions ranging from shallow and rocky to deep fresh, coarse loamy sands and heavy clays. The trembling aspen is a major component of the boreal forest in association with a variety of species in mixed stands. Species characteristic of the *Populus tremuloides* type include *Symphoricarpos albus* (snowberry), *Amelanchier alnifolia* (saskatoon), *Corylus cornuta* (beaked hazel), *Prunus virginiana* (choke cherry), *Cornus canadensis* (bunchberry), *Maianthemum canadense* (wild lily-of-the-valley) and *Schizachne purpurascens* (false melic grass).

Balsam poplar (*Populus balsamifer*) is the northernmost North American hardwood. It occurs on sites that are relatively rich in nutrients and less acidic, and in relatively small, localized stands. Species characteristic of the moister *Populus balsamifera* forests include *Cornus stolonifera* (red osier dogwood), *Salix discolor* (pussy willow), *Ribes oxyacanthoides* (northern gooseberry), *Alnus crispa* (green alder), *Lonicera involucrata* (bracted honeysuckle), *Mertensia paniculata* (bluebells), *Petasites palmatus* (palmate-leaved coltsfoot), *Mitella nuda* (mitrewort) and *Actaea rubra* (baneberry). Species common to both types include *Rosa acicularis, Rosa woodsii* (woods rose), *Viburnum edule* (low-bush cranberry), *Rubus idaeus* (wild red raspberry), *Rubus pubescens* (dewberry), *Lonicera dioica* (twining honeysuckle), *Aralia nudicaulis* (sarsaparilla), *Agropyron trachycaulum* (bearded wheat grass), *Disporum trachycarpum* (fairy bells), *Pyrola asarifolia* (pink wintergreen), *Aster ciliolatus* (Lindley's aster), *Galium boreale* (northern bedstraw), *Epilobium angustifolium* (fireweed), *Lathyrus ochroleucus* (cream-colored peavine), *Vicia americana* (American vetch), and *Smilacina stellata* (star-flowered Solomon's seal).

Shrub communities are more extensive in the northern portion of the subregion and often extend in belts outward from the forest communities. Major species are *Symphoricarpos occidentalis, Rosa* spp., *Prunus virginiana, P. pensylvanica, Amelanchier alnifolia* and *Elaeagnus commutata*.

A low shrub often associated with balsam poplar includes Red osier dogwood (Cornus sericea). It is a characteristic species of swamps, low meadows, and riparian zones; and it is also found in forest openings, open forest understories, and along forest margins. Dogwood refers rich, moist soils with pH range of 5.5 to 7.0. High levels of mineral nutrients needed for vigorous growth. Tolerates flooding and, consequently, is found on floodplains and wetlands and is often one

of the first shrubs to invade wet meadows. Seeds germinate above water level, but after several years' growth, the plants can live with the roots submerged in water for most of the growing season. Plants on such wet sites are found in mineral rich swamps or fens and not in nutrient poor sphagnum bogs. Can sprout from surviving roots or stolons and from the base of aerial stems following fire but may be killed by severe fires, which cause extended heating of the upper soil. Considered to be a semi-fire-tolerant, seed-banking species. Light fires that partially remove the duff stimulate germination of buried seed. Generally increases following fire, and may invade a recently burned area from adjacent unburned areas.64

Mammals: Food and cover for white-tailed deer, moose, cottontail rabbits, snowshoe hares, and numerous birds, including grouse. Fruit also eaten by mice and other mammals. Deer mice, meadow voles, and other small rodents feed on the young stems and bark. Beavers use it for food and to build dams and lodges. Particularly important to moose in the winter; it is also used in the summer and in the fall when leaves that have escaped frost are particularly favoured. Provides valuable cover for birds and other small animals, especially where it grows in thickets

Birds: Fruit is low in sugar so it is initially less attractive to wildlife, but is also less inclined to rot than other fruits, staying on the plant through the winter, and available when other fruits are gone. Eaten by songbirds, grouse, quail, partridge, ducks, crows, and other birds.

The Kennedale Ravine within the city of Edmonton, which now encompasses Kennedale and Hermitage Parks protects *"a variety of interesting mushrooms."*65

In **Reach Five** the river creates a general demarcation line between the Dry Mixedwood Subregion of the Boreal Forest Natural Region to the north and the Central Parkland Subregion of the Parkland Natural Region to the south.

In **Reach Six**, for the first half of its journey, the river passes exclusively through the Dry Mixedwood Subregion of the Boreal Forest Natural Region, and then for the second half of its journey it creates a general demarcation line between the Dry Mixedwood Subregion of the Boreal Forest Natural Region to the north and the Central Parkland Subregion of the Parkland Natural Region to the south.

5.1.1 Vascular Plants along the River66

Most species extend both north and south from the river. However, for a number of plants, the river valley represents the northern-most or the southern-most limit of their range in the province of Alberta.

Examples include typical boreal species such as: ground-pine (Lycopodium obscurum), actually a club moss, which is widespread across the boreal forest and found in moist sites in woods, thickets and clearings; bulb-bearing water-hemlock (Cicuta bulbifera) found in marshes, fens, wet meadows and shallow standing water, and is widespread but rarely abundant across boreal forest; northern starflower

(Trientalis borealis) in moist woods across the boreal forests of the prairie provinces.

Typical prairie species that are supported by sandy or otherwise dry habitats along the North Saskatchewan River include Skeletonweed (Lygodesmia juncea), meadow blazingstar (Liatris ligulistylis), which provides seed meals for goldfinches and other songbirds, and attracts Monarch butterflies. Blue grama (Bouteloua gracilis), typical of native grass species is not usually harmed by natural fire events, in fact, is sometimes increased by them, and sand grass (Calamovilfa longifolia) which grows on active dune complexes, stabilized blowouts, stabilized dunes, dune depressions, sand flats, sandy ridges and hills, south slopes, and dry valleys. It is an early colonizer in sand dunes and is characteristic of recently disturbed sand and deep sandy soils.[67] Because sand grass is a long-lived perennial that reproduces from rhizomes and seed, the benefits of its presence needs to be recognized in conjunction with long-term stabilization of sandy soils.

5.1.2 Non-Vascular Plants along the River[68]

The North Saskatchewan River, its islands and adjacent lands also harbour numerous common non-vascular plant species:

Common beaked moss (Eurhynchium pulchellum), Woodsy leafy moss (Plagiomnium cuspidatum), Golden ragged moss (Brachythecium salebrosum), Stocking moss (Pylaisiella polyantha) are typically found at the base of trees (usually deciduous) and/or on rotting wood in the riverine balsam poplar - mixed shrub stands along the river.

The dry, exposed or disturbed areas along the river are often inhabited by: Fire moss (Ceratodon purpureus), Cord moss (Funaria hygrometrica), Copper wire moss (Pohlia nutans). Clay pigtail moss (Hypnum lindbergii) grows along riverbanks, as does Meadow pigtail moss (Hypnum pratense). Red leaf moss (Bryoerythrophyllum recurvirostre) is found on slopes above the riverbank, but because of its very small size, there usually has to be a lot of this moss before it is noticed.

Along adjacent creeks grow species such as Large and gold spoon mosses (Calliergon giganteum and C. richardsonii), Hooked moss (Cratoneuron filicinum), clay hook moss (Drepanocladus aduncus), and Pale-leaved thread moss (Pohlia wahlenbergii).

The most common lichens found on the poplar trees along the river are members of the Rosette lichen family (Physciaceae: Phaeophyscia, Physcia, and Physconia), as well as the Orange lichen family (Teloschistaceae), Powdered Orange (Xanthoria fallax) and Pincushion orange (X. hasseana). Monk's hood lichen (Hypogymnia physodes) and Wax paper lichen (Parmelia sulcata) are also common on a variety of woody species. Because of high pollution levels near the urban areas, Horsehair lichen (Bryoria spp.), Spruce moss (Evernia mesomorpha) and Old Man's Beard lichen (Usnea spp.) are uncommon and found most

frequently on conifers. Pelt lichen (Peltigera spp.) occur occasionally on humus or the forest floor.

5.2 Rare Plant Species

Management of rare species used to be approached on an individual species basis. More recent scientific knowledge verifies what many naturalists have long believed, that no species exists alone. Biodiversity is now considered a significant factor in the conservation of rare species. The landscape, localized communities and specific habitats must now be considered in any management activity. The diverse ecosystems of the North Saskatchewan River corridor support many rare plant species, which have disappeared from other habitat. Rare species that are found along the North Saskatchewan River corridor could be indicative of favourable habitat that benefits other species. There is much work yet to be done in the area of rare plant surveys. Available data indicates whether a particular rare plant has been identified along the North Saskatchewan River, and when it was identified.

Elements are evaluated and ranked on their status (globally and state/provincially) using a system developed by The Nature Conservancy, which is in use throughout North America. Ranking is usually based primarily on the number of occurrences, since that is frequently the only information available. Information, such as population size and trend, life history and reproductive strategies, range and current threats is used when available.

Reach One

Non-vascular plants in Reach One ranked S1 and S2.

S1: Cushion Moss (*Dicranium angustum*), Moss sp. (*Orthothecium intricatum*), Moss sp. (*Didymodon tophaceus*), Lichen sp. (*Buellia retrovertens*), arid site Lichen (*Psora cerebriformis*), Lichen sp. (*Solorinella asteriscus*), Liverwort sp. (*Mannia fragrans*).

S2: Moss sp. (*Didymodon tophaceus*), Moss sp. (*Didymodon subandreaeoides*), Lichen sp. (*Arthrorhaphis citrinella*), Aloe-like Rigid Screw Moss (*Aloina rigida*), Rigid Screw Moss (*Didymodon regidulus*), Cuspidate Earth Moss (*Phascum cuspidatum*), Bent Screw Moss (*Tortella inclinata*), Lichen sp. (*Caloplaca Flavorubescens*), Lichen sp. (*Leptogium lichenoides*).

Vascular plants in Reach One ranked S1, S2, S3 and S4.

S1: (*Aster X maccallae*), (*Braya humilis var porsildii*), Alpine Braya (*Braya purpurascens*), Leafy Braya (*Braya humilis var maccallae*), Woolly Willow (*Salix lanata* ssp *calcicola*), Open Sedge (*Carex aperta*), (*Pellaea glabella ssp occidentalis*),

S2: Scented Everlasting (*Antennaria aromatica*), Hawk's Beard (*Crepis atribarba*), Wooly Hawkweed (*Hieracium cynoglossides*), Northern Bladderpod (*Lesquerella arctica var purshii*), (*Oxytropis campestris var davisii*), Small Northern Grass-of-Parnassus (*Parnassia parviflora*), Seaside Sedge (*Carex incurviformis var incurviformis*), Parry's Sedge (*Carex parryana var parryana*), Stone Sedge (*Carex petricosa*), Pale Blue-eyed Grass (*Sisyrinchium septentrionale*), Thread Rush (*Juncus Filiformis*)

Table 4 - Ranks in Alberta (G=Global; S=Alberta)		
Global Rank	Alberta Rank	Explanation
G1	S1	< 5 occurrences or only a few remaining individuals
G2	S2	6-20 occurrences or with many individuals in fewer occurrences.
G3	S3	21-100 occurrences may be rare and local throughout its range, or in a restricted range (may be abundant in some locations or may be vulnerable to extirpation because of some factor of its biology).
G4	S4	Apparently secure under present conditions, typically >100 occurrences but may be fewer with many large populations; may be rare in parts of its range, especially peripherally.
G5	S5	Demonstrably secure under present conditions, > 100 occurrences may be rare in parts of its range, especially peripherally.
GU	SU	Status uncertain often because of low search effort or cryptic nature of the element - possibly in peril, unrankable, more information needed.
GH	SH	Historically known, may be relocated in the future.
Other codes are: E: Exotic species established, may be native to nearby regions HYB: Hybrid taxon that is recurrent in the landscape P: Potentially exists; may have occurred historically (but having not been persuasively documented)		

S3: One-flowered Ironplant (*Pyrrocoma uniflora*), Narrow-petaled stonecrop (*Sedum stenopetalum*),

S4: Hooker's Cinquefoil (*Potentilla hookeriana*)

In 1980, the following plants were listed as "*unusual or rare*"[69]. Their present rank is not known. Mistassini Primrose (*Primula mistassinica*), Ground Daisy (*Townsendia sericea*), One-flowered Goldenweed (*Haplopappus uniflorus*), Cliff Brake (*Pellaea occidentalis*), and a dry environment fern (*Cheilanthes feei*).

Reach Two

Vascular plants in Reach Two ranked S2.

S2: White Adder's Mouth Orchid (*Malaxis monophylla*)

Reach Three

Vascular plants in Reach Two ranked S2.

S2: White Adder's Mouth Orchid (*Malaxis monophylla*)

Reach Four

Non-vascular plants in Reach Four ranked S1, S2, S3 and SU.

S1: Moss sp (*Pohlia atropurpurea*), Moss sp (*Bryum uliginosum*), Cushion Moss (*Didcranum ontatiense*), Blunt-leaved Moss (*Didymodon tophaceus*), Moss sp (*Entodon schliecheri*), Moss sp (*Leskea gracilescens*), Moss sp (*Leskea obscura*), Bladder-cap Moss (*Physcomitrium hookeri*), Moss sp (*Pohlia atropurpurea*), Moss sp (*Thuidium philibertii*), Lichen sp (*Phaeophyscia cernohorsky*), Lichen sp (*Physcia dimidiata*), Liverwort (*Mania pilosa*)

S2: Short-beaked Rigid Screw Moss (*Aloina Brevirostris*), Aloe-like Rigid Screw Moss (*Aloina rigida*), Moss sp (*Aongstroemia longipes*), Moss sp (*Entodon concinnus*), Liverwort (*Pellia neesiana*), Moss sp (*Brachythecium plumosum*), Moss sp (*Bryum algovicum*), Moss sp (*Bryum pallens*), Moss sp (*Conardia compacta*), Fallacious Screw Moss (*Didymodon fallax*), Moss sp (*Rhodobryum ontariense*), Moss sp (*Scouleria aquatica*), Lichen sp (*Physconia isidiigera*),

S3: Moss sp (*Bryobrittonia longipes*), Moss sp (*Brachythecium campestre*), Moss sp (*Campylium polygamum*)

SU: Moss sp (*Bryohaplocladium virginianum*)

Vascular plants in Reach Four ranked S1, S2 and S3.

S1: Leiberg's Millet (*Panicum Leibergii*), Canada Brome (*Bromus latiglumis*), Panic Grass (*Panicum wilcoxianum*), Marsh Muhly (*Muhlenbergia racemosa*), Canadian Rice Grass (*Oryzopsis canadensis*),

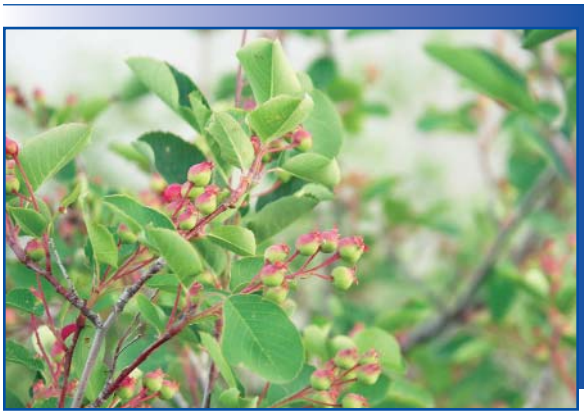
S2: Smooth Sweet Cicely (*Osmorhiza longistylis*), Herriot's Sagewort (*Artemisia tilesii*), Flat-topped White Aster (*Aster umbellatus*), American Water-horehound (*Lycopus americanus*), False Dragonhead (*Physostegia ledinghamii*), Long-leaved Bluets (*Hedyotis longifolia*), Crowfoot violet (*Viola pedatifida*), Hooker's Sedge (*Carex Hookerana*), Seaside Sedge (*Carex incurviformis var incurviformis*), Cyperus-like Sedge (*Carex pseudocyperus*), Turned Sedge (*Carex retrorsa*), White Adder's-mouth Orchid (*Malaxis monophylla*), Leather Grape Fern (*Botrychium multifidum var intermedium*), Field Grape Fern (*Botrychium campestre*), Fern sp (*Botrychium spathulatum*),

S3: Low Milkweed (*Asclepias ovalifolia*),

Reach Five:

Vascular plants in Reach Five ranked S1, S2 and S3.

S1: Panic Grass (*Panicum wilcoxianum*)



Unripe Saskatoons Edmonton
photo Billie Milholland

S2: Flat-topped White Aster (*Aster umbellatus*), American Water-horehound (*Lycopus americanus*), Long-leaved Bluets (*hedyotis longifolia*), Crowfoot Violet (*Viola pedatifida*)

S3: Low Milkweed (*Asclepias ovalifolia*),

Reach Six:

Vascular plants in **Reach Six** ranked S1, S2 and S3.

S1: Fringed Milkwort (*Polygala paucifolia*)

S2: False Dragonhead (*Physostegia leding hamii*), Long-leaved Bluets (*Hedyotis longifolia*), Turned Sedge (*Carex retrorsa*)

S3: Low Milkweed (*Asclepias ovalifolia*)

Regionally Rare

Moss:

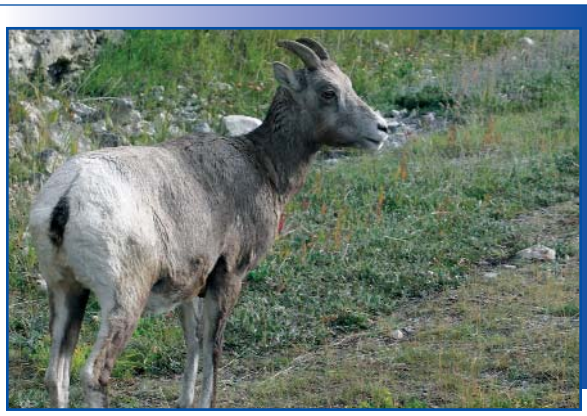
Reach One: *Miehlichhoferia macrocarpa* (Hook) in the upper reaches of the North Saskatchewan River. It was first discovered by Thomas Drummond, the assistant naturalist from the second Franklin expedition (1825 - 27)[70]

Disjunct

Anemone:

Reach One: Wood anemone (*Anemone quinquefolia*) is found only in the vicinity of Nordegg. It grows in mixedwood clearings, on sandy streamsides and riverbanks. The next nearest population of Wood Anemones is in east central Saskatchewan.[71]

Theme Six
Fauna



Mountain Sheep on Hwy 11
photo Billie Milholland

The Fauna theme addresses populations of animals that are associated with the river in performing their various activities such as nesting, feeding, migrating, and rearing young. These animals may be indigenous and perform all their activities in association with the river; migratory and visit the river environment seasonally to feed, moult, calve or breed; or transient and pass through the river environment enroute to their destination to stop and feed or rest. Sub-themes include:

The North Saskatchewan River flows through four Natural Regions and five sub regions, and supports a unique variety of animal species. Some of these species occur as individual populations and others occur within more complex inter-relationships. Mapping the overlapping mosaic of how animal species are inter-related is beyond the scope of this study. However, because of the importance to resource management of the emerging concepts of watersheds, airsheds and foodsheds this inter-relatedness will need to be explored in more detail in the future. Since it is well understood that species and communities exist only in relation with other species and communities, many new questions must be asked during the water management process.

For the purpose of this study, the river reaches identified in the Alberta portion of the North Saskatchewan River follow provincial Natural Subregion boundaries fairly closely and representative animal species found in each Subregion is described.

Reach One
Rocky Mountain Natural Region
Montane Sub-region

Wildlife

Douglas fir - limber pine habitats are typically inhabited by blue grouse, mountain chickadee, Hammond's flycatcher, Clark's nutcracker, mule deer, elk and Columbian ground squirrel. These habitats are also important ungulate winter range. Denser Douglas fir and lodgepole pine forests also contain yellow-rumped warbler (Audubon's subspecies), dark-eyed junco (Oregon subspecies), chipping sparrow, red crossbill, pine siskin and red squirrel. Aspen forests typically contain MacGillivray's warbler, warbling vireo and lazuli bunting.

Wetlands, streams and lakes are very productive for wildlife with Barrow's goldeneye, common snipe, red-winged blackbird, common yellowthroat, beaver, muskrat, and western toad. Spotted frog and long-toed salamander are two species of wet areas that are restricted to the Rocky Mountain Natural Region in Alberta.

Foothills Natural Region
Upper Foothills Sub-region

Animals of the Upper Foothills Subregion are similar to those of coniferous forests of the Lower Foothills and Subalpine Subregions. These include pine siskin, yellow-rumped warbler, ruby-crowned kinglet, white-crowned sparrow and varied thrush. Elk and both black and grizzly bear are also characteristic. Species diversity is lower here, generally, than in the Lower Foothills Subregion because of a lower vegetational diversity, including little deciduous forest.

Lower Foothills Sub-region

Wildlife

Many of the animal species of the Lower Foothills Subregion that inhabit coniferous forests are wide-ranging species that are common to spruce and pine forests of the Boreal Forest, Foothills, and Rocky Mountain Natural Regions. However, for those species that have Rocky Mountain and Boreal Forest subspecies, the Boreal Forest subspecies is characteristic of the Lower Foothills. Species of coniferous forests include boreal chickadee, spruce grouse, ruby-crowned kinglet, white-winged crossbill, and red squirrel.

Areas with deciduous forests have diverse animal communities including ruffed grouse, warbling vireo, black-capped chickadee and Tennessee warbler. Along the boundary with the Central Mixedwood Subregion, species more typical of the boreal forest occur including moose, yellow-bellied sapsucker (northern race), rose-breasted grosbeak and purple finch.

Reach Two
Foothills Natural Region
Lower Foothills Sub-region (see Reach One)

Reach Three
Boreal Forest Natural Region
Dry Mixedwood Sub-region

Wildlife

Characteristic species of deciduous forests in the Dry Mixedwood Subregion include least flycatcher, house wren, ovenbird, red-eyed and warbling vireos, Baltimore oriole and rose-breasted grosbeak. Species of mixedwood forests include yellow-bellied sapsucker, Swainson's thrush, solitary vireo, magnolia warbler, white-throated sparrow, pileated woodpecker and northern goshawk.

Typical mammals include beaver, moose, varying hare, black bear, wolf, lynx and ermine.

Reach Four

Parkland Natural Region
Central Parkland Sub-region

Wildlife

The animals of the Central Parkland Subregion are a mix of elements of the Northern Fescue Subregion and the boreal mixedwood Subregions. At the southern edge of the Subregion, grassland species such as upland sandpiper, Sprague's pipit and Baird's sparrow occur but become less common further north. Along the northern boundary, boreal forest species such as woodchuck, broad-winged hawk and rose-breasted grosbeak are more common. Franklin's ground squirrel and piping plover range primarily in this Subregion.

Species characteristic of forested uplands include red-eyed vireo, red-tailed hawk, least flycatcher, Baltimore oriole, yellow warbler, white-tailed deer, American porcupine, northern pocket gopher and snowshoe hare.

Wetlands are more common in this Subregion than in the Grassland Natural Region and contain a wide variety of birds and amphibians.

Bald eagle and osprey are widely distributed throughout the Subregion, nesting near the numerous lakes. Golden eagle, which does not breed in the Boreal Forest, nests locally on cliffs. Rare peregrine falcons have also nested on cliffs in the area.

Northern shrike and arctic loon are both subarctic species that have bred in the Subregion. Winter visitors from further north include willow ptarmigan and, occasionally, barren ground caribou and arctic fox.

Reach Five

Generally Parkland to the south & Mixedwoods to the north.

Reach Six

Generally Parkland to the south & Mixedwoods to the north.

6.1 Significant Animal Populations

Significant animal communities are understood to be indigenous to the river environment and valley or to stay temporarily there during part of their life cycle. The animal populations significant to this theme can be classified by taxonomy (fish, mammals, birds, reptiles, amphibians and invertebrates) or by exceptionality (outstanding examples of size of population, location, dynamic or diversity). Because, for the purpose of this study, the river reaches identified in the Alberta portion of the North Saskatchewan River follow provincial Natural Subregion boundaries fairly closely, it seems useful to describe representative species found in these Subregions.

In **Reach One** the river passes through the Montane Subregion of the Rocky Mountain Natural Region, and both the Upper Foothills and Lower Foothills Subregions of the Foothills Natural Region. In the area of the Kootenay Plains Ecological Reserve, grasslands usually associated with the prairies thrive, attracting bighorn sheep, deer, elk, and moose in a valley that provides winter protection from fierce weather events. Two hundred years ago aboriginal groups came here from both sides of the mountains to hunt bison. In the early 1800s, David Thompson came upon feral (wild) horses populating the valley of the North Saskatchewan River. Today, wild horses can still be seen roaming areas bordering the David Thompson Highway (Highway 11).[72]

In **Reach Two** the river passes exclusively through the Lower Foothills subregion of the Foothills Natural Region. Cougar, bear (black, brown, and grizzly), wolf, coyote, golden eagle, and bald eagle inhabit this region

Reaches One and Two: As far as the Brazeau River there is a significant number of boreal forest species that are at the southern limit of their range. These include: sandhill crane (*Grus canadensis*), boreal owl (*Aegolius funereus*), greater yellowlegs (*Tringa melanoleuca*) and Philadelphia vireo (*Vireo philadelphicus*). Here, palm warbler (*Dendroica palmarum*) and rose-breasted grosbeak (*Pheucticus ludovicianus*) are also found along with parkland species.[73]

In **Reach Three** the river passes exclusively through the Dry Mixedwood Subregion of the Boreal Forest Natural Region.

In the area of Crimson Lake populations of sandhill crane (*Grus canadensis*), boreal owl (*Aegolius funereus*), northern pygmy owl (*Glaucidium gnoma*), greater yellowlegs (*Tringa melanoleuca*), western tanager (*Piranga ludoviciana*) and solitary sandpiper (*Tringa solitaria*) can be sighted.

In the area of Burtonsville Island, Western Toad (*Bufo boreas*), Boreal Chorus Frog (Pseudacris triseriata maculata, and Wood Frog (Rana sylvatica) are commonly sighted.

This area also shelters a significant bird population: American Goldfinch (*Carduelis tristis*), Belted Kingfisher (*Ceryle alcyon*), Black-capped Chickadee (*Poecile atricapilla*), Blue-wing Teal (*Anas discors*), Blue Jay (*Cyanocitta cristata*), Brown-headed Cowbird (*Molothrus ater*), Bufflehead (*Bucephala albeola*), Cedar Waxwing (*Bombycilla cedrorum*), Northern Flicker (*Colaptes auratus*), Great Blue Heron (*Ardea herodias*), House Wren (*Troglodytes aedo*), Least Flycatcher (*Empidonax minimus*), Mallard (*Anas platyrhynchos*), Northern Oriole, Pileated Woodpecker (*Dryocopus pileatus*), Red-tailed Hawk (*Buteo jamaicensis*), Red-winged Blackbird (Agelaius phoeniceus), American Robin (Turdus migratorius), Ruffed Grouse (*Bonasa umbellus*), Solitary Sandpiper (*Tringa solitaria*), Song Sparrow (*Melospiza melodia*) Spotted Sandpiper (*Actitis macularia*) European Starling (*Sturnus vulgaris*), Tennessee Warbler (*Vermivora peregrina*), Trails Flycatcher, White-breasted Nuthatch (*Sitta carolinensis*), White-throated Sparrow (*Zonotrichia albicollis*), Yellow-bellied Sapsucker (*Sphyrapicus varius*).

In **Reach Four** the river passes exclusively through the Central Parkland Subregion of the Parkland Natural Region.

Reach Four: Big Lake *"is recognized as an important waterfowl moulting and staging site, and in other studies it has been recognized as one of the 20 most important waterfowl habitat units in Alberta. Estimates of peak numbers of staging waterfowl in the 1970s and 1980s range as high as 26,000, with totals for the entire fall migration period likely being much higher once turnover rates are factored in. Although recent estimates are not available the general consensus is that waterfowl usage remains at about the same level. Although most of the waterfowl consist of dabbling and diving ducks, large numbers of Tundra Swans are also present during the last few weeks of October. In addition to its importance for staging waterfowl, Big Lake also supports a large colony of nesting Franklin's Gulls in the west bay of the lake. In the 1980s, this colony was estimated to contain between 500 and 3000 nests (the latter number, when doubled, is greater than 1% of the world's estimated population). Recent estimates of this colony's size have not been obtained due to its inaccessible nature. Nesting colonies of Eared Grebes and Black Terns are also present."*[74]

In **Reach Five** the river creates a general demarcation line between the Dry Mixedwood Subregion of the Boreal Forest Natural Region to the north and the Central Parkland Subregion of the Parkland Natural Region to the south.

Beaverhill Lake *"is an important waterfowl staging area (spring and fall) with more than 200,000 individuals regularly using the site each year. During spring migration, more than 150,000 geese stage here, including daily numbers of 50-75,000 Snow Geese (greater than 1% of the global population) and 50-100,000 Greater White-fronted Geese (approximately 6.3% to 7.9% of the mid-continent population). In fall, 40-70,000 dabbling ducks (mostly Mallards and Pintails) are also present. The Lake is also an important waterfowl moulting area with up to 25,000 moulting ducks being reported (1976 data). Sandhill Cranes also stage here in spring migration with 8,000 being recorded in late April 1993. In addition to waterfowl, Beaverhill Lake regularly supports substantial numbers of a variety of shorebirds. Intensive shorebird surveys in 1995 included two counts with over 50,000 individuals present (19 and 24 May). In total, 32 species of shorebirds were recorded during 1995. Single species high counts included 10,000 Red-necked Phalaropes, 10,000 Pectoral Sandpipers, 10,000 dowitcher spp., 7,800 Black-bellied Plover, 7,200 Semipalmated Sandpiper, and 1,000 American Avocet. Intensive shorebird survey data are available for only a few years (1995, 1987) and average numbers for most of these species may to be lower. Nonetheless, these numbers suggest that approximately 20% of the estimated North American Pectoral Sandpiper population, and almost 16% of the estimated North American Black-bellied Plover population may have been present at Beaverhill Lake during May of 1995."*[75]

The Whitford and Rush Lakes, just south of Victoria Settlement, *"are extremely important wetland sites for waterfowl and other water birds. In both spring and fall, in years when water is present, large numbers of waterfowl stage in the area. In spring, Greater White-fronted Goose, Canada Goose, Tundra Swan, Mallard and Northern Pintail are the most common species. Numbers of fall staging waterfowl are larger than in the spring. One percent or more of the Canadian population of Forsters Terns (30 or more pairs) have nested in the marshes of Whitford and Rush lakes. Numerous other bird species, especially those associated with water, are also found at these lakes. Western Grebe, Eared Grebe, Franklins Gull, American White-Pelican and migrating Bald and Golden eagles are all seen."*[76]

In Reach Six, for the first half of its journey, the river passes exclusively through the Dry Mixedwood Subregion of the Boreal Forest Natural Region, and then for the second half of its journey it creates a general demarcation line between the Dry Mixedwood Subregion of the Boreal Forest Natural Region to the north and the Central Parkland Subregion of the Parkland Natural Region to the south.

Lac Sante, Lower Therien Lake, Reita Lake, Garnier Lake & Frog Lake were identified in 2001 as having high potential for Piping Plover habitat.[77]

Reach Seven: North of the river, **Redberry Lake** was set aside as a federal migratory bird sanctuary in 1915, and was designated a UNESCO World Heritage Site in January of 2000. It is an important site for several significant species of birds, including nine "endangered, threatened, or rare" birds as well as over 180 other species. It is a significant nesting site for the American White Pelican, the piping plover, the white-winged scoter, and the double crested cormorant among others. The site is also on the migration route of whooping cranes. During the fall of 2001, a birding group counted, in the Redberry Lake area: 1 Red-necked Grebe, 30 Horned Grebe, 8 Tundra Swan, 1500 Snow Geese, 30 Ross's Geese, 50 Mallards, 4 Northern Pintail, 20 Canvasbacks, 30 Redheads, 105 Lesser Scaup, 1 Black Scoter, 2 Surf Scoters, 15 White-winged Scoters, 25 Common Goldeye, 1 Barrow's Goldeye, 3 Buffleheads, 1 Common Merganser, 2 Bald Eagles, 1 Red-tailed Hawk, 1 American Kestrel, 1 Greater Yellowlegs, 10 Ring-billed Gulls, 200 Bonaparte's Gulls, 3 Black-capped Chickadees, 4 Black-billed Magpies, 3 American Crows, 2 Ravens, 1 American Tree Sparrow, and 90 Lapland Longspurs.[78]

Redberry Lake is not the only North Saskatchewan River area in Reach Seven to sight migrating Whooping Cranes. The big crane's flight path is over the first third of Reach Seven and because of their leisurely progress during the first part of their trip to the Texas Gulf (*"Once they leave [nesting grounds in Wood Buffalo National Park], they move on a daily, or every-second-day basis, going south,"*[79]), they are also sighted regularly in the area of **Radisson Lake** and **Blaine Lake**. Family groups of whooping cranes prefer to stop in small wetland areas. One mating pair is a frequent visitor to the west end of Radisson Lake, about 70 km northwest of Saskatoon and about three km west of the Town of Radisson, just off the Yellowhead Highway (No. 16).[80] Radisson Lake area is also a good place to see Piping Plover and Snow Geese. Whooping Crane are also sighted along the river north of Lloydminster, near North Battleford, near St. Walberg, and near Rabbit Lake.[81]

"Eight species of sport fish can be found in the river near Edmonton, and the fishing here has been reported as some of the best in the area."[82]

6.1.1 North Saskatchewan River Basin - Fish Species:[83]

Acipenser fulvescens - Lake Sturgeon

Hiodon alosoides - Goldeye

Hiodon tergisus - Mooneye

Couesius plumbeus - Lake Chub

Margariscus margarita - Pearl Dace
Notropis atherinoides - Emerald Shinner
Notropis blennius - River Shiner
Notropis hudsonius - Spottail Shiner
Phoxinus eos - Northern Redbelly Dace
Phoxinus neogaeus - Finescale Dace
Pimephales promelas - Fathead Minnow
Platygobio gracilis - Flathead Chub
Rhinichthys cataractae - Longnose Dace
Carpoides cyprinus - Quillback
Catostomus catostomus - Longnose Sucker
Catostomus commersoni - White Sucker
Catostomus platyrhynchus - Mountain Sucker
Moxostoma anisurum - Silver Redhorse
Moxostoma macrolepidotum - Shorthead Redhorse
Esox lucius - Northern Pike
Coregonus clupeaformis - Lake Whitefish
Prosopium williamsoni - Mountain Whitefish
Thymallus arcticus - Arctic Grayling (introduced)
Oncorhynchus clarki - cutthroat trout (introduced)
Oncorhynchus mykiss - Rainbow Trout (introduced)
Salmo trutta - Brown Trout (introduced)
Salvelinus confluentus - Bull Trout
Salvelinus fontinalis - Brook Trout (introduced)
Salvelinus namaycush - Lake Trout
Percopsis omiscomaycus - Trout-perch
Lota lota - Burbot
Culaea inconstans - Brook Stickleback
Cottus ricei - Spoonhead Sculpin
Etheostoma exile - Iowa Darter
Perca flavescens - Yellow Perch
Stizostedion canadense - Sauger
Stizostedion vitreum - Walleye

6.1.2. Molluscs

There is no specific list of freshwater molluscs present in the North Saskatchewan River, although they are known and were harvested from

prehistoric times until about the 1950's. Molluscs provide a good example of how many biotic species are interdependent upon other biotic species. A unique "molluscan feature is the glochidium larva of freshwater mussels. These animals retain their young for various lengths of time in modified portions of the gills. The young mussels are released by the parent when its light-sensitive mantle-spots are stimulated, for example by the shadow of a passing fish. .....The glochidia of each species of mussel, with a few exceptions, must attach to the gills or fins of a fish belonging to one or a few species for further development to take place."[84]

Since the existence or absence of freshwater mollucs is an indicator of the health of any water body it would be useful to determine the situation of molluscs in the North Saskatchewan River system. According to the U.S. Geological Survey: "Poised on the brink of mass extinction, freshwater mussels are the largest group of endangered animals in North America. About 70 percent of the 300 native species are considered endangered, threatened or of special concern. Biologists see the mussels' plight as a serious warning for our global ecology as a whole. When mussels begin to disappear, it is a sign that other species, and entire ecosystems, may be in peril as well. Mussels not only oblige us as environmental barometers, but they also strengthen the health and stability of a stream. As mussels feed and breathe, they filter water and make it cleaner. Because mussels are at the foundation of the aquatic food web, they contribute to the survival and vitality of other animals. A stream with abundant mussels can usually support more muskrats, otters, wading birds and game fish."[85]

Molluscs that have been known to be in or near the NSR[86]

All Reaches:

Rhomboid Fingernail Clam (Sphaerium rhomboideum), Grooved Fingernail Clam (Sphaerium simile), Striated Fingernail Clam (Sphaerium striatinum), Lake Fingernail Clam (Sphaerium lacustre), Pond Fingernail Clam (Sphaerium securis), Long fingernail Clam (Sphaerium transversum), Perforated Pea Clam (Pisidium punctatum), Globular Pea Clam (Pisidium ventricosum), Ubiquitous Pea Clam (Pisidium casertanum), Ridged-Back Pea Clam (Pisidium compressum), Rusty Pea Clam (Pisidium ferrugineum), Shainy Pea Clam (Pisidium nitidum), Fat Pea Clam (Pisidium rotundatum), Short-ended Pea Clam (Pisidium subtruncatum), Triangular Pea Clam (Pisidium variabile), Three-Keeled Valve Snail (Valvata tricarinata), Fat Mucket (Lampsilis radiata siliquoidea) - host fish: yellow perch and yellow perch-pike, Modest Fossaria (Fossaria modicella), Amphibious Fossaria (Fossaria parva), Great Pond Snail (Lymnaea stagnalis jugularis), Lake Stagnicola (Stagnicola catascopium catascopium), Common Stagnicola (Stagnicola elodes), Tadpole Snail (Physa gyrina gyrina), Two-ridged Ramshorn (Helisoma anceps anceps).

Reach One:

Arctic-Alpine Fingernail Clam (Sphaerium nitidum), Northern Valve Snail (Valvata Sincera).

Reaches Two - Seven:
White Heel-Splitter (Lasmigona complanata).

Reaches Three - Six:
Northern Floater (Anodonata grandis simpsoniana).

Reaches Three - Seven:
River Pea Clam (Pisidium fallax).

Reaches Four - Seven:
Common Floater (Anodonata grandis grandis)

Reach Seven:
Brook Lasmigona (Lasmigona compressa), Walker's Pea Clam (Pisidium walkeri).

6.2 Rare Animal Species

Elements are evaluated and ranked on their status (globally and state/provincially) using a system developed by The Nature Conservancy, which is in use throughout North America. Ranking is usually based primarily on the number of occurrences, since that is frequently the only information available. Information, such as population size and trend, life history and reproductive strategies, range and current threats is used when available.

6.2.1 Birds

Reach One
Birds in Reach One ranked S2 and S3.

S2: Calliope Hummingbird (Stellula calliope)
S3: Harlequin Duck (Histrionicus histrionicus), Golden Eagle (Aquila chrysaetos), Barred Owl (Strix varia)

Reach Two

Birds in Reach Two ranked S3.
S3: Peregrine Falcon (Falco peregrinus)

Reach Three

Birds in Reach Three ranked S3.
S3: Peregrine Falcon (Falco peregrinus)

Reach Four

Birds in Reach Four ranked S3.
S3: Peregrine Falcon (*Falco peregrinus*), Willow Flycatcher (*Empidonax trailii*)

Reach Five

Birds in Reach Five ranked S3.
S3: Peregrine Falcon (Falco peregrinus)

6.2.2 Fish

Reach Four

Fish in Reach Four ranked S2.
S2: Lake Sturgeon (Acipenser fulvescens)

Ranks in Alberta (G=Global; S=Alberta)

Global Rank	Alberta Rank	Explanation
G1	S1	< 5 occurrences or only a few remaining individuals
G2	S2	6-20 occurrences or with many individuals in fewer occurrences.
G3	S3	21-100 occurrences may be rare and local throughout its range, or in a restricted range (may be abundant in some locations or may be vulnerable to extirpation because of some factor of its biology).
G4	S4	Apparently secure under present conditions, typically >100 occurrences but may be fewer with many large populations; may be rare in parts of its range, especially peripherally.
G5	S5	Demonstrably secure under present conditions, > 100 occurrences may be rare in parts of its range, especially peripherally.
GU	SU	Status uncertain often because of low search effort or cryptic nature of the element; possibly in peril, unrankable, more information needed.
GH	SH	Historically known, may be relocated in the future.

Other codes are:
E: Exotic species established, may be native to nearby regions
HYB: Hybrid taxon that is recurrent in the landscape
P: Potentially exists; may have occurred historically (but having not been persuasively documented)

Reach Five

Fish in Reach Five ranked S2 and 3.
S2: River Shiner (Notropis blennius), Silver Redhorse (Moxostoma anisurum),
S3: Quillback (Carpiodes cyprinus)

6.2.3 Invertebrate

Reach One

Invertebrate in Reach One ranked S2 and S4.
S2: Astarte Fritillery (Boloria astarte), Whitehouse's Emerald Dragonfly (Somatochlora whitehousei)
S4: Grass-runner Tiger Beetle (Cicindela terricola)

6.2.4 Amphibian

Reach One

Amphibian in Reach One ranked S3.
S3: Columbia Spotted Frog (Rana Luteiventris)

Reach Four

Amphibian in Reach Four ranked S2.
S2: Leopard Frog (Rana pipiens), Whitehouse's Emerald Dragonfly (Somatochlora whitehousei)

6.2.5 Mammal

Reach One

Mammal in Reach One ranked S1.
S1: Woodland Caribou - mountain ecotype (Rangifer tarandus)

6.2.6 Invertebrate Species

Invertebrates form an important part of the biodiversity found in riparian areas that are still intact. While there are no insect species lists specific to the North Saskatchewan River, results from the annual Alberta Butterfly count indicates a good example of specific habitats along the river that support insect life.

6.2.7 COSEWIC species definition and status categories as of April 15, 2003.

Species - Any indigenous species, subspecies, variety, or geographically or genetically distinct population of wild fauna and flora.

Extinct (X) - A species that no longer exists.

Extirpated (XT) - A species no longer existing in the wild in Canada, but occurring elsewhere.

Endangered (E) - A species facing imminent extirpation or extinction.

Threatened (T) - A species likely to become endangered if limiting factors are not reversed.

Special Concern (SC) - A species that is particularly sensitive to human activities or natural events but is not an endangered or threatened species.

Data Deficient (DD) - A species for which there is inadequate information to make a direct, or indirect, assessment of its risk of extinction.

Not At Risk (NAR) - A species that has been evaluated and found to be not at risk.

Table 5 - 1999 Alberta Butterfly Count[87]

Area	Species	Number
Beaverhill Bird Observatory	Purplish Copper (*Lycaena helloides*), Cabbage White (*Pieris rapae*), Gray Copper (*Lycaena dione*), Bronze Copper (*Lycaena hyllus*), Western Tailed-Blue (*Everes amytula*), Silvery Blue (*Glaucophyche lygdamus*), Greenish Blue (*Phebijus saepiolus*), Gr. Spangled Fritillary (*Speyeria cybele*), Northern Crescent (*Phyciodes selenis*), White Admiral (*Limenitis arthemis*), Common Ringlet (*Coenonympha tullia*), Garita Skipper (*Oorisma garita*), European Skipper (*Thymelicus lineola*), Peck's Skipper (*Polites peckius*), Tawny-edged Skipper (*Polites themistocles*), Long Dash (*Polites mystic*), Grass Skipper sp.	17 Species, 1171 individuals
Coyote Lake	Canadian Tiger Swallowtail (*Papillo canadensis*), *Colias* sp, Blue sp., Northern Crescent (*Phyciodes selenis*), Red Admiral (*Vanessa atalanta*), Red-disked Alpine (*Erebia discoidalis*), Common Alpine (*Erebia epipsodea*).	7 Species, 765 individuals
Devon-Calmar	Blue sp., Gr. Spangled Fritillary (*Speyeria cybele*), Aphodite Fritillery (*Speyeria aphodite*), Atlantis Fritillery (*Speyeria atlantis*), Silver-bordered Fritillary (*Boloria selene*), Northern Crescent (*Phyciodes selenis*), Milbert's Toroiseshell (*Nymphalis milberti*), White Admiral (*Limenitis arthemis*), Common Ringlet (*Coenonympha tullia*), Common Wood-Nymph (*Cercyonis pegala*), European Skipper (*Thymelicus lineola*).	12 Species, 88 individuals
Edmonton	Canadian Tiger Swallowtail (*Papillo canadensis*), (Cabbage White (*Pieris rapae*), White sp., *Colias* sp., Purplish Copper (*Lycaena helloides*), Western Tailed-Blue (*Everes amytula*), Silvery Blue (*Glaucophyche lygdamus*), Greenish Blue (*Phebijus saepiolus*), Blue sp., *Boloria* sp., Northern Crescent (*Phyciodes selenis*), Tawny Crescent (*Phyciodes batesii*), Satyr Comma (*Polygonia satyrus*), *Polygonia* sp., White Admiral (*Limenitis arthemis*), Common Ringlet (*Coenonympha tullia*), Common Alpine (*Erebia epipsodea epipsodea*), Silver-spotted Skipper (*Epargyreus clarus*), Northern Cloudywing (*Thorybes pylades*), Arctic Skipper (*Caterocephalus palaemon*), Garita Skipper (*Orisma garita*), European Skipper (*Thymelicus lineola*), Peck's Skipper (*Polites peckius*), Tawny-edged Skipper (*Polites themistocles*), Long Dash (*Polites mystic*), Hobomok Skipper (*Poanes hobomok*), Common Roadside Skipper (*Amblyscirtes vialis*), Skipper sp.	24 Species, 542 individuals
Elk Island	Canadian Tiger Swallowtail (*Papillo canadensis*), Cabbage White (*Pieris rapae*), White sp., Pink-edged Sulphur (*Colias interior*), *Colias* sp., Western Tailed-Blue (*Everes amytula*), Silvery Blue (*Glaucophyche lygdamus*), Greenish Blue (*Phebijus saepiolus*), Cranberry Blue (*Vacciniina optilete*), Blue sp., Aphodite Fritillery (*Speyeria aphodite*), Atlantis Fritillary (*Speyeria atlantis*), Northwestern Fritillary (*Speyeria hesperis*), Bog Fritillary (*Boloria eunomia*), Silver-bordered Fritillary (*Boloria selene*), Meadow Fritillary (*Boloria bellona*), Northern Crescent (*Phyciodes selenis*), Tawny Crescent (*Phyciodes batesii*), White Admiral (*Limenitis arthemis*), Common Ringlet (*Coenonympha tullia*), Common Wood-Nymph (*Cercyonis pegala*), European Skipper (*Thymelicus lineola*), Tawny-edged Skipper (*Polites themistocles*), Long Dash (*Polites mystic*), Grass Skipper sp.	21 Species, 572 individuals

Area	Species	Number
Fort Saskatchewan	Canadian Tiger Swallowtail (*Papillo canadensis*), Mustard White (*Pieris oleracea*), Cabbage White (*Pieris rapae*), White sp., Clouded Sulphur (*Colias philodice*), Colias sp., Western Tailed-Blue (*Everes amytula*), Spring Azure (*Celastrina ladon*), Silvery Blue (*Glaucophyche lygdamus*), Blue sp., Meadow Fritillary (*Boloria bellona*), Mourning Cloak (*Nymphalis antiopa*), Milbert's Toroiseshell (*Nymphalis milberti*), Common Ringlet (*Coenonympha tullia*), Common Alpine (*Erebia epipsodea epipsodea*), Dreamy Duskywing (*Erynnis icelus*), Arctic Skipper (*Caterocephalus palaemon*), Hobomok Skipper (*Poanes hobomok*), Common Roadside Skipper (*Amblyscirtes vialis*), Grass Skipper sp.	16 Species, 220 Individuals
St. Albert-Wagner Natural Area	Canadian Tiger Swallowtail (*Papillo canadensis*), Mustard White (*Pieris oleracea*), Cabbage White (*Pieris rapae*), White sp., Clouded Sulphur (*Colias philodice*), *Colias* sp., Purplish Copper (*Lycaena helloides*), Copper sp., Western Tailed-Blue (*Everes amytula*), Silvery Blue (*Glaucophyche lygdamus*), Greenish Blue (*Phebijus saepiolus*), Blue sp., Northern Crescent (*Phyciodes selenis*), Meadow Fritillary (*Boloria bellona*), White Admiral (*Limenitis arthemis*), Common Ringlet (*Coenonympha tullia*), Common Alpine (*Erebia epipsodea epipsodea*), alpine sp., Arctic Skipper (*Caterocephalus palaemon*), Garita Skipper (*Orisma garita*), European Skipper (*Thymelicus lineola*), Long Dash (*Polites mystic*), Common Roadside Skipper (*Amblyscirtes vialis*), Skipper sp.	18 Species, 635 Individuals
Strathcona	Canadian Tiger Swallowtail (*Papillo canadensis*), White sp., Western Tailed-Blue (*Everes amytula*), Silvery Blue (*Glaucophyche lygdamus*), Greenish blue (*Phebijus saepiolus*), Blue sp., Northern Crescent (*Phyciodes selenis*), White Admiral (*Limenitis arthemis*), Common Ringlet (*Coenonympha tullia*), European Skipper (*Thymelicus lineola*), Peck's Skipper (*Polites peckius*), Tawny-edged Skipper (*Polites themistocles*), Long Dash (*Polites mystic*), Grass Skipper sp.	13 Species, 469Individuals
Ukalta Dunes	Cabbage White (*Pieris rapae*), White sp., Pink-edged Sulphur (*Colias interior*), Silvery Blue (*Glaucophyche lygdamus*), Melissa Blue (*Lycaeides Melissa*), Gr. Spangled Fritillary (*Speyeria cybele*), Aphodite Fritillery (*Speyeria aphodite*), Atlantis Fritillery (*Speyeria atlantis*), Mormon Fritillery (*Speyeria mormonia*), *Speyeria* sp., *Boloria* sp., Northern Crescent (*Phyciodes selenis*), Mourning Cloak (*Nymphalis antiopa*), White Admiral (*Limenitis arthemis*), Common Ringlet (*Coenonympha tullia*), Common Wood-Nymph (*Cercyonis pegala*)	14 Species, 139 Individuals

Rare animal species are those that are ranked by taxonomy and degree of rarity according to a recognized agency. In Alberta, in 2000, the Fish and Wildlife Service, Alberta Sustainable Resource Development, as part of an ongoing task, refined the status ranking procedure. See the following table for the recent changes to the ranking process.

Table 6 - Definitions of General Status CategoriesAs developed by Alberta Sustainable Development Resources.

Rank (2000)	Previous Rank (1996)	Definition (2000)
At Risk	Red	Any species known to be "At Risk" after formal detailed status assessment and designation as "Endangered" or "Threatened" in Alberta.
May be at risk	Blue	Any species that "May Be At Risk" of extinction or extirpation, and is therefore a candidate for detailed risk assessment.
Sensitive	Yellow	Any species that is not at risk of extinction or extirpation, but may require special attention or protection to prevent it from being at risk.
Secure	Green	A species that is not "At Risk," "May Be At Risk" or "Sensitive"
Undetermined	Status Undetermined	Any species for which insufficient information, knowledge or data is available to reliably evaluate its general status.
Not Assessed	N/A	Any species that has not be examined for the 2000 report
Exotic/Alien	N/A	Any species that has been introduced as a result of human activities.
Exterpated/ Extinct	N/A	Any species no longer thought to be present in Alberta (Extirpated) or no longer believed to be present anywhere in the world (Extinct).
Accidental/ Vagrant	N/A	Any species occurring infrequently and unpredictably in Alberta, i.e., outside its usual range. (These species may be in Alberta due to unusual weather occurrences, an accident during migration, or unusual breeding behaviour by a small number of individuals. If a species appears in Alberta with increasing predictability and more frequently, it may eventually be given a different rank. Changes in "Accidental/Vagrant" species may be a good indicator of general ecosystem or climatic changes.)

6.2.67a Reptiles

Red-sided garter snake (*Thamnophis sirtalis*)

Reaches Four, Five, Six and Seven:

Garter Snakes in Alberta are listed as Sensitive. Protection of key habitats (hibernaculae) will benefit the recovery of garter snakes.[88] South-facing cliffs and river crevices along the lower reaches of the North Saskatchewan River provide hibernation sites for garter snakes. Local residents have known about these sites since at least the turn of the 20th century.

Plains Garter Snake (*Thamnophis radix*) - adapts to a highly variable habitat; both wet and dry areas; not in heavily wooded areas. These snakes have been sighted in Reaches Five & Six in the areas where the central parkland subregion borders the river. Status in Alberta: Yellow a List (Sensitive)[89]

6.2.8 Fish

Reach One

The North Saskatchewan River supports both coldwater and cool water sport and game fish. Coldwater habitat on the river, suitable for trout and other coldwater fish "is mainly located above the junction of the Clearwater and the North Saskatchewan River."[90] Species that rely on the spring freshet (an event that no longer happens because of the water regulation of the dams) have been marginalized but can be recovered with a change in water use plans.[91]

6.2.9 Status of Fish in the North Saskatchewan River

Undetermined

Lake sturgeon (*Acipenser fulvescens*)

Reaches Four, Five, Six and Seven:

Declared in 1989 by American Fisheries Society to be "threatened"[92] Lake Sturgeon are found mostly in the vicinity of Edmonton and downstream.[93] In 2000, the population of sturgeon was estimated at fewer than 200 mature fish in the North Saskatchewan River.[94] The status of lake sturgeon in Alberta is currently "undetermined."[95] They are the slowest to mature of all freshwater fish, reaching maturity at about 15 years and then only spawn every five years.[96] They were abundant in the North Saskatchewan River until the early 1900's when there was a rapid decline.[97] In 1872, men of the Sanford Fleming expedition caught a 25-pound sturgeon near the mouth of the Sturgeon River.[98] These leathery giants can live up to 100 years, the longest life span of Alberta's cool-water fishes.[99]

Silver redhorse (*Moxostoma anisurum*)

Reach Four:

This fish is very rare. It is found only in western Canada near Medicine Hat in the South Saskatchewan and in the North Saskatchewan River between Devon and Fort Saskatchewan.[100] The most likely place to sight a

silver redhorse is from the Genesee Bridge to the mouth of the Sturgeon River.[101]

River shiner *(Notropis blennius)*

Reach Four

These tiny fish have a more limited range in the North Saskatchewan River than the Emerald and the only other river system in the prairies where they occur is the Lower Oldman River and the South Saskatchewan River where they occur only sporadically. They are an important food source for bigger fish and fish-eating birds.[102] A good place to find them is at the mouth of Whitemud Creek in Edmonton.[103] "This fish is so rare in Alberta that when it is caught most folks haven't the faintest idea what it is…"[104]

Quillback *(Carpiodes cyprinus)*

Reaches Four to Seven:

The northern-most range of the quillback is the North Saskatchewan River from Edmonton downstream. They are a turbid river, warm water fish.[105]

Finescale dace *(Phoxinus neogaeus)*

Reach Four:

These turbid river fish are found in Alberta in only a few scattered locations, one of these being upstream from Edmonton.[106]

Sensitive

Bull trout *(Salvelinus confluentus)*

Reaches One and Two:

In the North Saskatchewan River they are only found upstream from Drayton Valley. They had been common in the Edmonton area up until the 1930's, "The last known individual was obtained in 1957. There has been a significant reduction in the range of this species."[107]

Sauger *(Stizostedion canadense)*

Reaches Five, Six and Seven:

Sauger occurs only in prairie rivers, and of the northern rivers they occur only in the North Saskatchewan River. They are tolerant of silty water where they are bottom feeders on bottom-dwelling fish and aquatic insects.[108] They are found in the lower reaches of the North Saskatchewan River.[109]

Secure

Walleye *(Stizostedion vitreum vitreum)*

Reaches Four to Seven:

In the North Saskatchewan River around the mouth of the Battle River "in the spring and early summer some walleye of exceptional size can be caught…"[110] This is a very important sport and commercial fish. The North Saskatchewan River has produced some of the largest walleye in the province.[111]

Goldeye *(Hiodon alosoides)*

Reaches Four, Five, Six and Seven:

These fish have a lengthy river migration pattern. They lay semi-buoyant eggs in the river near Edmonton in the spring and these float downstream into Saskatchewan where they hatch and remain for about three years until they migrate back upstream to the Edmonton area.[112] Because they are short-lived Goldeye are good indicators of changing levels of mercury in fish. They used to absorb mercury from the chlor-alkali plants in Saskatchewan. Since these plants closed in 1978, the mercury concentrations of goldeye in the North Saskatchewan River have dropped.[113] Schools of goldeye can often be sighted downstream of the Shaw Conference Centre within the City of Edmonton (Reach Four).[114]

Mooneye *(Hidon tergisus)*

Reach Four:

These fish are only found in Alberta in the North Saskatchewan River and in the Red Deer River. They have a more limited range than goldeye and are found mostly in the Edmonton area.[115] Both mooneye and goldeye occur in the North Saskatchewan River and fossil evidence suggests their existence since the Paleocene epoch. A good place to see mooneye is along the north bank of the river below the Provincial Museum in Edmonton.[116]

Emerald shiner *(Notropis atherinoides)*

Reach Four:

These tiny fish occur mainly in the Devon area, around Big Island, west of Edmonton, and around Fort Saskatchewan. They are an important food source for bigger fish and fish eating birds.[117]

May Beat Risk

Spoonhead sculpin *(Cottus ricei)*

Reaches One and Four:

"This species is found almost entirely in the regions of Canada which were glaciated during the Wisconsinan Ice Age." They occur in muddy rivers, where they live under rocks and come out at night to feed. They are found primarily in the North Saskatchewan River around the mouth of the Clearwater River and in the Edmonton area.[118] According to Alberta Sustainable Development, July 31, 2002, this fish has the status rank: May Be At Risk.[119]

6.2.10 Status of Mammals along the North Saskatchewan River

Regionally Rare

Wolverine *(Gulo gulo)*

According to COSIWIC, May, 2003, wolverine have been designated endangered in eastern Canada and of special concern in western Canada. Although seldom seen along the river, the wolverine does have habitat in Reaches One and Two.

Raccoon (*Procyon lotor*)
Usually considered a creature of southeastern Alberta, in recent years raccoons have been observed along the river in Reach Six from the Elk Point area to the Frog Lake area.[120]

Badger (*Taxidea taxus*)
Is another animal more common to the grassland than the parkland, however, in the last few decades has been observed in Reach Six.

Prairie shrew (*Sorex haydeni*)
Reaches Four to Seven:
The North Saskatchewan River Valley from the Battlefords in Saskatchewan to around Big Island west of Edmonton is the northern most limit for this shrew. Statusa - uncommon.[121]

White-tailed Prairie Hare (*Lepus townsendii*)
Also known as Jack rabbit, is "commonly found on open prairie and fields"[122] However, in Reaches Four to Seven: The North Saskatchewan River Valley from The Forks in Saskatchewan to just west of Edmonton is the northern boundary of its habitat. Its status is uncommon in this part of its range.[123]

Northern long-eared bat (*Myotis septentrionalis*)
Reaches Three to Five:
The North Saskatchewan River Valley is the southern most boundary for this small mammal, which is found west from Victoria Settlement to around Drayton Valley. Status: uncommon.[124]

Fisher (*Martes pennanti*)
Reaches One, Two and Three:
The fisher is found along the North Saskatchewan River from the Brazeau River area upstream to the headwaters. Status: uncommon to rare.[125]

River otter (*Lutra canadensis*)
Reach Six and Seven:
This creature is usually found north of the North Saskatchewan River in the area south of St. Paul, but in the last decade it has been sighted by fishermen downstream from Fort George/Buckingham House and by wildlife watchers along the river in Saskatchewan. Status: Uncommon.[126]

Bobcat (*Felis rufus*)
Reach One:
The bobcat is found on the North Saskatchewan River only in the valleys of its upper reaches, west of Rocky Mountain House. Status: uncommon.[127]

Lynx (*Felis canadensis*)
All Reaches:
The lynx is a Boreal forest creature, a nocturnal hunter, whose tracks have been identified along the North Saskatchewan River in the winter.

6.2.11 Status of Birds along the North Saskatchewan River

Chickadee near river bank, Edmonton
photo Billie Milholland

Regionally Rare

Loggerhead shrike (*Lanius ludovicianus*)
Is at its northern most limit along the North Saskatchewan River. Usually associated with farming areas of the parkland it is often seen in the Whitney Lake area of the North Saskatchewan River, Reach Six.

Palm warbler (*Dendroica palmarum*)
The North Saskatchewan River Valley is the southern most limit of its habitat. It is found in receding muskegs.[128]

Hermit thrush (*Catharus guttatus*)
Reach Seven:
Its southern most limit in Saskatchewan is along the North Saskatchewan River around Prince Albert.[129]

Sensitive

Great blue heron (*Ardea herodias*)
Reaches Five to Seven:
The size and number of heron colonies is declining in Alberta.[130] It is still found in the areas of the North Saskatchewan River from at least Victoria Settlement to the Whitney Lake Parks.

Bald eagle (*Haliaeetus leucocephalus*)
Reaches Five and Six:
This majestic bird has a low density in Alberta.[131] It is still commonly sighted along the North Saskatchewan River from at least Duvernay to the Whitney Lake Parks.

American white pelican (*Pelecanus erythrorhynchos*)
Reaches Five to Seven:
The number of nesting pairs is increasing in Alberta.[132] The lower reaches of the North Saskatchewan River are popular summer sites for un-mated pelicans.

At Risk

Peregrine falcon (*Falco peregrinus*)
Reaches Three and Four:
There are less than 60 nesting pairs in Alberta. It is designated "threatened" under the *Wildlife Act*.[133] The river cliffs along the North Saskatchewan River are traditional nesting sites for the Peregrine falcon.

Recreation *Value*

The Human and Natural Heritage Values of the North Saskatchewan River support and complement the river's Recreational Value. Not only do these recreational activities provide health, spiritual and intrinsic value for the river users, but the activities also bring people closer to the river. In this way the Recreational Value of the North Saskatchewan River results in stimulating awareness and stewardship of this valuable river.

River-related recreational developments along the river are extensive and on going, spearheaded by provincial, municipal and private interests. These developments include extensive walking and hiking trails, walking bridges, nature observation sites, canoeing, river touring, seasonal river competitions and river-side entertainment.

As the concept of river corridor connections becomes understood and popularized, river-based recreation begins to develop within this paradigm. This is particularly evident in Reach Four with the efforts of the City of Edmonton, singularly with their interconnecting river trail systems, and collectively through an involvement with municipalities and counties between Devon and Fort Saskatchewan. Their collective goal is to extend and connect all the riverside trail systems under their jurisdictions.

Each reach has developed river-based recreation commensurate to the local character of the river:

Reach One

The mountain and foothills geology, the distinct milky-blue colour of the river, the braided channels, the unique and variable sets of rapids and convenient river access make this reach the most popular for extreme wilderness adventure touring and experienced paddlers.

One major dam on the river impedes its natural flow therefore shifting the recreational focus. However, although taming the wild water has compromised the integrity of the river for white water rafting, this factor encourages more recreational use for young families, novice to intermediate paddlers, as well as seniors and nature groups that use the river to observe wildlife. Therefore the recreational value has been expanded to include a wider skill level of watercraft users.

Specific Recreational Value

Reach One offers experienced canoe and kayak paddlers a variety of exciting adventures. From just below Saskatchewan Crossing to the mouth of the Siffleur River is a 29 km (18 mi) stretch of braided channel *"noted for its powerful eddies, occurring where old rock ledges extend into the river."*[134] The eddies at Whirlpool Point, 20 Km (12.5 mi) below Saskatchewan Crossing are particularly noteworthy where

the river narrows between steep rock walls.[135] The stretch of river from the Bighorn Dam to Rocky Mountain House has been tamed to some degree by regulation of the dam. *"It has, however, still retained rapids of sufficient complexity to demand of its paddlers skills in maneuverability."*[136] Downstream from Dutch Creek where the river assumes a single channel, the current speeds up and the banks become higher as the river nears The Gap (in the Brazeau Range), the channel narrows and *"numerous small rapids are formed on almost every bend."*[137] Through The Gap, the rapids increase to Class II for about 11 km (7 miles) *"to just downstream of Deep Creek, where a ledge is encountered on the north channel."*[138] The next major set of rapids begins about 800 m (1/2 mile) above Shunda Creek and continues on to Saunders Ferry. 5 km (3 miles) below Horburg is Devil's Elbow, an inverted U bend with Class II rapids. 6.5 km (4 miles) downstream from these rapids begin a series of four named rapids and several unnamed ones. They are: Old Stony where a large boulder emerges, mid-channel, Big and Little Fisher's Rapids downstream of a pipeline right-of-way, Grier Rapid about 5 km (3 miles) below these, and then Brierley Rapids at the Rocky Mountain House National Historic Park.

General Recreational Opportunities

Reach One:

Hiking, Backpacking, Horse Packing, Climbing, Mountain Biking, White Water Paddling, Kayaking, Canoeing, Historical Voyageur Canoeing, Nature Tours, Fishing, Camping, Gold Panning. (Many of these activities are now packaged as Eco-Adventures). Riverside Picnicking, Cross Country Skiing, Dog Sledding, Winter Hiking and Camping.

Reach Two:

Reach Two has only three river access points along the 100 km stretch, a consistent gradient, no rapids higher than Class II and a somewhat leisurely 2.5 day trip time. This attracts a wide range of open canoe paddlers, including family groups and wildlife enthusiasts. Past Drayton Valley the river twists and loops through relatively uninhabited terrain that is accessible to all levels of boating skills.

Specific Recreational Value

Reach Two has some standing waves, log jams and sweepers to keep paddlers alert, but no rapids of any note. Heavily forested riverbanks *"alternate with high, bare sandstone cliffs"*[139] and the river gradually widens to about .4 to .8 km (1/4 to 1/2 mile). Wildlife is abundant and fishing for goldeye, walleye and pike is good in this reach. *"The middle section of this reach from about 80 km (50 miles) downstream of Rocky Mountain House to the mouth of the Brazeau River offers many excellent campsites on the numerous islands, many with white sand beaches."*[140] Around the bridge east of Drayton Valley is a favourite area for weekend gold panning. This reach can easily be paddled in a weekend, one day to the confluence of the Baptiste River and the next to the campground on the east bank of the river below the Highway 39 bridge.[141] The river continually cuts new channels in this reach, which adds to the adventure.

General Recreational Opportunities

Reach Two

Hiking, Backpacking, Horse Packing, Mountain Biking, Paddling, Kayaking, Canoeing, Historical Voyageur Canoeing, Nature Tours, Fishing, Camping, Gold Panning. (Many of these activities are now packaged as Eco-Adventures). Riverside Picnicking, Cross Country Skiing, Dog Sledding, Winter Hiking and Camping. There are natural camping spots along the river and on river islands as well as organized wilderness camping around the Brazeau River Reservoir.

Reach Three is very pastoral, full of islands and bracketed by a deep river valley that preserves a sense of remote wilderness while being an easy drive from Edmonton. Many half day, full day and overnight trips are possible on this part of the river where wildlife abounds. The gravel bars at the beginning of this reach have become popular with weekend gold panners.

Specific Recreational Value

Reach Three is great for family groups and beginner paddlers, with many camping places on islands along the way. Downstream of the Barrymore Ferry to the Genesee Bridge is tricky maze of islands and side channels, with some stronger currents on the bends and frequent logjams and overhanging branches. The old site of Quagmire House is *"on the left bank of an exaggerated meander 1.6 km (1 mile) upstream of the Berrymore Ferry site."*[142] The old Buck Lake House site is opposite the mouth of Buck Lake Creek. Burtonsville Island offers many different outdoor adventure and educational opportunities. (See figure #10)

General Recreational Opportunities

Reach Three

Hiking, Backpacking, Horse Packing, Mountain Biking, Paddling, Kayaking, Canoeing, Nature Tours, Fishing, Camping, Gold Panning. Riverside picnicking, Cross Country Skiing, Dog Sledding, Winter Hiking and Camping.

Reach Four features a maturing river with a slower current that flows through a largely settled area. Gravel bars and low gravel shores, often opposite high sandstone cliffs, provide many picnic and camping places. The urban riparian area of Devon, Edmonton and Fort Saskatchewan is about 80 km long and has an abundance of access points on both sides of the river for canoes and kayaks, and is a well-used part of the river. The three municipalities host various summer events on the river and on any sunny afternoon from early spring to late fall anyone using a river trail can watch canoeists, kayakers, rowing teams, jet boat tours, rafters, park and police patrols and often the sternwheeler *"The Edmonton Queen"*. A concentrated effort has been made to preserve a 'Ribbon of Green' in the urban areas through which the North Saskatchewan River flows. (See City of Edmonton Ribbon of Green Master Plan) There are no seasons of the year or days of the week when people are not using the river for recreation in this reach. (See Figure 12)

Table 7 - Observed uses of the North Saskatchewan River during City of Edmonton River sampling[143]

Sampling Date 2002	Time	Weather	Observed Activities
June 18	7:40 a.m. - 3:10 p.m.	Partly cloudy in a.m. Cloud & drizzle in p.m.	• Allied Diving Team· • Construction on clover Bar Bridge • 1 man gold panning • Many people & dogs along banks
September 17	6:10 a.m. - 2:30 p. m.	Sunny & cool.	• Many rowers • 3 people sampling on Alberta Environment boat. • Jet Boat Tour Company with several people.
October 2	7:30 a.m. - 5:40 p.m.	Sunny & cool.	• 2 workers in EPCOR power boat • 4 adults & 2 children at Gold Bar boat launch • School group on scavenger hunt near Edmonton Queen • Construction on Clover Bar Bridge • 2 land surveyors working at Laurier Boat Launch • Many people with dogs along banks • Many rowers on river

City of Edmonton Ribbon of Green Master Plan

"The North Saskatchewan River Valley and Ravine System is a ribbon of green running through the City of Edmonton. The natural features, wildlife, vegetation, and cultural heritage of Edmonton will be conserved for present and future generations by management of these resources to prevent exploitation, destruction or neglect. Trails, paths and parks will tie Edmonton together providing a change from urban living and an opportunity for recreation in the tranquility of nature." (Vision Statement, 1992).

For almost 90 years, municipal, regional and provincial authorities have sought to protect the river valley's natural spaces form inappropriate urban development, while providing a park system suitable for a metropolitan area. This began in 1915, when the Provincial Government adopted landscape architect Frederick Todd's recommendation to protect the river valley environment so as to provide Edmonton with a contiguous recreation and open space system. In 1985, the North Saskatchewan River Valley Area Redevelopment Plan (City of Edmonton bylaw No. 7188) indicated that the river valley and ravine system shall be primarily used for major urban and natural parks and environmental protection uses. In 1992, The Ribbon of Green - North Saskatchewan River Valley and Ravine System Master Plan - outlined the planning framework for open space development in the river valley into the year 2000.

The best example of the continuing efforts, on the part of the City of Edmonton to conserve and maintain the riparian environment is the Louise McKinney Park site. The history of this site also reiterates how the character of the river

influences urban decision-making. This park site was directly affected by a major landslide between 1901-1905, and has been relatively unstable since that time. Since 1949, repeated geotechnical and slope stabilization measures have been undertaken. In 1986, serious flooding of the river necessitated extensive riverbank stabilization. These efforts have resulted in the park being left in a relatively undeveloped state, with the exception of a cycle path bisecting from east to west. In 1992, it was the home to the Dinosaur Project World Tour. Presently, the park is a conspicuous open patch amongst the existing green canopy of the river valley. Immediate efforts are being undertaken for its natural recovery.

Specific Recreational Value

Reach Four

River Valley Recreation

Edmonton's river valley is the largest stretch of urban parkland in North America encompassing 7400 hectares. This vast parkland is approximately 12 times larger than Central Park in New York City. Besides 22 different park areas Edmonton has: over 132 kilometres of trails including bicycle trails, 4 lake systems with a total of 11 lakes and 14 ravines.

The City of Edmonton's park operations of the river valley maintain all the major parks that run along the river valley, including 53 km of paved trails, 58 km of granular trails, and 52 km of ski trail.

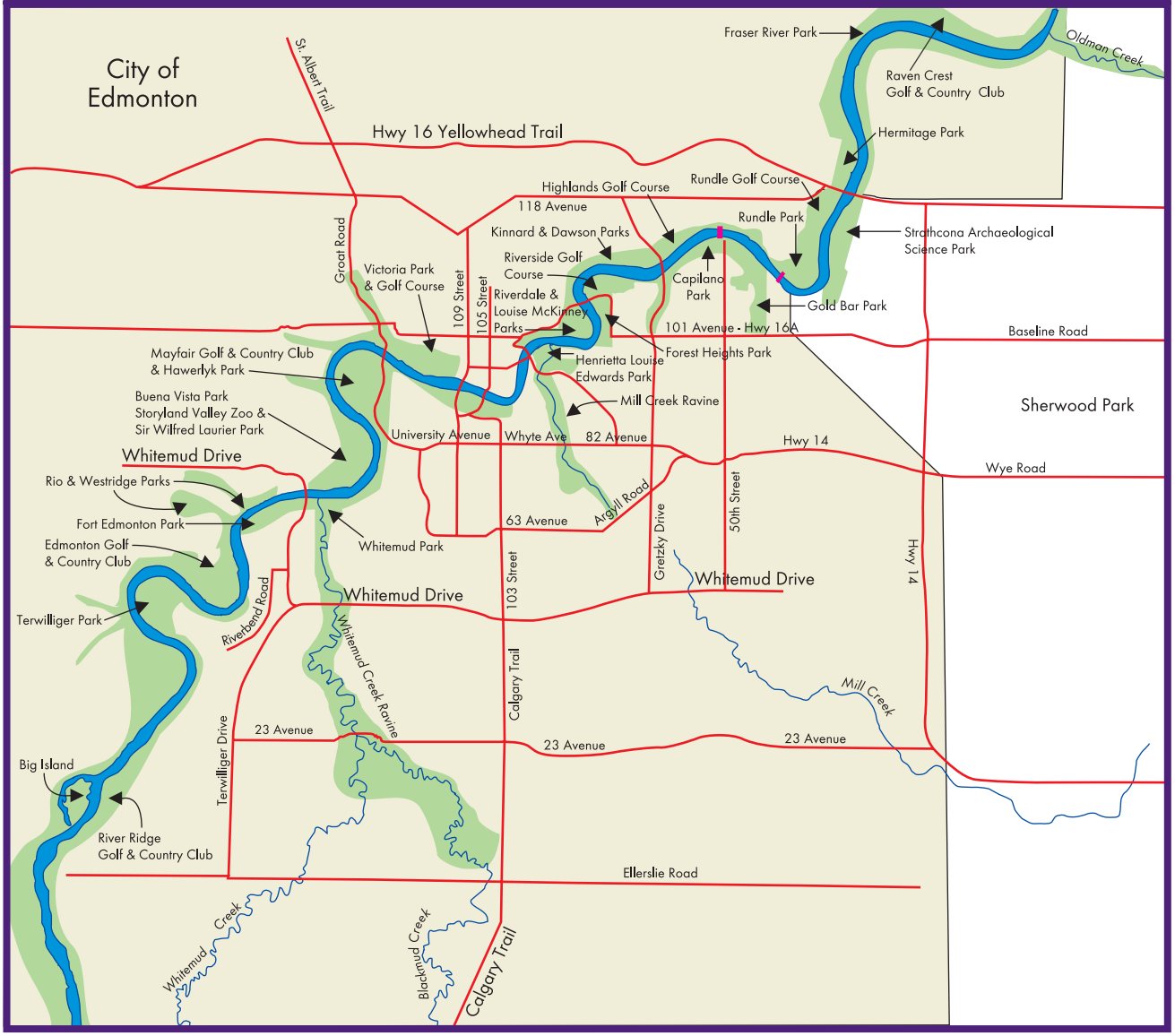
The City of Edmonton, with the consultants EDA Collaborative and Earth Tech Canada, have prepared a ten-year implementation strategy for a citywide network of multi-use trail corridors. This strategy establishes a comprehensive system of self propelled transportation facilities throughout the City that link residential districts with the downtown, university area and the river valley. Sixty-two km of multi-use trail corridors are proposed.

The Park Ranger Unit of River Valley, Forestry and Environmental Services, in conjunction with the Standing Committee on Fisheries & Wildlife Information and Education has developed a new **"River Recreation Guide"** for the North Saskatchewan River within the Edmonton City limits. This guide has a river map with access points, points of interest and distances as well as general information on safe boating, angling and water quality.

The Edmonton 'Parks For Paws' program supports and educates dog owners for river trail and river friendly dog activities.

In order to maintain the integrity of the river trails with in the City of Edmonton, the City has hosted a River Valley Cleanup Campaign every spring for the last fifteen years. Approximately 2,674 volunteers volunteered over 6000 hours to help and collect 2,920 bags of garbage in the spring of 2001.

Figure 12 - Ribbon of Green



Ribbon of Green

Parks, golf courses and ravines along the North Saskatchewan River create a diverse, vegetated riparian area, which makes water craft & river-trail recreation within city limits seem like a rural adventure. It also allows the river valley to continue its ancient role as a natural corridor for flora & fauna.

Since 1994, river valley park rangers have worked in Edmonton's river valley to improve the quality of experiences for all river park users. Rangers patrol the 7400-hectare boundary of the river valley, ravine systems and the North Saskatchewan River basin. This includes over 150 km of trails, the various parks and amenities. In the summer park rangers patrol by all terrain vehicles, Kawasaki Mule (a two seater ATV), mountain bikes, jet boat, and truck. In the winter, Rangers use cross-country skis, snowshoes, and a snowmobile.

General Recreational Opportunities

Reach Four

Several riverside festivals occur along the river: Annual running competitions and fundraising events, various riverside festivals (Folk Festival, Heritage Days Festival, Canada Day Riverside Events and Fireworks Display), River competitions and fundraising events (Canada Day Bath Tub Race, Dragon Boat Race). Hiking, Mountain Biking, Paddling, Kayaking, Canoeing, Jet-Boating, Nature Tours, Camping. Riverside picnicking, Historic Sternwheeler Adventures, Tobogganing, Cross Country Skiing, Dog Sledding, Winter Hiking and Camping. Fishing: (Fish Species within Edmonton City limits) burbot, goldeye/mooneye, lake sturgeon, mountain whitefish, northern pike, sauger, suckers, and walleye.[144]

Reach Five is considered, by experienced paddlers, to be a 'flat run'; the river is wide and there are no rapids over Class I. This part of the river is of particular interest to wildlife observers and people who fish. The variety of bird life along this reach is spectacular: eagles, hawks, osprey and even the rare peregrine falcon are often seen on this reach. Deer, beaver and fox are abundant and so are pelicans.

General Recreational Opportunities

Reach Five

Wildlife Viewing, Hiking, Mountain Biking, Paddling, Kayaking, Canoeing, Jet Boating, Nature Tours, Historic River Trail Rides, Camping, Fishing, Gold Panning, Riverside Picnicking, Tobogganing, Cross Country Skiing, Dog Sledding, Winter Hiking and Camping.

Reach Six

Specific Recreational Value

Reach Six has bridges so well spaced that there is about a one-day paddle between each bridge. On the north side of the river there are many places where the old Carlton/Victoria Trail is still used by trail riders, wagon trains and recently by people participating in Red River Cart re-enactments. In the middle of the reach is the riverside hamlet of Heinsburg inhabited by local people dedicated to replicating a pioneer village circa the turn of the century. An abandoned railway track runs along the river from Heinsburg to Elk Point. It is part of the Iron Horse Trail, an all-season recreational trail for hiking, horseback riding, biking, ATV use, as well as wagon train usage.

General Recreational Opportunities

Reach Six

Wildlife Viewing, Canoeing, Pole Rafting, Mountain Biking, Paddling, Kayaking, Jet Boating, Fishing, Nature Tours, Historic River Trail Rides, Camping, Gold Panning. Riverside Picnicking, Tobogganing, Cross Country Skiing, Dog Sledding, Winter Hiking and Camping.

Reach Seven is a mature river, wide and full of large islands, shifting sand and gravel bars and few working ferries. From the tiny community of Frenchman Butte to the city of Prince Albert the river is well accessed and used for all of the traditional river-based activities.

Specific Recreational Value

At the Battlefords there are local picnic areas and sites for viewing the confluence of the Battle River and the North Saskatchewan River. Findlayson Island, between the two Battlefords, has a network of 20 km of walking trails on either side of two old steel arched bridges as well as picnic areas and shelters. There are several different kinds of natural habitat on the island, marshy on the west side and thicker forest growing in clay on the east side with river-deposited sandy areas in between.

General Recreational Opportunities

Reach Seven

Canoeing, Pole Rafting, Mountain Biking, Paddling, Kayaking, Jet Boating, Fishing, Nature Tours, Historic River Trail Rides, Camping, Gold Panning. Riverside Picnicking, Tobogganing, Cross Country Skiing, Dog Sledding, Winter Hiking and Camping.

The Natural Heritage Value of the North Saskatchewan River is significant. The river flows through complex and varied ecosystems and geographically forms a specific demarcation line between boreal forest and prairie grassland, creating interesting and unusual environments for a broad diversity of wildlife, including many rare species. The water quality of river supports an abundance of fish and other wildlife.

These diverse river environments may play more prominent roles in the conservation of species than was predicted by older conservation models. New environmental concepts are emerging that emphasize river corridors as key players in environmental conservation.

During the summer of 2002 the North Saskatchewan River at Edmonton was the subject of a study exploring the significance of a river corridor and its impact on the environment. The results of studies like this provide evidence of the importance of the Natural Values of the North Saskatchewan River.

A healthy Recreational Value is evident along the entire North Saskatchewan River, where river communities have a strong commitment to the responsible development of the river for increased recreational touring and nature appreciation. Water-based recreation is well established and popular. Strong Natural and Heritage Values along all reaches of the river, as well as suitable river conditions for a variety of recreational activities also complement the Recreational Value of the river.

Theme Seven
Natural Heritage Value Conclusion

The Natural Heritage Value of the North Saskatchewan River is significant. The river flows through complex and varied ecosystems and geographically forms a specific demarcation line between boreal forest and prairie grassland, creating interesting and unusual environments for a broad diversity of wildlife, including many rare species. The water quality of river supports an abundance of fish and other wildlife.

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It is realistic to expect that the North Saskatchewan River can be managed to sustain the identified values that make this river an appropriate potential candidate for Heritage River nomination. (See Table 8 and 9)

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Table 8 - Phase 2 of the Canadian Heritage Rivers Systems Study of Rivers in Alberta 1995 - Natural Heritage Evaluation (including comments with regard to questions arising from the ratings)

Component	Subcomponent	Score	Rationale
Geology	Physiographic Section	10	The North Saskatchewan River traverses an assortment of physiographical sections as it flows eastward from its headwaters at the Saskatchewan Glacier in the Rockies, through the foothills and across the prairies. Most prominent are the uplands and plains of Eastern Alberta Plains.
	Bedrock Geology	10	Non-marine sandstone & coal of the Upper Cretaceous & Tertiary sandstones, shale & coal compose the predominant geological material of this area. Terrain of Precambrian & Palaeozoic origin represents only a minor component of the landscape traversed.
	Palaeontology	8	Several sites of high palaeontological sensitivity exist along the river within the City of Edmonton & just west of Edmonton. Undercut banks near the Genesee Bridge expose shale-like rock, which as it weathers exposes fossilized plants, some over 60 million years old. The two most common fossils are metasequoia & cercidiphyllium.
Surficial Geology	Parent Material	10	This river traverses landscapes containing the full spectrum of parent materials. Till, colluvium and bedrock are more prominent in the mountain and upland areas, whereas glaciolacustrine sediments, glaciofluvial deposits and till are dominant on the Western and Eastern Alberta Plains.
	Surface Expression	10	A diversity of surface expressions coincides with the wide range of parent materials. These grade from ridged and steeply inclined in the mountains to hummocky and undulating on the plains.
River Processes	Hydrology	4	The river has considerable representation and variation in hydrological characteristics and conditions. It contains such features as: pool & riffle sequences, rolling & standing waves, strong currents along meander bends, water falls, strong eddies caused by rock ledges extending into the river, boulder rapids & relatively long straight stretches of slow flow. The flow tends to slow significantly just past Edmonton. An interesting hydrological condition exists at the confluence of the Brazeau River, where clear waters of

Component	Subcomponent	Score	Rationale
			the Brazeau run along side the sediment laden north Saskatchewan waters for a distance prior to mixing. The water flow of the North Saskatchewan is regulated in the upper reaches by the Brazeau Dam (Brazeau Reservoir) and on the main river by the Bighorn Dam (Abraham Lake Reservoir). *NOTE: It is not clear why the score is so low for this category.*
	Water Quality	6	The most obvious change in water quality of this river occurs after Edmonton and Fort Saskatchewan. The impact of industrial and municipal use results in water quality falling below that stated in the Alberta Ambient Surface Water Quality guidelines at time, specifically with regards to dissolved oxygen, phosphorous, nitrogen, organic compounds & bacteria counts. *NOTE: since water quality has improved since the 1995 report, and continues to improve, it is important that up-to-date information is used when developing management plans and preparing the nomination document.*
	River Morphology	10	The river channel varies from sinuous & braided in the mountains & foothills to a single meandering channel with occasional islands on the plains. Several fragmentary terrace levels and a floodplain exist. These are very distinct in the Edmonton area. Point, mid-channel & sidebars may be encountered along this river. In many meander bends tall sandstone cliffs alternate with low gravel shores. Many of the meander bends have been undercut. Numerous remnants of glacial activity are also evident including: drumlins, spillways, alluvial fans & sand dunes.
Biota	Vegetation	10	Much of the North Saskatchewan River & valley is located within the Lower Foothills, Dry Mixedwood & Central Parkland natural subregions. The Sub-Alpine, Montane & Upper Foothills subregions comprise a much smaller component.
	Wildlife Habitat	8	Extensive ungulate habitat exists along the length of this river. Much lower amounts of quality fish and waterfowl habitat exist. *NOTE: It is debatable that "lower amounts" of habitat for fish & waterfowl exist compared to ungulate habitat.*

Component	Subcomponent	Score	Rationale
	Endanged/Threatened Species	10	This river & the associated environments contain a diverse selection of endangered and threatened species. Of note are the endangered Loggerhead Shrike, Peregrine Falcon & Trumpeter Swan.
	Species Concentration	8	A large amount of habitat for both wintering ungulates & migratory waterfowl exists.

Total Natural Heritage Theme Score 83.88

Table 9 - Phase 2 of the Canadian Heritage Rivers Systems Study of Rivers in Alberta 1995 - Recreation Evaluation

Component	Subcomponent	Score	Rationale
Diversity of Water Dependent Activities	Power Boating	8	Can be navigated throughout with only exception being the foothills - shallow depths in some areas preclude propeller driven boats, jet boats can navigate entire stretch.
	Flatwater Boating	10	Flow regime, length, size & availability of camping & services is quite good.
	Whitewater Boating	3	Only foothills section.
	Fishing	4	For catch & release Goldeye. *NOTE: Rationale & rating for this category is unclear. Fishermen report good fishing on most of the river & Goldeye is not the only catch & release fish. The 1995 report states "Highest diversity of fishes of any waterbody in the province", yet rates this category low. (Page 5). See also Figure 10 for American interest in North Saskatchewan River fishing.*
	Swimming	0	Flow regime / temperature & contaminants. *NOTE: Since people do swim in the river upstream of the Goldbar Wastewater Treatment Plant, the rating for this category could be reconsidered.*
Diveristy of Water Associated Activities	Trail Activities	8	Well developed in populated areas & excellent potential throughout.
	Hunting	4	Not in populated areas, but occurs in rural areas (whitetail deer, moose). NOTE: since most of the river runs through rural areas the rating for this category could be reconsidered.

Component	Subcomponent	Score	Rationale
	Camping	7	Most prevalent in upper reaches & excellent potential exists. *NOTE: Island camping exists along the entire river.*
Human Heritage Landscape Appriciation	Contemporary Landscape	10	Flows through numerous settlements, agricultural regions etc.
	Historical Landscape	7	Contains numerous historical settlements both developed and undeveloped. *NOTE: Reason for low rating in this category is unclear since entire length of river contains significant historical settlements - both developed & undeveloped. 1995 Study states, "Historical value very high." (page 21)*
Natural Landscape Appriciatioin	Natural & Visual Attractions	6	Scenic wide valley with high valley walls & changing land use patterns. *NOTE: Reason for low rating in this category is unclear since natural & visual attractions along the entire length of the river are richly diverse, even within urban stretches.*
	Remoteness	3	Generally flows through developed lands. *NOTE: There is room here for reinterpreting the idea of what constitutes 'remote'. Watercraft users report a satisfying feeling of remoteness even within urban area. The 1995 study concludes, "Lots of river, but overall a bit dull." (Page 5) This is obviously not a statement made by anyone familiar with the river.*
Physical Factors	Water Quality	2	Poor colour & lead contaminants. *NOTE: there is much to debate with this rating. For instance, this is a naturally turbid river, therefore in the spring when the river is swirling with glacial till and silt, its colour is not 'poor' (as in undesirable) - it is a natural & proper colour. More to the point is the clear water that exists between times of high runoff (which usually predominates during the summer & fall).*
	Shoreline Access	8	Accessible from most regions to waters edge - many developed launch areas exist.

Total Recreation Theme Score 58.6

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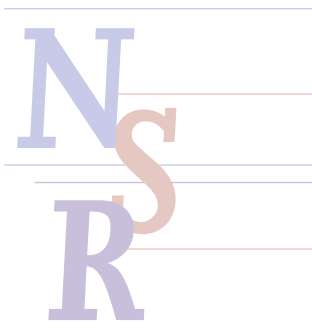

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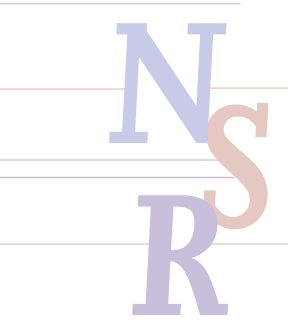

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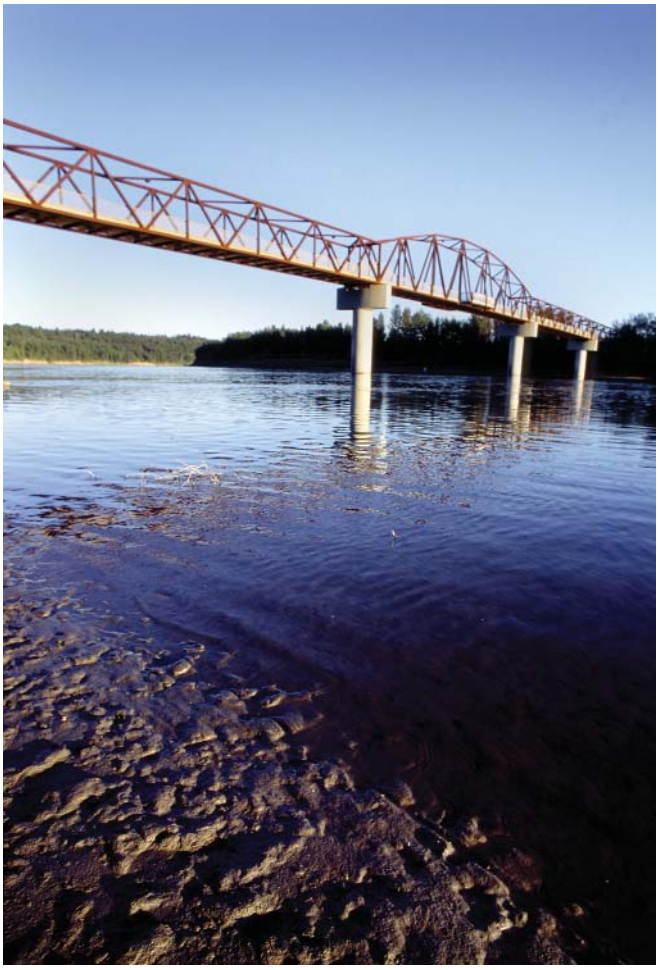
River At Edmonton
photo Billie Milholland



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Section IV

Pitikwahanapiwiyin Poundmaker and wife,
photo Canadian Heritage Archive

Kutenai man before 1910
photo Canadian Heritage Archive

Gabriel Dumont
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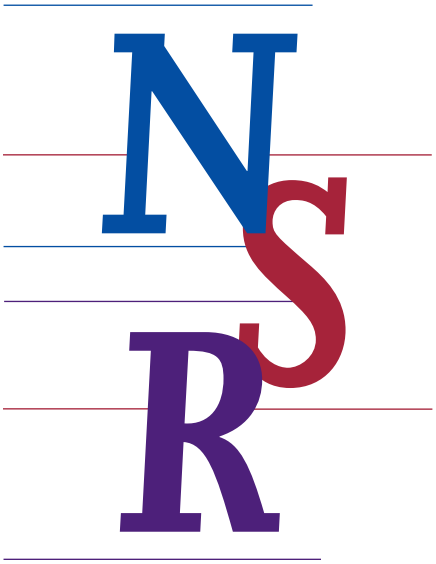


Glossaries

Glossaries
Cultural Glossary

Assiniboine

Assiniboine comes from "asini-pwan" meaning "stone Sioux," perhaps in reference to their method of cooking food by using hot stones to boil water. They are a Siouan-speaking people. It is believed the Assiniboine split from the Yankton Sioux in the mid 1600's. They became allied with the Cree people with whom they traveled west into the North Saskatchewan watershed in response to the pressure of European settlement in eastern Canada and opportunities offered by the advancing fur trade. Today the Assiniboine, now called the Stony People, are part of the Chiniki, Alexis, Bearspaw, Paul and Wesley bands in Alberta.

Athapaskan Speakers

Beaver, Chipewyan, Slavey and Sekani. Before the fur trade these people roamed the land as far south as the North Saskatchewan River.

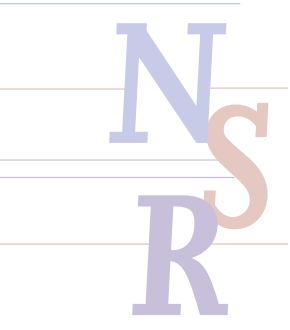
Blackfoot

The Blackfoot are divided into three Algonquian-speaking groups: Blackfoot (*Siksika*), Bloods (*Kainai*), Peigan (*Pekuni*). The name Blackfoot may have come from the discoloration of moccasins made by walking through the ashes of prairie grass fires. They were nomadic hunter-gatherers who lived in buffalo hide tipis. Each tribe divided into several hunting bands led by one or more chiefs and several councilors. Band membership was fluid and headmanship informal. As long as a leader provided benefits his people would stay. But if his generosity diminished members would leave and join another group. The bands wintered separately in river valleys and gathered together each summer for a Sun Dance. When Europeans arrived on the North Saskatchewan River, the Blackfoot were familiar and frequent visitors. They were once allied with the Atsina (Gros Ventre), a splinter group of the Arapaho People, as well as with the Sarsi.

Buffalo Jump	A cliff or steep bank over which the animals were driven to their deaths. Suitable jump locations along the North Saskatchewan River were rare and were used repeatedly.
Buffalo Pound	A circular corral into which a herd of buffalo were driven for slaughter. Sometimes a ramp was constructed up to the entrance so the buffalo could not jump back out. Such pounds were so effective that large camps of up to 300 lodges could be supported during the winter from the proceeds of one pound capture.
Bull Boat	green hides stretched over bent branch frames to create temporary watercraft for crossing the river when it is too deep to ford.
Coureurs des bois	Today this term is often used as a synonym for *voyageur*. It was used for the first time in New France in 1672. In 1680, it was estimated there were 800 *coureurs des bois*, and it was considered a honourable profession. Soon after that, a permit was required of anyone seeking to go inland from New France after furs, and the term became synonymous with the type of disobedient and rebellious men who traded without a permit.
Cree	"*Cree*" may have come from the French name for the tribe, "*Kristenaux*," a corruption of the French word for Christian, or perhaps from an Algonquian word meaning, first people. Cree people refer to themselves as *Ayisiniwok*, meaning "true men," or *Iyiniwok*, *Eenou*, *Iynu*, or *Eeyou*, meaning simply "the people". Cree people speak an Algonquian language consisting of five major dialects: Western/Plains Cree, Northern/Woodlands Cree, Central/Swampy Cree, Moose Cree, and Eastern Cree. Today the Cree are Canada's largest Aboriginal group.
Frog Lake Massacre	Also known as the Frog Lake incident, occurred on April 2, 1885 when members of *Mistahimaskwa's* (Big Bear) Cree Nation led by Ayimisis and *Kapapamahchakwew* (Wandering Spirit) killed Indian Agent Quinn and eight other white people.
Hudson Bay Company	On May 6, 1670, Hudson's Bay Company (HBC) was formed in England when King Charles II gave his cousin Prince Rupert & his cousin's friends a charter. They were awarded all the land whose rivers drained into the Hudson Bay. This was known as Rupert's Land until Confederation in 1867, when it was purchased by the new Canadian government.

Kutenai	The Kutenai people traveled the upper reaches of the North Saskatchewan River corridor for thousands of years. European advancement into the west strengthened other Aboriginal groups with arms and horses, forcing the Kutenai west across the mountains. The Kutenai built a sturgeon nosed canoe with canoes ends that were extended and pointed. With a load of people or freight the middle of the boat bent, bringing the points up out of the water. They made the frame from spruce, which is strong and flexible and covered it with white pine and/or birch. Leaks were patched with tree sap. The twine used to lace the canoe together came from pounded saskatoon shrub bark.
League	5.55600 kilometres
Made Beaver	1 Made Beaver = 1 beaver pelt or other furs counted in beaver equivalencies.
Métis	"*Metis*" means "mixed" in French. The term can refer to a mixed-blood Aboriginal person who has Aboriginal status in Canada; or, in other parts of North America, a member of a particular cultural group of mixed ancestry, the descendants primarily of French traders and Cree people. Métis people live in every province in Canada. The Northwest Rebellion of 1885 is a particularly important event in the history and development of the Métis people.
Mistaya	Stony word for grizzly bear.
Mooswa	Cree for moose
Nakota	The Assiniboin/Nakota people travelled from the Great Lakes area to the west, much of the time in association with the Cree people. They have been known by many names, and in Alberta, today, they are referred to as Stony.
North West Company	(NWC) The original NWC was a partnership of Montreal-based entrepreneurial traders formed in 1779. An internal quarrel led, in 1799, to the creation of the XY Company, which merged again into the NWC in 1804. A major fur trading company, it operated out of Montreal until 1821 when it amalgamated with its rival the HBC.

North West Rebellion	Also known as the North West Resistance or the Metis Rebellion, it began in the middle of March of 1885 at Clarke's Crossing, after Metis and Aboriginal peoples had endured many years of broken promises on the part of the Government of Canada. Most of the military action took place along the North Saskatchewan River.
NWMP	North West Mounted Police, a Canadian police force created by a Bill of Parliament in may 1873 to bring order to the western frontier, to encourage settlement, and to establish Canadian authority in the Northwest Territories (prior to Confederation the entire western part of Canada had been solely under the jurisdiction of the Hudson Bay Company. They first marched west in 1874.
Ojibwa	The Plains Chippewa (Ojibwa) often traveled with the Cree and Assiniboine People, and although they no longer form a distinct group in western Canada, they were once well known along the North Saskatchewan River.
Overlanders	220 men, one woman and three children left Fort Garry in June of 1862 in 100 Red River carts on the way west to join the Cariboo Gold Rush. At Fort Edmonton only 125 chose to continue the trek over the mountains.
Palliser Expedition	The Palliser Expedition of 1857-60 was a scientific endeavour headed by Dublin-born John Palliser, on behalf of the Royal Geographical Society, London, and with full support and assistance from the HBC. The explorers collected astronomical, meteorological, geological and magnetic data, and described the country from Red River through the Rocky Mountains, its fauna and flora, its inhabitants and its "capabilities" for settlement and transportation.
Pemmican	powdered meat & dried berries mixed with marrow oil in the early days of the fur trade. Later, due to high demand, a hurried factory-like production of pemmican resulted in melted fat substituted for the scarcer, but more nutritious marrow oil and berries became a rare ingredient.
Red River Cart	Re-designed by the Metis people from carts brought by Scottish and French settlers. For quick and easy repair it was built entirely of wood with the wheels wrapped tightly with rawhide. Grease was not used on the axels because the dirt it would attract would grind down the



axels faster. The wheels were faced outward from the hubs so the cart would not sink into the soft ground when carrying a heavy load. Some loads were over 800 pounds. When the wheels were removed the cart became a raft.

Beaver work
photo Billie Milholland

St. Georges Day

April 23. St. George was a horse soldier, martyred in 303 A.D. under anti-Christian Roman emperor Diocletian. Over time he emerged as the hero in the legend of a mythical dragon killer, a story known both in Europe and in Asia. He is the patron saint of England, but his day is celebrated all over Europe. Richard The Lion Heart adopted St. George's emblem, a red cross on a white background, as the flag of England in the 12th century.

Sarcee

The *Tsuu T'ina*, an Athabascan people who once traveled the North Saskatchewan corridor now live near Calgary, Alberta.

Seneca Root

the rootstock of a species of milkwort (*Polygala Senega*), aromatic but bitter tasting. It is used medicinally as an expectorant and diuretic, and in large doses as an emetic and cathartic. It was collected & sold in every reach of the North Saskatchewan River up until the early 1970's.

Shoshoni

The Shoshoni people called themselves "*Newe*" which means "The People". In earlier times they were sometimes referred to as the Snake or the Grass House People, and were frequent visitors to southern Alberta, sometimes coming as far north as the North Saskatchewan River. Now known as the Sosoni, these people once roamed the North American continent from New Mexico to the Rocky Mountains of central Alberta. Sacajawea, who guided the Lewis & Clark expedition, was a member of the Sosoni Nation.

York Boat

In his memoir, *Hudson's Bay, or, Everyday Life in the Wilds of North America*, Robert Ballantyne described the York boat as "*…long, broad and shallow, capable of carrying forty hundredweight, and nine men, besides three or four passengers, with provisions for themselves and the crew.*"

Section 4
Natural Values Glossary

Aeolian	pertaining to wind; caused by wind.
Alkalinity	water's capacity to neutralize acids is generally caused by carbonate, bicarbonate and hydroxide ions.
Alluvial fans	caused by inundation of alluvium from ancient lake & seabeds
Alluvium	eroded rock particles shed by hillsides and carried away by streams, often deposited during flood events.
B.P.	before present where the year 1950 is used as the "present."
Bed Armor	Streambed stones and gravel compacted over time to resemble tightly fitted cobblestones. During high stream flow events, light material (sand & fine gravel) is carried along in suspension. Heavy particles (coarse gravel, small stones) roll and slide along the bottom. Over time, these heavy particles, along with cobbles and boulders form a kind of pavement or armor at the bottom of the streambed. This armor protects undisturbed materials beneath it from scour.
Bentonite	Fine-grained clays deposited as volcanic ash during the making of the Rocky Mountains. Bentonites are interbedded with Cretaceous strata exposed by the North Saskatchewan River.
Biodiversity	biological variations of species in a given landscape or habitat
Braiding	a fluvial depositional landform expressed by temporary islands, shoals, and point or longitudinal bars caused by accretion of sands, gravels and cobble in the channel.
Canadian Shield	part of the ancient Precambrian basement of North America.
Cephalopods	small ancient marine life related to octopus & squid.
Cercidiphyllum	Fossil record shows *Cercidiphyllum* native to western North America during the Miocene Epoch (23 to 5 million years ago). Modern species are native to Japan.
Chert	Similar to flint but light in colour

Coal	Combustible sedimentary rock containing >50% by weight of carbonaceous material and composed mainly of lithified (Lithification - a process whereby sediment is converted to rock through compaction and cementation) plant remains.
Conglomerate	Sedimentary rocks made up of large sediments like sand and pebbles cemented together with dissolved minerals.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
Disjunct	A population separated from the main range of the species by 500 km or more.
Drumlins	low, smooth, rounded, elongated hill of composed of compact glacial till shaped by flowing ice.
Elements	defined as resources or groupings of resources identified as having values essential to the nomination of a river (A Framework for the Natural Values of Canadian Heritage Rivers Second Edition, March 2001)
Erratic	a glacial erratic is a rock formation carried by glacial ice and deposited some distance from its place of origin. Large erratics look obviously out of place on the landscape.
Feeder Lake	a lake with a direct outlet that empties into (in this report) the North Saskatchewan River.
Fluting	Weathering and erosion of coarse-grained rock so that it develops a corrugated surface.
Fluvial	Produced by the action of water, usually by a river or stream.
Freshet	a rapid temporary rise in the stream discharge and level caused by heavy rains or by rapid snow & ice melt (most often a spring thaw event).
Glaciolacustrine	characterized by glacial & lacustrine processes. (**lacustrine** deposits are lake sediments usually fine silt & clay)
Gog Group	Sand & silt carried by wind and compressed during the beginning of the Cambrian period. Gog Group describes any sedimentary rock from this era.

Hardness	Dissolved minerals (E.g. calcium & magnesium) create water hardness.
Hibernacula	winter shelters for hibernating animals
Mesic	In forest environments a site that is neither very wet nor very dry.
Metasequoia	a living species of this fossil genus was discovered in Central China in 1945, it (water larch) became of worldwide importance to botanists, arboriculturists, and foresters.
Moraine	Rocky material (boulders, sand, gravel, clay) called 'drift' deposited by direct glacial action or by water flowing from melting glaciers.
Mudstone	Fine-grained, detrital sedimentary rock made up of silt and clay-sized particles. Distinguished from shale by lack of fissility (the property of splitting along closely spaced planes, more or less parallel).
Oxbow	A channel cut off from the river. It was once a bend in the river.
Petrified wood	Wood from ancient times, preserved by a covering of volcanic ash, volcanic mud flows, sediments in lakes and swamps or material washed in by violent floods. This excludes oxygen & prevents decay.
Provincial Natural Areas	In Alberta, legislation defines major areas of intent, responsibility and operating parameters for parks and protected areas. Currently, these areas are administered under three separate pieces of legislation: the Provincial Parks Act; the Wilderness Areas, Ecological Reserves and Natural Areas Act; and the Willmore Wilderness Park Act. The Provincial Natural Areas are protected under the administration of Alberta Community Development (Parks and Protected Areas Division).
Provincial Natural Regions	Different areas in the world house different ecosystems. These ecological units are called biomes. They each have different flora, fauna, landscapes and weather patterns. An ecosystem is not the same as a biome. A biome is a large unit that is home to many different ecosystems. Within Alberta, there are six different biomes that each has specific flora and fauna distribution. These regions are indicated on the map of Alberta's Natural Regions, along with their subregions. *(See Figures 1,2,3)*

NSR

Quartzite

Metamorphosed quartz sandstone

RAMSAR

The Convention on Wetlands, signed in **Ramsar**, Iran, in 1971, is an intergovernmental treaty, which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. There are presently 130 Contracting Parties to the Convention, with 1140 wetland sites, totalling 91.7 million hectares, designated for inclusion in the Ramsar List of Wetlands of International Importance.

Rapid classification

River rapids vary in intensity. The International Rating system classifies rapids as follows:

Class A - Lake water
Still. No perceptible movement

Class I - Easy
Smooth water; light riffles; clear passages, occasional sand banks and gentle curves. The most difficult problems might arise when paddling around bridges and other obvious obstructions.

Class II - Moderate
Medium-quick water; rapids with regular waves; clear and open passages between rocks and ledges. Manoeuvring required. Best handled by intermediate paddlers who can manoeuvre canoes and read water.

Class III - Moderately difficult
Numerous high and irregular waves; rocks and eddies with passages clear but narrow and requiring experience to run. Visual inspection required if rapids are unknown. Open canoes without flotation bags will have difficulty. These rapids are best left to canoeists with expert skills.

Class IV - Difficult
Long and powerful rapids and standing waves; souse holes and boiling eddies. Powerful and precise manoeuvring required. Visual inspection mandatory. Cannot be run in canoes unless the craft is decked or properly equipped with flotation bags. Advance preparations for possible rescue work important.

Class V- Extremely difficult
Long and violent rapids that follow each other almost without interruption. River filled with obstructions. Big drops and violent currents. Extremely steep gradient.

River rocks
John Ulan 2001

Even reconnoitring may be difficult. Rescue preparations mandatory. Can be run only by top experts in specially equipped white water canoes, decked craft, and kayaks.

Class VI - Extraordinarily difficult
Paddlers face constant threat of death because of extreme danger. Navigable only when water levels and conditions are favourable. This violent white water should be left to paddlers of Olympic ability. Every safety precaution must be taken.

Riparian Zone — the strip of green (grass, shrubs, and/or trees) along the banks of rivers and streams, a transition zone between water and land use. Riparian areas have come to public attention in recent times because of the role they play in the overall ecological health of pasture and rangelands. This area has ecological importance beyond the small acreage it encompasses because of the quantity and diversity of plant species that find shelter here. A healthy riparian zone reduces soil erosion, stabilizes banks and filters runoff water.

Sand Dune — caused by wind deposition. **Barchan dunes**: crescent shapes like new moon with horns pointed in the direction the wind blows. **Parabolic dunes**: inside out barchans, usually stabilized by vegetation. **Transverse dunes**: straight ridges of barchan dunes are called transverse.

Sandstone — Sedimentary rocks made up of small grains of mineral quartz and feldspar, often formed in layers. Sometimes they are used as building stones.

Shale — A type of sedimentary rock formed from clay that is compacted by pressure.

Snye — A waterway that once had a continuous link to the river but is now a dead end channel. Sometimes during high water a snye may surround a height of land creating a temporary island.

Spillways — caused by glacial melting

Tufa — Dissolved minerals precipitated around springs

Tulliby — A nearly out of use name for whitefish

Turbidity — The number of particles in a sample of water can be measured by a variety of means, for example, by

turbidity analyses. Turbidity is a measure of the amount of light scattered by particles in the water sample; the higher the scatter, the greater the turbidity. Suspended matter such as clay, silt, organic materials and microscopic organisms causes turbidity in water. Its unit of measurement is called a nephelometric turbidity unit (NTU).

UNESCO — United Nations Educational, Scientific and Cultural Organization

Watershed — an area of land that catches precipitation and drains or seeps into a marsh, stream, river, lake or groundwater. Everyone lives in and impacts a watershed.

Section 4
People Connected to Activities along the North Saskatchewan River Glossary

Bell, Charles Napier — Born in Ontario, Bell joined the Perth Rifle Company as a bugler when he was twelve. He traveled west with young Sam Steele, and spent a year (1872-1873) hunting and trading along the North Saskatchewan River. He wrote a report of his experiences for Lieutenant-Governor Morris.

Big Bear — *Mistahimaskwa* was born about 1825, north of present-day North Battleford. Son of Chief Black Powder, an Ojibwa who led a small mixed band of Cree and Ojibwa, Big Bear headed a camp of 65 lodges (approximately 520 people) by 1874. He refused to sign Treaty Six, fearing the subjugation of his people. However, on December 8, 1882, faced with destitution and starvation, Big Bear was forced to sign an adhesion to the treaty. On April 2, 1885, Big Bear's band, led by his son *Ayimisis* and war chief, *Kapapamahchakwew* (Wandering Spirit), killed nine people at Frog Lake. Although Big Bear's efforts to stop the massacre failed, he was able to save the survivors by hiding them in his camp. On April 14, Big Bear saved the civilians and police at Fort Pitt from Wandering Spirit's attack. Big Bear did not participate in the battles of the North West Resistance, and gave himself up voluntarily. None-the-less, in Regina, on September 11, 1885, after deliberating only fifteen minutes, the jury found Big Bear guilty of treason-felony. After less than a year and a half at Stony Mountain Penitentiary, Big Bear was

released because of ill health. He died on the Poundmaker reserve on January 17, 1888.

Bird, James Curtis — He was born 5 February 1773 Acton, London, England. By 1788 he was a writer for the HBC at York Factory, and became Chief Factor in the early 1800's, remaining so until his retirement in 1824. He died 18 October 1856 at Marchmont House, Red River Settlement, at age 83.

Blakiston, Lt. Thomas W. — Magnetism observer Blakiston brought his delicate instruments by way of the Hudson Bay to join the Palliser Expedition on the North Saskatchewan River at Fort Carleton.

Butler, William Francis — An Irishman who served in the British Army at Madras, India, and visited his hero Napoleon's Island of St. Helena in 1864, Butler came to western Canada in October 1870 to report on the fur trade, the Indians, and to assess the need for troops in the west. *The Great Lone Land*, published in 1872, describes much of his trip along the North Saskatchewan River.

Dewdney, Edgar — Kingpin in Sir John A. MacDonald's government, he traveled extensively in the west. In 1882, when he became Lieutenant Governor of the Northwest Territories, he moved the capital from Battleford to Regina where he had purchased property.

Dickens, Francis — Born January 15, 1844, the third son and fifth child of Charles (the novelist) and Catherine Dickens, he served in the Bengal Mounted Police in India for seven years. After his father died in 1870, he squandered his inheritance, and lost his Bengal appointment. His aunt helped to get him a commission as a sub inspector in the newly formed North West Mounted Police. He became Inspector in 1880, and in 1883, Dickens was placed in charge of Fort Pitt on the North Saskatchewan River. After suffering through the Northwest Rebellion in 1885, he resigned from the force the next year.

Dumont, Gabriel — Born near Red River in 1837, Dumont could speak six languages. By the 1860s, Dumont led a group of Métis hunters in the Fort Carlton area. In 1872, he took advantage of increased traffic on the Carlton trail by opening a ferry across the South Saskatchewan River and a small store upstream from Batoche. In 1885, Dumont was named "adjutant general of the Métis people", proving to be an able commander in the short-lived Northwest Resistance. After a four-day battle near

Batoche, his small army was defeated on May 12, 1885 and Dumont escaped to the United States where he spent five years demonstrating his marksmanship in Buffalo Bill Cody's Wild West Show.

Earl of Southesk (1827 - 1905)

In 1859, at the age of 32, James Carnegie, the 9th Earl of Southesk, travelled to Canada from his native Scotland. He believed a journey into the wilderness would improve his health. It did. He returned to England, vigorous enough to marry for the second time and father eight children. He wrote, "*Saskatchewan and the Rocky Mountains: a diary and narrative of travel, sport and adventure, during a journey through the Hudson's Bay Company's territories, in 1859 and 1860*" Edinburgh: Edmonston and Douglas, 1875, describing his travels, much of which took place along the North Saskatchewan River.

Favel, Joe

Favel was a well known Métis fur trader and guide (sometimes independent and sometimes for the HBC) in the Fort Victoria area in the 1860's and 70's. He was one of the early-recorded residents of River Lot 3 at Victoria Settlement.

Fidler, Peter

Born in Bolsover, England, Fidler joined the HBC in 1788 at 19 years old, married a Cree woman, and travelled the west as a trader and surveyor with his family until his death in 1822. In 1992, during the bicentennial of Fort George/Buckingham House on the North Saskatchewan River, over 500 direct descendants of Peter & Mary gathered at Elk Point for the first Fidler family reunion. A 9.8 metre-high statue of Peter Fidler now stands next to Highway 41 at the northern entrance to Elk Point, Alberta.

Finlay, Jaco

Jaco Finlay, a Métis woodsman and hunter, first class, often guided David Thompson in the Northwest.

Fleming, Sir Sandford

Inventor of Universal Standard Time, designer of an early inline skate (1850), and an important personality in the development of the Canadian railway industry, Fleming led a scientific expedition along the North Saskatchewan River in the 1870's.

Franklin, Sir John

As an officer in the British Royal Navy he was shipwrecked on a reef for 50 days off the coast of Australia in 1803; he fought in the Battle of Trafalgar in 1805; was captured at New Orleans in the War of 1812, and was sent by the British government in 1819 to travel overland from Hudson's Bay to the Arctic ocean, through

Rupert's Land. That is when he spent time on the North Saskatchewan River.

Grandin, Bishop

Vital Grandin, born in northern France, became the first bishop of St. Albert in 1871, when the St. Albert Diocese, which later became the Edmonton Archdiocese, was created. He was the spiritual leader of the people in Alberta, Saskatchewan and Northwest Territories, an advocate of peace and social justice. Together with nine Oblate priests and a few brothers, Grandin ministered to about 12,000 Aboriginal people, 5,000 Métis people and a few hundred others. He died on June 3, 1902.

Grant, George Munro (1835-1902)

A Presbyterian minister born in Nova Scotia, his best known book, *Ocean to Ocean* (1873), is an account of his experiences with the western surveying expedition of Sir Sandford Fleming, chief engineer of the Canadian Pacific Railway.

Hardisty, Richard (1831-1889)

The last Chief Factor of Fort Edmonton, he was sometimes called, 'Red Head, Great Master of the Beaver House'. He married a missionary's daughter, 17-year-old Eliza McDougall, on September 20, 1866, and in 1888 he was appointed to the Senate of Canada.

Hearne, Samuel

Born in London in 1745, Hearne served in the Royal Navy from the age of twelve to twenty-one when he joined the HBC in 1766. After an Arctic odyssey of over 3500 miles in search of the Northwest Passage, Hearne traveled inland in 1774 to establish Cumberland House, the HBC's first inland trading post.

Hector, Dr. James

Medical doctor, geologist and naturalist for the Palliser Expedition of 1857 - 1860, Hector was twenty-three years old when he joined the group.

Henday, Anthony

A convicted smuggler from the Isle of Wight, he hired on to work for the HBC at Fort York in the lowest category job - as a labourer and net-maker. In 1754, he volunteered to travel inland to convince native trappers to bring furs to Hudson Bay, deflecting business from French traders working in the Saskatchewan district.

Henry, Alexander the Younger

He was a nephew of Alexander Henry the elder who came to Canada from the Thirteen Colonies in 1760 when General Amherst's army took the city of Montreal. The older Henry stayed, and became part of the original group to form the North West Company. Henry the younger, also born in the British Colony of New Jersey,

became a shareholder in the NWC in 1792. From then until he drowned in 1814, he kept an extensive journal of his travels in west, with significant mention of time spent on the North Saskatchewan River.

Howse, Joseph — A HBC trader who crossed Howse Pass in 1809, two years after David Thompson discovered it, Howse was in charge of Carlton House, on the North Saskatchewan River from 1799 to 1809.

Kane, Paul — Kane came to York (Toronto) from Ireland as a boy. As a young artist, he travelled along the North Saskatchewan River between 1846 and 1848 writing about and drawing the West.

Kelsey, Henry — A street urchin from London, Kelsey entered the service of the HBC 1684, at the age of seventeen, and worked with Groseilliers and Radisson. He respected the Indian life, and was, as the Company's committee described *"...delighting much in Indians company, never better pleased than when he is travelling among them."* He spoke several Aboriginal languages fluently. He is reputed to be the first English person to travel the North Saskatchewan River.

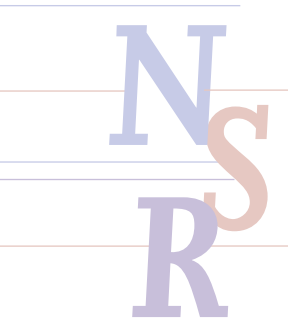
La France, Joseph — La France traveled to England in 1740 to talk about his adventures in the wilderness beyond New France. This included time spent on the North Saskatchewan River.

La Verendrye — The la Verendryes (father - Pierre Gaultier de Varennes et de La Verendrye, three sons and a nephew), from 1731 to 1743, travelled the rivers of the Canadian northwest, extending the French fur trade and searching for the *Mer de l'Ouest*, or Western Sea.

Lacombe, Father Albert — Born in 1827 in Quebec, Père Lacombe arrived at Fort Edmonton 1852 to spend the winter among the Cree and the Métis. He spent 62 years in the Canadian West, much of it along the North Saskatchewan system. Aboriginal peoples called him, "Man with a Heart", and his parishioners referred to him as *"notre vieux connaissant"* -- "our wise elder".

Lagimodiere, Marie-Anne: — Louis Riel's grandmother, city-born Marie-Anne traveled west with her *courier du bois* husband, becoming the first white woman on the North Saskatchewan River, and giving birth to the first white children in what is now Manitoba, Saskatchewan and Alberta.

Laird, David	The Honourable David Laird, from New Glasgow, Prince Edward Island, was the first resident Lieutenant Governor of the Northwest Territories after it was established as a separate administrative area by the *Northwest Territories Act* of 1876.
Lefroy, Sir John Henry	Sir John Henry Lefroy, soldier and scientist, who had made a number of valuable magnetic observations in the far northwest, recommended Thomas Blakiston, a 25-year-old lieutenant from his own regiment, the Royal Artillery, for the job of magnetic observer for the Palliser Expedition.
Legardeur de Saint-Pierre, Jacques Repentigny	Born in Quebec in 1695, de Repentigny traveled west to discover of the Great Western Sea. He took over the western fur trade posts founded by the La Verendryes. The men he sent to ascend the North Saskatchewan River claimed to have built a post near the Rocky Mountains in 1751.
Maskepetoon (1807 - 1869)	A highly intelligent Cree leader, Maskepetoon discussed theology with Methodist missionaries along the North Saskatchewan River. He was a close friend of both Robert Rundle and George McDougall, painted by Paul Kane, and called, "*the Ghandi of the Prairies*" by Alberta author and historian Grant MacEwan.
McDougall, John	Son of George, John met teacher (she began teaching a classroom of 70 students when she was thirteen) Abigail Steinhauer when she was fourteen, and married her when she turned seventeen, in 1865. They spoke Cree at home, Cree being the first language spoken by their three daughters. As well as preaching, John also did some fur trading, attended the treaty signing of both Treaty 6 and Treaty 7, and worked for the federal government as Commissioner to the Indians.
McDougall, Rev. George	A methodist missionary, McDougall, moved Thomas Woolsey's mission on Smoking Lake to Victoria Settlement in 1862. In 1863, after a winter in a buffalo-skin tipi with his wife and five of his children, McDougall built a small cabin and then a large eight-room house at the Mission.
McGillivray, Duncan	William, Simon and Duncan McGillivray were brothers born in Scotland. They apprenticed with their uncle, Simon McTavish in the North West Company. Duncan McGillivray was a clerk at Fort George in 1795 and some of his writing is published in *The Journal of Duncan*



	M'Gillivray of the North West Company at Fort George on the Saskatchewan, 1794-5. Arthur. S. Morton. Macmillan: Toronto, 1929. He retired from the fur trade in 1816.
Marquis de Lorne	The Right Hon. Sir John George Edward Henry Douglas Sutherland Campbell, K.G., G.C.M.G., the eldest son of the Duke of Argyle, was born in 1845. He married Queen Victoria's fourth daughter, Princess Louise Caroline Alberta, Duchess of Saxony, on March 21st, 1871, and became Canada's fourth post-Confederation governor general from 1878 to 1883.
Montgomery, Lucy Maude	Famous for her young adult books, especially *Anne Of Green Gables*, Lucy Maude spent time as a teenager with her father and step-mother on the banks of the North Saskatchewan River at Prince Albert, Saskatchewan.
Nisbet, Rev. James	In 1866, Nisbet founded a mission on the North Saskatchewan River at what is now Prince Albert, Saskatchewan.
Pangman, Peter	An independent fur trader from New Jersey, Pond wintered at Fort Dauphin in 1772. The HBC tried to remove him from HBC lands in 1773, but did not succeed. He later joined the North West Company.
Pond, Peter	A hot-tempered Connecticut Yankee, Pond became an independent fur trader in British Canada as an alternative to fighting in the American Revolution. He later became a founding member of the North West Company in 1783-84, but quarrelled with his partners in 1788 and returned to Connecticut.
Poundmaker	*Pitikwahanapiwiyin* was born in about 1842 near Battleford, Saskatchewan to a Stony shaman and his Cree wife. In August 1876, as headman of one of the River People bands, *Pitikwahanapiwiyin* spoke at the Treaty Six negotiations at Fort Carlton. Although he had grave misgivings he signed the Treaty on August 23 because the majority of his band was in favour of it. Even though *Pitikwahanapiwiyin* did not fight in the North West Resistance, and he successfully intervened to prevent the bloodshed of twenty-one teamsters captured from Colonel Otter's column, he was charged with treason-felony in Regina after the hostilities ceased, and sent to the Stony Mountain Penitentiary in Manitoba.

Riel, Louis (1844-1885)	In 1869, Riel founded the *Comité National des Métis* to protect the status and property rights of his people. This led to the Red River Uprising for which he was exiled to the United States. He returned in 1884 to set up a provisional government, and this led to the 1885 North West Resistance. After the defeat of the Mètis, Riel was executed for treason, arousing a controversy and debate that continues to this day.
Rowand, John (1787-1854)	Rowand, son of a Quebec physician, became a fur trader when he was fourteen, and served as Chief Factor at Edmonton House from 1823 until the day he died in the spring of 1854. He was a short man, but was called "Big Mountain" because he was heavy and thunderously loud. After he died during a fight at Fort Pitt, his bones were shipped to Montreal in a keg of rum so he could be buried in his family plot.
Rundle, Rev. Robert (1811-1896)	Rundle arrived at Fort Edmonton in 1840 to become a missionary to the First Nations people and chaplain for the HBC. He was one of the four British Wesleyan missionaries appointed as chaplains to the HBC.
Schubert, Catherine (1835 - 1918)	Schubert, newly pregnant, travelled with her husband and three children, ages 5, 3 and 1 from eastern Canada, up the North Saskatchewan River, across the Rocky Mountains to the gold fields in British Columbia with the Overlanders in 1862.
Shaw, Angus	He established Fort George for the NWC on the North Saskatchewan River in 1792. A seven-meter high chainsaw carved statue of Angus Shaw now stands in front of the Historical Museum in Bonnyville, Alberta.
Simpson, Sir George	Governor of the HBC, author, and businessman, Simpson was born out of wedlock in Scotland in 1787. Although he knew nothing of the North American fur trade, he accepted an appointment as governor-in-chief of the HBC in 1820. Because of his clear-headed business sense and his bargaining ability he became the driving force for the continued success of the HBC. After fathering seven illegitimate children (1 in Scotland, 1 in Britain, and the rest with mixed-blood women of the fur trade), 43-year-old Simpson married his 18-year-old cousin Francis.

Steele, Sam	Sir Samuel Benfield Steele was born at Purbrook, Canada West (near Orillia, Ontario) on January 5, 1849. He joined the militia in 1866 and was a private in the Red River Expedition of 1870, joined the Permanent Force Artillery in 1871 and, in 1873, became a sergeant major in the newly created NWMP.
Steinhauer, Rev Henry B.	*Shauwanegezhick*, an Ojibwa convert to Christianity, came west with Rev. Woolsey, and led the only mission run entirely by native leaders at Whitefish Lake, north of Victoria Settlement.
Strange, General T. B.	In 1885, General Strange, a retired militiaman, was given authority to organize the Alberta Field Force at Calgary, march to Edmonton, and travel down the North Saskatchewan River to Fort Pitt to deal with the Cree and free the hostages of the Frog Lake Massacre.
Thompson, David	Thompson joined the Hudson's Bay Company at 15 years old in the winter of 1784 -85. In 1797 he left the HBC for the rival North West Company. He honeymooned at Fort George (on the NSR near the Alberta/Saskatchewan border); he welcomed his first child into the world at Rocky Mountain House, and travelled the NSR many times before he retired in 1812. A 3.7 metre-high statue of David Thompson now stands on the lakeshore at Lac La Biche, Alberta.
Tomison, William (1740-1829)	An Orkneyman, Tomison joined the HBC in 1760 as a labourer, and eventually became the Company's first "Chief, Inland." Tomison established Buckingham House on the North Saskatchewan River in 1792 and in 1795 named Edmonton House, after Edmonton, England, the birthplace of Sir James Winter Lake, deputy governor of the HBC.
Woolsey, Rev. Thomas	Methodist missionary to the Cree along the North Saskatchewan River in the 1850's and 60's, he was replaced at Smoking Lake (Smoky Lake) by the McDougalls who moved the mission to Victoria Settlement.
Turnor, Philip	First surveyor for the HBC, hired in 1778, Turnor trained two of the fur trades most well known mapmakers, Peter Fidler and David Thompson.

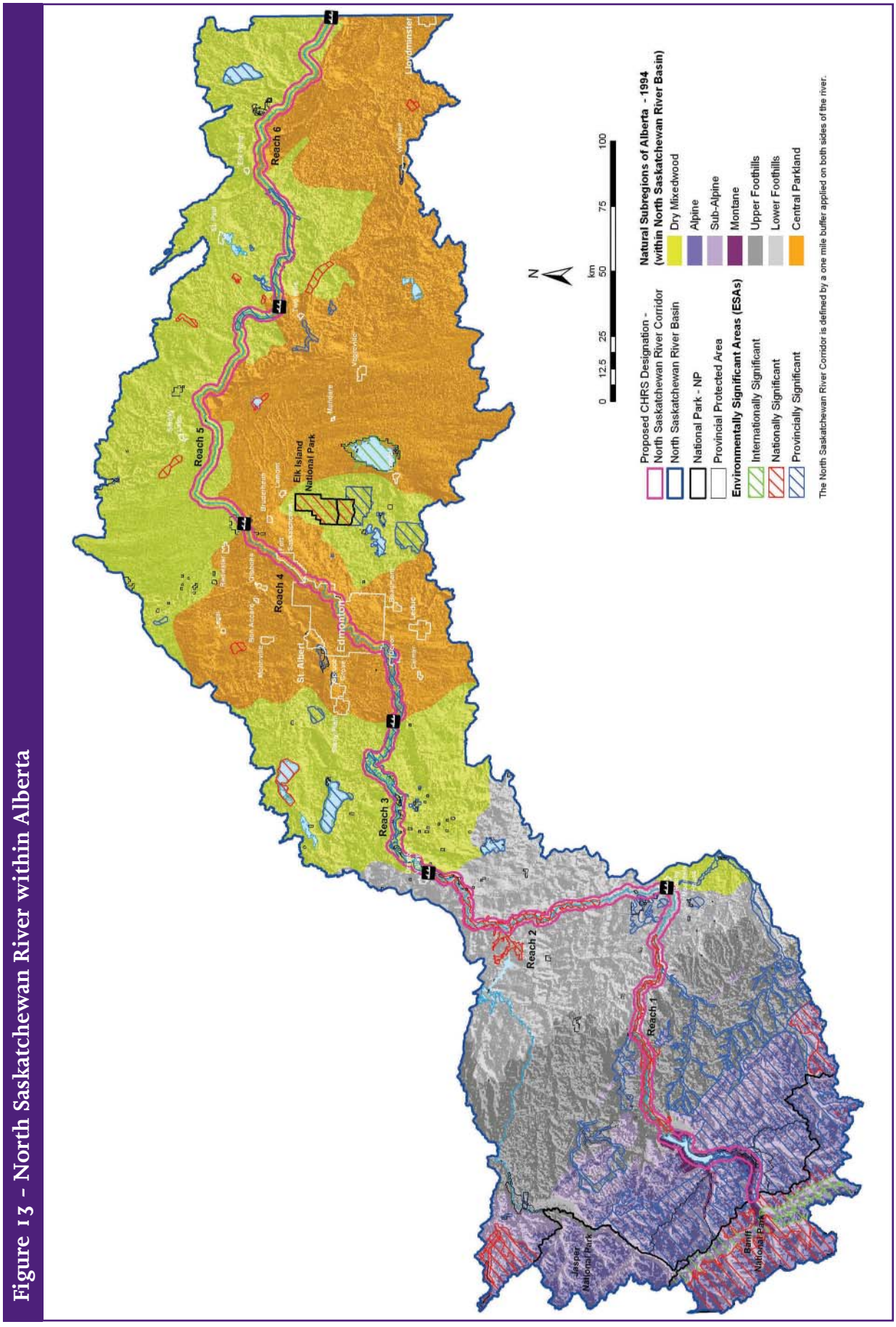


Figure 13 - North Saskatchewan River within Alberta