

THE SAHTU ATLAS

MAPS AND STORIES FROM THE SAHTU SETTLEMENT AREA IN CANADA'S NORTHWEST TERRITORIES



THE SAHTU ATLAS

WHAT THE SAHTU MEANS TO ME

The Sahtu means a lot to me, because my great granny and my cousins live here. At first when we moved here from Inuvik, I didn't like it. But then I stayed for while and I made lots of good friends. My friends in the Sahtu always make sure I'm okay.

My mom says, "We are going to live here forever."
I am fine with that.

Dylan Ritias, Grade 4, Norman Wells





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Mackenzie River © RWED

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SAHTU GIS PROJECT



Northwest Territories Resources, Wildlife and Economic Development



Great Bear Lake, Deline © Robert Kershaw

CONTENTS

ACKNOWLEDGEMENTS		IV
INTRODUCTION		1
NORTHWEST CANADA REFERENCE MAP		2
THE SAHTU	3	
An Ancient Heritage		4
Fur Trade		6
The Sahtu into the 20th Century		7
Sahtu Land Claim		8
Dene Knowledge		13
Transportation/Communications		15
Sahtu Communities		16
Colville Lake		17
Fort Good Hope		19
Tulita		21
Deline		23
Norman Wells		25
THE NATURAL WORLD	27	
Geology		28
Climate		31
Watersheds		36
Ecoregions		38
Boreal Biome and Treeline		43
Forest Fires		44
WILDLIFE	45	
Caribou: Mountain and Woodland		46
Moose		49
Sheep; Muskox		50
Bears		51
Wolves		52
Wolverine, Fox, Lynx , Marten		53
Fish		54
Birds		56
RESOURCES AND DEVELOPMENT	59	
Oil and Gas		60
Seismic Lines and Caribou		61
The Mackenzie Valley Pipeline: History and Proposal		62
Minerals and mining, Port Radium		63
Renewable Resource Management		64
Tourism		65
Canol Trail		66
APPENDIX AND BIBLIOGRAPHY	67-68	



Keele River © RWED

ACKNOWLEDGMENTS

An atlas, like any book, does not just appear in a library or a classroom on its own, but begins as an idea, possibly even a crazy idea. It succeeds with hard work, dedication and the co-operation of many.

The idea for the Sahtu Atlas was inspired by a comprehensive mapping and information collection process launched in 1996. The Sahtu Geographic Information Systems (GIS) project in Norman Wells is a partnership of the Sahtu Land Use Planning Board (SLUPB), the Sahtu Renewable Resources Board (SRRB), and Sahtu Resources, Wildlife and Economic Development (RWED). In the summer of 2001, a gathering of the Sahtu GIS partners developed the atlas idea with the aim of sharing the collected knowledge about this region, with its rich cultures, ecology, and natural resources. It was envisioned that the atlas would aid community organisations, land use planners, government agencies, industry representatives, researchers and educators. Alasdair Veitch (Sahtu RWED) and Miki Promislow (Sahtu GIS Project) agreed to take the lead on the project. Celina Stroeder, then Superintendent of Sahtu RWED, was an enthusiastic supporter.

And so the work began. James Auld was recruited in 2002 to make beautiful, informative maps for the atlas. Translating the masses of information collected in the GIS database into graphic form is no easy task, but James persisted. It is thanks to James's efforts and determination that the original dream has been realized.

But this atlas had to be more than just maps. Statistics, explanations, descriptions and images unique to the Sahtu were needed to give context and meaning to the maps. Miki Promislow, Alasdair Veitch, Jody Snortland, Melonie Dyck, Richard Popko, and Arianna Zimmer helped select photographs, offered research data and gathered numerous scientific tidbits.

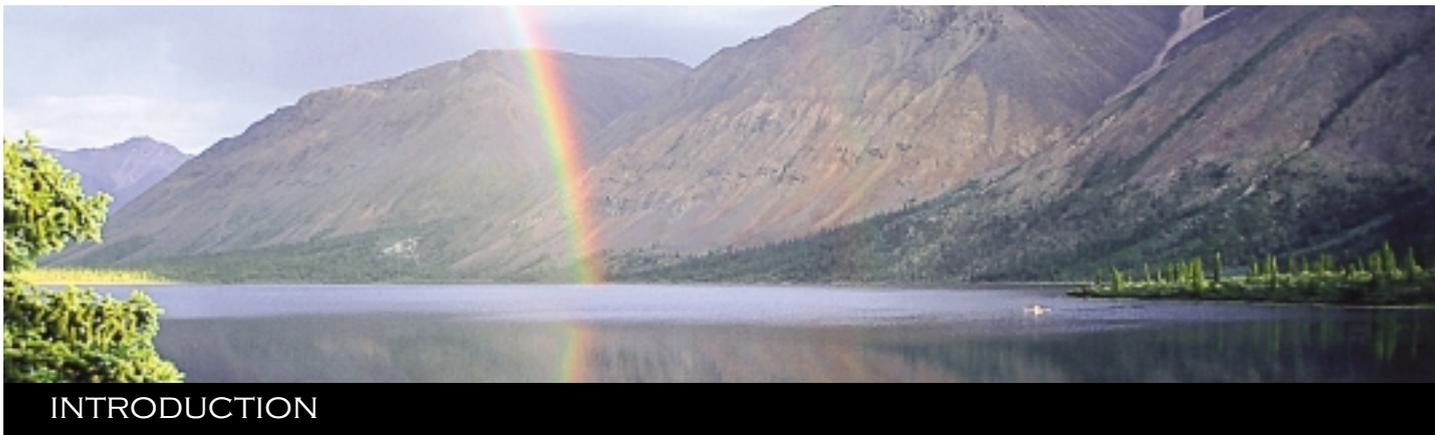
In 2003 Robert Kershaw, who had been involved with other publishing projects in the Sahtu, was brought on board to help manage the project, design the book, contribute content and oversee production and printing. As time moved along James and Robert found themselves working to keep a good idea on track as lagging spirits and personnel departures threatened to derail the project.

Of course many other people have had a part in the making of this atlas. First, thank you to the people the Sahtu, for generously sharing their stories of the land. This atlas is richer because of them. The stories are mainly drawn from three published sources in the Sahtu: reports on research by the Sahtu Land Use Planning Board and the Sahtu Heritage Places and Sites Joint Working Group, and stories published in the former Sahtu monthly newspaper *Mackenzie Valley Viewer* in a series of special supplements entitled *Sahtu Godé Dáhk'é/Sahtu Place of Stories* during 2000-2002. All stories are reprinted by permission of the publishers.

For their work on the traditional place names maps, thanks to researchers Irene Betsidea, Edith Mackeinzo, Marlene Tutcho, and Chuck Bloomquist, as well as Elders Alfred Taniton, and Peter Baton (Deline); Rose McNeely (Fort Good Hope), and Mabel Martin, Leon Andrew, Gilbert Horassi, David Yallee, Victor Menacho and Vivian Pellisey (Tulita). Thanks to Sam Kivi for her amazing ability to keep the Atlas project funded through it's darkest days. Thanks also to Alfred Masuzumi for his wonderful artwork, and the many photographers whose images have brought these pages to life.

Finally, the efforts of Deborah Simmons are incalculable. Deborah brought knowledge, writing and editing skills and most importantly a love of the Sahtu, its people and their stories, working behind the scene to fill in the many gaps the rest of us were unable to fill.

What began as an idea, became a puzzle, a puzzle that at times challenged all involved in the project. This atlas is the result of overcoming those challenges.



The Sahtu Region is a place rich in cultural heritage, breathtaking landscapes and natural resources. The maps in this atlas help reveal much of its wonder. There are recent maps of the Sahtu that represent ongoing scientific research, specializing in natural history, including climate, ecology, wildlife and resource distribution. Other maps show the Region's modern infrastructure: its roads, seismic lines and pipelines. Even the boundary map, a patchwork of political and property boundaries defining Aboriginal, Crown, and Territorial jurisdictions is relatively new, created with the signing of the Sahtu Dene and Métis Comprehensive Land Claim Agreement in 1993.

These maps are in contrast to the traditional mapping of the original inhabitants of this land, the Dene. A fine mesh of trails over centuries of use traces a relationship with a territory that once knew no boundaries. This map shows the land to be animated by the Dene. They travel across the land. They know it, they name it. In the words of Dene researcher Phoebe Nahanni, "We have our own place names for all our camps, for the lakes, the rivers, the mountains – indicating that we know the topography of our land intimately" (from Watkins, 1977).

For the Dene of the Sahtu, the land is mapped in words. The Dene place names spread across the landscape are linked to a multitude of ancient stories that bind the people to the land in a way that is more than purely functional. The land becomes a representation of Dene history and spirituality since time immemorial, and patterns of land use and travel identify what it means to be Dene. Knowledge and skills evolved over generations for survival in a harsh climate are linked to an ongoing sense of responsibility in taking care of the land.

Since the days of the fur trade, the Dene have shared this land with their Métis relatives and neighbours. The Dene and Métis continue to maintain land based subsistence practices, but land use and mapping are now influenced by new factors. The sinuous traditional trail system has been overlaid with rectilinear seismic lines and the straight lines of political jurisdictions. Recent maps reflect conflicting visions for development and conservation of natural resources.

Methods of map making have also changed. The maps in this atlas are the product of sophisticated Geographic Information System technology, providing colourful bird's-eye views of the land. But to truly know the Sahtu we still must walk the land, ride the rivers, learn and tell the stories.

Over the past decade, the Sahtu has become renowned as a centre for Dene and Métis cultural revitalisation and research, for its internationally significant conservation areas, and as a zone of intensive petroleum and mineral exploration and development. In bringing together stories and maps, this book reveals the key challenge of the current period in the Sahtu – that of balancing pressures for development and modernization with the values of environmental conservation, and preserving the access of the Dene and Métis to their cultural heritage on the land.

"Good quality maps can be used in support of many diverse projects such as: documenting traditional knowledge, determining shared use areas and reconciling conflicts, supporting compensation claims, negotiating co-management agreements, determining environmental impacts of development, negotiating protection and benefits from development, administering land use permits, providing baseline data for community planning and resource management, developing education curricula." - from original Sahtu Atlas proposal, 2001





AN ANCIENT HERITAGE

Over thousands of years, the Dene peoples of the Sahtu Region have adapted to an unforgiving environment that demands highly specialised skills and knowledge. Traditional knowledge has been transmitted orally from generation to generation. Some of the oral history and traditional practices have been documented by early missionaries and fur traders, and more recently by anthropologists and community researchers. Archaeologists have also documented traces of ancient human habitation in sites throughout the region. Dene communities continue to keep many of the traditional land-based practices and stories alive, adapting them to the modern context.

The pattern of traditional Dene life follows the changing seasons and movement of wildlife, with major changes marked by autumn freeze-up and spring thaw. Barrenland caribou are an important subsistence resource, and communal hunts during the fall migration are occasion for large community gatherings on the land where meat and hides are processed. This is also a good time for picking berries and harvesting herbal medicines. During the winter, families disperse to their traplines, often located in their traditional clan area. Moose and woodland caribou hunting also requires dispersal in smaller groups. The spring geese and duck migration provides another opportunity for larger gatherings. During the summer, camps are set up for communal processing of fish harvests. Dene people are experts at food preservation; dried and smoked meat and fish are prized delicacies in bush and town alike.

The four Dene peoples of the Sahtu have distinct dialects and practices. These are dynamic, informed by a long history of interaction among aboriginal peoples within the region and beyond. Linguists identify the North Slavey language of the Sahtu as part of the Athapaskan language group, which includes peoples stretching across the northwest from Alaska to Nunavut, and south to California, Arizona, New Mexico, Oklahoma, and into northwestern Mexico. Linguists and archaeologists theorize that Athapaskan peoples may have migrated from Siberia across the Bering Strait, and dispersed from Alaska eastward and southward, gradually evolving distinct languages and dialects. Old time stories told by various Athapaskan peoples also tell of dispersals caused by catastrophic events.

Today the ancient relationships among the northern Dene peoples are kept alive in regional gatherings attracting people from throughout the Northwest Territories and as far away as the western Yukon and eastern Nunavut. Cooperative hunts, spiritual gatherings and family celebrations are all occasions for drum dances, hand games and storytelling. In the Sahtu Region, this tradition now encompasses a wide variety of regional events including sporting events and cultural festivals. And now more than ever in the post-land claim era, there are gatherings to make strategic decisions on matters of common interest. Young men and women are encouraged to seek marriage partners from other communities, so family relationships continue to extend across the region and beyond.



TRADITIONAL CLAN AREAS

There is a traditional Dene land tenure system in the Sahtu Region. This system evolved in recognition of the areas that extended families or clans had established for their own use.

The dispersal of Dene people in small groups was crucial for survival in the days before grocery stores, motorboats and skidoos. People had to be close to enough wildlife for subsistence. In harsh climates, wildlife tends to be dispersed at lower population densities. So it makes sense that people would spread out as well.

The clan area is an important aspect of people's sense of identity. In the old days, people would know the land of that area intimately. This would be the area where they would establish seasonal campsites. It would be where their children were born and where their ancestors were buried. Many of the family stories passed down through the generations would be set in the clan area, mapping its history.

The clan system of land tenure was not incorporated into the Sahtu Dene and Métis Land Claim Agreement. However, the clan system is still alive in a modified form. Some research has been done to map clan areas, but this has not been systematic or comprehensive.



CLAN AREAS AROUND FORT GOOD HOPE AND COLVILLE LAKE



CLAN AREAS AROUND GREAT BEAR LAKE

IN THE WORDS OF OUR ELDERS

a n o u o a A u
 c' a n e l a n e n e a s t d n
 n e v g d n a d d
 c p a b t a b o a n
 e d u u u

 v u j o s d d
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 u m e s e l e c s u
 a v e d a s m e n n
 A n m e

 u o a A u c' v u u
 a n c' u o e d s

We are Dene wá (the people). So, with our words, with our personal endeavours, we have to protect our interests. We can't ignore opportunities. It would not be right. We have to love each other. That's the way it's supposed to be. We Dene wá have survived by righteous rules, and we are courageous in helping each other, by doing good, and being happy. So by helping one another, everyone feels content.

We Dene wá have to keep what we have through our personal endeavours, and through our words. We can't ignore our opportunities. It would not be right. We have to love one another.

We Dene wá have to survive by righteous rules, and we are courageous in helping one another. We should be content with our lives. For we are Dene wá, and we have survived by helping one another. So in general, the dene feel content.

Dene k'í syllabics by elder Leon Modeste, of Deline
 Narration in Dene language transcribed and translated by Alfred Masuzumi
 Originally published in the Mackenzie Valley Viewer, June 2001



Spring hunt with Joe Modeste
 Leon Modeste's father (1977)
 courtesy of Leon and Cecil Modeste



Leon and Cecil Modeste



TRADITIONAL CULTURAL GROUPS

Traditionally, the Sahtu Dene organized themselves into regional bands, each associated with a distinct dialect of Slavey language and each with a particular 'home' land use area. Membership was fluid however, and people accessed the entire area. Though all of the regional bands shared a common culture, many had their own stories, culture heroes, and places, creating unique cultural and social identities. The four major cultural groups within the region are: the K'ahsho Got'ine (Hare people), the Shita Got'ine (Mountain people), the K'áálq Got'ine (Willow Lake), the Sahtú Got'ine (Great Bear Lake people). The land claim agreement defined three districts that roughly correspond to these cultural groupings.

FUR TRADE

The people of the Sahtu were introduced to a fur trade economy by way of traditional trade routes with the Dene Sułine (Chipewyan) people, long before European traders made their way to the area. The northern fur trade era with the English and French traders began in 1670. Under a Royal Charter, the Hudson Bay Company was given ownership of the lands drained by the Hudson Bay. Over the next 100 years, trading centred in this region known as Rupert's Land. It was not until trade routes were established further north and west that traders looked to the Sahtu.

At the turn of the 18th century, fur trading posts under the North West Company were established in the Sahtu after Alexander Mackenzie's exploration of the Deh Cho River. The North West Company established a post in Deline (Fort Franklin) in 1799, in Tulita (Fort Norman) and in the vicinity of Fort Good Hope in 1804-1805. In 1821, the North West Company joined the Hudson's Bay Company. A century of relationships developed through the fur trade gave rise to the Métis Nation, a distinct people that brought together Dene and European cultures.

In the early days of the fur trade, the Dene would seldom trap a locality out. Subsisting out on the land, they would move camp often in search of game and would consequently trap lightly over a large area.

But fur was a lucrative commodity for European traders, and the trade rapidly expanded, exerting new pressures on fur-bearing animal populations. Early on, ships that delivered £650 worth of trade goods were returning to England with £19,000 worth of furs. Europeans increasingly found it profitable to enter the trade as trappers. In contrast to their nomadic Dene counterparts, European trappers brought most of their own provisions, established themselves in a chosen locality, built headquarters with small buildings and devoted most of their time to trapping to supply the market. In a few years, nearby fur-bearing populations would be exhausted, forcing them to seek new trapping areas.

As the 20th century dawned, trapping had become an established modern, market-driven activity. However, over-trapping and over-hunting were causing severe shortages of the wildlife that had been the source of survival for the Dene and Métis peoples. The tensions of those times are evoked in Dene bushman stories, which are said to be a response to the fearsome white strangers that had entered the wilderness.



Fort Good Hope trappers - courtesy of Dora Lafferty

caribou blanket

WHEN THE BUSHMAN CAME TO TOWN

By Corey Chinna, Gr 7-12, Fort Good Hope

(Originally printed in the Mackenzie Valley Viewer, February 2001)

I was just coming from my friend's house when I saw some kids riding around on skidoos. So I ran home to get my skidoo. I grabbed the skidoo from my house, and took off to follow the other kids. By the time I caught up with them, it was already dark. I just followed the skidoo in front of me.

Then I heard a weird noise coming from the engine. So I stopped to check it out. It didn't look like anything was wrong. I kicked the engine, and it went back to normal. I jumped back on and took off again.

All the kids were gone already, except one. So I followed him. He slowed down and stopped. I asked him if he knew where the other kids went. He didn't answer. I looked at his clothes. They were all hair! I remember my granny telling me a bushman was wandering around.

Then he stood up. He was about seven feet high, and hairy, too. He started grumbling like he was talking. I took off around a corner. I thought I'd lost him, so I said, "Whooo!" Then he jumped out of the bushes and covered my eyes so I couldn't see. I crashed into a ditch. When I turned around, he wasn't there. I went to the road to see if I could see him. I said, "Aah, I guess I'll go home and tell my dad about the skidoo."

Then I turned and there he was, towering over me like a giant. He grabbed me and picked me up. Suddenly something came out of nowhere and crushed the bushman. He was out cold. Later, I saw his arm move, so I ran.

He was running after me. I ran onto the river, which it wasn't very frozen. I kept running, and all of a sudden he fell through the ice. I checked to see if he fell in for sure. Then his big hand came out and grabbed my leg. I pulled out my lighter and burned his hand. Then he went back under. I ran home to warm up.

MACKENZIE'S MISTAKE

On June 3, 1789 25 year old fur trader Alexander Mackenzie, led his 12-person crew of French-Canadian voyageurs and Chipewyan guides and their fleet of birchbark canoes into the cold water of Lake Athabasca. He had every reason to believe that the voyage would lead westward to the shores of the Pacific Ocean.

The Pacific quest however was difficult from the outset. Progress on the Slave River, leading north was slow, and dangerous. Unseasonable ice on Great Slave Lake often brought the fragile birchbark canoes to a standstill.

The sagging spirits of the crew lifted when the next great river (Deh Cho) began to carry them westward. Soon the snow-capped wall of the Rocky Mountains in the distance appeared. But when the river itself turned north and parallel to the mountains, at Camsell Bend, the paddlers realized that their quest for the Pacific would be a failure.

On July 16, 6 weeks after their optimistic departure their fears were confirmed: their route had taken them not to the Pacific Ocean, but to the Arctic. Disappointed, Mackenzie and his guides paddled back to Lake Athabasca.

In May of 1793, Mackenzie tried a second time. This time he headed west from Athabasca, following the Peace River to the continental divide and reached the headwaters of the Fraser River which flows into the Pacific at present-day Vancouver.

His guides knowing the river's dangerous reputation advised Mackenzie against attempting to descend it. Instead, the explorer descended the Bella Coola River, becoming the first European to cross North America north of Mexico.

Adapted from Canadian Council for Geographic Education's "Mackenzie River - Wrong Turn."



THE SAHTU INTO THE 20TH CENTURY

The discovery of oil at Norman Wells in 1919 unleashed a new dynamic in the region. The signing of Treaty 11 a year later provided the legal basis for developing the oil wells. A rapid influx of southerners increased the exposure of Dene people to deadly epidemics. In 1928, a devastating flu epidemic took the lives of about 600 people in the Mackenzie District of the Northwest Territories, about 10-15% of each village. Tuberculosis and pneumonia spread in the wake of the epidemic, preying upon the weakened survivors. Between 1937 and 1941, tuberculosis was found in the District at a rate fourteen times the national average, and pneumonia at a rate of more than double the average. One Edmonton doctor visiting the NWT noted in 1934 that he could not find “a single physically sound individual” (quoted in Abel 1993, 208).

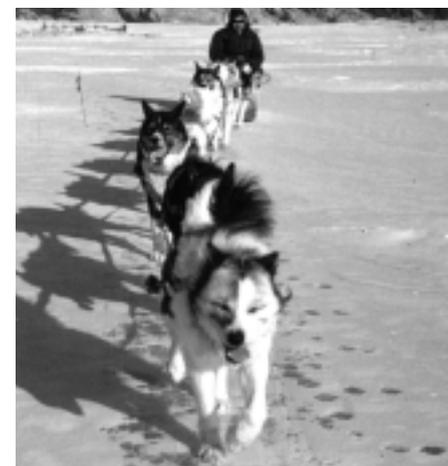
Bishop Gabriel Breynat was a tireless advocate for the sick and destitute Dene peoples. In 1938, he wrote an article entitled “Canada’s Blackest Blot” that was published in the Toronto Star Weekly, in which he noted that in “carefully compiled figures for 12 months during 1935-1936 (an exceptionally good year), it is estimated that the per capita income of these Indians was \$110” (quoted in Fumoleau 1996, 300).

Increasingly restrictive fur and game harvesting laws were an additional blow to Dene peoples, who already felt betrayed by broken promises in the aftermath of Treaty 11. In 1928, closed seasons on beavers were imposed, and further restrictions were added in amendments to the Game Act in 1929. This was despite evidence that non-aboriginal trappers from the south were having the greatest impact on wildlife populations.

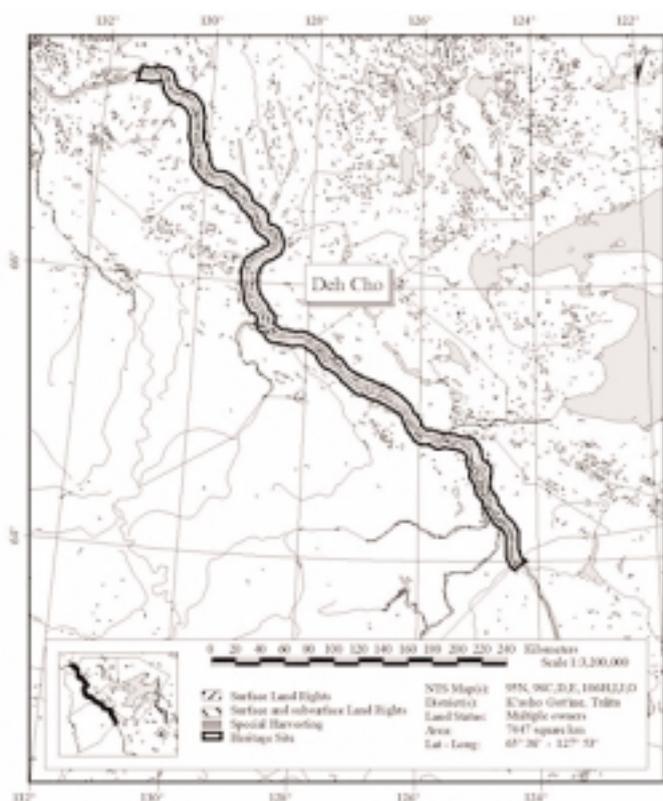
Fortunately, the game laws probably did not have much impact on the communities of the Sahtu. Many people were not aware of the laws, and local agents and police likely recognised the futility of attempting to enforce them (Abel 1993). However, by the end of the 1930’s, the Depression was affecting the Mackenzie Valley as fur prices crashed. An era that lasted 140 years in the Sahtu was coming to a close.

Meanwhile, the discovery of pitchblende at Port Radium on Great Bear Lake and gold at Yellowknife marked a turning point in the economy of the Mackenzie District in the 1930s. The opening of the Somba K’e (Port Radium) mine on Great Bear Lake in 1933 created a new home market for oil. Production of petroleum at Norman Wells increased at a dizzying speed, especially with the additional demand created in 1937 by the opening of gold mines in Yellowknife. Imperial Oil built a new refinery, and drilled two new wells. Production went from 910 barrels per year in 1932 to over 22,000 in 1938. In 1946, mineral production exceeded fur production in value, for the first time in the north.

Today, the economy of the Sahtu Region is based on a mix of industrial resource extraction, tourism, traditional trapping and subsistence harvesting. People of the Sahtu continue to rely on the land as a source of income, food, security and identity. Many Dene and Metis people have found ways to combine wage employment in town with traditional activities in the bush. Although young people are learning modern skills in school, there is also a movement to ensure that they are provided with teaching by their elders in the skills and knowledge needed for survival on the land.



Top - Hunters travelling by dog sled
Middle - Madeline Karkagie (Tulita) smoking hide.
Bottom - Caribou meat ready for transport
photos © Norm Simmons



DEH CHO (MACKENZIE RIVER)

The Deh Cho or 'Big River', from Blackwater River in the south, to Thunder River in the north, was and remains a very important route for Sahtu Dene and Metis... As a traditional use area, the Deh Cho continues to provide domestic fisheries, moose and waterfowl hunting areas, travel access to many other locations. It is associated with numerous legends, including stories of Yamoria.



boats along the Mackenzie River

FORGING A NEW MAP: THE SAHTU LAND CLAIM

The Sahtu Land Claim Agreement was negotiated with the government of Canada to clarify land title, and to enshrine the ongoing role of Dene and Metis people as stewards of the land.

AS LONG AS THIS LAND SHALL LAST: TREATY 11

The idea of establishing land title and boundaries dates back to 1920, soon after the first oil gusher was hit at Norman Wells. The nascent Council of the Northwest Territories began planning for the development of oil and gas reserves. But the aboriginal peoples had not ceded their rights to the territory. When it was pointed out that oil and gas licenses in this area existed outside the law, the Department of Indian Affairs undertook to conclude Treaty 11. The Crown considered this to have been accomplished in the summer of 1921, during a brief trip through the communities along the Mackenzie River. According to the treaty document, Dene and Métis peoples ceded their title to 599,000 square kilometres, stretching northward from the 60th parallel to the Arctic Ocean, and eastward from the Mackenzie Mountains to Great Slave Lake. Oral testimony shows that the Dene people did not understand the Treaty to be extinguishing title to their traditional lands.

LAND TITLE AND THE MACKENZIE VALLEY PIPELINE

Disparities between Dene and government interpretations of Treaty 11 came to light in the late 1960s, when a natural gas pipeline through the Mackenzie Valley was first proposed. In 1966, the Indian Brotherhood of the Northwest Territories launched an oral history project to determine the Dene understanding of the Treaty 11 process. On March 24, 1973, sixteen Dene chiefs put forward a legal claim of interest in an area covering more than one million square kilometres, and presented a caveat for registration under the Land Titles Act. Nearly six months later, Justice William G. Morrow presented a finding that the Dene peoples did indeed have aboriginal rights in the area. This caveat meant that no development could proceed until land title was established.

In 1974, the federal government set up a commission to investigate the “terms and conditions that should be imposed” in respect of the proposed pipeline. Justice Thomas Berger led the inquiry. Over a three year period, Berger travelled throughout the Western Arctic in an unprecedented consultation process involving more than a thousand witnesses. When the Berger Inquiry came to the Sahtu Region, people had their first opportunity to voice their opinions about the impact that such a major development would have on their land and their lives. In his final report, Berger recommended a moratorium on development until aboriginal land claims could be settled.

TAKING TREATY IN TULITA: REMEMBERING TREATY 11

The people were scared to take the treaty because they didn't know what was coming. The Treaty party couldn't just come to the town and say, “Here, we'll give you the money for nothing.” The Indians had feelings that the White people were going to take over something, that the White people were not giving the money away for nothing. They must be buying something, either the land or the people. That's how the Indians felt. So they just kept asking the White people what the money was for. They said, “You just can't give us the money for nothing. It must mean something ...” The White people kept bugging the people for treaty. They said, “You've got to take treaty.” The people said no. So everyone went home. The next day, it was the same thing again. They talked about taking the Treaty all day. They tried to force the people to take the Treaty. The people didn't want it

From interviews with Joe Kenny, Albert Menacho (Isadore Yukon, interviewer), John Blondin and Johnny Yakeleya (Bernard Masuzumi, interviewer), and notes by John Blondin, in As Long As This Land Shall Last, by Rene Fumoleau, OMI (Toronto: University of Calgary Press, 1975, 2004), 231-232.



Dene Nation Assembly, Tulita, 2001



The Sahtu and surrounding land claim regions and territories

Recognizing unfulfilled treaties throughout the NWT, the federal government established mechanisms for land claim negotiations. The first settlement was concluded with the Inuvialuit in 1984. The Dene and Metis came together and put forward a single Denendeh land claim. By 1988, Agreement-In-Principle was reached on this claim. However, the agreement fell apart over a number of issues. The Gwich'in communities withdrew from the process, soon followed by the Sahtu communities. In 1991, the Gwich'in Comprehensive Land Claim Agreement was signed. The Sahtu Dene and Metis Comprehensive Land Claim Agreement was concluded in 1993.

THE NEW LAND CLAIM MAP

The Sahtu Land Claim map involves multiple layers of boundaries: the boundary defining the region as a whole, referred to in the Land Claim as settlement lands; boundaries identifying three districts within the region; five municipal boundaries; and outside the municipalities, numerous boundaries defining federal, territorial and aboriginal land title.

The regional and district boundaries are necessarily provisional to some extent, given that there is overlap in traditional land use areas; fixed boundaries did not exist in the old clan area system. Although this issue affects all aboriginal lands in three northern territories, it is especially complex for the Sahtu since it is centrally located, sharing boundaries with the Yukon First Nations to the west; the Gwich'in, Inuvialuit and Nunavummiut (the people of Nunavut); the Dogrib of the North Slave region covered by Treaty 11 to the east, and the Deh Cho First Nation to the south .

DISTRICTS AND COMMUNITIES

The district boundaries were defined roughly corresponding with the core land use areas of the contemporary Dene and Métis communities within the Sahtu Region. Though the nomadic Dene had harvested in these areas for generations, permanent settlements were established relatively recently, in response to the expansion of the fur trade and subsequently, the development of petroleum and mining industries in the area. As the non-aboriginal population increased and wildlife became more scarce, it became increasingly difficult to sustain a wholly land-based subsistence. When the Federal government finally recognized its responsibility for the well-being of northern aboriginal peoples, they were encouraged to settle in centres established for convenient administration of services. Land use patterns shifted somewhat to accommodate a new hybrid way of life, combining town and bush.

Fort Good Hope and Tulita were both established early in the 19th century as fur trading and mission posts conveniently located along the Mackenzie River transportation route. Norman Wells, as its name implies, is a primarily non-aboriginal and Métis community founded as a result of the “discovery” of oil there in 1919 (though the aboriginal inhabitants of the area may well have known about this long before). Deline developed as a semi-permanent community on Great Bear Lake near the mouth of Great Bear River in the 1940s and 1950s with the expansion of the Port Radium uranium mine. The community achieved permanence with the closure of the mine in 1960, when the Dene residents of Port Radium were compelled to move to Deline. Colville Lake was created in 1962 as part of a movement to revive traditional trapping practices, linked to the establishment of a Roman Catholic mission there.

Although there are close interrelationships among the Dene communities, they are culturally and linguistically distinct. The K'ahsho Got'ine/Hare people are now centred in Fort Good Hope and Colville Lake. The Shita Got'ine/Mountain people have joined with the K'áálô Got'ine/Willow Lake people in the community of Tulit'a. The Sahtúot'ine are named after Sahtú/Great Bear Lake, and are based in Deline. Métis people, descendents of relationships established between Dene people and fur traders, reside in all five communities of the region.

THE BERGER INQUIRY IN FORT GOOD HOPE

The following is excerpted from the address given by Chief Frank T'Seleie at the Pipeline Inquiry during its visit to Fort Good Hope, August 5, 1975.

Mr. Berger, as chief of the Fort Good Hope Band I want to welcome you and your party to Fort Good Hope. This is the first time in the history of my people that an important person from your nation has come to listen and learn from us, and not just come to tell us what we should do, or trick us into saying “yes” to something that in the end is not good for us

It is not at all inevitable that there will be a pipeline built through the heart of our land. Whether or not your businessmen or your government believes that a pipeline must go through our great valley, let me tell you, Mr. Berger, and let me tell your nation, that this is Dene land and we the Dene people intend to decide what happens on our land....

Mr. Berger, you have visited many of the Dene communities. The Dene people of Hay River told you that they do not want the pipeline because, with the present development of Hay River, they have already been shoved aside. The Dene people of Fort Franklin [Deline] told you that they do not want the pipeline because they love their land and their life and do not want it destroyed. Chief Paul Andrew and his people in Fort Norman [Tulita] told you that no man, Dene or white, would jeopardize his own future and the future of his children. Yet you re doing just that if you asked him to agree to a pipeline through this land

Our Dene nation is like this great river. It has been flowing before any of us can remember. We take our strength and our wisdom and our ways from the flow and direction that has been established for us by ancestors we never knew, ancestors of a thousand years ago. Their wisdom flows through us to our children and our grandchildren to generations we will never know. We will live out our lives as we must and we will die in peace because we will know that our people and this river will flow on after us.

From Watkins, Ed. Dene Nation: The Colony Within. (1977: 12-17).



Dene Nation logo

NORTHERN FRONTIER NORTHERN HOMELAND: THE BERGER REPORT

Justice Thomas Berger summarized the key points from his extensive report in a letter to Warren Allmand, Minister of Indian Affairs and Northern Development, dated April 15, 1977. Below are excerpts from Berger's letter.

We are now at our last frontier. It is a frontier that all of us have read about, but few of us have seen. Profound issues, touching our deepest concerns as a nation, await us there.

The North is a frontier, but it is a homeland too, the homeland of the Dene, Inuit and Metis, as it is also the home of the white people who live there. And it is a heritage, a unique environment that we are called upon to preserve for all Canadians.

The decisions we have to make are not, therefore, simply about northern pipelines. They are decisions about the protection of the northern environment and the future of northern peoples....

THE MACKENZIE VALLEY

I have concluded that it is feasible, from an environmental point of view, to build a pipeline and to establish an energy corridor along the Mackenzie Valley, running south from the Mackenzie Delta to the Alberta border. Unlike the Northern Yukon, no major wildlife populations would be threatened and no wilderness areas would be violated

However, to keep the environmental impacts of a pipeline to an acceptable level, its construction and operation should proceed only under careful planning and strict regulation. The corridor should be based on a comprehensive plan that takes into account the many land use conflicts apparent in the region even today....

ECONOMIC IMPACT

The pipeline companies see the pipeline as an unqualified gain to the North; northern businessmen perceive it as the impetus for growth and expansion. But all along, the construction of the pipeline has been justified mainly on the ground that it would provide jobs for thousands of native people....

Although there has always been a native economy in the north, based on the bush and the barrens, we have for a decade or more followed policies by which it could only be weakened and depreciated. We have assumed that the native economy is moribund and that the native people should therefore be induced to enter industrial wage employment. But I have found that income in kind from hunting, fishing and trapping is a far more important element in the northern economy than we had thought.

The fact is that large-scale projects based on non-renewable resources have rarely provided permanent employment for any significant number of native people. There is abundant reason to doubt that a pipeline would provide meaningful and ongoing employment to many native people

It is an illusion to believe that the pipeline will solve the economic problems of the North. Its whole purpose is to deliver northern gas to homes and industries in the South. Indeed, rather than solving the North's economic problems, it may accentuate them.

The native people, both young and old, see clearly the short term character of pipeline construction. They see the need to build an economic future for themselves on a surer foundation. The real economic problems in the North will be solved only when we accept the view the native people themselves expressed so often to the Inquiry: that is, the strengthening of the native economy. We must look at forms of economic development that really do accord with native values and preferences. If the kinds of things that native people now want are taken seriously, we must cease to regard large-scale industrial development as a panacea for the economic ills of the North....

IF THERE IS NO PIPELINE NOW

An economy based on modernization of hunting, fishing and trapping, on efficient game and fisheries management, on small-scale enterprise, and on the orderly development of gas and oil resources over a period of years – this is no retreat into the past; rather, it is a rational program for northern development based on the ideals and aspirations of northern native peoples.

To develop a diversified economy will take time. It will be tedious, not glamorous, work. No quick and easy fortunes will be made. There will be failures. The economy will not necessarily attract the interest of the multinational corporations. It will be regarded by many as a step backward. But the evidence I have heard has led me to the conclusion that such a program is the only one that makes sense....

IMPLICATIONS

I believe that, if you and your colleagues accept the recommendations I am making, we can build a Mackenzie Valley pipeline at a time of our own choosing, along a route of our own choice. With time, it may, after all, be possible to reconcile the urgent claims of northern native people with the future requirements of all Canadians for gas and oil.

From Northern Frontier Northern Homeland: The Report of the Mackenzie Valley Pipeline Inquiry, revised edition (Toronto: Douglas and McIntyre, 1977, 1988). 14-29.



Proposed Mackenzie Valley pipeline through the Sahtu

LAND TITLE , ADMINISTRATION AND GOVERNANCE

The Sahtu Dene and Métis of the three Districts now have title to 41,437 square kilometres of settlement lands, of which 1,838 square kilometres or 22.5% includes the ownership of subsurface resources (petroleum and minerals). Sahtu Dene and Métis lands were selected according to a variety of criteria, including spiritual sites, traditional land use and harvesting areas, and some lands with resource revenue potential. In addition, a number of Special Harvesting Areas have been set aside for land claim beneficiaries.

The Land Claim provided for the transfer of settlement lands outside the municipalities in return for a Federal payment of \$75 million to designated organisations accountable to Sahtu Dene and Métis beneficiaries. Administration of Land Claim funds and activities on behalf of Land Claim beneficiaries is accomplished by way of seven community Land Corporations (including separate Dene and Métis organisations in Tulita and Fort Good Hope) and the regional Sahtu Secretariat Incorporated. Political leadership for Dene beneficiaries is provided by local Band Councils, and the regional Sahtu Dene Council.

The Sahtu Secretariat Incorporated (SSI) is the coordinating body for the seven Land Corporations and is the main contact for federal and territorial governments with respect to education, health, environment and economic development. The SSI also holds land claim funds in trust for the land corporations, and facilitates corporate decision-making at a regional level.

The local Band Councils and regional Sahtu Dene Council are the political bodies responsible for treaty matters and matters relating to the Indian Act. The Band Councils play an important leadership role in determining community priorities, and administer a number of social programs. The Sahtu Dene Council reviews and makes decisions on issues that influence the way in which Sahtu business is conducted, and provides advice to the SSI.

The Land Claim also provides for the negotiation of self-government agreements with the Federal and Territorial governments. Deline was the first Sahtu community to undertake negotiations and an Agreement-in-Principal was signed August 23, 2003.

THE FIGHT FOR A LAND CLAIM

At the time of the Berger Inquiry, George Barnaby of Fort Good Hope was an elected member of the Territorial Council representing the Mackenzie/Great Bear region. He resigned while in office, following which he was elected Vice-President of the Indian Brotherhood of the NWT (now known as the Dene Nation). He became a leading proponent of the Denendeh comprehensive land claim agreement.

“The land claim of the Dene is a claim not only for land but also for political rights. Up to this time the native people have had no say in what happens on their land. Everything has been decided by Ottawa or a few people in Yellowknife. This does not apply to development on the land only, but also in the way we live. Laws are made by people from the south that do not make sense to us, but which we have to live by. These laws are to serve the system of the south. They are not laws to protect the Dene way of life.

The land claim is our fight to gain recognition as a different group of people – with our own way of seeing things, our own values, our own life style, our own laws.

The land claim is a fight for self-determination using our own system with which we have survived till now. This system is based on community life. Whether it be a settlement or a trapping camp, whether people live by working in a wage economy or off the land, the laws we follow are concerned with all the people, not to benefit a few at the expense of the rest.”

The land claim is our fight to survive as a nation and to decide our own future.

From Dene Nation: The Colony Within, Mel Watkins, Editor (Toronto: University of Toronto Press, 1977). 120-124.

SURFACE, SUB-SURFACE RIGHTS AND MUNICIPAL DISTRICTS

Settlement and Municipal Lands

Under the Sahtu Land Claim Agreement the Sahtu Dene and Metis have title to 41,437 square kilometers of settlement lands of which 1,838 square kilometers includes the rights to subsurface resources. These Sahtu-owned lands are privately owned in fee simple and not reserves under the Indian Act. Municipal lands are fee simple title lands within the municipal boundaries excluding subsurface title.

Federal Crown Lands

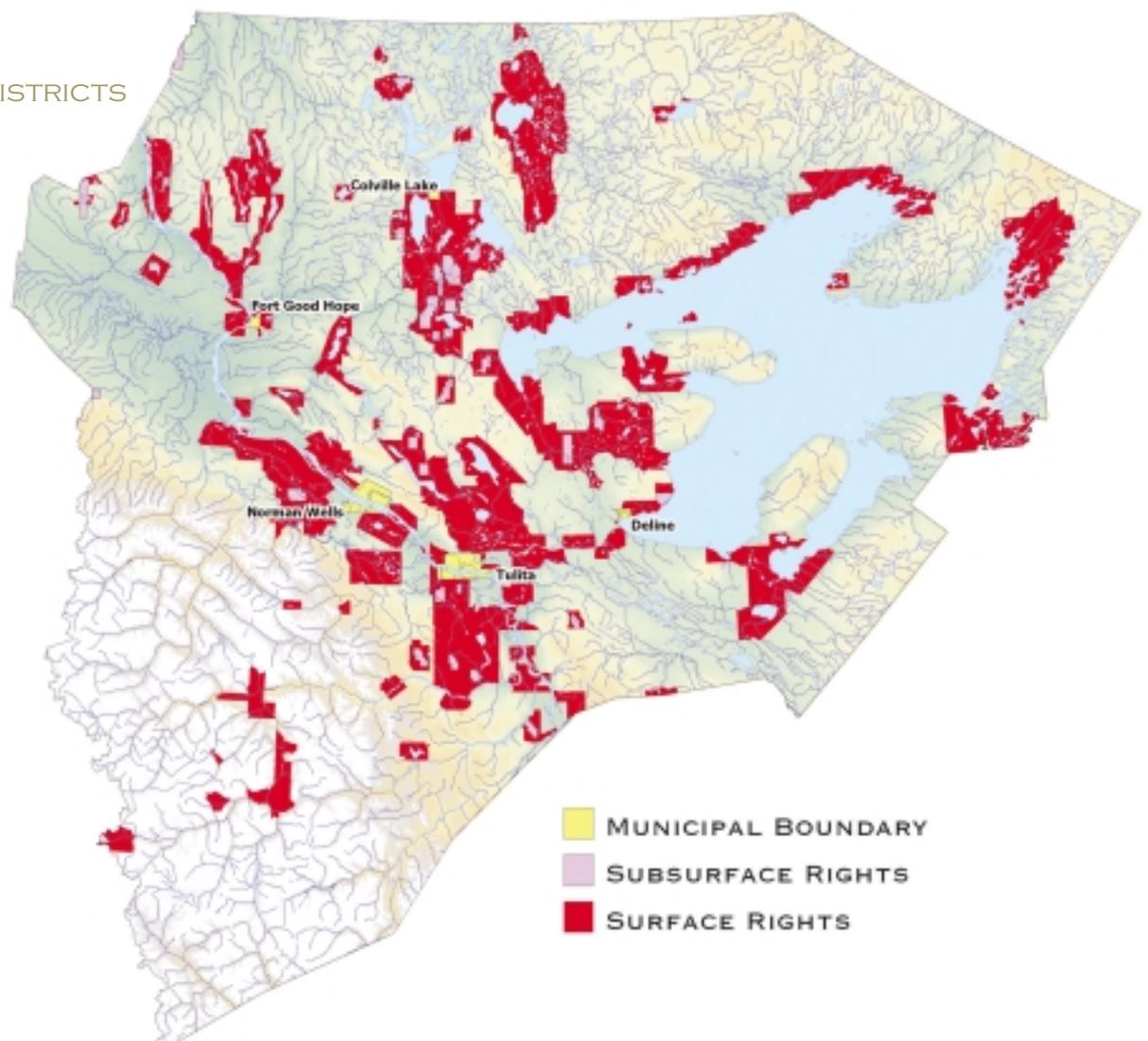
Over 80 percent of land within the SSA are Federal Crown lands. On these lands the Government of Canada owns and controls most of the lands and resources, both surface and subsurface.

Commissioners Lands (Block Transfers)

These are lands within or near municipal boundaries of communities where control of surface rights have been transferred to the Commissioners of the NWT. The Commissioner therefore acts like an owner and is able to confer interests in land to third parties.

Norman Wells Proven Area Agreement

Signed in 1944 the federal government granted Imperial Oil exclusive right to drill for and produce petroleum and natural gas from the area for three consecutive 21 year terms. This agreement is valid until 2008.



CO-OPERATIVE RESOURCE MANAGEMENT

A new system of co-operative resource management (co-management) was created by the Land Claim to address the longstanding concern of Sahtu people that they be provided with opportunities to participate in decisions affecting Sahtu lands. The Claim identifies three Boards responsible for resource management, including the Sahtu Land Use Planning Board, the Sahtu Land and Water Board and the Sahtu Renewable Resources Board.

The Sahtu Renewable Resources Board was the only organisation actually established through the Land Claim. The other two boards were established five years later (in 1998) through the Mackenzie Valley Resource Management Act. This Act instituted an integrated system of land and water management across regional boundaries, guided by existing land claim agreements. The Gwich'in resource management boards were also established by the act, along with the Mackenzie Valley Land and Water Board and the Mackenzie Valley Environmental Impact Review Board. As their names imply, the latter two boards are responsible for the Mackenzie Valley area including the Sahtu Region.

The purpose of the co-management system is mainly to ensure that Sahtu residents are able to participate in the management and regulation of our resources in a direct and meaningful way. The new system recognises the special knowledge that Sahtu residents have about the land, and accounts for their rights as land users and participants in decision-making. The co-management boards are accountable to the public in that aboriginal, territorial and federal governments nominate their directors. To ensure an equal voice for the rights of land claim beneficiaries, the Sahtu Secretariat Incorporated nominates one half of the members on each of the Sahtu boards.

Although the three levels of government are involved in the appointment of board members, the boards themselves are independent, and don't directly answer to any level of government. As so-called "Institutions of Public Government," they are accountable only to their legal mandate. This allows them to have a more direct relationship with each other, and with Sahtu residents.

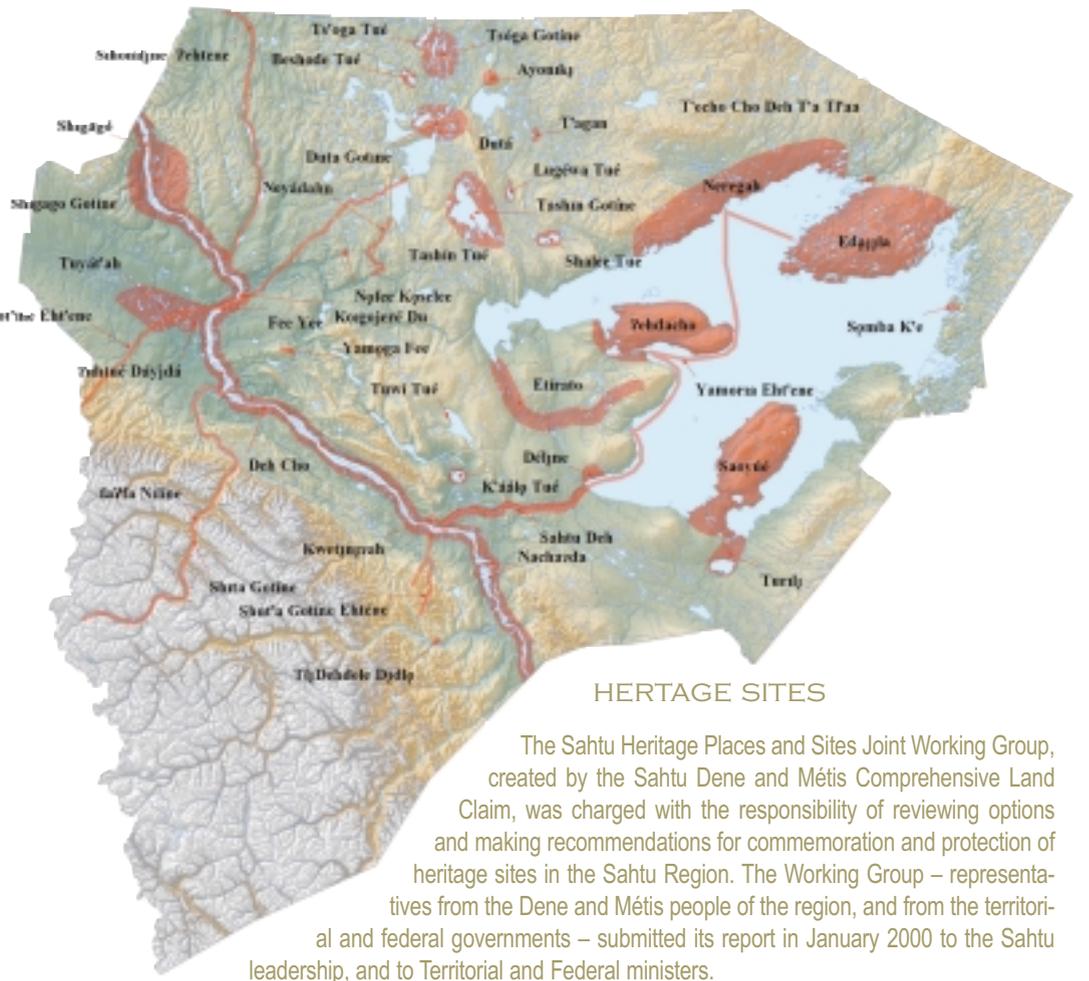
The new system also involves co-operation among the boards both within the Sahtu and in bordering regions to facilitate more effective and integrated resource management. The law allows the boards to "share staff and facilities with one another for the effective and efficient conduct of their affairs."

THE SAHTU CO-MANAGEMENT BOARDS

The Sahtu Land Use Planning Board is tasked with developing a land use plan for the Sahtu that guides the conservation, utilisation, and development of the land.

The Sahtu Land and Water Board deals with water licenses and land use permits on the Sahtu. Once a Land Use Plan is in place, all licenses and permits will have to comply with the policies laid out in the plan.

The Sahtu Renewable Resources Board is the main body responsible for fisheries, forestry, and wildlife management in the Sahtu. They are guided by community-based Renewable Resource Councils.



OVERVIEW OF SAHTU GOVERNANCE STRUCTURE

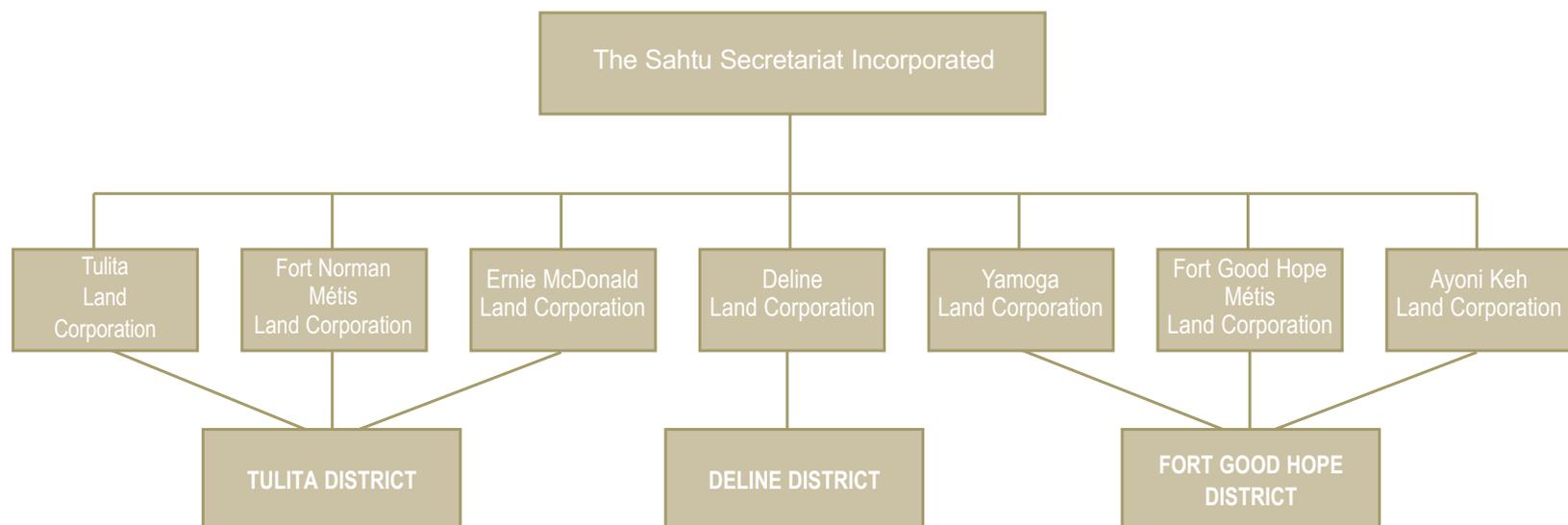


Figure from Draft Sahtu Land Use Plan

DENE KNOWLEDGE

The Dene people's relationship with the land has given rise to a particular kind of knowledge that has been passed on orally across the generations, evolving through time so that each new generation can draw upon hundreds of years of Dene experience. This knowledge is articulated through the rich and specialised vocabulary of the Dene language and dialects.

Knowledge that draws upon lived experience and is passed on from generation to generation has become known as "traditional knowledge." Because this knowledge is highly adaptive and continually incorporates new experiential learnings, it is perhaps misleading to use the term "traditional;" some argue that it is more appropriate to refer to "Dene knowledge."

Non-Dene people have been made aware of the value of Dene knowledge since their first arrival in this region. Without naming it, early explorers and scientists recognized the value of this kind of knowledge; they almost always hired Dene people as their guides, and depended on Dene knowledge for their survival. The success of the fur trade has always been dependent on the specialized Dene knowledge of fur-bearing mammals. Dene oral traditions affirm that notwithstanding the official histories of the north, Dene knowledge was responsible for the first discoveries of the region's most profitable resources, pitchblende (radium/uranium) and oil.

In the 1970s, the value of Dene knowledge gained some level of official recognition. Justice Thomas Berger broke new ground in declaring oral testimony admissible as evidence in court. The Sahtu Dene and Métis Land Claim Agreement is founded in Dene knowledge of traditional land use, and it sets out a cooperative resource management regime that requires the incorporation of Dene knowledge in research and decision-making.

There are still significant challenges involved in integrating Dene and other knowledges. As the communities of the Sahtu Region move into an era of self-government, there will be opportunities to apply Dene knowledge to the transformation of government, education, and health and social programs, so that these institutions will be better adapted to people's needs.

DENE KNOWLEDGE RESEARCH IN THE SAHTU

Dene knowledge was never something to be researched before the arrival of the Europeans. Dene people possessed this knowledge because they were taught by their elders, and this knowledge was essential to survival on the land. Europeans arriving in this region in the late 19th century saw Dene knowledge as a subject for study. They were aware that the hunting and gathering way of life was disappearing elsewhere in the world, and felt that it was urgent to document Dene knowledge and practices before these too were lost.

This was in large part the driving force behind the history of anthropology in the Sahtu. Catholic missionary Father Petitot was perhaps the founder of anthropology in the Sahtu during the late 1800s. Throughout the 20th century, many anthropologists have followed in his path – living in the Dene communities of the Sahtu, travelling on the land with Dene families, and then publishing numerous research papers, articles and books. Some of these have made international reputations based on their research in the Sahtu. Unfortunately, the community members have often not had access to the publications; they are published in the south for southern audiences, and the research results usually have not been presented to the communities.

A new era of research was initiated in the 1970s and 1980s with the Dene Nation mapping project and other traditional knowledge research sponsored by the Dene Cultural Institute, or precipitated by the comprehensive land claims process. During this period, the first generation of Dene community researchers was trained to conduct research that was designed to fulfill Dene interests.

However, there were still parallels to the anthropological tradition in that projects tended to be designed by specialists from the outside; community researchers were provided only with the narrow technical training required to conduct interviews. This weakened the level of accountability to the communities, and their ability to effectively harness research results.

Co-operative resource management and the growing confidence of the Dene communities have given rise to new approaches to research. Communities increasingly want to be equal partners in developing and designing research projects, and evaluating results. Community members want to be trained through every phase of the research process, so that community capacity grows.

As precondition for approval of development projects, petroleum corporations are now more prepared to invest in traditional knowledge research. This presents a major opportunity for the people of the Sahtu. It also presents a challenge to ensure that community interests are served. Research must be carefully designed, that community researchers be thoroughly trained to recognized standards, and that research results be verified by the community.



Top - The Sahtu land use planning process

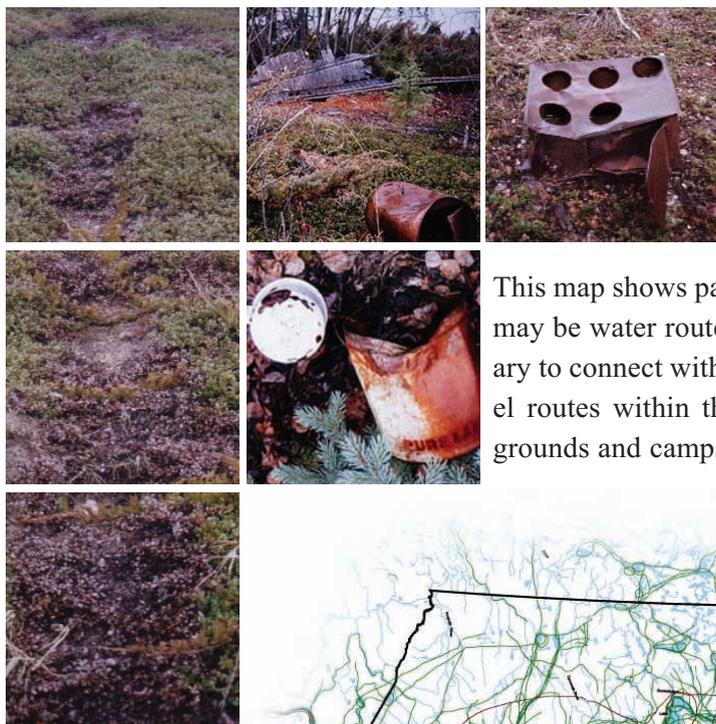


Above - Radio Broadcast Translators (Dene Nation Assembly, Tulita 2001)



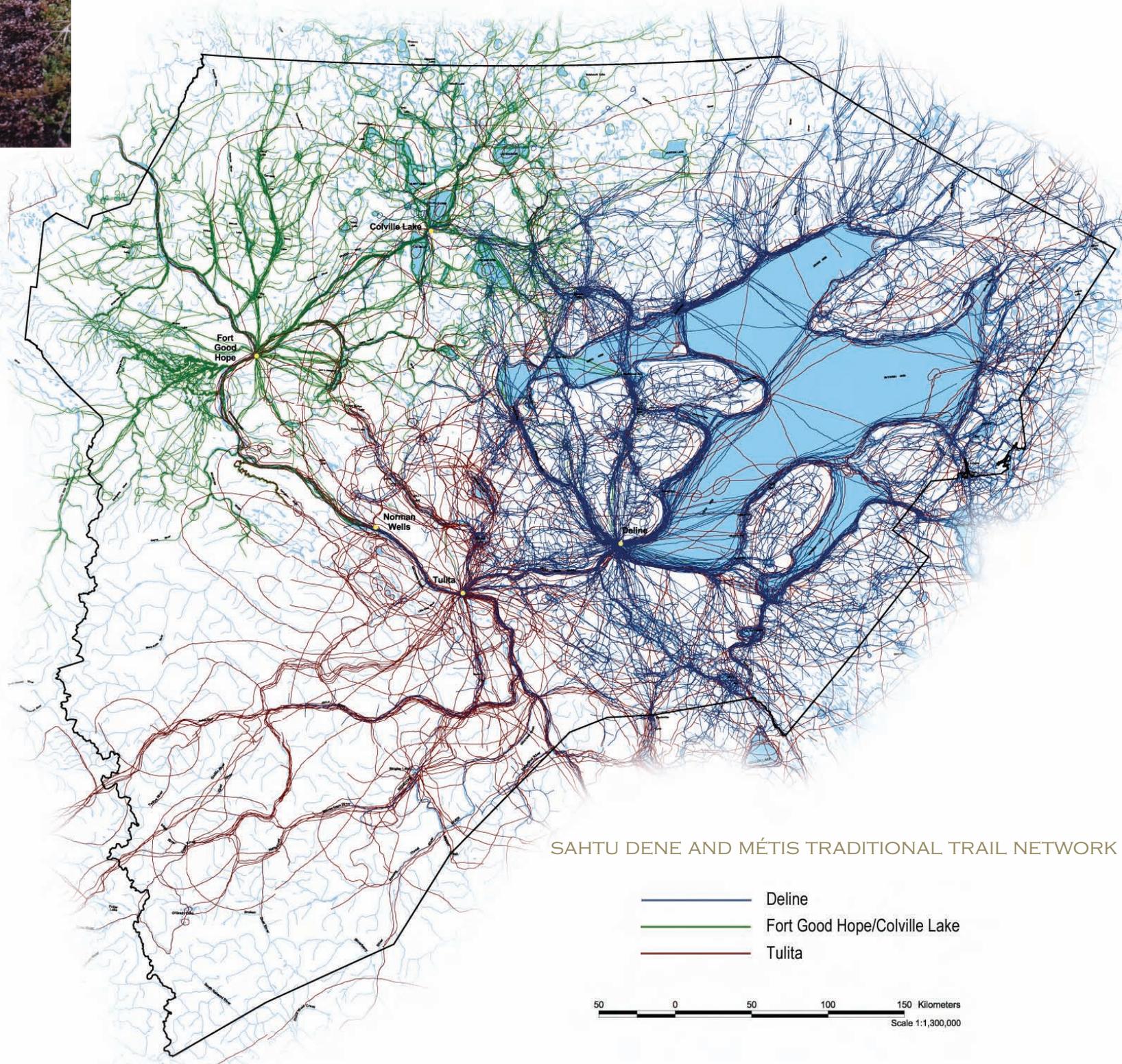
Right - Elders Marie Theresa Kenny and Rosie Sewi participate in workshop, Deline 2003

TRADITIONAL TRAVEL



The land itself is of particular importance in transmitting knowledge from one generation to the next. The Sahtu Dene and Métis landscape is known intimately to elders. Trails, used year-round, provide access to a vast harvesting region. The trails link thousands of place names, each with a story, sometimes many, bound to the place. Names and narratives convey knowledge, and in this way Sahtu Dene and Metis culture is tied directly to the landscape. The network of interconnecting trails provides access to a Sahtu land use area encompassing some 300,000 km.

This map shows patterns of land use derived through the Sahtu Dene and Métis trails mapping project. The trails may be water routes or land routes or both depending on the season, and many extend beyond the Sahtu boundary to connect with other major routes of the north. While cutlines and winter roads have opened up further travel routes within the Sahtu, some traditional routes are still used for travel to and from settlements, hunting grounds and camps.



When you put out these maps it brings back memories of long time ago. I remember one time we travelled to town walking, no dogs or skiddoo from Aubry Lake. We camped once. The next day we made it to the Hare Indian River. At that time there were no maps. There were people that were smart that made trail from Colville Lake to Fort Good Hope. *Anonymous, Dene Nation mapping project*



We used the traditional method to fool the caribou by rubbing two small tree ends together, to make them think that a caribou is rubbing his antlers onto a small tree, or the hoofs clicking together. - *Charlie Codzi*



About 20 hides with no hair were used for the bottom section of the tipi. Hides with hair were used for the top. Raven feathers were used for decoration. - *Therese Codzi*



People traditionally wore caribou hide capes, which were also used for blankets. - *Veronica Kochon*



When the hunters carried the hides back to camp, sometimes they added light delicacies to their load, like the breast bone and other goodies. - *Veronica Kochon*



Drying meat in the sun. The hides are also laid out to be dried and cured for blankets. - *Therese Codzi*



Eselo (Belé yah) leading a herd of caribou on a lake. That little caribou was raised by a human. It has a burnt colour, reddish-brown. He didn't want his antlers to grow long, so he burned them. That's why his antlers have black tips.

There is a saying that it never leads the caribou by the shore. It leads only in the middle of the lake. It breaks trail, then circles around the herd very fast to keep it going. I saw this form myself on Loche Lake once. - *Louie Boucan*

Alfred Masuzumi is an artist and writer living in Fort Good Hope. His first book, Caribou Hide, was published in 2000 by Raven Rock Publishing (Yellowknife). Bush Life originally published in the Mackenzie Valley Viewer, 2001. Printed with permission.



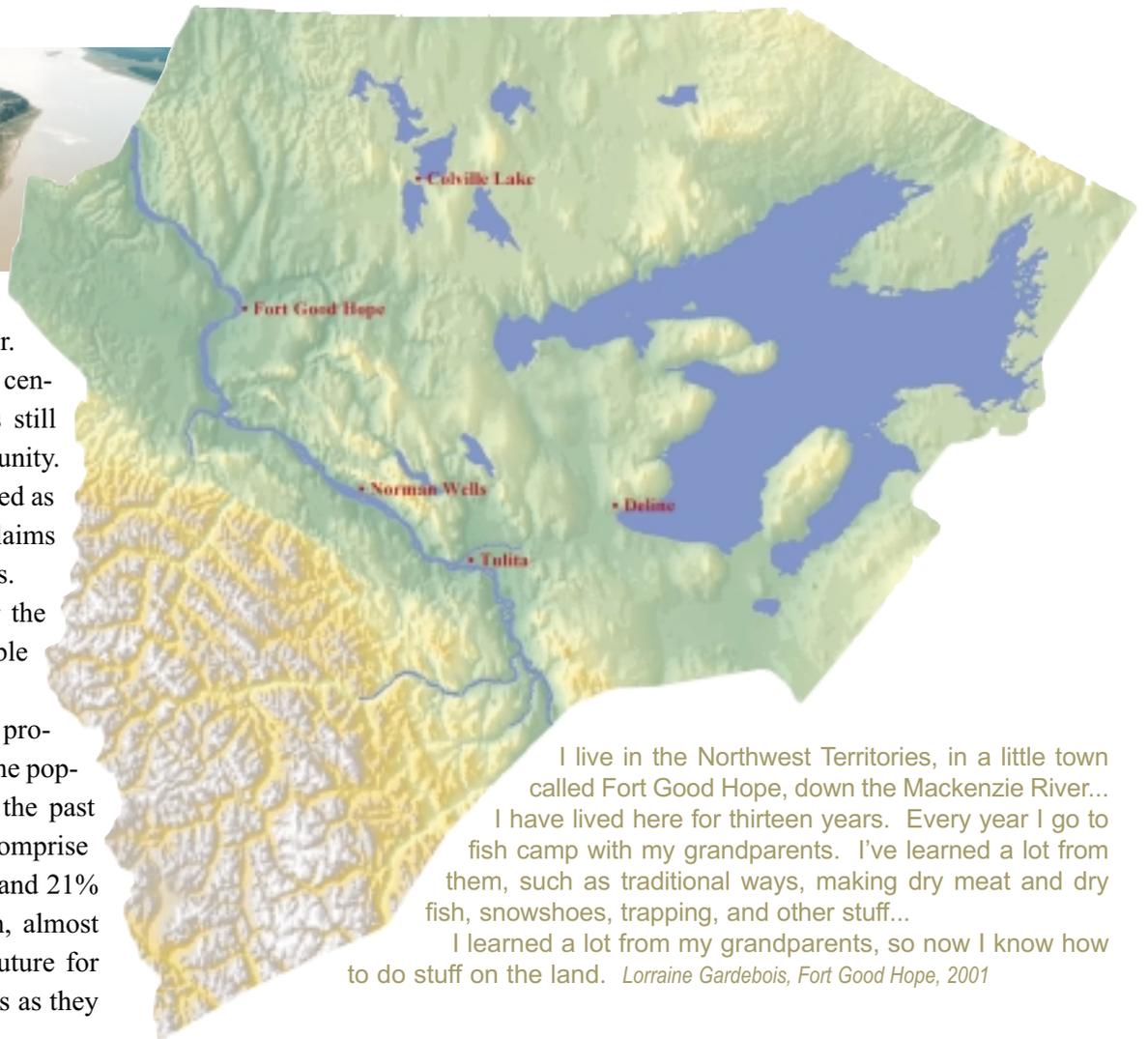
COMMUNITIES OF THE SAHTU



The Sahtu communities are all founded in the resource industry, but retain traces of their original frontier character. The four Dene communities were originally established as centres in the fur trade. The economy of Norman Wells is still based on the oil resource that first gave rise to the community. Local economies have more recently diversified and evolved as administrative centres for social services and land claims implementation, including resource management functions.

The communities have modernized considerably over the past several decades, and now boast water delivery, cable television, regular air service and winter road access.

Today, the population of the Sahtu is over 2,800 and is projected to exceed 3,000 by the year 2019. The diversity of the population reflects the changes that have taken place over the past century. As of the 2001 federal census, the Sahtu Dene comprise 71% of the total population; 7% are Métis, 1% are Inuit, and 21% are non-aboriginal. A large proportion of the population, almost 40%, is under the age of 25. The creation of a viable future for these youth in the region is a major focus of Sahtu leaders as they move toward greater control of resources and services.



I live in the Northwest Territories, in a little town called Fort Good Hope, down the Mackenzie River... I have lived here for thirteen years. Every year I go to fish camp with my grandparents. I've learned a lot from them, such as traditional ways, making dry meat and dry fish, snowshoes, trapping, and other stuff... I learned a lot from my grandparents, so now I know how to do stuff on the land. *Lorraine Gardebois, Fort Good Hope, 2001*

TRANSPORTATION

Like much of Northern Canada, the Sahtu and its communities cannot be accessed by southern methods of transportation such as all-season roads or railways. Inhabitants rely on year-round air transport, summer river barge service and ice roads in the winter to move around the Region and to ship supplies and goods.

BARGES

From mid-June to mid-October, high power tug boats launch from Hay River push specially designed flat-bottom barges up and down the Mackenzie River, delivering boats, cars, snowmobiles, heavy equipment, fuel oils, building supplies, bulk foods and other goods.

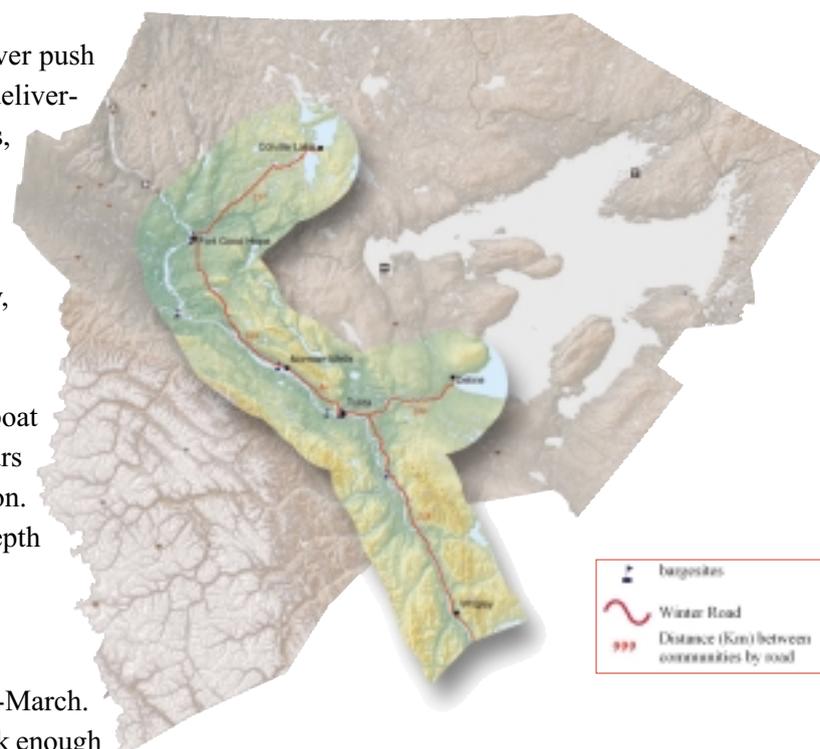
Service was originally provided by private barge companies hired by the Canadian government. Eventually competition reduced the barge companies to the single, government-owned Northern Transportation Company, Ltd (NTC). In the 1970s, as part of their land claims settlement, the Inuit became owners of the NTC's large fleet of tugs and barges.

The Mackenzie River demands expert navigational skills from the tug boat crews. The river's annual freeze up and sudden flood of water and ice scours the river bottom, changing the navigation channel from season to season. Coast Guard crews patrol the river, measuring depth using electronic depth sounders, then anchoring buoys to mark the channels for the barges.

WINTER ROADS

Winter roads usually open mid-to-late December and operate through mid-March. Freeze-up provides a bed of frozen ground and a coat of ice on the lakes, thick enough to allow the weight of vehicle traffic. The winter road is cleared and maintained from the termination of the permanent highway at Wrigley up along the Mackenzie Valley with an extension near Tulita going east to Deline and an extension at Fort Good Hope travelling east to Colville Lake.

For the communities along the Mackenzie River, the winter road replaces summer barge service with truck service. For Deline and Colville Lake, which do not have access to barge service in the summer, the winter road is critical for the delivery of bulk supplies such as heating fuel, electricity and other necessary goods not practical or possible to be delivered by air.



Climate and terrain challenge transportation to the Sahtu and within the region

From Ts'ódun Rákoyé (Child's Play) by Alfred Masuzumi

*I have long been told stories about the huge mountain called **Ayonikj** (Maunoir Dome)...*

Ayonikj is named after the little phalarope, who is said to have once beat the great whistling swan in a test of strength when no other animal would dare take him on. This mountain is known as the birthplace of all the Inuit and Indian nations of the country.

In the beginning, the people had the innocence of a child. They had no knowledge of what was good. They had no knowledge of what was bad. No one knew what disagreement was. There were no borders on the land.

One day, a young Inuit boy and a young Gwich'in boy were playing together, shooting arrows and chasing after them. When they came upon an owl up in a tree, they both took aim and shot at it. One arrow killed it. The owl fell out of the tree, and the boys started arguing about who killed the owl.

The Inuit boy's dad tried to solve the dispute by reaching over and taking the owl away from the boys. But as the Inuit father turned away, the Gwich'in youth shot him in the back.

Thus started a great war in which mothers turned against their mothers, fathers against fathers, sisters against sisters, brothers against brothers. The lush forest was trampled. There were piles of bodies everywhere, and a lake of blood was formed. To this day, there are no trees on Ayonikj, and a lake of blood can still be seen on top of the dome.

Finally, a truce was called. The people said "This fighting is crazy – we're all one family and we're killing each other off!" But Akaitcho was so enraged about the owl that he wanted the bloodshed to continue. There was a big council fire, and the wise ones of the family said "We can no longer live together. We must all go our separate ways."

There are two versions to the legend of Ayonikj – the human version and the animal version. In the human version, the people dispersed from the council fire. The children went east, the mothers went south, and the young men of twenty years went west. But before the young men left, they put some meat by the council fire. This was for the gray haired old man who was too old to go anywhere. The young men who went west are the Inuit people. The gray haired old man is the K'ahsho Got'ine. *Mackenzie Valley Viewer, 2001*



Fort Good Hope/Colville Lake Traditional Place Names project map



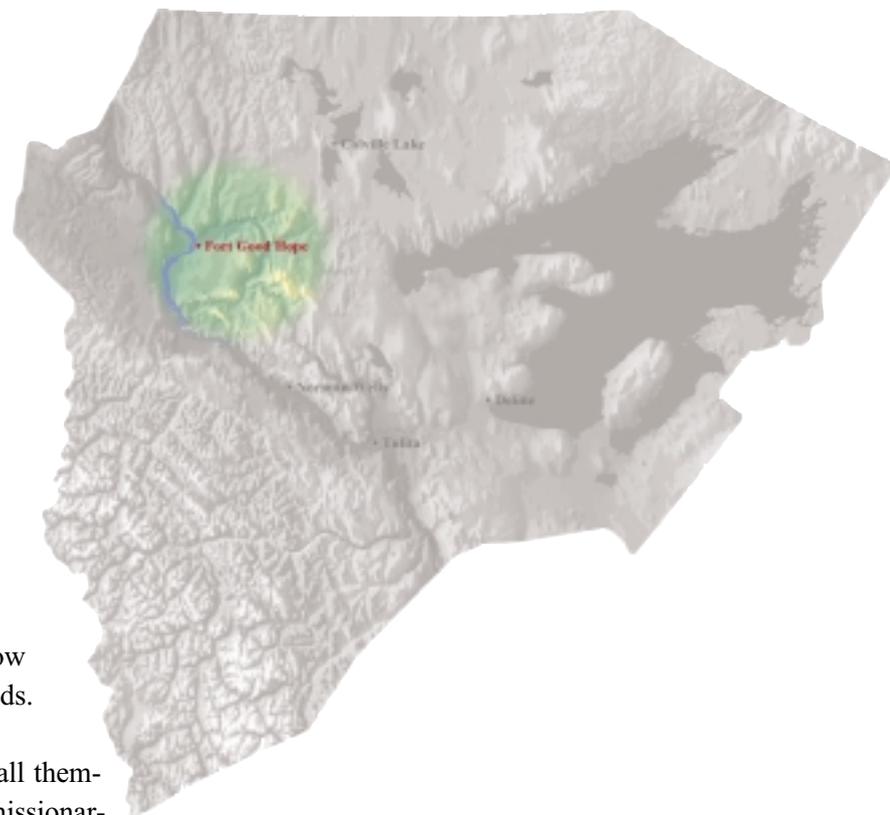
artefacts along K'abamj Tué Eht'ene

K'abamj Tué Eht'ene / Colville Lake Trail

This walking trail, linking Fort Good Hope and Colville Lake, was used every summer in June by people from Colville Lake. Travelling with dog packs, people would walk to the fort to trade their furs, and would remain in the Good Hope area fishing, taking treaty, and visiting with family, returning to Colville in August. It was used before fur trade times as well. It is known as a very long trail, noted for difficult walking conditions, thick bush, long stretches of wet muskeg, and many mosquitoes. The trail is still used in winter. The last family to walk the trail in summer was the Oudzj family in 1965, however in 1998 a team of people led by Charlie Tobac, walked the trail from Colville to Good Hope with a film crew as part of a cultural revival project.

Sahtu Heritage Places and Sites Joint Working Group, Rakekée Gok'é Godi: Places We Take Care Of.

RÁDEYILIKÓÉ FORT GOOD HOPE



Fort Good Hope is named Rádeyilíkóé, meaning “home at the rapids,” for its location below the Ramparts Rapids. The Ramparts also refers to the steep walled river canyon at the rapids. Known as Fee Yee in the local dialect, this is an ancient fishery and spiritual site.

Known in anthropological literature as Hareskin people, the Dene of Fort Good Hope call themselves K’asho Got’ine, or “big arrowhead people.” This may have been confused by early missionaries and anthropologists with the Dene term for rabbit, “gah”; indeed, the people of this area were known for their skill at making woven rabbitskin clothing.

Fort Good Hope was established by the North West Company in 1805 as the first fur trading post in the lower Mackenzie Valley. Thus it became a gathering place for Shita Got’ine, Gwich’in, and even Inuvialuit people of the Mackenzie Delta who came there to trade. Fort Good Hope became the centre of a vast trading network, extending north to Herschel Island and west to Russian Alaska.

A Roman Catholic mission was established by Oblate priest Henri Grollier in 1859, and during the 1960s, Father Emile Petitot worked with local people to construct the first Roman Catholic church in the Northwest Territories. Using paints made with local fish oils, Petitot decorated the church with richly coloured murals.

Fort Good Hope came to national attention in 1975 when the community hosted a hearing of the Berger Inquiry and a documentary film was made about the event. Community members have since played a strong role in documenting traditional environmental knowledge as a basis for defining the terms of economic development, so as to minimize environmental impacts and maximize benefits for Dene and Métis people. Home of the biennial Wood Block Music Festival, Fort Good Hope has nurtured a strong culture of music, including traditional drumming, the Métis fiddle style evolved during the fur trade, and contemporary rock and roll.

There’s A Little Town Called Fort Good Hope.

By Miranda McNeely, FGH

There’s a little town called Fort Good Hope, and it is a cultural and traditional town where the Dene and Metis still live off the land.

Some families still stay out on the land. They hunt and fish. The men will set traps and hunt. The women will go about their daily chores such as making dry meat or cutting up the meat. They also cook for their families, and do sewing and cleaning. So all day, every person in the camp is busy. In the evening, they all relax and take it easy.

They would stay out there for three months or two months. When Christmas comes, they travel back by skiddoo to a little town called Fort Good Hope. It takes about seven or eight hours, but it depends where they stayed in the bush.

When they get home, the people hug their family and their kids. They’re glad to be back in a little town called Fort Good Hope.

Mackenzie Valley Viewer, 2001



Main Street
Summer feast

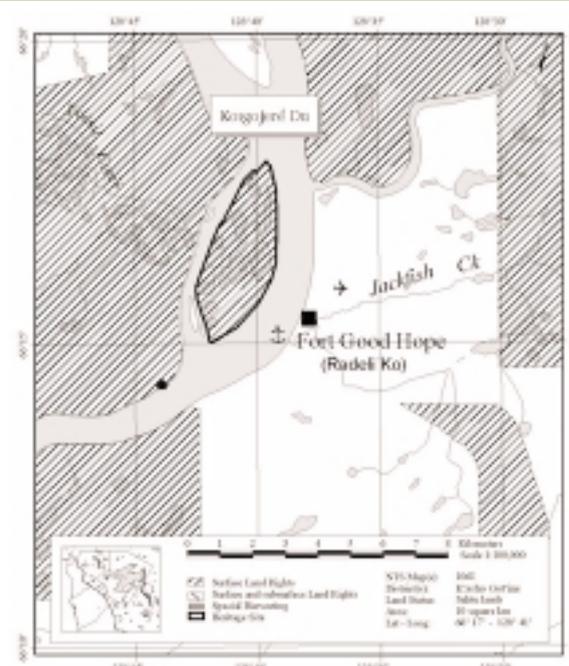
photos © Robert Kershaw

Koigojeré Du / Manitou Island

Manitou Island is used by the residents of Fort Good Hope as a source of firewood, and for small game hunting. The logs for the community complex were cut and hauled from here. Together with its history as a former location of the HBC fort, the island is very important to the community.

Fort Good Hope was established in 1804 by the North West Company, and originally located on the left bank of the Mackenzie River somewhere near Thunder River (Voorhis 1930:75). In 1826, after the 1821 amalgamation with the Hudson’s Bay Company, the fort was moved to Manitou Island where it operated until 1836. Flooded, and damaged by ice in 1836, it was moved to its current location on the right bank of the Mackenzie River, across from Manitou Island.

Sahtu Heritage Places and Sites Joint Working Group, *Rakekée Gok’è Godi: Places We Take Care Of*.



Tsodehnline and Tuyát'ah / Ramparts River and Wetlands

The Ramparts River and Wetlands flows from the foothills of the Mackenzie Mountains east to the Mackenzie River, entering it just above the Ramparts Canyon, and the community of Fort Good Hope. The river, meandering through critical wetlands, has been an important hunting, trapping and fishing area for Fort Good Hope families for generations. Particularly important for hunting moose, beaver and muskrats, the area is also known locally as a critical waterfowl breeding site. It is also known as an excellent place to begin teaching young hunters the rules and behaviours necessary for a successful hunt.

The Ramparts River and Wetlands contains many named places including a sacred site, the Thunderbird Place.

ʔiditué Dáyjádá / The Thunderbird Place

Located on a sharp bend in the Ramparts River, the Thunderbird Place is a dangerous place. In times long ago, a giant Thunderbird lived here, and travellers were often killed by it. An elder with powerful medicine killed the Thunderbird, making river travel safe again. There are several places in the Sahtu settlement area where other water monsters live, or have lived, and these places are always considered dangerous, requiring special rituals or practices when travelling nearby. As told by an elder from Fort Good Hope, the story recounts how people still to this day feel uneasy when traveling past the Thunderbird Place:

This was in the ancient days, people who traveled this river would come to this spot and they were killed by the Thunderbird monster, which lived there. Finally, an elder decided to do something to rid this area of this monster. Maybe this man had medicine to understand what made the monster tick. He threw a rock into the water, and from then on there was no problem with it again. Some places the water is muddy and I don't feel as relaxed as when I go to other places. I always feel uneasy if I'm in this area.

Sahtu Heritage Places and Sites Joint Working Group, Rakekée Gok'é Godi: Places We Take Care Of.



Fort Good Hope/Colville Lake Traditional Place Names project map



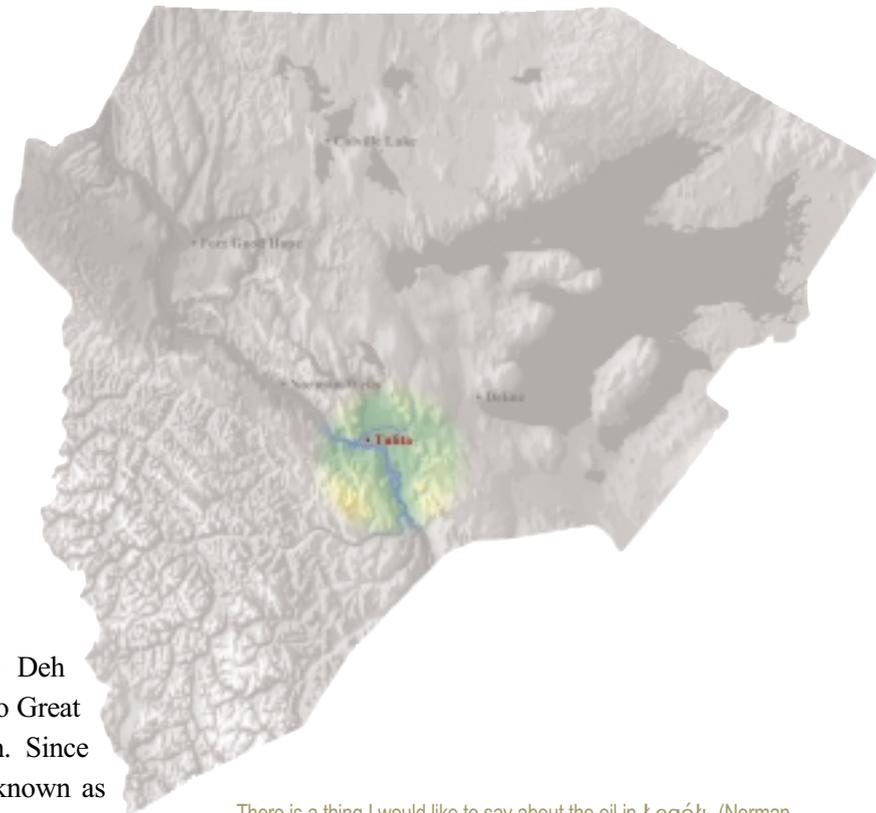
Sheep hunting up Mountain River © R. Kershaw, 2004

Faʔfa Niljne / Mountain River

An important traditional trail used by Mountain Dene from Fort Good Hope. There are many named places, camping, hunting and fishing locations and many stories associated with the river. In the old days, mooseskin boats were built to float down the river in spring. Many stories recount the trials and tribulations of mooseskin boat travellers attempting to navigate the many dangerous canyons on the river. At the head of the canyons, the boats would stop to let the women and children out to walk over on the portage trail. Only the men would lead the boats through. Today it continues to be an important moose hunting area, and is known as the shortest route to the highest mountains, and sheep hunting areas. Popular with white water canoeists, the river has tremendous tourism potential.

Sahtu Heritage Places and Sites Joint Working Group, Rakekée Gok'é Godi: Places We Take Care Of.

TULÍT'Á
TULITA



Tulita is named for its location where the Sahtu Deh/Great Bear River flows into Deh Cho/Mackenzie River, “where the waters meet.” Great Bear River is the Dene travel route to Great Bear Lake, where people of the Sahtu Region travel to hunt for caribou, and rarely, muskoxen. Since ancient times, people would camp at Tulita across from the huge limestone outcropping known as Kwetenᓂᓐᓐ /Bear Rock, an important site in Dene lore. The Northwest Company established Fort Norman as a fur trading post at this crossroad in 1810 to encourage trade with peoples south of Fort Good Hope and with the Sahtúot’ine of Great Bear Lake. When the Hudson’s Bay Company took over the post, it was relocated several times, but by 1851 it returned to the original site.

The Dene people of Tulita are known for having revived the traditional skill of making moose skin boats. This was the first such boat to be built in decades. It is thought that the boats came into use during the fur trade. Their construction combines the ancient design of the smaller Dene birch and spruce bark canoes, and the shallow, broad and long York boats developed by fur traders in the 19th century to navigate the inland rivers of Canada with large loads. A second moose skin boat was constructed for the documentary film *The Last Moose Skin Boat*, and the boat remains preserved at the Prince of Wales Heritage Centre.

Situated within an oil-rich district, the people of Tulita have had to become adept at negotiating with petroleum interests, and many young community members have found jobs in the industry. At the same time, the community is taking measures to protect traditional heritage sites.

There is a thing I would like to say about the oil in Łegółı (Norman Wells). What was the name of the man who found that oil? It was our own father, Francis Nineye. When he found the oil, he took a sample of it, put it in a lard pail and brought it out into Tulit’a (Fort Norman). That same summer, he had an accident and died.

Now the white people turn around and claim they found the oil. My dad was the first guy to find that oil...He was staying right where Łegółı is now, and the Dene had about five or six log shacks. They were trapping and hunting there for a living. He took the sample of that oil in a lard kettle and brought it into Tulit’a. He gave it to Gene Gaudet, the Hudson’s Bay Manager and he sent it out on the boat, it had to be a boat, there was no planes then. We never heard of that oil again and we never got the lard kettle back. We never could do anything about it again. There is no record.

John Blondin, from Dene Cultural Institute, Dehcho: “Mom, we’ve been discovered!” Yellowknife: Dene Cultural Institute, 1989. 40.

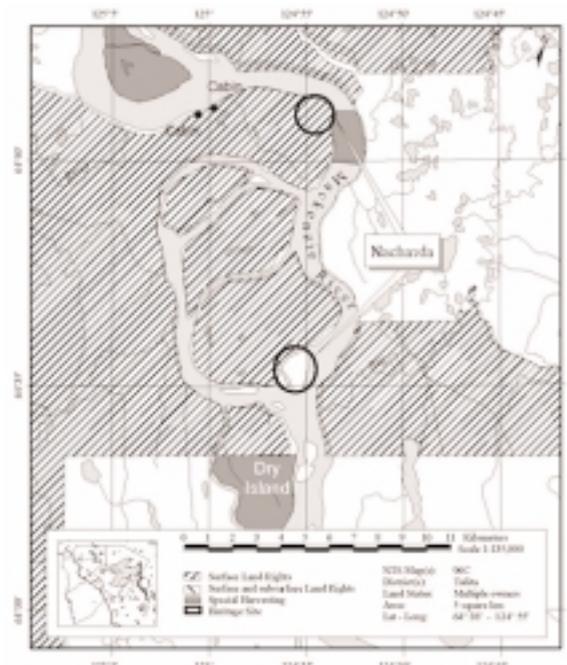


Bear Rock and winter road
Watching the Mackenzie River, Tulita © R. Kershaw

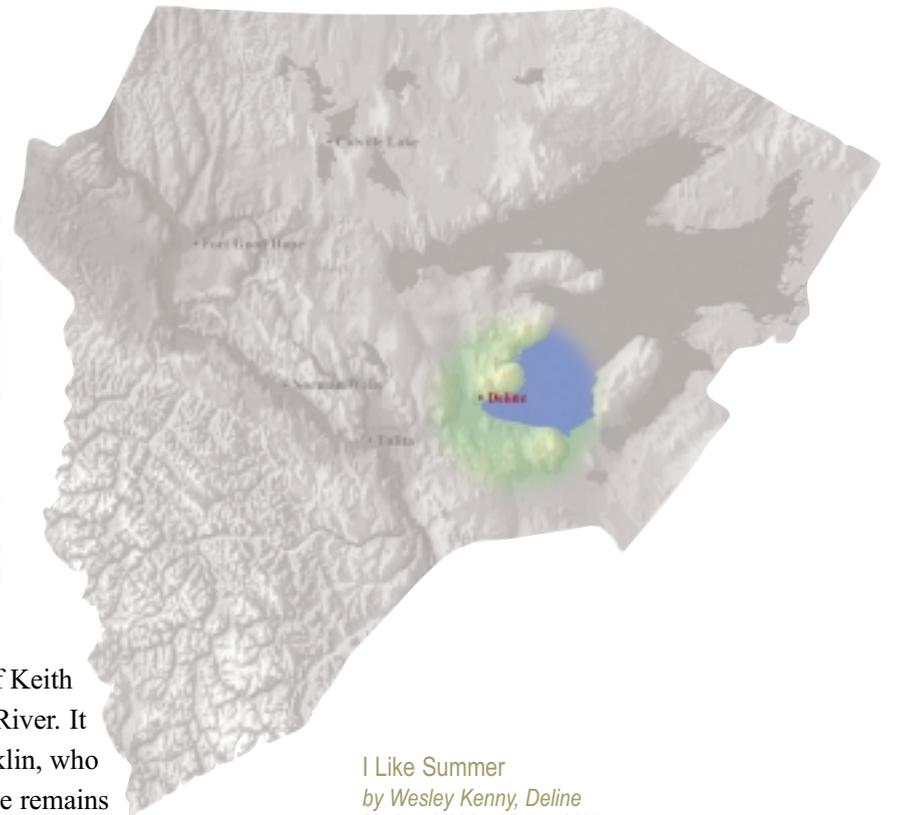
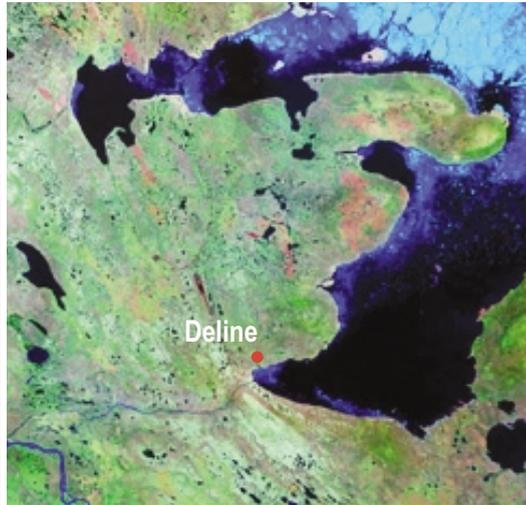
Nachaᓂᓐᓐ / Old Fort Point

Fort Norman was constructed in 1810 at the confluence of the Mackenzie and Great Bear Rivers. In 1844 it was moved about 48 km upstream to a site a few miles below the Keele River, called ‘Old Fort Point’, near the site of the old North West Co. Fort Castor. In 1851 it was moved back to its present site.

Archaeological investigations at Old Fort Point in the summer of 1973 recorded the presence of two storage cellar depressions and the remains of two stone chimney piles. The archaeologists noted that the site had undergone considerable erosion. Artifacts recovered from the site include a kaolin pipe stem, a small strip of copper, and pieces of chinking clay, as well as several fragments of moose, caribou, and beaver bones. Fort Castor, built in 1804, was never located during the archaeological survey. On the site map (below) we have marked two locations; one at Old Fort Point (the site of old Fort Norman) and a second site to the south. Local tradition indicates that this might be the remains of another post and may be Fort Castor. *From Rakekée Gok’é Godi: Places We Take Care Of.*



DÉLINE
DELINE



Deline, “where the water flow” is a community of about 650 people located on the west end of Keith Arm of Great Bear Lake/Sahtú, about 10 km from the outlet of the lake into the Great Bear River. It is a place thriving with wildlife. At one time, Deline was named after explorer Sir John Franklin, who built a fort there and used it as winter quarters during his second expedition in 1825-1827. The remains of the old fort were excavated in 1987. A letter from Sir John Franklin may have documented the first games of hockey at Fort Franklin in 1825, which he described as an enjoyable form of exercise for his crew.

Deline is also known as an important spiritual centre, birthplace of the prophet known as Ehtséó/Grandfather Ayha. Ehtséó Ayha’s life spanned 1858-1940, a critical period of contact with non-aboriginal outsiders. These included fur traders, missionaries, and opportunists seeking to profit from the rich radium/uranium pitchblende that was discovered on the east shore of Great Bear Lake in 1930. Ehtséó Ayha’s wisdom and prophecies are commemorated annually at a Spiritual Gathering in Deline attracting people from across the Northwest Territories, and as far away as Kugluktuk, Nunavut.

The trauma caused by the realization of the possible impacts of uranium mining on the land and people has been a catalyst for positive action by the Sahtúot’ine, the Dene people of Deline. In addition to reviving spiritual practices, the Sahtúot’ine have taken strong initiatives in researching the impacts of the mine, protecting the land and achieving self-government. As a result of hard work and years of persistence, the community succeeded in achieving the establishment of Grizzly Bear Mountain/Saoyúé and Scented Grass Hills/Ehdacho, Canada’s largest National Historic Sites in 1998. Deline is a leading community in the negotiation of terms for self-government.

I Like Summer
by Wesley Kenny, Deline
Mackenzie Valley Viewer, 2001

I like summer because of...
Going for boatrides...
or picking berries...
or going hunting...
Or playing soccer...
Or going to the bush...
Or going fishing...
Or going for a bike ride...
Or camping...
Or going for a trip to Yellowknife...
Or playing in the new playground...
Or playing kick the can at the church...
Or playing games at the old campground...
...With my friends.
Or playing boards with my friends...
Or playing football...
Or baseball...
Or taking jumps around with my friends...

Then we go to the Northern and buy pop...
because we are thirsty.

Then we might play soccer again.

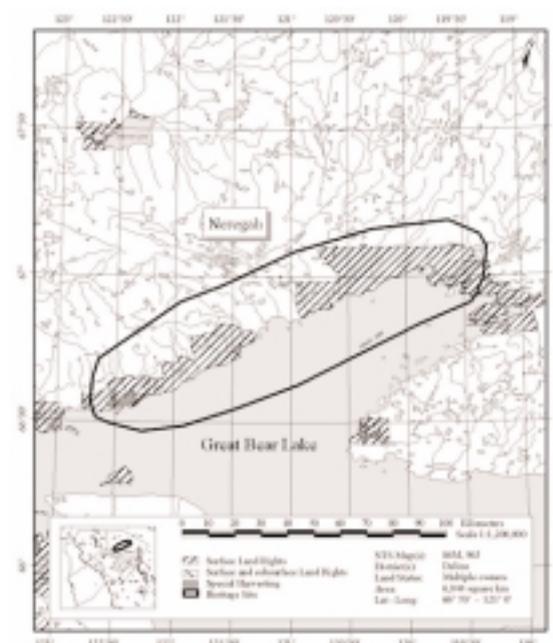


Deline youth © Robert Kershaw, 2004
Fort Franklin site marker © Morris Neyelle

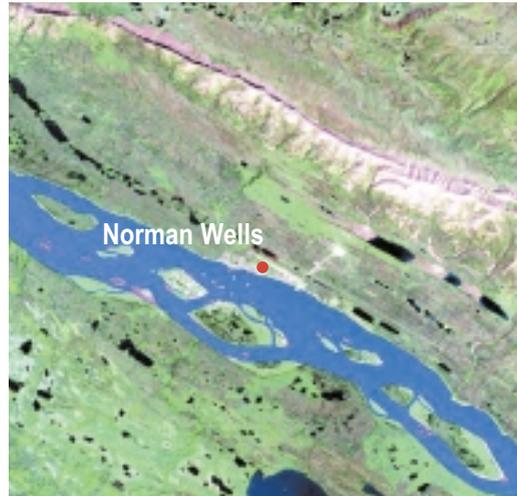
Neregah / North Shore of Great Bear Lake

The north shore of Great Bear Lake (from McGill Bay, east to Greenhorn River) is a very important traditional use area, associated with many stories and named places. From the north shore Sahtu Dene gained access to caribou and musk ox hunting, and barrenlands trapping. Many of the stories talk of contact with the Inuit who were met inland, northward from the north shore. It is still used today as a traditional use area.

Sahtu Heritage Places and Sites Joint Working Group, *Rakekée Gok'é Godi: Places We Take Care Of.*



TŁEGÓHLI
NORMAN WELLS



Both the English and Dene names for Norman Wells refer to the oil on which the local economy is based. The existence of oil seepages was known by Dene people passing through the area, and explorer Alexander Mackenzie noted these in the 18th century. But it wasn't until 1919 that the first well, called "Discover," was drilled. And it wasn't until the opening of the uranium mine at Port Radium in 1932 that it became economically feasible to commence production. Norman Wells benefited from a second boom during World War II with the construction of the Canol pipeline to Whitehorse, but this was short-lived.

After the war, the size of the Norman Wells operation followed expansion of the oil and gas industry. In the mid-1980's, a pipeline was completed to Zama, Alberta. The population grew to a peak of about 3,000, the majority of whom were fortune-seekers from the south. With highly skilled, high wage jobs available, Norman Wells still has one of the highest average income populations in Canada.

The town became a regional hub with jet service north and south and a number of regional government offices. A strong Métis community also took root in Norman Wells, and increasing numbers of Dene people from the Sahtu communities now are finding seasonal employment there.

Oil reserves at Norman Wells are now in decline, and the population recently shrunk to less than half its earlier size. However, development of adventure tourism diversified the economy, and oil and gas developments elsewhere in the region are providing new opportunities for growth.

The Town I Live In

My town
Norman Wells
lying in the valley
between two
mountain ranges.
A wide, fast river,
passing by the town.
Our main transportation
source in the summer.
The summers are hot
with the sun never setting.
Hot, sizzling, dry heat
Everywhere.
Cold, blinding winters.
Rushing winds everywhere.
The northern lights
sparkling like diamonds
or dancing fireflies.

by John Bounds, 13 years
Norman Wells, 2000

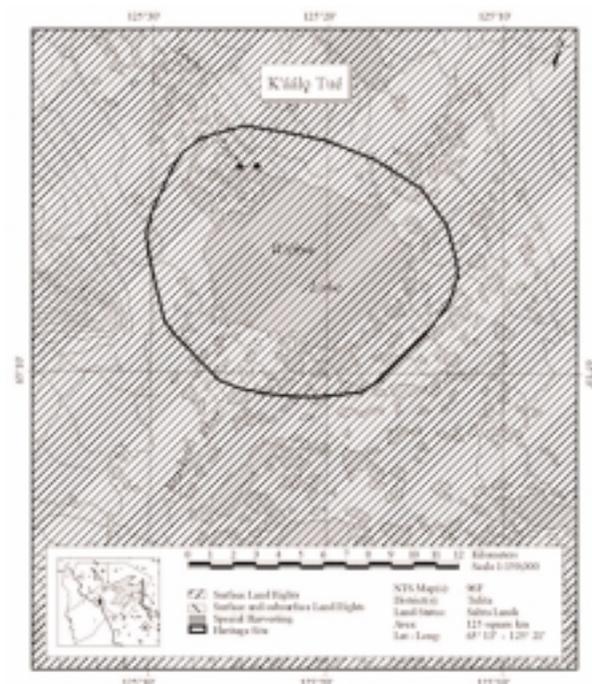


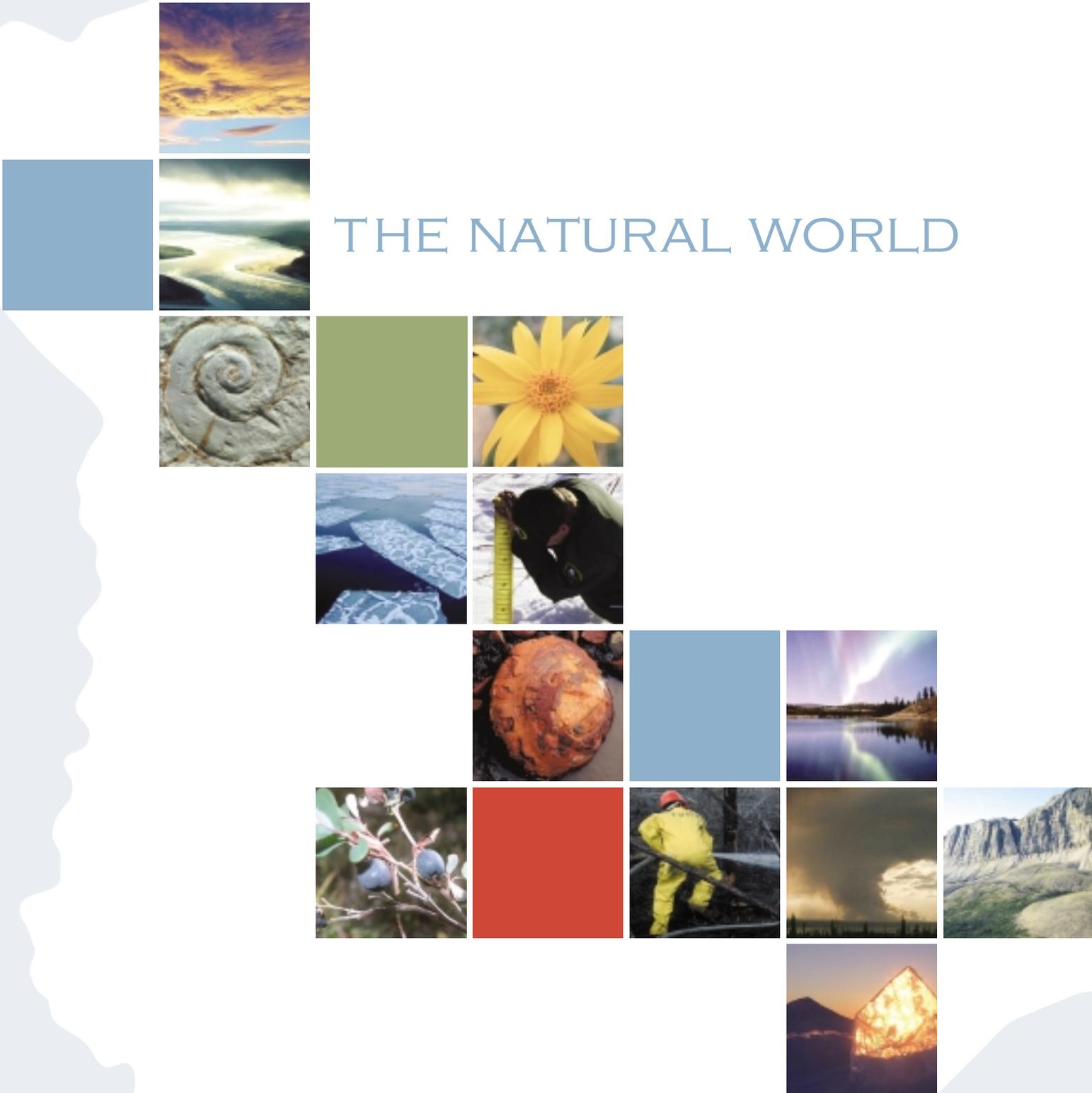
Historic Centre in Norman Wells
Drilling Islands on the Mackenzie River

K'áálq Tué / Willow Lake (Brackett Lake)

Willow Lake (called Brackett Lake on the official maps) is the site of an important seasonal camp, and is considered the home of the K'áálq Got'ine, or 'Willow Lake People'. The area is important for hunting, fishing and trapping, and the lake and wetlands nearby support large populations of animals. A small community of several cabins is located on the lake. The oral tradition records many stories, which tell of the importance of this lake. In the story below, Yamoria, who was pursued by an elderly couple and his angry father-in-law, uses Willow Lake to avoid capture. In so doing he creates an important subsistence fishery on the lake [adapted from Hanks 1993:39-41]

Sahtu Heritage Places and Sites Joint Working Group, *Rakekée Gok'é Godi: Places We Take Care Of*.





THE NATURAL WORLD

This land is our source of survival. Our grandfathers, our fathers, and we the elders of today have all strived on the land. I myself have been committed to living on the land. So when we speak of the land, we speak nothing but the truth. It is as if we are speaking of our own hearts.

Yes, the land is very important to us. Not only do we dwell on it, but also the wildlife survives on it. As humans, we survive by eating the wildlife. That also is a way of life.

Water, wildlife, caribou, moose, beaver, muskrat, and fish. These are all life sustaining for us. We can't allow these resources to be mismanaged. We have to be constantly aware of our responsibility for proper land management...We can't break our connection to nature.

from Sahtu Land Use Plan Board - Building a Vision for the Land (1999)

GEOMORPHOLOGY: THE SHAPE OF THE SAHTU LANDSCAPE

A geological province is an extensive region with distinctive characteristics that differentiate it from surrounding areas. A shield is an large area of very ancient rocks that have been levelled by erosion. A platform the part of a continent covered by flat-lying or gently tilted rock and underlain by very ancient rocks consolidated before deposition of the overlying layer. The rocks of the platform layer are usually sedimentary. An orogenic belt is a part of the continent where the Earth's crust has been deformed, leading to the creation of a mountain range. There are four geological provinces found within the Sahtu: the Cordillera, Interior Platform and Bear provinces. These large regions are each found within even larger geomorphic regions respectively: Rocky Mountain Cordillera, Interior Plains, Canadian Shield and Arctic Platform. To be identified as a geomorphic region, each must have three major characteristics – a large connected area with similar geological features, landforms that have been shaped by similar processes and common geological structure with a shared geological history.

GEOLOGICAL PROVINCES



- Arctic Platform
- Bear Province
- Cordilleran Orogen
- Interior Platform

The Arctic Platform extends under the islands of the Arctic archipelago, between the Innuitian Orogen and the Shield. Some of its strata may contain oil and natural gas.

The Bear Province forms part the Canadian Shield, mostly made of Pre-Cambrian igneous and metamorphic rocks. Rocks 2.5 billion years old once formed mountains, but have since eroded. Often exposed within the Canadian Shield, these rocks are also found beneath most of the more recent geomorphic regions such as the Interior Plains.

The Cordillera includes the Mackenzie and the Franklin Mountains, part of the western chain of mountains stretching through North and South America. During the Wisconsin ice age, 25,000 years ago, the Cordillera in the Sahtu was heavily glaciated, It became mostly ice free approximately 10,000 years ago, leaving river terraces and alluvial fans.

The Interior Platform underlies most of the Sahtu. Part of its thick layer of sedimentary rocks contains ancient fossils deposited by advancing and receding oceans after the end of the Pre-Cambrian era (1/2 billion years ago).



Cordillera



Interior Platform



Canadian Shield

BEDROCK GEOLOGICAL MAP: Intact, solid bedrock at or near the earth's surface

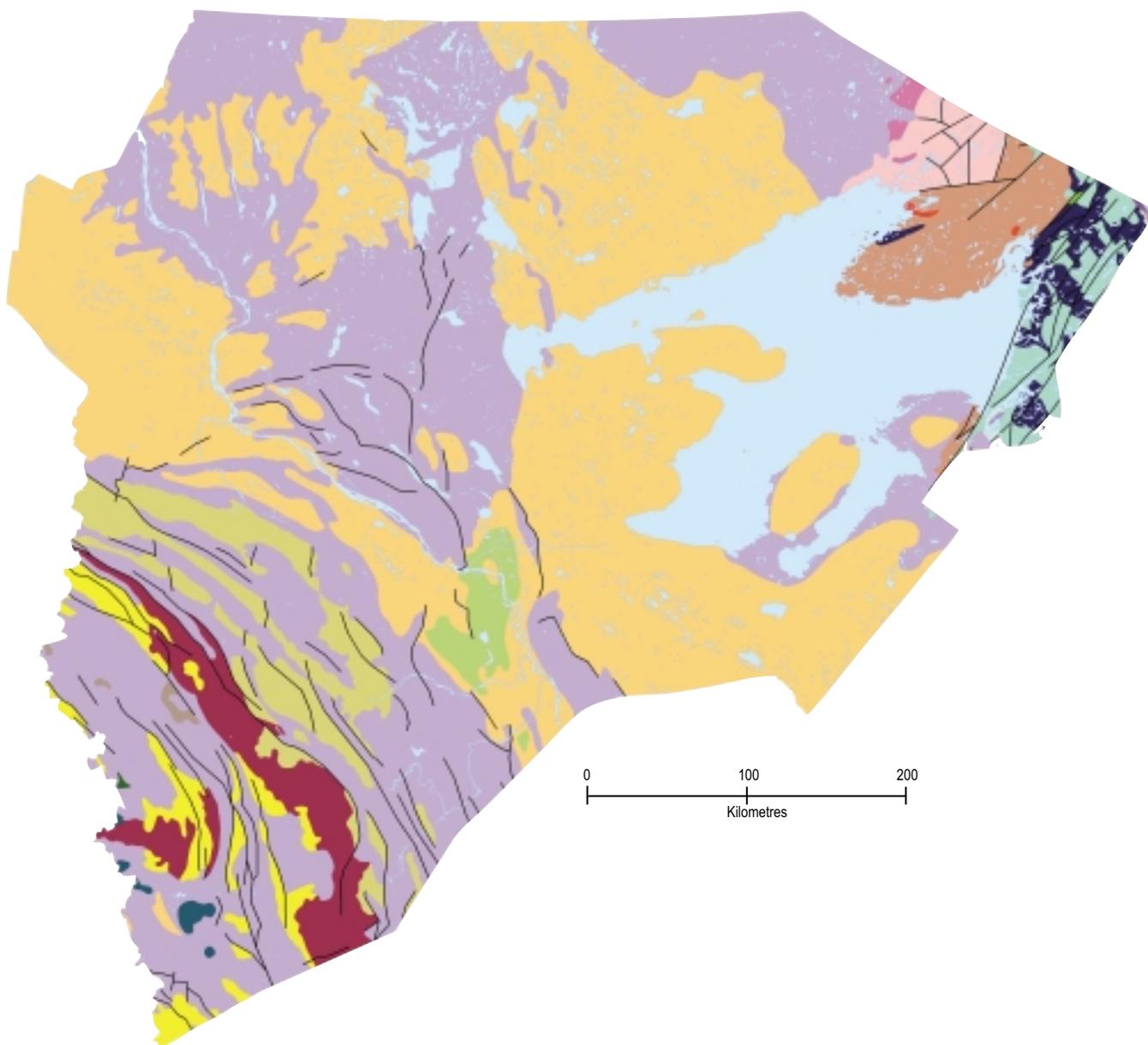
Intrusive Rock - Igneous rock formed by the entrance of magma into preexisting rock

Igneous Rock - Formed from molten (melted) or partly molten material that has cooled and solidified

Sedimentary Rock - Formed from the consolidation of solid fragments from rocks or organic remains, or by precipitation of minerals from solution

Volcanic (extrusive) Rock - Igneous rock formed from lava the flowed out onto the Earth's surface, characterized by rapid solidification and grains barely visible to the naked eye.

- Fault Line
- Geological Class**
- Archean intrusive rocks
 - Archean-Paleoproterozoic intrusive rocks
 - Archean-Paleoproterozoic sedimentary and volcanic rocks
 - Mesoproterozoic sedimentary rocks
 - Mesoproterozoic volcanic rocks
 - Mesoproterozoic-Neoproterozoic sedimentary rocks
 - Mesozoic intrusive rocks
 - Mesozoic sedimentary rocks
 - Mesozoic-Cenozoic sedimentary rocks
 - Neoproterozoic intrusive rocks
 - Neoproterozoic sedimentary rocks
 - Neoproterozoic-Mesozoic sedimentary rocks
 - Neoproterozoic-Paleozoic sedimentary rocks
 - Paleoproterozoic intrusive rocks
 - Paleoproterozoic sedimentary rocks
 - Paleoproterozoic volcanic rocks
 - Paleoproterozoic-Mesoproterozoic intrusive rocks
 - Paleoproterozoic-Mesoproterozoic sedimentary rocks
 - Paleozoic sedimentary rocks
 - Paleozoic volcanic rocks



GLACIATION

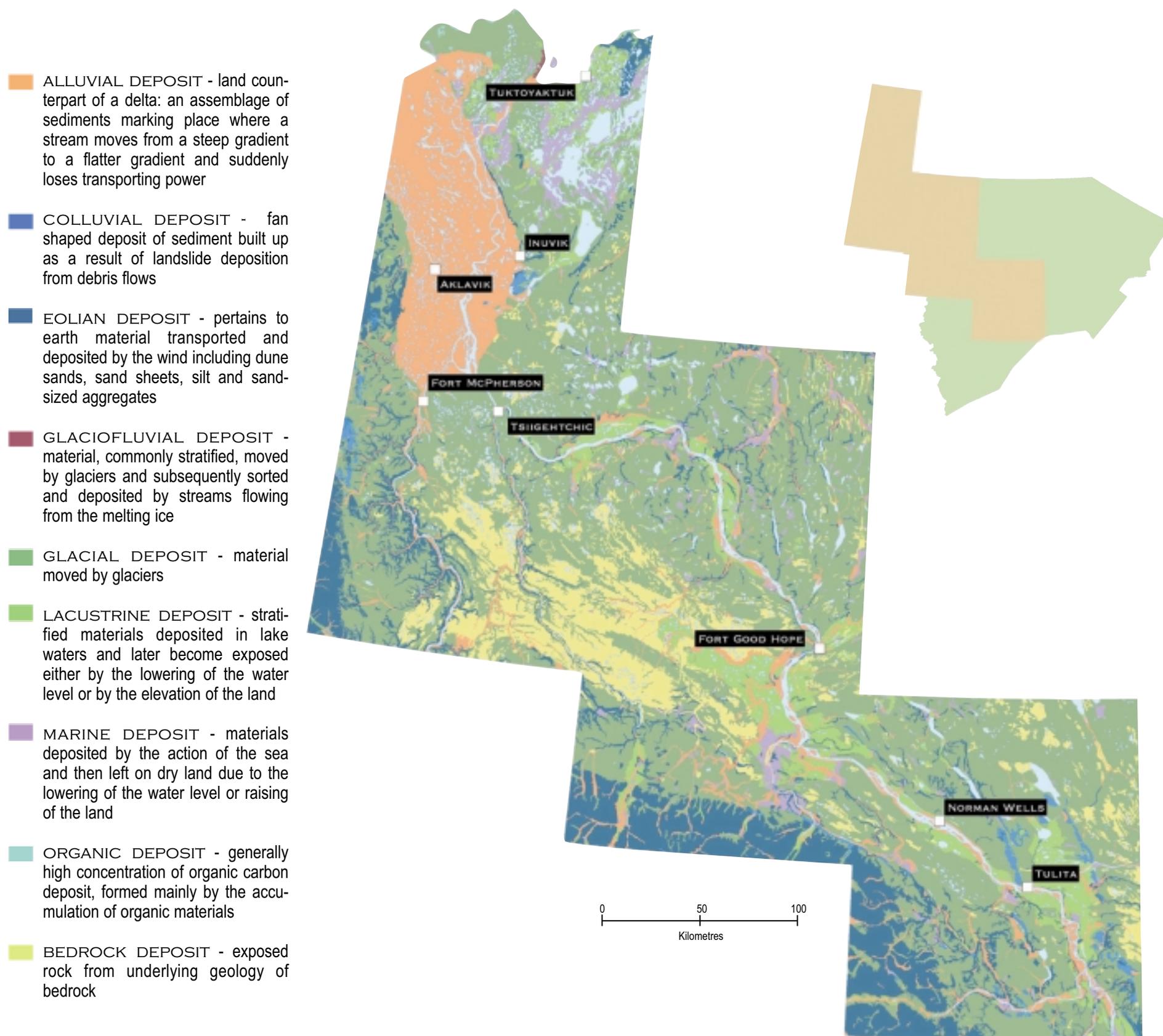
Much of the landscape we see in the Sahtu today has been shaped by glaciation. Very thick sheets of ice (some as much as a kilometre or more in height) once covered much of the Sahtu. While parts of Canada weathered at least five glaciation periods, geological records indicate that the Wisconsin Laurentide Ice Sheet (25,000 years ago) reached the Mackenzies. These grew and shrank, and finally melted away scraping and scouring the bedrock and leaving behind thick deposits of gravel and sand dotted with boulders.

SURFICIAL GEOLOGY

Surficial material is the sediment deposited by ice, water, wind and gravity during the ice ages through to the present (Quaternary period). Because permafrost underlies much of the Sahtu, most surficial deposits are generally frozen or contain ground ice.

Much of the Sahtu, especially within the Interior Platform has a thin to thick cover of glacial till which either blankets the underlying bedrock or creates a hummocky, rolling landscape.

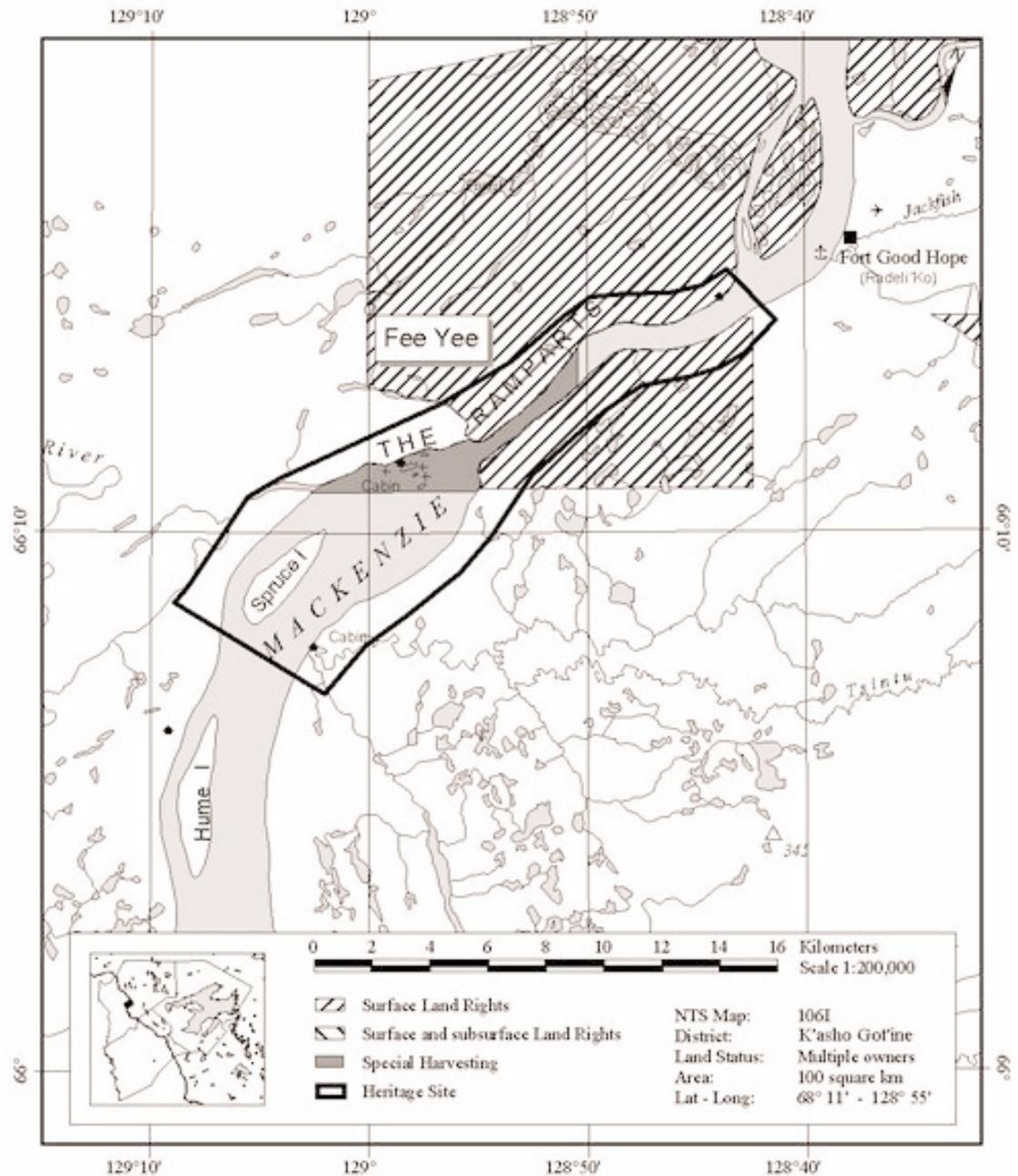
SURFICIAL GEOLOGY MAP showing the composition of surface layers, such as soil, exposed bedrock, or glacial deposits.



FEE YEE / THE RAMPARTS

Fee Yee is a formation of high limestone cliffs located up the Mackenzie River from Fort Good Hope. Here the river cuts through sedimentary bedrock, harder than the alluvial materials in most of the rest of its valley. Fee Yee is an important domestic fishery and was historically used as a refuge for local people to defend against raiding parties of Inuit travelling from the Arctic coast.

Wichididelle, an important culture-hero for the people of Fort Good Hope, created the topographic features at Fee Yee while chasing the giant beavers, and other creatures from the land.



The Ramparts rapids [located at the head of the Ramparts] were created when Wichididelle threw rocks at a giant beaver. There's also a place where he laid down for a nap—his head and footprints can still be seen today. The small waterfall is where he had a pee. These places are close [to Fort Good Hope].... There's a fish camp with cliffs close by where he took a bear. He continued his travels until he got to Bear River where he killed some beavers and pegged their skins on Bear Rock. His arrows can still be seen in the river near Tulita. They'll remain this way until the end of time.

His boat is located above the rapids [Spruce Island is said to be his overturned boat]. He said in the legends that he would return one day for it. The giant did return for his boat once but he met the wolverine and told him his intentions to return to this land to get his boat, and also that there should be more people for him to eat. The wolverine told him, "Everything remains the same as when he left, not many people there at all." So the giant turned back and forgot his plans to come back. His boat is still there.

Sahtu Heritage Places and Sites Joint Working Group, Rakekée Gok'é Godi: Places We Take Care Of.

CLIMATE

Solar radiation by the Earth's surface and atmosphere is key to the climate of the Sahtu. The strength of this radiation is determined primarily by latitude. Snow cover, clouds and large variation in hours of daylight and sun elevation during the year are also factors.

The heat of the sun is constantly redistributed between regions by air circulation. In the winter, the Sahtu is dominated by air flowing from the polar region. The Mackenzie Mountains protect this air mass from milder, moist Pacific air. The low sun angles ensure low solar input.

In general, the Sahtu has long, cold winters and relatively short, cool summers. The average temperature in January ranges from -20°C to -30°C , while the average temperature in July ranges from 10°C to 15°C . Annual precipitation varies from 200 mm in the barrenlands to 700 mm in the mountains. The summer and winter cycle is very pronounced and is separated by spring break-up and autumn freeze-up.

In the summer, the air circulation pattern alters. Arctic air recedes, allowing low pressure cells to gain access from the southwest. Along with this change, the air flow from the south combine with the long hours of sunlight make the Sahtu, especially in the Mackenzie Valley, the warmest for its latitude in all of Canada.

Temperature inversion, when the cooling of air temperature with altitude is reversed, is a common phenomenon in the Mackenzie Valley. Inversions in Norman Wells can result in air temperatures at the top of the Franklin Mountains (approx. 1000 m) 10 degrees warmer than at ground level.

Precipitation in the Sahtu is restricted partly because of the rain-shadow effect of the Mackenzie Mountains. Average precipitation throughout the Sahtu is 300-400 mm annually. Precipitation decreases at the more northern latitudes, tapering off to 250 mm at the northern boundary.

Low pressure systems enter the Sahtu, typically from two major routes. Air flow originating in the northern Pacific Ocean moves through the Alaskan valleys into the Yukon and then into the Mackenzie Valley, proceeding south. Air moving directly south from the Beaufort Sea mixes with this Pacific flow to form the primary pathway.

The second air mass flows from south in the Pacific Ocean through various breaks in the Cordillera and finally moving north through the Liard Valley or along the Taiga Plains further east.

Daily rainfall is typically light with few days exceeding 5 mm. Heavy daily rains from localized storms in the summer can exceed 50 mm.

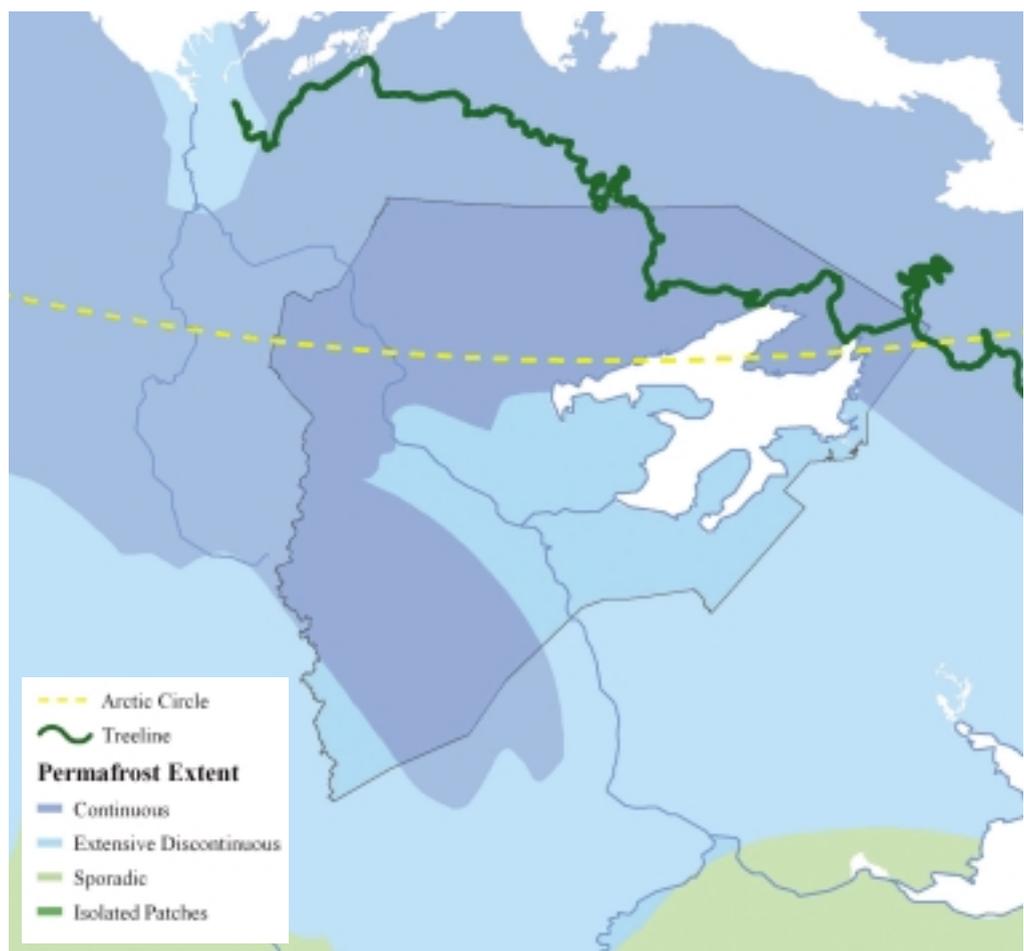
By November, precipitation primarily falls as snow. Mean monthly snowfall rises sharply and then diminishes through the winter months as the arctic high stabilizes and prevents humid air from the Pacific from moving in. Even as snowfall decreases, snow accumulation steadily increases throughout the winter due to lack of any significant thaws. Maximum snowpack depth is reached in March. A more rapid decrease in the snowpack then occurs over the spring season.



© Robert Kershaw, 2004

Early winter ice forming along Great Bear Lake shoreline

PERMAFROST



The Sahtu lies entirely within the permafrost region of northwestern Canada. The temperature of the ground is continuously below 0°C over significant proportions of the area. Therefore most moisture in the ground occurs as ground ice. This ground ice occurs in many forms, most often as fillings in the pores of soils; however, it can also form much more massive bodies, such as ice wedges and layers up to several metres thick. The ground surface undergoes annual deep seasonal thawing and freezing with summer's heat and extreme winter cold. Both the presence of ground ice and surface thaws and freezes have major effects on the landscape on roads, construction and development in the Sahtu.

WINDCHILL

Wind Speed (km/hr)	Temperature ($^{\circ}\text{C}$)											
	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50
5	4	-2	-7	-13	-19	-24	-30	-36	-41	-47	-53	-58
10	3	-3	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63
15	2	-4	-11	-17	-23	-29	-35	-41	-48	-54	-60	-66
20	1	-5	-12	-18	-24	-31	-37	-43	-49	-56	-62	-68
25	1	-6	-12	-19	-25	-32	-38	-45	-51	-57	-64	-70
30	0	-7	-13	-20	-26	-33	-39	-46	-52	-59	-65	-72
35	0	-7	-14	-20	-27	-33	-40	-47	-53	-60	-66	-73
40	-1	-7	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74
45	-1	-8	-15	-21	-28	-35	-42	-48	-55	-62	-69	-75
50	-1	-8	-15	-22	-29	-35	-42	-49	-56	-63	-70	-76
55	-2	-9	-15	-22	-29	-36	-43	-50	-57	-63	-70	-77
60	-2	-9	-16	-23	-30	-37	-43	-50	-57	-64	-71	-78
65	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79
70	-2	-9	-16	-23	-30	-37	-44	-51	-59	-66	-73	-80
75	-3	-10	-17	-24	-31	-38	-45	-52	-59	-66	-73	-80
80	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81

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WHAT IS WIND CHILL?

Wind Chill is the cooling sensation caused by the combined effect of temperature and wind. Our bodies insulate us somewhat from the outside temperature by warming up a thin layer of air close to our skin. When the wind blows, this protective layer is taken away. Energy is needed for our bodies to warm up a new layer. If each layer keeps getting blown away, our skin temperature will drop. Wind also makes you feel colder by evaporating moisture on your skin, drawing more heat away from your body.

In parts of the country with a milder climate, a wind chill warning is issued at -35°C . Most of Canada hears a warning at about -45°C . Residents of the arctic regions have grown more accustomed to cold, severe conditions and are warned at about -50°C .

WHERE IS THE COLDEST WIND CHILL IN CANADA?

The coldest wind chill on record occurred at Kugaaruk (formerly Pelly Bay), Nunavut, on January 13, 1975. The air temperature was -51°C , and the 56 km/h winds produced a wind chill of -78°C .

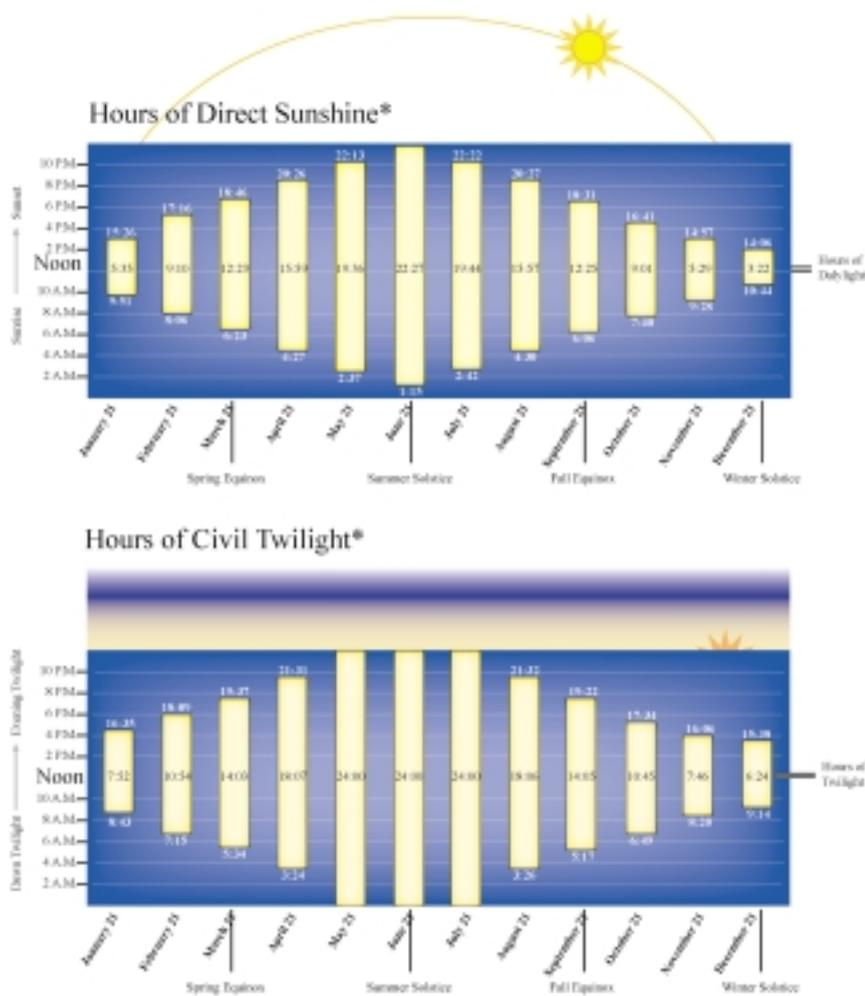
The above table shows the relative drop in temperature at varying wind speeds.



Sunrise and sunset conventionally refer to the times when the upper edge of the disk of the sun is on the horizon, considered unobstructed relative to the location of interest. Atmospheric conditions are assumed to be average, and the location is assumed to be in a level region on the Earth's surface.

Civil twilight is defined to begin in the morning and end in the evening, when the center of the sun is geometrically 6 degrees below the horizon. This is the limit at which twilight illumination is sufficient, under good weather conditions, for terrestrial objects to be clearly distinguished; at the beginning of morning civil twilight, or end of evening civil twilight, the horizon is clearly defined and the brightest stars are visible under good atmospheric conditions, in the absence of moonlight or other illumination.

In the morning, before the beginning of civil twilight and in the evening, after the end of civil twilight, artificial illumination is normally required to carry on ordinary outdoor activities. Complete darkness, however, ends sometime prior to the beginning of morning civil twilight and begins sometime after the end of evening civil twilight.



Sun dogs, also called mock suns or "parhelia", are colored, luminous spots caused by the refraction of light by ice crystals in the atmosphere. These bright spots form at points on the solar halo, 22 degrees on either side of the sun and at the same elevation.

Sundogs are visible when the sun is near the horizon (therefore seen during the winter months) and on the same horizontal plane as the observer and the ice crystals. As sunlight passes through the ice crystals, it is bent by 22 degrees before reaching our eyes. This bending of light results in the formation of a sundog.

The difference between sundogs and sun halos is the result of the orientations of the ice crystals. If the sun passes through the hexagonal crystals when their flat faces are horizontal a sundog is observed. If the hexagonal crystals are randomly oriented, a halo is observed.

Sundogs over Great Bear Lake

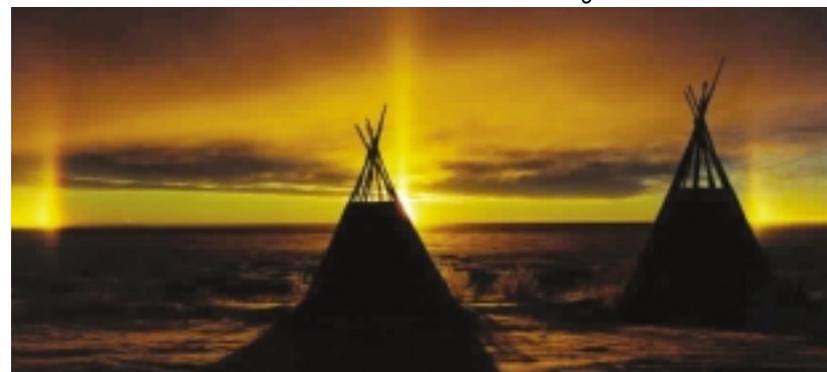


photo by Morris Neyelle, Deline

Aurora Borealis, or Northern Lights, are distributed along a narrow band encircling the North Pole. The Sahtu lies within the auroral zone, in which the Lights are most often seen.

The Aurora Borealis is an electrical discharge powered by a "generator" composed of the solar 'plasma particle' wind and the earth's magnetosphere.

As the solar wind blows towards the earth from the sun, a cavity known as the magnetosphere is formed when the plasma meets an invisible obstacle of the earth's magnetic field. The earth's magnetic lines above the polar region fan out and connect to the solar wind's magnetic lines at the magnetosphere's boundary. The solar wind blows around this boundary across the connected field lines, generating power up to 1,000 billion watts. When this current of (mostly) electrons collides with atoms and molecules in the upper atmosphere, they emit the characteristic northern lights. The whole process is comparable to neon lighting.

(Adapted from the GNWT Resource Wildlife and Economic Development: www.gov.nt.ca/RWED/)

Aurora Borealis



TEMPERATURE

In general, the Sahtu has long, cold winters and relatively short, cool summers. The average temperature in January ranges from -20°C to -30°C , while the average temperature in July ranges from $+10^{\circ}\text{C}$ to $+15^{\circ}\text{C}$. Annual precipitation varies from 200mm in the barrenlands to 700mm in the mountains.

Mean monthly temperatures tend to be relatively uniform, however there are regional variations. Temperature inversions, when the cooling of air temperature with altitude is reversed, is a common winter phenomenon in the Mackenzie Valley. Inversions in Norman Wells can result in air temperatures at the top of the Franklin Mountains (approx. 1000 m) 10 degrees C warmer than at ground level. The area surrounding Great Bear Lake is cooler in the summer than the Mackenzie Valley. The lake's large water body, whose temperature rarely exceeds 5°C , creates a cooling effect on the surrounding air mass. Throughout the 20th century, mean annual temperatures for most recording stations in the Sahtu have on average risen between 1 and 2 degrees Celsius.

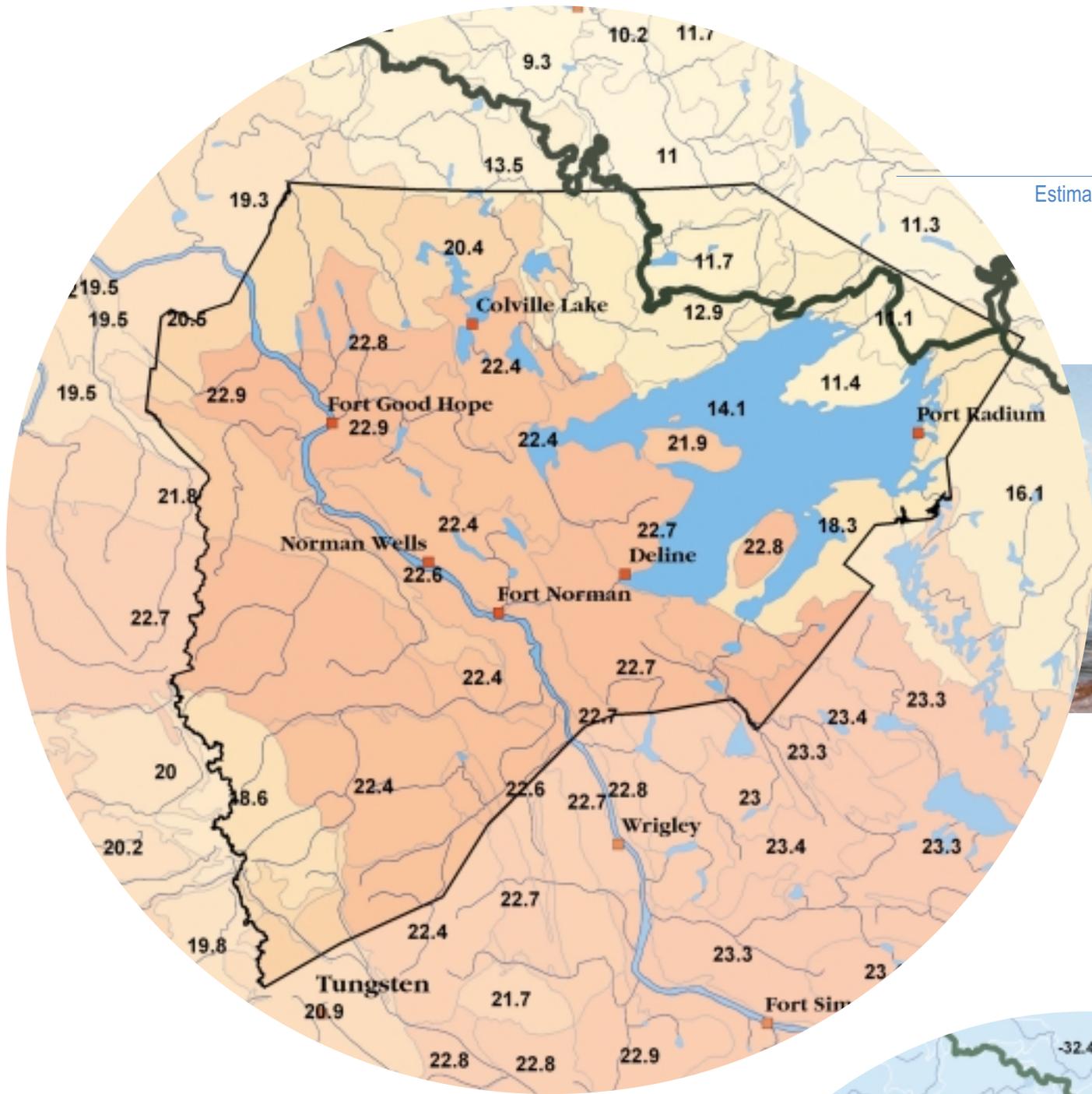


Fall can turn to winter quickly. In two days, ice has begun to form in Keith Arm on Great Bear Lake.

© Robert Kershaw, 2002



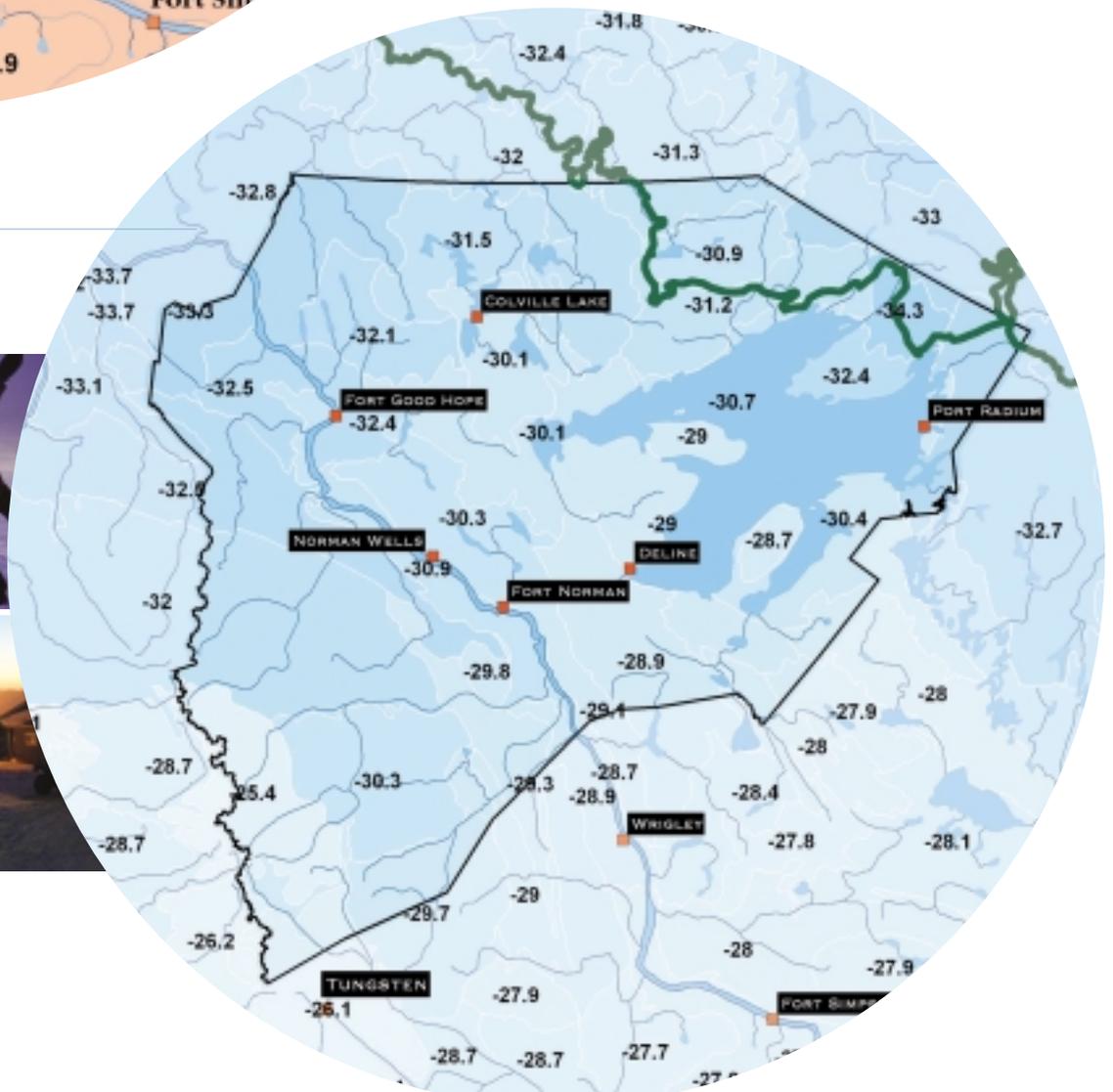
This model estimates the mean daily temperature of each ecozone based on an interpretation of data collected from weather stations in the region. The maximum and minimum temperatures of each day at each weather station are averaged to obtain the mean daily temperature. The mean daily temperatures are then averaged over a 30-year period (where available) for every day of the year.



SUMMER TEMPERATURES
Estimated average daily high temperature in July.



..AND IN THE DARKNESS OF WINTER
Estimated average daily high temperature in February.

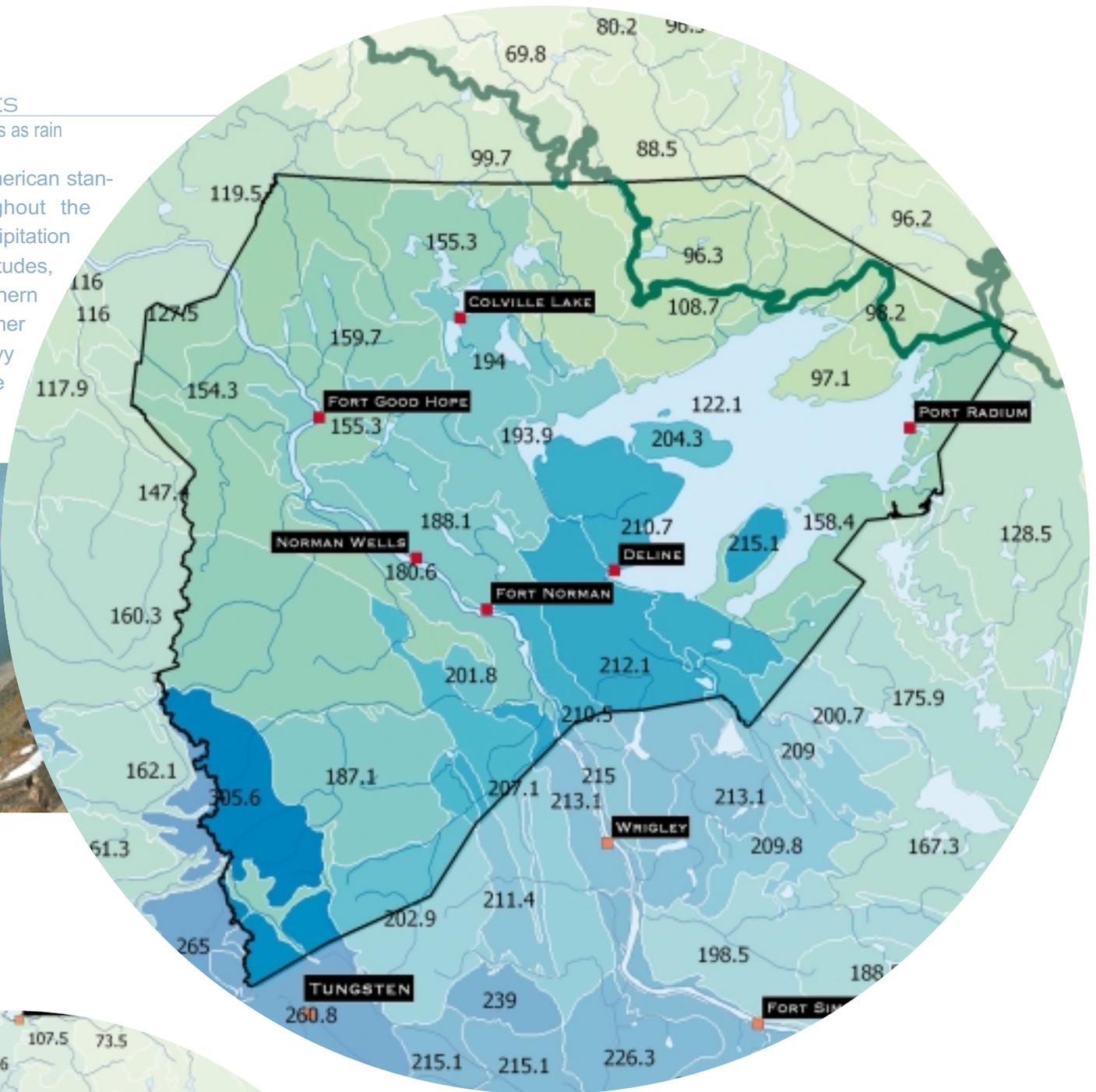


WHEN IT RAINS DOES IT POUR?

TOTAL RAINFALL IN MILLIMETRES

Estimated average annual precipitation that falls as rain

Snow and rainfall are low by North American standards. Average precipitation throughout the Sahtu is 300-400 mm annually. Precipitation decreases at the more northern latitudes, tapering off to 250 mm at the northern boundary. Daily rainfall in the warmer months rarely exceeds 5 mm. Heavy daily rains from localized storms in the summer however can exceed 50 mm.



TOTAL SNOWFALL IN MILLIMETRES

Estimated average average annual snowfall throughout the Sahtu

By November precipitation primarily falls as snow. Mean monthly snowfall rises sharply in the autumn and then diminishes through the winter months as the arctic high stabilizes and prevents humid air from the Pacific from moving in. Even as snowfall decreases snow accumulation steadily increases throughout the winter due to lack of any significant thaws. Maximum snowpack depth is reached in March then a more rapid decrease in the snowpack occurs as summer approaches.





WATERSHEDS

Watersheds are areas of land containing a common set of streams and rivers that all drain into a single larger body of water, such as a larger river, a lake or an ocean. The Mackenzie River watershed which drains into the Beaufort Sea is one of the largest watersheds in the world. Large watersheds like the Mackenzie are commonly termed basins. All the rivers that drain into the Mackenzie, large and small, are part of the Mackenzie Basin Watershed, but also have their own smaller watersheds. Not only does water run into the streams and rivers from the surface of a watershed, but it also filters through the soil eventually draining into the streams and rivers.

THE MACKENZIE RIVER BASIN

The Mackenzie River Basin begins at the headwaters of the Peace and Athabasca Rivers, and ends 4,200 kilometres later at the Beaufort Sea. The watershed is 1.8 million square kilometres in size, and drains one-fifth of Canada's land-base.

The Mackenzie River or Deh Cho (Big Water) begins at Great Slave Lake, forging a wide, 1,738 kilometre watercourse, heading "down north" across the Arctic Circle to the Beaufort Sea. Along the way, the Deh Cho's warm, shallow water passes boreal and taiga forest. Finally, its heavy burden of sand and silt is deposited into the channels, lakes and sandbars of the Mackenzie Delta which provides vital habitat for many Arctic species. Millions of migrating birds use the Mackenzie River valley as their main migratory route toward the delta.



Mackenzie River



Great Bear River



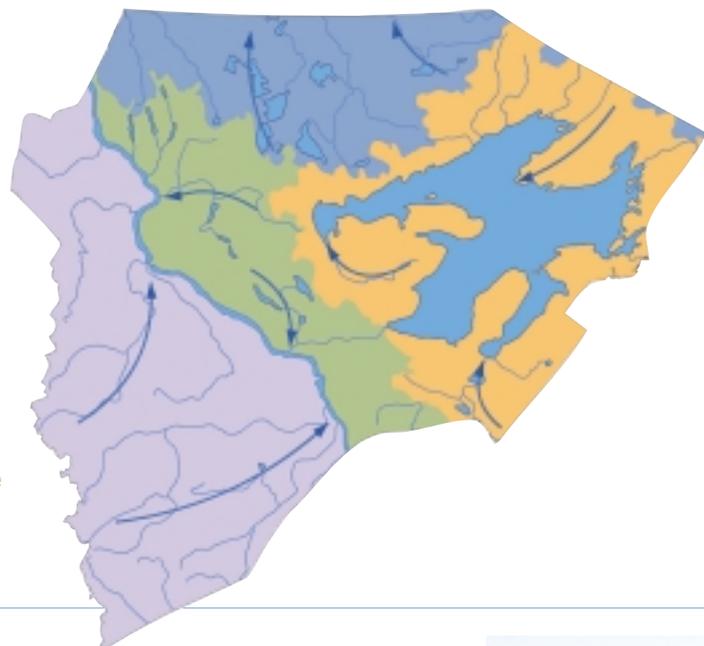
Keele River



WHERE THE WATER FLOWS

The Sahtu can be seen as having four major directions of waterflow:

- 1) The **West Mackenzie Region**, in which water flows down from the Mackenzie mountains and whose watersheds drain into the west side of the Mackenzie River
- 2) The **East Mackenzie Region**, in which water flows eastward and whose watersheds flow into the Mackenzie River on its east side.
- 3) The **Arctic Region**, in which water flows northward and whose watersheds flow directly into the Arctic ocean.
- 4) The **Great Bear Region**, in which all water flows into Great Bear Lake which then empties into the Mackenzie River via Great Bear River.



BREAKUP *Lisa-marie Pierrot, Fort Good Hope, 2000*

I am going to tell you a story from when I was about six or seven years old. There is only so much that I can remember from when I was that age and younger. My family, some of my aunts and uncles, and my grandparents went out on the land for spring hunt. We stay along the Mackenzie River at a place (across from) Grandview :

Here is one moment I will never forget, because it was so exciting. The ice was almost ready to go. One early morning, my dad and uncle went out hunting. They were gone all day. Everyone was sitting around after a hard day of work, when all of a sudden the ice cracked in half. It slowly started to move.

We all started to get very frightened because my dad and uncle were still not back from their hunt. The rest of us sat around in an endless wait for my dad and uncle, calling all the places we could to see if anyone up river had seen them. Finally we saw a little black dot at the end of the point on the river. Sure enough, it was them.

I can't really remember what had happened next, but what I do remember was that while the ice was moving, I was standing along the riverbank, watching a good friend of the family running on the ice while it was still moving. She saved our skidoo from drowning. Somebody had left it on the ice before it started to move. We were very thankful that we had her there with us. If not, we would have never had a skidoo for next winter.

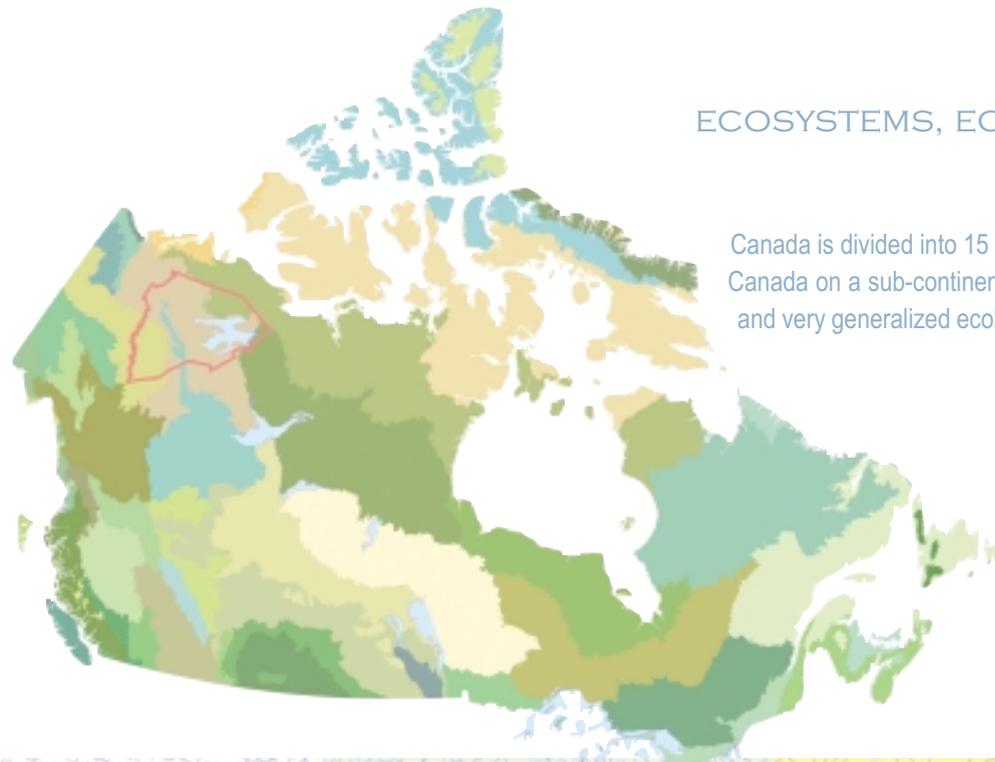


Spring break-up, Deline

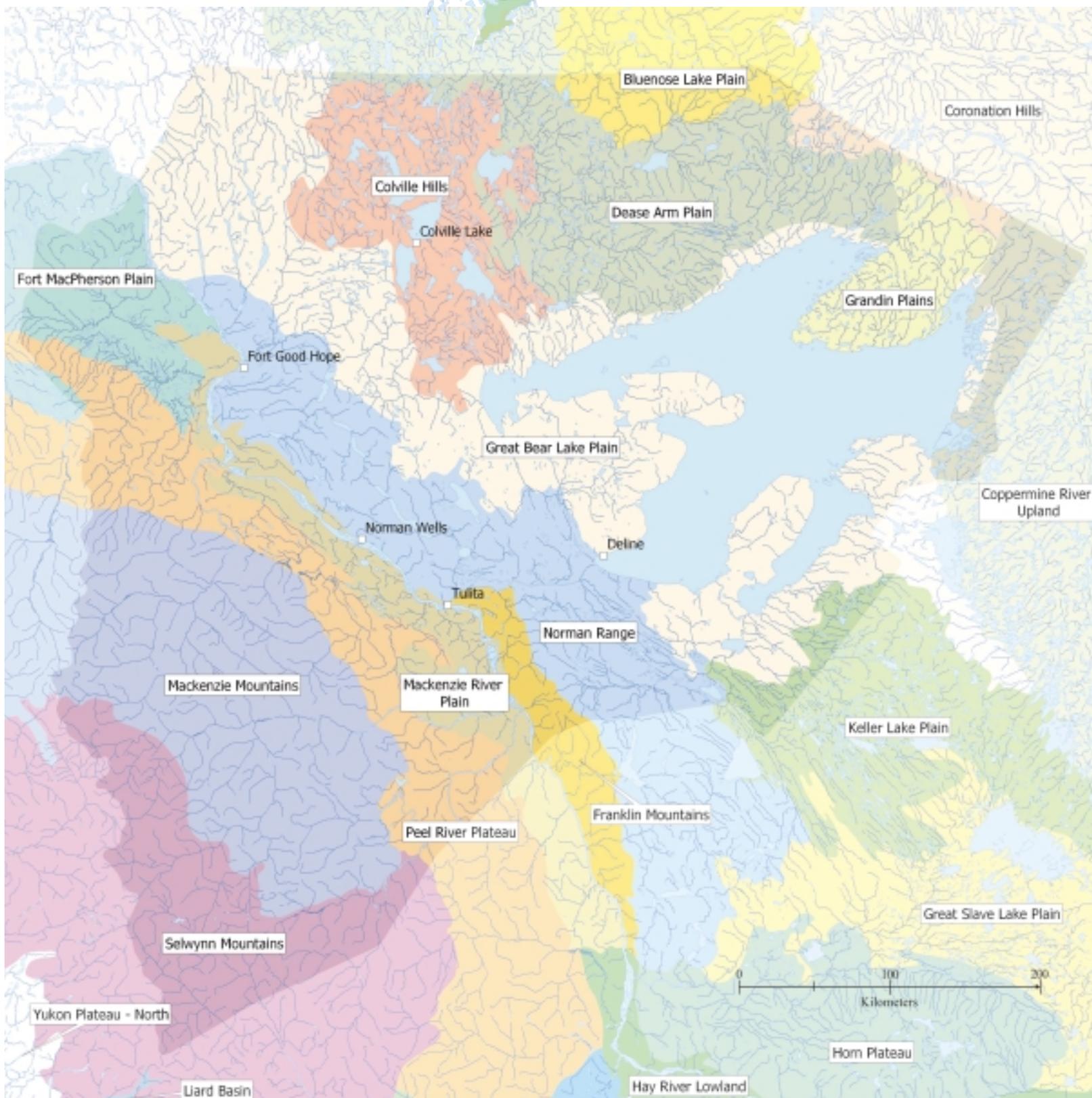
MAJOR WATERSHEDS FOUND IN THE SAHTU AND SURROUNDING REGIONS



ECOSYSTEMS, ECOZONES AND ECOREGIONS



Canada is divided into 15 ecozones. At the top of the hierarchy, ecozone defines the ecological mozaic of Canada on a sub-continental scale. They represent an area of the earth's surface representative of large and very generalized ecological units characterized by interactive and adjusting abiotic and biotic factors.



ECOPROVINCE

A subdivision of an ecozone characterized by major assemblages of structural or surface forms, faunal realms, and vegetation, hydrology, soil, and macro climate. There are 53 ecoprovinces in Canada

ECOREGION

A subdivision of an ecoprovince characterized by distinctive regional ecological factors, including climate, physiography, vegetation, soil, water, and fauna. There are 194 ecoregions in Canada. **The Sahtu has 15 ecoregions.**

ECODISTRICT

Subdivision of an ecoregion is characterized by a distinctive assemblage of relief, landforms, geology, soil, vegetation, water bodies and fauna. Canada has 1021 ecodistricts.

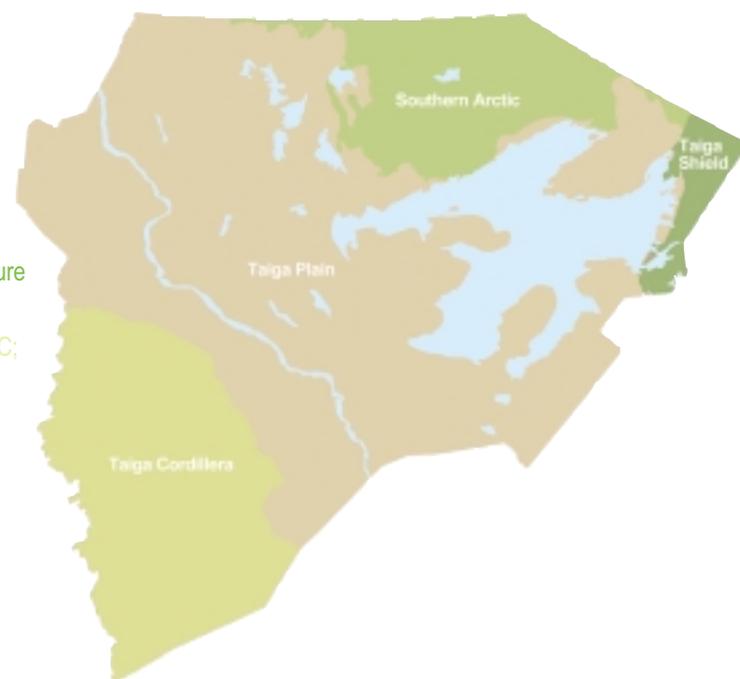
The Sahtu has four ecozones represented within its boundaries:

Southern Arctic - short cool summers; mean daily July temperature + 1° C; mean daily January temperature - 30° C; annual precipitation 250 to 500 mm

Taiga Plains - long cold winters; mean daily July temperature + 10 to 15° C; mean daily January temperature - 22.5 to -3 0° C; 250 to 500 mm precipitation

Taiga Shield - short cool summers; mean daily July temperature + 7.5 to + 17.5; mean daily January temperature - 17.5 to -27.5; 250-500 mm annual precipitation

Taiga Cordillera - summers warm in south, short and cool in north; mean daily July temperature + 12 to + 15° C; mean daily January temp. - 25 to - 30° C; 300-700 mm annual precipitation



ECOREGIONS OF THE SAHTU

DEASE ARM PLAIN

Located north of Great Bear Lake, Dease Arm Plain is classified as having a high subarctic ecoclimate. Tall shrub tundra, usually consisting of dwarf birch and willow, is the most common vegetative cover. The southern boundary of the ecoregion encompasses the area of tundra and subarctic forest transition, where open, very stunted stands of black spruce and tamarack with secondary quantities of white spruce and ground cover of dwarf birch, willow, ericaceous shrubs, cottongrass, lichen, and moss, are predominant. This ecoregion's rolling surface, which is generally below about 300 m elevation, is covered by glacial drift and outwash. A number of hills reach about 460 m. A wide range of Cryosolic soils, as well as Eutric and Dystric Brunisolic soils, have formed on hummocky to undulating, loamy glacial till. Organic landforms are usually high-centred lowland polygons.

NORMAN RANGE

The Norman Range lies between the Mackenzie River and Great Bear Lake Plains. This large region has a low subarctic ecoclimate. Vegetation is dominated by open stands of black spruce with an understory of dwarf birch, Labrador tea, lichen, and moss. Drier and warmer sites tend to have more white spruce, paper birch, and some aspen. Wet sites are usually covered with bog-fen vegetation such as dwarf black spruce, Labrador tea, ericaceous shrubs, and mosses. The Norman Range forms a series of north-south-trending, linear, relatively low ridges, largely of resistant Palaeozoic carbonates, and reaching elevations of about 1040 m asl. Great Bear Plain, composed of Cretaceous strata, has a rolling surface generally below 500 m asl. The surface of the ecoregion is covered with steeply sloping to undulating glacial drift, colluvium, and organic deposits in the form of polygonal peat plateaus. Turbic and Organic Cryosols, as well as Eutric Brunisols, are the dominant soils.

FRANKLIN MOUNTAINS

The Franklin Mountain ecoregion and its low subarctic ecoclimate extends from Tulita down past Wrigly. The predominant vegetation is open stands of black spruce with an understory of dwarf birch, Labrador tea, lichen, and moss. Drier and warmer sites tend to have more white spruce, paper birch, and some aspen. Wet sites are usually covered with bog-fen vegetation such as dwarf black spruce, Labrador tea, ericaceous shrubs, and mosses. The Franklin Mountains form a series of linear, relatively low ranges and ridges, largely composed of resistant carbonates, that reach elevations of about 1525 m. This ecoregion's surface is covered with steeply sloping glacial drift, colluvium, and organic deposits in the form of polygonal peat plateaus. Turbic Cryosols, Eutric Brunisols, and Organic Cryosols are the dominant soils.





COLVILLE HILLS

Surrounding Colville Lake this ecoregion also has a high subarctic ecoclimate. The dominant vegetation is open, stunted stands of black spruce and tamarack with secondary quantities of white spruce, and a ground cover of dwarf birch, willow, ericaceous shrubs, cottongrass, lichen, and moss. Poorly drained sites usually support tussocks of sedge, cottongrass, and sphagnum moss. Low shrub tundra, consisting of dwarf birch and willow, is also common. The Colville Hills embrace several ridges of Palaeozoic carbonate strata that stand above the surrounding plains. The hills and ridges enclose basins which contain several large lakes in a netlike pattern with meshes of 15 km or more across. The lowlands lie at about 245–300 m above sea level (asl), whereas sinuous ridges reach elevations of 670 m. This hummocky to undulating plain is also characterized by extensive polygonal peat plateaus. Organic and Turbic Cryosols and Dystric Brunisols are the dominant soils in the ecoregion.

FORT MCPHERSON PLAIN

Another ecoregion classified as having a high subarctic ecoclimate Fort Mcpherson Plain's predominant vegetation consists of open, very stunted stands of black spruce and tamarack with secondary quantities of white spruce. It has a ground cover of dwarf birch, willow, ericaceous shrubs, cottongrass, lichen, and moss. Like the Colville Hills the poorly drained sites usually support tussocks of sedge, cottongrass, and sphagnum moss and the low shrub tundra consists of dwarf birch and willow. Cretaceous shale lie below the surface, and incorporates a broad, shallow basin in its southwestern section at about 120 m asl. In the northeast, isolated hills rise to about 460 m, where it consists of Palaeozoic carbonate rocks. Both the Arctic Red and the Ontaratue rivers follow deeply incised valleys through to the Mackenzie River. Turbic and Organic Cryosols with some Static Cryosols developed on level to undulating morainal and organic deposits are the dominant soils. Unfrozen Dystric and Eutric Brunisolic soils also occur. Wetlands cover over 25% of the area in the north of the ecoregion, over 50% of the area in the south.

GRANDIN PLAINS

The Grandin Plains cover the entire area on the east side of Great Bear Lake known as ?ehdaɣla (Caribou Point). The ecoregion has a high subarctic ecoclimate. The latitudinal limits of tree growth are reached along its eastern boundary. The dominant vegetation is open, very stunted stands of black spruce and tamarack with secondary quantities of white spruce, and a ground cover of dwarf birch, willow, ericaceous shrubs, cottongrass, lichen, and moss. Low shrub tundra consists of dwarf birch and willow and poorly drained sites typically support tussocks of sedge, cottongrass, and sphagnum moss. Wetlands of peat plateau bogs, and ribbed and horizontal fens cover approximately 25% of the ecoregion. The Grandin Plain is covered by undulating glacial drift, raised beaches, and outwash deposits. Turbic Cryosols with Static and Organic Cryosols developed on loamy morainal and organic deposits are the dominant soils. Brunisolic soils have developed on unfrozen materials. The Grandin Plains also include a small portion of Great Bear Plain that is largely composed of Cretaceous shale.

GREAT BEAR LAKE PLAIN

This high subarctic ecoregion stretches across the widest section of the Sahtu and encompasses the community of Deline. The latitudinal limits of tree growth are reached along its northern boundary. The predominant vegetation consists of open, very stunted stands of black spruce and tamarack with secondary quantities of white spruce and a ground cover of dwarf birch, willow, ericaceous shrubs, cottongrass, lichen, and moss. Like many of the Sahtu's ecoregions, the poorly drained sites support tussocks of sedge, cottongrass, and sphagnum moss and the low shrub tundra, consists of dwarf birch and willow. Composed of flat-lying Cretaceous shale and Devonian limestone strata, the surface of this ecoregion is generally below 310 m asl. As elevations gradually increase southward, entrenched river channels lie some 60–150 m below the surrounding surface. The ecoregion is generally covered by undulating glacial drift and outwash deposits. Turbic Cryosols with Static and Organic Cryosols developed on organic deposits with deep permafrost are the dominant soils. Unfrozen Organic and Brunisolic soils also occur.

KELLER LAKE PLAIN

Keller Lake Plain extends into a small portion of the region along the Sahtu's eastern edge. It is classified as having a low subarctic ecoclimate. The main vegetation is open stands of black spruce with an understory of dwarf birch, Labrador tea, lichen, and moss. Drier and warmer sites tend to have more white spruce, paper birch, and some aspen. Wet sites are usually covered with bog-fen vegetation such as dwarf black spruce, Labrador tea, ericaceous shrubs, and mosses. Wetlands cover over 25% of this ecoregion, which also includes the southeastern portion of Great Bear Plain and the northern section of Great Slave Plain. Composed of Cretaceous shale, its surface is generally below 310 m asl and is covered by undulating, peat-covered glacial drift and outwash deposits. Turbic and Organic Cryosols developed on organic and loamy morainal deposits are the dominant soils in the ecoregion.

MACKENZIE RIVER PLAIN

The Mackenzie River Plain is unique in the Sahtu with its subhumid high boreal ecoclimate. The ecoregion is a broad, rolling, drift-covered plain lying between the Mackenzie and Franklin mountains, into which the Mackenzie River is entrenched. Native vegetation consists predominantly of medium to tall, closed stands of black spruce and jack pine with an understory of feathermoss, bog cranberry, blueberry, Labrador tea, and lichens. White spruce, balsam fir, and trembling aspen occur in the warmer, more moist sites in the southern section of the region. Drier sites have more open stands of black spruce and jack pine. Low, closed and open stands of black spruce, ericaceous shrubs, and sphagnum mosses dominate poorly drained, peat-filled depressions. Wetlands cover 25–50% of the ecoregion, and are characteristically peat plateau bogs, and ribbed and horizontal fens. Dominant soils in the ecoregion are Organic and Turbic Cryosols and Eutric and Dystric Brunisols with some Regosols that have developed on terraced to rolling morainal, alluvial, lacustrine, and organic deposits.

PEEL RIVER PLATEAU

This high subarctic ecoregion is the plateau that rises above the Mackenzie River Plains to the Mackenzie Mountains. The predominant vegetation is open, very stunted stands of black spruce and tamarack with secondary quantities of white spruce, and a ground cover of dwarf birch, willow, ericaceous shrubs, cottongrass, lichen, and moss. Poorly drained sites usually support tussocks of sedge, cottongrass, and sphagnum moss. The low shrub tundra supports dwarf birch and willow. The surface of this ecoregion is characterized by truncated and upturned edges of Palaeozoic and Mesozoic strata, forming terraces, and rounded plateaus. Some portions of the ecoregion in the southwest are unglaciated, but most of its surface is covered by thin, discontinuous, hummocky to dissected glacial drift and organic deposits. Wetlands are present on over 25% of the ecoregion, characterized by peat plateau bogs, and ribbed and horizontal fens. Turbic and Organic Cryosols with some Eutric Brunisols and Static Cryosols are the dominant soils in the ecoregion.

MACKENZIE MOUNTAINS

The Mackenzies show evidence of localized alpine and valley glaciation. The region is characterized by alpine tundra at upper elevations and sub-alpine open woodland vegetation at lower elevations. Alpine vegetation consists of lichens, mountain avens, intermediate to dwarf ericaceous shrubs, sedge, and cottongrass in wetter sites. Barren talus slopes are common. Subalpine vegetation consists of discontinuous open stands of stunted white spruce and occasional alpine fir in a matrix of willow, dwarf birch, and Labrador tea. The Ogilvie Mountains, composed of Palaeozoic and Proterozoic sedimentary strata intruded by granitic stocks, reach 2134 m asl in elevation. The Wernecke Mountains are formed of phyllite and nearly horizontal carbonate rocks carved by glaciation. They are divided into several ranges by broad northwesterly-trending valleys. Alluvium, fluvioglacial deposits, and morainal veneers and blankets are dominant in the region. Rock outcrops are common at higher elevation. Turbic Cryosols with some Dystric Brunisols and Regosols occur on steeply sloping colluvium.



SELWYN MOUNTAINS

For the most part this northern extension of the Rocky Mountains in the southern most tip of the Sahtu is a rugged mountain wilderness. The highest mountains found in the Northwest Territories occur in this ecoregion. The ecoregion is characterized by alpine tundra at upper elevations and by subalpine open woodland vegetation at lower elevations. Alpine vegetation consists of crustose lichens, mountain avens, dwarf willow, and ericaceous shrubs; sedge and cottongrass are associated with wetter sites. Barren talus slopes are common. Subalpine vegetation consists of discontinuous open stands of stunted white spruce, and occasional alpine fir and lodgepole pine, in a matrix of willow, dwarf birch, and northern Labrador tea with a ground cover of moss and lichen. Sedge, cottongrass, and mosses occur in wet sites. The Selwyn Mountains, which have been extensively glaciated, are composed of Palaeozoic and Proterozoic strata intruded by granitic stocks. They are divided into several ranges by broad, northwesterly-trending valleys. Some contain alpine and valley glaciers. Mount Keele, at 2950 m asl, is the most outstanding peak. Local alpine glaciers exist in the highest ranges of this ecoregion. Bare rock outcrops and rubble are common at higher elevation. Dystric and Eutric Brunisols on alluvial, fluvio-glacial, and morainal veneers and blankets are dominant in the region. Static and Turbic Cryosols with Dystric Brunisols or Regosols are developed on upper-elevation, steeply-sloping colluvium.

COPPERMINE RIVER UPLAND

The Coppermine River Upland the edges into the upper eastern area of the Sahtu is predominantly a high subarctic ecoclimate region. It is part of the tundra and boreal forest transition, where the latitudinal limits of tree growth are reached. The predominant vegetation consists of open, very stunted stands of black spruce and tamarack with secondary quantities of white spruce and a ground cover of dwarf birch, willow, ericaceous shrubs, cottongrass, lichen, and moss. Poorly drained sites typically support tussocks of sedge, cottongrass, and sphagnum moss. Low shrub tundra, consisting of dwarf birch and willow, is also common. This ecoregion includes the western half of the Bear-Slave Upland, which consists mainly of massive Archean rocks that form broad, sloping uplands, plateaus, and lowlands. The surface is typical of the bare rock parts of the Shield. Numerous lakes fill the lowlands, and rounded rocky hills reach 490 m asl in elevation. Bare rock outcrops are common, and Dystric Brunisols with some Turbic, Static, and Organic Cryosols are the dominant soils in the ecoregion. The soils have formed on discontinuous veneers and blankets of hummocky to rolling, sandy morainal, fluvio-glacial, and organic deposits.

BLUENOSE LAKE PLAIN

The Bluenose Lake Plain along the Sahtu's north east edge has a low arctic ecoclimate. Shrub tundra vegetation forms a nearly continuous cover, consisting of dwarf birch, willow, northern Labrador tea, *Dryas* spp., and *Vaccinium* spp. Tall dwarf birch, willow, and alder occur on warm sites; wet sites are dominated by sphagnum moss and sedge. Much of the ecoregion is underlain by nearly flat-lying, Paleozoic carbonates and late Proterozoic sediments. The landscape surface reaches elevations of 365–610 m asl, the higher parts being in the south. The western portion of the region is rocky where exposed bedrock outcroppings are common. Eastern sections are covered by rolling to undulating glacial drift. With few exceptions, lakes are small and scattered. Streams gather size northward and become entrenched 60–120 m below the surface. Turbic Cryosols developed on rolling glacial moraine are the dominant soils, and are underlain by continuous permafrost with medium to high ice content in the form of ice wedges.

CORONATION HILLS

A thin edge of the Coronation Hills occupies the northeast section of the Sahtu. Like the Bluenose Lake Plains it is classified as having a low arctic ecoclimate. The nearly continuous cover of shrub tundra vegetation consists of dwarf birch, willow, northern Labrador tea, *Dryas* spp., and sedge tussocks. Tall dwarf birch, willow, and alder occur on warm sites; wet sites are dominated by willow and sedge. The southern boundary of the region has a mix of tundra vegetation and open, dwarf coniferous forest. The ecoregion is composed of large, rounded, low hills and lowlands consisting of Palaeozoic carbonates and stratified, down-faulted, and folded Proterozoic sediments. Surfaces range in elevation 200–600 m asl in Coronation Hills. Turbic and Static Cryosols developed on undulating to ridged glacial tills, fluvio-glacial, and marine deposits are the dominant soils in the ecoregion. Organic Cryosols are associated with organic materials composing peat plateaus and high centre polygons.





BOREAL BIOME

Much of the Sahtu is located in the boreal or “northern” forest – Canada’s largest biome. The boreal biome occupies 35% of the total Canadian land area and 77% of Canada’s total forest land, stretching between northern tundra and southern grassland and mixed hardwood trees. Named after Boreas, the Greek god of the North Wind, the boreal biome starts in the Yukon Territory, forming a band almost 1000 kilometres wide, and sweeps southeast towards Newfoundland. To its north is the treeline, and beyond that the tundra of the Arctic.

By far, the most dominant tree species are conifers, which are well-adapted to the harsh climate and thin, acidic soils. Black and White Spruce are characteristic species of this region along with Tamarack, Jack Pine and Balsam Fir. There are also deciduous trees, which are at times mixed in among the conifers, especially in more southern areas - they may include White Birch and Poplars. Over 200 bird species breed here, as well as being home to species such as Caribou, Lynx, Black Bear, Moose, Coyote, Timber Wolf and recovering populations of Wood Bison.

Also characteristic of the boreal biome are innumerable water bodies: bogs, fens, marshes, shallow lakes, rivers and wetlands, mixed in among the forest, and holding a vast amount of water. The winters are long and severe while summers are short, though often warm.

TREELINE

There is evidence that the treeline once extended well north of Inuvik and the Arctic coast some 9000 years ago; it was of course pushed many hundreds of miles to the south, into what is now the central USA, by ice ages in the not so distant past.

Trees grow farther north through the Sahtu along the Mackenzie Valley up to the Mackenzie Delta almost to the shores of the Beaufort Sea, farther than anywhere else in Canada. The Mackenzie River and Valley create a micro-climate that is much friendlier to tree growth than other places at the same latitude.

It is a lack of summer warmth that sets a northern limit to tree growth. This explains why the treeline does not lie neatly along a parallel of latitude. It runs diagonally south-eastward from a point just north of Inuvik, to the southeast corner of the NWT.

The treeline is controlled by the following factors:

- Active Layer
- Altitude
- Aspect/Orientation
- Climate
- Latitude
- Permafrost
- Shelter
- Soils
- Water Availability



treeline

Where the permafrost is close to the surface, the active or seasonally thawed soils are too thin to accommodate roots. A tree’s height is limited by the depth and holding power of the soil it is rooted in. Therefore, trees become shorter and smaller as the treeline is approached.

While direct economic forest resources in the Sahtu such as logging are limited by infrastructure, population and tree size, the forests play a key role in supporting activities that remain essential parts of life in the Sahtu. Wood is still used by many for home heating and cabin construction. The Boreal forest also provides the habitat for wildlife which Dene and non-Dene rely on for food and income.



Deline log building project- top
Harvesting logs from the Mackenzie River - middle
Collecting winter fire wood supply - above

FOREST FIRES

Fire destroys and renews. The boreal forest of the Sahtu has been shaped by fire for thousands of years. All life in these forests has in some way adapted to or, in many cases, come to rely on the presence of natural wildfire. In the heart of boreal, natural fire frequency probably ranges from 50 to 200 years. Some areas burn more frequently, some less. Below is a map showing the forest fire history of the Sahtu.

WHAT DOES FIRE DO FOR THE FOREST?

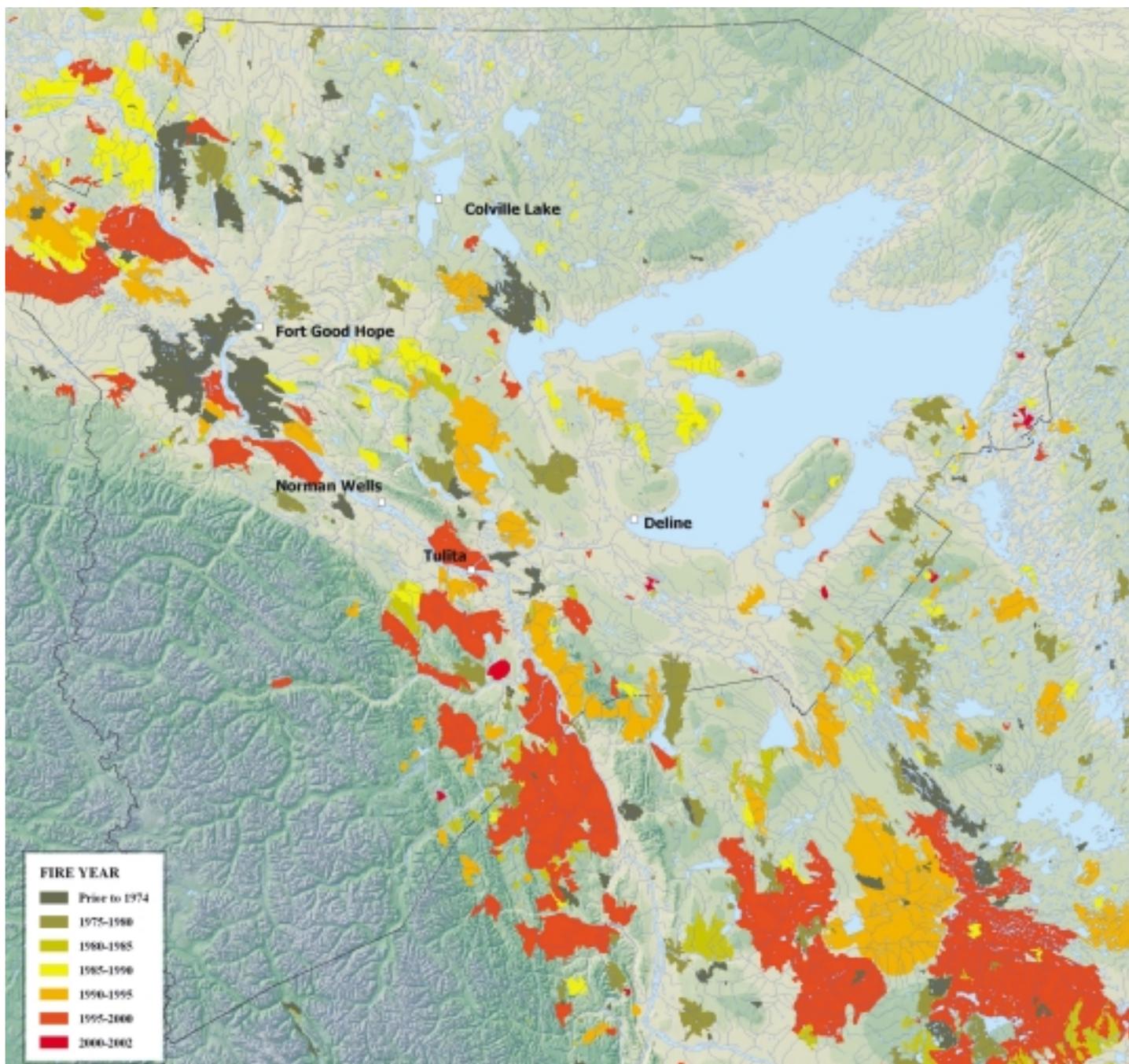
- breaks rock and builds soil
- kills pathogens and bacteria
- clears accumulated leaf (needle) litter exposing good mineral-soil seed bed
- fire blackened soil absorbs light, creating greenhouse effect for seeds and seedlings
- knocks back fire-sensitive/shade-tolerant trees
- helps re-establishment of conifer forest
- recycles nutrients locked up in leaf litter and woody debris.

Black spruce and Jack pine are well adapted to fire. Black Spruce cones tend to sit high on the tree to ensure the best chance of seed survival during a fire. Their semi-waxen seal often breaks open after a fire, allowing reseedling of the burned area.

Jack pine are thin barked and highly resinous. Biologists have described these trees as “roman candles” that can literally explode into flame. Jack pine cones only open under high heat – 50 degrees Celsius or more – and its seedlings need the open post-fire conditions to thrive.

Natural fires can range drastically in intensity, from smouldering ground fires that slowly clear off leaf litter to searing crown fires that destroy all vegetation in their path. Interestingly, it is now widely acknowledged that our efforts to suppress wild fires may in fact be skewing the pattern of wildfires toward less frequent, but much larger, hotter fires. By allowing dead wood and other fuels to build up in the forest, we are actually setting the stage for more destructive fires.

FOREST FIRE HISTORY IN THE SAHTU



top - Tulita fire 1995
middle - water bomber demonstration
above - fire crew puts out hot spot



When the earth was created, the wolves and the caribou held a big meeting around the Aklavik area. The wolves said to the caribou "Caribou should not be on earth any longer". The caribou responded: "As long as we've been here, we've been good and we've eaten well. We've done nothing to you. We've not destroyed your food. You have lived well off us. So what's wrong with us?" The wolves said: "That's right. There's nothing wrong with them. They don't get in anybody's way. So we shouldn't tell them what to do. Let them graze, and feed, and wander around. Let's not destroy them completely, because in the future we will need them."

from Ékwé Gulí (The Fate of Caribou), told by William Sewi

CARIBOU IN THE SAHTU

If one thing could be singled out that binds the people of the Sahtu most strongly to their land and heritage, it would be caribou. This animal has always been a staple of Dene subsistence, and its seasonal migrations have determined people's movements on the land.

There are two sub-species of caribou in the Sahtu - barrenground, *Rangifer tarandus granti* and woodland, *Rangifer tarandus caribou*. Within the woodland caribou, there are two ecotypes - the mountain and the boreal. Most people in the Sahtu, however, know their local caribou by their herd names such as Bluenose East, Bluenose West and Cape Bathurst (in the barrenland).

BARRENGROUND CARIBOU

Barrenground caribou have long legs ending in large, broad, sharp-edged hooves, which give good support and traction when traveling over snow, ice or muskeg. In winter, the pads between the hooves shrink, and the hair between the toes forms tufts that cover the pads, so the animal walks on the horny rims of its hooves and the hair protects the fleshy pads from contact with the frozen ground.

The colour of a caribou's coat varies seasonally. The old fur that has faded to very light beige over the long winter falls out in large patches revealing a new chocolate brown coat. When the moult is complete, caribou are uniformly dark brown with a white belly and white mane. Adult males also sport a white flank stripe and white socks above their hooves. In the fall, as white-tipped guard hairs grow out through the summer hair, caribou become a more uniform light brown. The exceptional warmth of the winter coat is the result of individual hairs which are hollow. The air cells in the hair act as an insulating layer.

Barrenground caribou have the largest antlers in relation to their body size of any deer species and are the only species in which females grow antlers. Antlers are shed and regrown each year. Calves have short spikes, but as an animal gets older, antlers increase in size and complexity. Adult males have the largest antlers and they may be shed as early as November, just after the rut. Younger males may retain their antlers until the following April, while females lose their antlers after calving in June.

BEHAVIOUR

Caribou are generally silent animals except after calving and during the rut. After calving, cows communicate with their young in short grunts. Males vocalize during the rut with a snorting, bellowing sound.

Another sound which caribou make, though not vocal, is the sharp clicking noise resulting from the movement of the tendons and bones just above the hooves. This noise is heard most clearly on calm cold days as large groups of animals journey across the tundra.

When migrating, they walk at about 7 km/hr, covering between 20 and 65 km a day. When startled, a caribou runs in a loose, even trot. The head is held high with the nose up and the tail erect. When galloping at top speed most caribou can outrun wolves, their major predator, but wolves close in quickly on any animal that stumbles or takes a wrong turn.

Caribou are excellent swimmers. Their hollow hairs enable them to float high in the water and their broad hooves propel them along at speeds of about 3 km/hr.



Bull caribou



top- caribou calf
above - caribou trail

The difference between caribou hide and moose hide is that caribou hide tends to get dried up easily when smoking so it is seldom tanned ...

Some women were telling me that to tan a white caribou hide, it is a lot of hassle trying to work on it. And at the same time, you have to keep it real clean so it won't get dirty.

You work on the hide like you would a moose hide, but you don't tan it. The white caribou hide is used for making white slippers or gloves.

*From oral narratives by Pauline Lecou, Fort Good Hope
From the Committee for Original People's Entitlement collection.*

Some writers believe the word "caribou" was derived from the Micmac "xalibu" which means "the power." The term for caribou varies in the Sahtu from community to community. In Deline, the term is "ékwé" and the people in Fort Good Hope say "éfé." European explorers naturally called these animals reindeer, or simply deer, the terms used for this species in the Old World.

Ékwé Deyúe ?ehdaralə

when caribou changes its clothes

Story told by Deline elder William Sewi

Ékwé (caribou) migrates to the barrengrounds, even though it doesn't have navigating tools. It still travels straight. It migrates to change its clothing, just the way a man would change his clothing when it wears out.

There is a kind of ékwé known in the Deline dialect as *bele yah* (eseleə in the K'ahsho Got'ine dialect). It looks like a two year old ékwé. And it is said that it is the boss of all ékwé.

Bele yah scouts up ahead of the herd. When it finds a good feeding ground, it goes back and rounds up the herd, and leads them to the area. Yes, it is the boss of all ékwé.

It is amazing how straight it travels. They say it is as intelligent as humans.

Along the migration route to the barrengrounds, there is a hill called Radú Dahk'ale (white outcrop). It has been said that this is where Ékwé changes its footwear.

The same as we humans do when our moccasins wear out, so it's been said that Ékwé changes its footwear on this hill. It is said that Ékwé sang a song on this hill. This song was not passed on.

From that hill, Ékwé continues along on the barren-grounds. It goes a long way, all the way to its calving grounds.

It has been said that Ékwé rears its young as people do. When it licks its young one, it is actually changing its diaper.

There is an inscription in the skull of Ékwé. It is written in a strange language. They say that one day in the future, someone will be able to interpret the inscription.

Whenever it rains, Ékwé feeds good, and that's how Ékwé gets fat. Like if we ate dry food, for example, we wouldn't like it! But if the food is boiled, it is very good for us.

Long ago when it rained, people used to exclaim, "Haaay, it's raining! That's great, Ékwé is going to be fat!"



Caribou on the Move

This map of caribou migration patterns over the past five years is the product of a satellite collaring program initiated by RWED in 1996. The project was a model of cooperative management, with the support and involvement of aboriginal representatives. It was co-funded by the Inuvialuit Land Claim Implementation funds, Gwich'in Renewable Resource Board, Sahtu Renewable Resources Board, GNWT, and the Nunavut Wildlife Management Board. The project leaders were Resource Wildlife and Economic Development biologists John Nagy and Alasdair Veitch.

By mapping migration patterns and studying the genetics of samples from caribou antlers that have been dropped by cows on calving grounds, scientists have confirmed the existence of three separate herds in the northwest mainland of the Northwest Territories and Nunavut. These are known in English as the Bluenose-East, Bluenose-West, and Cape Bathurst herds. This map shows the two herds that migrate through the Sahtu Region.

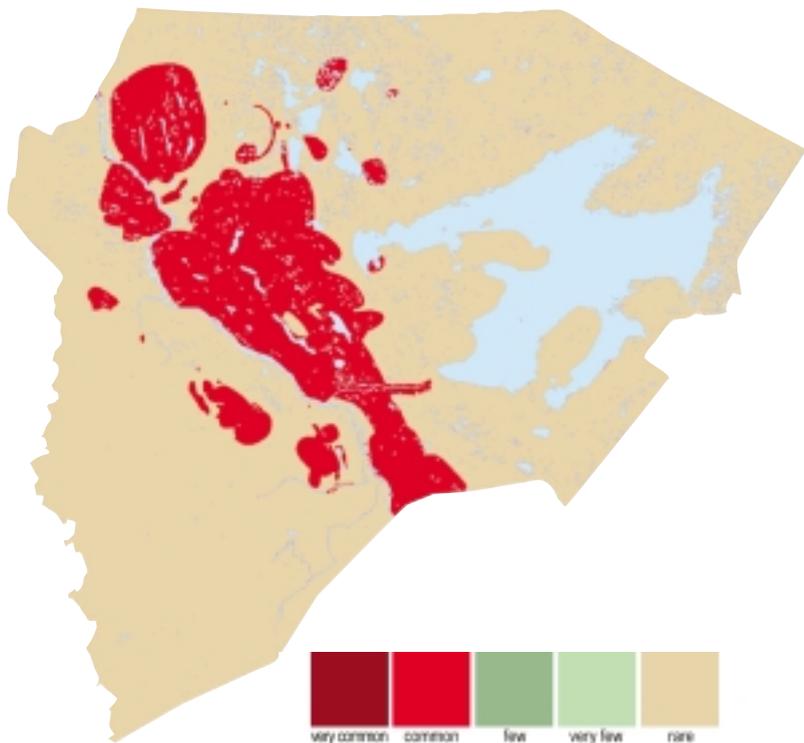
Having sorted out the existence of the three herds, it now becomes possible to get population estimates and other information specific to each herd. Along with traditional knowledge about caribou, this information will assist in monitoring the health of the herds over the long term.

CARIBOU POEMS by Carla Kenny, Grade 5, Deline - 2001

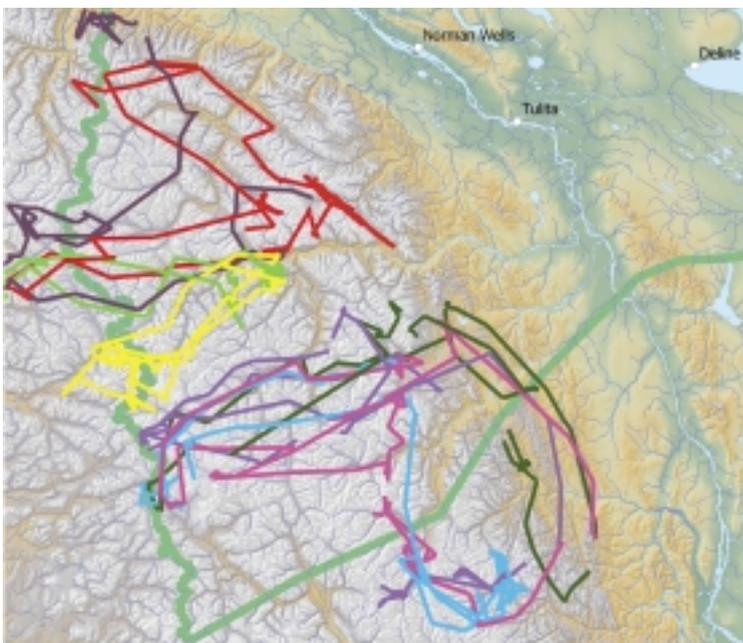
I	II	III
caribou, caribou come to my land caribou, caribou we love you caribou, caribou we will catch you caribou, caribou we will cut you up caribou, caribou we will eat you.	we love caribou, we will hunt them, we will eat them, you will be in our stomach, you will die. caribou are good to eat they are healthy for our heart.	caribou soup, caribou soup you are so good caribou soup, caribou soup you are so yummy

CARIBOU PARTS CLASSIFIED BY FOOD GROUPS

Milk and Milk Products soft ends of bones stomach contents intestines	Meat and Alternatives meat, heart, liver kidneys, brain, blood	Bread and Cereals heart, liver, kidneys bone marrow intestines web covering stomach	Fruits and Vegetables stomach contents eyes, liver
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There are two ecotypes of woodland caribou in the Sahtu Region, which are differentiated by habitat use. Boreal woodland caribou are non-migratory and remain in forested regions outside the Mackenzie Mountains year-round. Mountain woodland caribou migrate between forested and alpine habitats throughout the Mackenzie Mountains and parts of the Mackenzie Valley.



Above map: coloured lines shows the yearly movement of individual mountain woodland caribou through the Mackenzie Mountains
Data obtained by RWED from caribou fitted with satellite collars.



Boreal woodland caribou

WOODLAND CARIBOU

Woodland caribou that live in the boreal forests of Canada (boreal caribou) are a type of caribou that is considered to be different from the large, migratory barren-ground herds, and from the woodland caribou that live in the Mackenzie Mountains, which are known as “mountain caribou.” However, genetically both boreal and mountain caribou are in the same subspecies. They just have a different “lifestyle” whereby the boreal caribou live in small, rather isolated groups and prefer areas of old growth conifer forest.

One thing that we know about boreal caribou is that they are sensitive to activities associated with oil and gas exploration and extraction, particularly the cutting of seismic lines through the forests in which the caribou live.

Extensive research in northeastern Alberta done by Alberta’s Boreal Caribou Research Program (BCRP) have found that wolves can travel much faster through the forest along seismic lines than through the bush, especially during the summer. This increases their efficiency at finding and killing radio-collared caribou.

As a result of this increased risk of predation, the radio-collared caribou were more likely to be found in habitats that were at least 250 meters from seismic lines. The areas within 250 meters of seismic lines can therefore be considered to be areas of habitat loss for caribou, just as if those patches of habitat had been cut, burned by forest fire, or otherwise altered.

Biologists are examining the density of seismic lines across the Sahtu to determine the current oil and gas “footprint” in our region in light of what we know about such activity and its impact on caribou in Alberta. This information will be shared with the communities, with co-management boards, and with organizations with responsibility for environmental impact assessment.



Mountain woodland caribou

CARIBOU AND NUTRITION

Adapted from "Nutrition," by Jill Christensen, in People and Caribou in the Northwest Territories, Ed Hall, Editor (1989).

Caribou has long been a staple food for the Dene people of the Sahtu. Now, every community has at least one food store.

This is a mixed blessing. On the one hand it means that starvation, which was once common, is no longer a threat. On the other hand, stores are a source of many foods whose nutritional value is considerably lower and less complete than traditional country food. To this day, caribou remains a key source of nutrition for many people.

Caribou can provide nutrients that would require eating a wide variety of foods in a modern diet - not only meat, but also milk, bread, fruits and vegetables. The

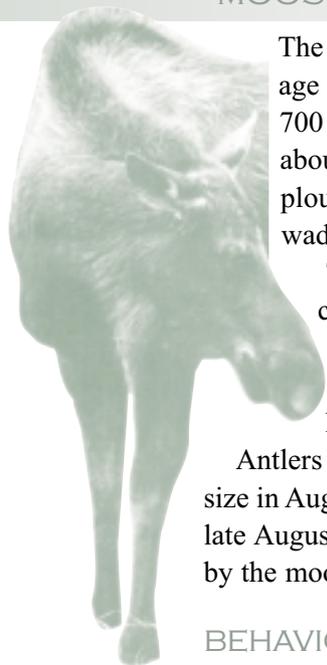
only essential nutrient that is not found in caribou is vitamin D. Traditionally, people had to use other food such as fish liver oil to get this.

Caribou will provide such a complete source of nutrition only if all the parts are eaten. Caribou liver is rich in vitamin C, but caribou muscle is not. If the liver isn't eaten, it is necessary to get vitamin C from another food source.

Caribou is leaner than most store-bought meats. Caribou fat is also better for you, since it is more "unsaturated." This means that those who eat it are in less danger of getting heart disease.

Eating country foods such as caribou can also prevent other diseases, such as diabetes which as become distressingly common in communities more dependent on store-bought food.

MOOSE IN THE SAHTU



The moose, *Alces alces* is the largest member of the deer family. Bulls average a weight of 500 kilograms; however, they may weigh as much as 700 to 750 kilograms. Cows are lighter in weight. Both sexes stand about 2 meters at the shoulder. Moose have long legs, well suited for ploughing through deep snow, walking over bushes and logs, and wading through muskeg.

Thick hides and warm coats insulate the moose against the winter cold. A fine undercoat of grey wool, and coarse, scaly guard hairs helps to retain heat. In spring, the old coat is shed and replaced with a short, dark brown coat. In late summer, the guard hairs grow longer and produce a rich, reddish, brown-black coat.

Antlers begin growing on mature males in April and reach their maximum size in August or September. They are covered with skin and hair, or "velvet". In late August, the blood supply to the velvet is cut off and it starts to shed, aided by the moose rubbing the antlers against trees.

BEHAVIOUR

Moose are unpredictable in their behaviour. They have excellent senses of hearing and smell, but relatively poor vision. When a moose perceives a threat, it often withdraws silently into the trees and stands quietly until the danger has passed. A startled or frightened moose will crash noisily headlong through the bush. Its antlers do not become entangled in dense thickets when it runs because it holds its head back so the antlers lie along the shoulders and the branches are pushed aside.

Moose are solitary animals and do not form permanent groups. The only social bond formed is between mother and calf. Moose may "yard" together in winter, but this is more of a temporary survival mechanism than a social one. When snow is very deep, it tends to restrict their movements to small areas which become well-packed and laced with trails.

STATUS IN THE NWT

Moose have always been highly valued in the Sahtu. Historically, Dene relied heavily on them for survival. The huge hides were at one time painstakingly prepared and sewn together to cover large, spruce-frame boats. Moosehide leggings, coats, hats and footwear were necessary apparel to ward off the severe cold. Moose meat was essential to people subsisting in remote areas and the hides were used for tents. A successful hunt was occasion for a feast, and the elders were honoured with the head, which is a delicacy.

Today, the moose is still an important resource in many Sahtu communities. With a single animal yielding as much as 300 kg of meat, it continues to be a staple food. In addition, the hides are usually home-tanned and used extensively for making moccasins, heavy winter mitts and handicrafts. Most hunters and trappers below the treeline still prefer handmade mukluks to manufactured winter footwear, and moosehide is essential for their soles, as caribou hide is neither thick nor tough enough.



Cow and bull moose



MOOSE ALONG THE DEHCHO

by Jonas Neyelle, Tulita

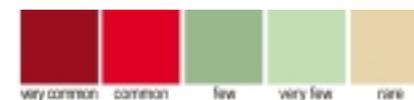
Dad used to tell us stories of people along the Dehcho (Mackenzie River) in summer. This was before my time. Some people only come to trading post to sell their furs and moved back to their chosen camp along the river. Usually the camps would be in a good fishing place. People would stay there for the summer making dry fish.

Dad said that in those days, moose were very scarce. If a hunter found a moose track they hunted it until they killed it or the animal got away. I must also mention Dad saying that once the hunter found signs of moose, the poor animal would have a very poor chance of getting away, because in those days there were many good hunters.

Perhaps this is the reason why the number of moose along the Dehcho went into decline. Dad said hunters would have to spend many hours and days checking out good areas for moose, sometimes coming home empty handed.

That was when the government put restriction on moose. People were not allowed to kill cow or calf moose. I don't know how long the restriction was in effect. After I was twelve or thirteen years old, we would only see one or two moose along the Mackenzie River as we travelled between Blackwater and Fort Norman.

Mackenzie Valley Viewer, September 2001



DALL'S SHEEP

Dall's sheep, *Ovis dalli dalli* are medium-sized, hoofed mammals, or ungulates. Rams weigh from 80 to 100 kg and ewes are smaller at 60 kg. Both rams and ewes grow horns throughout their lives.

They are graceful and agile in their rugged, mountainous habitat. The pliable centre of their hooves and a hard rim provide good traction on steep outcrops. Sheep have excellent eyesight and a well developed sense of smell.

BEHAVIOUR

Usually, rams that are older than 4 years roam in small groups of 3 to 10 individuals, but sometimes rams are found alone. Ewe groups tend to be larger and contain young rams, yearlings and lambs of the year.

Individual Dall's sheep confine almost all their movements to a particular mountain block that contains both the winter and summer range. Up to 300 sheep can use the same winter and summer blocks each year and from generation to generation. Therefore Dall's sheep are very slow to recolonize an area if the population is severely reduced. It also means that the sheep are very sensitive to intense human activity on their ranges.

DIET

Grasses and sedges make up about 70% of the diet of Dall's sheep. The leaves and stems of some shrubs and certain flowering plants are also selected and may be important seasonally. Lichens and mosses may be eaten in winter when the sheep often must paw through several centimetres of snow. Minerals from mineral licks are an essential component of the diet of Dall's sheep and well established trails lead to the licks.



K'éyeneyo means "place where sheep are chased down." It is an isolated mountain, south of the Gravel River, at the headwaters of the Moose Horn River. It is a good place to find ewes and lambs at this time of year. In the old days, sheep were chased down from the tundra plateau into snares of babiche. Sheep are famous for their climbing skill. In fact, Alfred Thomas of Fort Simpson said that the white sheep had a gummy substance that was exuded from between their toes when they were climbing or descending steep terrain, increasing their traction. But there is one cliff they cannot climb, north northwest of K'éyeneyo. It is called Pet'árenejo, or "mountain where sheep are run against a cliff." There they could be killed by hunters.

From *Snowshoes and Ptarmigan Feathers* by Norman Simmons with Maurice Mendo
Originally published in the Mackenzie Valley Viewer, October 2002



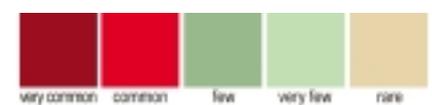
sheep hair



MUSKOXEN

Muskoxen, *Ovibos moschatus* are found on the arctic islands of the Northwest Territories, as well in the area north of Great Bear Lake up to the Arctic coast. Recently, they have increased in numbers and expanded their range into the Franklin Range.

Muskoxen are completely covered by hair, except for the horns, hooves, lips and nose. They have an under layer of short fine wool of exceptional warmth, known as qiviut, covered by a dark brown or black shaggy coat. Their diet consists of willows, sedges, rushes, grasses and willow herbs during the summer, and graminoids, crowberries, bilberries and willows in the winter.



BEARS

BLACK BEAR

Black bears, *Ursus americanus* are chunky in shape, 1.5 to 1.8 m long and almost 1 m tall at the shoulder. On average, males weigh 115 to 170 kg, while females are smaller at 90 to 155 kg. They are heaviest in the fall, when they may gain as much as 14 kg in a week.

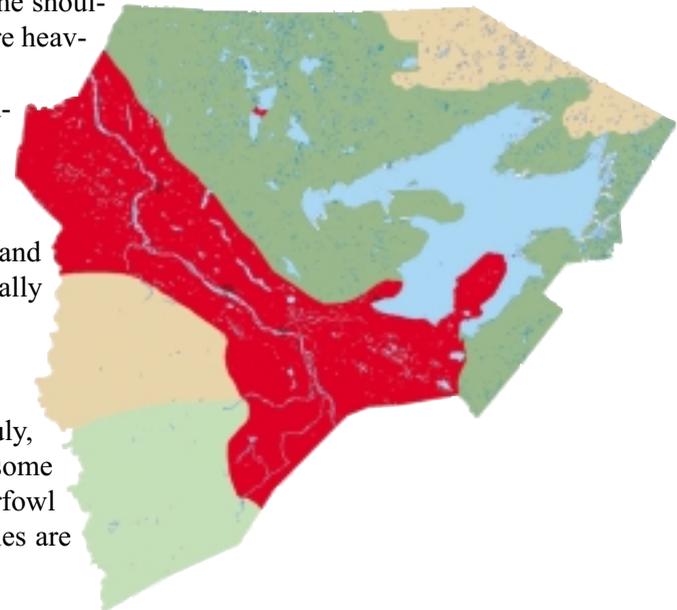
Black bears have a broad head and short neck. Their eyes are small and black, their ears rounded and the snout long. In the Sahtu, the most common coat colour is black, with a tan muzzle.

DISTRIBUTION

In the Sahtu, black bears prefer habitat that combines forested areas, which provide seclusion and safety, with open spaces that provide berries, shrubs and grasses. Black bear densities are typically highest within river valleys.

DIET

Black bears are omnivorous and highly adaptable in their food habits. From May until late July, black bears forage on grasses and sedges along rivers. In early spring, they also depend to some extent on the carrion of winter-killed animals. Later on, they feed on eggs from nesting waterfowl on river banks, fish along streams, and dig up roots and tubers. In later summer and fall, berries are an important food.



GRIZZLY BEARS

Grizzly bears, *Ursus arctos horribilis* vary considerably in size depending on the area they inhabit. In the Mackenzie Mountains, where winters are long and cold and the forage is sparse, the heaviest male recorded in a 5-year study weighed only 214 kg. Females are smaller than males and do not continue to gain weight with age as males do.

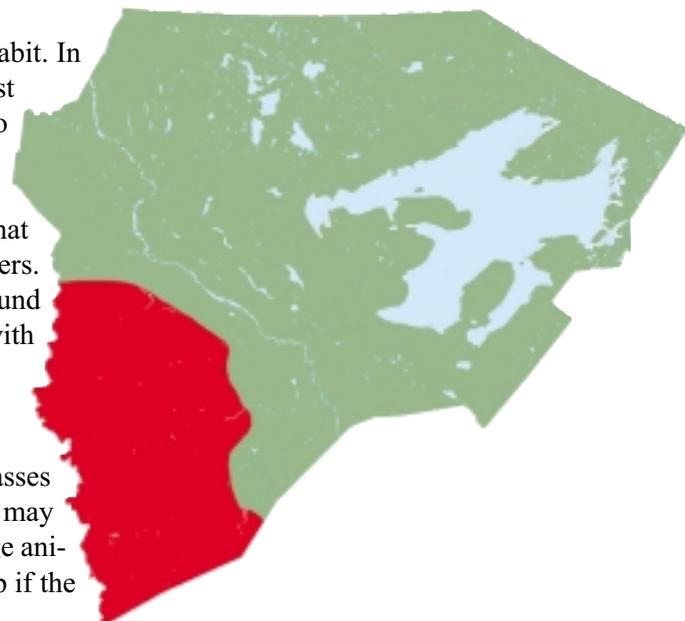
Grizzly bears are larger than black bears and more heavily built. They are usually recognizable in profile by the shape of the snout, which is long and upturned rather than convex like that of a black bear. Another distinguishing feature is the prominent hump of muscle on the shoulders. They have long shaggy coats with coarse guard hairs overlying a dense mat of underfur. Around the shoulders, the hair lengthens to form a ruff. Colour varies from light gold to almost black, with pale bears being the most common on the barrenlands.

DIET

Grizzly bears are omnivorous. In spring, they graze first on roots and then switch to new grasses and sedges as they emerge. During late summer and fall, they feed primarily on berries. They may also eat lemmings and ground squirrels, which they excavate from burrows. With respect to large animals, bears are opportunistic predators and will kill caribou, moose, muskoxen and Dall's sheep if the occasion arises.

HIBERNATION

Scientists differ as to whether or not bears enter a state of true hibernation, but the controversy may be largely a matter of terminology. Many smaller mammals enter a deep sleep from which they cannot be easily roused. While they are dormant, their body temperatures are much lower than normal. A bear's temperature, in contrast, does not drop more than about 5°C. Bears can awaken easily, but if undisturbed, may sleep for as long as a month without changing position. Smaller mammals awaken periodically to eat and expel body wastes. Bears cease all such functions during their hibernation.



Grizzly bear



Black bear sow and cubs

WOLVES

Wolves, *Canus lupus* are a member of the dog, *Canidae* family. Adult males average about 35 - 40 kg, while females are smaller, at about 30 - 35 kg. Length of males, from nose to the tip of the tail, varies from 1.5 to 2.0 m, with females from 1.4 to 1.8 m.

Wolf coat colour varies from pure white to black, with accompanying shades of cream and brown. The most common colour is grey. The wolf's coat is thick; composed of long, coarse guard hairs and short, soft underfur. In the Northwest Territories, the coat moults only once, in late spring. By winter, the short, new pelage grows into a silky coat with the underfur appearing in autumn.



DISTRIBUTION

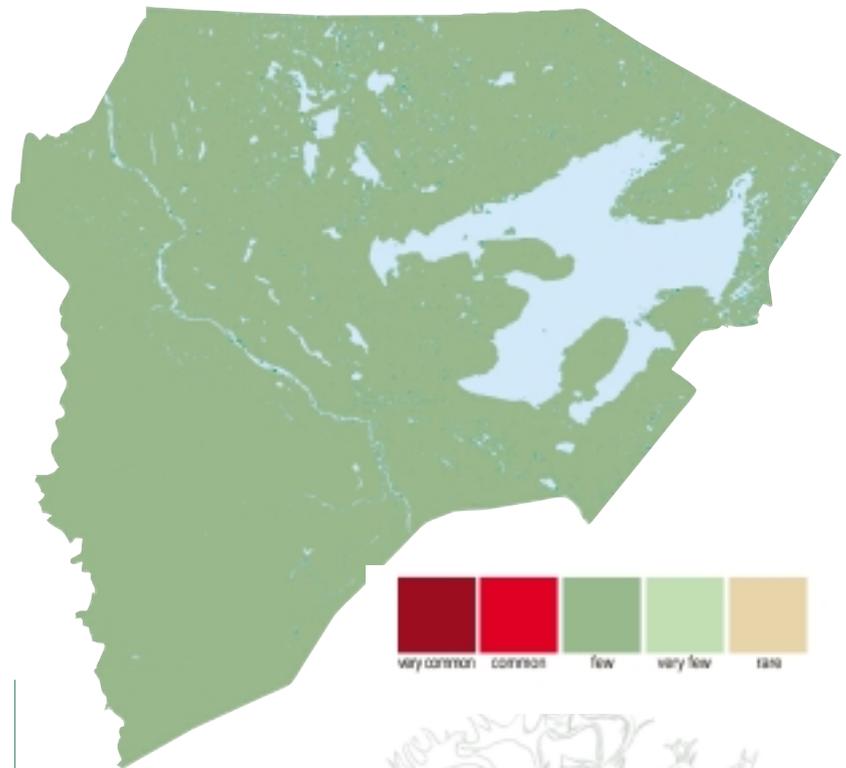
In the Northwest Territories, two different groups of wolves can be distinguished based on behaviour and distribution. Wolves that live below the tree-line or in the mountains are commonly known as timber wolves. They depend mostly on non-migratory prey like moose. Wolves that travel above and below the treeline on the mainland of the Northwest Territories are commonly known as tundra or caribou wolves. They depend largely on barrenground caribou and do not maintain regular territories

BEHAVIOUR

Howling may be a wolf's message to pack members of its whereabouts. A howl may summon pack members to a nightly hunt or adults may howl to find a lost pup. It may also be that wolves simply enjoy howling, alone or in groups. People who have observed group howls attest to the wolves' obvious pleasure in the occasion and to the marvelous sounds of the wolf voices in harmony.

Throughout the winter, wolf packs travel many kilometres, feeding where they find prey and resting when they are tired, or when extreme temperatures and storms cause them to seek refuge. Winter travel routes include game trails, ridges, seismic lines and frozen waterways. In deep, fluffy snow, wolves find traveling difficult and will often use roads or snowmobile trails to ease movement.

Wolves accompany nearly all caribou herds most of the year. Under most circumstances a caribou can easily outrun a wolf. However, in most cases, wolves simply chase a large herd of caribou, on the alert for any animal caught off guard, that stumbles or appears weak. Old and ailing caribou, or a calf which hesitates a second too long, are often victims.



THE FATE OF CARIBOU/ Éfé Guli

told by William Sewi

© Alfred Masuzumi

Here's a good story. Long ago, when the wildlife were new, Ékwé and Dígai (wolf) met out on the barrengrounds, north of Aklavik. The leaders of both groups were old.

The old dígai leader said, "Ékwé should be wiped off the face of the earth." They were all sitting face to face, and no one said anything for awhile. Finally, old Ékwé asked, "What's the misunderstanding? Why don't you simply tell us what you don't like about us?"

Then Dígai said, "The purpose of this meeting is to wipe you from the face of the earth."

Ékwé asked, "What wrong are we accused of? All we look for is food for our survival. And the humans are surviving from us. In the future, people will depend on us for their food.

You, Dígai, are not like that. You are a conniving animal, and we predict that in the future you will kill humans. There will be packs of you attacking and killing humans. And you will also be killing us. This is how you will survive. You'll kill moose, and every other animal.

"You are a sly animal. When human kills game for his survival and covers it for safekeeping, you will steal his food. And when he's out trapping, you'll go along his trapline and take out the bait. That is how you will be spending your time. Yes, this is how you will be in the future.

"We ékwé, we are the good wildlife. We are on the earth only to look for our food. We can never disrupt anything in nature. This is our destiny until the end of the world.

"Whatever people eat, it becomes their flesh and blood. This can never be taken away from man.

"Yes, in the future people will be surviving on us for food, and you will also.

And then Dígai got up and said, "Yes, Ékwé speaks the truth. What he says of the future is true. And I believe him."

And so Ékwé won, and old Dígai was over-ruled.

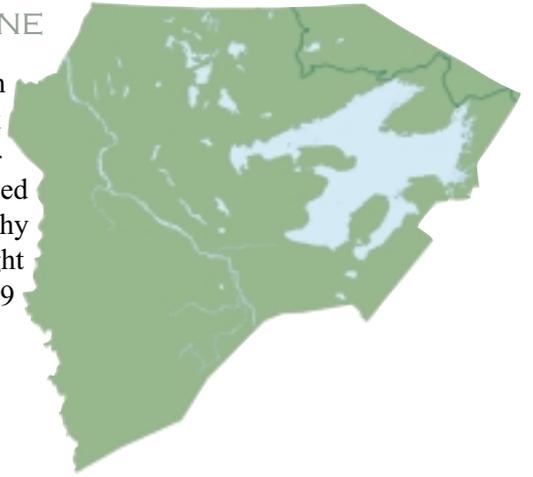
Ékwé said, "Henceforth until the end of the world you will survive off of us. There'll be no need to bring this matter up ever again. And so, this meeting is over."

Originally published in the Mackenzie Valley Viewer, March 2001. Printed with permission.



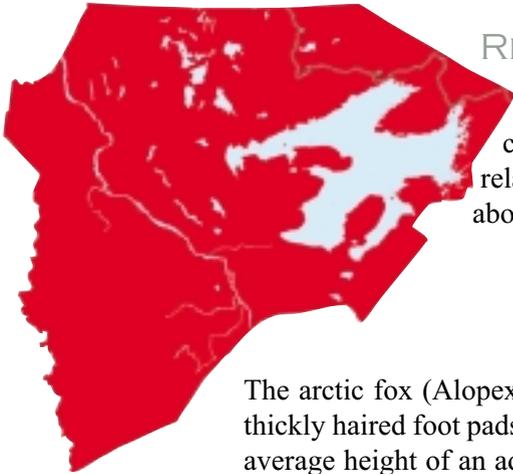
WOLVERINE

The wolverine (*Gulo gulo*) is the largest member of the mustelid family (otters, weasels, etc.) in North America. This squat, powerfully-muscled animal resembles a small, flattened bear. Wolverines are dark brown with a light grayish forehead and a pale stripe running from the shoulders along each side and crossing the rump. The wolverine's dense fur, with long guard hairs that do not ice up in winter, is highly prized for trimming parkas. Their large paws help them move on top of crusted snow. A wolverine has a dark bushy tail, a broad rounded head, small eyes and ears. Males average 1.2 meters in length and 0.5 meters in height at the shoulder. An average male weighs about 15 kilograms. Females are smaller, averaging about 0.9 metres in length and weighing about 10 kilograms.



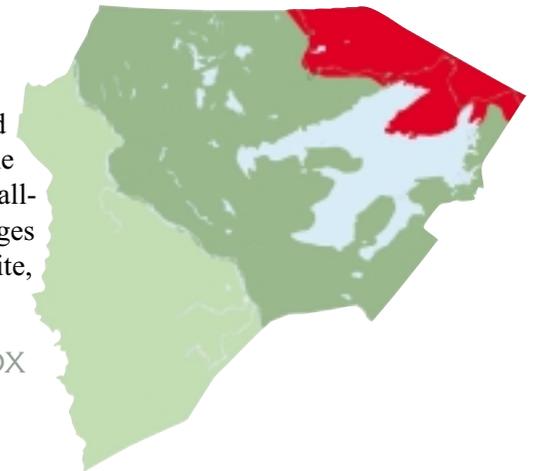
RED FOX

The red fox (*Vulpes vulpes*) ranges throughout the Sahtu below the treeline. The red fox is a small carnivore with an agile and lightly built frame. It is distinctive for its coat of long lustrous fur, and its relatively large and bushy brush (tail) and ruff (collar). A typical male fox weighs about 5 kg and stands about 35 cm at the shoulder, while the female tends to be slightly smaller.



The arctic fox (*Alopex lagopus*) has a compact body with short legs, short ears, dense fur, and thickly haired foot pads which provide traction on the ice as well as protection from the cold. The average height of an adult male is 25-30 cm at the shoulder, with the female being slightly smaller. The adult male fox weighs about 3-4 kg. Like many arctic animals, the arctic fox changes colour with the seasons to stay camouflaged. In the winter, their coat turns to a brilliant white, although some may have blue-grey patches, while in the summer it turns brown.

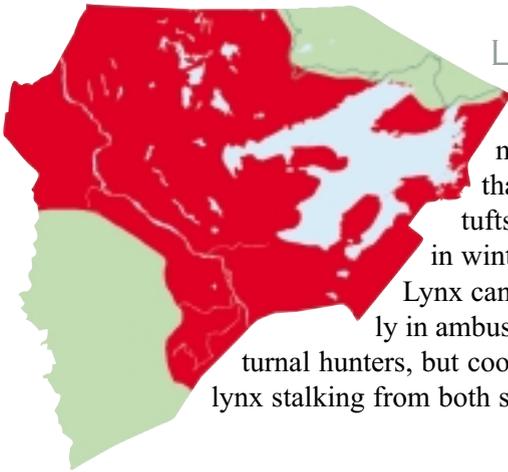
ARCTIC FOX



LYNX

The lynx (*Lynx canadensis*) is the only wild felid found in the boreal forests of the Northwest Territories. It is a medium-sized animal (10 kg for males and 8.5 kg for females) set on solid legs, those at the rear noticeably longer than the front, with large paws, a fairly small head, and a very short tail. The coat is long and thick with distinctive tufts on the ear tips. Long fur on the feet aids movement over soft snow. "Sideboards" become especially noticeable in winter, and may develop to a nearly full ruff. Its colour ranges from grey to brown.

Lynx can climb well and are good swimmers. They have acute vision and will stalk prey over long distances or wait patiently in ambush before making a final, typical cat-like bound from as close as possible. They are usually solitary animals and nocturnal hunters, but cooperative hunting has occasionally been observed, with rabbits being driven towards a waiting ambush, or a pair of lynx stalking from both sides of joint prey.

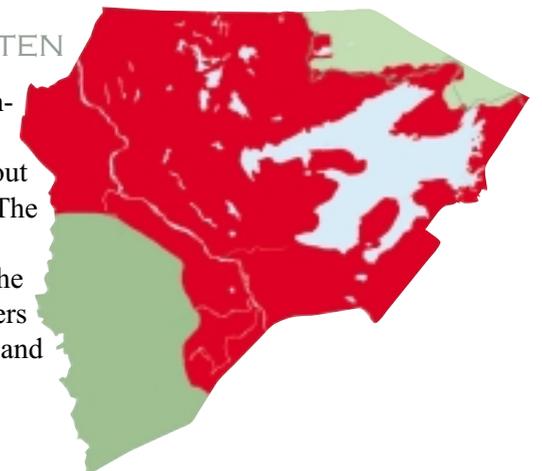


MARTEN

The marten (*Martes americana*) is found within the boreal forest of the Northwest Territories. It is a medium-sized member of the weasel (*Mustelidae*) family, and is closely related to fishers, badgers and weasels.

Martens that are found in the Northwest Territories are larger than those found further south. They are about the size of a house cat, with the adult male weighing about 1.5 kg, and measuring about 75 cm in length. The adult female is about three-fourths the size of the male.

The fur of the marten is soft and thick, varying in color from yellowish-brown to reddish or dark brown. The martens' throats are pale buff; their tails and legs are black. Two vertical black lines run above the inner corners of their eyes. In winter, long hairs grow between the toe pads on the martens' feet. These keep the feet warm and enable them to travel on snow.



WOLVERINE



RED FOX



ARCTIC FOX



MARTEN

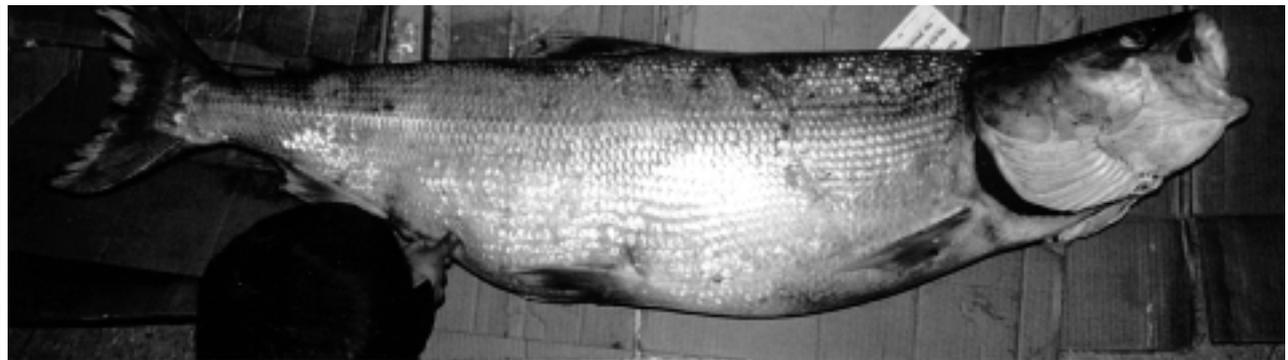


FISH OF THE SAHTU

The freshwater fish inhabiting the waters of the Sahtu have unique and diverse histories. Many species now in this area survived under harsh conditions in northern portions of unglaciated Alaska during the last ice age (ending about 10,000 years ago) while the majority survived in southern areas of the United States.

Fish are cold-blooded creatures, typically with scaly bodies and paired fins, that breathe by means of gills. Fish are excellent indicators of water quality and the presence or absence of certain species can provide immediate clues as to the conditions within a given area. Contaminant studies reveal further information about the aquatic environment. Due to the wide consumption of fish in the Sahtu, contaminant studies on several fish species are done to monitor environmental and public health.

Fishing remains one of the most important cultural and social activities for the people of the Sahtu. While wildlife may be absent from some areas during certain portions of the year, some fish species always remain accessible and thus have played a major role in the well being of the original inhabitants. World-renowned recreational angling by residents and visitors (a 33 kg Lake Trout was caught in Great Bear Lake in 2001) further reinforce the benefits and need for strong, sustainable fisheries, resource management and research.



Mackenzie River 'Coney', Fort Good Hope © Robert Kershaw

Bodo and the Big Fish *Told by Peter Baton, Deline Elder*

My Grandmother told me this story of Bodo and the Giant Fish, She says once the fish in Mackintosh Bay go bad they disappear. That is what happened one time, so we had a hard time.

Bodo went to check his hooks by knife point. He only caught a very skinny fish. He then thought to himself that other people might be using medicine to keep the animals away, so catching this little fish made him angry because there are people and dogs to feed and they are not catching any animals. He put his hook back in the water and caught a fish, but the hole was too small, so he had to use his knife to make the hole bigger. He then got the fish out. It was so big that he had to cut it up and bring some home. My Grandmother said Bodo told them to get two dogs and go to the hooks and pick up the rest of the fish. My granny says that the trout was so big that it had horns about the size of a thumb and the guts were out in a separate pile for the dogs. It was just fat.

That is what my granny has told me about Bodo and the Giant Fish.



Residents of Fort Good Hope have long relied on fish from the Mackenzie River as a source of food for themselves and their dogs. Accelerated oil and gas development in the Mackenzie Delta has many people concerned about possible negative impacts on the fisheries resource. As the fisheries resource is perhaps one of the most valuable of all renewable resources in the Mackenzie Delta and the one most likely to be negatively impacted by oil and gas development, it is one that should be monitored for changes.

From the Department of Oceans and Fisheries/Sahtu Renewable Resources Index Netting Study

Photos top to bottom
Ice fishing on Great Bear Lake © George Tackazo
Mackenzie River fish camp © Robert Kershaw
Matthew Perriot, Loche Lake © Robert Kershaw
Jeffery Jackson checking net © Robert Kershaw

KEY FISH SPECIES IN THE SAHTU

ARCTIC GRAYLING / T'áe



The arctic grayling is a beautiful fish: dark blue on the back and purple grey on the sides. A distinctive characteristic is its large, sail-like dorsal fin, which is coloured a blackish blue with violet spots.

Average weights are from 0.5 to 1 kg (1 to 2 lbs.), but the world record arctic grayling was caught in the Great Bear Lake area and weighed 2.7 kg (6 lbs.).

In the Sahtu, the grayling is particularly common in the Mackenzie, Great Bear and Anderson drainages. During the summer, they can be caught in cold, swift rivers and in bays of some larger lakes.

LAKE TROUT / Sahba

Lake trout are coloured with light spots on a darker background and a light-coloured belly. The background colour may vary from light green or grey to dark green, brown or black.

The lake trout is found throughout the Mackenzie drainage systems. Although most angling has occurred on Great Bear Lake, “lakers” are plentiful and provide spectacular sport in hundreds of fast-flowing rivers and streams. The best trophy recorded was a world record catch from Great Bear Lake weighing 33 kg (74 lbs). Many others have come close to this, and 13 to 18 kg (30 to 40 lbs.) fish are common.



JACKFISH (PIKE) / ?óhda



Pike, or jackfish, prefer warm, slow, heavily-vegetated rivers, or shallow, warm, weedy bays of lakes. They occur throughout most of mainland Northwest Territories. They have a long body with a dark green to brown colour along their back. The sides are lighter and marked with 7 to 9 irregular vertical rows of yellow to white, bean-shaped spots. Pike generally run between 2 and 7 kg (5 to 15 lbs.), but many pike weighing 13 to 18 kg (30 to 40 lbs.) have been taken

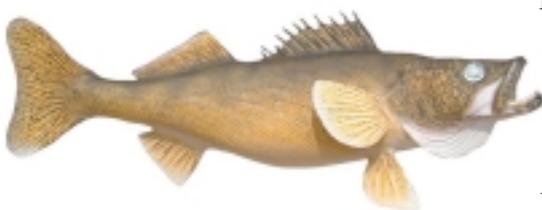
LAKE WHITEFISH / Luge wá

The lake, or humpback, whitefish occurs mainly in lakes, although some are taken in larger rivers and some in lakes with brackish waters. It is a large and somewhat egg-shaped fish with silver sides that may shade to dark or olive brown. The snout overhangs the lower jaw and has two flaps between the openings of each nostril.

The whitefish is mainly a bottom feeder, eating freshwater clams, snails, insects and invertebrates. Some may feed on plankton. Spawning takes place in the fall on rocky reefs in lakes or the shallows of rivers.



WALLEYE / ?éhch'íq



The walleye is a member of the perch family and has sharp teeth and two dorsal fins on its back, the front one supported by large spines. Walleye are olive-brown flecked with gold, shading to a white belly. The large, silvery eyes are distinctive.

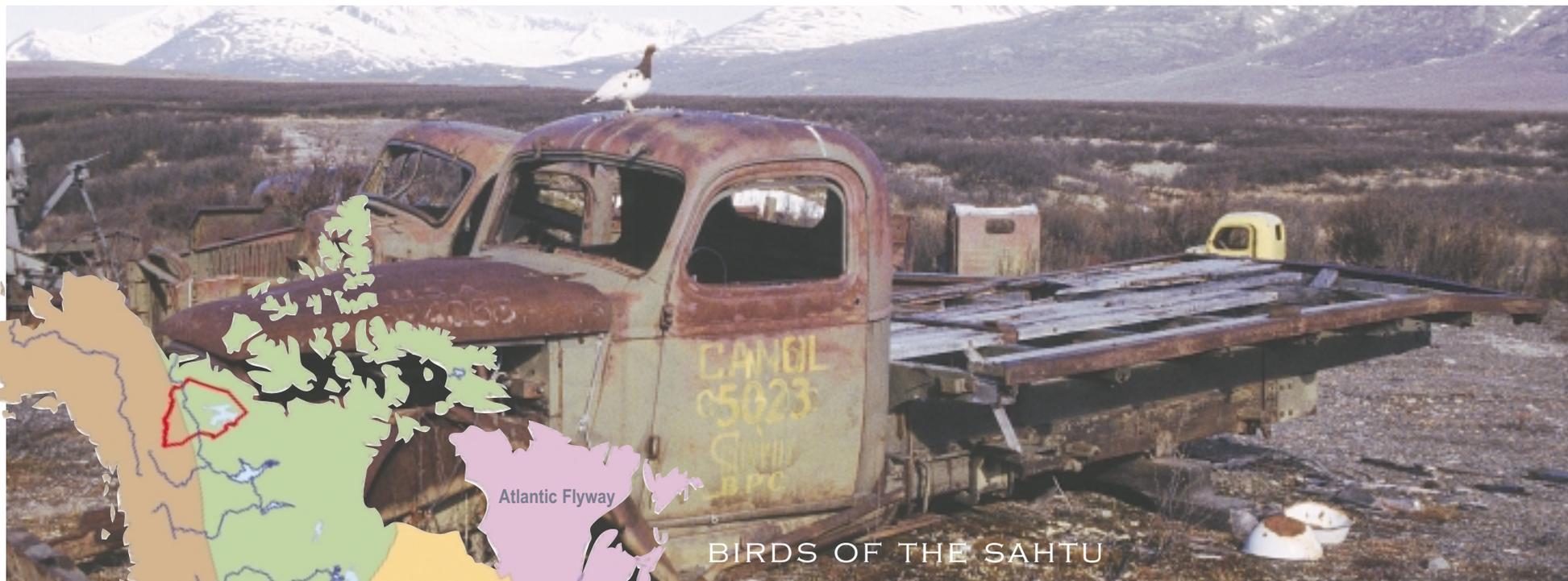
Also known as doré or pickerel, walleye are plentiful in smaller lakes to the south, but are less common in the Sahtu.

Walleye generally run up to 2.5 kg (5 lbs.). They are easiest to fish in the spring when they are running in the rivers

INCONNU / Sih

Fur trade voyageurs gave this “unknown” fish its name. Locally called Coney, it is a member of the whitefish family. With large scales, dark back, silvery sides, and deeply forked tail fin, it resembles a large herring. Still unknown to many anglers, it is found in the tributaries throughout the Mackenzie River Valley. Weights can average 4-9 kg (9-20 lbs) although some have been reported over 32 kg (70 lbs).





BIRDS OF THE SAHTU

There are four major North American flyways: Atlantic, Mississippi, Central and Pacific Flyways. The Sahtu straddles both the Pacific and Central flyways.

Bird migration is usually thought of as a north-and-south movement, with the lanes of heavier concentration following the coasts, mountain ranges and principal river valleys. Generally, the great routes of migration do conform very closely to major topographical features when these happen to lie in the general direction of the travel to be performed. It happens to work out nicely in North America where the coasts, mountain chains and many of the larger rivers do not depart from a north-and-south alignment. As a result, birds use the Mackenzie Valley, River and Mountains to navigate their way north and south.

Over 90 percent of the bird species in the Sahtu and throughout the Northwest Territories are migratory. In all, 41 families and over 200 species of bird spend time in the Sahtu.

The Sahtu also acts as a “production line” for numerous species. The abundant lakes, ponds and wetlands in the forested portion of the Northwest Territories provide important breeding and nesting habitat for a number of duck species and for other aquatic birds such as geese, loons and grebes.

The Sahtu also contains northern breeding range for species of song birds .

The terms "migration route" and "flyway" are to some extent theoretical concepts. Migration routes may be defined as the lanes of individual travel from any particular breeding ground to the winter quarters of the birds that use them. Flyways, on the other hand, may well be conceived as those broader areas in which related migration routes are associated or blended in a definite geographic region. They are wide arterial highways to which the routes are tributary.



Since 1995, The Tulita Renewable Resources Council, the Government of the Northwest Territories' Department of Resources, Wildlife and Economic Development, and the United States Fish and Wildlife Service have collaborated on a duck banding research project at Willow Lake in Sahtu Settlement Area. Each year, a waterfowl biologist, two assistants and two summer students set 18 funnel traps in August (for an equivalent of 423 trap-nights). Barley is used as bait, around 2300 kg (5000 lb). The primary goal for this site project is to band mallards northern pintail and all other ducks prior to the start of the fall hunting season.

In 1993, standard leg bands were placed on 1348 ducks: 435 American green-winged teals, 312 American wigeons, 298 mallards, 296 northern pintails, 6 blue-winged teals and one American black duck. This total number of ducks banded is similar to the nine-year average for the Willow Lake banding station.

SOME KEY SAHTU SPECIES

ARCTIC TERN

Terns are slender birds with long narrow wings, forked tails, and a pointed bill. The arctic tern (*Sterna paradisaea*) is grey and white with a black cap and red bill. Though it is primarily a sea bird, spending most of its life over the ocean and along the coast, it moves inland during the breeding season and may be found nesting virtually anywhere in the Northwest Territories, near open waters.

Terns are skillful and agile fliers, earning their living by diving into the water in search of small fish. They undertake spectacular migrations, leaving their breeding grounds in the north to fly to the Antarctic Ocean where they winter for a short time over the pack ice. As daylight hours in the Antarctic decrease, the terns start their return journey up the Atlantic and Pacific coasts following the sun as it returns north.



CANADA GOOSE

Although there are many subspecies that vary in size and colour, the Canada goose (*Branta canadensis*) is always readily identified by its black head, black neck and white cheek patch. It breeds throughout the mainland Northwest Territories as well as on some of the arctic islands.

Canada geese are the earliest of all waterfowl to nest. They arrive in the north while the land is still snow-covered and begin nesting as soon as the nest sites are clear. Although they prefer to nest on the ground near water, they employ a greater diversity of nest sites than all other waterfowl. These include marshes, tundra, islands, cliffs, abandoned nests in trees and tops of muskrat or beaver houses.

GYRFALCON

The gyrfalcon (*Falco rusticolus*), the Northwest Territories' ceremonial bird, is the world's largest falcon (50-63 cm tall). The colour of their plumage varies from dark grey throughout the mountains and southern tundra of the NWT to light grey or white in the east and on the Arctic islands.

Gyrfalcon's do not build nests. Eggs are laid and incubated by the female on a cliff ledges or, more usually, in the nests of other species such as ravens and golden eagles. Gyrfalcons nest in April in the Mackenzie Mountains and in May over the rest of their range. The same nesting ledge is frequently used in successive years.



LOONS

Loons are heavy-bodied birds with strong pointed bills, webbed feet, and short stiff tails. The legs are attached far back on the body, and while this makes loons awkward on land, it facilitates swimming and diving. Loons sit low in the water and dive from the surface. They can remain submerged for several minutes if necessary, and can swim very rapidly underwater. Loons are fish eaters, catching their prey while in underwater pursuit. When taking off, they must flap and run across the water's surface a lengthy distance before becoming airborne.

Four species occur in the Northwest Territories: the common loon (*Gavia immer*), the Arctic loon (*Gavia arctica*), the red-throated loon (*Gavia stellata*), and the yellow-billed loon (*Gavia adamsii*). The common loon is found throughout the Northwest Territories during the summer season, with the exception of the Arctic Islands. Both the yellow-billed and Arctic loon can be spotted above the tree-line during the summer season, while the red-throated loon can be found along the arctic coast throughout the summer months.



PEREGRINE FALCON

The peregrine falcon (*Falco peregrinus*) is one of the swiftest birds in the world, able to pursue its prey in high-speed aerial chases, reaching speeds close to 320 km-h in a downward dive. In the arctic, peregrines prey on birds varying in size from small songbirds to ducks and ptarmigan. The falcon swoops down on its prey at high speed and kills it in midair using bill and talons, or stuns it with a blow and kills it on the ground.

Peregrine falcons breed throughout most of the Northwest Territories on high rocky cliff ledges usually near the sea or some smaller body of water, habitat of its prey

PTARMIGAN

All three North American species of ptarmigan are found in the Sahtu: willow (*Lagopus lagopus*), white-tail (*Lagopus leucurus*) and rock ptarmigan (*Lagopus mutus*). Though the species are quite similar in appearance, the willow ptarmigan is a little larger and has a heavier bill. In summer, the brown of the willow ptarmigan is more reddish, while that of the Rock Ptarmigan is paler and more yellowish. In winter, both are white and have black tail feathers however the rock ptarmigan males have a black line through the eye.

As its name suggests, the rock ptarmigan frequents higher, more barren hills than the willow ptarmigan. In the winter, the willow ptarmigan seeks sheltered areas.



RAVENS

Ravens (*Corvus corax*) are the most commonly seen bird year-round in the Northwest Territories. They are large black birds with a thick bill, a shaggy ruff at the throat, and a wedge-shaped tail. In flight, they alternately flap and soar like a hawk.

Ravens are found in a variety of habitats, but are partial to cliffs and rocky mountainous country where they soar and perform acrobatics on the updrafts. They also congregate in settlements where tall buildings permit the same activities. Garbage dumps too are preferred spots as the raven is a scavenger and carrion-eater. Ravens are often seen in the company of wolves feeding on the remains of caribou on frozen lakes in winter.



ROUGH-LEGGED HAWK

The rough-legged hawk (*Buteo lagopus*) is a large hawk (48-60 cm tall), it is a common summer inhabitant of the mountains and the tundra of mainland NWT and the southern Arctic archipelago. Winters are spent throughout the USA.

It is the only arctic hawk whose legs are completely feathered to the base of the toes. It has a broad tail and wings, and flying overhead can be identified by its distinctive black wrist patches. The adult plumage is variable in colours and marking but usually displays a dark patch or shield on the belly and a light tail with a distinct dark edge. A breeding pair builds a large stick nest on cliff ledges or on the ground, and may maintain several nests that are reused in subsequent years. Two or three eggs are laid in late May.

SANDHILL CRANE

Sandhill cranes (*Grus canadensis*) are extremely large birds that are nearly a metre long, with a wingspan of up to 2 m. In flight, they can be identified by their outstretched neck, long trailing legs, and characteristic wing stroke (a quick jerk or flap of the wings upward). Adults are ash-coloured with a bare red patch on the forehead and crown. The voice is a deep incessant kr-r-r-oo, which sounds a bit like a piece of machinery in need of oil. Sandhill cranes may be found throughout most of the Northwest Territories, as far north as Banks Island.



SHORT-EARED OWL

The short-eared owl (*Asio flammeus*) is a medium-sized owl with a brown back, and buffy-yellow head and breast, streaked with brown. Its ear-tufts are small and not usually visible. Unlike most owls, it is active throughout the day, cruising low, over open country, seeking out voles and lemmings. They are common during the breeding season in areas such as tundra, marshes, grasslands, and low scrub country. They breed throughout the mainland.

LESSER SNOW GOOSE

The Lesser Snow Goose (*Chen caerulescens caerulescens*) has two colour phases, white and blue, and were once thought to be separate species. In the white form, adults are white with black wingtips. In the blue form, they are dark grey accompanied by a white head. They have wingspan of about 90 cm and its average weight is 2.2 to 2.7 kg, the male being larger. In the Sahtu, lesser snow geese breed entirely above the treeline.



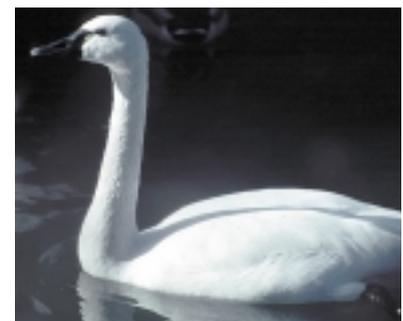
SNOWY OWL

The heaviest of North American owls, the snowy owl (*Nyctea scandiaca*) stands nearly half a metre tall, with a wingspan of almost 1.5 m. Unlike most owls it is active in the day during the arctic summer, as well as at night. As is the case with most diurnal birds of prey—those that are active during the day—the female is larger and heavier than the male. The average weight of the female is 2.3 kg compared to 1.8 kg for the male. The feathers are sometimes pure white, but more generally they are barred and spotted with dark brown, particularly on the female. As an adaptation to its arctic environment, the snowy owl has completely feathered legs and toes. They usually nest above treeline.

TUNDRA SWAN

The tundra swan (*Cygnus columbianus*), formerly known as the whistling swan, is one of the largest birds found in the arctic. It has a wingspan of over 2 metres and a weight of 5-8 kg. It is completely white, with the exception of a slight rusty stain on the head and neck of some birds. The bill is black with bare skin extending back to the eye and sometimes a yellow or orange spot in front of the eye along with black legs.

Tundra swans generally arrive in the Northwest Territories by about mid May. They nest on the mainland above the treeline, as well as on some of the arctic islands and wetlands in the Sahtu.



GRAY JAY

The gray jay (*Perisoreus canadensis*), 25 to 33 centimetres in length, is slightly larger than a robin. Its tail is long and its wings short and rounded. The throat, cheeks and breast, as well as an area round as a penny covering the forehead, are pearl grey. The back of the head is dark grey, the shoulders, back and tail lighter grey, sometimes with a bluish sheen. The legs are black, and light grey "whiskers" surround the base of the black bill.

The gray jay's fearless and venturesome behaviour towards men living and working in the forest has earned it many informal names. "Whiskey-Jack" is the best known, said to come from the mispronunciation of the native name "wiss-ka-tjon" or "wis-ka-chon" turned into "whiskey-John".



On August 25, 1920, the first oil gusher was hit at Norman Wells, bringing a rush of fortune seekers into the area. The discovery of pitchblend and gold marked another turning point in the economy of the Mackenzie District in the 1930s. The opening of the Sômba K'e (Port Radium) uranium mine on Great Bear Lake in 1933 created a new home market for oil. Production of petroleum at Norman Wells increased, especially with the additional demand created in 1937 by the opening of gold mines in Yellowknife. Imperial Oil built a new refinery, and drilled two new wells. Production went from 910 barrels per year in 1932 to over 22,000 in 1938. For the first time, mineral production exceeded fur production in value for the first time in the north.

PETROLEUM EXPLORATION

With the Japanese bombing of Pearl Harbour in 1942, the United States Government planned to ensure a supply of fuel from Norman Wells via a refinery at Whitehorse to Alaska for military use.

The construction of the Canol pipeline for this purpose crossed 580 miles of rugged, mountainous country – much of it unmapped. Thousands of American

troops, many of them blacks from the deep south who had never seen snow before, were sent north to assist in the construction of the Canol road and pipeline. Dene people were hired as guides – for many this was their first experience participating in a wage economy.

The first crude oil was pumped through the pipeline in 1944. Petroleum output rose from 266,882 barrels in 1943 to 1,229,310 barrels in 1944. But by the time the pipeline was completed, the Japanese threat had been countered and other cheaper fuel sources had been found. Production at Norman Wells fell to 353,117 barrels in 1944.



Early oil rig in the Sahtu
Present-day rig near Colville Lake

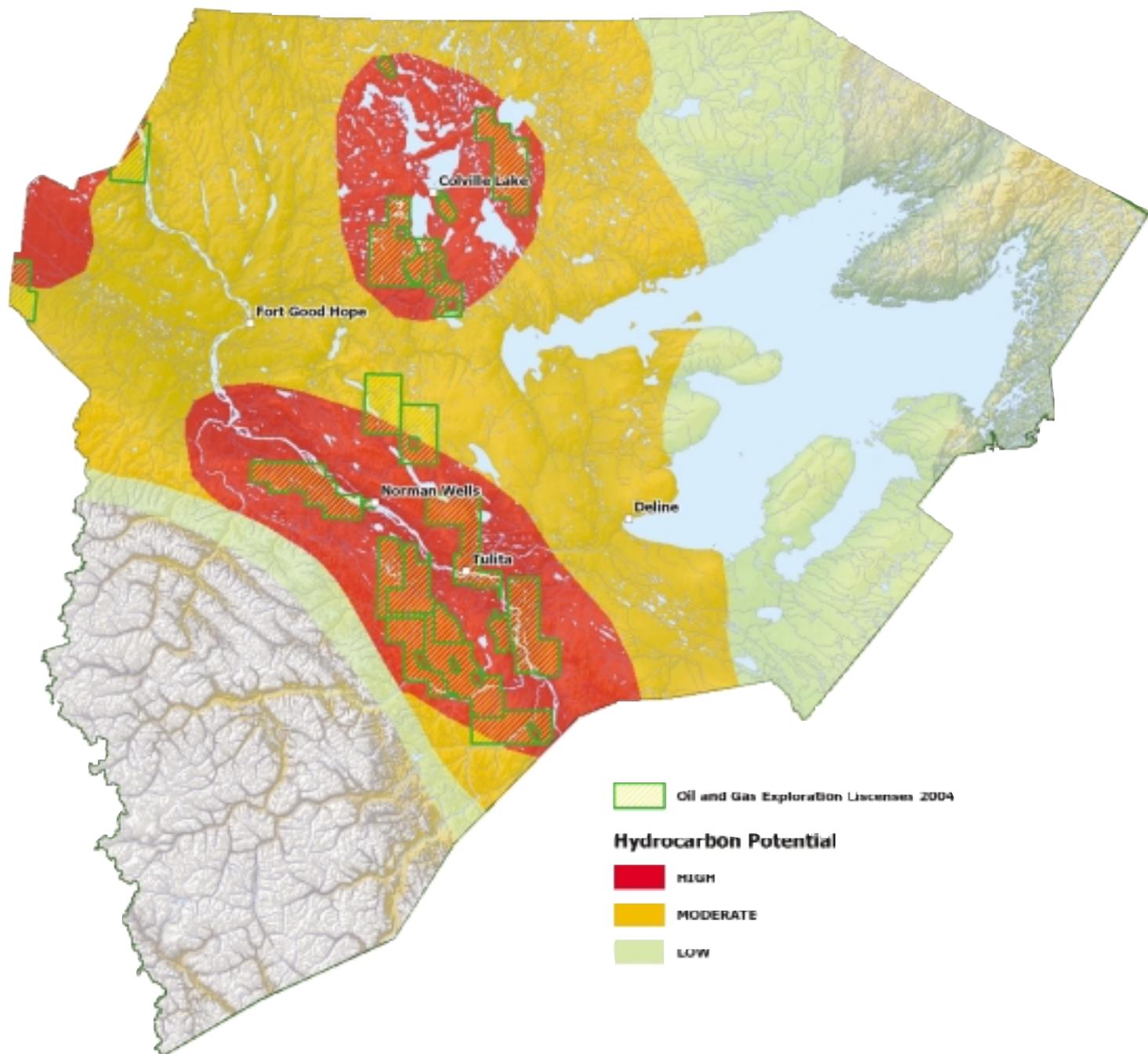
There is one thing I would like to say about the oil in Łe Gohlını (Norman Wells). What was the name of the man who found that oil? It was our own father, Francis Nineye. When he found the oil, he took a sample of it, put it in a lard pail and brought it out into Tulit'a. That same summer, he had an accident and died.

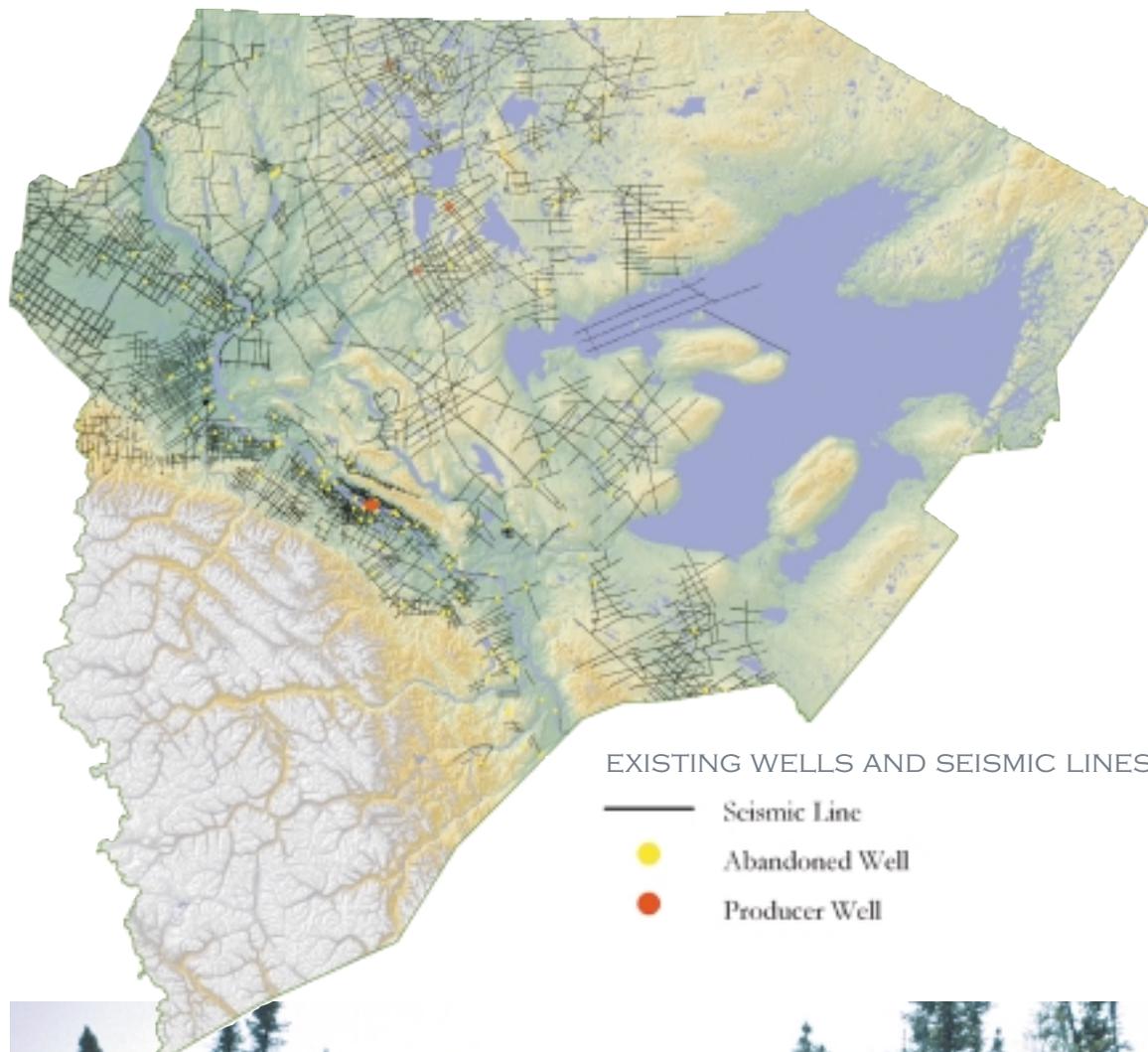
Now the white people turn around and claim they found the oil. My dad was the first guy to find that oil. He was staying right where Āe Gohlını is now, and the Dene had about five or six log shacks. They were trapping and hunting there for a living. He took the sample of that oil in a lard kettle and brought it into Tulit'a. He gave it to Gene Gaudet, the Hudson's Bay Manager, and he sent it out on the boat, it had to be a boat, there was no planes then. We never heard of that oil again and we never got the lard kettle back. We never could do anything about it again. There is no record.

By John Blondin from *Dehcho: "Mom, We've Been Discovered!"* (Dene Cultural Institute, 1989)



top - Rigworker, near Colville Lake
middle - Drilling Island, Norman Wells
bottom - Gas plant, Norman Wells





WHAT ARE SEISMIC LINES?

Most people in the Sahtu easily recognize the long, relatively straight cutlines that criss-cross much of the landscape. These lines are created during the early stages of oil and gas exploration to help “see” what is below the ground. Once a seismic line is cleared, sophisticated equipment is laid out along it to measure acoustic shocks that are sent through the ground. By analysing the variations in the acoustic shocks as they travel through the ground, exploration companies can get an idea of what lies underground and if there is any indication of oil and/or gas.



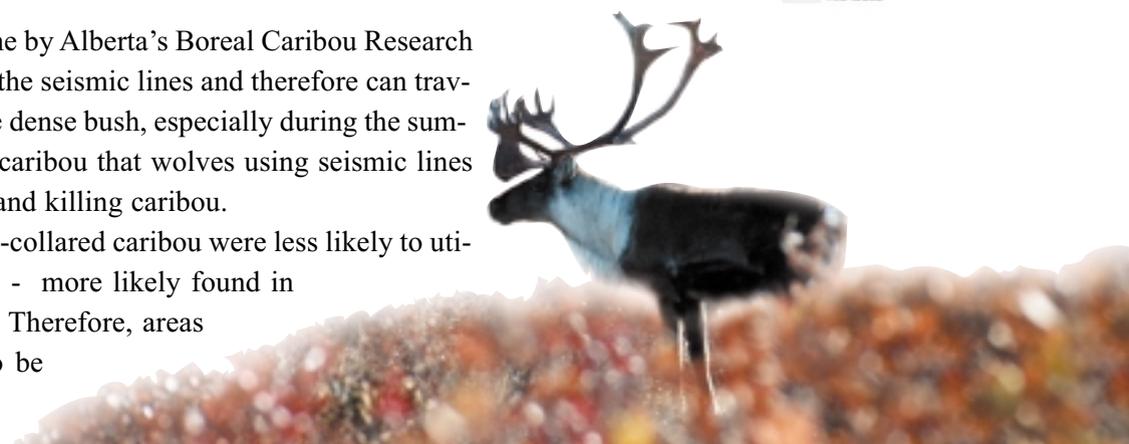
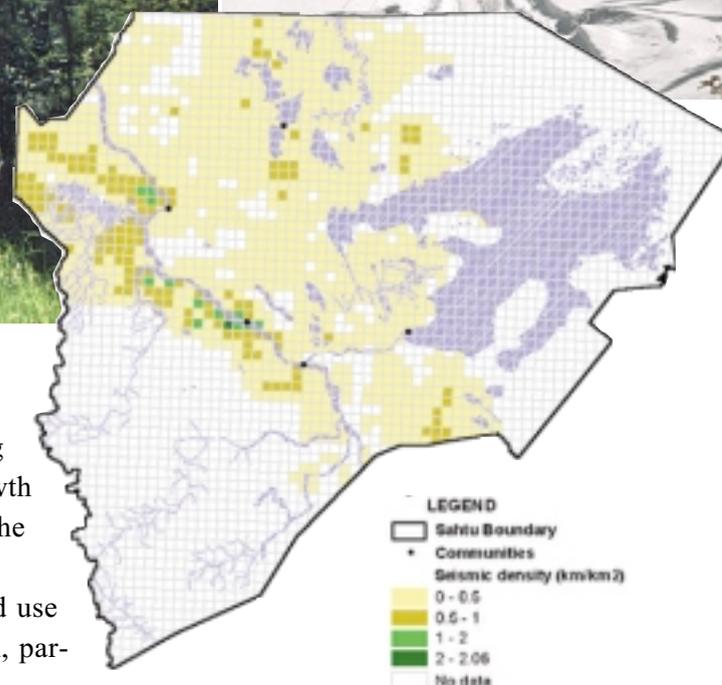
CARIBOU AND SEISMIC LINES

Woodland “boreal” caribou are distinct from the woodland “mountain” caribou even though both are genetically the same subspecies. The key distinction being boreal caribou live in small, rather isolated groups and prefer areas of old growth conifer forest whereas the mountain caribou inhabit the plains and valleys of the Mackenzie Mountain region.

Research shows that boreal caribou are sensitive to the more intensive land use activities found in their habitat such as oil and gas exploration and extraction, particularly the cutting of seismic lines.

Extensive research in northeastern Alberta done by Alberta’s Boreal Caribou Research Program (BCRP) have found that wolves utilize the seismic lines and therefore can travel much faster through the forest than through the dense bush, especially during the summer. It was found by monitoring radio-collared caribou that wolves using seismic lines were able to increase their efficiency at finding and killing caribou.

With this increased risk of predation, the radio-collared caribou were less likely to utilize habitat with a high density of seismic lines - more likely found in areas over 250 meters away from seismic lines. Therefore, areas within 250 meters of seismic are considered to be areas of habitat loss for caribou.



MACKENZIE VALLEY PIPELINE PROPOSAL

In the 1960s, the Sahtu became the focus for major industrial development with the proposal of a Mackenzie Valley pipeline.

A flurry of seismic activity led to the discovery of major gas reserves at Prudhoe Bay, and subsequently beneath the North Slope of Alaska. The construction of a pipeline through Alaska was subject to delays due to environmental concerns and aboriginal claims. There was also opposition to transporting the fuel by tanker along the shores of the Pacific.

In 1967, feasibility studies were launched for a Canadian pipeline route. The pipeline would be 2,600 miles long, stretching from Alaska, across northern Yukon, then south through the Mackenzie Valley. The idea was given added impetus with the discovery of Canadian gas fields in the Beaufort Sea.

The federal government recognised that there could be legal complications in pursuing development, given that provisions of Treaty 11 remained unfulfilled. An initial offer including a financial package and promises of reserves was rejected by the Indian Brotherhood of the Northwest Territories.

In 1973, Chief Francois Paulette of the Fort Smith Chipewyan band filed a “caveat” claiming an interest in lands covering over one million square kilometres. Justice William Morrow decided the Dene case deserved to be heard. The Supreme Court reversed the decision upon appeal by the government, but the initial decision made it clear that aboriginal interests could no longer be ignored.

The Berger Inquiry from 1974-1977 investigated the “terms and conditions that should be imposed” in respect of the proposed pipeline. The Inquiry led to a moratorium on pipeline development in the Mackenzie Valley. It had a lasting impact on the people of the Sahtu in other respects. Research was initiated on aboriginal land use practices. This included the massive Dene Nation mapping project, and a variety of social and economic studies showing the significance of hunting and trapping for the communities. A layer of experienced Dene and Métis negotiators emerged in the Sahtu to lead the communities into the future.



above - proposed Mackenzie Valley pipeline route and alternative Alaskan route
below - Laying the present-day Enbridge Pipeline and route map



THE PRESENT MACKENZIE PIPELINE ROUTE

The present Enbridge Pipeline extends approximately 870 kilometres (540 miles) between Norman Wells, Northwest Territories and Zama Alberta. From Zama, crude oil is transported through the pipeline facilities of others to Edmonton for refining.

As of July 2001, 26,000 barrels of sweet crude are shipped every day to Zama from Norman Wells along the Enbridge-owned pipeline which was completed in 1985. Because of the permafrost, it has to be cooled down to ensure that it does not melt the frozen earth and cause pipeline breaks.



URANIUM AND THE SAHTÚOT'INE

In 1930, prospectors found pitch blend radium and uranium at Great Bear Lake. At first, the main interest was in the radium used for medical purposes. But when the lethal use of uranium was discovered, the Somba K'e (Port Radium) mine was secretly transferred to the Canadian government.

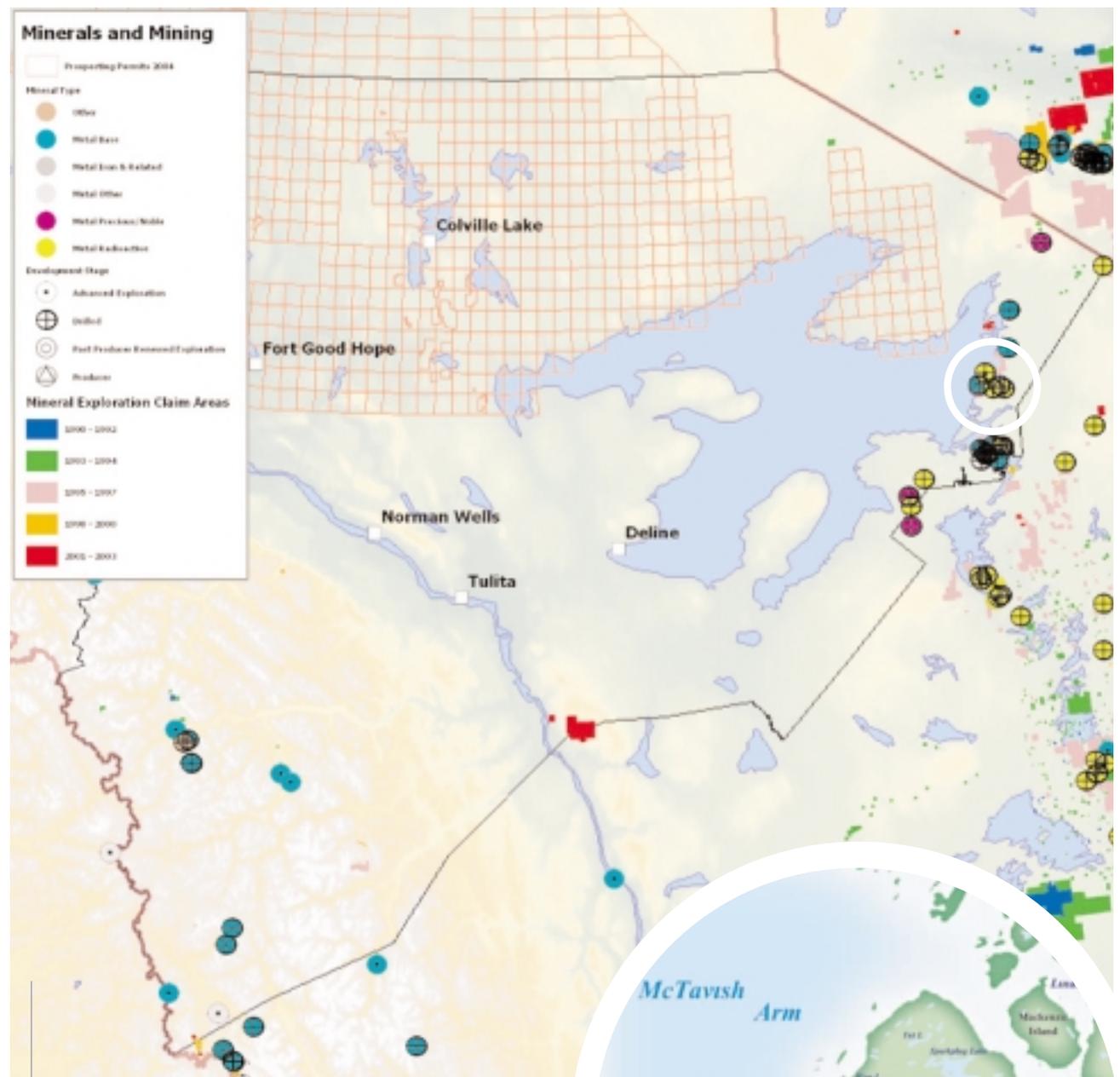
The uranium ore from Great Bear Lake was refined at Port Hope, Ontario, and from there went directly to the Manhattan Project to make an atomic bomb. After the destruction of Hiroshima and Nagasaki, Great Bear Lake uranium ore was sent to the United States for the construction of more bombs.

At its inception, the mine employed few Dene workers. The new demand for uranium led to the employment of Dene people. Many Sahtúot'ine worked as ore carriers, loggers and suppliers of country food for mine employees. Some moved their families close to the mine. The ore had to be transported in 100-pound bags down the Great Bear River by barge, then portaged by truck at the rapids and loaded onto another boat.

At every stop, the bags had to be loaded and unloaded on the backs of the ore carriers. And every time it was handled, the powdery ore would leak from the bags. An estimated 1.7 million tonnes of radioactive tailings were left behind at the mine site when the mine closed down.

The workers and families were not told about the risks from exposure to uranium ore, nor about its connection to the bombing of Hiroshima and Nagasaki. In an effort to make amends, a delegation of Dene people attended the peace ceremonies at Hiroshima in 1998 on the anniversary of the bombing. Bella Modeste was a member of that delegation: "We Dene people are a good people... We hope that blame won't be put on us because we had no knowledge about all that happened in the war."

Deline continues to research the impact of radiation on the environment and the people who lived there.



THE MONEY PLACE

Dene elders knew about the strange substance at what later became known to them as "the money place," Somba K'e, long before they showed it to the white men who claimed to have "discovered" it. For the Sahtúot'ine, this has always been a powerful and dangerous place. George Blondin (1990:78-9) records an ancient story prophesying the grim legacy of Port Radium:

In the old days, the Sahtu Dene traveled across the lake to the Barrenlands every summer, to hunt caribou. Some of these Dene hunters were paddling near the shore on the east side of Sahtu (where Port Radium is today) and they came to a place where rocky cliffs rise high over the water. Like all Dene, they believed it was bad medicine to pass in front of this rock: it was said that loud noises came from within it. These particular hunters pulled their canoes out of the water, but decided not to portage...instead they camped near the cliff. During the night everybody was awakened by the singing of the medicine man... In the morning, when the medicine man stopped singing the people at last spoke to him... "Why did you sing all night...?"

"I foresaw many things and I was disturbed," replied the medicine man... The medicine man told them of his strange vision. "I saw people going into a big hole in the ground—strange people, not Dene. Their skin was white ... [and] they were going into a hole with all kinds of ... tools and machines... On the surface where they lived, there were strange houses with smoke coming out of them... I saw ... big boats with smoke coming out of them, going back and forth on the river. And I saw a flying bird—a big one. They were loading it with things..." "I watched them and finally saw what they were making with whatever they were digging out of the hole—it was something long, like a stick. I wanted to know what it was for—I saw what harm it would do when the big bird dropped this thing on people—they all died from this long stick, which burned everyone... But it isn't for now; it's a long time in the future. It will come after we are all dead."

From Sahtu Heritage Places and Sites Joint Working Group, Rakekée Gok'é Godi: Places We Take Care Of.



old core boxes, Port Radium

RENEWABLE RESOURCE MANAGEMENT

Renewable resources (fish, wildlife, and forests) have sustained the people of the Mackenzie Basin for countless years. In the past, each part of the resource base was managed separately without consideration of how it might be related to the whole. This division often allowed conflicting resource policy to develop.

Resource management has changed over the years, but many people in the Sahtu still have an intimate relationship with the land. The communities use renewable resources in a holistic way – for food, healing medicines, spiritual sustenance, cultural and heritage activities, recreation and income.

In 2000, the Sahtu Land Use Planning Board undertook a Resource Mapping project. The project focused on interviewing people about their uses and knowledge of trapping, timber, fish and plants. People provided the most detailed information about fish harvesting, showing the importance of fish as a subsistence food.

The study showed that people use timber resources for a wide variety of purposes, including traditional arts, healing, construction and firewood. This is reflected in their specific knowledge of the variety of timber available, where drywood, rotten wood and driftwood are included as separate categories. Campsites for hunting, trapping or recreation would often be selected specifically because of the quality of the surrounding timber stand.

Berries and plants are also important resources for people. Berry picking is an important activity for women in the fall. Many people, especially elders, continue to use plants and trees for medicinal purposes.

From "Renewable Resource Potentials for Alternative Development in the Mackenzie River Region," by John T'Seleie and Robert Ruttan, in Dene Rights: Supporting Research and Documents, Vol. 5, Dene Development.

Fisheries are probably the most important renewable resource in the Northwest Territories in terms of quantity and potential for future economic development. Their value as a domestic resource of native people has been clearly documented.

In order that all of the future demands on the fisheries be met, the resource must be safeguarded from pollution and other environmental damage such as over-fishing and hazards such as large dams and other river uses which destroy or damage spawning areas or block migration between critical seasonal habitats.

Furbearing mammals have been the major source of income for native people from the beginning of the fur trade until recent years. Although socioeconomic changes have caused a 'decline in the fur industry,' many individuals still trap for profit and as a way of life.

Forest resource productivity in the north is low and timber growth is very slow; up to 200 years may be required to grow a merchantable tree. While existing sawmills are not all recognised as highly profitable ventures, they contribute substantially to the local economies by furnishing seasonal jobs and locally needed products.

Limited operation mills designed to serve the needs of small communities may well prove to be the most efficient way of utilising the irregularly distributed timber resources of the upper Mackenzie Basin. Careful planning and appropriate safeguards reduces or avoids deleterious impacts. Future management of northern forests also considers the value of forests as a critical wildlife habitat and important in the protection of watersheds.



Pictures top to bottom
Drying fish
Stretching beaver skins, Fort Good Hope
Fort Good Hope community sawmill

SAHTU SETTLEMENT HARVEST STUDY

The Sahtu Settlement Harvest Study is an important project required under the Sahtu Dene and Métis Comprehensive Land Claim Agreement (13.5.6) and is the responsibility of the Sahtu Renewable Resources Board (SRRB).

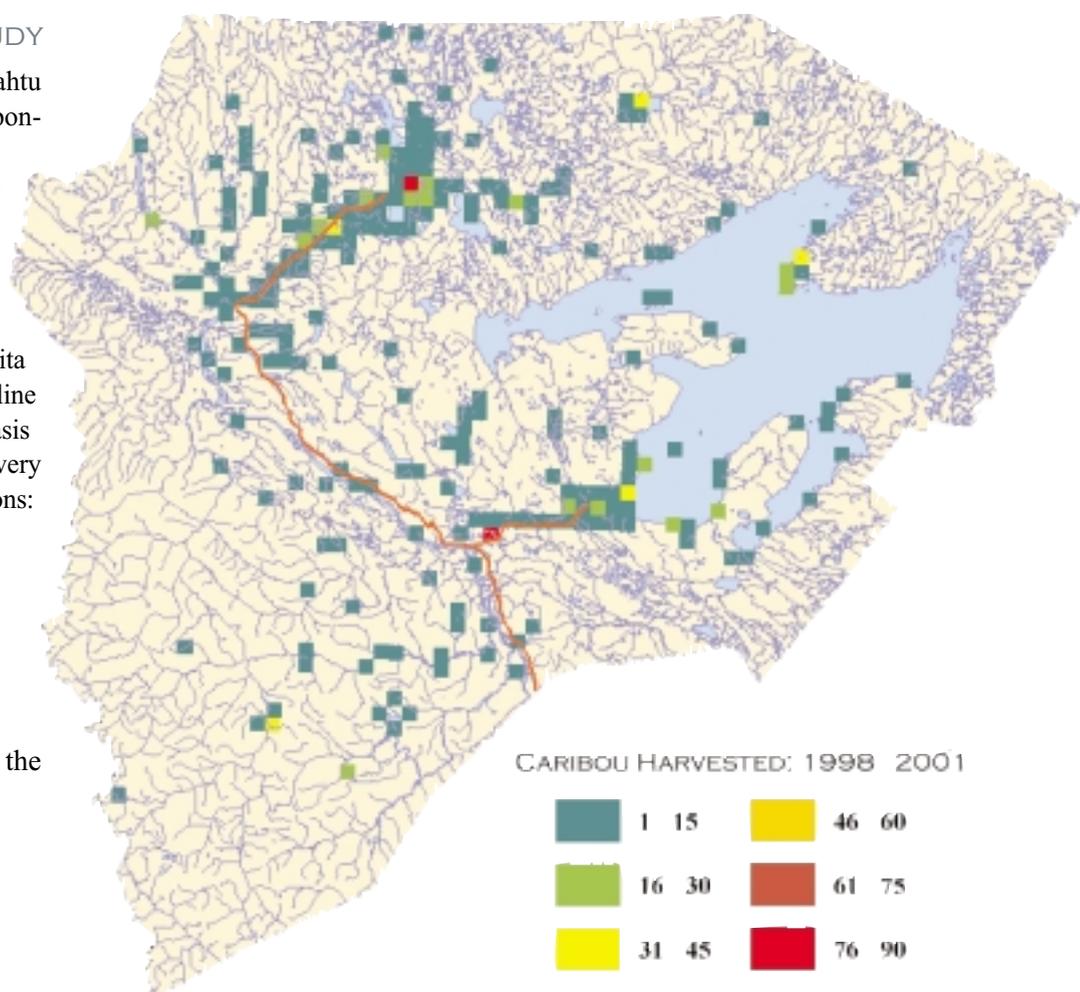
The most recent Sahtu Settlement Harvest Study of Sahtu Dene and Métis hunters, trappers and fishers counted the number of animals, fish and birds currently harvested by Sahtu Dene and Métis throughout a five-year period (1998-2003). The study is confidential; harvester names are not released and information collected not used to prosecute harvesters.

The communities of Colville Lake, Fort Good Hope, Norman Wells and Tulita began participating in the Harvest Study in April 1998. The community of Deline began participating in January 1999. Harvest data was collected on a monthly basis by a community field-worker using a census approach – the aim was to interview every eligible harvester in the Sahtu. An eligible harvester met all the following conditions:

- Is a Sahtu Dene, Métis or non-participant of the claim who provides for their Sahtu Dene-Métis family
- Currently resides in the Sahtu Settlement Area
- Is 16 years of age or over
- Currently hunts, fishes and/or traps

Data collected is entered in the Harvest Study Database. Once completed, the database will be used as a tool by the SRRB to do two main things:

- Make effective management decisions regarding the land and natural resources in the Sahtu
- Determine the Sahtu Basic Needs Level, which is the number of animals required to feed all Sahtu, Dene and Metis households each year so their harvesting traditions can be protected.



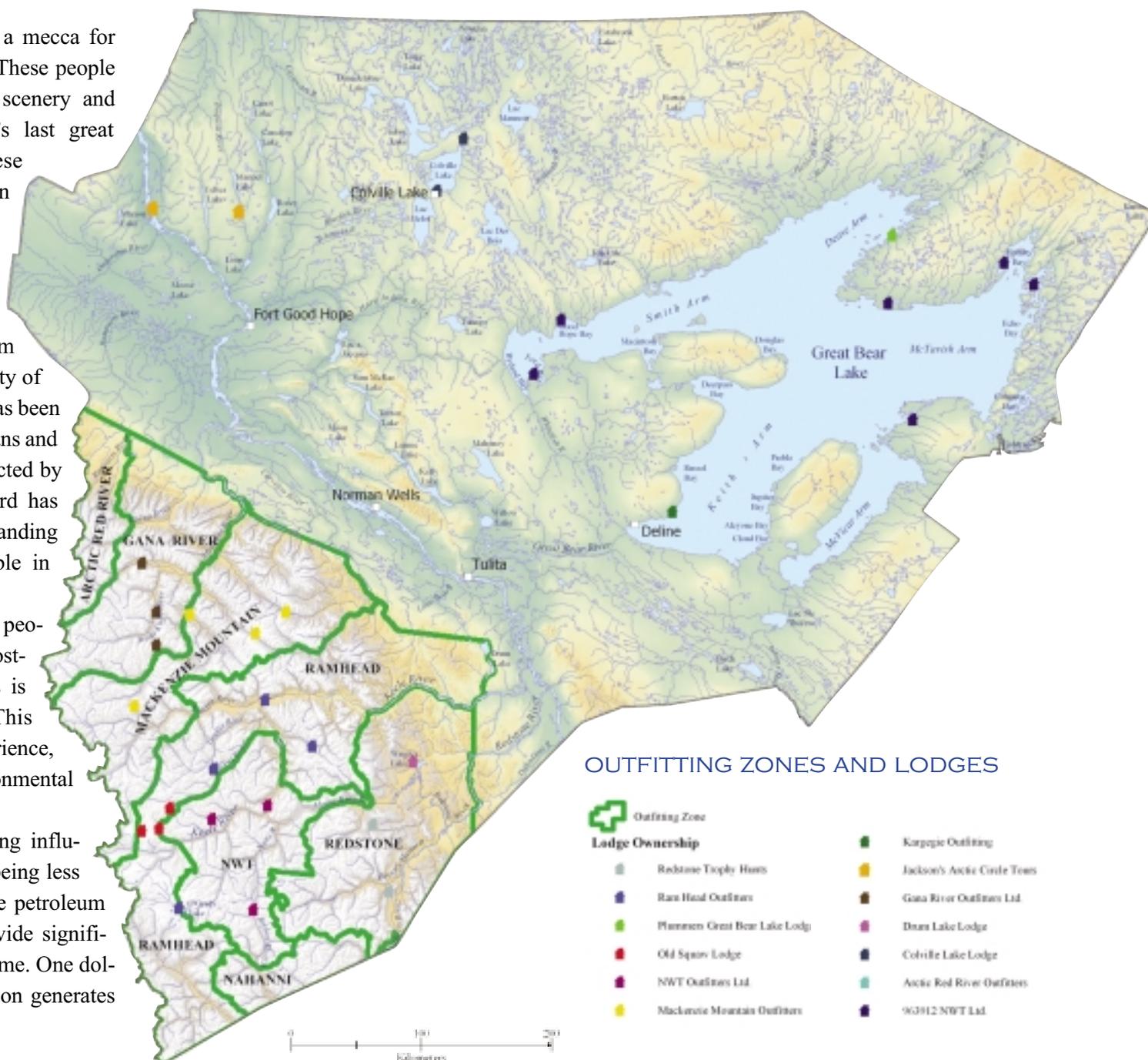
TOURISM

In summer, the Sahtu becomes a mecca for adventurers from other places. These people are seeking to experience the scenery and wildlife of one of the world's last great wildernesses. Increasingly, these people are having an impact on the economy of the Sahtu.

Overall, tourism has been expanding. Hunting and fishing has historically been the strongest sector in the tourism business. However, the popularity of canoeing, kayaking and hiking has been growing in recent years. Americans and Europeans in particular are attracted by the cheap dollar. As well, word has been spreading about the outstanding experience and services available in the Sahtu.

The logistics of transporting people into the area by air can be costly. But the number of tourists is proportionately smaller. This enhances the wilderness experience, and reduces the social and environmental impacts.

Tourism can have a stabilizing influence on the regional economy, being less subject to the fluctuations of the petroleum industry. Tourism tends to provide significant jobs over a long period of time. One dollar spent by a tourist in the region generates about \$3 of business on average.



SPRING HUNT A FAMILY TRADITION

By Teri Bavard, Aurora College, Tulita

The dictionary says that a tradition is a belief or custom which is handed down from generation to generation. In some families, it is a tradition to open presents after the midnight mass on Christmas Eve, or to eat turkey and have the family over on Thanksgiving.

My family has many customs and traditions. One that I especially like is the tradition of going out on the land for spring hunt.

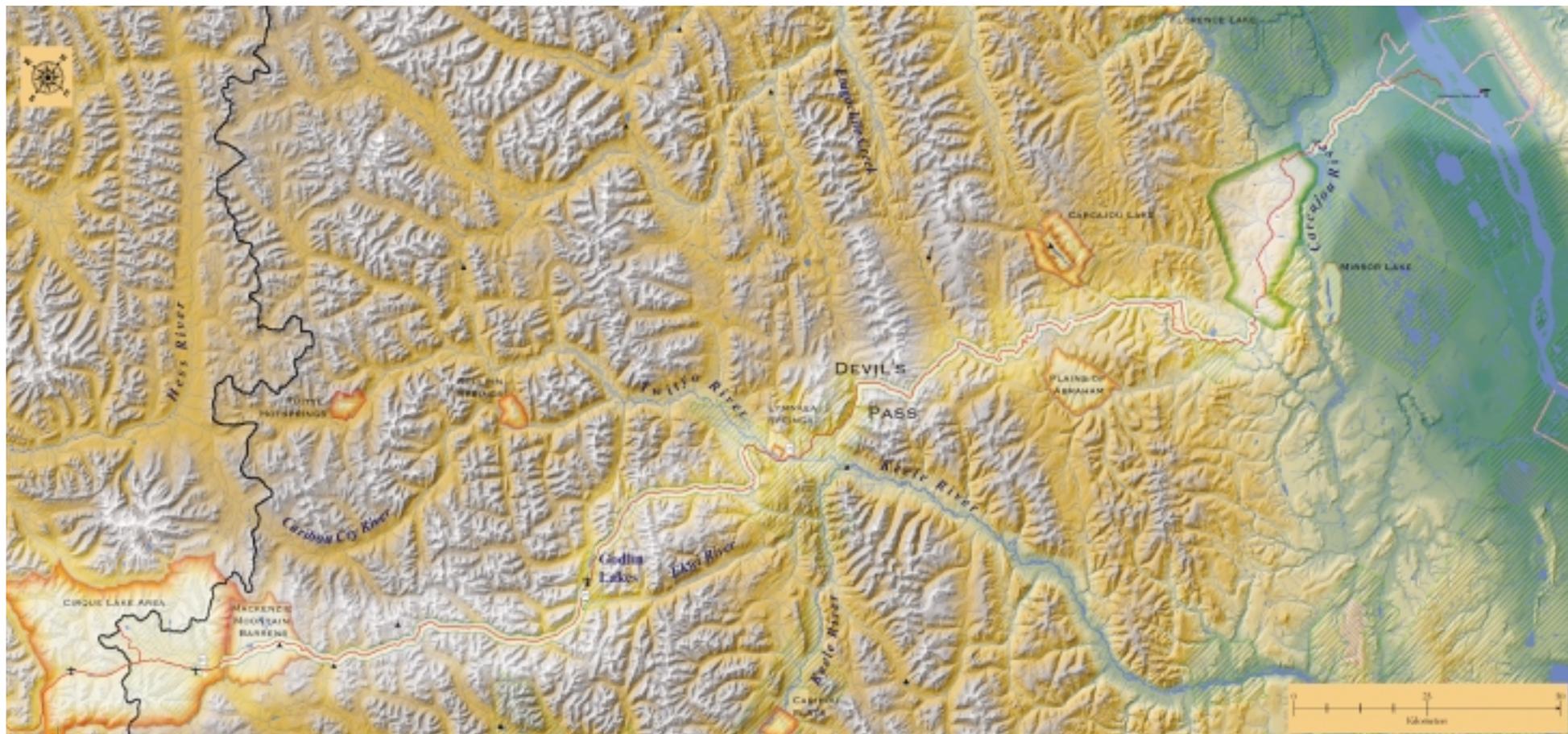
In April, when it is early spring, our family and relatives get together and help each other to go to the campsite up the Mackenzie River before the ice melts. We use the skidoo to take the things in the bush. After breakup, we return to town by boat. It takes just one day to get there.

The tradition of spring hunt is carried on from our ancestors. At least that is what I believe. Following the old ways, many of the people of our community still go out on the land. Traditions are important because it is a way of keeping families together and being there for each other.

We like it out on the land. It is a lot of work, but we enjoy being out on the land with the fresh air. There are many things to do, such as setting snares or just going for a walk to see the beautiful scenery.

I really enjoy the bush, and it is good to know that my children are learning how to live on the land. I especially like the quietness and the peacefulness, and listening to the birds sing. It is a wonderful feeling to experience. You feel free out there on the land.

CANOL TRAIL



The abandoned Canol Road winds its way for 372 km from the Norman Wells oilfield, across the broad Mackenzie River valley, through several mountain ranges, over the Mackenzie Mountain Barrens and up to MacMillan Pass on the Continental Divide, before passing into the Yukon. The raised roadbed provides an opportunity to traverse many portions of the route. Landslides and washed-out bridges make some areas impossible or very difficult to ford.

The Canol Road project was conceived during World War II, when Japanese warplanes attacked petroleum installations in the Aleutian Islands of Alaska. With Pacific shipping and coastal facilities at risk, the Norman Wells oilfield became strategically important. Between 1942 and 1945, more than \$300 million was spent, and 30,000 people were employed, to install 1600 km of telephone lines, lay 2650 km of 4- and 6-inch pipe, and construct an accompanying road to provide access to the pumping stations which lifted the oil over high passes.

By the time the pipeline was completed, the Japanese had been driven from the Aleutian Islands, and the pipeline lost its importance. In April of 1945, after less than a year of operation, the entire project was abandoned. Pump engines and most pipe was salvaged, but a lot of other equipment was simply abandoned. Sixty years later, the remains of pumping stations, road camps, bridges and trucks can still be seen along the trail.

The route has recently been designated the Canol Heritage Trail, and has been given National Historic Site status.



top- Trail switchback
right - Bridge remains
left - Fording river
© SLUPB

The Government of the Northwest Territories published a 30-page Hiker's Guide to the Canol Heritage Trail. Guide contains section maps, important notes about river crossings and trail conditions, and other important information for hikers. The booklet is available from:

Resources, Wildlife and Economic Development
Government of the Northwest Territories
Box 130, Norman Wells, NT, Canada X0E 0V0
Phone: (867) 587-3500

APPENDIX

CHECKLIST OF BIRDS IN THE SAHTU

BREEDING CODES (BR) *Note: This list is abbreviated from the original data*

CB - Confirmed Breeding

- Nest building or adult carrying nest material; code not used for wrens or woodpeckers
- Distraction display or injury feigning
- Used nest or egg shells found
- Recently fledged young or downy young
- Occupied nest indicated by adult entering or leaving nest site or adult seen incubating
- Adult seen carrying food or faecal sac of young
- Nest with eggs
- Nest with young

PB - Probable Breeding

- Pair observed in suitable nesting habitat
- Territory presumed by nesting behaviour at same location on at least twice a week.
- Courtship behaviour between a male and a female
- Visiting probable nest site, without other evidence
- Nest building/excavation of nest hole by Wrens or Woodpeckers

M - Migrant

V - Vagrant or rare (less than 5 observations or only reported before 1989)

SPECIES	BR	SPECIES	BR	SPECIES	BR	SPECIES	BR
Red-throated Loon	PB	White-tailed Ptarmigan	PB	Thick-billed Murre		Cedar Waxwing	
Pacific Loon		Ruffed Grouse	CB	Razorbill		European Starling (CB 1970s)	V
Common Loon	CB	Sharp-tailed Grouse	CB	Black Guillemot		Tennessee Warbler	V
Yellow-billed Loon	M	Yellow Rail		Atlantic Puffin		Orange-crowned Warbler	CB
Pied-billed grebe		Sora	CB	Mourning Dove	V	Yellow Warbler	CB
Horned Grebe	CB	American Coot	CB	Great Horned Owl	CB	Magnolia Warbler	PB
Red-necked Grebe	PB	Sandhill Crane	CB	Snowy Owl	M	Yellow-rumped Warbler	CB
Eared Grebe		Whooping Crane	M	Northern Hawk Owl	PB	Cape May Warbler	
Northern Fulmar		Black-bellied Plover	M	Barred Owl		Palm Warbler	CB
Greater Shearwater		American Golden Plover	CB	Great Gray Owl	PB	Bay-breasted Warbler	
American White Pelican	V	Common Ringed Plover		Long-eared Owl	PB	Black-and-White Warbler	PB
Double-crested Cormorant		Semipalmated Plover	PB	Short-eared Owl	CB	Blackpoll Warbler	CB
American Bittern	V	Killdeer	CB	Boreal Owl	CB	Mourning Warbler	
Tundra Swan	M	American Avocet		Common Nighthawk	CB	McGillivray's Warbler	
Trumpeter Swan	CB	Greater Yellowlegs	V	Belted Kingfisher	CB	Connecticut Warbler	
Greater White-fronted Goose	M	Lesser Yellowlegs	CB	Yellow-bellied Sapsucker	PB	Canada Warbler	
Snow Goose	M	Solitary Sandpiper	CB	Downy Woodpecker	PB	Wilson's Warbler	PB
Ross' Goose		Wandering Tattler	PB	Hairy Woodpecker	PB	Ovenbird	
Brant		Spotted Sandpiper	CB	Three-toed Woodpecker	CB	Northern Waterthrush	CB
Canada Goose	CB	Upland Sandpiper	CB	Black-backed Woodpecker	CB	Common Yellowthroat	CB
Green-winged Teal	CB	Eskimo Curlew (CB 1880s)	M	Northern Flicker	CB	American Redstart	CB
American Black Duck	V	Whimbrel	M	Pileated Woodpecker		Western Tanager	V
Mallard	CB	Hudsonian Godwit	V	Olive-sided Flycatcher	CB	American Tree Sparrow	CB
Northern Pintail	CB	Marbled Godwit	V	Western Wood-pewee		Chipping Sparrow	CB
Blue-winged Teal	CB	Ruddy Turnstone	M	Yellow-bellied Flycatcher	CB	Clay-colored Sparrow	CB
Northern Shoveler	CB	Red Knot		Alder Flycatcher	CB	Vesper Sparrow	V
Gadwall	PB	Sanderling		Least Flycatcher	CB	Savannah Sparrow	CB
American Wigeon	CB	Semipalmated Sandpiper	M	Hammond's Flycatcher		LeConte's Sparrow	V
Canvasback	PB	Western Sandpiper	V	Eastern Phoebe	CB	Nelson's Sharp-tailed Sparrow	
Redhead	M	Least Sandpiper	M	Say's Phoebe	CB	Fox Sparrow	CB
Ring-necked Duck	PB	White-rumped Sandpiper	M	Eastern Kingbird	CB	Song Sparrow	V
Greater Scaup	CB	Baird's Sandpiper	M	Northern Shrike	M	Lincoln's Sparrow	CB
Lesser Scaup	CB	Pectoral Sandpiper	M	Blue-headed Vireo	PB	Swamp Sparrow	CB
Common Eider		Purple Sandpiper		Warbling Vireo	CB	White-throated Sparrow	PB
King Eider		Dunlin		Red-eyed Vireo	PB	Golden-crowned Sparrow	
Harlequin Duck	CB	Stilt Sandpiper	M	Philadelphia Vireo		Harris's Sparrow	PB
Long-tailed Duck	M	Buff-breasted Sandpiper	M	Gray Jay	CB	White-crowned Sparrow	CB
Black Scoter		Short-billed Dowitcher	V	Black-billed Magpie	CB	Dark-eyed Junco	CB
Surf Scoter	PB	Long-billed Dowitcher	M	American Crow		Lapland Longspur	PB
White-winged Scoter	PB	Common Snipe	CB	Common Raven	CB	Smith's Longspur	M
Common Goldeneye	PB	Wilson's Phalarope	V	Horned Lark	CB	Snow Bunting	M
Barrow's Goldeneye	PB	Red-necked Phalarope	M	Tree Swallow	CB	Rose-breasted Grosbeak	
Bufflehead	CB	Red Phalarope		Violet-green Swallow		Red-winged Blackbird	CB
Hooded Merganser		Pomarine Jaeger		Bank Swallow	CB	Yellow-headed Blackbird	
Common Merganser	PB	Parasitic Jaeger	CB	Cliff Swallow	CB	Rusty Blackbird	CB
Red-breasted Merganser	PB	Long-tailed Jaeger	CB	Barn Swallow	CB	Brewer's Blackbird	V
Ruddy Duck	V	Franklin's Gull		Black-capped Chickadee	PB	Common Grackle	V
Osprey	CB	Little Gull		Gray-headed Chickadee		Brown-headed Cowbird	PB
Bald Eagle	CB	Bonaparte's Gull	PB	Boreal Chickadee	CB	Gray-crowned Rosy Finch	CB
Golden Eagle	CB	Mew Gull	CB	Red-breasted Nuthatch		Pine Grosbeak	PB
Northern Harrier	CB	Ring-billed Gull	V	Winter Wren		Purple Finch	V
Sharp-shinned Hawk	PB	California Gull	V	Marsh Wren		Red Crossbill	
Cooper's Hawk		Herring Gull	CB	American Dipper	PB	White-winged Crossbill	PB
Northern Goshawk	CB	Thayer's Gull	V	Golden-crowned Kinglet		Common Redpoll	CB
Swainson's Hawk	V	Iceland Gull		Ruby-crowned Kinglet	CB	Hoary Redpoll	M
Red-tailed Hawk	CB	Glaucous Gull	M	Northern Wheatear	V	Pine Siskin	
Rough-legged Hawk	M	Great Black-backed Gull		Mountain Bluebird	CB	Evening Grosbeak	V
Broad-winged Hawk		Black-legged Kittiwake		Townsend's Solitaire	CB	House Sparrow	
American Kestrel	CB	Ross's Gull		Gray-cheeked Thrush	PB	Additional Species Not on List	
Merlin	PB	Sabine's Gull		Swainson's Thrush	CB	Bar-tailed godwit	V
Peregrine Falcon	CB	Ivory Gull		Hermit Thrush	PB	Lazuli Bunting	V
Gyrfalcon	CB	Caspian Tern		American Robin	CB	Cinnamon Teal	V
Spruce Grouse	CB	Common Tern		Varied Thrush	CB	Ruby-throated Hummingbird	V
Blue Grouse		Arctic Tern	PB	Yellow Wagtail		Mallard / Northern pintail hybrid	V
Willow Ptarmigan	CB	Black Tern	CB	American Pipit	PB	Mallard / Black duck hybrid	V
Rock Ptarmigan	CB	Dovekie		Bohemian Waxwing	PB		

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Deline guide and trapper, Morris Modeste, stands on top of one of Gorabe's two prominent red rock outcrops. Also known as Manitou Island, Gorabe, located off the south shore of Great Bear Lake's Keith Arm is a sacred site for the Dene.

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THE SAHTU ATLAS

MAPS AND STORIES FROM THE SAHTU SETTLEMENT AREA IN CANADA'S NORTHWEST TERRITORIES

Over the past decade, the Sahtu has become renowned as a centre for Dene and Métis cultural revitalisation and research, for its internationally significant conservation areas, and as a zone of intensive petroleum and mineral exploration and development. In bringing together stories and maps, this book reveals the key challenge of the current period in the Sahtu that of balancing pressures for development and modernization with the values of environmental conservation, and preserving the access of the Dene and Métis to their cultural heritage on the land.



SAHTU GIS PROJECT



Northwest Territories Resources, Wildlife and Economic Development